CERTIFICATION TEST REPORT

Report no.:
300-ELAB-2526-EPA Rev4 110821

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Init.: JSA/
Order no.: 946206
No. of appendices: 35

Requested by:	Company:	Morsø Jernstøberi A/S
	Address:	Furvej 19
	Postcode/town:	DK-7900 Nykøbing Mors
	Country:	Denmark
	Email:	info@morsoe.com
	Web:	www.morsoe.com

Product: Wood heater type: Morsø 2B Classic 2020

Sample: Receipt at DTI, Aarhus: 1. September 2020

Test period: Date of testing: 2.-4. September 2020

Procedure Testing of a wood heater in accordance with DTI method "ELAB-PP-BR-15" based on a relevant selection of standards and methods:

ASTM E2515-11	Yes
ASTM E3053-17 (Cordwood)	Yes
US EPA Method 28R in combination with ASTM E2780-10 (Cribwood)	No
CSA B415.1-10	Yes
EPA Communication on alternative method for Cordwood testing	Yes

Result: The stove/ meets the requirements of NSPS §40 CFR Part 60.

Remarks: See paragraph 2 - Remarks.

Terms: Accredited testing was carried out in compliance with international requirements, and the general terms and conditions of The Danish Technological Institute. The test results apply to the tested products only. This test report may be reproduced in extract only if the laboratory has approved the extract in writing. Danish Technological Institute is an EU Notified Body with identification number 1235 and DIN Certco test laboratory, PL 168.

Issued: 11. August 2021, Danish Technological Institute, Aarhus, Stoves&Boiler test lab

Signature:

Jes Sig Andersen
Senior Specialist

Max Bjerrum
Quality Assurance

Test reg. no. 300

Jes Sig Andersen
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Content

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1. Introduction

1.1. General

This report concerns testing of a free-standing cast iron wood heater, type Morsø 2B Classic 2020

The certification test report holds 35 annexes. From this 2. revision of the report, do not any longer distinguish between CBI and non-CBI reports. The same unitary report applies for all purposes, meaning only one version of the report is issued.
Please find the full list of annexes in chapter 14.

Figures are stated in European notation, with a comma as the decimal separator and period as the thousand's separator.

1.2. Report revision history overview

Release	Report number	Number of pages (report only)	Issued date
initial	300-ELAB-2526-EPA (CBI and non-CBI)	45 (non-CBI)	18. Nov. 2020
Rev 1	300-ELAB-2526-EPA Rev 1 211221 (CBI and non-CBI)	45 (non-CBI)	21. Jan. 2021
Rev 2	300-ELAB-2526-EPA Rev 2 220621	48	22. June 2021
Rev 3	300-ELAB-2526-EPA Rev 3 250621	49	25. June 2021
Rev 4	300-ELAB-2526-EPA Rev 4 110821	49	11. August 2021

1.3. Revision 1 changes

- New issue date 21. January 2021 and revision # raised to Rev 1
- Clause 3.5 amended with the laboratory's declaration of test appropriateness, starting with "Based on the evidence above"
- Clause 3.6 amended with the laboratory's declaration of test appropriateness, starting with "Based on the evidence above"
- Clause 3.8 amended with the laboratory's declaration of test appropriateness, starting with "Based on the evidence above"
- Annex 35; new annex holding the laboratory hand notes

1.4. Revision 2 changes

- New issue date 22. June 2021 and revision # raised to Rev 2
- Clause 1.1 General amended with notice of abandoning of distinguishing between a CBI and a non-CBI report. Now one unitary report applies for all purposes.
- New clause 1.3 added, holding the EPA list of findings
- Clause 3.2, further elaboration of the reason for discarding of the HF1 test due to a clogged filter
- Clause 4.2, Note added on discarding of the HF1 results
- Report page count raised from 45 to 48

1.5. Revision 3 changes

- New issue date 25. June 2021 and revision # raised to Rev 3
- Clause 7.3, the test string "and the action of the air controls" was added
- Revised Annex 26, Assembly drawings showing in detail how the lower restriction of the air controls is accomplished, notably drawing 2B-148 (Primary Air Controls) showing the bushing which stops the spinner from being closed below three quarters of a turn. Further drawing 2B-511 (Main assy drawing) displaying an explanatory note on the air controls extreme settings, the minimum being 0,75 turn which resembles an effective open valve area of 212 sq mm.
- Revised annex 31a, US Users' manual, on page 9 (printed manual pages 14-15) providing information in a highlighted frame on the nature of the lower air controls restriction and a warning of NOT to tamper with the physical stop.
- Revised annex 31b, CAN(Fr) Users' manual, the same warning

- Revised annex 34, Manufacturers' QA plan, showing on page 4 where and how to check the action of the air controls, again emphasizing that the minimum primary air controls setting is 0,75 turn corresponding to a gap between the spinner and the door on approximately 1 mm
- Report page count raised from 48 to 49

1.6. Revision 4 changes

- New issue date 11. August 2021 and revision # raised to Rev 4
- New clause 1.3 added, describing the report changes from the initial (final) report to the Rev 1 report
- New clause 1.4 added, describing the report changes from the Rev 1 to the Rev 2 report
- New clause 1.5 added, describing the report changes from the Rev 2 to the Rev 3 report
- New clause 1.6 added, describing the report changes from the Rev 3 to the Rev 4 report

1.7. List of Issues found (ref. Sanzhez email of June 10. 2021)

List of Issues Found				
Issue	**Applicable Method/Rule Section**	**Notes**	**How the manufacturer/test lab addressed the issue**	**Clause # or page # where to find addres-sing of irregu-larities**
1. Page 32 "**For the low fire test, after ignition the air valve is throttled to 3 quarters of a revolution open**, and for the medium fire test, after ignition the air valve is throttled to 1 and one quarter of a revolution open." Need to document that the stove cannot burn any lower than the ¾ turn as described in the low burn test. **See additional notes below.**	**40 CFR 60.537 (2)** All documentation pertaining to the certification test used to obtain certification, including the full test report and raw data sheets, laboratory technician notes, calculations, the test results for all test runs, and discussions of the appropriateness and validity of all test runs, including runs attempted but not completed. The retained certification test documentation must include, as applicable, detailed discussion of all anomalies, whether all burn	Manual says that the low fire is fixed and cannot be adjusted further. This means that it was tested at the lowest possible burn rate**. Is that assertion correct?** Need clarification in the TR about the ¾ turn for the low burn setting.	There is a fixed stop in place on production models that prevents the air controls from being closed more that as tested (3/4 of turn), which results in a linear measurement of 1mm between the spinner and the frame. The appliance cannot be turned any lower down than what was tested. This restriction is shown in detail in drawing 2B-148, page 7 of annex 26 (assembly drawings) and further in drawing 2B-511, page 2 of annex 26 (reply clarified the 21/6 2021 by JSA)	Annex 26 (assembly drawings), page 2, the main assy drawing 2B-511 and on page 7, primary air controls assy, drawing 2B-148 (21/6 JSA)

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		rate categories were properly achieved, any data not used in the calculations and, for any test runs not completed, the data that were collected and the reason that the test run was not completed. **The retained certification test also must include documentation that the burn rate for the low burn rate category was no greater than the rate that an operator can achieve in home use and no greater than is advertised by the manufacturer or retailer.**			
2.	Page 36, Discussion of Results doesn't document run appropriateness	**The basis for determining whether or not the appliance has complied with this requirement is based on 40 CFR 60.533(b)(5). Per the requirement, "Documentation must include discussion of each test run and its appropriateness and validity, and must include detailed discussion of all anomalies, whether all burn rate categories were achieved, any data not used in the calculations and, for any test runs not completed, the data collected during**	Revised discussion.	The test run summaries (sections 3.3, 3.5, and 3.7) have been edited to state that the runs were determined to be appropriate. (reply modified the 21/6 by JSA – former page numbers deleted)	End of section 3.3 on page 14; End of section 3.5 on page 18; End of section 3.7 on page 21 (21/6 JSA)

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	the test run and the reason(s) that the test run was not completed and why."			
3. Page 54-56, Annex 3 says, "Sequence of images from the tests, the 5th February 2020" but report indicates test was 9/2/2020.		Date just needs to be changed in the test report.	This was a typo that has been corrected.	Annex 3 cover page; Annex 3 header on pages 2-4 (21/6 JSA)
4. Page 484 – doesn't include proper use of air controls and proper low fire operation. In manufacturer instructions to the lab they included things such as turning controls 3 ¼ for fully open etc.	**40 CFR 60.536 (g)(3)(iii)** Proper use of air controls, including how to establish good combustion and how to ensure good combustion at the lowest burn rate for which the heater is warranted.	Would recommend manufacturer modifying text to give more description on home use instructions on operating the air controls.	User manual instructions have been updated to provide more clarity on various operational settings including images for better guidance (reply modified and clarified the 21/6 by JSA – former page number deleted)	Annex 31a Users' manual (US) page 9; Annex 31b Users' manual (CAN) page 9 (21/6 JSA)
5. Did not see raw data sheets for filter weighing etc. 6. Did not see raw data sheets for dry gas meter for each test run.	**40 CFR 60.533 (b)(5)**	Need filter weight raw data sheets and raw technician notes. **Submit data.**	Technician notes have been added to the report, see Annex 35 Gas meter values are recorded pre- and post test only, in-test monitoring of sample rates and proportionality are done via calibrate flow meters, data from these flow meters are shown on raw data sheets. Calibration certificates by external Force Technology to be seen in Annex 15, page 34-36 (main train – instrument id 144236 tracible to DTIs' instrument database And further page 37-39 (split train – instrument id 144239) (reply amended the 21/6 by JSA – Flow metering details added and former page number deleted)	Annex 35 in its entirety; Annex 21 HF1 Logger data, page 7-11 (main train flow vel. in the right most column, labelled Flow H) and pages 12-16 (split train flow vel. in the left most column, labelled Flow D) And similarly in annexes 22-25 for the remaining tests (21/6 JSA)

7. HF1 was omitted and we see the description in the anomalies section which we find acceptable. 8. HF1 in other sections (tables) needs the same note stating that it was omitted due to a clogged filter.		If the TR is being modified, then please make the appropriate changes to justify the exclusion of HF1. A statement in each table that says: "HF1 was excluded due to a clogged filter."	There are no fewer than 6 references to the fact that HF1 was excluded due to filter issues, including all the relevant summary tables (3.1, **3.2**, 4.1, 4.2, and **11**) As well as the individual run summary section (**3.3**), where else would you have us include this information? (reply amended the 21/6 by JSA – the statement "HF1 was excluded due to a clogged filter" was amended to the explanatory note underneath clause 3.2 'Main results')	Clause 3.2 on page 10; Clause 3.3 on page 14 (bottom); Clause 11 on page 40 (21/6 JSA)

1.8. Scope of testing

The appliance was tested to demonstrate compliance with the NSPS 2020 limits, using the ASTM E3053 ALT-125 Cordwood test method broadly accepted by the administrator. Please find the letter of acceptance enclosed in annex 1.

1.9. Site

Testing was accomplished by Danish Technological Institute, Kongsvang Allé 29, DK-8000 Aarhus C, Denmark in accordance with DTI's accredited EPA test procedure ELAB-PP-BR-15.
The test procedure is amended in annex 14.

1.10. Participants

DTI staff
Testing in the laboratory was accomplished by:

- Jes Sig Andersen, Senior Specialist (lead)
- Rene Lyngsø Hvidberg, Senior specialist (trainee)

Client staff
The test work was witnessed by:

- Frank Juel Nielsen, Morsø Jernstøberi A/S

1.11. Test specimen

The stove was manufactured by:

Company:	Morsø Jernstøberi A/S
Address:	Furvej 6

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Postcode/town: DK-7900 Nykøbing Mors
Country: Denmark

The stove weighs 98 kg.

The stove is not equipped with a catalyst. The landscape type of firebox is deeper that its wide, accommodation up to half a meter wood logs.

Variants: At the time of testing there was no known variants of the 2B Classic 2020 wood heater.

1.12. Description of the wood heater

Appliance Manufacturer: Morsø Jernstøberi A/S

Wood Stove Model: 2B Classic 2020

Type: Freestanding, radiant-type wood fired room heater.

WOOD HEATER DESCRIPTION

Materials of Construction: The unit is constructed primarily of cast iron with a stainless-steel secondary combustion air supplying baffle. The firebox is lined with molded vermiculite firebricks. The feed door has a 145 mm by 158 mm glass panel and one 870 mm by 8 mm glass fiber gasket. The ash door is sealed with one 570 mm by 8 mm glass fiber gasket.

Air Introduction System: Air enters the firebox through a spin-draft located at the front of the appliance at the top of the fuel-loading door. Secondary air enters the appliance through the upper back and supplies a three-step, tiered hollow baffle.

Combustion Control Mechanisms: The combustion air inlet is controlled by a spin draft on the fuel-loading door.

Combustor: N/A.

Internal Baffles: A stainless steel baffle with a ceramic blanket is mounted in the upper portion of the firebox. The flame path is forced to the front of the firebox where it travels up through the opening between the baffle and primary air manifold.

Other Features: N/ A.

Flue Outlet: The 6'' diameter flue outlet is located at the top of the unit.

Firebox volume: 0,01943 m^3 or 0,6826 ft^3 calculated in SolidWorks CAD simulator. Please find the firebox drawing showing details on the firebox dimensions amended in Annex 33

2. Aging prior to testing

The stove had been aged more than 50 hours of operation prior to the certification test while pre-testing at Morsø including:

- The 21st of August 10 hours
- The 24th of August 10 hours
- The 26th of August 10 hours
- The 27th of August 10 hours
- The 28th of August 11 hours

Please find the set of pre-conditioning data in annex 2.

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3. Summary of test results

3.1. Test schedule

The full certification test comprises three HF test runs, one MF test run and one LF test run.

Date	Test I	Test II	Remarks
2-9-2020	HF test	LF test	Both tests valid, however the HF filters clogged
3-9-2020	HF test	MF test	Both tests valid
4-9-2020	HF test	none	Valid HF test

3.2. Main results

Please see also the full set of test results in table of chapter 11 and with more decimals in section 4.10

		Burn rate kg dry matter/hour	Emission grams/hour
#1*	HF1 2-9	1,92	2,3
#2	LF 2-9	0,61	0,1
#3	HF2 3-9	2,05	1,7
#4	MF 3-9	0,92	0,3
#5	HF3 4-9	2,33	1,1
	Weighted average		0,5

*) The HF1 test is discarded of in the weighted average emission calculation. HF1 was excluded due to a clogged filter. Please find details in the test summary below in section 3.3

3.3. Summary of the CS+HF and LF tests the 02-09-2020

Data logger files Id: 2020-09-02_08:43:10 (CS+HF) and 2020-09-02_14:01:25 (LF)

12:19:15	Ignition of the Cold Start part test using the gas torch for 45 seconds. The air valve is set in position 100% open (full action = 3 and one quarter revolution open). 0.604 kg of kindling (10% moisture DB) and 0.913 kg start-up fuel (19,7% moisture DB) was entered
12:20:00	Ignition is over, the door is kept ajar.
12:24:00	The door is closed, and the air valve is maintained in its fully open position
12:47:05	End of the Cold start at 550 grams of embers, which value is taken down. The embers are evened out
12:47:10	Loading of the High Fire fuel load; 4 logs of 3,155 kg beech wood (19.1% moisture DB)
12:47:50	End of loading time after 40 seconds.
	The door was closed right away, and the air valve was maintained in its fully open position, being the High Fire setting allowing maximum output rate
13:19:15	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 8856,9 normal litres
13:40-13:50	The flow rate of the main train needs repetitive adjustments, the filter has taken on to clogging
13:50:45	PM sampling in the main train is suspended and the pair of filters extracted
13:53:50	PM sampling in the main train is resumed on a fresh pair of filters
14:00:30	End of High Fire test cycle at 300 grams of embers (net). The combined bed of ember mass at the end of the High fire test hence amounted 550+300 = 850 g. The bed of embers was evened, and the air valve kept in its fully open position
14:06:00	Loading of the Low Fire fuel load; 5 logs of in total 3,840 kg of firewood (19,5% moisture DB) at platform scale reading 675 grams
14:06:50	End of loading time after 50 seconds has elapsed; the door is closed right away
14:15:35	The air valve is throttled to its final position being ¾ of a revolution open according to the 15% of the fuel load mass combusted criteria
15:06:20	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 9577,91 normal litres
19:19:48	The Low Fire test is over at platform scale reading of 675 grams

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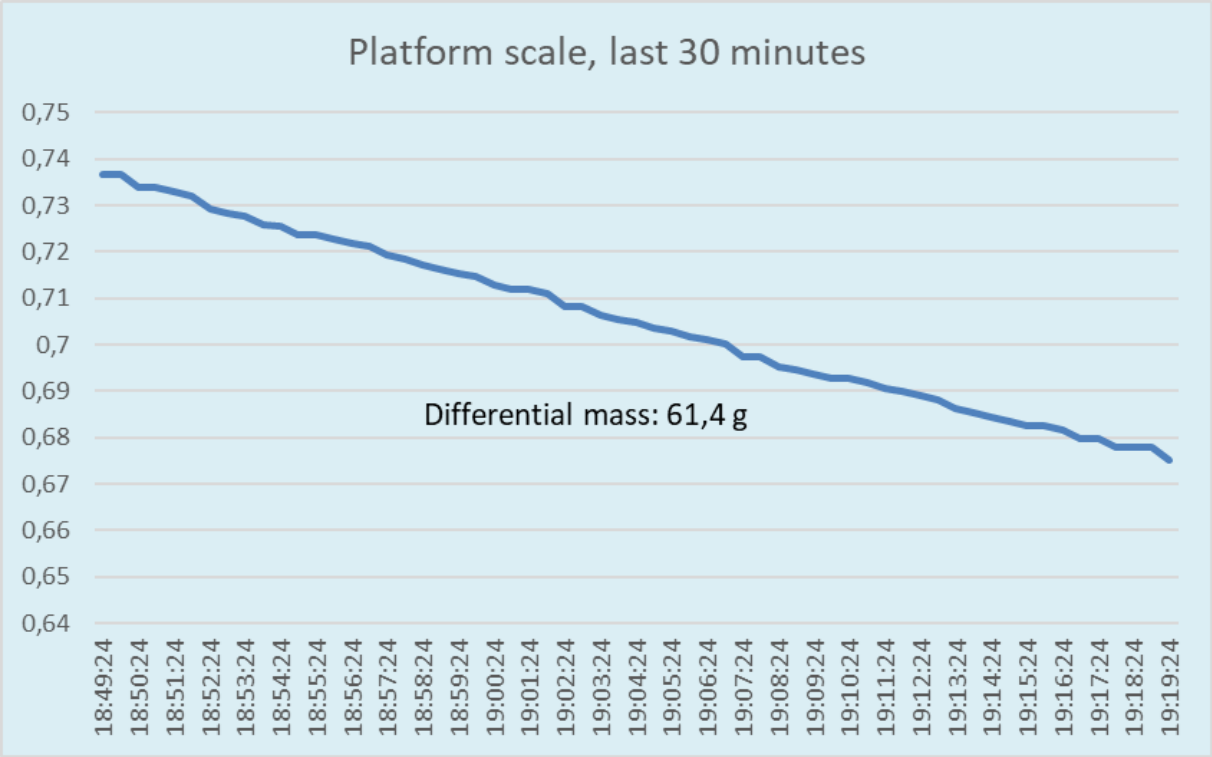
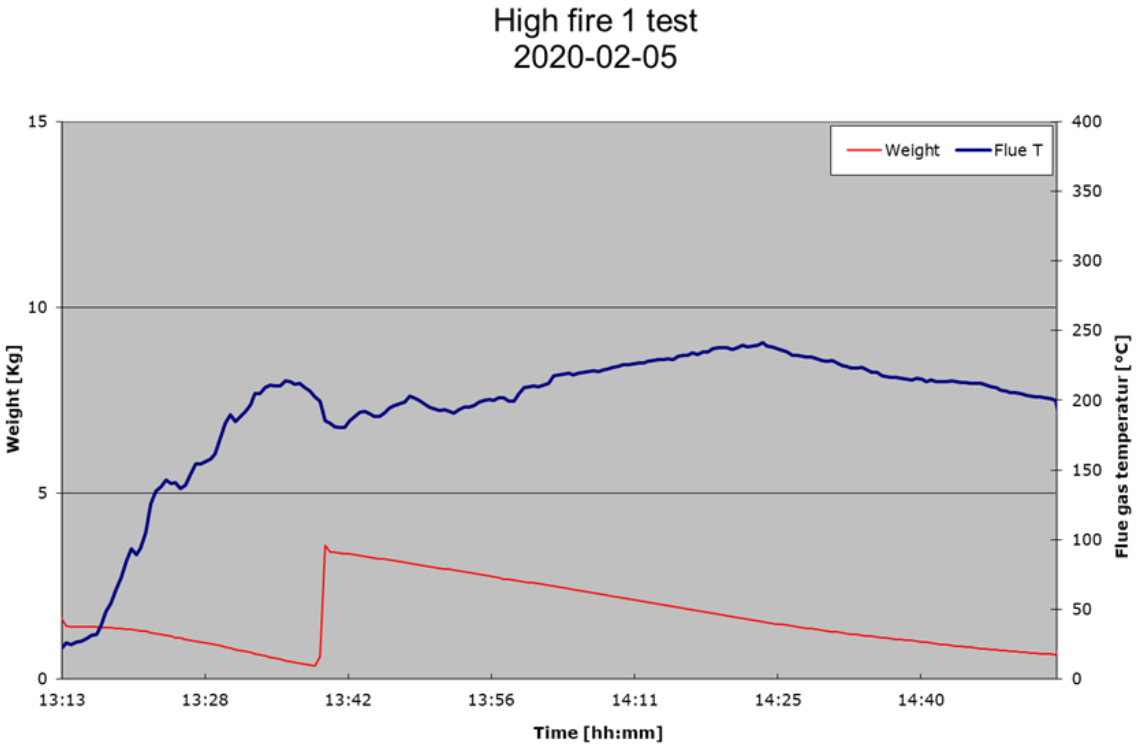
Post Check	The mass combusted during the last 30 minutes of the LF test was 736,6-675,2 = 61,4 grams, thus rendering the LF test valid with respect to the fire out criteria of no less the 50 g combusted during half an hour.

Please find the corresponding sequence of images in annex 3



Course of combustion and residual mass over the last 30 minutes of the Low Fire test



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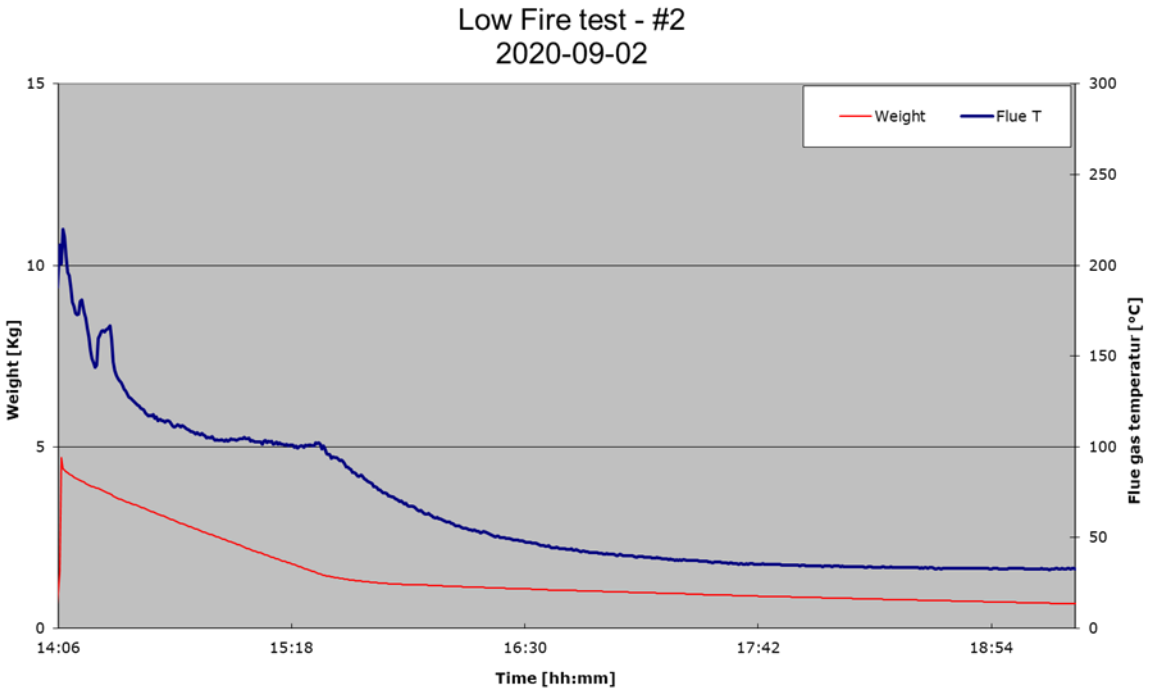

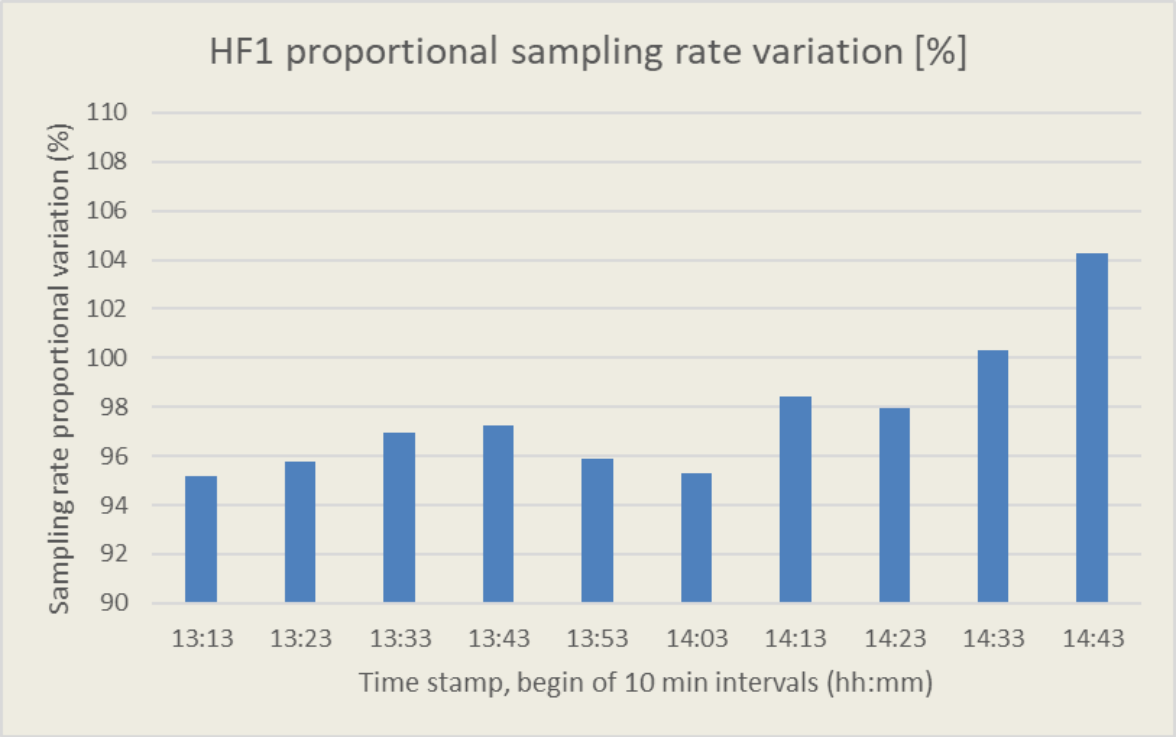

CS and HF1 (#1) proportional sampling rate variation as per ASTM E2515 clause 9.8.1

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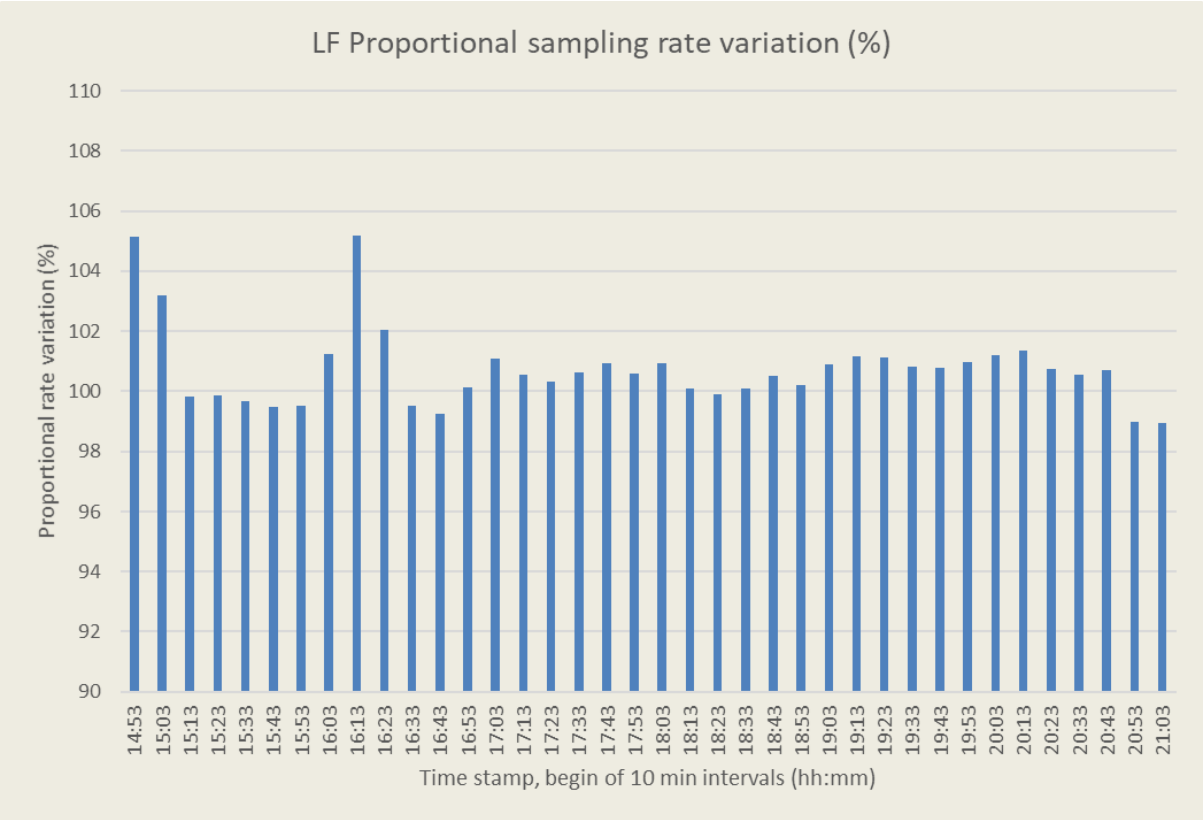
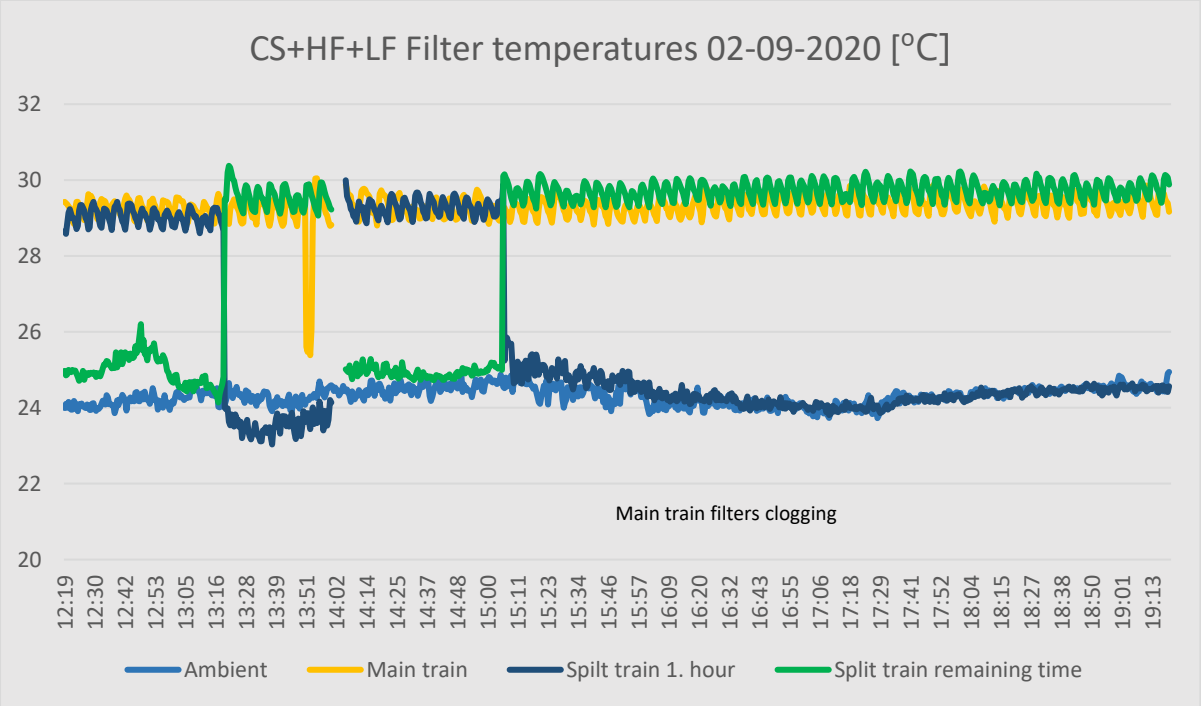


LF (#2) proportional sampling rate variation as per ASTM E2515 clause 9.8.1



Evidence of filter temperature maintained in-between 26,7-32,2 °C (80-90 F) on the 2nd of September as per Alt-125 letter clause 1) requirement modifying the ASTM E2515

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Time	EPA Flue gas Temperature (°C)	Surface temperature Top (°C)	Surface temperature Rear (°C)	Surface temperature Right side (°C)	Surface temperature Left side (°C)	Surface temperature Bottom (°C)	Mean temp (°C)
12:19:15	23,3	24,3	24,0	25,9	25,4	24,7	24,9

Evidence of cold starting conditions on day one, the 2nd of September 2020 to ASTM E3053 clause 8.5.1 (Ambient temp was 24,0 degr C at 12:19:15 hours)

Based on the evidence presented above and, DTI declares test runs #1 (Cold start and High fire 1 test) and #2 (Low fire test) was determined to be conditional and appropriate. Because the filter clogged and sampling had to be suspended temporarily during test run #1, **we exclude test run #1, meaning it will not be used for the average result calculations**. Test run #2 however is deemed valid in any respect.

Please also see section 3.9 Anomalies for further discussion of the test run #1 filter clogging incident.

3.4. **Duct traverse data 2. September 2020**

Measuring points	Start	Intermed.	Center	Intermed.	Last	
ref. ASTM E2515	6,70%	25%	50%	75%	93,30%	[relative]
Fig 6	12,7	37,5	75,0	112,5	137,3	[mm]
First direction (X)	21,3	23,3	31,9	25,9	18,2	Pd [Pa]
Angular direction (Y)	25,6	32,6	32,8	28,9	20,4	Pd [Pa]

Pitot tube dynamic pressure		Duct tempera-ture			Pitot tube static pressure		
30,8	Pd [Pa]	24,3	Temp [°C]		48,8	Ps [Pa]	

Resulting pitot factor Fp: 0,92

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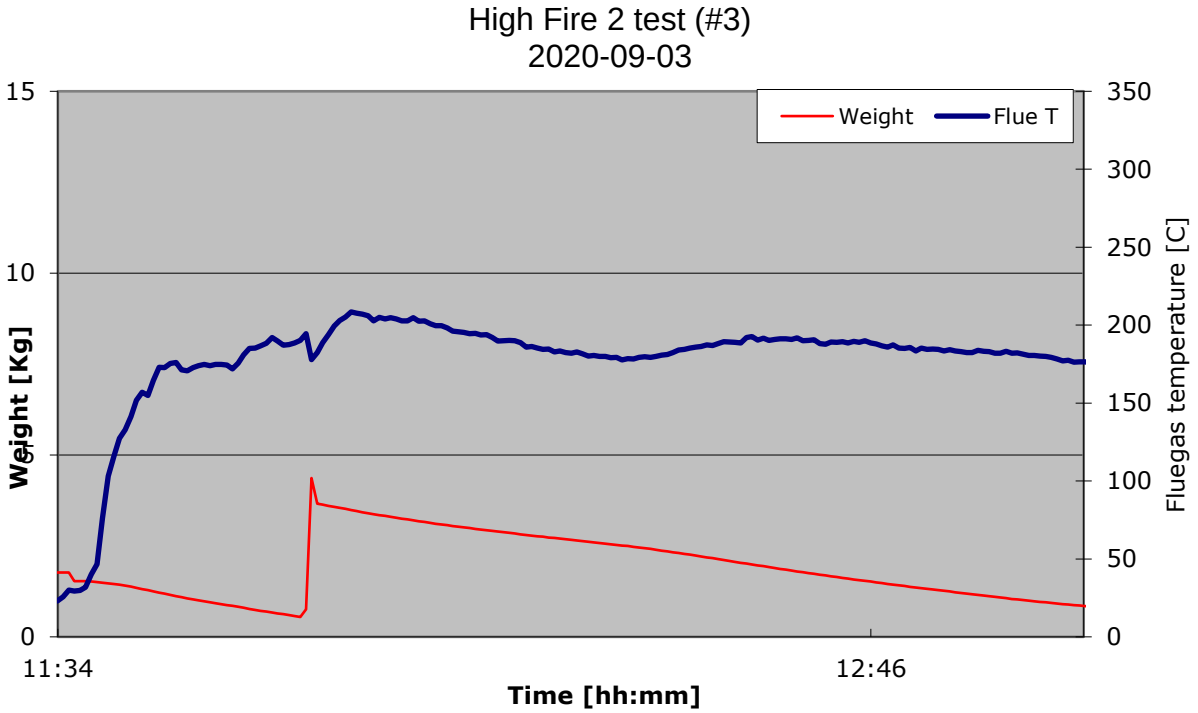
3.5. **Summary of the CS+HF and MF tests the 03-09-2020**

Data logger file Id: 2020-09-03_08-30-28

11:34:00	Ignition of the Cold Start part test using the gas torch for 60 seconds. The air valve is set in position 100% open (full action 3 and one quarter revolution). 0.603 kg of kindling (10% moisture DB) and 0.897 kg start-up fuel (19,7% moisture DB) was entered
11:39:45	Ignition is over, the door is closed. The air valve is maintained in its fully open position
11:55:26	End of the Cold start at 550 grams of embers, which value is taken down. The embers are evened out
11:55:30	Start loading of the High Fire fuel load using 4 logs of 3,190 kg firewood (19,3% moisture DB)
11:56:25	End of loading time after 55 seconds.
12:01:25	The door was closed after 5 minutes acrac, and the air valve was kept in its fully open position
12:34:00	Change of the split train filter holder arrangement at the hour, at gas meter reading 11828,3 normal litres
13:04:51	End of High Fire test cycle at 300 grams of embers (net), the combined bed of ember masses at the end of the High fire test was hence 550+300 = 850 g. The bed of embers was evened, and the air valve kept in its fully open position
Break	Pass time to meet the LF start of test criteria
13:14:40	At the platform scale reading of 675 grams, start loading of the Medium Fire fuel load using 5 logs of in total 3,736 kg of firewood (19,4% moisture DB)
13:15:25	End of the loading time after 45 seconds and the air valve kept fully open to a start and then slowly reduced stepwise.
13:19:30	At platform scale reading 4,25 kg, the air valve is set in its final MF position being 1 and a quarter revolution open
14:14:40	Change of the filter holder arrangement in the split extraction train at the hour, at gas meter reading 12471,6 normal litres
16:38:18	The Medium Fire test is over at platform scale reading of 675 grams

Please find the corresponding sequence of images in annex 4



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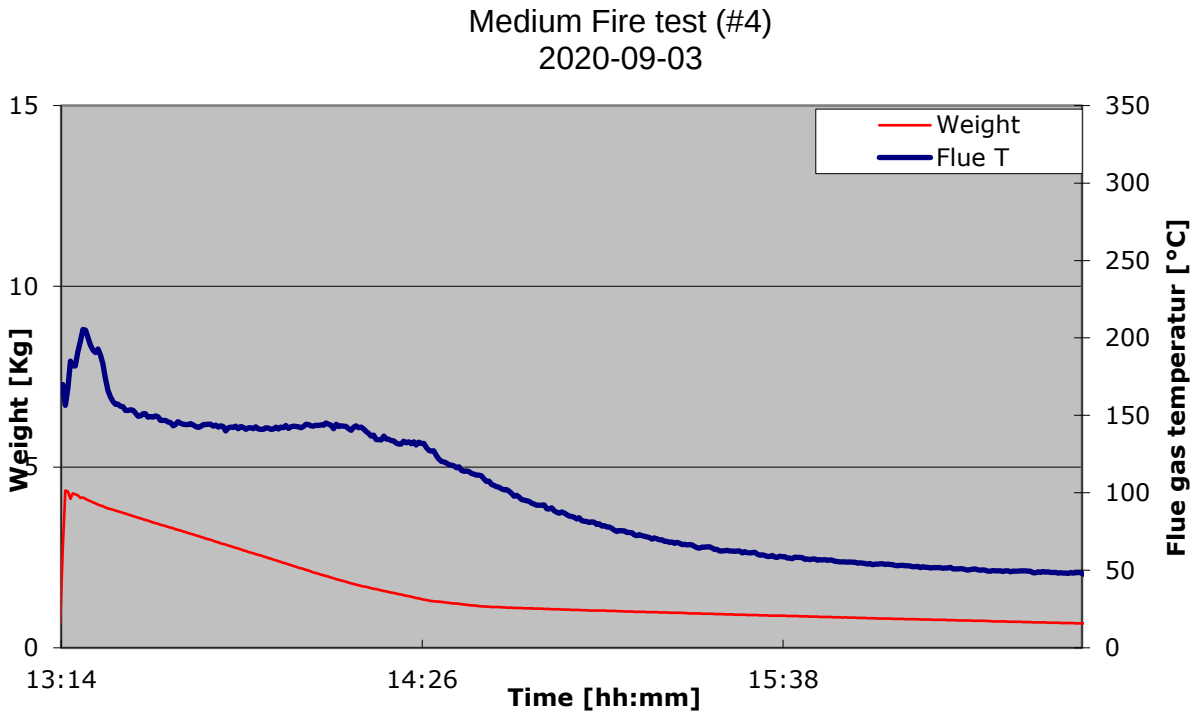

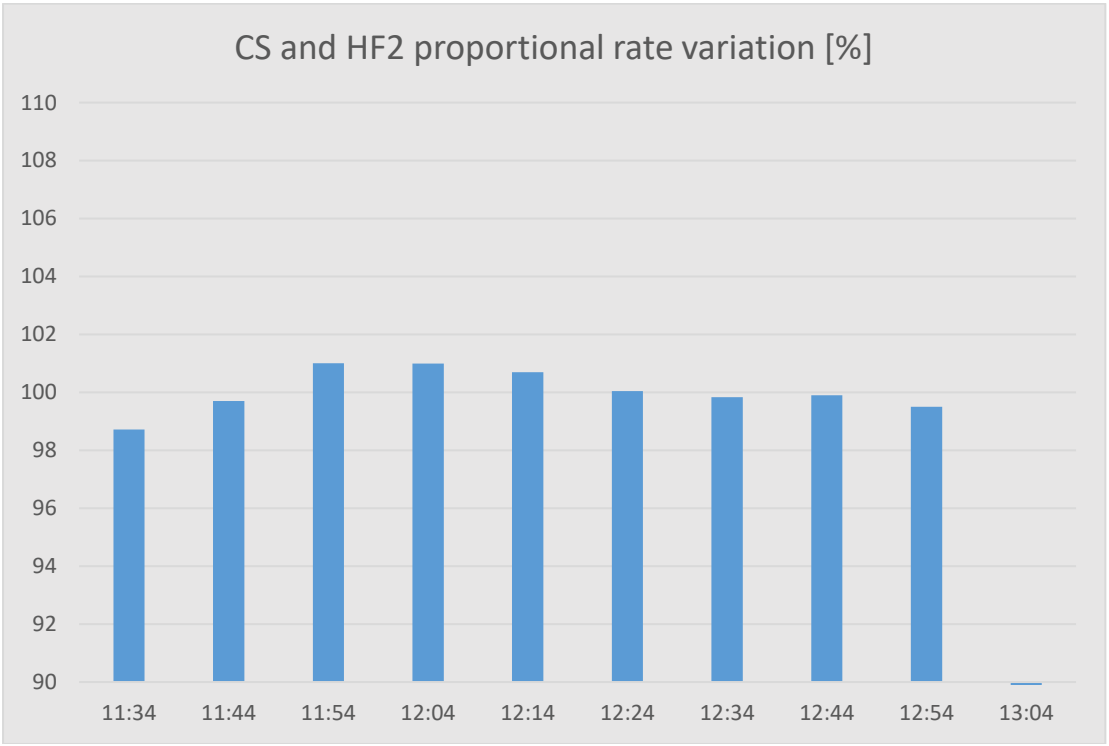

CS and HF2 (#3) proportional sampling rate variation as per ASTM E2515 clause 9.8.1

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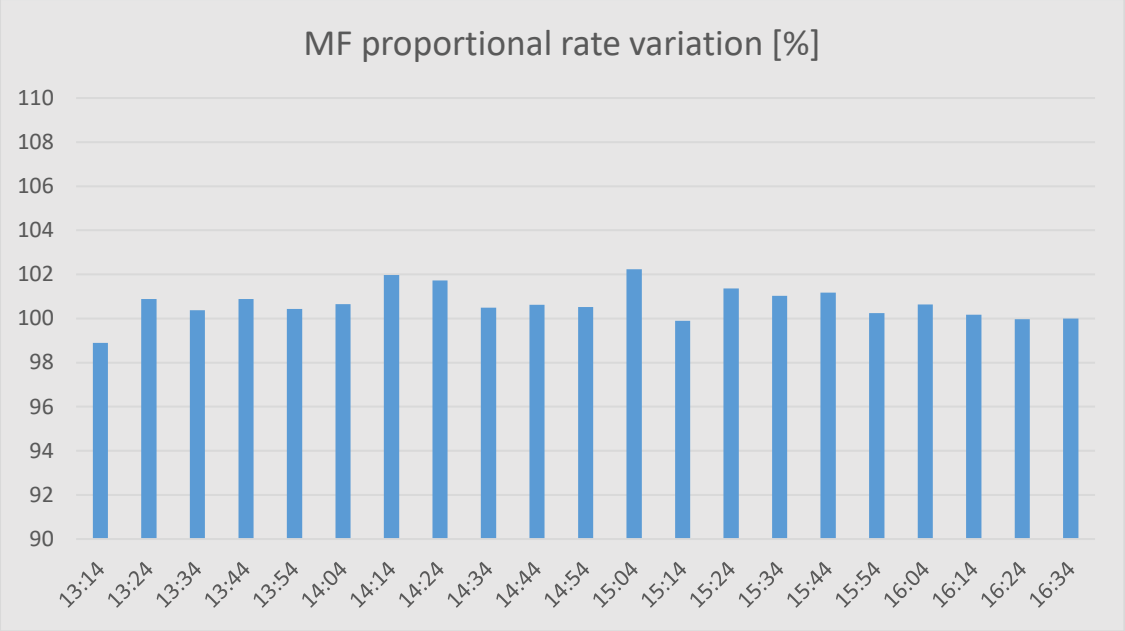
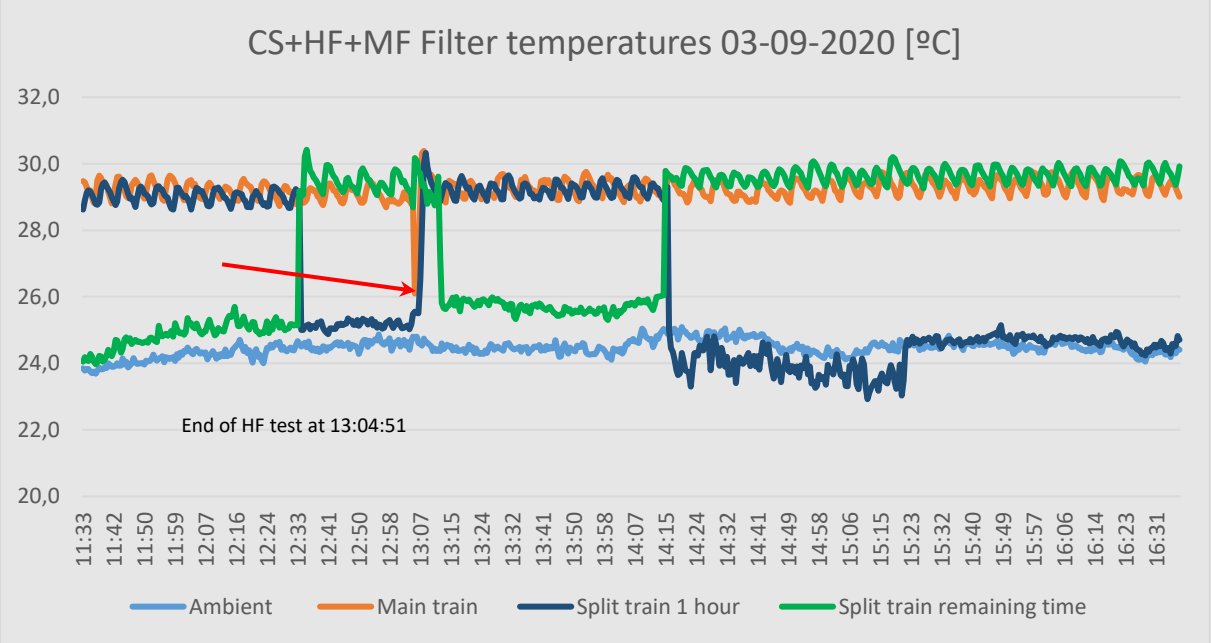


MF (#4) proportional sampling rate variation as per ASTM E2515 clause 9.8.1



Evidence of filter temperature maintained in-between 26,7-32,2 ºC (80-90 F) the 3rd of September as per Alt-125 letter clause 1) requirement modifying ASTM E2515

Time	EPA Flue gas Temperature (ºC)	Surface temperature Top (ºC)	Surface temperature Rear (ºC)	Surface temperature Right side (ºC)	Surface temperature Left side (ºC)	Surface temperature Bottom (ºC)	Mean temp (ºC)
11:34:00	23,0	24,3	23,6	25,5	24,9	24,5	24,6

Evidence of cold starting conditions on day two, the 3rd of September 2020 to ASTM E2515 clause 9.8.1 (Ambient temp was 23,8 degr C at 13:34:00 hours)

Based on the evidence presented above, DTI declares test runs #3 (cold start and high fire 2) and #4 (medium fire test) were determined to be as well appropriate as valid.

3.6. **Duct traverse data the 3. September 2020**

Measuring points	Start	Intermed.	Center	Intermed.	Last	
ref. ASTM E2515	6,70%	25%	50%	75%	93,30%	[relative]
Fig 6	12,7	37,5	75,0	112,5	137,3	[mm]
First direction (X)	24,9	30,8	33,2	29,3	23,3	Pd [Pa]
Angular direction (Y)	20,5	22,5	32,7	27,3	22,5	Pd [Pa]

Pitot tube dynamic pressure		Duct tempera-ture			Pitot tube static pressure		
31,5	Pd [Pa]	26,5	Temp [°C]		48,4	Ps [Pa]	

Resulting pitot factor Fp: 0,92

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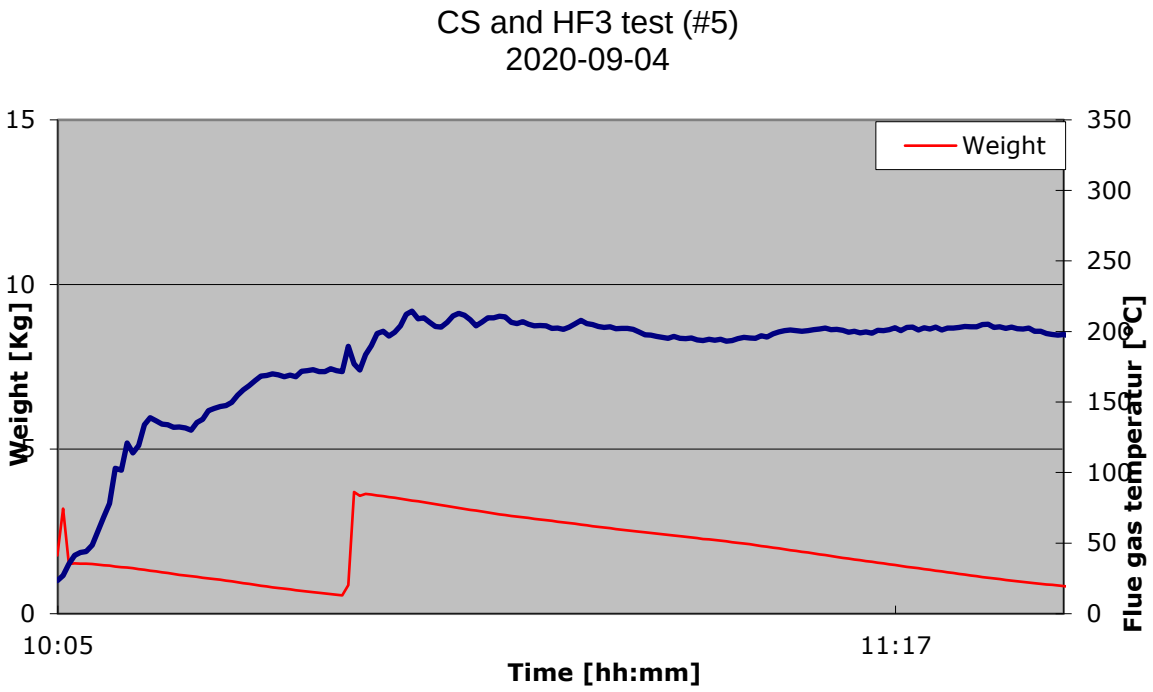
3.7. **Summary of CS+HF test the 4-09-2020**

Data logger file Id: 2020-09-04_09-16-26

10:05:58	Ignition of the Cold Start part test using the gas torch for 55 seconds. The air valve is set in position 100% open (full action 3 and one quarter revolution). 0.605 kg of kindling (10% moisture DB) and 0.909 kg start-up fuel (19,5% moisture DB) was entered
10:11:54	Ignition is over, the door is closed. The air valve is maintained in its fully open position
10:30:40	End of the Cold start at 550 grams of embers, which value is taken down. The bed of embers is
10:31:00	Start loading of the High Fire fuel load using 4 logs of 3,183 kg firewood (19,2% moisture DB)
10:31:55	End of loading time after 55 seconds.
10:36:50	The door was closed after 5 minutes and 50 seconds acrac, and the air valve was kept in its fully open position
11:05:58	Change of the split train filter holder arrangement at the hour, at gas meter reading 13924,5 normal litres
11:32:25	End of High Fire test cycle at 290 grams of embers (net), the combined bed of ember masses at the end of the High fire test was hence 550+290 = 840 g.



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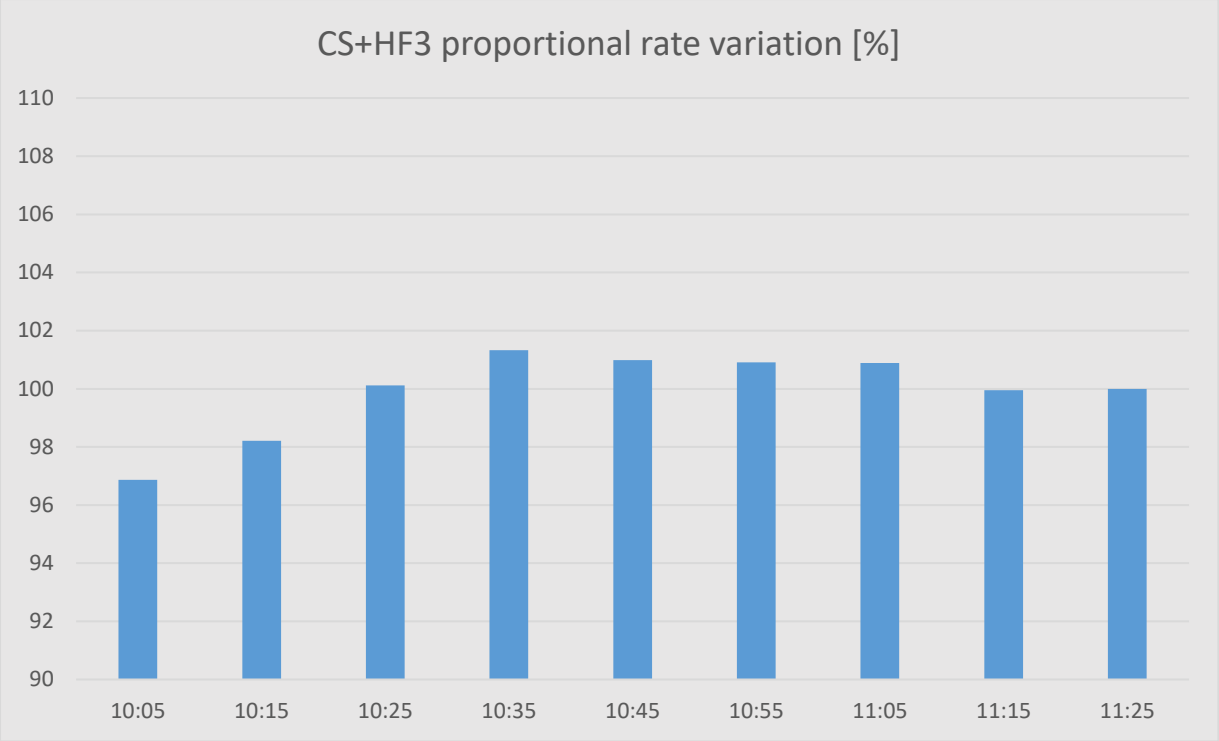
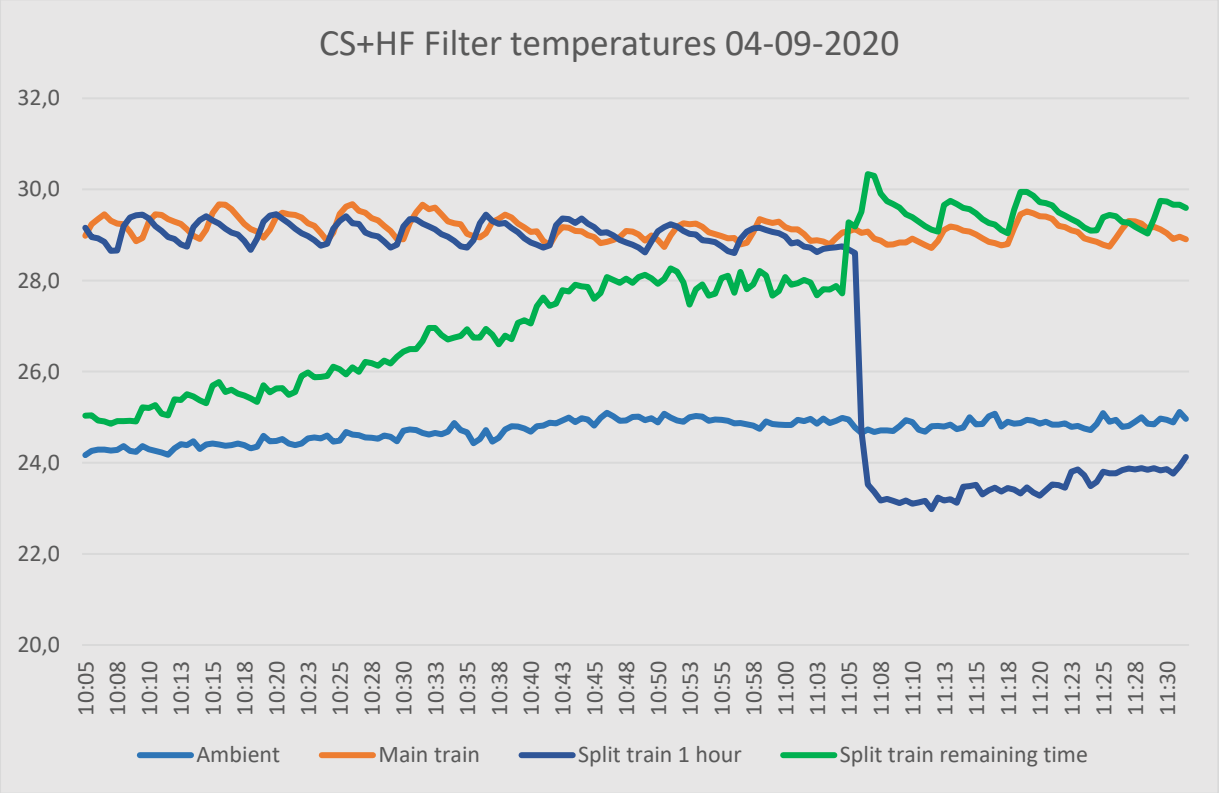


CS and HF3 (#5) proportional sampling rate variation as per ASTM E2515 clause 9.8.1



Evidence of filter temperature maintained in-between 26,7-32,2 °C (80-90 F) the 4th of September as per Alt-125 letter clause 1) requirement modifying ASTM E2515

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Time	EPA Flue gas Temperature (°C)	Surface temperature Top (°C)	Surface temperature Rear (°C)	Surface temperature Right side (°C)	Surface temperature Left side (°C)	Surface temperature Bottom (°C)
11:34:00	23,4	25,4	24,5	25,9	25,3	24,6

Evidence of cold starting conditions on day three, the 4th of September 2020 to ASTM E2515 clause 9.8.1 (Ambient temp was 24,2 degr C at 10:05:55 hours)

Based on the evidence presented above, DTI declares test run #5 (Cold start and High fire 3 test) was determined to be as well appropriate as valid.

3.8. **Duct traverse data the 4. September 2020**

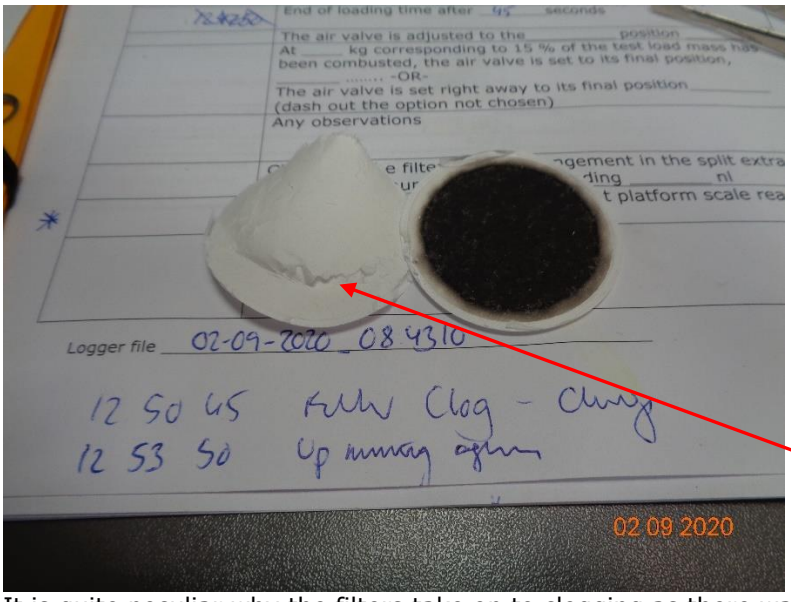
Measuring points	Start	Intermed.	Center	Intermed.	Last	
ref. ASTM E2515	6,70%	25%	50%	75%	93,30%	[relative]
Fig 6	12,7	37,5	75,0	112,5	137,3	[mm]
First direction (X)	22,3	25,1	29,8	29,3	19,9	Pd [Pa]
Angular direction (Y)	18,7	20,8	30	29,4	18,9	Pd [Pa]

Pitot tube dynamic pressure		Duct tempera-ture			Pitot tube static pressure		
28,8	Pd [Pa]	27,4	Temp [°C]		44,9	Ps [Pa]	

Resulting pitot factor Fp: 0,92

3.9. **Anomalies**

In the first HF test, the 2nd of September (#1) the front filter in the main train took to clogging after an hours and ten minutes. It was not possible to maintain the target flowrate, so the PM sampling had to be aborted temporarily, while the pair of filters were changed.
Because of the high vacuum building up over the filter holder, the back-filter Teflon tissue was torn when the hose was removed.



It is quite peculiar why the filters take on to clogging as there was only 2,3 milligrams of particulate mass on the filter. This does not indicate very poor combustion quality for a High Fire test. However, we

observed that the particulate specimen was quite sticky, which is the closest we can get to an explanation why the filter clogged.
On earlier occasion where we have seen the Teflon-filters clogging, it also happened close to an hour into the test, either shortly before or shortly after changing of the filters in the split sampling train.

4. High Fire net fuel consumption and burn rate calculations

HF1; 02-09-2020	Mass (kg AF)	%-moisture	Ref basis	Dry mass (kg)/(*lb*)
Kindling	0,604	10	DB	0,549
Start-up fuel	0,913	16,5	WB	0,762
HF fuel load	3,155	16,0	WB	2,650
Total mass entered	4,672			3,962
End of CS bed of embers recorded	0,550	0		-0,550
Incremental HF bed of embers	0,300	0		-0,300
Cascaded mass of embers	0,850	**Total wood consumption**		**3,112**
Net dry fuel mass for ASTM PM calc		0		3,112
Net dry fuel mass for ASTM burn rate calc		0		2,350
HF Test duration (hours)	01:13:20	→	decimal	1,222
Resulting HF1 burn rate (kg/h) dry				**1,923**
Weighted avg WB moisture% for CSA PM calc				15,20
WB moisture% for CSA CO calc				16,00
Input total wet fuel mass for CSA PM calc (kg)		15,20	WB	3,670
Input total wet fuel mass for CSA PM calc (lb)		15,20	WB	*8,090*
Input total wet fuel mass for CSA CO calc (kg)		16,00	WB	2,798
Input total wet fuel mass for CSA CO calc (lb)		16,00	WB	*6,168*

HF2; 03-09-2020	Mass (kg AF)	%-moisture	Ref basis	Dry mass (kg)/(lb)
Kindling	0,603	10	DB	0,548
Start-up fuel	0,897	16,5	WB	0,749
HF fuel load	3,190	16,2	WB	2,673
Total mass entered	4,690			3,970
End of CS bed of embers recorded	0,550	0		-0,550
Incremental HF bed of embers	0,300	0		-0,300
Cascaded mass of embers	0,850	**Total wood consumption**		**3,120**
Net dry fuel mass for ASTM PM calc		0		3,120
Net dry fuel mass for ASTM burn rate calc		0		2,373
HF Test duration (hours)	01:09:21	→	decimal	1,156
Resulting HF2 burn rate (kg/h) dry				**2,053**
Weighted avg WB moisture% for CSA PM calc				15,34
WB moisture% for CSA CO calc				16,20
Input total wet fuel mass for CSA PM calc (kg)		15,34	WB	3,686
Input total wet fuel mass for CSA PM calc (lb)		15,34	WB	*8,126*
Input total wet fuel mass for CSA CO calc (kg)		16,20	WB	2,832
Input total wet fuel mass for CSA CO calc (lb)		16,20	WB	*6,243*

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HF3; 04-09-2020	Mass (kg AF)	%-moisture	Ref basis	Dry mass (kg)/(*lb*)
Kindling	0,605	10	DB	0,550
Start-up fuel	0,909	16,2	WB	0,762
HF fuel load	3,183	16,1	WB	2,671
Total mass entered	4,697			3,982
End of CS bed of embers recorded	0,550	0		-0,550
Incremental HF bed of embers	0,290	0		-0,290
Cascaded mass of embers	0,840	**Total wood consumption**		**3,142**
Net dry fuel mass for ASTM PM calc		0		3,142
Net dry fuel mass for ASTM burn rate calc		0		2,381
HF Test duration (hours)	01:01:25	→	decimal	1,024
Resulting HF1 burn rate (kg/h) dry				**2,326**
Weighted avg WB moisture% for CSA PM calc				15,22
WB moisture% for CSA CO calc				16,10
Input total wet fuel mass for CSA PM calc (kg)		15,22	WB	3,706
Input total wet fuel mass for CSA PM calc (lb)		15,22	WB	*8,171*
Input total wet fuel mass for CSA CO calc (kg)		16,10	WB	2,837
Input total wet fuel mass for CSA CO calc (lb)		16,10	WB	*6,255*

4.1. **Summary of test results**

Test run number	Test designation	First hour emission rate (g/h)	Overall emission rate (g/h) from ASTM calc	Burn rate (Kg/h)	Heat output (BT/h) at LHV	Emission of CO (g/MJ)	Overall efficiency (%) at HHV
1*	HF1	2,85	2,32	1,92	27585	0,55	80,3
2	LF	0,51	0,11	0,61	9037	3,33	82,2
3	HF2	1,97	1,75	2,05	28092	0,91	76,9
4	MF	1,12	0,33	0,92	13150	2,66	79,8
5	HF3	1,17	1,13	2,33	31988	1,02	76,6

*) HF1 is discarded of in the weighted average calculations

4.2. **ADEC 18 AAC 50.077 Compliance (Fairbanks proof)**

Test run number	Test designation	First hour emission rate (g/h)	AAC 50.077(C)(2) 1H emi < 6 g/h
1*	HF1	2,85	Pass
2	LF	0,51	Pass
3	HF2	1,97	Pass
4	MF	1,12	Pass

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5	HF3	1,17	Pass

*) HF1 is discarded of in the weighted average calculations

4.3. **CSA HF1 PM report (#1)**

DTI HF1 PM calc

Manufacturer: Morsø
Model: 2B Classic 2020
Date: 09-02-20
Run: #1
Control #: Fully open
Test Duration: 101,023
Output Category: High fire

Technicians:
-Jes Sig Andersen
-Rene Lyngsø Hvidberg

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	98,6%	105,6%
Combustion Efficiency	99,5%	99,5%
Heat Transfer Efficiency	99%	106,2%

Output Rate (kJ/h)	34.276	32.514	(Btu/h)
Burn Rate (kg/h)	1,85	4,07	(lb/h)
Input (kJ/h)	34.755	32.969	(Btu/h)

Test Load Weight (dry kg)	3,11	6,86	dry lb
MC wet (%)	15,2		
MC dry (%)	17,92		
Particulate (g)	3,92		
CO (g)	-37		
Test Duration (h)	1,68		

Emissions	Particulate	CO
g/MJ Output	0,07	-0,64
g/kg Dry Fuel	1,26	-11,89
g/h	2,33	-21,98
lb/MM Btu Output	0,16	-1,49

Air/Fuel Ratio (A/F)	11,42

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4.4. **CSA HF1 CO, HO, EFF report (#1)**

DTI, HF1 CO Calculation

Manufacturer: Morsø
Model: 2B Classic 2020

Date: 09-02-20
Run: #1
Control #: Fully open
Test Duration: 72,5165
Output Category: High fire

Technicians:
-Jes Sig Andersen
-Rene Lyngsø Hvidberg

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	80,3%	86,0%
Combustion Efficiency	99,5%	99,5%
Heat Transfer Efficiency	81%	86,5%

Output Rate (kJ/h)	29.367	27.858	(Btu/h)
Burn Rate (kg/h)	1,95	4,29	(lb/h)
Input (kJ/h)	36.567	34.687	(Btu/h)

Test Load Weight (dry kg)	2,35	5,18	dry lb
MC wet (%)	16		
MC dry (%)	19,05		
Particulate (g)	0		
CO (g)	20		
Test Duration (h)	1,21		

Emissions	Particulate	CO
g/MJ Output	0,00	0,55
g/kg Dry Fuel	0,00	8,37
g/h	0,00	16,28
lb/MM Btu Output	0,00	1,29

Air/Fuel Ratio (A/F)	10,69

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4.5. **CSA LF report (#2)**

DTI, LF Calculation

Manufacturer: Morsø
Model: 2B Classic 2020
Date: 2nd Sept 2020
Run: #2
Control #: Closed to 3/4 rev.
Test Duration: 313,0681667
Output Category: Low fire

Technicians:
-Jes Sig Andersen
-Rene Lyngsø Hvidberg

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	82,2%	88,1%
Combustion Efficiency	96,3%	96,3%
Heat Transfer Efficiency	85%	91,5%

Output Rate (kJ/h)	9.526	9.037	(Btu/h)
Burn Rate (kg/h)	0,62	1,36	(lb/h)
Input (kJ/h)	11.583	10.988	(Btu/h)

Test Load Weight (dry kg)	3,21	7,09	dry lb
MC wet (%)	16,3		
MC dry (%)	19,47		
Particulate (g)	0,59		
CO (g)	165		
Test Duration (h)	5,22		

Emissions	Particulate	CO
g/MJ Output	0,01	3,33
g/kg Dry Fuel	0,18	51,47
g/h	0,11	31,71
lb/MM Btu Output	0,03	7,74

Air/Fuel Ratio (A/F)	10,64

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4.6. **CSA HF2 PM report (#3)**

DTI, HF2 PM Calculation

Manufacturer: Morsø

Technicians:
-Jes Sig Andersen
-Rene Lyngsø Hvidberg

Model: 2B Classic 2020

Date: 09-03-20

Run: #3

Control #: Fully open

Test Duration: 91,02183333

Output Category: High fire

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis	
Overall Efficiency	100,2%	107,4%	
Combustion Efficiency	99,5%	99,5%	
Heat Transfer Efficiency	101%	107,9%	

Output Rate (kJ/h)	41.251	39.131	(Btu/h)
Burn Rate (kg/h)	2,19	4,83	(lb/h)
Input (kJ/h)	41.162	39.047	(Btu/h)

Test Load Weight (dry kg)	3,32	7,32	dry lb
MC wet (%)	15,34		
MC dry (%)	18,12		
Particulate (g)	2,65		
CO (g)	-70		
Test Duration (h)	1,52		

Emissions	**Particulate**	**CO**
g/MJ Output	0,04	-1,11
g/kg Dry Fuel	0,80	-20,95
g/h	1,75	-45,88
lb/MM Btu Output	0,10	-2,58

Air/Fuel Ratio (A/F)	11,99

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4.7. **CSA HF2 CO, HO, EFF report (#3)**

DTI, HF2 CO Calculation

Manufacturer: Morsø
Model: 2B Classic 2020
Date: 09-03-20
Run: #4
Control #: Fully open
Test Duration: 69,51649999
Output Category: High fire

Technicians:
-Jes Sig Andersen
-Rene Lyngsø Hvidberg

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	76,9%	82,4%
Combustion Efficiency	99,4%	99,4%
Heat Transfer Efficiency	77%	82,9%

Output Rate (kJ/h)	29.614	28.092	(Btu/h)
Burn Rate (kg/h)	2,05	4,52	(lb/h)
Input (kJ/h)	38.517	36.537	(Btu/h)

Test Load Weight (dry kg)	2,37	5,23	dry lb
MC wet (%)	16,2		
MC dry (%)	19,33		
Particulate (g)	0		
CO (g)	31		
Test Duration (h)	1,16		

Emissions	Particulate	CO
g/MJ Output	0,00	0,91
g/kg Dry Fuel	0,00	13,21
g/h	0,00	27,06
lb/MM Btu Output	0,00	2,12

Air/Fuel Ratio (A/F)	11,78

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4.8. **CSA MF report (#4)**

DTI, MF Calculation

Manufacturer: Morsø

Technicians:

-Jes Sig Andersen

-Rene Lyngsø Hvidberg

Model: 2B Classic 2020
Date: 3rd Sept 2020
Run: #4
Control #: set at 1 and 1/4 rev open
Test Duration: 203,0461667
Output Category: Medium fire

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	79,8%	85,5%
Combustion Efficiency	97,3%	97,3%
Heat Transfer Efficiency	82%	87,9%

Output Rate (kJ/h)	13.862	13.150	(Btu/h)
Burn Rate (kg/h)	0,92	2,04	(lb/h)
Input (kJ/h)	17.376	16.483	(Btu/h)

Test Load Weight (dry kg)	3,13	6,89	dry lb
MC wet (%)	16,3		
MC dry (%)	19,47		
Particulate (g)	1,12		
CO (g)	125		
Test Duration (h)	3,38		

Emissions	Particulate	CO
g/MJ Output	0,02	2,66
g/kg Dry Fuel	0,36	39,82
g/h	0,33	36,81
lb/MM Btu Output	0,06	6,17

Air/Fuel Ratio (A/F)	11,28

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4.9. **CSA HF3 PM report (#5)**

DTI, HF3 PM Calculation

Manufacturer: Morsø

Technicians:

-Jes Sig Andersen

-Rene Lyngsø Hvidberg

Model: 2B Classic 2020
Date: 09-04-20
Run: #5
Control #: Fully open
Test Duration: 86,52133334
Output Category: High fire

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	107,5%	116,8%
Combustion Efficiency	99,5%	99,5%
Heat Transfer Efficiency	108%	117,4%

Output Rate (kJ/h)	44.069	41.804	(Btu/h)
Burn Rate (kg/h)	2,18	4,80	(lb/h)
Input (kJ/h)	40.977	38.871	(Btu/h)

Test Load Weight (dry kg)	3,14	6,93	dry lb
MC wet (%)	15,22		
MC dry (%)	17,95		
Particulate (g)	1,63		
CO (g)	-79		
Test Duration (h)	1,44		

Emissions	Particulate	CO
g/MJ Output	0,03	-1,24
g/kg Dry Fuel	0,52	-25,02
g/h	1,13	-54,53
lb/MM Btu Output	0,06	-2,88

Air/Fuel Ratio (A/F)	11,65

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4.10. CSA HF3 CO, HO, and EFF report (#5)

DTI, HF3 CO Calculation

Manufacturer: Morsø

Technicians:

-Jes Sig Andersen

-Rene Lyngsø Hvidberg

Model: 2B Classic 2020

Date: #5

Run: Fully open

Control #: 61,0135

Test Duration: High fire

Output Category:

Test Results in Accordance with CSA B415.1-10

	HHV Basis	LHV Basis
Overall Efficiency	76,6%	82,1%
Combustion Efficiency	99,2%	99,2%
Heat Transfer Efficiency	77%	82,7%

Output Rate (kJ/h)	33.721	31.988	(Btu/h)
Burn Rate (kg/h)	2,34	5,16	(lb/h)
Input (kJ/h)	44.021	41.759	(Btu/h)

Test Load Weight (dry kg)	2,38	5,25	dry lb
MC wet (%)	16,1		
MC dry (%)	19,19		
Particulate (g)	0		
CO (g)	35		
Test Duration (h)	1,02		

Emissions	Particulate	CO
g/MJ Output	0,00	1,02
g/kg Dry Fuel	0,00	14,67
g/h	0,00	34,36
lb/MM Btu Output	0,00	2,37

Air/Fuel Ratio (A/F)	10,99

Version 2,4 15-04-2010

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4.11. Weighted avg. calculation (LF#2, HF2#3, MF#4, HF3#5)

Model name	Morsø 2B Classic 2020			
Usable Firebox Volume - ft_3	0,686			
Convection air fan	No			
Average for Each Test Run Category	LF	MF	HF2	HF3
Burn Rate - kg/h DB*	0,61	0,92	2,05	2,32
PM Emission Rate - g/h	0,1	0,3	1,7	1,1
CO Emissions Rate - g/h	31,7	36,8	27,1	34,4
Overall Efficiency - CSA B415.1-10				
% HHV Basis	82	80	77	77
% LHV Basis	88	85	82	82
Heat Output - Btu/h	9037	13150	28092	31988
Category Weighting	40%	40%	10%	10%

ASTM E3053 Weighted Averages			
PM Emission Rate - g/h	0,5		
CO Emissions Rate - g/h	33,5		
Overall Efficiency - CSA B415.1-10			
% HHV Basis	80		
% LHV Basis	86		
Heat Output Range - Btu/h	9037	to	31988

CO arithmetical average for EPA g/h **	32,4
CO arithmetical average for EPA g/min	0,5

*) The LF burn rate is corrected from 0,62 kg dry/h as suggested by the CSA HF2 CO, HO & EFF calculation to the true burn rate of 0,61 (0,6145) kg dry/h from the ASTM calculation.
Similarly, the HF3 burn rate is corrected from 2,34 kg dry/h as suggested by the CSA HF1 CO, HO &EFF calculation to the true burn rate of 2,33 kg dry/h (2,326) from the ASTM calculation.

**) please also find the arithmetic CO emi average in the Main results table, chapter 10

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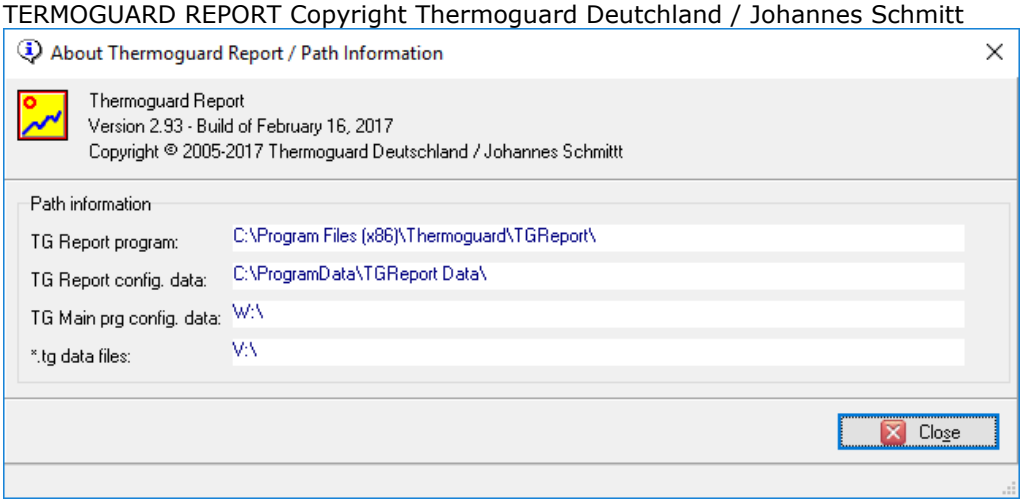
4.12. Test facility conditions

DTI is located at Kongsvangs Allé 29, DK-8000 Århus Denmark, at sea level.
Latitude North: 56,1374
Longitude East: 10,1864
Altitude above sea level: 15 meters

Test facility room temperature, relative humidity and barometric pressure is monitored by the software TERMOGUARD REPORT Copyright Thermoguard Deutchland / Johannes Schmitt



4.13. Fuel properties

The test fuel was natural Beech wood split and cut according to the manufacturer' written instructions and compliant with the provisions of ASTM E3053, clause 8.4
The specific gravity of 0,67 dry weight to dry volume ratio was taken from E3053 Fig 2 page 6. Similarly, the gross calorific value of 18800 MJ/kg or 8088 Btu/lb was selected from E3053 Annex A1, table A.1.1 page 17.
The length of the wood logs was 32-34 cm. The basic shape of the wood logs was approximated triangular, trapezoidal or rhombic respecting the minor to major ratio > 40% according to figures 1A and 1B of E3053

The composition of the HF and LF/MF fuel batches were calculated using the standard XLS Wood calculator adjunct to ASTM E3053

The nominal mass of the HF fuel load was 3,112 kg or 6,862 lb
The nominal HF mass range was 3,00-3,30 kg or 6,50-7,20 lb
The allowable mass range of the HF Core load was 1,40-2,00 kg or 3,10-4,50 lb
The allowable mass range of the HF Remainder load was 1,10-1,70 kg or 2,40-3,80 lb

The nominal mass of the LF/MF fuel load was 3,735 kg or 8,234 lb
The nominal LF/MF mass range was 3,548-3,922 kg or 7,822-8,646 lb
The allowable mass range of the LF/MF Core load was 1,681-2,428 kg or 3,705-5,352 lb
The allowable mass range of the LF/MF Remainder load was 1,301-2,054 kg or 2,882-4,529 lb

For the High fire test fuel loads, the mass was distributed on 4 logs, 3 core and 1 remainder

Fir the Low fire/Medium fire fuel loads, the mass was distributed on 5 logs, 3 core and 2 remainder

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4.14. Summary of test fuel load properties

	Core 1	Core 2	Core 3	Remainder 1	Remainder 2	Rem1/Rem 2 ratio [%]
HF1 mass (kg)	0,598	0,633	0,700	1,224		
HF1 moist. (% DB)	18,5	20,0	18,8	19,0		
LF mass (kg)	0,700	0,742	0,759	1,059	0,580	55
LF moist. (% DB)	22,2	18,8	18,0	19,8	18,4	
HF2 mas (kg)	0,669	0,671	0,617	1,233		
HF2 moist. (% DB)	18,8	18,3	18,9	20,5		
MF mass (kg)	0,776	0,703	0,650	1,020	0,587	58
MF moist (%DB)	19,2	18,7	19,2	20,8	18,5	
HF3 mas (kg)	0,671	0,654	0,634	1,224		
HF3 moist. (% DB)	18,9	19,8	18,9	19,2		

Please find the ASTM E3053 fuel load calculations enclosed in appendices 5-8

Total amount of firewood for the CS+HF+LF tests the 2-9-2020: (top left to bottom right)

- HF fuel load of 4 logs
- LF fuel load of 5 logs
- Kindling bits
- Start-up fuel

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5. Test accomplishment

5.1. Remarks

The certification tests were accomplished in accordance with the manufacturers written test instruction for the lab (please find enclosed in annex 11), the ASTM E3035-17 Cordwood test standard, the EPA ALT125 letter and the ASTM E2515-11 dilution tunnel and sampling standard.

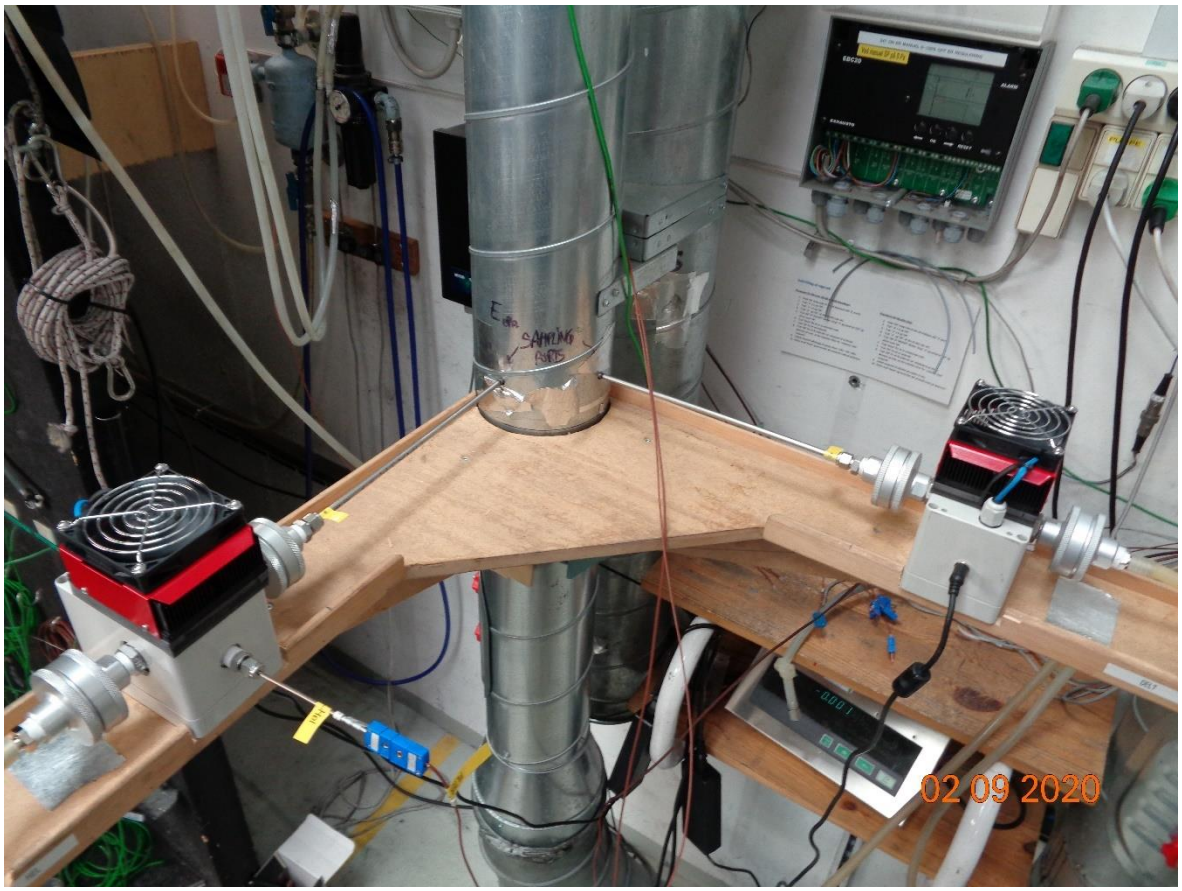
5.2. Start-up operation

The Morsø 2B Standard 2020 stove has a traditional air control system with a rotary type dial on the loading door to the front. For start-up operation, the air valve is kept fully open (3 and one quarter of a revolution), which position is maintained throughout the high fire tests. For the low fire test, after ignition the air valve is throttled to 3 quarters of a revolution open, and for the medium fire test, after ignition the air valve is throttled to 1 and one quarter of a revolution open.

Please find a detailed description of the start-up procedure in the manufacturers test instruction for testing procedure (annex 11)

5.3. Sampling arrangement

The PM specimen is extracted from the Ø150 mm Full Flow Dilution Tunnel by means of a dual probe and filter holder system as specified by ASTM E2515-11, clause 6.1.1.1. The filter holders are of type 47 mm Pall 1235. There are 3 sets of backed-up filter holders for PM sampling and one single filter holder for the room blanc measurement. The PM sampling line filter holder arrangements have thermostatic support to maintain the filter temperatures in between 26,7-32,2 degrees C, respectively 80-90 degrees F.



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5.4. **Fluepipe and chimney configuration**

The chimney is composed by single wall uninsulated black painted steel fluepipe in combination with half insulated system steel chimney compliant with ASTM E3053-17 clause 6.3

The single wall fluepipe extends to 2,50 m above the test rig floor. In combination, the insulated system chimney extends to 4,40 m above the test rig floor, compliant with ASTM E3053-17 clause 8.2.3, stating 2,6 ±0,1 m for the uninsulated part of the flue and 4,6 ± 0,3 m for the total height of the chimney.

Please find a schematic drawing of the chimney configuration in annex 13

The chimney was connected to the stove using the top flue outlet

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6. Sampling methods

6.1. Particulate extraction system

The particulate matter is sampled in accordance with ASTM E2515-11. Two identical sampling trains are placed at angular position to each other. The sampling trains consists each of a set of front and back Pall type 1235 Al 47 mm in-line filter holders. Filter for PM sampling are Pall TX-40 EMFAB Teflon-coated 47 mm membrane filters.
The sampling train operated throughout the entire duration of the test is called the 'Main train'.
The other sampling train, shifting filters at the hour is called the 'Split train'.

6.2. Calculation of PM emission

The calculations are enclosed in a format following the notation of equations in ASTM E2512-11

Please find the calculation of the first High Fire test (test run #1) in annex 16; the calculations of the Low Fire test (test run #2) in annex 17; the calculations of the second High Fire test (test run #3) in annex 18, the calculations of the Medium Fire test (test run #4) in annex 19 and the calculations of the third High fire test (test run #5) in annex 20

7. Quality assurance

7.1. Instrument calibration

There is a set of EPA instrument calibration certificates in annex 13

7.2. Logger data

Please find the sets of logger data, sampled every 5 seconds and recorded every 30 seconds in appendices 21 (HF1 test 020920), annex 22 (LF test 020920), annex 23 (HF2 test the 030920), annex 24 (MF test 030920) and in Annex 25 (HF3 test 040920)
For verification please request XLS logger files from DTI.

Legend:

Rum - [°C]	Filter-1-H - [°C]	Filter-2-D1 - [°C]
1	2	3
Ambient temperature	Main train filter temp	Split train 1H filter temp

Row 1 is the original Danish notation incl metric
Row 2 is the data logger channel number
Row 3 -5 are the corresponding terms in English

7.3. Morsø's Quality Assurance Plan

Quality Assurance Plan is a plan for assuring the quality for products, tested according to NSPS by taking measurements and checks of some key components and the action of the air controls, referred to as K-list components.
Please find the entire QA plan amended in annex 34.

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8. Documentation material

Documentation material:

Assembly drawings in annex 26

Parts drawings in annex 27a

Spare parts drawing in annex 27b

Materials sheets in annex 28

Label(s) in annex 29

Picture(s) in annex 30

User's manual North America in annex 31a

User's manual Canada (in French language) in annex 31b

Sample analysis in annex 32

Firebox drawing incl volume indication in annex 33

Manufacturers QA plan in annex 34

Laboratory hand notes in annex 35

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9. Remarks

9.1. Internal correction of gasmeters

The Vögtlin Red-Y gasmeters have internal correction to as well normal temperature (here 0-degree C) and to pressure (here 1013 hPa)
Consequently, in the calculations, the gasmeter temperature and pressure is entered as 0 degr C respectively 1013 hPa.
1013 Hectopascal (hPa) equals 14,69 psi or 10329,7 mm water column.

9.2. Unitary DTI Cribwood and Cordwood spreadsheet

The spreadsheet used for calculation of the emissions is a unitary Cribwood and Cordwood spreadsheet, in so far as the particle emission calculation is identical for Cribwood and Cordwood. When used for a Cordwood test there are some void spaces under the cribs and spacers calculations in the beginning. Also, generally the fuel is referred to as 'Cribs' even though for good reasons, for Cordwood, wood logs are used.

9.3. Request of restriction of the air valve action

The action of the air valve must be restricted by means of a physical stop as to prevent use of the stove at any valve setting lower than the one used during the Low Fire test, here 3 quarters of a revolution open.

9.4. Duplicated High fire calculations

As well for the ASTM calculations as for the CSA calculations we have performed double calculations. One which applies for the HF part alone, to return the burn rate and another for the combined CS + HF part tests, to return the particle emission. On each of the duplicate HF result sheet, the invalid result sections are blanked out with a red bar.

10. Discussion of Results

For some of the burn rate calculations, there is a minor still insignificant deviation from the (true) ASTM calculation to the CSA calculation.

For the Low fire test, the true burn rate is 0,6145 (rounded to 0,61) kg dry matter per hour. CSA suggests 0,62 kg dry matter per hour

For the HF3 test, the true burn rate is 2,3256 (rounded to 2,33) kg dry matter per hour. CSA suggests 2,34 kg dry matter per hour

The deviating results are attributed to different rounding and number of decimal places, metric conversion factors in combination with direct test run timekeeping for ASTM calculation, but derived or truncated test run timekeeping for the CSA calculation to the nearest sampling time in a 30 seconds interval.

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11. Main results

	High fire 1 *	Low fire	High fire 2	Medium fire	High fire 3
Date	2-9-2020	2-9-2020	3-9-2020	3-9-2020	4-9-2020
Run Number	#1	#2	#3	#4	#5
ASTM 3053 Emission Rate g/Hr.	2,3	0,1	1,7	0,3	1,1
ASTM E3053 Emissions – First Hour (g/hr)	2,8	0,5	2,0	1,1	1,2
ASTM 3053 Burn Rate Kg/Hr.	1,92	0,61	2,05	0,92	2,33
BTU/Hr.	27858	9037	28092	13150	31988
Overall Efficiency (%) HHV	80	82	77	80	77
CO Emissions (g/MJ Output)	0,6	3,3	0,9	2,7	1,0
CO Emissions (g/kg Dry Fuel)	8,4	51,4	13,2	39,8	14,7
CO Emissions (g/hr)	16,3	31,7	27,1	36,8	34,4
CO Emissions (g/min)	0,3	0,5	0,5	0,6	0,6

Weighed particle emission rate, average of 4 test runs (LF, HF2, MF, HF3)	0,5 g/h
Weighted average energy efficiency (at HHV) of 4 test runs (LF, HF2, MF, HF3)	80 %
Arithmetical average emission of CO for EPA of 4 test runs (LF, HF2, MF, HF3)	32,4 g/h respectively 0,5 g/min

*) The High fire 1 results are discarded off in the weighted average calculation

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12. Test details

12.1. Pre-conditioning

The stove had been aged more than 50 hours at the client's internal test lab prior to the certification test.

Please find the documentation of pre-conditioning amended in annex 2

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12.2. Data, HF1 (#1) test run 2nd of September 2020

Parameter	Value	Unit
Pitot factor (F_p)	0,92	
Dynamic pressure duct, Pd	30,8	Pa
Static pressure duct, Ps	48,8	Pa
Date of testing	02-09-2020	dd-mm-yyyy
Start of Cold start test	12:19:15	hh:mm:ss
Start of the High fire test	12:47:10	hh:mm:ss
End of High fire	14:00:30	hh:mm:ss
Test duration (Cold start + High fire)	1:41:15	hh:mm:ss
Duration of the High fire test	1:13:20	hh:mm:ss
Mean stove surface temperature at the start	24,9	°C
Kindling and Start-up fuel load	1,517	kg
Start-up fuel moisture	19,7	% DB
Test fuel load	3,155	kg
Test fuel moisture	19,1	% DB
Resulting burn rate	1,92	kg (dry matter)/h
Particulate emission rate, first hour	2,85	g/h
Particulate emission rate, overall	2,32	g/h
Sampled gas volume (nl), main train	720,7	Nl
Captured pm mass, main train	4,3	mg
Sampled gas volume (nl), split train	726,2	Nl
Captured pm mass, split train	4,8	mg
PM mass total (average)	3,92	g
Relative deviation in pm emission, main train to split train	4,8	%
Absolute deviation in pm emission, main train to split train	-0,13	g/kg (dry matter)
Mean flow rate probe, main train	7,25	m/s
Mean flow rate probe, split train	7,31	m/s
Mean flow rate duct	7,30	m/s
Flue gas temperature (mean)	146	°C
Flue draught (mean)	9	Pa

Parameter	Start value	End value	Units
Ambient temperature	24,3	24,4	°C
Relative humidity	40	38	%
Barometric pressure	1018	1015	hPa
Draft in front of the test rig	0,08	0,05	m/s
Flue gas temperature	27	166	°C

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12.3. Data, LF (#2) test run 2nd of September 2020

Parameter	Value	Unit
Pitot factor (F_p)	0,92	
Dynamic pressure duct, Pd	30,8	Pa
Static pressure duct, Ps	47,1	Pa
Date of testing	02-09-2020	dd-mm yyyy
Start of test	14:06:00	hh:mm:ss
End of test	19:19:48	hh:mm:ss
Test duration	05:13:48	hh:mm:ss
Mean stove surface temperature at the start	NA	°C
Kindling and Start-up fuel load	NA	kg
Start-up fuel moisture	NA	% DB
Test fuel load	3,840	kg
Test fuel moisture	19,5	% DB
Resulting burn rate	0,61	kg (dry matter)/h
Particulate emission rate, first hour	0,51	g/h
Particulate emission rate, overall	0,11	g/h
Sampled gas volume (nl), main train	2246,0	Nl
Captured pm mass, main train	0,8	mg
Sampled gas volume (nl), split train	2245,6	Nl
Captured pm mass, split train	0,8	mg
PM mass total (average)	0,59	g
Relative deviation in pm emission, main train to split train	0,51	%
Absolute deviation in pm emission, main train to split train	-0,002	g/kg (dry matter)
Mean flow rate probe, main train	7,29	m/s
Mean flow rate probe, split train	7,30	m/s
Mean flow rate duct	7,32	m/s
Flue gas temperature (mean)	65	°C
Flue draught (mean)	4	Pa

Parameter	Start value	End value	Units
Ambient temperature	24,4	24,5	°C
Relative humidity	38	37	%
Barometric pressure	1015	1013	hPa
Draft in front of the test rig	0,05	0,07	m/s
Flue gas temperature	208	33	°C

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12.4. Data, HF2 (#3) test run 3rd of September 2020

Parameter	Value	Unit
Pitot factor (F_p)	0,92	
Dynamic pressure duct, Pd	30,5	Pa
Static pressure duct, Ps	47,1	Pa
Date of testing	03-02-2020	dd-mm-yyyy
Start of Cold start test	11:34:00	hh:mm:ss
Start of the High fire test	11:55:30	hh:mm:ss
End of High fire test	13:04:51	hh:mm:ss
Test duration (Cold start + High fire)	01:30:51	hh:mm:ss
Duration of the High Fire test	01:09:21	hh:mm:ss
Mean stove surface temperature at the start	24,6	°C
Kindling and Start-up fuel load	1,500	kg
Start-up fuel moisture	19,7	% DB
Test fuel load	3,190	kg
Test fuel moisture	19,3	% DB
Resulting burn rate	2,05	kg (dry matter)/h
Particulate emission rate, first hour	1,97	g/h
Particulate emission rate, overall	1,75	g/h
Sampled gas volume (nl), main train	647,9	Nl
Captured pm mass, main train	2,9	mg
Sampled gas volume (nl), split train	647,9	Nl
Captured pm mass, split train	3,3	mg
PM mass total (average)	2,55	g
Relative deviation in pm emission, main train to split train	5,95	%
Absolute deviation in pm emission, main train to split train	-0,11	g/kg (dry matter)
Mean flow rate probe, main train	7,25	m/s
Mean flow rate probe, split train	7,26	m/s
Mean flow rate duct	7,28	m/s
Flue gas temperature (mean)	178	°C
Flue draught (mean)	11	Pa

Parameter	Start value	End value	Units
Ambient temperature	23,8	24,6	°C
Relative humidity	40	41	%
Barometric pressure	1013	1011	hPa
Draft in front of the test rig	0,04	0,02	m/s
Flue gas temperature	26	177	°C

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12.5. Data, MF (#4) test run 3rd of September 2020

Parameter	Value	Unit
Pitot factor (F_p)	0,92	
Dynamic pressure duct, Pd	29,8	Pa
Static pressure duct, Ps	46,0	Pa
Date of testing	03-09-2020	dd-mm-yyyy
Start of test	13:14:40	hh:mm:ss
End of test	16:38:18	hh:mm:ss
Test duration	03:23:38	hh:mm:ss
Mean stove surface temperature at the start	NA	°C
Kindling and Start-up fuel load	NA	kg
Start-up fuel moisture	NA	% DB
Test fuel load	3,736	kg
Test fuel moisture	19,4	% DB
Resulting burn rate	0,92	kg (dry matter)/h
Particulate emission rate, first hour	1,12	g/h
Particulate emission rate, overall	0,33	g/h
Sampled gas volume (nl), train 1	1423,7	Nl
Captured pm mass, train 1	1,2	mg
Sampled gas volume (nl), train2	1423,8	Nl
Captured pm mass, train 2	1,4	mg
PM mass total (average)	1,12	g
Relative deviation in pm emission, train 1 to train 2	6,73	%
Absolute deviation in pm emission, train 1 to train 2	-0,05	g/kg (dry matter)
Mean flow rate probe, train 1	7,15	m/s
Mean flow rate probe, train 2	7,16	m/s
Mean flow rate duct	7,19	m/s
Flue gas temperature (mean)	98	°C
Flue draught (mean)	7	Pa

Parameter	Start value	End value	Units
Ambient temperature	24,5	24,3	°C
Relative humidity	40,0	41,0	%
Barometric pressure	1013,0	1011,0	hPa
Draft in front of the test rig	0,02	0,03	m/s
Flue gas temperature	174	48	°C

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12.6. Data, HF3 (#5) test run 4th of September 2020

Parameter	Value	Unit
Pitot factor (F_p)	0,92	
Dynamic pressure duct, Pd	30,8	Pa
Static pressure duct, Ps	48,8	Pa
Date of testing	02-09-2020	dd-mm-yyyy
Start of Cold start test	12:19:15	hh:mm:ss
Start of the High fire test	12:47:10	hh:mm:ss
End of High fire	14:00:30	hh:mm:ss
Test duration (Cold start + High fire)	1:41:15	hh:mm:ss
Duration of the High fire test	1:13:20	hh:mm:ss
Mean stove surface temperature at the start	24,9	°C
Kindling and Start-up fuel load	1,517	kg
Start-up fuel moisture	19,7	% DB
Test fuel load	3,183	kg
Test fuel moisture	19,2	% DB
Resulting burn rate	2,05	kg (dry matter)/h
Particulate emission rate, first hour	1,17	g/h
Particulate emission rate, overall	1,13	g/h
Sampled gas volume (nl), main train	609,9	Nl
Captured pm mass, main train	1,8	mg
Sampled gas volume (nl), split train	610,5	Nl
Captured pm mass, split train	1,8	mg
PM mass total (average)	1,63	g
Relative deviation in pm emission, main train to split train	0,20	%
Absolute deviation in pm emission, main train to split train	0,002	g/kg (dry matter)
Mean flow rate probe, main train	7,16	m/s
Mean flow rate probe, split train	7,17	m/s
Mean flow rate duct	7,20	m/s
Flue gas temperature (mean)	181	°C
Flue draught (mean)	11	Pa

Parameter	Start value	End value	Units
Ambient temperature	24,3	24,9	°C
Relative humidity	44	44	%
Barometric pressure	1012	1013	hPa
Draft in front of the test rig	0,09	0,03	m/s
Flue gas temperature	23	199	°C

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13. Test equipment

Testing was carried out at test rig C. (EPA setup)

Instrument	**Traceability**	**Instrument number Test rig C**
Scale, Mettler, 600 kg, KC 600	ELAB	270-A-1638
Thermo couples, EPA sampling train Type T	ELAB	Id No. 145092
Thermo couples, others, Type T and type K	ELAB	Id No.134396
DOP version II	-	-
Data acquisition unit, HP 34970A	DANAK 200	270-A-1630
Surface temperature, Technoterm 5500	DANAK 200	270-A-0976
Surface temperature, Dan 1200	DANAK 200	270-A-0876
Pressure gauge, Autotran 700 (flue draught)	ELAB	270-A-1632
Pressure gauge, Autotran 700 (Pd)	ELAB	Id No. 145065
Pressure gauge, Autotran 700 (Ps)	ELAB	270-A-1634
Calibrator, Jofra 650 SE	DANAK 200	270-A-0912
Scale, Mettler Toledo (15kg/1g)	ELAB	Id No. 5822
Scale, Mettler Toledo XS4002S (4,1kg/10mg)	ELAB	Id No. 135794
Scale, Mettler Toledo XS204 (220g/0,1mg)	DANAK 200	Id No. 7084
Testo 440 and Turbolence probe (Air velocity Laboratory)	DANAK 200	Id No. 176529
TSI Micromanometer and Pitottube (Air velocity Dilution tunnel)	DANAK 200	Id No. 4771 (270-A-2406)
Hygrometer (air humidity) Thermoguard	DANAK 200	Id No. 142357
Barometric reading (atmospheric pressure) Thermoguard / (Ahlborn)	DANAK 200	Id No. 7102
Pitot tube (air velocity in flue)	ELAB	270-A-1631-14
Dust measuring equipment (particle measuring equipment)	-	Id No. 145093
Gas meter, Red-y (-H) (Whole charge, With outlet)	DANAK 200	Id No. 144236
Gas meter, Red-y (-D) (Divided charge with outlet)	DANAK 200	Id. No. 144239
Flow meter (-R) (Room blanc)	DANAK-200	Id No. 144257
Thermo sensor, Dilution tunnel, Pt 100	DANAK 200	270-A-1628
PST leakage meter (Brooks glass tube)	ELAB	Id no. 83013
CO/CO_2 analyzer, ABB IR	ELAB	270-A-2276
Spangas CO/CO_2, AGA (High CO and CO_2)	Swedac	Id no. 135573
Spangas CO/CO_2, AGA (Low CO)	Swedac	Id no. 135574
Moisture meter	ELAB	Id No. 145070
Vacuum meter (-H) (Main train)	DANAK 200	Id No. 145074

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Vacuum meter (-D) (Split train)	DANAK 200	Id No. 145076
Vacuum meter (-R) (Room)	DANKA 200	Id No. 145077
Pressure meter (-H) (Main train)	DANAK 200	Id No. 145078
Pressure meter (-D) (Split train)	DANAK 200	Id No. 145079
Thermometer (Fuel storage room)	ELAB	Id No. 145081

14. **Annexes**

Annex 1: EPA Letter of acceptance, ALT 126 (3 pages)
Annex 2: Documentation of aging (2 pages)
Annex 3: Images from the test sequence the 2. September 2020 (3 pages)
Annex 4: Images from the test sequence the 3. September 2020 (2 pages)
Annex 5: Images from the test the 4. September 2020 (2 pages)
Annex 6: High fire 1 fuel load calculator 020920 (2 pages)
Annex 7: Low fire fuel load calculator 020920 (2 pages)
Annex 8: High fire 2 fuel load calculator 030920 (2 pages)
Annex 9: Medium fire fuel calculator 030920 (2 pages)
Annex 10: High fire 3 fuel load calculator 040920 (2 pages)

Annex 11: Manufacturer's test instruction (4 pages)
Annex 12: Manufacturer's description of the stove (1 page)
Annex 13: Chimney configuration (1 page)
Annex 14: DTI test procedure EPA tests (26 pages)
Annex 15: Set of calibration certificates (79 pages)
Annex 16: HF1 ASTM calculations (11 pages)
Annex 17: LF ASTM calculations (11 pages)
Annex 18: HF2 ASTM calculations (11 pages)
Annex 19: MF ASTM calculations (11 pages)
Annex 20: HF3 ASTM calculations (11 pages)

Annex 21: Set of HF1 logger data 020920 (25 pages)
Annex 22: Set of LF logger data 020920 (65 pages)
Annex 23: Set of HF2 logger data 030920 (24 pages)
Annex 24: Set of MF logger data 030920 (61 pages)
Annex 25: Set of HF3 logger data 040920 (28 pages)
Annex 26: Assembly drawings (7 pages)
Annex 27a: Parts drawings (60 pages)
Annex 27b: Spare parts drawings (2 pages)
Annex 28: Material sheets (32 pages)
Annex 29: Labels (2 pages)
Annex 30: Pictures (2 pages)

Annex 31a: User' manual North America (13 pages)
Annex 31b: User' manual Canada (13 pages)
Annex 32: Sample analysis (5 pages)
Annex 33: Firebox drawing with volume (1 page)
Annex 34: Manufacturers QA Plan (10 pages)
Annex 35: Laboratory hand notes (8 pages)

Annex 1

Title: Alt-125 Acceptance letter of cordwood testing

Pages total: 3, excl this cover page

Annex 1 (3 pages)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

FEB 2 8 2018

OFFICE OF
AIR QUALITY PLANNING
AND STANDARDS

Mr. Justin White
Hearthstone QHPP, Inc.
#17 Stafford Ave.
Morrisville, VT 05661

Dear Mr. White,

I am writing in response to your letter dated January 12, 2018, regarding wood heaters manufactured by Hearthstone QHPP, Inc. (Hearthstone). This response, dated February 28, 2018, supercedes our previous response (dated February 26, 2018) to correct an inaccuracy regarding required changes to ASTM E3053-17.

You are requesting to use an alternative test method, using cord wood, as referenced in section 60.532(c) of 40 CFR part 60, Subpart AAA, Standards of Performance for New Residential Wood Heaters (Subpart AAA) to meet the 2020 cord wood alternative compliance option. The 2020 cord wood alternative compliance option states that each affected wood heater manufactured or sold at retail for use in the United States on or after May 15, 2020, must not discharge into the atmosphere any gases that contain particulate matter in excess of 2.5 g/hr. Compliance must be determined by a cord wood test method approved by the Administrator along with the procedures in 40 CFR 60.534. You have requested approval to use the procedures and specifications found in ASTM Method E3053-17, a cord wood test method titled, "Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters using Cordwood Test Fuel," in conjunction with ASTM E2515-11 and Canadian Standards Administration (CSA) Method CSA-B415.1-10, which are specified in 40 CFR 60.534.

We understand that Hearthstone is also requesting that the alternative method proposed above be approved to apply broadly to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA, from the approval date of this request until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, providing all requirements of section 60.533 of Subpart AAA are met.

With the caveats set forth below, we approve your alternative test method request for certifying wood heaters using ASTM E3053-17 in conjunction with section 60.534 of Subpart AAA to meet the 2020 cord wood compliance option until such time that Subpart AAA is revised or replaced to require a different cord wood certification method. We also approve application of this alternative method to all wood heaters manufactured by Hearthstone meeting the requirements of Subpart AAA.

As required in Subpart AAA, section 60.354(d), you or your approved test laboratory must also measure the first hour of particulate matter emissions for each test run using a separate filter in one of the two parallel sampling trains. These results must be reported separately and also included in the total particulate matter emissions per run. Also, as required by Subpart AAA, section 60.534(e), you must have your approved laboratory measure the efficiency, heat output, and carbon monoxide emissions of the tested wood heater using CSA-B415.1-10. For measurement of particulate matter emission concentrations, ASTM 2515-11 must be used.

The following change to ASTM E3053-17 must be followed:

1. Coal bed conditions prior to loading test fuel. The coal bed shall be a level plane without valleys or ridges for all test runs in the high, low, and medium burn rate categories.

The following changes to ASTM E2515-11 must be followed:

1. The filter temperature must be maintained between 80 and 90 degrees F during testing.

2. Filters must be weighed in pairs to reduce weighing error propagation; see ASTM 2515-11, Section 10.2.1 Analytical Procedure.

3. Sample filters must be Pall TX-40 or equivalent Teflon-coated glass fiber, and of 47 mm, 90 mm, 100 mm, or 110 mm in diameter.

4. Only one point is allowed outside the +/- 10 percent proportionality range per test run.

A copy of this letter must be included in each certification test report where this alternative test method is utilized.

It is reasonable that this alternative test method approval be broadly applicable to all wood heaters subject to the requirements of 40 CFR part 60, Subpart AAA. For this reason, we will post this letter as ALT-125 on our website at *http://www3.epa.gov/ttn/emc/approalt.html* for use by other interested parties. As noted earlier in this letter, this alternative method approval is valid until such time that Subpart AAA is revised or replaced to require a different cord wood certification method, and at such time, this alternative will be reconsidered and possibly withdrawn.

If you have additional questions regarding this approval, please contact Michael Toney of my staff at 919-541-5247 or toney.mike@epa.gov.

Sincerely,

Steffan M. Johnson, Group Leader
Measurement Technology Group

cc: Amanda Aldridge, EPA/OAQPS/OID
Adam Baumgart-Getz, EPA/OAQPS/OID
Rafael Sanchez, EPA/OECA
Michael Toney, EPA/OAQPS/AQAD

Annex 2

Title: Documentation of aging

Pages total: 2, excl this cover page

Morsø 2B Classic 2020 pre-test conditioning

Last 50+ hours at medium burnrate

Date dd.mm.yyyy	Time (hour)	Fuel added (kg)	Fuel moisture (% wet basis)	Flue gas temperature (C°)
28.08.2020	0	1,53	≈10/20,1	23,16
	0,53	3,237	17,5	160,63
	1			183,86
	1,77	3,9	18,8	168,48
	2			128,64
	3			99,74
	4			49,42
	5			37,52
	6			33,37
	7			31,45
	8			30,93
	9			30,22
	10			29,76
	11			29,99
27.08.2020	0	1,54	≈10/17,9	23,09
	0,51	3,273	17,7	164,62
	1			155,8
	1,86	3,878	18,9	167,53
	2			145,98
	3			98,13
	4			50,92
	5			37,76
	6			33,56
	7			31,64
	8			30,86
	9			30,27
	10			30,02
26.08.2020	0	1,504	≈10/19,1	23,24
	0,56	3,23	18,8	141,16
	1			178,88
	1,95	3,765	19,2	162,29
	2			172,18
	3			109,58
	4			51,79
	5			38,04
	6			33,17
	7			30,62
	8			29,81
	9			29,35
	10			29,29
24.08.2020	0	1,516	≈10/15,5	21,38

	0,58	3,171	15,8	161,05
	1			161,83
	1,88	3,882	16	183,46
	2			145,67
	3			108,64
	4			51,17
	5			38,11
	6			33,91
	7			31,78
	8			30,89
	9			30,63
	10			30,54
21.08.2020	0	1,525	≈10/17,5	24,17
	0,51	3,214	18,4	152,75
	1			200,91
	1,71	3,812	18,9	180,6
	2			131,42
	3			85,98
	4			46,3
	5			36,66
	6			33,12
	7			32,14
	8			30,93
	9			29,94
	10			30,85

Annex 3

Title: Sequence of images, course of testing the 2nd September 2020

Pages total: 3, excl this cover page

1) Aged 2B Classic 2020 on the test rig

2) Supply of natural Beech wood logs

3) Pre-selection of wood logs

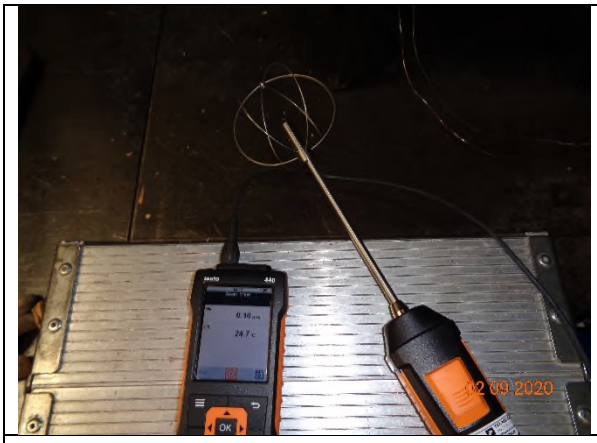
4) Measurement of surface temp (5 in total)

5) Day 1 fuel loads prepared

6) Recording of HF fuel load moisture

7) Recording of LF fuel load moisture

8) Arrangement of kindling and SU fuel



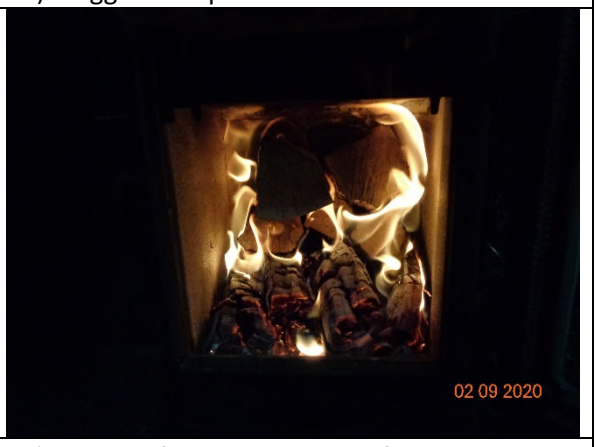
9) Measurement of air velocity prior

10) Bed of embers at the end of the Cold start

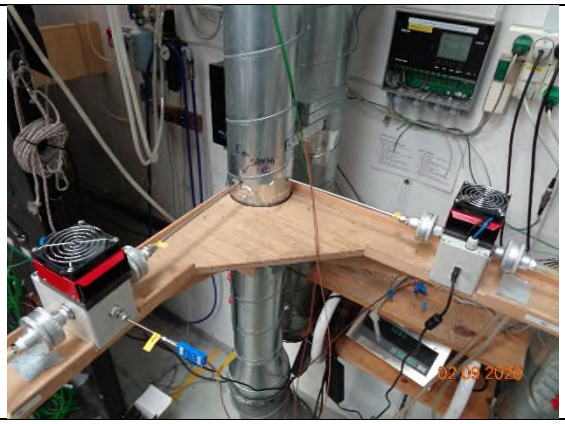
11) Firebed shortly after loading the HF batch

12) Clogged first pair of HF filers

13) Bed of embers at the end of the HF test



14) Shortly after loading the LF fuel load



15) Temp controlled sampling lines

16) Intermediate air velocity measurement

17) Air velocity measurement at the end

18) Insulated part of the measurement section and the hood. No visible smoke detected.

Annex 4

Title: Sequence of images, course of testing the 3rd September 2020

Pages total: 2, excl this cover page

1) Preparation of wood logs

2) Kindling, start-up fuel and HF and MF loads

3) Arrangement of kindling and SU fuel

4) Air velocity measurement prior

5) Bed of embers at the end of the Cold Start

6) Firebed shortly after loading the HF fuel load

7) Intermediate air velocity measurement

8) Bed of embers at the end of the HF test

	
9) Air velocity measurement, end of the MF test	10) Platform scale, end mass of the MF test

Annex 5

Title: Sequence of images, course of testing the 4th September 2020

Pages total: 2, excl this cover page

1) Kindling, SU fuel and HF fuel load line up

2) Record of HF fuel moisture

3) Arrangement of HF fuel load

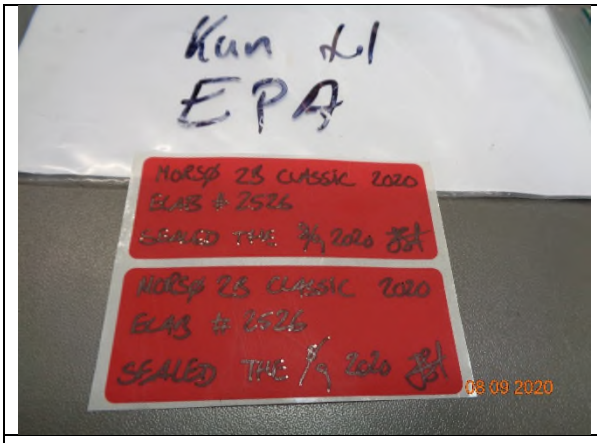
4) Air velocity measurement prior

5) Arrangement of kindling and SU fuel

6) Ignition from the top

7) Bed of embers at the end of the Cold start

8) Air velocity measurement end of the HF test

	
9) Preparation of seals	10) Sealed 2B Classic 2020 stove

Annex 6

Title: HF1 Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

Imperial units 1

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10,000	lb/ft3				
Usable Firebox Volume	0,68616	ft3				
Total Nom. Load Wt. Target	6,862	lb				
Total Load Wt. Allowable Range	6,500	to	7,200	lb		
Core Target Wt. Allowable Range	3,100	to	4,500	lb		
Remainder Load Wt. Allowable Range	2,400	to	3,800	lb		
						Mid-Point
Core Load Pc. Wt. Allowable Range	1,000	to	1,700	lb		1,350
Remainder Load Pc. Wt. Allowable Range	0,700	to	3,800	lb		2,250
	Pc. #					
Core Load Piece Wt. Actual	1	1,318	lb	In Range		
	2	1,396	lb	In Range		
	3	1,543	lb	In Range		
Core Load Total. Wt. Actual		4,26	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	2,698	lb	In Range		
(1 to 3 Pcs.)	2		lb	NA		
	3		lb	NA		
Remainder Load Tot. Wt. Act		2,698	lb	In Range		
Total Load Wt. Actual		6,956	lb	In Range		
Core % of Total Wt.		61%		In Range		45-65%
Remainder % of Total Wt.		39%		In Range		35-55%
Actual Load % of Nominal Target		101%		In Range		95-105%
Actual Fuel Load Density		10,1	lb/ft3			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		1,391	lb			
Actual Kindling Wt.		1,332	lb	In Range		19,1%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		2,087	lb			
Actual Start-up Fuel Wt.		2,013	lb	In Range		28,9%
Allowable Residual Start-up Fuel Wt. Range	0,696	to	1,391	lb		Mid-Point
Actual Residual Start-up Fuel Wt.		1,213	lb	In Range		1,043
Total Wt. All Fuel Added (wet basis)		10,30	lb			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	0,626	to	0,765	lb		0,696
Actual Fuel Load Ending Wt.		0,661	lb	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,1	19	18,4	18,5	In Range	1,113	lb	0,505	kg
21	20,9	18,1	20,0	In Range	1,163	lb	0,528	kg
19,2	18,3	18,8	18,8	In Range	1,299	lb	0,589	kg
19,1	19,3	18,6	19,0	In Range	2,268	lb	1,029	kg
			NA	NA	NA	lb	NA	kg
			NA	NA	NA	lb	NA	kg

Total Load Ave. MC (%-dry basis)	19,1	In Range			
Total Load Ave. MC % (wet basis)	16,0				
Total Test Load Weight (dry basis) →			5,842	lb	2,650 kg

Kindling Moisture (%-dry basis)

10	10	10	10,0	In Range	1,211	lb	0,549 kg

Start-up Fuel Moisture Readings (%-dry basis)

19,4	19,9	19,8	19,7	In Range	1,682	lb	0,763 kg

Total Wt. All Fuel Added (dry basis) →		8,735	lb	3,96 kg
Total Wt. All Fuel Burned (dry basis) →		6,861	lb	3,112 kg

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

Metric units 2

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	160,185	kg/m³				
Usable Firebox Volume	0,01943	m³				
Total Nom. Load Wt. Target	3,112	kg				
Total Load Wt. Allowable Range	3,000	to	3,300	kg		
Core Target Wt. Allowable Range	1,400	to	2,000	kg		
Remainder Load Wt. Allowable Range	1,100	to	1,700	kg		
						Mid-Point
Core Load Pc. Wt. Allowable Range	0,500	to	0,800	kg		0,650
Remainder Load Pc. Wt. Allowable Range	0,300	to	1,700	kg		1,000
	Pc. #					
Core Load Piece Wt. Actual	1	0,598	kg	In Range		
	2	0,633	kg	In Range		
	3	0,700	kg	In Range		
Core Load Total. Wt. Actual		1,93	kg	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	1,224	kg	In Range		
(1 to 3 Pcs.)	2		kg	NA		
	3		kg	NA		
Remainder Load Tot. Wt. Act		1,224	kg	In Range		
Total Load Wt. Actual		3,155	kg	In Range		
Core % of Total Wt.		61%		In Range		45-65%
Remainder % of Total Wt.		39%		In Range		35-55%
Actual Load % of Nominal Target		101%		In Range		95-105%
Actual Fuel Load Density		162,4	kg/m³			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		0,631	kg			
Actual Kindling Wt.		0,604	kg	In Range		19,1%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		0,947	kg			
Actual Start-up Fuel Wt.		0,913	kg	In Range		28,9%
Allowable Residual Start-up Fuel Wt. Range	0,316	to	0,631	kg		Mid-Point
Actual Residual Start-up Fuel Wt.		0,550	kg	In Range		0,473
Total Wt. All Fuel Added (wet basis)		4,67	kg			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	0,284	to	0,347	kg		0,316
Actual Fuel Load Ending Wt.		0,300	kg	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,1	19	18,4	18,5	In Range	1,113	lb	0,505	kg
21	20,9	18,1	20,0	In Range	1,163	lb	0,528	kg
19,2	18,3	18,8	18,8	In Range	1,299	lb	0,589	kg
19,1	19,3	18,6	19,0	In Range	2,268	lb	1,029	kg
			NA	NA	NA	lb	NA	kg
			NA	NA	NA	lb	NA	kg
Total Load Ave. MC (%-dry basis)			19,1	In Range				
Total Load Ave. MC % (wet basis)			16,0					
Total Test Load Weight (dry basis) →					5,842	lb	2,650	kg
Kindling Moisture (%-dry basis)								
10	10	10	10,0	In Range	0,549	lb	0,249	kg
Start-up Fuel Moisture Readings (%-dry basis)								
19,4	19,9	19,8	19,7	In Range	0,763	lb	0,346	kg
Total Wt. All Fuel Added (dry basis) →					7,154	lb	3,25	kg
Total Wt. All Fuel Burned (dry basis) →					6,304	lb	2,860	kg

Annex 7

Title: LF Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
Cordwood Fuel Load Calculators - 12 lb/ft^3 Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Imperial units

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft^3 - Low and Medium Fire

Nominal Required Load Density (wet basis)	12,000	lb/ft3				
Usable Firebox Volume	0,68616	ft3				
Total Nom. Load Wt. Target	8,234	lb				
Total Load Wt. Allowable Range	7,822	to	8,646	lb		
Core Target Wt. Allowable Range	3,705	to	5,352	lb		
Remainder Load Wt. Allowable Range	2,882	to	4,529	lb		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	1,235	to	2,058	lb		1,647
Remainder Load Pc. Wt. Allowable Range	0,823	to	2,470	lb		1,647
	Pc. #					
Core Load Piece Wt. Actual	1	1,543	lb	In Range		
	2	1,636	lb	In Range		
	3	1,673	lb	In Range		
Core Load Total. Wt. Actual		4,85	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	2,335	lb	In Range		
(2 or 3 Pcs.)	2	1,279	lb	In Range		
	3		lb	NA		
Remainder Load Piece Weight Ratio - Small/Large		55%		In Range		≤ 67%
Remainder Load Tot. Wt. Act		3,613	lb	In Range		
Total Load Wt. Actual		8,466	lb	In Range		
Core % of Total Wt.		57%		In Range		45-65%
Remainder % of Total Wt.		43%		In Range		35-55%
Actual Load % of Nominal Target		103%		In Range		95-105%
Actual Fuel Load Density		12,338	lb/ft3			
Allowable Charcoal Bed Wt. Range (lb)	0,897	to	1,643			Mid-Point
Actual Charcoal Bed Wt.		1,488	lb	In Range		1,270
Actual Fuel Load Ending Wt.		0,000	lb	Valid Test		≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		8,466	lb			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
25,2	20,5	21	22,2	In Range	1,263	lb	0,573	kg
18,8	19,8	17,8	18,8	In Range	1,377	lb	0,625	kg
17,9	18,1	18,1	18,0	In Range	1,418	lb	0,643	kg
18,6	22,3	18,6	19,8	In Range	1,948	lb	0,884	kg
18,5	18,5	18,3	18,4	In Range	1,080	lb	0,490	kg
			NA	NA	NA	lb	NA	kg
Total Load Ave. MC % (dry basis)			19,5	In Range				
Total Load Ave. MC % (wet basis)			16,3					
Total Test Load Weight (dry basis)					7,085	lb	3,214	kg
Total Fuel Weight Burned During Test Run (dry basis)					7,085	lb	3,214	kg

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
Cordwood Fuel Load Calculators - 12 lb/ft^3 Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Metric units

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft^3 - Low and Medium Fire

Nominal Required Load Density (wet basis)	192,222	kg/m³				
Usable Firebox Volume	0,01943	m³				
Total Nom. Load Wt. Target	3,735	kg				
Total Load Wt. Allowable Range	3,548	to	3,922	kg		
Core Target Wt. Allowable Range	1,681	to	2,428	kg		
Remainder Load Wt. Allowable Range	1,307	to	2,054	kg		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	0,560	to	0,934	kg		0,747
Remainder Load Pc. Wt. Allowable Range	0,373	to	1,120	kg		0,747
	Pc. #					
Core Load Piece Wt. Actual	1	0,700	kg	In Range		
	2	0,742	kg	In Range		
	3	0,759	kg	In Range		
Core Load Total. Wt. Actual		2,20	kg	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	1,059	kg	In Range		
(2 or 3 Pcs.)	2	0,580	kg	In Range		
	3		kg	NA		
Remainder Load Piece Weight Ratio - Small/Large		55%		In Range		≤ 67%
Remainder Load Tot. Wt. Act		1,639	kg	In Range		
Total Load Wt. Actual		3,840	kg	In Range		
Core % of Total Wt.		57%		In Range		45-65%
Remainder % of Total Wt.		43%		In Range		35-55%
Actual Load % of Nominal Target		103%		In Range		95-105%
Actual Fuel Load Density		197,633	kg/m³			
Allowable Charcoal Bed Wt. Range (kg)	0,434	to	0,718			Mid-Point
Actual Charcoal Bed Wt.		0,675	kg	In Range		0,576
Actual Fuel Load Ending Wt.		0,000	kg	Valid Test		≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		3,840	kg			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
25,2	20,5	21	22,2	In Range	1,263	lb	0,573	kg
18,8	19,8	17,8	18,8	In Range	1,377	lb	0,625	kg
17,9	18,1	18,1	18,0	In Range	1,418	lb	0,643	kg
18,6	22,3	18,6	19,8	In Range	1,948	lb	0,884	kg
18,5	18,5	18,3	18,4	In Range	1,080	lb	0,490	kg
			NA	NA	NA	lb	NA	kg

Total Load Ave. MC % (dry basis)	19,5	In Range			
Total Load Ave. MC % (wet basis)	16,3				
Total Test Load Weight (dry basis)			7,085	lb	3,214 kg
Total Fuel Weight Burned During Test Run (dry basis)			7,085	lb	3,214 kg

Annex 8

Title: HF2 Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

Imperial units 1

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10,000	lb/ft3				
Usable Firebox Volume	0,686179	ft3				
Total Nom. Load Wt. Target	6,862	lb				
Total Load Wt. Allowable Range	6,500	to	7,200	lb		
Core Target Wt. Allowable Range	3,100	to	4,500	lb		
Remainder Load Wt. Allowable Range	2,400	to	3,800	lb		
						Mid-Point
Core Load Pc. Wt. Allowable Range	1,000	to	1,700	lb		1,350
Remainder Load Pc. Wt. Allowable Range	0,700	to	3,800	lb		2,250
	Pc. #					
Core Load Piece Wt. Actual	1	1,475	lb	In Range		
	2	1,479	lb	In Range		
	3	1,360	lb	In Range		
Core Load Total. Wt. Actual		4,31	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	2,718	lb	In Range		
0 0	2	0,000	lb	Out of Range		
	3	0,000	lb	Out of Range		
Remainder Load Tot. Wt. Act		2,718	lb	In Range		
Total Load Wt. Actual		7,033	lb	In Range		
Core % of Total Wt.		61%		In Range		45-65%
Remainder % of Total Wt.		39%		In Range		35-55%
Actual Load % of Nominal Target		102%		In Range		95-105%
Actual Fuel Load Density		10,2	lb/ft3			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		1,407	lb			
Actual Kindling Wt.		1,329	lb	In Range		18,9%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		2,110	lb			
Actual Start-up Fuel Wt.		1,978	lb	In Range		28,1%
Allowable Residual Start-up Fuel Wt. Range	0,703	to	1,407	lb		Mid-Point
Actual Residual Start-up Fuel Wt.		1,213	lb	In Range		1,055
Total Wt. All Fuel Added (wet basis)		10,34	lb			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	0,633	to	0,774	lb		0,703
Actual Fuel Load Ending Wt.		0,661	lb	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,2	19,1	19,1	18,8	In Range	1,241	lb	0,563	kg
18,6	18,1	18,3	18,3	In Range	1,250	lb	0,567	kg
19,2	18,4	19	18,9	In Range	1,144	lb	0,519	kg
20,3	19,6	21,6	20,5	In Range	2,256	lb	1,023	kg
0	0	0	0,0	Out of Range	NA	lb	NA	kg
0	0	0	0,0	Out of Range	NA	lb	NA	kg
Total Load Ave. MC (%-dry basis)			19,4	In Range				
Total Load Ave. MC % (wet basis)			16,2					
Total Test Load Weight (dry basis) →					5,892	lb	2,673	kg
Kindling Moisture (%-dry basis)								
10	10	10	10,0	In Range	1,209	lb	0,548	kg
Start-up Fuel Moisture Readings (%-dry basis)								
19,3	19,6	20,2	19,7	In Range	1,652	lb	0,749	kg
Total Wt. All Fuel Added (dry basis) →					8,752	lb	3,97	kg
Total Wt. All Fuel Burned (dry basis) →					6,878	lb	3,120	kg

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

Metric units 2

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	160,185	kg/m³				
Usable Firebox Volume	0,019430	m³				
Total Nom. Load Wt. Target	3,112	kg				
Total Load Wt. Allowable Range	3,000	to	3,300	kg		
Core Target Wt. Allowable Range	1,400	to	2,000	kg		
Remainder Load Wt. Allowable Range	1,100	to	1,700	kg		
						Mid-Point
Core Load Pc. Wt. Allowable Range	0,500	to	0,800	kg		0,650
Remainder Load Pc. Wt. Allowable Range	0,300	to	1,700	kg		1,000
	Pc. #					
Core Load Piece Wt. Actual	1	0,669	kg	In Range		
	2	0,671	kg	In Range		
	3	0,617	kg	In Range		
Core Load Total. Wt. Actual		1,96	kg	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	1,233	kg	In Range		
0 0	2	0,000	kg	Out of Range		
	3	0,000	kg	Out of Range		
Remainder Load Tot. Wt. Act		1,233	kg	In Range		
Total Load Wt. Actual		3,190	kg	In Range		
Core % of Total Wt.		61%		In Range		45-65%
Remainder % of Total Wt.		39%		In Range		35-55%
Actual Load % of Nominal Target		102%		In Range		95-105%
Actual Fuel Load Density		164,2	kg/m³			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		0,638	kg			
Actual Kindling Wt.		0,603	kg	In Range		18,9%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		0,957	kg			
Actual Start-up Fuel Wt.		0,897	kg	In Range		28,1%
Allowable Residual Start-up Fuel Wt. Range	0,319	to	0,638	kg		Mid-Point
Actual Residual Start-up Fuel Wt.		0,550	kg	In Range		0,478
Total Wt. All Fuel Added (wet basis)		4,69	kg			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	0,287	to	0,351	kg		0,319
Actual Fuel Load Ending Wt.		0,300	kg	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,2	19,1	19,1	18,8	In Range	1,241	lb	0,563	kg
18,6	18,1	18,3	18,3	In Range	1,250	lb	0,567	kg
19,2	18,4	19	18,9	In Range	1,144	lb	0,519	kg
20,3	19,6	21,6	20,5	In Range	2,256	lb	1,023	kg
0	0	0	0,0	Out of Range	NA	lb	NA	kg
0	0	0	0,0	Out of Range	NA	lb	NA	kg
Total Load Ave. MC (%-dry basis)			19,4	In Range				
Total Load Ave. MC % (wet basis)			16,2					
Total Test Load Weight (dry basis) →					5,892	lb	2,672	kg
Kindling Moisture (%-dry basis)								
10	10	10	10,0	In Range	0,548	lb	0,249	kg
Start-up Fuel Moisture Readings (%-dry basis)								
19,3	19,6	20,2	19,7	In Range	0,749	lb	0,340	kg
Total Wt. All Fuel Added (dry basis) →					7,189	lb	3,26	kg
Total Wt. All Fuel Burned (dry basis) →					6,339	lb	2,875	kg

Annex 9

Title: MF Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
Cordwood Fuel Load Calculators - 12 lb/ft^3 Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Imperial units

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft^3 - Low and Medium Fire

Nominal Required Load Density (wet basis)	12,000	lb/ft3					
Usable Firebox Volume	0,68618	ft3					
Total Nom. Load Wt. Target	8,234	lb					
Total Load Wt. Allowable Range	7,822	to	8,646	lb			
Core Target Wt. Allowable Range	3,705	to	5,352	lb			
Remainder Load Wt. Allowable Range	2,882	to	4,529	lb			
						Mid-Point	
Core Load Fuel Pc. Wt. Allowable Range	1,235	to	2,059	lb		1,647	
Remainder Load Pc. Wt. Allowable Range	0,823	to	2,470	lb		1,647	
	Pc. #						
Core Load Piece Wt. Actual	1	1,711	lb	In Range			
	2	1,550	lb	In Range			
	3	1,433	lb	In Range			
Core Load Total. Wt. Actual		4,69	lb	In Range			
	Pc. #						
Remainder Load Piece Wt.	1	2,249	lb	In Range			
(2 or 3 Pcs.)	2	1,294	lb	In Range			
	3		lb	NA			
Remainder Load Piece Weight Ratio - Small/Large		58%		In Range	≤ 67%		
Remainder Load Tot. Wt. Act		3,543	lb	In Range			
Total Load Wt. Actual		8,236	lb	In Range			
Core % of Total Wt.		57%		In Range	45-65%		
Remainder % of Total Wt.		43%		In Range	35-55%		
Actual Load % of Nominal Target		100%		In Range	95-105%		
Actual Fuel Load Density		12,003	lb/ft3				
Allowable Charcoal Bed Wt. Range (lb)	0,874	to	1,597			Mid-Point	
Actual Charcoal Bed Wt.		1,488	lb	In Range		1,235	
Actual Fuel Load Ending Wt.		0,000	lb	Valid Test	≥ 90%		
Total Wt. of Fuel Burned During Test Run lb.		8,236	lb				

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,5	18,1	21	19,2	In Range	1,435	lb	0,651	kg
18,5	18,9	18,7	18,7	In Range	1,306	lb	0,592	kg
19,1	18	20,4	19,2	In Range	1,203	lb	0,545	kg
18,8	22	21,6	20,8	In Range	1,862	lb	0,844	kg
18,7	18,9	18	18,5	In Range	1,092	lb	0,495	kg
			NA	NA	NA	lb	NA	kg

Total Load Ave. MC % (dry basis)	19,4	In Range			
Total Load Ave. MC % (wet basis)	16,3				
Total Test Load Weight (dry basis)			6,897	lb	3,128 kg
Total Fuel Weight Burned During Test Run (dry basis)			6,897	lb	3,128 kg

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version
Cordwood Fuel Load Calculators - 12 lb/ft^3 Nominal Load Density
Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Metric units

Values to be input manually

For Usable Firebox Volumes up to 3.0 ft^3 - Low and Medium Fire

Nominal Required Load Density (wet basis)	192,222	kg/m^3				
Usable Firebox Volume	0,01943	m^3				
Total Nom. Load Wt. Target	3,735	kg				
Total Load Wt. Allowable Range	3,548	to	3,922	kg		
Core Target Wt. Allowable Range	1,681	to	2,428	kg		
Remainder Load Wt. Allowable Range	1,307	to	2,054	kg		
						Mid-Point
Core Load Fuel Pc. Wt. Allowable Range	0,560	to	0,934	kg		0,747
Remainder Load Pc. Wt. Allowable Range	0,373	to	1,120	kg		0,747
	Pc. #					
Core Load Piece Wt. Actual	1	0,776	kg		In Range	
	2	0,703	kg		In Range	
	3	0,650	kg		In Range	
Core Load Total. Wt. Actual		2,13	kg		In Range	
	Pc. #					
Remainder Load Piece Wt.	1	1,020	kg		In Range	
(2 or 3 Pcs.)	2	0,587	kg		In Range	
	3		kg		NA	
Remainder Load Piece Weight Ratio - Small/Large		58%			In Range	≤ 67%
Remainder Load Tot. Wt. Act		1,607	kg		In Range	
Total Load Wt. Actual		3,736	kg		In Range	
Core % of Total Wt.		57%			In Range	45-65%
Remainder % of Total Wt.		43%			In Range	35-55%
Actual Load % of Nominal Target		100%			In Range	95-105%
Actual Fuel Load Density		192,275	kg/m^3			
Allowable Charcoal Bed Wt. Range (kg)	0,424	to	0,697			Mid-Point
Actual Charcoal Bed Wt.		0,675	kg		In Range	0,560
Actual Fuel Load Ending Wt.		0,000	kg		Valid Test	≥ 90%
Total Wt. of Fuel Burned During Test Run lb.		3,736	kg			

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,5	18,1	21	19,2	In Range	1,435	lb	0,651	kg
18,5	18,9	18,7	18,7	In Range	1,306	lb	0,592	kg
19,1	18	20,4	19,2	In Range	1,203	lb	0,545	kg
18,8	22	21,6	20,8	In Range	1,861	lb	0,844	kg
18,7	18,9	18	18,5	In Range	1,092	lb	0,495	kg
			NA	NA	NA	lb	NA	kg
Total Load Ave. MC % (dry basis)			19,4	In Range				
Total Load Ave. MC % (wet basis)			16,3					
Total Test Load Weight (dry basis)					6,897	lb	3,128	kg
Total Fuel Weight Burned During Test Run (dry basis)					6,897	lb	3,128	kg

Annex 10

Title: HF3 Cordwood fuel load calculator (Imperial and metrics)

Pages total: 2, excl this cover page

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

Imperial units 1

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	10,000	lb/ft3				
Usable Firebox Volume	0,68616	ft3				
Total Nom. Load Wt. Target	6,862	lb				
Total Load Wt. Allowable Range	6,500	to	7,200	lb		
Core Target Wt. Allowable Range	3,100	to	4,500	lb		
Remainder Load Wt. Allowable Range	2,400	to	3,800	lb		
						Mid-Point
Core Load Pc. Wt. Allowable Range	1,000	to	1,700	lb		1,350
Remainder Load Pc. Wt. Allowable Range	0,700	to	3,800	lb		2,250
	Pc. #					
Core Load Piece Wt. Actual	1	1,479	lb	In Range		
	2	1,442	lb	In Range		
	3	1,398	lb	In Range		
Core Load Total. Wt. Actual		4,32	lb	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	2,698	lb	In Range		
0 0	2	0,000	lb	Out of Range		
	3	0,000	lb	Out of Range		
Remainder Load Tot. Wt. Act		2,698	lb	In Range		
Total Load Wt. Actual		7,017	lb	In Range		
Core % of Total Wt.		62%		In Range		45-65%
Remainder % of Total Wt.		38%		In Range		35-55%
Actual Load % of Nominal Target		102%		In Range		95-105%
Actual Fuel Load Density		10,2	lb/ft3			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		1,403	lb			
Actual Kindling Wt.		1,334	lb	In Range		19,0%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		2,105	lb			
Actual Start-up Fuel Wt.		2,004	lb	In Range		28,6%
Allowable Residual Start-up Fuel Wt. Range	0,702	to	1,403	lb		Mid-Point
Actual Residual Start-up Fuel Wt.		1,213	lb	In Range		1,053
Total Wt. All Fuel Added (wet basis)		10,36	lb			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	0,632	to	0,772	lb		0,702
Actual Fuel Load Ending Wt.		0,661	lb	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,5	18,8	19,3	18,9	In Range	1,245	lb	0,565	kg
18,7	20,9	19,7	19,8	In Range	1,204	lb	0,546	kg
18,7	19,2	18,9	18,9	In Range	1,175	lb	0,533	kg
19,2	19,5	18,8	19,2	In Range	2,264	lb	1,027	kg
0	0	0	0,0	Out of Range	NA	lb	NA	kg
0	0	0	0,0	Out of Range	NA	lb	NA	kg

Total Load Ave. MC (%-dry basis)	19,2	In Range			
Total Load Ave. MC % (wet basis)	16,1				
Total Test Load Weight (dry basis) →			5,888	lb	2,671 kg

Kindling Moisture (%-dry basis)

10	10	10	10,0	In Range	1,213	lb	0,550	kg

Start-up Fuel Moisture Readings (%-dry basis)

18,8	19,5	20,2	19,5	In Range	1,677	lb	0,761	kg

Total Wt. All Fuel Added (dry basis) →			8,778	lb	3,98 kg
Total Wt. All Fuel Burned (dry basis) →			6,904	lb	3,131 kg

Adjunct to ASTM E3053 Wood Heater Cordwood Test Method - May 10, 2017 Version

Cordwood Fuel Load Calculators - 10 lb/ft^3 Nominal Load Density

Core 45-65% of Total Load Weight, Remainder 35-55% of Total Load Weight

Values to be input manually

Metric units 2

For All Usable Firebox Volumes - High Fire Test Only

Nominal Required Load Density (wet basis)	160,185	kg/m³				
Usable Firebox Volume	0,01943	m³				
Total Nom. Load Wt. Target	3,112	kg				
Total Load Wt. Allowable Range	3,000	to	3,300	kg		
Core Target Wt. Allowable Range	1,400	to	2,000	kg		
Remainder Load Wt. Allowable Range	1,100	to	1,700	kg		
						Mid-Point
Core Load Pc. Wt. Allowable Range	0,500	to	0,800	kg		0,650
Remainder Load Pc. Wt. Allowable Range	0,300	to	1,700	kg		1,000
	Pc. #					
Core Load Piece Wt. Actual	1	0,671	kg	In Range		
	2	0,654	kg	In Range		
	3	0,634	kg	In Range		
Core Load Total. Wt. Actual		1,96	kg	In Range		
	Pc. #					
Remainder Load Piece Wt.	1	1,224	kg	In Range		
0 0	2	0,000	kg	Out of Range		
	3	0,000	kg	Out of Range		
Remainder Load Tot. Wt. Act		1,224	kg	In Range		
Total Load Wt. Actual		3,183	kg	In Range		
Core % of Total Wt.		62%		In Range		45-65%
Remainder % of Total Wt.		38%		In Range		35-55%
Actual Load % of Nominal Target		102%		In Range		95-105%
Actual Fuel Load Density		163,8	kg/m³			
Kindling and Start-up Fuel						
Maximim Kindling Wt. (20% of Tot. Load Wt.)		0,637	kg			
Actual Kindling Wt.		0,605	kg	In Range		19,0%
Maximum Start-up Fuel Wt. (30% of Tot. Load Wt.)		0,955	kg			
Actual Start-up Fuel Wt.		0,909	kg	In Range		28,6%
Allowable Residual Start-up Fuel Wt. Range	0,318	to	0,637	kg		Mid-Point
Actual Residual Start-up Fuel Wt.		0,550	kg	In Range		0,477
Total Wt. All Fuel Added (wet basis)		4,70	kg			
High Fire Test Run End Point Range	Low		High			Mid-Point
Based on Fuel Load Wt. (w/tares)	0,286	to	0,350	kg		0,318
Actual Fuel Load Ending Wt.		0,300	kg	In Range		

Fuel Piece Moisture Reading (%-dry basis)

1	2	3	Ave.		Pc. Wt. Dry Basis			
18,5	18,8	19,3	18,9	In Range	1,244	lb	0,564	kg
18,7	20,9	19,7	19,8	In Range	1,204	lb	0,546	kg
18,7	19,2	18,9	18,9	In Range	1,175	lb	0,533	kg
19,2	19,5	18,8	19,2	In Range	2,264	lb	1,027	kg
0	0	0	0,0	Out of Range	NA	lb	NA	kg
0	0	0	0,0	Out of Range	NA	lb	NA	kg

Total Load Ave. MC (%-dry basis)	19,2	In Range			
Total Load Ave. MC % (wet basis)	16,1				
Total Test Load Weight (dry basis) →			5,888	lb	2,671 kg
Kindling Moisture (%-dry basis)					
10 10 10	10,0	In Range	0,550	lb	0,249 kg
Start-up Fuel Moisture Readings (%-dry basis)					
18,8 19,5 20,2	19,5	In Range	0,761	lb	0,345 kg
Total Wt. All Fuel Added (dry basis) →			7,199	lb	3,27 kg
Total Wt. All Fuel Burned (dry basis) →			6,349	lb	2,880 kg

Annex 11

Title: Manufacturers instruction for testing procedure

Pages total: 4, excl this cover page

Manufacturers instruction for testing procedure

according to ASTM E3053-17

Morsø 2B Classic 2020 High Fire Procedure

Test Fuel:

Recommended test fuel species is beech.
The guidelines of the Cordwood standard E3053-17 are followed in regards of moisture content and weight ratios for kindling, startup, core and sub loads.
The nominal length for High Burn core and sub load is 12'' (30 cm.)
The usable firebox volume is 0.686199 ft^3 (0,019431 m^3)

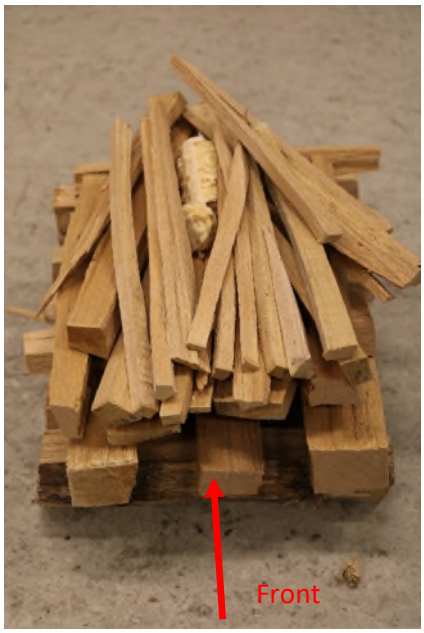
Kindling and Startup:

The Start-up load is added to the kindling load. Ignited together in the same batch.
A "top-down" approach is used when igniting the fire.
The firebox is deep and narrow. To make things simple keep the length of kindling and start-up pieces just about the same lenght as the minimum width of the firebox.

Left to right:

- Startup load. Consist of 6-8 pieces. Weight of each pieces varies from 100-150 grams. Diameter 3 cm to 5 cm.
- Kindling, medium size. Consist of pieces with a weight of 30-60 grams. Diameter 1 cm to 2 cm.
- Kindling, small size. Consist of pieces with a weight up to 20 grams. Diameter approximate 0.5 cm

Start-up load at the bottom, distributed in two layers. Each layer is perpendicular to each other.
Next, on top of the startup load, the medium sized kindling is distributed in two to three layers. These layers are also perpendicular to each other
Finally, the smallest kindling pieces is placed loosely on top, all in the same direction, stove front to stove back.
On top of the wood, place one or two fire-starters. Re-arrange a couple of the top kindling pieces so they support the fire-starters on the sides. This will prevent the fire-starters from falling off and ease ignition of the wood.
Keep a ≈ 2'' distance from the load to the baffle.



If there is too much wood in the stack to comply with this, then take the remaining kindling pieces and lay next to the main stack.

Load ignition

Set the air controller at maximum setting and fully open the stove door. Maximum setting is 3¼ turns on the primary air control spinner

Build the start-up and kindling wood-stack as described. The wood-stack should be centered in the middle of the hearth.

Ignite one of the fire-starters with a gas torch.

Keep the door ajar and let the fire built up for up to 5 minutes before closing the door.

High Fire loading and ignition:

The charcoal bed for the High Fire should be around the midpoint of the allowable range. But keep an eye on the charcoal bed, do not wait too long, if the charcoal bed seems to burn out and getting too cold.

High Fire Load sample
Nominal length 12''

High Fire Load sample
Arrangement

The High Fire fuel load consist of four pieces. The preferred configuration of the load is a bottom layer of two pieces and second layer on top with two pieces. The load should be stacked compact without much air between each piece.
It is important that the fuel load height is kept below the path of the secondary air outlet stream (baffle plate)
Start the High Fire by fully open the stove door. Keep the air controller setting at maximum. If the burnt Kindling and Start-up wood-stack has not collapsed completely, even out the charcoal pieces with a poker. The bigger charcoal pieces should be poked to the front end of the hearth. Next load the fuel, keep a distance between fuel load and the back wall of the firebox of approximately 0.5''-1'' (1.25 cm-2.5 cm).

The load should ignite rapidly

When the fire is steady close the door. This will take approximately 1 minute. Keep air controller fully open.

The High Fire should be stopped at the lower end of the allowable weight range.

Manufacturers instruction for testing procedure

according to ASTM E3053-17

Morsø 2B Classic Medium and Low Fire Procedure

Test Fuel:

Recommended test fuel species is beech.
The guidelines of the Cordwood standard E3053-17 are followed in regards of moisture content and weight ratios for kindling, startup, core and sub loads.
The nominal length for High Burn core and sub load is 12'' (30 cm.)

The usable firebox volume is 0.686199 ft^3 (0,019431 m^3)

Low and Medium Fire loading and ignition:

The Low and Medium Fire test is much like the High Fire, regarding both test procedure and load arrangement.

The Low/Medium Fire fuel load consist of five pieces. The preferred configuration of the load is a bottom layer of three pieces and second layer on top with two pieces. The load should be stacked compact without much air between each piece.
It is important that the fuel load height is kept below the path of the secondary air outlet stream (baffle plate)
Start the Low/Medium Fire by fully open the stove door. Keep the air controller setting at maximum. Even out the charcoal pieces on the hearth with a poker. Next load the fuel, keep a distance between fuel load and the back wall of the firebox of approximately 0.5''-1'' (1.25 cm-2.5 cm).

The load should ignite rapidly.

When the fire is steady close the door. This will take approximately 1-3 minute.

Adjust and set the primary air controller at latest, half a minute before the allowable timeframe closes. The Low Fire setting is ¾ turn on the air controller valve. Medium Fire setting is 1¼ turn on the air controller valve.

Low and Medium Fire Test Run Completion-The test run is completed when the scale indicates the remaining weight of the test fuel load is 0.0 lb. (0.00 kg) or less for 30 s OR if at least 90 % of the test fuel load weight has been consumed and there is no measurable weight loss (<0.1 lb (0.05 kg) or 1.0 % of the test fuel load weight, whichever is greater) for at least 30 min.

Annex 12

Title: Manufacturers description of the wood heater

Pages total: 1, excl this cover page

WOOD HEATER INFORMATION

Appliance Manufacturer: Morsø Jernstøberi A/S

Wood Stove Model: 2B Classic 2020

Type: Freestanding, radiant-type wood fired room heater.

WOOD HEATER DESCRIPTION

Materials of Construction: The unit is constructed primarily of cast iron with a stainless-steel secondary combustion air supplying baffle. The firebox is lined with molded vermiculite firebricks. The feed door has a 145 mm by 158 mm glass panel and one 870 mm by 8 mm glass fiber gasket. The ash door is sealed with one 570 mm by 8 mm glass fiber gasket.

Air Introduction System: Air enters the firebox through a spin-draft located at the front of the appliance at the top of the fuel-loading door. Secondary air enters the appliance through the upper back and supplies a three-step, tiered hollow baffle.

Combustion Control Mechanisms: The combustion air inlet is controlled by a spin draft on the fuel-loading door.

Combustor: N/A.

Internal Baffles: A stainless steel baffle with a ceramic blanket is mounted in the upper portion of the firebox. The flame path is forced to the front of the firebox where it travels up through the opening between the baffle and primary air manifold.

Other Features: N/ A.

Flue Outlet: The 6'' diameter flue outlet is located at the top of the unit.

Annex 13

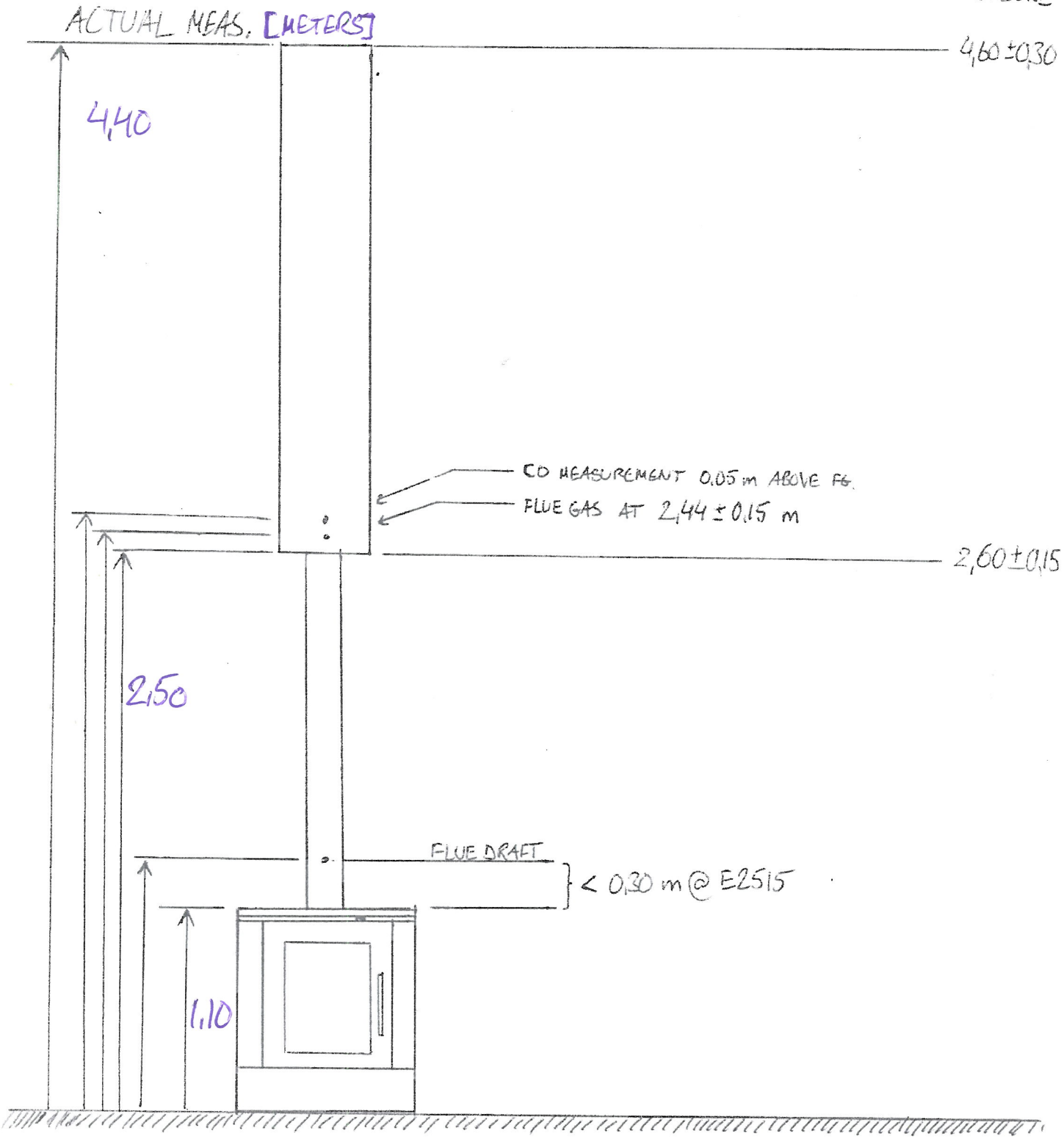
Title: Chimney configuration

Pages total: 1, excl this cover page

EPA TEST FLUE/CHIMNEY

STOVE: HORSØ 2B CLASSIC 2020

DATE OF TEST: 2.-4. SEPTEMBER 2020



Annex 14

Title: DTI Cordwood test procedure (CBI)

Pages total: 26, excl this cover page

Indhold

1 FORMÅL

Formålet med prøvningsproceduren er at afprøve brændeovne i henhold til metode til bestemmelse af partikelemission, med Crib- og Cordwood, der kan opnå godkendelse hos EPA i USA.

2 GYLDIGHEDSOMRÅDE

Afprøvningen omfatter lukkede brændeovne og indsatse til fyring med træ, og begrænset til en maksimal ydelse på 50 kW.

3 ANSVARSFORHOLD

Den laboratorieansvarlige er ansvarlig for procedurens vedligeholdelse.
De opgaveansvarlige er ansvarlige for dokumentets anvendelse på opgaver inden for området.
Sektionsleder og Centerchefen har det overordnede ansvar for området.

4 Procedure for partikelmåling til EPA godkendelse

4.1 Indledning

Proceduren er baseret på kravene i The Rule, 'Standards of Performance for New Residential Wood Heaters' US EPA 40 CFR Part 60 som offentliggjort i the Federal Register mandag den 16. marts 2015 The Rule henviser i subpart AAA, §60.534 til test standarderne:

- ASTM E2515-11 (Sampling og analysemetoder, herunder brug af fortyndingstunnel)
- ASTM E2780-10 med undtagelser defineret af Metode 28R (Fyring og drift)
- US EPA Metode 28R (korrigendum til standarden ASTM E2780-10)
- US EPA Metode 28, udvalge elementer som specificeret af Metode 28R (Fyring og drift, samt vægtet middelværdi emissionsberegninger)
- ASTM E3053-17 Bestemmelse af PM emission ved brug af Cordwood (dvs. brændetræ)
- CSA B415.1-10 (måling af CO emission og bestemmelse af virkningsgrad og varmeydelse afsnittene 13.7-13.10).
    - Standard regneark tilhørende CSA B415.1-10

Der henvises i øvrigt til punkt 6, Referencer.

4.1.1 Definitioner
-Cribwood; Prøveklodsen er sammensat af 'Cribs', dvs savskåret Douglas træ på fast mål
-Cordwood; Prøvebrændsel i form af naturlige brændekævler fra udvalgte løvtræssorter

Se øvrige definitioner i de enkelte standarder.

4.1.2 Prøveudtagning, emne
I forbindelse med afprøvning efter denne procedure findes der ingen specielle retningslinjer for prøveudtagning af emnet. Fabrikanten/Importøren forestår selv udvælgelsen af prøveemnet.

4.1.3 Prøvningsmetode
-Prøvningen foretages som anført i denne procedure. Se detaljer under punkt 4.7 og 4.9.
-Brug af fortyndingstunnel er primært baseret på ASTM E2515-11. Se punkt 4.7.
-Ved prøvning med Cribwood er betjening af ovnen er primært baseret på ASTM E2780-10 med modifikationer efter EPA metode 28R. Se punkt 4.9.
-Ved prøvning med Cordwood er fyringsmønster og betjening af ovnen baseret på standarden ASTM E3053-17 (Standard Test Method for Determining Particulate Matter Emissions from Wood Heaters Using Cordwood Test Fuel)

4.1.4 Fortyndingstunnel
Partikelprøve udtages i en fortyndingstunnel som beskrevet i standarden ASTM E2515-11, 6.1.6. med tillæg af indbyggede plader til tvangsopblanding af røggassen i miksesektionen, i overensstemmelse med standarden CSA B415.1-10, 6.4.6
Fortyndingstunnellen måler indvendig diameter ø150 mm ± 2 mm i prøveudtagningssektionen. Hvis det er mere hensigtsmæssigt kan kanal diameteren øges til Ø200mm.

4.1.5 Princip
Prøvningsmetoden afprøver ovnen med hensyn til partikelemission ved forskellige ydelsesområder. Partiklerne udtages i fortyndingstunnel. Ovnen opstilles på en platformsvægt således at afbrændingen og grundglødelaget kan registreres.
Der bestemmes en partikelkoncentration i fortyndingstunnelen, og ud fra denne samt ud fra flowet i fortyndingstunnelen bestemmes en samlet partikelemission angivet i gram/time [g/h]. Samtidig med PM målingen bestemmes virkningsgrad, varmeydelse og emission af CO efter metoderne i standarden CSA415.1-10, afsnittene 13.7 – 13.10

4.1.6 Prøvningsudstyr, stand C (EPA setup)

Instrument	**Traceability**	**Instrument number Test rig C**
Scale, Mettler, 600 kg, KC 600	ELAB	270-A-1638
Thermo couples, EPA sampling train Type T	ELAB	Id No. 145092
Thermo couples, others, Type T and type K	ELAB	Id No.134396
DOP version II	-	-
Data acquisition unit, HP 34970A	DANAK 200	270-A-1630
Surface temperature, Technoterm 5500	DANAK 200	270-A-0976
Surface temperature, Dan 1200	DANAK 200	270-A-0876

Pressure gauge, Autotran 700 (flue draught)	ELAB	270-A-1632
Pressure gauge, Autotran 700 (Pd)	ELAB	Id No. 145065
Pressure gauge, Autotran 700 (Ps)	ELAB	270-A-1634
Calibrator, Jofra 650 SE	DANAK 200	270-A-0912
Scale, Mettler Toledo (15kg/1g)	ELAB	Id No. 5822
Scale, Mettler Toledo XS4002S (4,1kg/10mg)	ELAB	Id No. 135794
Scale, Mettler Toledo XS204 (220g/0,1mg)	DANAK 200	Id No. 7084
Disa Dantec flow analyser (Air velocity Laboratory)	DANAK 200	Id No. 424 (13486)
TSI Micromanometer and Pitottube (Air velocity Dillution tunnel)	DANAK 200	Id No. 4771 (270-A-2406)
Hygrometer (air humidity) Thermoguard	DANAK 200	Id No. 142357
Barometric reading (atmospheric pressure) Thermoguard / (Ahlborn)	DANAK 200	Id No. 7102
Pitot tube (air velocity in flue)	ELAB	270-A-1631-14
Dust measuring equipment (particle measuring equipment)	-	Id No. 145093
Gas meter, Red-y (-H) (Whole charge, With outlet)	DANAK 200	Id No. 144236
Gas meter, Red-y (-D) (Divided charge with outlet)	DANAK 200	Id. No. 144239
Flow meter (-R) (Room blanc)	DANAK-200	Id No. 144257
Thermo sensor, Dilution tunnel, Pt 100	DANAK 200	270-A-1628
PST leakage meter (Brooks glass tube)	ELAB	Id no. 83013
CO/CO_2 analyser, ABB IR	ELAB	270-A-2276
Spangas CO/CO_2, AGA (High CO and CO_2)	Swedac	Id no. 135573
Spangas CO/CO_2, AGA (Low CO)	Swedac	Id no. 135574
Moisture meter	ELAB	Id No. 145070
Vaccum meter (-H) (Whole)	DANAK 200	Id No. 145074
Vaccum meter (-D) (Divided)	DANAK 200	Id No. 145076
Vaccum meter (-R) (Room)	DANKA 200	Id No. 145077
Pressure meter (-H) (Whole)	DANAK 200	Id No. 145078
Pressure meter (-D) (Divided)	DANAK 200	Id No. 145079
Thermometer (Fuel storrage room)	ELAB	Id No. 145081

4.1.7 Underleverandører
Der bruges kun underleverandører til kalibreringer.

4.2 Opsætning af fortyndingstunnel og samplingslinje
Proceduren er primært baseret på standarden ASTM E2515-11 'Standard Test Method for Determination of Particulate Matter Emissions Collected by a Dilution Tunnel'

4.2.1 Hastighed i fortyndingstunnel
Forud for test skal der bestemmes hastighed i fortyndingstunnel indenfor intervallet 4-10 m/s (Normalt maksimalt 7 m/s). Hastigheden måles med L-formet pitotrør i center af kanal, og registreres på datalogger. Hastigheden skal afpasses således at der under ingen omstændigheder slipper røggas ud ved siden af hætten. Se 4.2.3.

4.2.2 Bestemmelse af pitotfaktor
Forud for hver prøve skal der bestemmes pitotfaktor Fp, som er udtryk for forskellig flow profil på tværs af kanalen.
Pitotfaktoren bestemmes som forholdet imellem hastighed for travers i forhold til hastigheden i center, dvs. forholdet imellem middelværdien for de lokale flow, målt med TSI Micromanometer samt L-formet pitotrør (id nr. 4771, mærket 270-A-2406) i 8 punkter i samme plan, og det med pitotrør kontinuert målte flow i kanalens centrum. Fordelingen af de 8 forskellige enkeltmålinger, hvor der traverseres, fremgår af figur 6 på side 7 i E2515-11. Fp, der er en værdi på ca. 0,90 bestemmes ud fra disse målinger.
Placering af pitotrør og traversmålinger skal opfylde angivelser i E2515-11 figur 3 side 4.

4.2.3 Kontrol af suge kapacitet
Efter at have indstillet fortyndingstunnellen, kontrolleres det visuelt at suge kapaciteten er tilstrækkelig til at al røgen der opstår, når ovnen fyres med rigeligt med pindebrænde og spjældet er indstillet til maksimal ydelse, kan bortfjernes. Kontrollen udføres både med lågen lukket og åben. NB Hætten skal have en åbning på mindst 4x kanal diameter.

4.2.4 Læk test af samplingslinje

Samplingslinjen skal læk testes forud for fortesten og igen efter afslutningen af en prøve. Strækningen fra sonden til pumpen, hvor der er undertryk, testes ved at blokere sondeåbningen.
Den maksimalt tilladte lækage er 0,3 l/minut eller 4% af middel udsugningshastigheden.
Der skal her opnås et vakuum der er mindre end det der opnås ved prøven, eller -0,5 Bar.

Strækningen fra pumpen til og med gasmåleren, hvor der kunne være overtryk, testes i forbindelse med den halvårlige kalibreringsrunde. Se E2515-11 pkt. 9.6.1.

4.2.5 Læk test af pitotrør med forbindelse

Ved første ibrugtagning og ved den halvårlige kalibreringsrunde kontrolleres pitotrøret og dets forbindelsesslanger for lækage.

Pitotrøret udtages og kontrolleres med tilhørende forbindelsesslanger ved at blokere åbningerne i pitotrøret og påføre et tryk på minimum 745 Pa, trykket skal holdes konstant i minimum 15 sekunder. Dette gøres for både Ps (Det statiske tryk i hullerne i siden) og Pt (Det totale tryk i spidsen).

Forbindelsen til pitotrøret bør læk testes forud for fortesten og skal læk testes efter afslutningen af en prøve. Se E2515-11 pkt. 9.6.4.2 og 9.6.5.2.

Ved den daglige kontrol af pitotrørets forbindelsesslanger efterses slanger for begyndende revnedannelse. Begges slanger fjernes fra trykmåler og blæses med trykluft for at fjerne begyndende tilstopning.

4.2.6 Partikelmåling

Forud for hver prøvning skal der konditioneres og afvejes 4 stk. udsugningsrør incl. 4 stk. forreste filterhus part og 2x3+1 pakninger (O-Ringe) Samt 7 stk. Ø47 glasfiber planfiltre. (3 sæt sonder og et stk. sonde til måling af baggrundsluft)
Konditioneringen foregår således:

- Filtre, forreste part af første filterhus, alle pakninger (O-Ringe) og udsugningsrør konditioneres ved 20 +- 5,6 grader i eksikator i minimum 24 timer.
- Filtre og pakninger (O-ringe) vejes parvis, forreste part af første filterhus incl. udsugningsrør vejes enkeltvis.
- Vejningen skal gøres på under 2 minutter i laboratoriemiljøet.
- Der vejes med minimum 0,1mg opløsning på vægt.
- Vægten kontrolleres med 50-150% af vægten på et filter. Hvis fejlen er mere end ±0,1mg skal vægten kontrolleres sporbart i 5 punkter, indenfor det anvendte måle område, før brug.

Der skal måles partikler således:

- Et sæt bestående af 2 stk. Ø47mm filtre i serie skal måle over hele prøveperioden
- Et sæt bestående af 2 stk. Ø47mm filtre i serie skal måle over den første time i prøveperioden.
- Et sæt bestående af 2 stk. Ø47mm filtre i serie skal måle efter 1 times prøvning og resten af prøveperioden.
- Et enkelt filter Ø47mm skal måle baggrundsluften i laboratoriet over hele prøveperioden.

I samplingslinjerne i forlængelse af de 3 førstnævnte sæt filtre, skal røggasen udtørres og afkøles til maksimalt 27,5 °C, før den ledes ind i en gasmåler. Afkølingen sker ved at lede gassen igennem glaskølere som er kølet ned til <5°C. I det sidste filter til baggrundsluften måles der flow udelukkende ved brug af flowmeter sammenholdt med udsugningstiden.
Der skal udsuges maksimalt 7 liter/min (0,42 m3/h) på hver af filterserierne.
Udsugningshastigheden i samplingslinjerne, udtrykt i m/s, skal ligge indenfor 10%'s variation af kanalhastigheden, ligeledes udtrykt i m/s.
Proberne placeres i samme plan, indenfor en imaginær cirkel af diameter 50 mm omkring centerlinjen, 90 grader forskudt i forhold til hinanden og med mindst 25 mm horizontal afstand mellem de to rør mundinger. Der skal måles på 2 sæt filtre hele tiden hvor det ene sæt skiftes efter 1 time hvis prøveperioden overstiger 1 time. Omgivelses målingen skal foretages maksimalt 3,1m fra hætten hvor fortyndingsluften suges ind i fortyndingstunnellen.
Efter prøven konditioneres udsugningsrør og planfiltre igen helt som før prøvningerne, og den udsugede partikelmasse bestemmes.

4.2.7 Rengøring af fortyndingstunnel mm

Fortyndingstunnellen rengøres før hver test.

Pitotrør renses før hver test.

Proberør renses før hver test ved brug af sæbevand og herefter blæses med trykluft. Hvis proberør har været udsat for meget støv vil disse også blive renset med acetone. Efter rensning konditioneres og vejes proberør som foreskrevet.

4.3 Klargøring til prøve

4.3.1 Klargøring af ovnen generelt

Der skal måles lækage på kold ovn. Herunder skal alle spjældgreb sættes i position 'lukket'. Hvis der er tilsigtede åbninger der ikke lukkes via spjæld, lukkes disse også og lækagen måles igen.

Lækagen, måles ved at påføre et overtryk på 25 Pa i ovnen med lukket spjæld og evt. andre tilsigtede luftindtag også lukket. Der måles hvilket flow der skal til for at opretholde dette tryk i ovnen, og flowet bør her ikke overstige ca. 5 m3/h eller anden værdi specificeret af fabrikanten.

Ovnen vejes.

Bestem brændkammerets effektive volumen som produktet af længde x bredde x højde. Som højde regnes så langt op som brændsel kan placeres, når der tages hensyn til røgvenderplade, luftkanaler eller andre permanente forhindringer.
Som længde regnes den største af brændkammerets vandrette dimensioner, der er parallel med en væg.
Som bredde regnes den mindste af brændkammerets vandrette dimensioner, der er parallel med en væg.
Såfremt brændkammerets isoleringsmateriale dækker mere end 1/3 af brændkammerets sider, er det tilladt at måle længde/bredde som afstanden mellem de modstående isoleringsplader. Hvis der findes et permanent kævlefang, er det tilladt ikke at medregne det rum der ligger udenfor kævlefanget.
Kævlefanget må dog maksimalt have en udstrækning på 1/5 af den totale dimension i samme plan.

Ved bestemmelse af bundarealet regnes hele bundarealet med. Hvis røgvenderpladen gaber mere end 10 cm til nogen af brændkammeret vægge, skal volumenet over røgvenderpladen, indtil en højde af 10 cm over indfyringsåbningens overkant, regnes med til det effektive brændkammer volumen.

Ovnen forberedes for montering at termoelementer midt på hver af de 5 ydersider af brændkammeret; Begge sider, top, bund og bagside. Fremføring af termoelementer må ikke påvirke betjening af låge eller spjældgreb og eventuel askeskuffe, bypass greb eller andre betjeningsgreb. Vær opmærksom på eventuelle indbyggede luftkanaler og juster eventuel følerplacering.

En ny ovn skal brændes ind i tilstrækkelig tid, inden prøven. Ovnen skal have brændt i 50 timer ved middel belastning forud for prøven, men ikke nødvendigvis i træk.
Ældning af ovnen skal kunne dokumenteres, eksempelvis ved hjælp af kurveforløb over røgtemperatur som funktion af tid eller kurveforløb over brændkammerets overfladetemperaturer som funktion af tid.

4.3.2 Klargøring af ovnen, særligt for Cordwood

Det er tilladt fabrikanten at specificere områder i brændkammeret, hvor der ikke må placeres brændsel (ref. E3053-17, clause 8.3). Kontroller derfor vejledningen, for at se om fabrikanten har angivet en 'max load limit' eller på anden måde undtaget bestemte område hvor brænde ikke må placeres, og beregn det effektive brændkammer volumen i overensstemmelse hermed

4.3.3 Klargøring af prøvebrændsel Cribwood

Til prøve og til forfyring skal der benyttes Douglas gran opskåret som bygningstømmer. Tømmeret skal have en densitet på 401-578 kg/m3 som tør basis og fugtindhold 16-20% på våd basis, svarende til 19-25% på tør basis.

> Note: Det anbefales i almindelighed at vælge træ med forholdsvis høj densitet, for at begrænse prøveklodsens volumen mest muligt. Dog kan træ med lavere densitet have lettere ved at fænge. Overvej evt at sammensætte prøveklodsen af træ af forskellig densitet, så det lette træ findes placeret der hvor træet skal antændes.

Der benyttes bygningstømmer på nominelt mål 2”x4” og 4”x4”.

Aktuel mål for 2”x4” skal være 38x89 mm ± 1,5 mm.

Aktuel mål for 4”x4” skal være 89x89 mm ± 1,5 mm.

Der skal desuden bruges afstandskloder af mål 130x40x20 mm ± 1,5 mm.

Brændslet skal være konditioneret indenfor temperaturintervallet 18-32 grader Celcius.

Brændslets fugtighed måles med en elektronisk fugtmåler. Der måles på mindst 3 forskellige sider, stifterne bankes i til ca. 19 mm dybde, og det resulterende fugtindhold beregnes som middelværdien af de udførte målinger. Fugtindhold skal oplyses i nærmeste heltal.
Prøveklodsen skal påfyres senest 4 timer efter at fugtigheden i træet er blevet målt.
Temperaturen i brænderummet noteres som prøveklodsens temperatur.

Til brændkamre med et effektivt volumen på under 43 liter benyttes udelukkende 38x89 mm tømmer.

Til brændkamre med et effektivt volumen på 43-85 liter benyttes en kombination af 38x89 og 89x89 mm tømmer.

Til brændkamre med et volumen på over 85 liter benyttes udelukkende 89x89 mm tømmer.

Prøveklodsens masse beregnes som 112 ±11,2 kg/m3 (100,8-123,2 kg/m3) effektiv brændkammer volumen, som våd basis.

Prøveklodsens sammensættes som vist i figur 1 i standarden ASTM E2780-10, idet der for enden af hvert stykke tømmer, både på forsiden og på bagsiden, påsømmes afstandsklodser, således 4 i alt pr stykke tømmer.

Prøveklodsen skal mindst kunne dække 5/6 af brændkammerets længste dimension af længde. Længde er i den forbindelse den længste af brændkammerets vandrette dimensioner.

Ved kontrol af prøveklodsens densitet indenfor 401-578 kg/m3 på tør basis, indgår alene selv brændestykkerne i beregningen. Men ved beregning af prøveklodsens vægt på våd basis, indgår også afstandsklodser men ikke søm.

4.3.4 Klargøring af prøvebrændsel, Cordwood

Der fyres med kløvet brænde med grundliggende trekantet tværsnitsfacon (ref E3053-17 Fig 1, side 6) og tilvirket af bøg, birk, ask, ahorn, eg, elm eller anden sort (ref E3053-17 Fig 2, side 6), og som specificeret af fabrikanten i vejledningen.
Længden af brændestykkerne skal være som angivet i vejledningen, dog indenfor 300-600 mm.

Samme træsort benyttes til både pindebrænde, forfyring og prøvebrændsel.

Til High Fire prøven beregnes brændemængden ud fra densitetskrav på 161 kg/m3 (dry)

Til Medium Fire og Low Fire prøverne beregnes brændemængden ud fra densitetskrav på 194 kg/m3 (dry)

For det enkelt brændestykke skal fugtindholdet ligge på 18-28% tør basis, tilsv. 15-21,3% våd basis. For den samlede brændemængde, skal middelfugtindholdet være på 19-25% tør basis, tilsv. 15,6-19,4% våd basis. Der foretages 3 målinger af hvert brændestykke, hvortil det er tilladt af forbore hullerne til sømmene, dog fraregnet de sidste 6-10 mm.

Pindebrænde der er opbevaret ved rumtemperatur og ved en relativ luftfugtighed på 50±10% i mindst 2 døgn formodes at have et fugtindhold på 10% (dry basis)

Når brændet har været opbevaret minimum 24 timer i brænderummet forud for bestemmelse af fugtindhold, sættes brændets temperatur lig med rumtemperaturen.

Brændestykkerne til prøven vælges eller tildannes, så de har et forhold mellem dimensionerne 'Minor' og 'Major' (ref E3053-17 Fig 1 side 6), således at Minor målet er på mindst 40% af Major målet.
Det er tilladt at opdele prøvebrændet i to sub-loads der må påfyres successivt.

4.3.5 Klargøring af prøvestanden

Vægten nulstilles inden ovnen placeres på platformsvægten.

Efter at ovnen er opsat på vægten, men inden skorsten og følere forbindes, tjekkes vægtens kalibrering ved at belaste vægten yderligere med et kalibreret lod, der vejer 20-80% af prøveklodsens masse. Vægten skal kunne gengive loddets masse indenfor enten 5 grams nøjagtighed, eller 1% af prøveklodsens masse, hvad nu der er størst.

Efter at skorsten, termoelementer og måleudstyr er blevet monteret, tareres vægten af kold ovn incl skorsten mm. Vægten skal senere bruges til bestemmelse af grundglødelag forud for prøvens start.

Kanal strømningshastigheden indstilles til en værdi på nominelt 6,0 m/s (4-10 m/s, Normalt maksimalt 7 m/s), hvilket svarer til ca. 381 Nm3/time, i en Ø150mm kanal. Der er mulighed for at øge kanal diameteren til Ø200mm hvis dette i enkelte tilfælde kan være mere hensigtsmæssigt. Røgtrækket målt i skorstenen her på kold ovn må maksimalt være 1,25 Pa.

Udsugningssystemet, opbygges som udgangspunkt med et proberør med en udvendig diameter på Ø6,35 mm og en godstykkelse på 0,89mm. Flowet i udsugningssonden indstilles også til en nominel værdi på 6,0 m/s hvilket svarer til ca. 0,35 m3/time (5,9 l/min). Der suges med ca. samme hastighed i proben som der er i kanalen. Der er mulighed for at øge flowet op til 7 l/min. i sonden, og kanal flowet øges tilsvarende.

Før og efter hver prøve skal udsugningslinjen kontrolleres for lækage. Se 4.2.4

Efter hver prøve skal forbindelsen til pitotrøret samt forbindelse kontrolleres for lækage, Se 4.2.5

Rumluft filterhus klargøres til prøve.

4.3.6 Valg af skorsten

Medmindre andet er specificeret af fabrikanten, skal der bruges en skorsten der er sammensat af et uisoleret stålrør indtil en højde af 2,40 m ± 0,10 m over gulvet (heri indgår ovnens højde). Ovenpå det

uisolerede stålrør fortsætter en isoleret sektion (25 mm isolering = halvisoleret skorsten) til en samlet højde af 4,60 m ± 0,30 m over gulvet.
Måling af røgtemperatur skal foretages i en højde af 2,60 ± 0,15 m over gulvet, dvs nominelt 0,20 m oppe i den isolerede del af skorstenen. Røggasser til bestemmelse af CO og CO2 skal udtages 0,05 m ovenover det sted hvor røgtemperaturen måles.
Røgtræk måles i en højde af 0,30 m over røgstudsen.

Samme type skorsten bruges til både fritstående ovne og til indsatse.

Skorstenens diameter skal modsvare røgstudsens diameter, dvs brug af adaptor skal ikke finde sted.

Hvis det udtrykkeligt kræves i fabrikantens vejledning, må der benyttes en skorsten der er isoleret i hele sin udstrækning (zero clerance ovne).

Hvis der bruges andet end en standard skorstenen, skal den anvendte skorsten efter prøven er ovre forsegles og opbevares sammen med den ligeledes forseglede ovn.

4.4 Fyringsmønster samt betjening af ovnen, Cribwood

Proceduren for fyring med Cribwood er primært baseret på standarden ASTM E2780-10, med ændringer specificeret i Metode 28 R der henviser til visse bestemmelser fra US EPA Metode 28

4.4.1 Optænding og forfyring

Arranger bålet i ovnen og optænd som angivet i fabrikantens vejledningen. Ud over pindebrænde og tændmateriale, er det til forfyringen tilladt at bruge mindre stykker af træ, dog ikke mindre end 1/3 af de stykker der indgår i prøveklodsen. Det er tilladt at toppe op med ekstra brændsel, undervejs i prøvefyringen.

Prøvefyringen bruges til at finde den spjældindstilling der skal benyttes for at opnå den ønskede forbrændingshastighed. Mindst en time forud for prøvens start skal spjældet være sat i den omtrentlige stilling, der skal benyttes under prøven.
I tiden frem til et kvarter inden prøvens start, er det tilladt at foretage mindre justeringer af:

1. Spjældindstilling
2. Tilføre ekstra brændsel
3. Fjerne brændsel eller trækul
4. Slå næsten forbrændte brændestykker itu for at sikre ensartet forbrænding af træet
5. Få bålet til at falde sammen
6. Udjævne eller arrangere gløder og trækul

Noter alle justeringer der gøres incl tidspunktet.

I tidsrummet 0-15 minutter inden prøvens start, er det kun tilladt at udjævne eller arrangere gløder og trækul. I den forbindelse må lågen ikke være åben mere end 1 minut sammenlagt.

Overgange for afslutning af forfyringen til start af prøven må ske, når brændslet er nedbrændt til kun at udgøre 20-25% af prøveklodsens masse.
Grundglødelaget defineres som den øjeblikkelige vægt at varm ovn incl skorsten mm, gløder og trækul, minus tara vægten af den kolde ovn incl skorsten mm.
Noter det valgte grundglødelag.

4.4.2 Prøveperioden

Prøveperioden begynder når forfyringen er afsluttet som beskrevet ovenfor. Gasmålere aflæses, sonderne placeres i kanalen, vægten af grundglødelaget registreres, pumpen startes og der noters starttidspunktet.

Brændeklodserne skal være påfyret senest 1 minut efter starttidspunktet, men i praksis altid hurtigst muligt, åbnes lågen og brændeklodserne arrangeres som indstuderet. Brændslet skal placeres således at afstandsklodserne ligger parallelt med ovnens bund, dvs tømmer stykkerne enten liggende på den flade side, eller stående på højkant, og med tilstødende ender af afstandsklodserne. Vær opmærksom på om gløder eller træ forhindre pilot- og tertiær huller i at skyde luften ud som ønsket.

Når brændeklodserne er påfyret noteres tiden (Maksimalt 1 minut fra starttidspunktet). Det er her tilladt at holde lågen på klem og bruge spjældene til at få forbrændingen ordentlig i gang indtil 5 minutter efter starttidspunktet. Når de 5 minutter er gået skal døren være lukket og spjældet sat i den blivende position.

Noter alle justeringer der foretages i løbet af de første 5 minutter.

Efter de 5 minutter er gået, er det ikke tilladt at ændre spjældindstilling eller omplacere brændet, dog med følgende to undtagelser:

1. Det er tilladt at omplacere brændslet, én gang, hvis mere end 60% af prøveklodsens masse er blevet omsat, og massen i løbet af 10 minutter ikke er aftaget med mere end 50 gram, eller 1% af den oprindelige masse, hvad nu der er højest. Lågen må højst være åben i 15 sekunder, i forbindelse med omplaceringen.
2. Hvis ovnen har regulering af den tertiære luftforsyning, må den, under nærmere beskrevne vilkår, justeres én gang i løbet af prøveperioden, i overensstemmelse med fabrikantens betjeningsvejledning. Justeringen må dog ikke resultere i en ændring af afbrændingshastigheden på mere end 25%. Se afsnit 8.10 i Metode 28, for fuldstændig beskrivelse af krav til, og forudsætninger for at justering af tertiær luftforsyning kan benyttes.

Hvis ovnen er forsynet med en konvektionsluft blæser, skal blæseren benyttes i henhold til fabrikantens brugsvejledning, eller i fravær af instruktion, stilles blæseren til høj ydelse.

Eventuel rysterist og bypass spjæld må betjenes én gang i løbet af prøven, i henhold til fabrikantens brugsvejledning.

Hvis prøven strækker sig over mere end en time, skiftes det det ene filterarrangement på timen, gasmåler aflæses og der fortsættes med nyt filterarrangement resten af tiden. Det andet filterarrangement benyttes gennemgående over hele prøven.

Prøveperioden afsluttes når al det påfyrede prøvebrændsel er blevet omsat og vægten viser samme grundglødelag som ved starttidspunktet, hvorefter:

1. Rumluft filter flowmeter aflæses
2. Pumpene standses
3. Gasmålere aflæses
4. Filter arrangement udtages af fortyndingstunellen
5. Der udføres læk test af samplings linjen
6. Sonde og forreste filterhus afrenses for støv og partikelmasse.
7. Filterarrangement overføres straks til vejerum og klargøres til konditionering i eksicator skab.

8. Kontroller at ovnen har været i termisk ligevægt. Der må maksimalt være 70 graders forskel på middel overfladetemperaturen fra start til slut.
9. Kontroller at total emissionen afviger maksimalt 7,5% fra middelværdien eller forskellen på de 2 målinger er maksimalt 0,5 g/kg (Tør). Hvis bare en af disse 2 forhold er opfyldt kan prøven accepteres.

4.4.3 Flere prøver i rækkefølge

Der er tilladt at køre flere prøver i rækkefølge, men der skal være et ophold af mindst en times varighed mellem hver prøve.

Forud for ny prøve rages gløder og aske ud, og der tændes op med ny optænding og forfyring som beskrevet under 4.4.1

4.4.4 Ekstra prøver

Det er tilladt at køre flere prøver på samme belastningstrin. Hvis en prøve er mislykket, skal der køres to andre som er vellykkede. Resultaterne fra 2/3 af de kørte prøver skal indgå i beregning af den vægtede gennemsnitlige emission. Alle prøver, uanset udfaldet skal dokumenteres og indgå i rapporten.

4.4.5 Belastningsområder

Ovnen skal testes ved 4 belastningsområder

- BR1 som er <0,80 kg tørstof i timen
- BR2 som er 0,80 – 1,25 kg tørstof i timen
- BR3 som er 1,25 – 1,90 kg tørstof i timen
- BR4 som er Maksimal ydelse

BR4 prøven skal køres med forbrændingsluft forsyningen 100% åben, hvilket omfatter både skylleluft og bundluft.

Såfremt ovnen ikke kan klare at brænde i BR1, skal der køres en ekstra prøve i BR2. En af de to BR2 prøver skal dog ligge på under 1,00 kg tørstof afbrændt i timen.

Såfremt ovnen ved spjældet 100% åben ikke klarer at komme op i BR4, duplikeres prøvningsresultaterne ved max ydelse op i den eller de højere belastningsområder.

Som bevis på at ovnen ikke kan klare at brænde i BR1, skal der foreligge mindst to dokumenterede forsøg, hvor ovnen enten er gået ud eller hvor afbrændingshastigheden var over 0,80 kg tørstof i timen, til trods for at spjældet stod i den lavest mulige indstilling.
Ovnen anses for værende gået ud, når der er forløbet mindst 30 minutter og vægten maksimalt har ændret sig med 50 gram eller 1% af prøveklodsens masse, hvad end der nu er størst.

4.5 Fyringsmønster samt betjening af ovnen, Cordwood

Der fyres efter et særligt fyringsmønster (burn rates) til Cordwood prøven, bestående af High Fire, Low Fire og Medium Fire. Til High Fire prøven skal spjældet stå i stilling 100% åben, dvs max output. Til Low Fire prøven skal spjældet stå i lavest mulige stilling, dvs min output. (der må gerne være en 'stop' ligesom til DEFRA prøven, hvorved spjældets vandring begrænses nedadtil) Til Medium Fire prøven skal spjældet stå i en stilling på maksimalt halvvejs mellem max og min setting. Se videre detaljer om krav til Medium Fire spjældindstilling i E3053-17, clause 8.8

4.5.1 Optænding og forfyring

Overgangen for forfyring til prøveperiode defineres ved et glødelag på 10-20% af prøvebrændets samlede masse på våd basis. Brug billed- eller video til at dokumentere glødelagets tilstand, ved overgangen fra forfyring til prøveperiode. Vægten af glødelaget registreres eller vægten tareres inden prøvens start. Hvis påfyringen er langstrakt og der derunder forbruges gløder/masse, gælder den initiale registrering som startvægt.

High Fire prøven startes fra kold ovn, dvs optænding og brændsel til forfyring lægges i på én gang. Prøvebrændslet påfyres når man er nede på et grundglødelag (residential start-up fuel bed) på 10-20% af prøvebrændets samlede masse på våd basis, i overensstemmelse med E3053-17 clause 8.5.8

Medium Fire prøven er en varm-til-varm prøve, der kan udføres i forlængelse af High Fire prøven eller tilsvarende forfyring . Se endvidere E3053-17, clause 8.6

Low Fire prøven er en varm-til-varm prøve, der kan udføres i forlængelse af High Fire prøven eller tilsvarende forfyring. Se endvidere E3053-17, clause 8.6

4.5.2 Prøveperiode
Det er tilladt at opdele prøvebrændslet i to sub-batches der påfyres successivt. Den tid det må vare, indtil hele mængden er påfyret, beregnes som funktion af det effektive brændkammer volumen således; 1060 sekunder per kubikmeter. (Eksempel; En brændeovn har et effektivt brændkammer volumen på 0,33 m3. Så bliver tiden 1060/0,33 = 3180 sekunder, svarende 53 minutter indtil det sidste af prøvebrændslet skal være påfyret)

Ved start af prøveperioden startes pumpen inden der tændes op.

I overensstemmelse med fabrikantens vejledning, er det tilladt at holde lågen på klem under optænding for at sikre god antænding af pindebrænde og forfyring.

Det er tilladt at åbne lågen på klem i op til 5 min efter udløbet af den maksimale påfyringsperiode og herunder om arrangere brændet, for at sikre en god antændelse af prøvebrændet.
Derefter er det tilladt at ompositionere brændt én gang i indtil 15 minutter efter udløbet af den maksimale påfyringsperiode (ref E3053-17, clause 8.5.9.5 stk 1)) I den forbindelse må lågen højst være åben i 30 sekunder, og der skal tages billeddokumentation før og efter. Billederne sammen med en skriftlig begrundelse skal indgå i rapporten.

Hvis ilden er ved at gå ud efter at 60% af brændemassen er fortæret, her defineret som der afbrændes mindre en 50 gram på 10 minutter, er det tilladt af åbne lågen og rage op i brændet. Tag før&efter billeder og tage dem med i rapporten.

Andre spjæld en forbrændingsluftspjældet må betjenes én gang på et vilkårligt tidspunkt i prøven, som beskrevet i vejledningen. Eventuelle automatisk styrede spjæld skal have lov at arbejde som de gør.

Prøven afsluttes og pumpen standses, når 90% af det påfyrede prøvebrændsel er blevet fortæret

Ved Low Fire og Medium Fire prøver der ikke udføres i forlængelse af en High Fire prøve, skal der opbygges et glødelag tilsvarende i overensstemmelse med High Fire proceduren i E3053-17, clause 8.5.2 – 8.5.9.8. Det er i den forbindelse tilladt at justere spjældet og udjævne glødelaget inden starten af Low Fire eller Medium Fire prøven, i overensstemmelse med fabrikantens angivelser i vejledningen.

I sjældne tilfælde er der ikke plads til at al træet kan placeres i fyrboksen. Hvis alt har været forsøgt, er det tilladt at undlade påfyring af det sidste stykke brænde, i overensstemmelse med E3053-17, clause 8.6.3.1. Dokumentation og begrundelse skal medtages i rapporten. Registrer vægten af det udeladte brændestykke og genberegn load densiteten som benyttet under prøven.

Spjældet må bruges i op til 15 minutter efter påfyring.
Fabrikanten skal anvise brændets placering (orientering) i fyrboksen
Hvis mindre end 90% af brændemængden er blevet fortæret når for brændingen går i stå, her defineret som en forbrug på under 50 gram eller 1% iløbet af 30 minutter, betegnes prøven som ugyldig.

Low Fire prøven køres ved spjældet i den laveste indstilling og ovnen skal bræ ned i mindst 8 timer eller have en burn rate på mindre end eller lig med 1,15 kg/h (dry matter). Hvis 8 timers kriteriet vælges, må burn rate ikke overstige 1,5 kg/h (dry matter)

Medium Fire prøven skal køres ved en spjældindstilling på maksimalt halvdelen af vandingen mellem min og max setting, målt ud fra spjælgrebet. Hvis den derved opnåede burn rate er højere end medianen mellem min og max output, skal spjældet sættes yderligere ned, indtil kravet om max 50% er overholdt.

4.5.3 Ekstra prøver

Det er tilladt at køre flere prøver på samme belastningstrin. Hvis en prøve er mislykket, skal der køres to andre som er vellykkede. Resultaterne fra 2/3 af de kørte prøver skal indgå i beregning af den vægtede gennemsnitlige emission. Alle prøver, uanset udfaldet skal dokumenteres og indgå i rapporten.

4.6 Samtidig bestemmelse af Virkningsgrad, varmeydelse og emission af CO

Under EPA emissionsprøven, er det tilladt samtidigt at bestemme ovnens virkningsgrad, varmeydelse og emission af CO. Det skal ske efter standarden CSA B415.1-10 'Performance testing of 'Solid-fuel-burning heating appliances', afsnittene 13.7-13.10

Udtagning af røggasser skal ske 50 mm ovenfor det sted i den isolerede del af skorstenen, hvor der måles røgtemperatur.

Beregning af virkningsgrad, varmeydelse og emission af CO skal ske i det regneark, der følger med standarden CSA B415.1-10. Der beregnes kun på værdier en gang pr minut.

4.7 Afrapportering

Se forslaget til rapport disposition i Metode 28, afsnit 12.6

For Cordwood prøver skal rapporten endvidere indeholde et 'Test Summary' indeholdende nøgleoplysninger og billeder. Til formålet benyttes en Excel template der er udleveret ved køb af standarden.

4.8 Registrering af måledata
Flere steder kræves det at måledata skrives ned hvert 10 minut. Idet DTI benytter løbende periodisk dataopsamling, registreres alle data hver 30. sekund. Der beregnes 10 minutters værdier som middelværdi af data indenfor den pågældende 10 minutters periode. Det omfatter udsuget volumen (dog ikke rumluft blanc filter), kanal temperatur, kanal hastighed og gasmåler temperaturer.
Se endvidere pkt 4.6 ifbm beregning af virkningsgrad, CO og varmeydelse.

5 Beregninger
5.1 Beregninger for Cribwood
Beregning af den vægtede middelemission for Cribwood med indtil 4 burn rates udføres i overensstemmelse med standarden E2780-10, clause 10.

5.2 Beregninger for Cordwood
Beregninger af emissioner fra de tre output niveauer, og beregning af vægtet middelemission udføres i overensstemmelse med standarden E3053-17, clause 9

5.3 Beregning for fortyndingstunnel (fælles)
Beregning af flow, udsuget volumen og balance mellem de to sampling trains sker i overensstemmelse med standarden E2515-11.

6 Usikkerhed
Usikkerhed beregnes for hver enkelt prøvning lig angivelser i ASTM E2515-11 Bilag X1.

6.1 Præcision og bias
Både standarden for Cribwood (E2780-10) og standarden for Cordwood (E3053-17) anfører i clause 11.1 at det ikke er muligt at opgøre præcisionen ved en prøve af PM emission, fordi såvel betjening, fyringsmetode og ovnen selv giver anledning til varierende emissioner. Af den årsag kan test resultatet ikke benyttes til at fastsætte metodens reproducerbarhed (mellem afprøvningsinstitutter) eller repeterbarhed (gentagne prøver indenfor samme institut)

Både standarden for Cribwood (E2780-10) og standarden for Cordwood (E3053-17) anfører i clause 11.2, at der ikke kan oplyses noget om metodernes bias, da der ikke findes noget referencemateriale.

7 REFERENCER

- The Rule, NSPS 40 CRF Part 60, 16. Marts 2015
- ASTM Designation: E2515-11, Offentliggjort December 2011.
- ASTM Designation: E2780-10, 2010 udgaven
- ASTM Designation: E3053-17, 2017 udgaven
- US EPA Metode 28R: som del af NSPS offentliggjort i Federal Register, mandag den 16. marts 2015
- US EPA 28: Certification and Auditing of Wood Heaters. Downloadet 08.11.2016 fra EPA's hjemmeside. Samt eventuelle underliggende EPA metoder der er henvisning til, fra metode 28.
- CSA standard 415.1-10: Performance testing of solid fuel burning appliances, bekræftet udgave fra 2015.

8 Bilag:
Bilag 1 Udskrift af anvendte formler (Appendix 4 til rapporten på 11 sider)

Calculations PM

ASTM E2780 and E2515

Appendix 4-1

EN-NS-EPA-Ber-3-12: Rev. 22-06-2017 MXB

Manufacturer:	#I/T
Type:	#I/T
ELAB no.:	Foreløbig beregning
Order number:	#I/T
Testdate:	0
File Name:	#I/T
Testrun:	#I/T
Fil dato og tid (Start):	0

Weight of test fuel spacers, dry basis, kg
E2780

$Equation\,(1) \qquad M_{Sdb} = (M\_Swb) * (\frac{100}{100 + FM_S})$

M_swb	#I/T	kg (wet basis)
FM_s	#I/T	% (dry basis)

M_sdb = (#I/T) x (100 / (100 + #I/T)) kg (dry basis)

M_sbd = #I/T kg (dry basis)

Weight of test fuel crip, excluding nails and spacers, dry basis, kg
E2780

$Equation\,(2) \qquad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}}\right)$

M_CPnwb	#I/T	kg (wet basis)
FM_CPn	#I/T	% (dry basis)

M_Cdb = Σ[(#I/T) x (100 / (100 + #I/T))] kg (dry basis)

M_Cdb = #I/T kg (dry basis)

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3
E2780

$Equation\,(3) \qquad D_{Cdb} = \frac{M_{Cdb}}{V_C}$

M_Cdb	#I/T	kg (dry basis)
V_C	#I/T	m3

D_Cdb = #I/T / #I/T kg (dry) / m3

D_Cdb = #I/T kg (dry) / m3

Appendix 4-2

Total weight of fuel crip excluding nails, dry basis, kg
E2780

$$Equation\,(4) \qquad M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

M_Sdb	#/T	kg (dry basis)	
M_Cdb	#/T	kg (dry basis)	
M_FTAdb	=	#/T + #/T	kg (dry basis)
M_FTAdb	=	#/T	kg (dry basis)

Burn rate, kg (dry/h)
E2780

$$Equation\,(5) \qquad BR = \frac{60 * M\_FTAdb}{\theta}$$

M_FTAdb	#/T	kg (dry basis)	
θ	0,00	min	
BR	=	60 x #/T / 0	
BR	=	#/T	

Appendix 4-3

Air velocity in tunnel at traverse measurements:
E2515

Equation (9) $Vs = Fp \times Kp \times Cp \times \sqrt{\Delta Pavg} \times \sqrt{\frac{Ts}{Ps \times Ms}}$

F_p	1,00	(Direckt)						
K_p	34,97	-						
C_p	0,99	-						
ΔP_avg	#I/T	mmVS	P_Dynamisk	#I/T	Pa			
T_s	#I/T	K	T_Kanal	#I/T	°C			
P_s	#I/T	mmHg	P_s	#I/T	Pa	Ps_Tryk	#I/T	Pa
M_s	29,00	g/g mole						

$$V_s = 1{,}00 \times 34{,}97 \times 0{,}99 \times \left(\#I/T\right)^{0{,}5} \times \left(\frac{\#I/T}{\#I/T \times 29{,}00}\right)^{0{,}5}$$

$$V_s = \#I/T \text{ m/s (V\_soent)}$$

Pitot tube factor for center:
E2515

Equation (1) $Fp = \frac{Vstrav}{Vscent}$

V_strav	#I/T	m/s	(Average)
V_soent	#I/T	m/s	(Average)

$$F_p = \frac{\#I/T}{\#I/T}$$

$$F_p = \#I/T \text{ -}$$

Appendix 4-4

Air velocity in dilution tunnel during test charge
E2515

Equation (9) $Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$

F_p	#I/T	-			
K_p	34,97	-			
C_p	0,99	-			
Delta P_avg	#VÆRDI!	mmVS	P_Dynamisk	########	Pa
T_s	#VÆRDI!	K			
P_s	#VÆRDI!	mmHg			
M_s	29,00	g/g mole			

$$V_s = \#I/T \times 34{,}97 \times 0{,}99 \times \left(\frac{}{\#\#\#\#\#}\right)^{0,5} \times \left(\frac{\#VÆRDI!}{\#\#\#\#\# \times 29{,}00}\right)^{0,5}$$

V_s = #I/T m/s (V_soent)

Average gas flow rate in dilution tunnel:
E2515

Equation (3) $Qstd = 60 * (1 - Bws) * Vs * A * \left(\frac{Tstd * Ps}{Ts * Pstd}\right)$

B_ws	0,02	-					
V_s	#I/T	m/s					
A	0,017671	m2					
T_std	293	K					
P_s	#VÆRDI!	mmHg	P_s	#####	Pa	Ps_Tryk	### Pa
T_s	#VÆRDI!	K	T_Kanal	#####	°C		
P_std	760	mmHg					

$$Q_{std} = 60 \times (1 - 0{,}02) \times \#I/T \times 0 \times \left(\frac{293 \times \#\#\#}{\#\#\#\#\# \times 760}\right)$$

Q_std = #I/T dscm/min

Appendix 4-5

Measurements sample train 1 entire charge
E2515

Equation (7_1) $Vmc = Vm - (Lp - La) * \theta$

Equation (7) $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	#I/T	dcm			
K_1	0,3855	K/mmHg			
Y	1	Gasmåler Faktor			
P_bar	759,8108	mmHg	P_bar	1013	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	0	min			

V_mc = #I/T - (0 - 0) x 0

V_mc = #I/T dscm

$$V\_mc(std) = 0,3855 \times \#I/T \times 1 \times \left(\frac{759,8 + \frac{0}{13,6}}{273}\right)$$

V_mc(std) = #I/T dscm

Equation (12) $m_n = m_p + m_f + m_g$

m_p	0 mg
m_f	0 mg
m_g	0 mg

m_n = 0 + 0 + 0

m_n = 0 mg

Equation (13) $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	0	mg
V_m(std)	#I/T	dscm

$$C\_s = 0,001 \times \frac{0}{\#I/T}$$

C_s = #I/T g/dscm

Equation (15) $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	#I/T	g/dscm
c_r	#I/T	g/dscm
Q_std	#I/T	dscm/min
θ	0	min

E_T = (#I/T - #I/T) x #I/T x 0

E_T = #I/T g

Appendix 4-6

Measurements sample train 2 first hour of charge
E2515

$Equation\ (7_1) \quad Vmc = Vm - (Lp - La) * \theta$

$Equation\ (7) \quad Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	#I/T	dcm			
K_1	0,3855	K/mmHg			
Y	1	Gasmåler Faktor			
P_bar	759,8108	mmHg	P_bar	1013	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	0	min			

V_mc = #I/T - (0 - 0) x 0

V_mc = #I/T dcm

$V\_mc(std) = 0,3855 \times \#I/T \times 1 \times \left(\frac{759,8 + \frac{0}{13,6}}{273}\right)$

V_mc(std) = #I/T dscm

$Equation\ (12) \quad m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	0	mg
m_g	0	mg

m_n = 0 + 0 + 0

m_n = 0 mg

$Equation\ (13) \quad C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	0	mg
V_m(std)	#I/T	dscm

$C\_s = 0,001 \times \frac{0}{\#I/T}$

C_s = #I/T g/dscm

$Equation\ (15) \quad E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	#I/T	g/dscm
c_r	#I/T	g/dscm
Q_std	#I/T	dscm/min
θ	0	min

E_T = (#I/T - #I/T) x #I/T x 0

E_T = #I/T g

Appendix 4-7

Measurements sample train 2 from 1 hour and rest of charge
E2515

Equation (7$_1$) $Vmc = Vm - (Lp - La) * \theta$

Equation (7) $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	#I/T	dcm			
K_1	0,3855	K/mmHg			
Y	1	Gasmåler Faktor			
P_bar	759,8108	mmHg	P_bar	1013	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	0	min			

V_mc = #I/T - (0 - 0) x 0

V_mc = #I/T dcm

V_mc(std) = 0,3855 x #I/T x 1 x $\left(\frac{759,8 + \frac{0}{13,6}}{273}\right)$

V_mc(std) = #I/T dscm

Equation (12) $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	0	mg
m_g	0	mg

m_n = 0 + 0 + 0

m_n = 0 mg

Equation (13) $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	0	mg
V_m(std)	#I/T	dscm

C_s = 0,001 x $\frac{0}{\#I/T}$

C_s = #I/T g/dscm

Equation (15) $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	#I/T	g/dscm
c_r	#I/T	g/dscm
Q_std	#I/T	dscm/min
θ	0	min

E_T = (#I/T - #I/T) x #I/T x 0

E_T = #I/T g

Appendix 4-8

Room blanc

F2515

$$Equation\ (8) \quad Vmr(std) = K1 * Vmr * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$$

K_1	0,3855	K/mmHg			
V_mr	#I/T	dcm			
Y	1	Gasmåler Faktor			
P_bar	759,8108	mmHg	P_bar	1013	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C

$$V\_mr(std) = 0,3855 \times \#I/T \times 1 \times \left(\frac{759,8 + \frac{0}{13,6}}{273}\right)$$

V_mr(std) = #I/T dscm

$$Equation\ (14) \quad C_r = K_2 * \frac{m_r}{Vm_{r(std)}}$$

K_2	0,001	g/mg
m_r	0	mg
V_m_r(std)	#I/T	dscm

$$C\_r = 0,001 \times \frac{0}{\#I/T}$$

C_r = #I/T g/dscm

Appendix 4-9

Proportional Rate first 10 minutes
E2515

Equation (16) $$PR = \frac{\theta \cdot (V_{mi} \cdot V_s \cdot T_m \cdot T_{si})}{10 \cdot (V_m \cdot V_{si} \cdot T_s \cdot T_{mi})} \cdot 100$$

θ	0,00	min
V_mi	#VÆRDI!	l
V_s	#I/T	m/s
T_m	#I/T	K
T_si	#VÆRDI!	K
V_m	#I/T	l
V_si	#VÆRDI!	m/s
T_s	#VÆRDI!	K
T_mi	#VÆRDI!	K

$$PR = \frac{0{,}00 \times (\#\#\#\# \times \#I/T \times \#I/T \times \#\#\#)}{10 \times (\#I/T \times \#\#\#\# \times \#\#\#\#\# \times \#\#\#)} \times 100$$

PR = #VÆRDI! -

Notation and units
E2780

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crip, excluding nails and spacers, wet basis, kg
	FM_CPn	avarage fuel moisture of test fuel piece n in fuel crip, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crip, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m3
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m3
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimentionless (assigned a value of 0.99)
	ΔP_avg	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m2	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m3/min	Leakage rate observed during the post-test leakcheck
	L_a	m3/min	Maximum acceptable leakage rate for either a oretest og post-test leak-check, equal to 0.0003 m3/min
	θ	Min	Total sampling time
	V_mc	-	V_m - (L_p - L_a) * θ
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Consentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas meter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute avarage dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 15

Title: Calibration certificates

Pages total: 78, excl this cover page

Internt kalibreringscertifikat vedr. kalibrering af vægte i DTI's laboratorier

Obligatorisk for vægte, som anvendes til vejninger, der er omfattet af DTI's DANAKs akkrediteringer, bortset fra akkreditering nr. 200. Certifikatet må i uddrag kun gengives, såfremt DTI's kvalitetschef har godkendt uddraget.

Afdeling: DTI/ Energi	Laboratorium: ELAB
Afdelingsnummer: 270	Certifikatnummer: ELAB-38-2019

Dato for kalibrering/klassificering af lodder:	Dato for modtagelse af lodder:	Dato for kalibreringens udførelse:	Certifikatdato:	Vedr. akkr. Nr.:	Sidenummer:
12.11.2014/F1 09.04.2014 /M2 + ukendte 15x20kg fra murværk, 300kg i alt	16.09.2019	18.09.2019	23.09.2019	300	Side 1 af 1

Identifikation den kalibrerede vægt:	Ansvarlig:	Antal bilag:
270-A-1638, KC 600, 600kg, Stand C		

Vægtens max-kapacitet:	Vægtens deling i 1. range:	Vægtens deling i 2. range:	Vægtens kalibreringsværdi i 1. range:	Vægtens kalibreringsværdi i 2. range:	Vægtens serienummer:
600kg	d =1g		e =		

Kontrol af nivellering, nulpunkt og taraindretning

Temperatur: 22

Ved kalibreringens start:

Viser vægten nul i ubelastet tilstand? x ja

Er taraindretningen frakoblet? x ja

Står vægten stabilt og vandret? x ja

Vejeprøve

Overholdt: ☒Ja☐Nej

Belastningspunkt B	Visning, opvejning; I	Visning, nedvejning; I	Evt. tillægslast; opvejning/nedvejning	Fejlvisning, opvejning; F	Fejlvisning, nedvejning; F
0,0 kg	0,000	0,000		0	0
1,0 kg	1,000	1,002		0	0,002
6,0 kg	6,001	6,003		0,001	0,003
16,0 kg	16,002	16,004		0,002	0,004
100,0 kg	99,990	99,992		-	-
106,0 kg	105,988	105,991		-0,002	-0,001
116,0 kg	115,989	115,990		-0,001	-0,002
200,0 kg	199,928	199,940		-	-
206,0 kg	205,927	205,920		-0,001	-0,020
300,0 kg	299,901	299,904		-	-
306,0 kg	305,901	305,901		0,000	-0,003

Undersøgelse af repetérbarhed

Overholdt: ☒Ja☐Nej

Ca. 10 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	5.vejning
40,0 kg	40,005	40,004	40,004	40,005	40,004
Ca. 80 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	5.vejning
80,0 kg	79,999	79,999	79,999	79,999	79,998

Prøvning af excentricitet

Overholdt: ☒Ja☐Nej

Ca. 33 % af Max	1. vejning (HB)	2.vejning (VB)	3.vejning (VT)	4.vejning (HT)	DIFF
120,0 kg	119,942	119,974	119,965	119,952	**0,032kg**

Metodegrundlag:	Sporbarhed på anvendte lodder (oplys certifikatnummer og dato):	Kalibreringen er udført af:	Godkendt af:
Institutprocedure nr. 900-6.0-1	200-P-22776 (F1) og 200-P-22557 (M2)	KMSA	

Grøn

Kalibrering af løse termofølere i EPA stand E

Måleskema til kontrol af temofølere i stand E (EPA)

Dato: 15-09-2020 Udført af: MXB

Brændeovnsprøvestand: E (c) Emne Id nr.: 145092

Certifikat nr.: ELAB-38-2020

Kalibrator ref.: 270-A-1625 (Jofra)

#nye korr.
kopieret fra øverste filterrækker

PC indgang		Sand temp.	Vist temp.	Fejl	(Brugt ved Kalibrering) Aktuel Korrektion Konst.	1. gard	(Ny valgt korr.) Ny Korrektion Konst.	1. grad	Ber. Uden korr.	Ber. Ny korr.	Ber. Ny fejl.	Krav	
Rum temp.	-1	29,39	28,7	-0,69	0,1	1	0,1	1	28,6	28,7	-0,7	1	
Filter-1-H A	-2	29,39	29,8	0,41	0,3	1	0,3	1	29,5	29,8	0,4	1	
Filter-2-D1 A	-3	29,39	29,6	0,21	0,3	1	0,3	1	29,3	29,6	0,2	1	
Filter-3-D2 A	-4	29,39	30	0,61	0,6	1	0,6	1	29,4	30,0	0,6	1	
Filter-4-R A	-5	29,39	29,8	0,41	0,5	1	0,5	1	29,3	29,8	0,4	1	
Køler-1-H	-6	29,39	29,7	0,31	0,5	1	0,5	1	29,2	29,7	0,3	1	
Køler-2-D	-7	29,39	30	0,61	0,9	1	0,9	1	29,1	30,0	0,6	1	
Gasm-H	-8	29,39	29,8	0,41	0,8	1	0,8	1	29,0	29,8	0,4	1	
Gasm-D	-9	29,39	29,9	0,51	0,8	1	0,8	1	29,1	29,9	0,5	1	
Gasm-R	-10	29,39	29,6	0,21	0,5	1	0,5	1	29,1	29,6	0,2	1	
Gas-Disp	-11	29,39	29,6	0,21	0,6	1	0,6	1	29,0	29,6	0,2	1	
Løs føler tilknyttet		29,39	-	#VÆRDI!	0,1	1			#VÆRDI!	#VÆRDI!	#VÆRDI!	2	ikke monteret (ikke til stede i logger-opsætning)
Filter-1-H B	-2	29,39	29,7	0,31	0,3	1	0,3	1	29,4	29,7	0,3	1	
Filter-2-D1 B	-3	29,39	29,6	0,21	0,3	1	0,3	1	29,3	29,6	0,2	1	
Filter-3-D2 B	-4	29,39	29,8	0,41	0,6	1	0,6	1	29,2	29,8	0,4	1	
Filter-4-R B	-5	29,39	29,7	0,31	0,5	1	0,5	1	29,2	29,7	0,3	1	

Kalibrering af løse termofølere i brændeovnsprøvestand B, C og D

Måleskema til kontrol af temofølere i stand B, C og D

Dato: 15-09-2020 Udført af: MXB

Brændeovnsprøvestand: E/C Emne Id nr.: 134396

Certifikat nr.: ELAB-38-2020

Kalibrator ref.: 270-A-1625 (Jofra) #Ny indtastet 2020

				(Brugt ved Kalibrering) Aktuel Korrektion		(Ny valgt korr.) Ny Korrektion		Ber.	Ber.	Ber.		
PC indgang	Sand temp.	Vist temp.	Fejl	Konst.	1. gard	Konst.	1. grad	Uden korr.	Ny korr.	Ny fejl.	Krav	
Rum temp.	29,39	28,7	-0,69	0,1	1	0,1	1	28,6	28,7	-0,7	1,5	
Br.rum	83,99	84,7	0,71	1,4	1	1,4	1	83,3	84,7	0,7	2	
Konv.	83,99	84,9	0,9	1,5	1	1,5	1	83,4	84,9	0,9	3	
Gasmåler	83,99	#I/T	#I/T					#I/T	#I/T	#I/T	2	Alm. C prøvestand
Disp-T1	83,99	#I/T	#I/T					#I/T	#I/T	#I/T	2	Alm. C prøvestand
Disp-T2	83,99	#I/T	#I/T					#I/T	#I/T	#I/T	2	Alm. C prøvestand
Disp-T3	83,99	84,6	0,61	0	1	0,5	1	84,6	85,1	1,1	2	
Disp-T4	83,99	84,0	0,01	0,1	1	-0,5	1	83,9	83,4	-0,6	2	
Disp-T5	83,99	84,0	0,0	0,1	1	-0,4	1	83,9	83,5	-0,5	2	
Disp-K6	83,99	83,8	-0,19	1,1	1	-0,7	1	82,7	82,0	-2,0	2	
Disp-K7	83,99	84,4	0,41	1	1	0,6	1	83,4	84,0	0,0	2	
Disp-K8	83,99	83,7	-0,29	-0,2	1	-0,8	1	83,9	83,1	-0,9	2	
Disp T Bag (disponibel-T)	83,99	#I/T	#I/T					#I/T	#I/T	#I/T	2	Alm. C prøvestand
Disp T side	83,99	#I/T	#I/T					#I/T	#I/T	#I/T	2	Alm. C prøvestand
Dsip 1K	83,99	#I/T	#I/T					#I/T	#I/T	#I/T	2	Alm. C prøvestand
Disp 2K	83,99	#I/T	#I/T					#I/T	#I/T	#I/T	2	Alm. C prøvestand
Røg EN	83,99	82,4	-1,59	-1	1	-1	1	83,4	82,4	-1,6	5	
Røg EN	249,48	249,7	0,22	-1	1	-1	1	250,7	249,7	0,2	5	
Røg EN	348,61	349,3	0,69	-1	1	-1	1	350,3	349,3	0,7	5	
NS røg	83,99	83,4	-0,59	-1,3	1	-1,3	1	84,7	83,4	-0,6	2	
NS røg	249,48	249,2	-0,28	-1,3	1	-1,3	1	250,5	249,2	-0,3	2	
NS røg	348,61	349,2	0,59	-1,3	1	-1,3	1	350,5	349,2	0,6	2	
Før Kat.	83,99	82,7	-1,29	-1,3	1	-1,3	1	84,0	82,7	-1,3	3	
Før Kat.	249,48	250,2	0,72	-1,3	1	-1,3	1	251,5	250,2	0,7	3	
Før Kat.	348,61	350	1,39	-1,3	1	-1,3	1	351,3	350,0	1,4	3	
Ovf. Top	83,99	83,6	-0,39	-0,5	1	0	0,99	84,1	83,3	-0,7	1	
Ovf. Top	249,48	251,4	1,92	-0,5	1	0	0,99	251,9	249,4	-0,1	1	
Ovf. Top	348,61	351,7	3,09	-0,5	1	0	0,99	352,2	348,7	0,1	1	
Ovf. Bag	83,99	86,6	2,61	2,1	1	1	0,99	84,5	84,7	0,7	1	
Ovf. Bag	249,48	252,3	2,82	2,1	1	1	0,99	250,2	248,7	-0,8	1	
Ovf. Bag	348,61	352,8	4,19	2,1	1	1	0,99	350,7	348,2	-0,4	1	
Ovf. Side-1	83,99	84,7	0,71	1,4	0,99	0,5	0,99	84,1	83,8	-0,2	1	
Ovf. Side-1	249,48	250,7	1,22	1,4	0,99	0,5	0,99	251,8	249,8	0,3	1	
Ovf. Side-1	348,61	349,8	1,19	1,4	0,99	0,5	0,99	351,9	348,9	0,3	1	
Ovf. Side-2	83,99	85,3	1,31	1,8	1	0,5	1	83,5	84,0	0,0	1	
Ovf. Side-2	249,48	251,1	1,62	1,8	1	0,5	1	249,3	249,8	0,3	1	
Ovf. Side-2	348,61	350,5	1,89	1,8	1	0,5	1	348,7	349,2	0,6	1	
Ovf. Bund	83,99	83,3	-0,69	0,5	0,99	2	0,99	83,6	84,8	0,8	1	
Ovf. Bund	249,48	247,7	-1,78	0,5	0,99	2	0,99	249,7	249,2	-0,3	1	
Ovf. Bund	348,61	346,2	-2,41	0,5	0,99	2	0,99	349,2	347,7	-0,9	1	

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KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-E-20811

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Datalogger**

Fabrikat:	Hewlett Packard A/S	Model:	34970A
Serienr.:	**MY44006319**	Kundemærke:	**270-A-1992**
Område:	mV, V, mA	Klasse:	-
Inddeling:	0,001 mV / 0,00001 V / 0,0001 V	Type:	-
Udgangssignal:	-	Diameter:	-
Tilbehør:	-		

Rekvisitionsnr.: MXB

Periode: Modtaget: 09-09-2019 Kalibreret: **10-09-2019**

Procedure: D1-7.1 & D1-7.3

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Javier I. Camacho, 72 20 25 92, jcam@teknologisk.dk

Godkendt og digitalt signeret 30-09-2019 af:

Jan Nielsen
Cand. Scient

ilac-MRA DANAK
CAL Reg.nr. 200

TERMOMETRILABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Voltmeter: Udført på kabel mrk.1 i logger kanal 201

Område	Referenceværdi (Indstilling)	Aflæsning	Fejl	Usikkerhed
100 mV	0,000 mV	0,000 mV	1,0E-07 V	5,9E-07 V
100 mV	100,000 mV	100,004 mV	4,0E-06 V	2,8E-06 V
1 V	0,00000 V	0,00000 V	0,0E-06 V	5,8E-06 V
1 V	1,00000 V	1,00003 V	3,5E-05 V	1,3E-05 V
10 V	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
10 V	1,0000 V	1,0000 V	2,0E-05 V	5,9E-05 V
10 V	2,0000 V	2,0000 V	4,0E-05 V	6,2E-05 V
10 V	5,0000 V	5,0001 V	9,8E-05 V	8,8E-05 V
10 V	10,0000 V	10,0002 V	1,9E-04 V	1,3E-04 V

Kalibrering af mA loggere

Område & Input 10 V 20 mA	Referenceværdi	Aflæsning	Fejl	Usikkerhed
Kabel: 12 Kanal: 112	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	1,9999 V	-0,6E-04 V	1,9E-04 V
Kabel: 13 Kanal: 113	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	2,0004 V	4,4E-04 V	1,9E-04 V
Kabel: 26 Kanal: 301	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	2,0001 V	1,3E-04 V	1,9E-04 V
Kabel: 27 Kanal: 302	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	2,0003 V	2,8E-04 V	1,9E-04 V
Kabel: 28 Kanal: 303	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	2,0008 V	7,7E-04 V	1,9E-04 V
Kabel: 29 Kanal: 304	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	2,0006 V	5,8E-04 V	1,9E-04 V
Kabel: 30 Kanal: 305	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	1,9998 V	-2,4E-04 V	1,9E-04 V
Kabel: 31 Kanal: 306	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	1,9997 V	-3,5E-04 V	1,9E-04 V
Kabel: 32 Kanal: 307	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	1,9995 V	-5,0E-04 V	1,9E-04 V
Kabel: 33 Kanal: 308	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	1,9995 V	-5,1E-04 V	1,9E-04 V
Kabel: 34 Kanal: 309	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	1,9990 V	-10,0E-04 V	1,9E-04 V
Kabel: 35 Kanal: 310	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	1,9991 V	-9,1E-04 V	1,9E-04 V
Kabel: 36 Kanal: 311	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	2,0000 V	0,4E-04 V	1,9E-04 V
Kabel: 37 Kanal: 312	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	2,0007 V	7,0E-04 V	1,9E-04 V
Kabel: 38 Kanal: 313	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	1,9995 V	-5,0E-04 V	1,9E-04 V
Kabel: 39 Kanal: 314	0,0000 V	0,0000 V	0,0E-05 V	5,8E-05 V
	2,0000 V	2,0004 V	3,7E-04 V	1,9E-04 V

TERMOMETRILABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Kalibrering af TC Type K : Udført på logger kanal 202 (*)

Input	Referenceværdi (Simuleret TC-Temp.)	Aflæsning	Fejl	Usikkerhed
0,0000 mV	0,0 °C	0,3 °C	3,0E-01 °C	1,2E-01 °C
4,0920 mV	100,0 °C	100,3 °C	2,8E-01 °C	1,3E-01 °C
8,1385 mV	200,0 °C	200,3 °C	3,4E-01 °C	1,3E-01 °C
16,3971 mV	400,0 °C	400,3 °C	3,0E-01 °C	1,2E-01 °C
24,9055 mV	600,0 °C	600,3 °C	2,8E-01 °C	1,3E-01 °C

Kalibrering af TC Type T : Udført på logger kanal 203 (*)

Input	Referenceværdi (Simuleret TC-Temp.)	Aflæsning	Fejl	Usikkerhed
0,0000 mV	0,0 °C	0,0 °C	0,0E-01 °C	1,2E-01 °C
2,0357 mV	50,0 °C	50,0 °C	0,0E-01 °C	1,2E-01 °C
4,2785 mV	100,0 °C	100,0 °C	0,0E-01 °C	1,2E-01 °C
6,7041 mV	150,0 °C	150,0 °C	0,0E-01 °C	1,2E-01 °C
9,2881 mV	200,0 °C	200,0 °C	0,0E-01 °C	1,2E-01 °C

(*) Thermocouple Test med ekstern cold junction v. 0 °C - elektromotorisk kraft defineret i DS/EN 60584-1:2014

Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.

Fejl = Aflæsning - referenceværdi.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k =2, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:
Rumtemperatur: 23 °C ± 1 °C

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

DANISH TECHNOLOGICAL INSTITUTE	**KONTROL AF TRYKMÅLERE**
CP	**Test af kontinuerligt registrerende trykmålere**
Side 1 af 1	**Udstedt af: ELAB**

Logbog/kontrol – Autotran 700/ACI tryktransmittere

Emne nr.: Id nr. 148230 (0-25,4Pa)

Placering: Stand C, Røgtræk

Dato: 07-09-2020

Certifikat nr.: ELAB-37-2020

Signatur: MXB

Ref. Udstyr: 270-A-2406 TSI

Ca. Målepunkt [Pa] (0-25,4Pa)	Ca. Målepunkt [PA] (0-60Pa)	Reference [Pa] (1 decimal)	Aflæst tryk [Pa] (1 decimal)	Fejl [Pa] <1Pa
0	0	0,0	0,0	
4	5	4,2	4,1	
8	10	8,4	8,3	
12	15	12,5	12,3	
16	20	16,7	16,5	
20	40	20,1	19,9	
24	55	23,7	23,4	

Grøn OK

DANISH TECHNOLOGICAL INSTITUTE	**KONTROL AF TRYKMÅLERE**
CP	**Test af kontinuerligt registrerende trykmålere**
Page 1 of 1	**Udstedt af: ELAB**

Logbog/kontrol – Autotran 700/ACI tryktransmittere

Emne nr.: Id nr.: 148231 (0-60Pa)

Placering: Stand C, Pd

Dato: 07-09-2020

Certifikat nr.: ELAB-37-2020

Signatur: MXB

Ref. Udstyr: 270-A-2406 TSI

Ca. Målepunkt [Pa] (0-25,4Pa)	Ca. Målepunkt [PA] (0-60Pa)	Reference [Pa] (1 decimal)	Aflæst tryk [Pa] (1 decimal)	Fejl [Pa] <1Pa
0	0	0,0	0,0	
4	5	5,3	5,2	
8	10	10,0	9,9	
12	15	15,3	15,2	
16	20	20,2	20,0	
20	40	41,0	40,6	
24	55	55,0	54,5	

Grøn OK

DANISH TECHNOLOGICAL INSTITUTE	**KONTROL AF TRYKMÅLERE**
CP	**Test af kontinuerligt registrerende trykmålere**
Side 1 af 1	**Udstedt af: ELAB**

Logbog/kontrol – Autotran 700/ACI tryktransmittere

Emne nr.: Id nr. 94839 (0-254Pa)

Placering: Stand C, Ps

Dato: 07-09-2020

Certifikat nr.: ELAB-37-2020

Signatur: MXB

Ref. Udstyr: 270-A-2406 TSI

Ca. målepunkt [Pa] (0-25,4Pa)	Ca. målepunkt [Pa] (0-250 Pa)	Reference [Pa] (1 decimal)	Aflæst tryk [Pa] (1 decimal)	Fejl [Pa] <3Pa
0	0	0,0	0,0	
4	5	5,5	5,5	
8	10	10,4	10,2	
12	20	21,4	21,6	
16	50	50,2	49,9	
20	100	102,5	102,2	
24	240	233,3	231,8	

Grøn

TEKNOLOGISK
INSTITUT

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info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-T-23175

Rekvirent: Teknologisk Institut
Kongsvang Allé 29
8000 Århus C

Emne: **Temperatur-kalibrator, digital**

Fabrikat:	Ametek Denmark A/S	Model:	601
Serienr.:	**912525**	Kundemærke:	**270-A-1625**
Område:	50 - 600 °C	Inddeling:	1 °C
Type:	Tørblok kalibrator		

Rekvisitionsnr.: MXB

Periode: Modtaget: 10-09-2020 Kalibreret: **11-09-2020**

Procedure: D1-5.1

Bemærkninger: Kalibreret i området 30 - 350°C. Aksial inhomogenitet, hysterese samt temperaturinstabillitet er undersøgt iht. EURAMET cg-13 Version 3.0 (02/2015). Kalibreringen er foretaget med en referenceføler på 6,5 mm og et foret isoleringsrør med en diameter på 32 mm og en højde på ca. 200 mm. Isoleringsrøret er placeret omkring referenceføleren oven på tørblokken. Indsats (uden id.) med én central udboring er benyttet under kalibringen. Mellem tørblokken og isoleringsrøret er der isoleret med mineraluld

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Bjørn Kjærsgaard Nielsen, 72203534, bjni@teknologisk.dk

Godkendt og digitalt signeret 17-09-2020 af:

Søren Andersen

Søren Lindholt Andersen
Konsulent, Ph.d.

ilac-MRA DANAK
CAL Reg.nr. 200

TEMPERATURLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Kalibrator mærket: 270-A-1625

Reference-værdi °C	Aflæsning °C	Fejl °C	Usikkerhed °C	Note
29,39	30,00	0,61	0,65	
83,99	85,00	1,01	0,65	
249,48	250,00	0,52	0,65	
348,61	350,00	1,39	0,65	

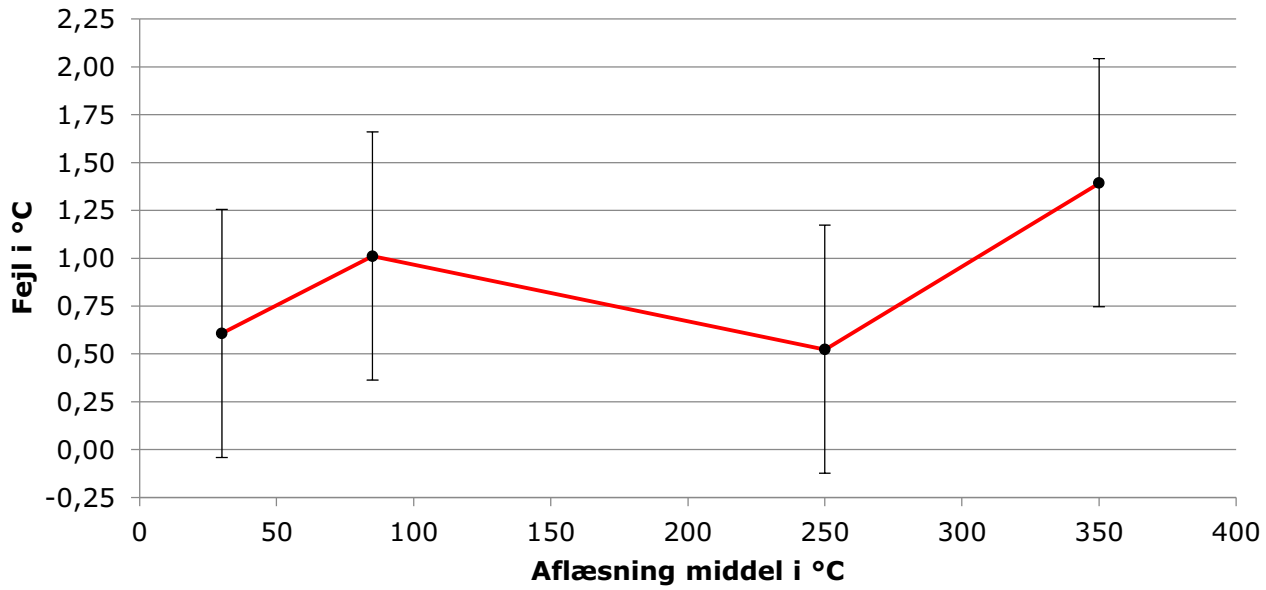
Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

TEMPERATURLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Fejlkurve

Kalibrator mærket: 270-A-1625



Kun de markerede punkter er målt.

Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k =2, således at dækningssandsynligheden svarer til ca. 95 %.
Alle temperaturer er i henhold til ITS90

Kalibreringsforhold:

Rumtemperatur:	22,5 °C ± 1,1 °C
Relativ fugtighed:	49,8 %rh ± 8,1 %rh
Barometerstand:	1013,5 mbar ± 4,2 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Internt kalibreringscertifikat vedr. kalibrering af vægte i DTI's laboratorier

Obligatorisk for vægte, som anvendes til vejninger, der er omfattet af DTI's DANAK akkrediteringer, bortset fra akkreditering nr. 200. Certifikatet må i uddrag kun gengives, såfremt DTI's kvalitetschef har godkendt uddraget.

Afdeling: DTI/ Energi	Laboratorium: ELAB
Afdelingsnummer: 270	Certifikatnummer: ELAB-36-2020

Dato for kalibrering/klassificering af lodder:	Dato for modtagelse af lodder:	Dato for kalibreringens udførelse:	Certifikatdato:	Vedr. akkr. Nr.:	Sidenummer: Side 1 af 1
12.11.2014/FI og 09.04.2014/M2	01.09.2020	03.09.2020	03.09.2020	300	

Identifikation den kalibrerede vægt: Mettler Toledo - 270-A-1989	Ansvarlig:	Antal bilag:

Vægtens max-kapacitet:	Vægtens deling i 1. range:	Vægtens deling i 2. range:	Vægtens kalibreringsværdi i 1. range:	Vægtens kalibreringsværdi i 2. range:	Vægtens serienummer:
15kg	d = 1g		e =		2738141

Kontrol af nivellering, nulpunkt og taraindretning

Temperatur: 23 grader

Ved kalibreringens start:

Viser vægten nul i ubelastet tilstand? x ja

Er taraindretningen frakoblet? x ja

Står vægten stabilt og vandret? x ja

Vejeprøve

Overholdt Ja Nej X*

Belastningspunkt B - kg	Visning, opvejning; I	Visning, nedvejning; I	Evt. tillægslast;a opvejning/nedne jnig	Fejlvisning, opvejning; F	Fejlvisning, nedvejning; F
0,000	0,000	0,000		-	-
0,005	0,005	0,005		-	-
0,050	0,050	0,050		-	-
0,200	0,200	0,200		-	-
0,500	0,500	0,500		-0,001kg	-
1,000	0,999	0,999		-0,001kg	-0,001kg
2,000	1,999	1,999		-0,001kg	-0,001kg
7,000	6,995	6,995		-0,005kg	-0,005kg
12,000	11,990	11,990		-0,010kg	-0,010kg

Undersøgelse af repeterbarhed

Overholdt xJa ☐Nej

Ca. 10 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	5.vejning
1,000kg	0,999	0,999	0,999	0,999	0,999
Ca. 80 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	5.vejning
10,000kg	9,992	9,992	9,992	9,992	9,992

Prøvning af excentricitet

Overholdt xJa ☐Nej

Ca. 33 % af Max	1. vejning	2.vejning	3.vejning	4.vejning	Diff.:
5,000kg	4,996	4,997	4,995	4,996	±0,001kg

Metodegrundlag: Institutprocedure nr. 900-6.0-1	Sporbarhed på anvendte lodder (oplys certifikatnummer og dato): **200-P-22776 (F1) og 200-P-22557 (M2)**	Kalibreringen er udført af: MXB	Godkendt af:

GUL *krav EN 5/10 gram hhv. under/over 7,5kg overskredet med 5g (under 7,5kg) og 10g (over 7,5kg).

Y:\Labspace\LAB2C_Labspace\Kalibrering Arbejdskopi\2020\EPA certifikater 3-kv-2020\09-Mettler Toledo, 270-A-1989, 15kg.docx

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR:
200-A-162-1530

TEKNOLOGISK INSTITUT
Teknologiparken
Kongsvangs Allé 29
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www.teknologisk.dk

Rekvirent: **Teknologisk Institut**
Kongsvang Allé 29,
8000 Aarhus
Att.: Max Bjerum

Emne:

Type:	Digital Vægt	Kundemærke:	7084
Fabrikat:	Mettler Toledo	Måleområde:	0-220 g
Model:	XS 204	Serienr.:	B042079566

Modtaget dato: 03-09-2020 Kalibreringsdato: 03-09-2020

Testmetode: Auto D1-10.1

Kalibreringssted: Teknologisk Institut, Kongsvang Allé 29 - 8000 Aarhus

Sporbarhed: Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Bemærkninger: Resultatet af kalibreringen fremgår af de efterfølgende sider

Vilkår: Kalibreringen er udført i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt dette.

Udført af:

Dato: 04-09-2020

Lars H. Hudecek - Faglig Ansvarlig

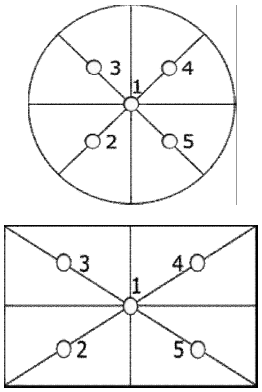
Ivan Sand - Automobilteknik

ilac-MRA DANAK
CAL Reg.nr. 200

Måleresultater:

Ekcentrisk belastning

Position	Deling	1	2	3	4	5
	[g]	[g]	[g]	[g]	[g]	[g]
Visning	0,0001	50,0000	49,9999	50,0000	50,0000	49,9999
Fejl		0,0000	-0,0001	0,0000	0,0000	-0,0001
Største Fejl:		0,0001				



Placering af målepunkter

Repeterbarhed

Anvendt masse	Deling	Målt 1	2	3	4	5
[g]	[g]	[g]	[g]	[g]	[g]	[g]
100,0000	0,0001	99,9999	99,9999	99,9999	99,9999	99,9999
200,0000	0,0001	199,9998	199,9998	199,9998	199,9998	199,9998

Linearitet

Reference masse	Deling	Målt I1	I2	Imiddel	Fejl	Udv. måle-usikkerhed	Dæknings faktor
[g]	[g]	[g]	[g]	[g]	[g]	[g]	
0,001000	0,0001	0,0010	0,0010	0,001000	0,000000	0,000064	2,00
0,050000	0,0001	0,0500	0,0500	0,050000	0,000000	0,000079	2,00
0,50000	0,0001	0,5000	0,5000	0,50000	0,00000	0,00012	2,00
5,00001	0,0001	5,0000	5,0000	5,00000	-0,00001	0,00022	2,00
20,00005	0,0001	20,0000	20,0000	20,00000	-0,00005	0,00036	2,00
50,00013	0,0001	50,0000	50,0000	50,00000	-0,00013	0,00052	2,00
100,00025	0,0001	99,9999	99,9999	99,99990	-0,00035	0,00093	2,00
150,0004	0,0001	149,9999	149,9999	149,9999	-0,0005	0,0014	2,00
220,0006	0,0001	219,9998	219,9998	219,9998	-0,0008	0,0022	2,00

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren k, som for en t-fordeling, med det relevante antal frihedsgrader, giver en dækningssandsynlighed på ca. 95%

Omgivelser:

Temperatur	**24,0** ± 1 °C
Luftfugtighed	**44** ± 5 %RH
Lufttryk	**1011** ± 5 hPa
Beregnet Luftdensitet	**1,180** ± 0,012 kg/m3

TEKNOLOGISK
INSTITUT

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info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-L-21364

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Lufthastighedsmåler, Anemometer**

Fabrikat:	Testo	Serienr.:	**61503580**
Kundemærke:	**176529**	Område:	0 - 0,7 m/s
Inddeling:	0,01 m/s	Type:	Varmetrådsanemometer
Udgangssignal:	m/s		
Tilbehør:	Displayenhed: Testo, id nr. 176529-Display, serie nr. 83010838		

Rekvisitionsnr.: MXB

Periode: Modtaget: 07-09-2020 Kalibreret: **14-09-2020**

Procedure: D1-2

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Mikkel Brochstedt Copeland, 72 20 13 87, mico@teknologisk.dk

Godkendt og digitalt signeret 16-09-2020 af:

Søren Haack
Konsulent

CIPM MRA

ilac-MRA DANAK
CAL Reg.nr. 200

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

ANEMOMETER

Måleområde: 0 - 0,7 m/s

Luft temperatur °C	Luft massefylde kg/m^3	Reference hastighed m/s	Emnets visning m/s	Fejl m/s	Usikkerhed m/s
22,76	1,198	0,050	0,07	0,020	0,023
22,76	1,198	0,202	0,22	0,018	0,023
22,76	1,198	0,403	0,41	0,007	0,023
22,76	1,198	0,605	0,62	0,015	0,023
22,76	1,198	0,706	0,72	0,014	0,023
22,76	1,198	0,706	0,73	0,024	0,023
22,76	1,198	0,605	0,62	0,015	0,023
22,76	1,198	0,403	0,41	0,007	0,023
22,76	1,198	0,202	0,22	0,018	0,023
22,76	1,198	0,050	0,07	0,020	0,023

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

LABORATORIEBETINGELSER OG SPORBARHED

Laboratoriebetingelser:

Rumtemperatur (°C)	:	22,8 ± 0,6
Relativ luftfugtighed (%)	:	57 ± 10
Barometerstand (mbar)	:	1023,4 ± 1

Referencer:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering
og EA's og ILAC's multilaterale aftaler for kalibrering,
hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren *k = 2*, som for en normalfordeling svarer til en dækningssandsynlighed på ca. 95%. Standardusikkerheden er fastlagt i overensstemmelse med EA-04/2.

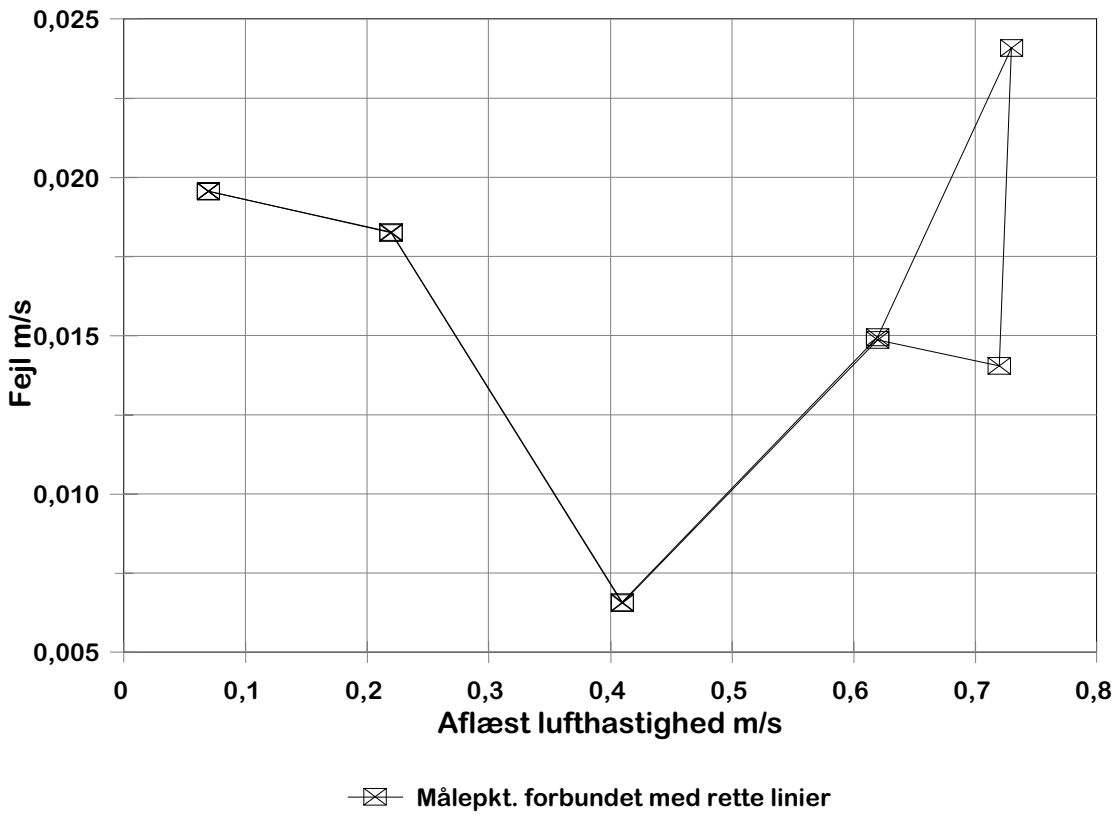
LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato : 2020.09.14 Cert nr 200-L-21364

KALIBRERINGSCERTIFIKAT

FEJLKURVE



Sand hastighed = Aflæst - Fejl (med fortegn)

Usikkerhed: 0,023 m/s til 0,023 m/s

TEKNOLOGISK
INSTITUT

Teknologiparken
Kongsvang Allé 29
Bygning 14
8000 Aarhus C
Tlf. +45 72 20 20 00
info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-P-24979

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Mikromanometer**

Fabrikat:	TSI	Model:	8705-M-GB
Serienr.:	**56050491**	Kundemærke:	**270-A-2406**
Område:	-1245 - 3735 Pa	Inddeling:	0,1 Pa
Type:	DP-CALC		

Rekvisitionsnr.: MXB

Periode: Modtaget: 03-09-2019 Kalibreret: **05-09-2019**

Procedure: D1-3.2

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Javier I. Camacho, 72 20 25 92, jcam@teknologisk.dk

Godkendt og digitalt signeret 05-09-2019 af:

Kenn Øholm
Konsulent, tekniker

ilac-MRA DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: -1245 - 3735 Pa

Reference Op 1	Aflæsning Op 1	Reference Ned 1	Aflæsning Ned 1	Reference Op 2	Aflæsning Op 2	Reference Ned 2	Aflæsning Ned 2
Pa	Pa	Pa	Pa	Pa	Pa	Pa	Pa
0,00	0,0	0,00	-0,1	0,00	0,0	0,00	-0,1
2,01	2,0	2,04	1,9	1,97	1,9	2,01	1,9
9,99	10,0	10,00	9,9	9,97	10,0	9,96	9,9
19,68	19,7	20,27	20,4	19,81	19,9	20,28	20,4
29,78	29,9	30,31	30,5	29,75	29,9	30,26	30,4
99,72	100,4	100,17	101,1	99,72	100,5	100,20	101,1
199,75	201,5	200,03	201,8	199,81	201,5	199,97	202,0
300,27	302,7	300,29	303,2	300,29	302,9	300,20	303,0

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Måleområde: -1245 - 3735 Pa

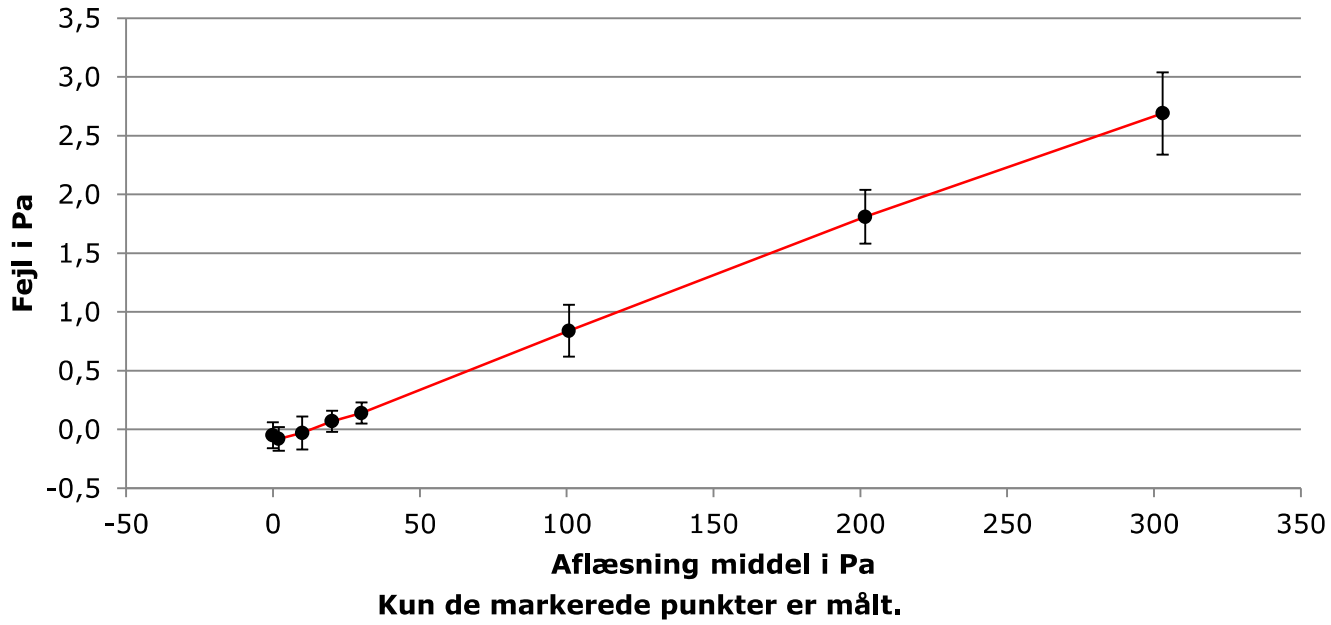
Reference middelværdi Pa	Aflæsning middelværdi Pa	Opløsning Pa	Hysterese Pa	Fejl Pa	Usikkerhed Pa
0,00	-0,05	0,1	0,07	-0,05	0,11
2,01	1,93	0,1	0,06	-0,08	0,10
9,98	9,95	0,1	0,11	-0,03	0,14
20,01	20,09	0,1	0,03	0,07	0,09
30,03	30,17	0,1	0,02	0,14	0,09
99,95	100,79	0,1	0,17	0,84	0,22
199,89	201,71	0,1	0,17	1,81	0,23
300,26	302,96	0,1	0,31	2,69	0,35

Maks. hysterese:	0,310 Pa
Maks. fejl:	2,690 Pa
Maks. relativ fejl i forhold til måleområdet:	0,054 %

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Alle værdier under 'Op' og 'Ned' er afrundede middelværdier af 10 målinger (rådata). Værdierne under 'Fejl' er ligeledes afrundede middelværdier af samme rådata (evt. 2 gange, dvs. 20 eller 40 målinger). Der kan derfor forekomme uoverensstemmelse mellem måleresultater og fejl, da alle tal afrundes til 2 betydende cifre, jf. EA4/02.
Fejl = aflæsningsværdi - referenceværdi.
Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysterese fra det kalibrerede emne.
Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k=2, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Luft
Rumtemperatur:	20,3 °C ± 0,4 °C
Relativ fugtighed:	62,7 %rh ± 6,6 %rh
Barometerstand:	1005,3 mbar ± 2,0 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

TEKNOLOGISK
INSTITUT

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8000 Aarhus C
Tlf. +45 72 20 20 00
info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-U-23649

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Relativ fugtmåler, Luft fugtighed og Rum temperatur i ELAB**

Fabrikat:	Thermoguard	Model:	57713
Serienr.:	**OK + 02457265**	Kundemærke:	**142357**
Område:	0 - 100 %RH / -40 - +80 °C	Inddeling:	0,1 %RH / 0,1 °C
Tilbehør:	Føler S/N: OK+02427057		

Rekvisitionsnr.: MXB

Periode: Modtaget: 04-09-2020 Kalibreret: **10-09-2020**

Procedure: D1-6.1

Bemærkninger: Aflæsning er foretaget vha. software.
Kalibrering er foretaget i to-trykgenerator.

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Mette Pedersen, 72 20 12 32, mo@teknologisk.dk

Godkendt og digitalt signeret 11-09-2020 af:

Mette Pedersen
Kvalitets & måletekniker

ilac-MRA DANAK
CAL Reg.nr. 200

FUGTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

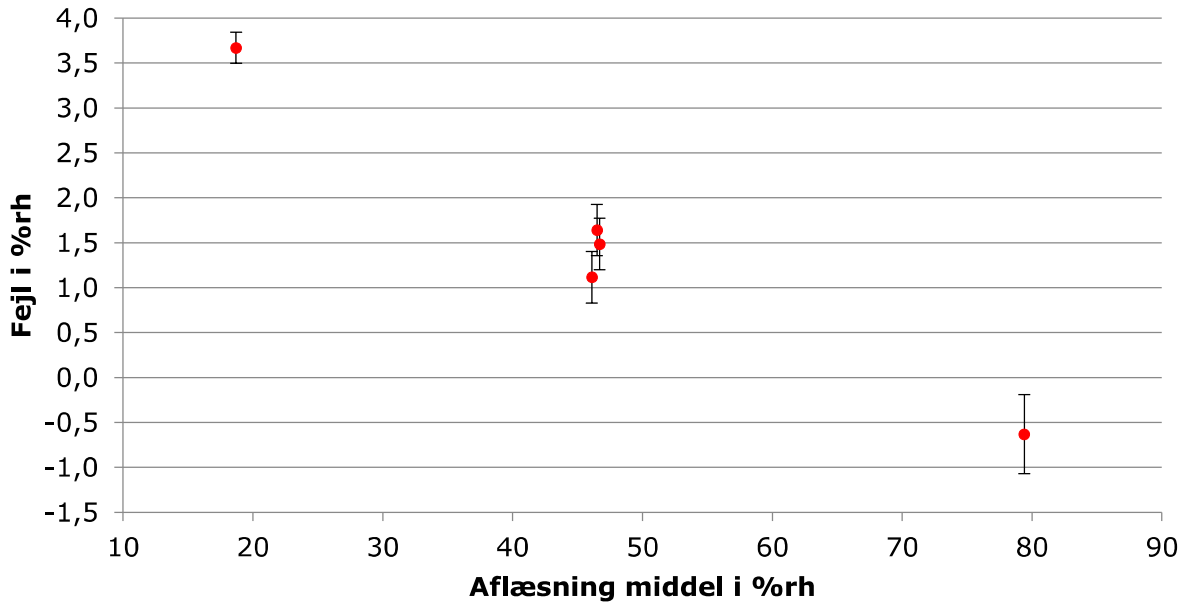
Reference-værdi °C	Reference-værdi %rh	Aflæsning %rh	Fejl %rh	Usikkerhed %rh	Note
17,86	44,86	46,50	1,64	0,29	
22,03	15,03	18,70	3,67	0,17	
22,03	44,98	46,10	1,12	0,29	
22,04	80,03	79,40	-0,63	0,44	
28,03	45,21	46,70	1,49	0,29	

Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

FUGTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

FUGTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Reference-værdi °C	Aflæsning værdi °C	Fejl °C	Usikkerhed °C	Note
17,862	17,70	-0,162	0,040	
22,034	21,90	-0,134	0,070	
28,034	27,90	-0,134	0,075	

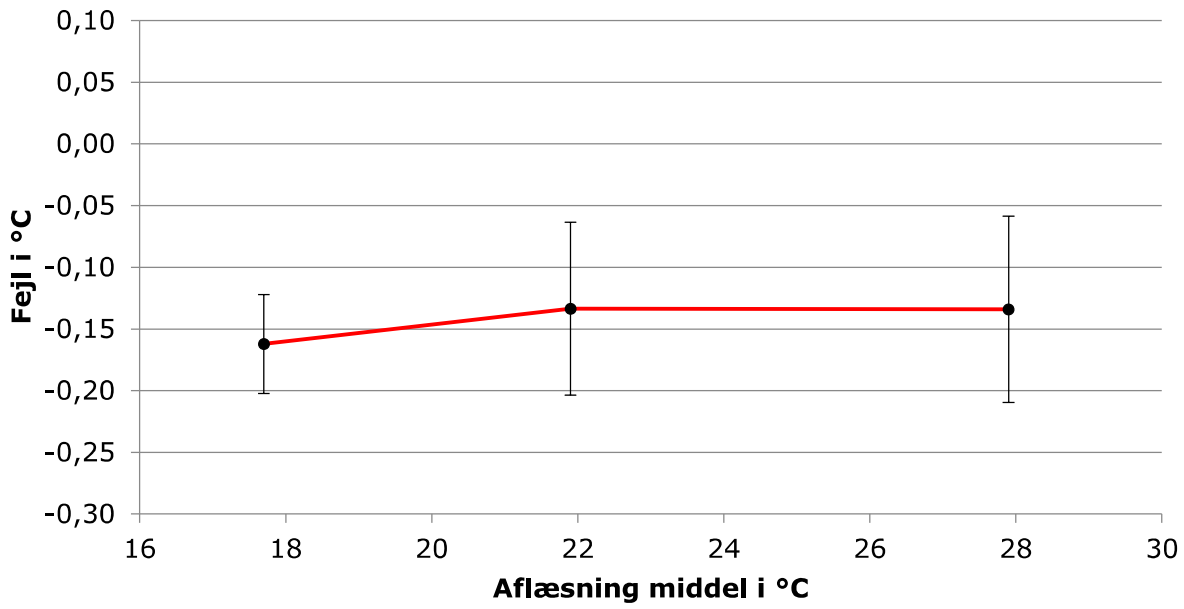
Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

FUGTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k = 2$, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:
Rumtemperatur: 22 °C ± 3 °C

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

TEKNOLOGISK
INSTITUT

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Bygning 14
8000 Aarhus C
Tlf. +45 72 20 20 00
info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-P-25297

Rekvirent: Teknologisk Institut, Pressometri
Kongsvang Allé 29
8000 Århus C

Emne: **Barometer**

Fabrikat:	Ahlborn	Model:	Almemo FD A612-SA
Serienr.:	**08120625**	Kundemærke:	**270-A-2617**
Område:	700 - 1050 mbar abs	Inddeling:	0,1 mbar abs
Tilbehør:	Displayenhed: Ahlborn, Almemo 2490, Kundemærke: 270-A-2618.		

Periode: Modtaget: 17-01-2020 Kalibreret: **20-04-2020**

Procedure: D1-6.1

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

Godkendt og digitalt signeret 20-04-2020 af:

Mette Pedersen
Kvalitets & måletekniker

ilac-MRA DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 700 - 1050 mbar a

Reference Op 1	Aflæsning Op 1	Reference Ned 1	Aflæsning Ned 1	Reference Op 2	Aflæsning Op 2	Reference Ned 2	Aflæsning Ned 2
mbar a	mbar a	mbar a	mbar a	mbar a	mbar a	mbar a	mbar a
949,99	950,1	949,99	950,2	949,99	950,1	949,99	950,2
969,99	970,2	969,99	970,2	969,99	970,2	969,99	970,2
989,99	990,1	989,99	990,1	989,99	990,1	989,99	990,1
1.009,99	1.009,9	1.009,99	1.009,9	1.009,99	1.009,9	1.009,99	1.009,9
1.029,99	1.029,8	1.029,99	1.029,8	1.029,99	1.029,8	1.029,99	1.029,8
1.049,99	1.049,5	1.049,99	1.049,6	1.049,99	1.049,5	1.049,99	1.049,6

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Måleområde: 700 - 1050 mbar a

Reference middelværdi mbar a	Aflæsning middelværdi mbar a	Opløsning mbar a	Hysterese mbar a	Fejl mbar a	Usikkerhed mbar a
949,99	950,15	0,1	0,10	0,16	0,22
969,99	970,20	0,1	0,00	0,21	0,10
989,99	990,10	0,1	0,00	0,11	0,10
1.009,99	1.009,90	0,1	0,00	-0,09	0,10
1.029,99	1.029,80	0,1	0,00	-0,19	0,10
1.049,99	1.049,55	0,1	0,10	-0,44	0,22

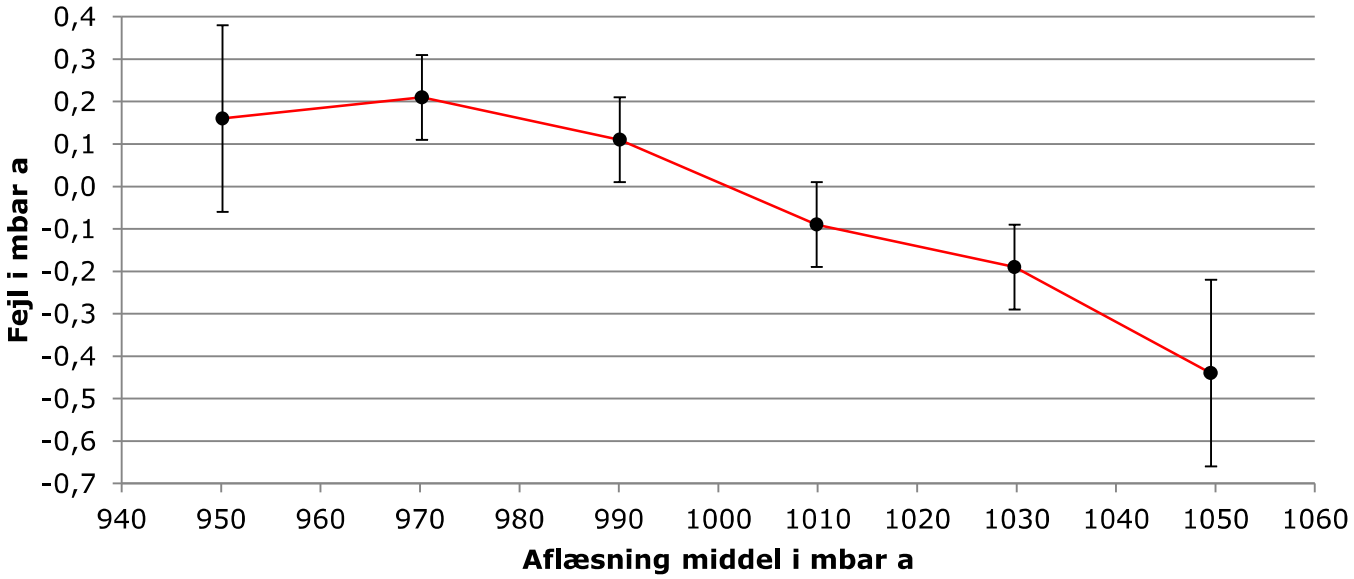
Maks. hysterese:	0,10 mbar a
Maks. fejl:	-0,44 mbar a
Maks. relativ fejl i forhold til måleområdet:	0,13 %

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Fejl = aflæsning middel - referenceværdi.
Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysterese fra det kalibrerede emne.
Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k=2, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Luft
Rumtemperatur:	20,8 °C ± 0,3 °C
Relativ fugtighed:	44,5 %rh ± 4,2 %rh
Barometerstand:	1029,3 mbar ± 2,0 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

DANAK
CAL Reg. nr. 9

Kalibreringscertifikat

Task nr.: 120-31006
Certifikat nr.: 9.8-22637
Side: 1 af 3

OBJEKT:
Prøveemne: Masseflowmåler
Fabrikat: Vögtlin
Id nr. Hel
Serie nr.: 198703 144236 Hel
Størrelse: 10 nl/min N2

REKVIRENT: Teknologisk Institut
Kongsvang Allé 29
8000 Århus C
Att.: Torben Nørgaard Jensen

SKALA//SKALAINDDELING: 0 - 10 nl/min // 0,1 nl/min

PRØVNINGSBETINGELSER:
Prøvningsmetode/medie: Gennemstrømning med nitrogen.
Middelbarometerstand: 1010 mbar
Omgivelsestemperatur: 20 ± 1 °C

PRØVNINGSOMFANG: Kalibrering ved : 2,5; 5,0; 7,5 og 10 nl/min
Resultater opgives i nl/min
(1 nl/min = 1 l/min ved 0 °C, og 1013,25 mbar.)

KALIBRERING iht.: FORCE instruktion nr. 60.2.02.
KALIBRERINGSDATO: 2020-09-08
KALIBRERINGSRESULTAT: Resultater, se side 2.

SPORBARHED: Prøveanlæg: FORCE nr.: C02-006 Se side 3.

BEMÆRKNINGER: Teknisk vurdering: Ingen bemærkninger.

UDSTEDELSESDATO: 2020-09-08

Preben Bendt Toftdahl Jensen
Opgaveansvarlig

Flemming Grud Madsen
Underskriftsberettiget

OBJEKT:

Prøveemne:	Masseflowmåler	Qmax:	10 nl/min
Fabrikat:	Vögtlin	Qmin:	0 nl/min
Id nr.	Hel	Scale division:	0,1 nl/min
Serie nr.:	198703		
Størrelse:	10 nl/min N2		

Referenceværdier		Udstyr under kalibrering						
Sandt flow	**Ucmc**	**Vist flow**	**Standard-usikkerhed**	**Fejl Relativ**	**Ekspanderet usikkerhed**	**Dæknings-faktor (k)**	**Tryk**	**Tempera-tur**
nl/min	±nl/min	nl/min	nl/min	%	±%		mbara	°C
9,991	0,017	10,00	0,03	0,09	0,50	1,65	1014,1	20,0
7,465	0,013	7,50	0,03	0,47	0,65	1,65	1013,9	20,0
4,9362	0,0084	5,00	0,03	1,29	0,98	1,65	1013,8	20,0
2,4818	0,0042	2,50	0,03	0,73	1,92	1,65	1013,7	20,0

"Ucmc" er 0,17% af "Sandt flow".

"Vist flow" er middelværdi af visninger aflæst i målerens display. Antallet af aflæsninger var 10-14.

I "Standardusikkerhed" er et bidrag fra standardafvigelsen knyttet til "Vist flow" samt et bidrag fra aflæsningernes afrundingsfejl. Standardafvigelsen var nul i alle flowpunkter.

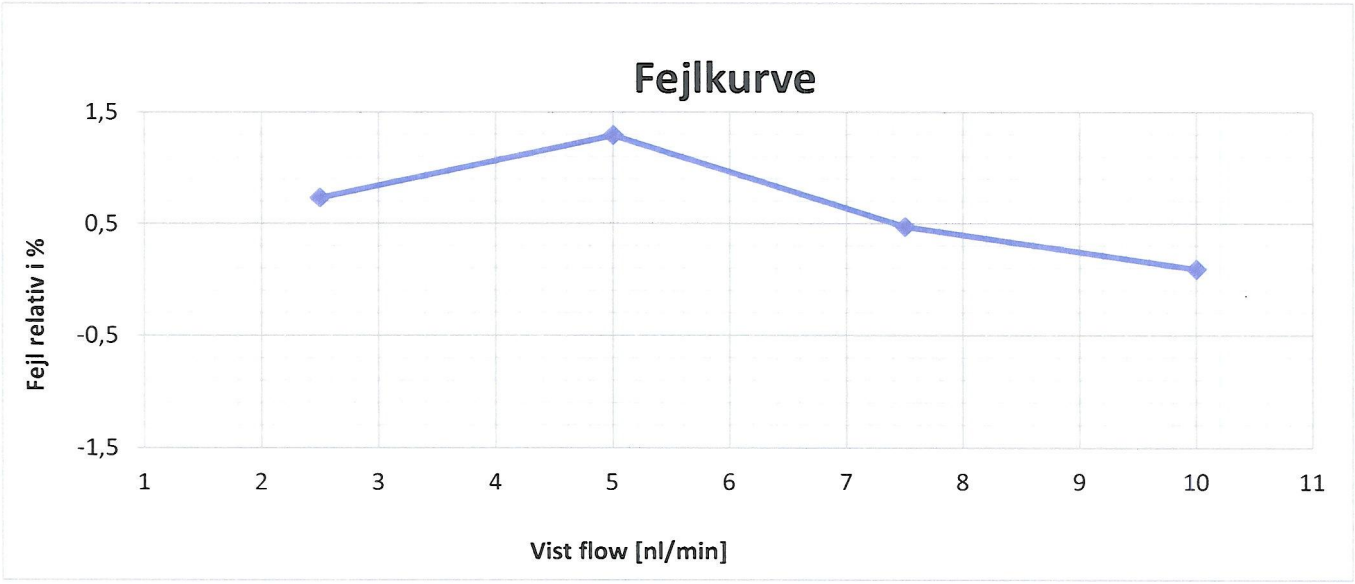
"Fejl relativ" blev beregnet med formlen: ("Vist flow" - "Sandt flow")/"Sandt flow"x100.

Summen af bidrag i måleusikkerhed fra måleevnen "Ucmc" og fra standardafvigelsen knyttet til "Vist flow" divideret med bidraget fra afrundingsfejlen i aflæsningerne er 0,3 eller mindre. Det viser at "Fejl Relativ" er omtrent firkantfordelt. Dækningsfaktoren er derfor 1,65.

"Ekspanderet usikkerhed" blev beregnet med formlen:

$$\frac{k}{"Sandt\ flow"} \times \sqrt{\left(\frac{"Ucmc"}{2}\right)^2 + "Standardusikkerhed"^2} \times 100$$

"Temperatur" og "Tryk" blev målt efter måler.



Målepunkter er forbundet med rette linier

LABORATORIETS KONTROLUDSTYR

De med x mærkede arbejdsnormaler er anvendt til kalibreringen.

	Arbejdsnormaler:	FORCE nr:	Sporbarhed:
	Anlæg: FORCE nr. C02-006.		
	Small tube 1-750 ml/min	A00-070	Trescal
	Medium tube 1-10000 ml/min	A00-069	Trescal
x	Big tube 1-50000 ml/min	A00-068	Trescal
	Øvrigt udstyr:		
x	Temperaturmålere	A70xxx	kalibreres i.h.t. instruktioner
x	Trykmålere	A80xxx	kalibreres i.h.t. instruktioner

Laboratoriets måleevne:

I beregningen af måleevnen Ucmc er medtaget alle betydende bidrag bortset fra målerens standardafvigelse og afrundingsfejl, som medtages i beregningen af den rapporterede ekspanderede usikkerhed.

Måleevnen Ucmc er: ±0,17% relativ.

Ekspanderet usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k, således at dækningssandsynlighed svarer til ca. 95 %.

* VSL, Holland via FORCE Technology´s nationale referencelaboratorium i Vejen.

End of certificate.

ilac-MRA DANAK CAL Reg. nr. 9 CIPM MRA FORCE TECHNOLOGY

Kalibreringscertifikat

Task nr.: 120-31006
Certifikat nr.: 9.8-22638
Side: 1 af 3

OBJEKT:
Prøveemne: Masseflowmåler
Fabrikat: Vögtlin
Id nr. 144239 / Delt 144239 Delt
Serie nr.: 198691
Størrelse: 10 nl/min N2

REKVIRENT: Teknologisk Institut
Kongsvang Allé 29
8000 Århus C
Att.: Torben Nørgaard Jensen

SKALA//SKALAINDDELING: 0 - 10 nl/min // 0,1 nl/min

PRØVNINGSBETINGELSER:
Prøvningsmetode/medie: Gennemstrømning med nitrogen.
Middelbarometerstand: 1010 mbar
Omgivelsestemperatur: 20 ± 1 °C

PRØVNINGSOMFANG: Kalibrering ved : 2,5; 5,0; 7,5 og 10 nl/min
Resultater opgives i nl/min
(1 nl/min = 1 l/min ved 0 °C, og 1013,25 mbar.)

KALIBRERING iht.: FORCE instruktion nr. 60.2.02.
KALIBRERINGSDATO: 2020-09-08
KALIBRERINGSRESULTAT: Resultater, se side 2.

SPORBARHED: Prøveanlæg: FORCE nr.: C02-006 Se side 3.

BEMÆRKNINGER: Teknisk vurdering: Ingen bemærkninger.

UDSTEDELSESDATO: 2020-09-08

Preben Bendt Toftdahl Jensen
Opgaveansvarlig

Flemming Grud Madsen
Underskriftsberettiget

OBJEKT:

Prøveemne:	Masseflowmåler	Qmax:	10 nl/min
Fabrikat:	Vögtlin	Qmin:	0 nl/min
Id nr.	144239 / Delt	Scale division:	0,1 nl/min
Serie nr.:	198691		
Størrelse:	10 nl/min N2		

Referenceværdier		Udstyr under kalibrering						
Sandt flow	**Ucmc**	**Vist flow**	**Standard-usikkerhed**	**Fejl Relativ**	**Ekspanderet usikkerhed**	**Dæknings-faktor (k)**	**Tryk**	**Tempera-tur**
nl/min	±nl/min	nl/min	nl/min	%	±%		mbara	°C
10,023	0,017	10,00	0,03	-0,23	0,50	1,65	1014,1	20,1
7,438	0,013	7,50	0,03	0,83	0,66	1,65	1013,9	20,1
4,9737	0,0085	5,00	0,03	0,53	0,97	1,65	1013,8	20,1
2,5057	0,0043	2,50	0,03	-0,23	1,91	1,65	1013,8	20,1

"Ucmc" er 0,17% af "Sandt flow".

"Vist flow" er middelværdi af visninger aflæst i målerens display. Antallet af aflæsninger var 11-14.

I "Standardusikkerhed" er et bidrag fra standardafvigelsen knyttet til "Vist flow" samt et bidrag fra aflæsningernes afrundingsfejl. Standardafvigelsen var nul i alle flowpunkter.

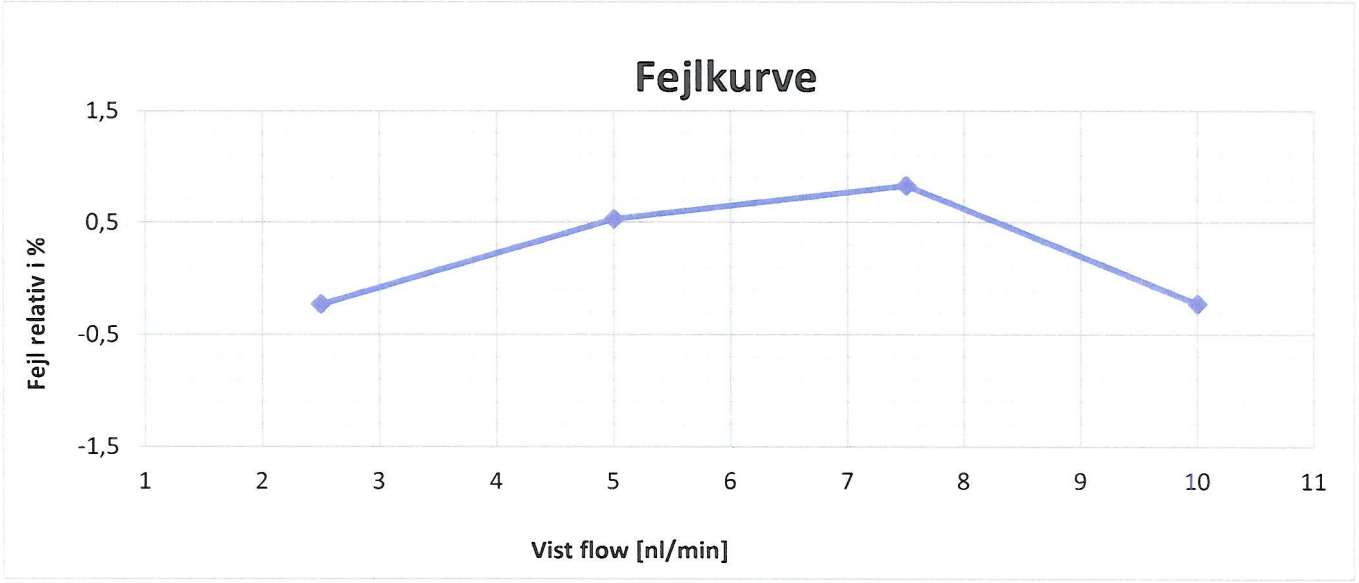
"Fejl relativ" blev beregnet med formlen: ("Vist flow" - "Sandt flow")/"Sandt flow"x100.

Summen af bidrag i måleusikkerhed fra måleevnen "Ucmc" og fra standardafvigelsen knyttet til "Vist flow" divideret med bidraget fra afrundingsfejlen i aflæsningerne er 0,3 eller mindre. Det viser at "Fejl Relativ" er omtrent firkantfordelt. Dækningsfaktoren er derfor 1,65.

"Ekspanderet usikkerhed" blev beregnet med formlen:

$$\frac{k}{"Sandt\ flow"} \times \sqrt{\left(\frac{"Ucmc"}{2}\right)^2 + "Standardusikkerhed"^2} \times 100$$

"Temperatur" og "Tryk" blev målt efter måler.



Målepunkter er forbundet med rette linier

LABORATORIETS KONTROLUDSTYR

De med x mærkede arbejdsnormaler er anvendt til kalibreringen.

	Arbejdsnormaler:	FORCE nr:	Sporbarhed:
	Anlæg: FORCE nr. C02-006.		
	Small tube 1-750 ml/min	A00-070	Trescal
	Medium tube 1-10000 ml/min	A00-069	Trescal
x	Big tube 1-50000 ml/min	A00-068	Trescal
	Øvrigt udstyr:		
x	Temperaturmålere	A70xxx	kalibreres i.h.t. instruktioner
x	Trykmålere	A80xxx	kalibreres i.h.t. instruktioner

Laboratoriets måleevne:

I beregningen af måleevnen Ucmc er medtaget alle betydende bidrag bortset fra målerens standardafvigelse og afrundingsfejl, som medtages i beregningen af den rapporterede ekspanderede usikkerhed.

Måleevnen Ucmc er: ±0,17% relativ.

Ekspanderet usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k, således at dækningssandsynlighed svarer til ca. 95 %.

* VSL, Holland via FORCE Technology´s nationale referencelaboratorium i Vejen.

End of certificate.

Kontrol af flowmåler for Rumblank.

Dato:	17-09-2020	Int.:	MXB	Ref.: Id nr. 144239 (Delt)	
Id nr.:	144257	Cert nr.:	ELAB-38-2020	T_rum:	**24**

Flowmeter Rumblank l/m	Ref. Delt. nl/m		Ref. d.d. **24** °C l/m	
		Faktor	1,0879	Korrektion
6	5,8		6,3	0,3
7	6,8		7,4	0,4
8	7,9		8,6	0,6

Korrigeres efter certifikat.

TEKNOLOGISK
INSTITUT

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www.teknologisk.dk

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-T-23163

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Termometer, Modstandstermometer**

Fabrikat:	Kamstrup A/S	Model:	81 41221101002100085
Serienr.:	-	Kundemærke:	**270-A-1629 BUND KANAL**
Område:	0 - 100 °C	Type:	Pt-100 med FlexTop transmitter
Udgangssignal:	4 - 20 mA	Diameter:	8 mm.

Rekvisitionsnr.: MXB

Periode: Modtaget: 04-09-2020 Kalibreret: **14-09-2020**

Procedure: D1-2.2

Bemærkninger: Kalibreret i området 20 - 95°C. Aflæsningen er foretaget på DMM, Teknologisk Institut id. 270-A-1438. Kalibreringen er foretaget i væskebade ved sammenligning med referenceføler. Føleren er neddyppet til og med forskruningens gevindstykke.

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Bjørn Kjærsgaard Nielsen, 72203534, bjni@teknologisk.dk

Godkendt og digitalt signeret 23-09-2020 af: Søren Andersen

Søren Lindholt Andersen
Konsulent, Ph.d.

ilac-MRA DANAK
CAL Reg.nr. 200

TEMPERATURLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Føler mærket: 270-A-1629 BUND KANAL

4 - 20 mA ~ 0 - 100 °C

Reference-værdi °C	Reference-værdi mA	Aflæsning mA	Fejl mA	Usikkerhed mA	Note
20,0008	7,2001	7,2201	0,0200	0,0059	
45,0011	11,2002	11,2440	0,0438	0,0059	
65,0044	14,4007	14,4393	0,0386	0,0058	
95,0002	19,2000	19,2186	0,0185	0,0059	

Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

TEMPERATURLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Føler mærket: 270-A-1629 BUND KANAL

4 - 20 mA ~ 0 - 100 °C

Reference-værdi °C	Aflæsning mA	Beregnet °C	Fejl °C	Usikkerhed °C	Note
20,001	7,220	20,126	0,125	0,037	
45,001	11,244	45,275	0,274	0,037	
65,004	14,439	65,245	0,241	0,036	
95,000	19,219	95,116	0,116	0,037	

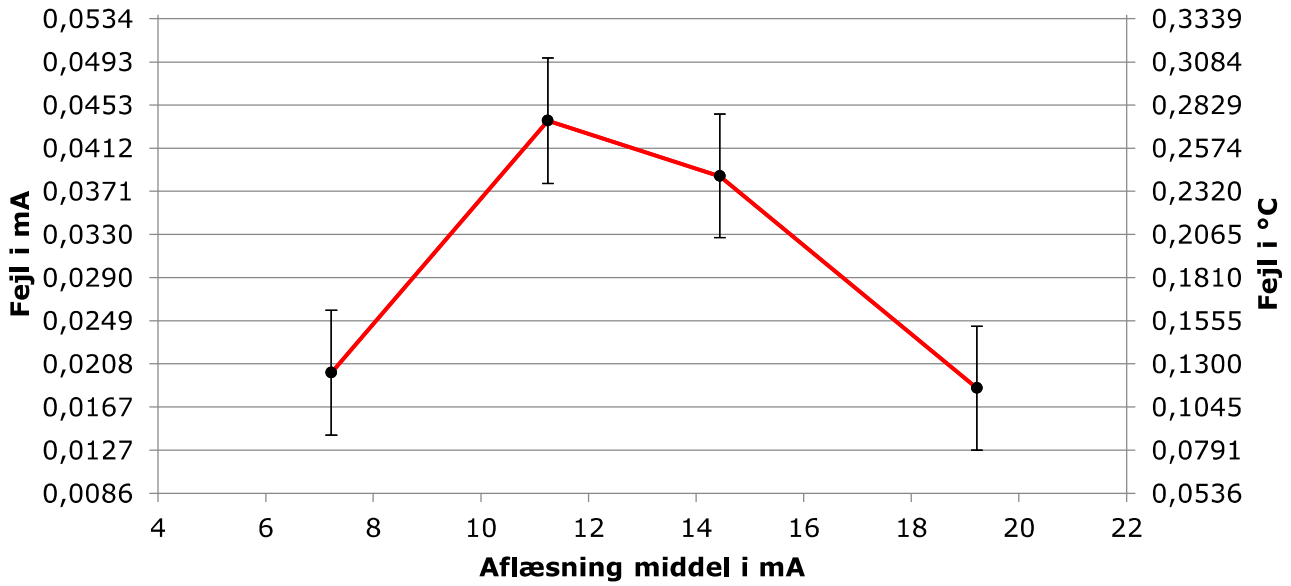
Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Beregnet - referenceværdi.

TEMPERATURLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Fejlkurve

Føler mærket: 270-A-1629 BUND KANAL



Kun de markerede punkter er målt.

Bemærkninger:
Aflæsning er middelværdien af flere aflæsninger på det kalibrerede måleinstrument.
Fejl = Aflæsning - referenceværdi.

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren $k = 2$, således at dækningssandsynligheden svarer til ca. 95 %.
Alle temperaturer er i henhold til ITS90

Kalibreringsforhold:

Rumtemperatur:	22, °C ± 1,1 °C
Relativ fugtighed:	51,5 %rh ± 11,6 %rh
Barometerstand:	1017,2 mbar ± 7,7 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

TEKNOLOGISK
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8000 Aarhus C
Tlf. +45 72 20 20 00
info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-L-21246

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Flowmåler, Brændeovns lækagetester**

Fabrikat:	Brooks	Serienr.:	**P20438; 0112030/489315001; B2110016701**
Kundemærke:	**Id nr. 83013**	Område:	0 - 21 m3/h
Udgangssignal:	Skala		

Rekvisitionsnr.: MXB

Periode: Modtaget: 23-09-2019 Kalibreret: **23-09-2019**

Procedure: D2-1

Bemærkninger: Rør nr. 1: 0,09 - 0,9 m³/h
Referenceflow er omregnet til normalbetingelserne: 20°C og 1013,25 mBar
Måleren er aflæst midt på kugle.

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Søren Haack, 72 20 23 38, sorh@teknologisk.dk

Godkendt og digitalt signeret 24-09-2019 af:

Søren Haack
Konsulent

ilac-MRA DANAK
CAL Reg.nr. 200

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

LUFTFLOWMÅLER

Måleområde: 0,09 - 0,9 m³/h

Luft temperatur °C	Kalibrering Tryk mBar abs.	Reference flow m^3/h	Reference flow m^3n/h	Emnets visning m^3n/h	Fejl m^3n/h	Usikkerhed m^3n/h
22,62	1603,90	0,07	0,11	0,12	0,01	0,01
22,62	1584,70	0,15	0,24	0,24	0,00	0,01
22,62	1567,60	0,25	0,38	0,38	-0,00	0,01
22,62	1548,90	0,40	0,60	0,58	-0,02	0,02
22,62	1523,70	0,53	0,79	0,76	-0,03	0,02
22,62	1509,60	0,64	0,94	0,90	-0,04	0,02
22,62	1511,90	0,64	0,94	0,90	-0,04	0,02
22,62	1528,30	0,53	0,79	0,76	-0,03	0,02
22,62	1547,30	0,39	0,59	0,58	-0,01	0,02
22,62	1570,50	0,25	0,38	0,38	-0,00	0,01
22,62	1586,70	0,15	0,24	0,24	0,00	0,01
22,62	1605,90	0,07	0,11	0,12	0,01	0,01

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

LABORATORIEBETINGELSER OG SPORBARHED

Laboratoriebetingelser:

Rumtemperatur (°C) :	22,6 ± 0,6
Relativ luftfugtighed (%) :	52 ± 10
Barometerstand (mbar) :	1015,3 ± 1

Referencer:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering
og EA's og ILAC's multilaterale aftaler for kalibrering,
hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Usikkerhed:

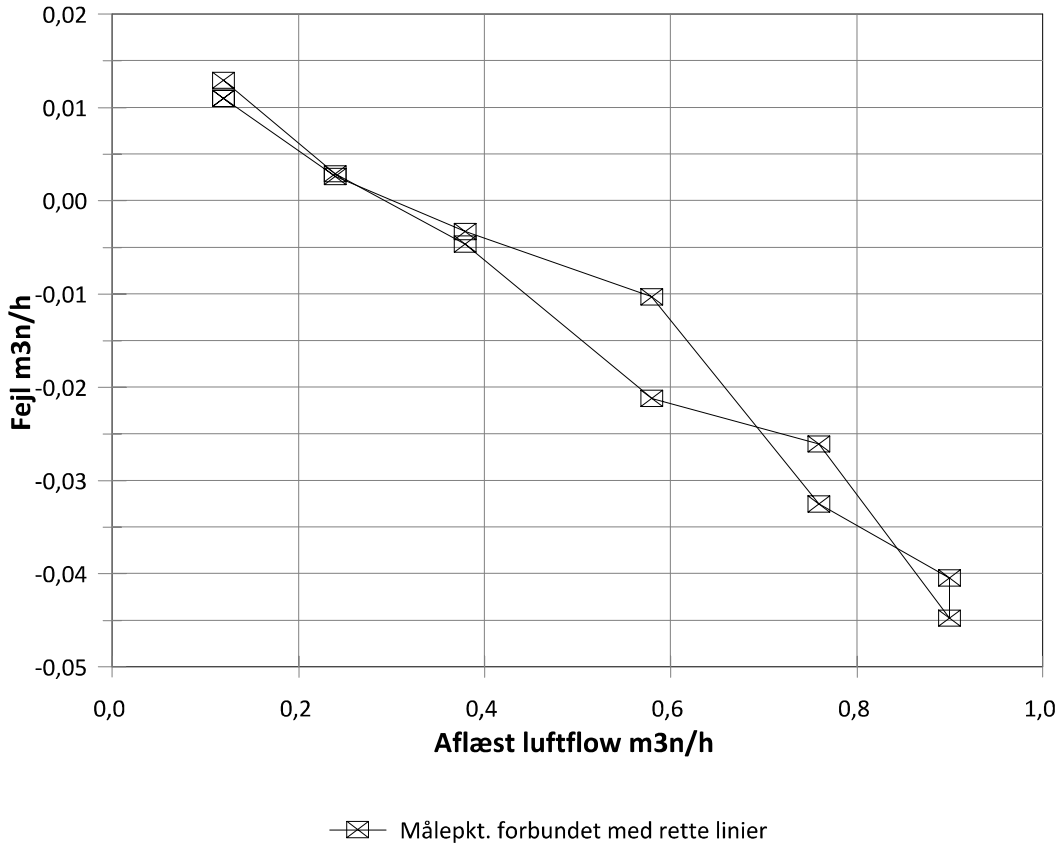
Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren k = 2, som for en normalfordeling svarer til en dækningssandsynlighed på ca. 95%. Standardusikkerheden er fastlagt i overensstemmelse med EA-4/02.

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

FEJLKURVE



Sand Luftflow = Aflæst - Fejl (med fortegn)

Usikkerhed:

0,01 m^3n/h til 0,02 m^3n/h

TEKNOLOGISK
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Teknologiparken
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8000 Aarhus C
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info@teknologisk.dk
www.teknologisk.dk

KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-L-21247

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Flowmåler, Brændeovns lækagetester**

Fabrikat:	Brooks	Serienr.:	**P20438; 0112030/489315001; B2110016701**
Kundemærke:	**Id nr. 83013**	Område:	0 - 21 m3/h
Udgangssignal:	Skala		

Rekvisitionsnr.: MXB

Periode: Modtaget: 23-09-2019 Kalibreret: **23-09-2019**

Procedure: D2-1

Bemærkninger: Rør nr. 2: 0,5 - 5 m³/h
Referenceflow er omregnet til normalbetingelserne: 20°C og 1013,25 mBar

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Søren Haack, 72 20 23 38, sorh@teknologisk.dk

Godkendt og digitalt signeret 24-09-2019 af:

Søren Haack
Konsulent

ilac-MRA DANAK
CAL Reg.nr. 200

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

LUFTFLOWMÅLER

Måleområde: 0,5 - 5 m3/h

Luft temperatur °C	Kalibrering Tryk mBar abs.	Reference flow m^3/h	Reference flow m^3n/h	Emnets visning m^3n/h	Fejl m^3n/h	Usikkerhed m^3n/h
22,42	1560,80	0,63	0,97	0,80	-0,17	0,09
22,42	1547,60	0,71	1,08	1,00	-0,08	0,09
26,06	1502,90	1,09	1,58	1,50	-0,08	0,09
22,62	1851,20	1,37	2,48	2,50	0,02	0,08
22,62	1785,50	2,05	3,59	3,50	-0,09	0,09
22,62	1728,20	2,64	4,46	4,25	-0,21	0,11
22,62	1678,40	3,17	5,21	5,00	-0,21	0,12
22,62	1678,40	3,16	5,19	5,00	-0,19	0,12
22,62	1704,50	2,68	4,46	4,25	-0,21	0,11
22,62	1808,30	2,00	3,54	3,50	-0,04	0,09
22,62	1878,80	1,36	2,49	2,50	0,01	0,08
22,42	1504,00	1,08	1,59	1,50	-0,09	0,09
22,42	1551,50	0,71	1,07	1,00	-0,07	0,09
22,42	1561,40	0,61	0,94	0,80	-0,14	0,09

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

LABORATORIEBETINGELSER OG SPORBARHED

Laboratoriebetingelser:

Rumtemperatur (°C) :	22,5 ± 0,6
Relativ luftfugtighed (%) :	51 ± 10
Barometerstand (mbar) :	1015,5 ± 1

Referencer:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering
og EA's og ILAC's multilaterale aftaler for kalibrering,
hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren k = 2, som for en normalfordeling svarer til en dækningssandsynlighed på ca. 95%. Standardusikkerheden er fastlagt i overensstemmelse med EA-4/02.

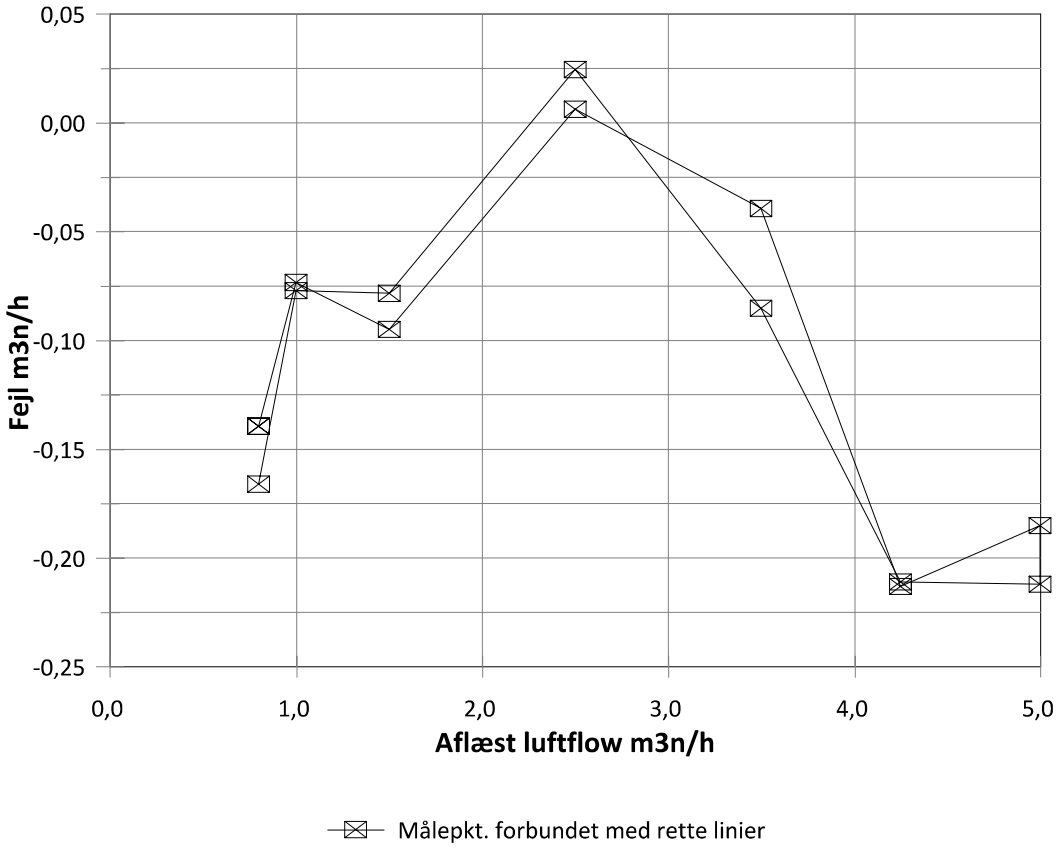
LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato: 2019.09.23 Cert. nr.: 200-L-21247

KALIBRERINGSCERTIFIKAT

FEJLKURVE



Sand Luftflow = Aflæst - Fejl (med fortegn)

Usikkerhed:

0,08 m^3n/h til 0,12 m^3n/h

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KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-L-21244

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Flowmåler, Brændeovns lækagetester**

Fabrikat:	Brooks	Serienr.:	**P20438; 0112030/489315001; B2110016701**
Kundemærke:	**Id nr. 83013**	Område:	0 - 21 m3/h
Udgangssignal:	Skala		

Rekvisitionsnr.: MXB

Periode: Modtaget: 10-09-2019 Kalibreret: **23-09-2019**

Procedure: D2-1

Bemærkninger: Rør nr. 3: 2,7 - 21 m³/h Referenceflow er omregnet til normalbetingelserne: 20°C og 1013,25 mBar

Vilkår: Kalibreringen er udført akkrediteret i henhold til gældende vilkår fastlagt af DANAK, jf. www.danak.dk, og i henhold til Teknologisk Instituts almindelige vilkår, som er gældende på tidspunktet for aftaleindgåelsen. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis laboratoriet skriftligt har godkendt uddraget.

Kalibreret af: Søren Haack, 72 20 23 38, sorh@teknologisk.dk

Godkendt og digitalt signeret 24-09-2019 af:

Søren Haack
Konsulent

ilac-MRA DANAK
CAL Reg.nr. 200

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

LUFTFLOWMÅLER

Måleområde: 2,7 - 21 m3/h

Luft temperatur °C	Kalibrering Tryk mBar abs.	Reference flow m^3/h	Reference flow m^3n/h	Emnets visning m^3n/h	Fejl m^3n/h	Usikkerhed m^3n/h
22,32	3772,52	0,77	2,83	3,50	0,67	0,04
22,32	3574,82	1,94	6,80	7,00	0,20	0,07
22,32	3362,12	3,46	11,38	11,00	-0,38	0,11
22,32	3121,02	4,89	14,93	14,50	-0,43	0,15
22,32	2857,32	6,62	18,53	17,50	-1,03	0,20
22,32	2860,22	6,57	18,39	17,50	-0,89	0,20
22,32	3143,62	5,05	15,55	14,50	-1,05	0,16
22,32	3390,22	3,42	11,36	11,00	-0,36	0,11
22,32	3607,22	1,89	6,66	7,00	0,34	0,07
22,32	3799,62	0,74	2,74	3,50	0,76	0,04

LUFTLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

LABORATORIEBETINGELSER OG SPORBARHED

Laboratoriebetingelser:

Rumtemperatur (°C) :	22,3 ± 0,6
Relativ luftfugtighed (%) :	51 ± 10
Barometerstand (mbar) :	1015,6 ± 1

Referencer:

Dette kalibreringscertifikat er omfattet af DANAK akkreditering
og EA's og ILAC's multilaterale aftaler for kalibrering,
hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Usikkerhed:

Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden multipliceret med dækningsfaktoren k = 2, som for en normalfordeling svarer til en dækningssandsynlighed på ca. 95%. Standardusikkerheden er fastlagt i overensstemmelse med EA-4/02.

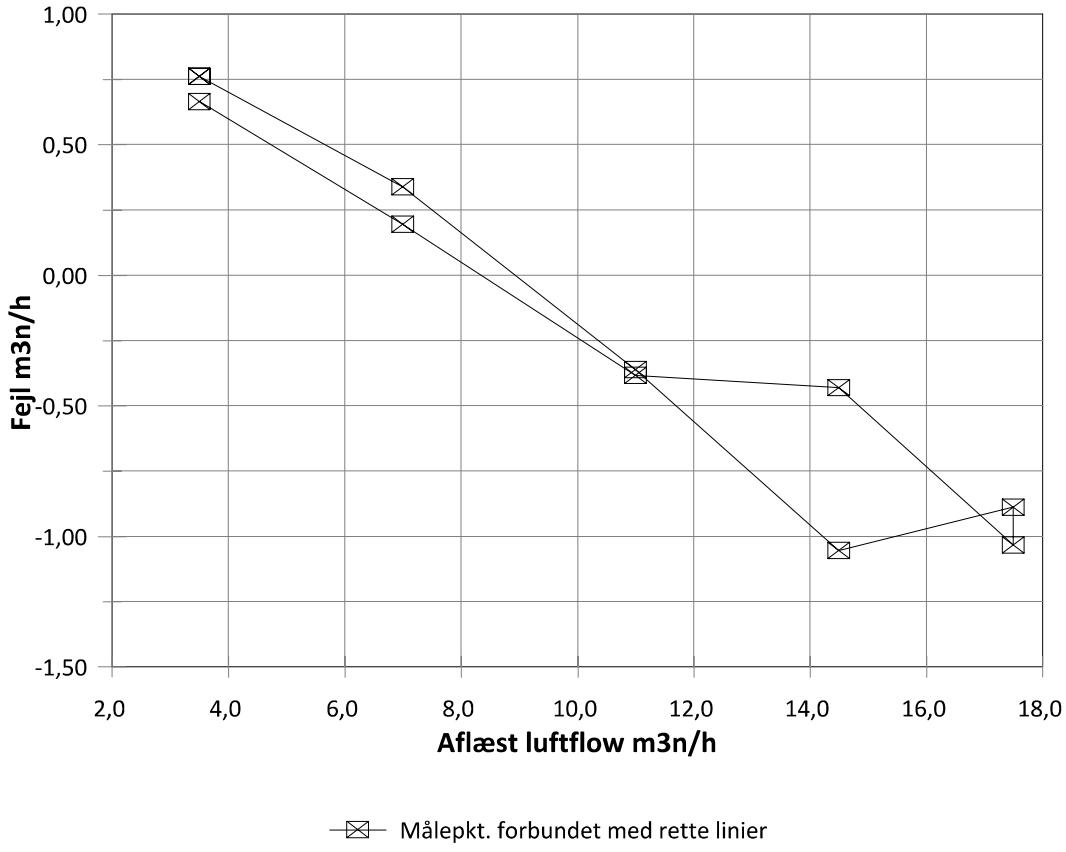
LUFTLABORATORIET

TEKNOLOGISK INSTITUT

Dato: 2019.09.23 Cert. nr.: 200-L-21244

KALIBRERINGSCERTIFIKAT

FEJLKURVE



Sand Luftflow = Aflæst - Fejl (med fortegn)

Usikkerhed:

0,04 m^3n/h til 0,20 m^3n/h

Kalibrering Humimeter, Fugtmåler

Måleskema til kontrol af Fugtmåler(EPA)

Dato:	01-09-2020	Udført af:	MXB
		Emne Id nr.:	145070
Certifikat nr.:	ELAB-36-2020		
Kalibrator ref.:	148135 (test block)		

Fremgangsmetode: Fugtmåler kontrolleres op imod test block fra samme producent. Er visningen indenfor range er grundkalibrering OK.
https://www.youtube.com/watch?v=wmGqFWhd_Yk

1- Sørg for der ikke er fugt på nålene.

2- Tænd og aflæs rumtemperatur: 24,1 (range 20-26°C)

3- Find "Test Block"

4- Test side 1 "22,0" ved at sætte de to flanger fra "test block'en" på de to møtrikker nålene er monteret med

5- Noter hvad apparatet måler: 22,3% (range 21,5-22,5%)

6- Test side 2 "41,0" ved at sætte de to flanger fra "test block'en" på de to møtrikker nålene er monteret med

7- Noter hvad apparatet måler: 41,3% (range 39,5-42,0%)

8- Er visningerne uden for det anbefalede range kan punkter sidst i denne video følges, alternativt sendes apparat til kalibrering.

9- Apparat bruges normalt kun som rettesnor for fugtniveau, ikke til endelig fugtangivelse. Til endeligt fugtangivelse benyttes ovn i mellemgang.

TEKNOLOGISK
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KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-P-25427

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Vacuummeter, EPA (-H)**

Fabrikat:	Wika	Serienr.:	**N/A**
Kundemærke:	**145074**	Område:	0 - -1 bar
Klasse:	1,6	Inddeling:	0,05 bar
Diameter:	60 mm		

Rekvisitionsnr.: MXB

Periode: Modtaget: 04-09-2020 Kalibreret: **09-09-2020**

Procedure: D1-2.1

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

Godkendt og digitalt signeret 11-09-2020 af:

Mette Pedersen
Kvalitets & måletekniker

ilac-MRA DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - -1 bar

Reference Ned 1 bar	Aflæsning bar	Reference Op 1 bar	Aflæsning bar
-0,0499	-0,05	-0,0499	-0,05
-0,1998	-0,20	-0,1998	-0,20
-0,3997	-0,40	-0,3997	-0,40
-0,5996	-0,61	-0,5996	-0,61
-0,7995	-0,80	-0,7995	-0,80
-0,9494	-0,95	-0,9494	-0,95

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Måleområde: 0 - -1 bar

Reference middelværdi bar	Aflæsning middelværdi bar	Opløsning bar	Hysterese bar	Fejl bar	Usikkerhed bar
-0,0499	-0,0500	0,01	0,0000	-0,0001	0,0058
-0,1998	-0,2000	0,01	0,0000	-0,0002	0,0058
-0,3997	-0,4000	0,01	0,0000	-0,0003	0,0058
-0,5996	-0,6100	0,01	0,0000	-0,0104	0,0058
-0,7995	-0,8000	0,01	0,0000	-0,0005	0,0058
-0,9494	-0,9500	0,01	0,0000	-0,0006	0,0058

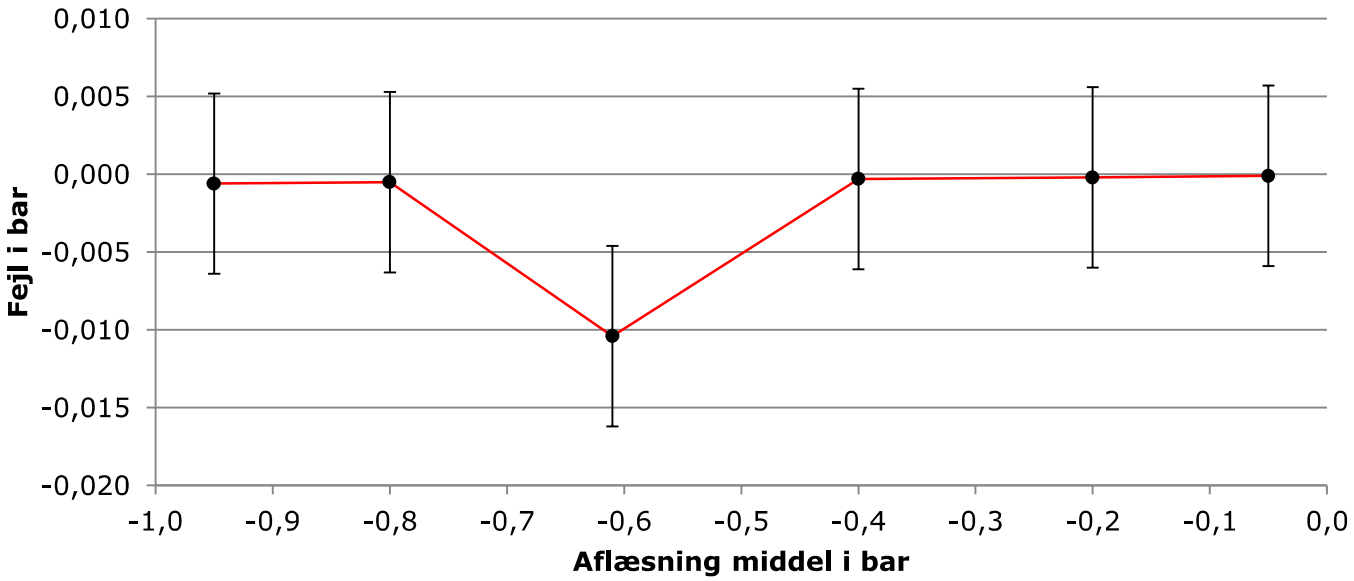
Maks. hysterese:	0,0000 bar
Maks. fejl:	-0,0104 bar
Maks. relativ fejl i forhold til måleområdet:	1,0 %

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Fejl = aflæsning middel - referenceværdi.
Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysterese fra det kalibrerede emne.
Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k=2, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Nitrogen
Rumtemperatur:	20,2 °C ± 0,3 °C
Relativ fugtighed:	64,2 %rh ± 4,2 %rh
Barometerstand:	1010 mbar ± 2,0 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

TEKNOLOGISK
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KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-P-25429

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Vacuummeter, EPA (-D)**

Fabrikat:	Wika	Serienr.:	**N/A**
Kundemærke:	**145076**	Område:	0 - -1 bar
Klasse:	1,6	Inddeling:	0,05 bar
Diameter:	60 mm		

Rekvisitionsnr.: MXB

Periode: Modtaget: 04-09-2020 Kalibreret: **09-09-2020**

Procedure: D1-2.1

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

Godkendt og digitalt signeret 11-09-2020 af:

Mette Pedersen
Kvalitets & måletekniker

ilac-MRA DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - -1 bar

Reference Ned 1 bar	Aflæsning bar	Reference Op 1 bar	Aflæsning bar
-0,0499	-0,04	-0,0499	-0,04
-0,1998	-0,19	-0,1998	-0,19
-0,3997	-0,39	-0,3997	-0,39
-0,5996	-0,60	-0,5996	-0,60
-0,7995	-0,80	-0,7995	-0,80
-0,9494	-0,95	-0,9494	-0,95

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Måleområde: 0 - -1 bar

Reference middelværdi bar	Aflæsning middelværdi bar	Opløsning bar	Hysterese bar	Fejl bar	Usikkerhed bar
-0,0499	-0,0400	0,01	0,0000	0,0099	0,0058
-0,1998	-0,1900	0,01	0,0000	0,0098	0,0058
-0,3997	-0,3900	0,01	0,0000	0,0097	0,0058
-0,5996	-0,6000	0,01	0,0000	-0,0004	0,0058
-0,7995	-0,8000	0,01	0,0000	-0,0005	0,0058
-0,9494	-0,9500	0,01	0,0000	-0,0006	0,0058

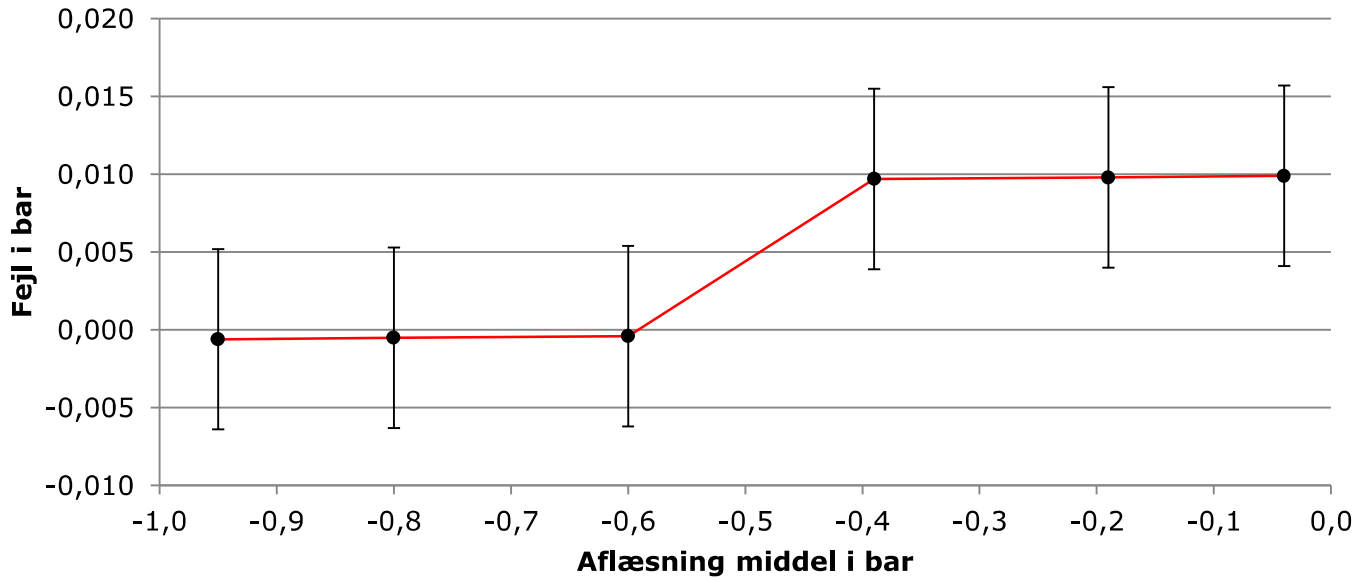
Maks. hysterese:	0,0000 bar
Maks. fejl:	0,0099 bar
Maks. relativ fejl i forhold til måleområdet:	0,99 %

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Fejl = aflæsning middel - referenceværdi.
Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysterese fra det kalibrerede emne.
Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k=2, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Nitrogen
Rumtemperatur:	20,2 °C ± 0,3 °C
Relativ fugtighed:	64,9 %rh ± 4,2 %rh
Barometerstand:	1009,8 mbar ± 2,0 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

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KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-P-25428

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Vacuummeter, EPA (-R)**

Fabrikat:	Wika	Serienr.:	**N/A**
Kundemærke:	**145077**	Område:	0 - -1 bar
Klasse:	1,6	Inddeling:	0,05 bar
Diameter:	60 mm		

Rekvisitionsnr.: MXB

Periode: Modtaget: 04-09-2020 Kalibreret: **09-09-2020**

Procedure: D1-2.1

Bemærkninger:

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

Godkendt og digitalt signeret 11-09-2020 af:

Mette Pedersen
Kvalitets & måletekniker

ilac-MRA DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - -1 bar

Reference Ned 1 bar	Aflæsning bar	Reference Op 1 bar	Aflæsning bar
-0,0499	-0,03	-0,0499	-0,03
-0,1998	-0,19	-0,1998	-0,19
-0,3997	-0,39	-0,3997	-0,39
-0,5996	-0,60	-0,5996	-0,60
-0,7995	-0,79	-0,7995	-0,79
-0,9494	-0,94	-0,9494	-0,94

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Måleområde: 0 - -1 bar

Reference middelværdi bar	Aflæsning middelværdi bar	Opløsning bar	Hysterese bar	Fejl bar	Usikkerhed bar
-0,0499	-0,0300	0,01	0,0000	0,0199	0,0058
-0,1998	-0,1900	0,01	0,0000	0,0098	0,0058
-0,3997	-0,3900	0,01	0,0000	0,0097	0,0058
-0,5996	-0,6000	0,01	0,0000	-0,0004	0,0058
-0,7995	-0,7900	0,01	0,0000	0,0095	0,0058
-0,9494	-0,9400	0,01	0,0000	0,0094	0,0058

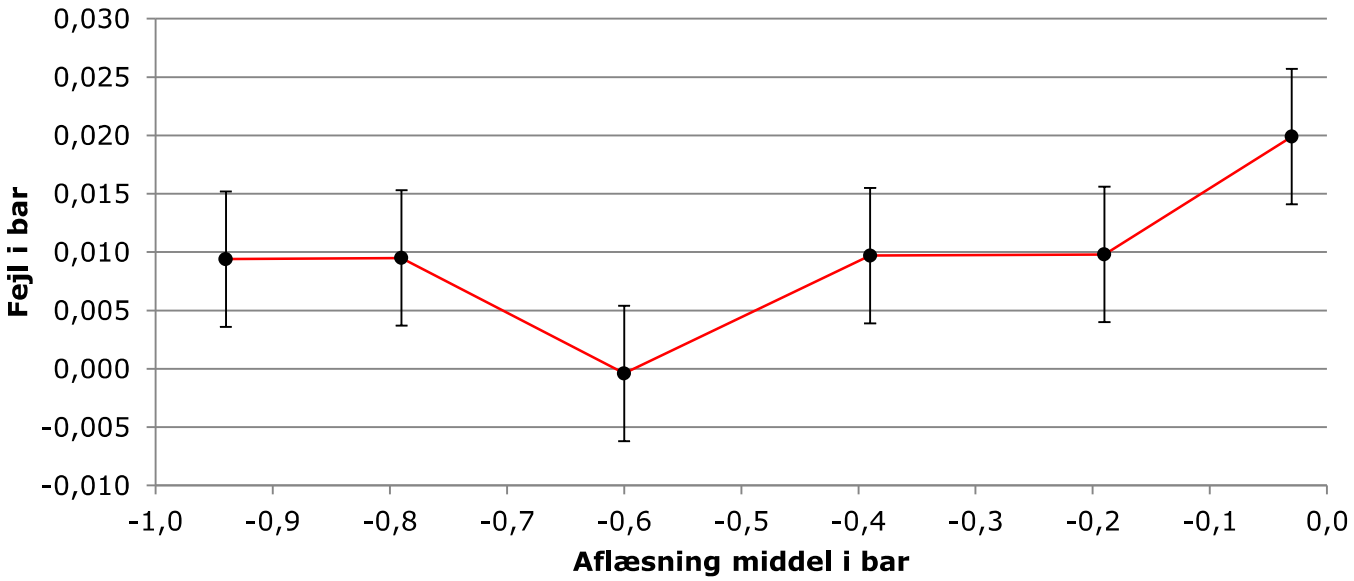
Maks. hysterese:	0,0000 bar
Maks. fejl:	0,0199 bar
Maks. relativ fejl i forhold til måleområdet:	2,0 %

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Fejl = aflæsning middel - referenceværdi.
Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysterese fra det kalibrerede emne.
Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k=2, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Nitrogen
Rumtemperatur:	20,2 °C ± 0,3 °C
Relativ fugtighed:	64,6 %rh ± 4,2 %rh
Barometerstand:	1009,8 mbar ± 2,0 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

TEKNOLOGISK
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KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-P-25430

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Manometer, EPA (-H)**

Fabrikat:	WIKA	Serienr.:	**N/A**
Kundemærke:	**145078**	Område:	0 - 10 mbar
Klasse:	1,6	Inddeling:	0,2 mbar
Diameter:	100 mm.		

Rekvisitionsnr.: MXB

Periode: Modtaget: 04-09-2020 Kalibreret: **10-09-2020**

Procedure: D1-2.1

Bemærkninger: Viser "hænger" og urværk kører ujævnt.

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

Godkendt og digitalt signeret 11-09-2020 af:

Mette Pedersen
Kvalitets & måletekniker

ilac-MRA DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - 10 mbar

Reference Op 1 mbar	Aflæsning mbar	Reference Ned 1 mbar	Aflæsning mbar
0,00	0,00	0,00	0,00
2,12	2,16	2,12	2,20
4,12	4,36	4,12	4,40
6,12	6,44	6,12	6,60
8,12	8,72	8,12	8,76
9,28	10,00	9,28	10,00

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Måleområde: 0 - 10 mbar

Reference middelværdi mbar	Aflæsning middelværdi mbar	Opløsning mbar	Hysterese mbar	Fejl mbar	Usikkerhed mbar
0,00	0,00	0,04	0,00	0,00	0,15
2,12	2,18	0,04	0,04	0,06	0,16
4,12	4,38	0,04	0,04	0,26	0,16
6,12	6,52	0,04	0,16	0,40	0,27
8,12	8,74	0,04	0,04	0,62	0,16
9,28	10,00	0,04	0,00	0,72	0,15

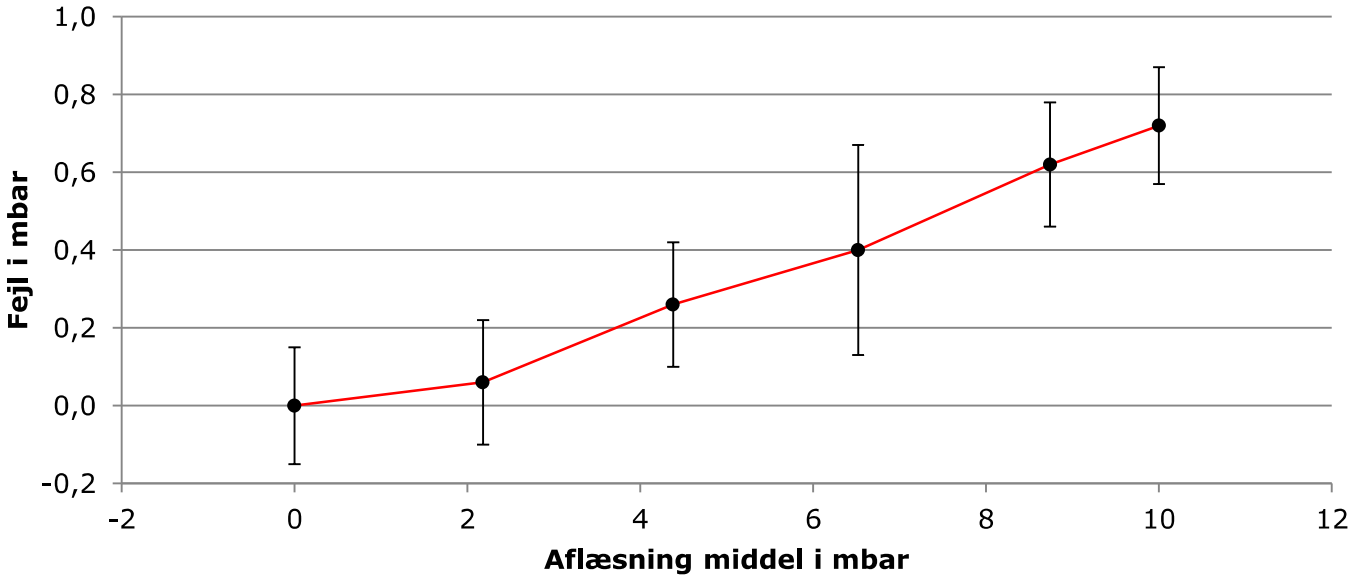
Maks. hysterese:	0,16 mbar
Maks. fejl:	0,72 mbar
Maks. relativ fejl i forhold til måleområdet:	7,2 %

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Fejl = aflæsning middel - referenceværdi.
Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysterese fra det kalibrerede emne.
Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k=2, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Nitrogen
Rumtemperatur:	20 °C ± 0,3 °C
Relativ fugtighed:	47,5 %rh ± 4,2 %rh
Barometerstand:	1017,6 mbar ± 2,0 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

TEKNOLOGISK
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KALIBRERINGSCERTIFIKAT

CERTIFIKATNR.:
200-P-25431

Rekvirent: Teknologisk Institut, Biomasse og bioraffinering
Kongsvang Allé 29
8000 Århus C

Emne: **Manometer, EPA (-D)**

Fabrikat:	WIKA	Serienr.:	**N/A**
Kundemærke:	**145079**	Område:	0 - 10 mbar
Klasse:	1,6	Inddeling:	0,2 mbar
Diameter:	100 mm.		

Rekvisitionsnr.: MXB

Periode: Modtaget: 04-09-2020 Kalibreret: **10-09-2020**

Procedure: D1-2.1

Bemærkninger: Viser "hænger" og urværk kører ujævnt.

Vilkår: Kalibreringen er udført akkrediteret i henhold til internationale krav (ISO/IEC 17025:2005) og i henhold til Teknologisk Instituts almindelige vilkår. Kalibreringsresultater gælder udelukkende for det kalibrerede emne. Kalibreringscertifikatet må kun gengives i uddrag, hvis Teknologisk Institut skriftligt har godkendt uddraget.

Kalibreret af: Kenn Øholm, 72 20 34 98, koh@teknologisk.dk

Godkendt og digitalt signeret 11-09-2020 af:

Mette Pedersen
Kvalitets & måletekniker

ilac-MRA DANAK
CAL Reg.nr. 200

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Målinger

Måleområde: 0 - 10 mbar

Reference	Aflæsning	Reference	Aflæsning
Op 1		Ned 1	
mbar	mbar	mbar	mbar
0,00	0,00	0,00	0,00
2,12	2,12	2,12	2,16
4,12	4,20	4,12	4,32
6,12	6,32	6,12	6,44
8,12	8,44	8,12	8,48
9,56	10,00	9,56	10,00

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT
Resultater

Måleområde: 0 - 10 mbar

Reference middelværdi mbar	Aflæsning middelværdi mbar	Opløsning mbar	Hysterese mbar	Fejl mbar	Usikkerhed mbar
0,00	0,00	0,04	0,00	0,00	0,15
2,12	2,14	0,04	0,04	0,02	0,16
4,12	4,26	0,04	0,12	0,14	0,23
6,12	6,38	0,04	0,12	0,26	0,23
8,12	8,46	0,04	0,04	0,34	0,16
9,56	10,00	0,04	0,00	0,44	0,15

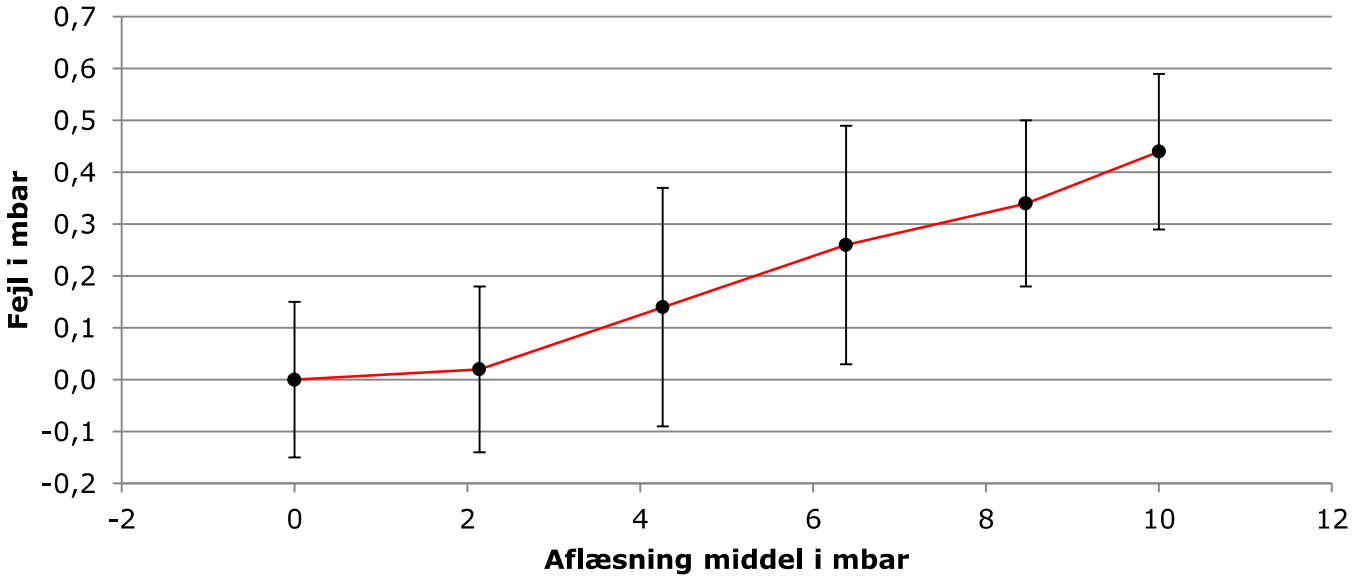
Maks. hysterese:	0,12 mbar
Maks. fejl:	0,44 mbar
Maks. relativ fejl i forhold til måleområdet:	4,4 %

TRYKLABORATORIET

TEKNOLOGISK INSTITUT

KALIBRERINGSCERTIFIKAT

Fejlkurve



Kun de markerede punkter er målt.

Bemærkninger:
Fejl = aflæsning middel - referenceværdi.
Den beregnede standardusikkerhed inkluderer relevante korttidsbidrag samt den halve hysterese fra det kalibrerede emne.
Den rapporterede ekspanderede usikkerhed er angivet som standardusikkerheden af målingen multipliceret med dækningsfaktoren k=2, således at dækningssandsynligheden svarer til ca. 95 %.

Kalibreringsforhold:

Prøvemedium:	Nitrogen
Rumtemperatur:	20 °C ± 0,3 °C
Relativ fugtighed:	47,5 %rh ± 4,2 %rh
Barometerstand:	1017,6 mbar ± 2,0 mbar

Sporbarhed:
Dette kalibreringscertifikat er omfattet af DANAK akkreditering og EA's og ILAC's multilaterale aftaler for kalibrering, hvilket sikrer, at målingerne er sporbare til SI enhedssystemet.

Kalibrering af løse termofølere i EPA stand E

Måleskema til kontrol af temofølere i stand E (EPA)

Dato:	15-09-2020	Udført af:	MXB	
Brændeovnsprøvestand:	A+B+C+D+E	Emne Id nr.:	177617	Skiftet instrument
Certifikat nr.:	ELAB-38-2020			
Kalibrator ref.:	270-A-1625 (Jofra)			

Display	Sand temp.	Vist temp.	Fejl	Krav
Temp. Brænderum	29,39	29,5	0,11	2,2

17.09.2020
Y:\Labspace\LAB2C_Labspace\Kalibrering Arbejdskopi\2020\EPA certifikater 3-kv-2020\29-Id-169522-ELAB-38-2020-Lækage.docx
MXB

Kontrol af lækage efter pumper i forbindelse med EPA målinger på stand E.

Dato: 17.09.2020 Int.: MXB Ref.: 270-A-2406 (TSI)

Id nr.: 169522 Cert nr.: ELAB-38-2020

Kontrol af lækage efter pumpen på "Hel" serie

Startværdi: **1760** Pa

Slutværdi efter 1 minut: **1560** Pa

Kontrol af lækage efter pumpen på "Delt" serien

Startværdi: **1740** Pa

Slutværdi efter 1 minut: **1640** Pa

Kontrol af lækage efter pumpen på "Rum" serien

Startværdi: **1800** Pa

Slutværdi efter 1 minut: **1780** Pa

(Krav er startværdi < 1800Pa og slutværdi >1300Pa ved 1 minuts måletid)

Luk de 2 drøvleventiler helt, og påfør tryk med håndpumpe på udgang af kugleflowmeteret (Øverst).

Annex 16

Title: HF1 ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E2780 and E2515

EN-NS-EPA-Ber 3-61 01-09-2020 MXB

Manufacturer:	Morsø Jernstøberi AS
Type:	2 B Classic 2020
ELAB no.:	2526
Order number:	#N/A
Testdate:	02-09-2020
File Name:	HF1 PM Calc
Testrun:	#1
Fil dato og tid (Start):	02-09-20 08:43:32

Weight of test fuel spacers, dry basis, kg

E2780

$$Equation\,(1) \qquad M_{Sdb} = (M\_Swb) * (\frac{100}{100 + FM_S})$$

M_swb	0	kg (wet basis)
FM_s	0	% (dry basis)

M_sdb = (0) x (100 / (100 + 0)) kg (dry basis)

M_sbd = 0 kg (dry basis)

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$$Equation\,(2) \qquad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}}\right)$$

M_CPnwb	#REF!	kg (wet basis)
FM_CPn	0	% (dry basis)

M_Cdb = Σ[(###) x (100 / (100 + 0))] kg (dry basis)

M_Cdb = #REF! kg (dry basis)

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$$Equation\,(3) \qquad D_{Cdb} = \frac{M_{Cdb}}{V_C}$$

M_Cdb	#REF!	kg (dry basis)
V_C	#N/A	m3

D_Cdb = #REF! / #N/A kg (dry) / m3

D_Cdb = #REF! kg (dry) / m3

Total weight of fuel crip excluding nails, dry basis, kg
E2780

$$Equation\ (4) \qquad M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

M_Sdb	0	kg (dry basis)
M_Cdb	#REF!	kg (dry basis)

M_FTAdb = 0 + #REF! kg (dry basis)

M_FTAdb = #REF! kg (dry basis)

Burn rate, kg (dry/h)
E2780

$$Equation\ (5) \qquad BR = \frac{60 * M\_FTAdb}{\theta}$$

M_FTAdb	#REF!	kg (dry basis)
θ	101,25	min

$$BR = \frac{60 \text{ x } \#REF!}{101}$$

BR = #REF!

Air velocity in tunnel at traverse measurements:

E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	1,00	(Direckt)					
K_p	34,97	-					
C_p	0,99	-					
ΔP_avg	3,14	mmVS	P_Dynamisk	30,80	Pa		
T_s	297,30	K	T_Kanal	24,30	°C		
P_s	762,01	mmHg	P_s	101601	Pa	Ps_Tryk	-49 Pa
M_s	29,00	g/g mole					

$$V_s = 1{,}00 \times 34{,}97 \times 0{,}99 \times \left(3{,}14\right)^{0{,}5} \times \left(\frac{297{,}30}{762{,}01 \times 29{,}00}\right)^{0{,}5}$$

V_s = 7,12 m/s (V_scent)

Pitot tube factor for center:

E2515

$$Equation\,(1) \qquad Fp = \frac{Vstrav}{Vscent}$$

V_strav	6,52	m/s	(Average)
V_scent	7,12	m/s	(Average)

$$F_p = \frac{6{,}52}{7{,}12}$$

F_p = 0,9160 -

Air velocity in dilution tunnel during test charge
E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	0,9160	-			
K_p	34,97	-			
C_p	0,99	-			
Delta P_avg	3,13	mmVS	P_Dynamisk	30,67	Pa
T_s	305,72	K			
P_s	762,02	mmHg			
M_s	29,00	g/g mole			

$$V_s = 0{,}9160 \times 34{,}97 \times 0{,}99 \times \left(3{,}13\right)^{0{,}5} \times \left(\frac{305{,}72}{762{,}02 \times 29{,}00}\right)^{0{,}5}$$

$$V_s = 6{,}60 \text{ m/s (V\_scent)}$$

Average gas flow rate in dilution tunnel:
E2515

$$Equation\,(3) \qquad Qstd = 60 * (1 - Bws) * Vs * A * \left(\frac{Tstd * Ps}{Ts * Pstd}\right)$$

B_ws	0,02	-					
V_s	6,596107	m/s					
A	0,017671	m2					
T_std	293	K					
P_s	762,0218	mmHg	P_s	####	Pa	Ps_Tryk	-47 Pa
T_s	305,7244	K	T_Kanal	32,7	°C		
P_std	760	mmHg					

$$Q_{std} = 60 \times (1 - 0{,}02) \times 6{,}6 \times 0 \times \left(\frac{293 \times 762}{305{,}72 \times 760}\right)$$

$$Q_{std} = 6{,}58611 \text{ dscm/min}$$

Measurements sample train 1 entire charge
E2515

Equation (7_1) $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

Equation (7) $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	0,72071	dcm			
K_1	0,3855	K/mmHg			
Y	0,9953	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	101,25	min			

V_mc = 0,72071 - (0 - 0) x 101

V_mc = 0,72071 dscm

$$V\_mc(std) = 0,3855 \times 0,72071 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$$

V_mc(std) = 0,76982 dscm

Equation (12) $m_n = m_p + m_f + m_g$

m_p	0,5 mg
m_f	2,1 mg
m_g	1,7 mg

m_n = 0,5 + 2,1 + 1,7

m_n = 4,3 mg

Equation (13) $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001 g/mg
m_n	4,3 mg
V_m(std)	0,769819 dscm

$$C\_s = 0,001 \times \frac{4,3}{0,76982}$$

C_s = 0,00559 g/dscm

Equation (15) $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,005586 g/dscm
c_r	2,6E-16 g/dscm
Q_std	6,586107 dscm/min
θ	101,25 min

E_T = (0 - 0) x 6,6 x 101

E_T = 3,7248 g

Measurements sample train 2 first hour of charge
E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$

V_m	0,42763	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	60	min			

V_mc = 0,42763 - (0 - 0) x 60

V_mc = 0,42763 dcm

$$V_{mc(std)} = 0{,}3855 \times 0{,}42763 \times 0{,}998 \times \left(\frac{760 + \frac{0}{13{,}6}}{273}\right)$$

V_mc(std) = 0,45801 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	2,3	mg
m_g	1	mg

m_n = 0 + 2,3 + 1

m_n = 3,3 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	3,3	mg
V_m(std)	0,458008	dscm

$$C_s = 0{,}001 \times \frac{3{,}3}{0{,}45801}$$

C_s = 0,00721 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,007205	g/dscm
c_r	2,6E-16	g/dscm
Q_std	6,586107	dscm/min
θ	60	min

E_T = (0 - 0) x 6,6 x 60

E_T = 2,84722 g

Measurements sample train 2 from 1 hour and rest of charge
E2515

$$Equation\,(7_1) \qquad Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$$

$$Equation\,(7) \qquad Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$$

V_m	0,29852	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	41,25	min			

V_mc = 0,29852 - (0 - 0) x 41

V_mc = 0,29852 dcm

$$V\_mc(std) = 0{,}3855 \times 0{,}29852 \times 0{,}998 \times \left(\frac{760 + \frac{0}{13{,}6}}{273}\right)$$

V_mc(std) = 0,31973 dscm

$$Equation\,(12) \qquad m_n = m_p + m_f + m_g$$

m_p	0	mg
m_f	0,9	mg
m_g	0,6	mg

m_n = 0 + 0,9 + 0,6

m_n = 1,5 mg

$$Equation\,(13) \qquad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001	g/mg
m_n	1,5	mg
V_m(std)	0,319726	dscm

$$C\_s = 0{,}001 \times \frac{1{,}5}{0{,}31973}$$

C_s = 0,00469 g/dscm

$$Equation\,(15) \qquad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,004692	g/dscm
c_r	2,6E-16	g/dscm
Q_std	6,586107	dscm/min
θ	41,25	min

E_T = (0 - 0) x 6,6 x 41

E_T = 1,27458 g

Room blanc

E2515

Equation (8) $$Vmr(std) = K1 * Vmr * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$$

K_1	0,3855	K/mmHg			
V_mr	0,661741	dcm			
Y	1	Gasmåler Faktor			
P_bar	762,436	mmHg	P_bar	1016,5	mBar
Delta_H	0	mmVS			
T_m	296,9059	K	T_Gasmåler	23,9059	°C

$$V\_mr(std) = 0,3855 \times 0,66174 \times 1 \times \left(\frac{762,4 + \frac{0}{13,6}}{297}\right)$$

V_mr(std) = 0,65508 dscm

Equation (14) $$C_r = K_2 * \frac{m_r}{Vm_{r(std)}}$$

K_2	0,001	g/mg
m_r	1,71E-13	mg
V_m_r(std)	0,655084	dscm

$$C\_r = 0,001 \times \frac{1,7E\text{-}13}{0,65508}$$

C_r = 2,6E-16 g/dscm

Proportional Rate first 10 minutes

E2515

$$Equation\,(16) \qquad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	101,25	min
V_mi	0,079205	l
V_s	6,60	m/s
T_m	300,6244	K
T_si	304,4242	K
V_m	0,79	l
V_si	6,62	m/s
T_s	305,7244	K
T_mi	300,5668	K

$$PR = \frac{101,25 \times (0,08 \times 6,60 \times 300,6 \times 304)}{10 \times (1 \times 6,62 \times 305,7 \times 301)} \times 100$$

$$PR = 100,277 \; -$$

Notation and units

E2780

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crip, excluding nails and spacers, wet basis, kg
	FM_CPn	avarage fuel moisture of test fuel piece n in fuel crip, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crip, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m3
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m3
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimentionless (assigned a value of 0.99)
	ΔP_avg	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m2	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m3/min	Leakage rate observed during the post-test leakcheck
	L_a	m3/min	Maximum acceptable leakage rate for either a oretest og post-test leak-check, equal to 0.0003 m3/min
	θ	Min	Total sampling time
	V_mc	-	V_m - (L_p - L_a) * θ
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Consentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute avarage dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 17

Title: LF ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E2780 and E2515

EN-NS-EPA-Ber 3-61 01-09-2020 MXB

Manufacturer:	Morsø Jernstøberi AS
Type:	2B Classic 2020
ELAB no.:	2526
Order number:	#N/A
Testdate:	02-09-2020
File Name:	LF 020920
Testrun:	#2
Fil dato og tid (Start):	02-09-20 14:01:50

Weight of test fuel spacers, dry basis, kg

E2780

$$Equation\,(1) \qquad M_{Sdb} = (M\_Swb) * (\frac{100}{100 + FM_S})$$

M_swb	0	kg (wet basis)
FM_s	0	% (dry basis)

M_sdb = (0) x (100 / (100 + 0)) kg (dry basis)

M_sbd = 0 kg (dry basis)

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$$Equation\,(2) \qquad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}}\right)$$

M_CPnwb	#REF!	kg (wet basis)
FM_CPn	0	% (dry basis)

M_Cdb = Σ[(###) x (100 / (100 + 0))] kg (dry basis)

M_Cdb = #REF! kg (dry basis)

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$$Equation\,(3) \qquad D_{Cdb} = \frac{M_{Cdb}}{V_C}$$

M_Cdb	#REF!	kg (dry basis)
V_C	#N/A	m3

D_Cdb = #REF! / #N/A kg (dry) / m3

D_Cdb = #REF! kg (dry) / m3

Total weight of fuel crip excluding nails, dry basis, kg
E2780

$$Equation\ (4) \qquad M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

M_Sdb	0	kg (dry basis)
M_Cdb	#REF!	kg (dry basis)

M_FTAdb = 0 + #REF! kg (dry basis)

M_FTAdb = #REF! kg (dry basis)

Burn rate, kg (dry/h)
E2780

$$Equation\ (5) \qquad BR = \frac{60 * M\_FTAdb}{\theta}$$

M_FTAdb	#REF!	kg (dry basis)
θ	313,80	min

$$BR = \frac{60 \text{ x } \#REF!}{314}$$

BR = #REF!

Air velocity in tunnel at traverse measurements:

E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	1,00	(Direckt)					
K_p	34,97	-					
C_p	0,99	-					
ΔP_avg	3,14	mmVS	P_Dynamisk	30,80	Pa		
T_s	297,30	K	T_Kanal	24,30	°C		
P_s	760,13	mmHg	P_s	101351	Pa	Ps_Tryk	-49 Pa
M_s	29,00	g/g mole					

$$V_s = 1{,}00 \times 34{,}97 \times 0{,}99 \times \left(3{,}14\right)^{0{,}5} \times \left(\frac{297{,}30}{760{,}13 \times 29{,}00}\right)^{0{,}5}$$

V_s = 7,13 m/s (V_scent)

Pitot tube factor for center:

E2515

$$Equation\,(1) \qquad Fp = \frac{Vstrav}{Vscent}$$

V_strav	6,53	m/s	(Average)
V_scent	7,13	m/s	(Average)

$$F_p = \frac{6{,}53}{7{,}13}$$

F_p = 0,9160 -

Air velocity in dilution tunnel during test charge
E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	0,9160	-			
K_p	34,97	-			
C_p	0,99	-			
Delta P_avg	3,14	mmVS	P_Dynamisk	30,84	Pa
T_s	302,71	K			
P_s	760,15	mmHg			
M_s	29,00	g/g mole			

$$V_s = 0{,}9160 \times 34{,}97 \times 0{,}99 \times \left(3{,}14\right)^{0{,}5} \times \left(\frac{302{,}71}{760{,}15 \times 29{,}00}\right)^{0{,}5}$$

$$V_s = 6{,}59 \text{ m/s (V\_scent)}$$

Average gas flow rate in dilution tunnel:
E2515

$$Equation\,(3) \qquad Qstd = 60 * (1 - Bws) * Vs * A * \left(\frac{Tstd * Ps}{Ts * Pstd}\right)$$

B_ws	0,02	-					
V_s	6,589983	m/s					
A	0,017671	m2					
T_std	293	K					
P_s	760,1465	mmHg	P_s	####	Pa	Ps_Tryk	-47 Pa
T_s	302,7098	K	T_Kanal	29,7	°C		
P_std	760	mmHg					

$$Q_{std} = 60 \times \left(1 - 0{,}02\right) \times 6{,}6 \times 0 \times \left(\frac{293 \times 760}{302{,}71 \times 760}\right)$$

$$Q_{std} = 6{,}62917 \text{ dscm/min}$$

Measurements sample train 1 entire charge
E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	2,24598	dcm			
K_1	0,3855	K/mmHg			
Y	0,9953	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	313,8	min			

V_mc = 2,24598 - (0 - 0) x 314

V_mc = 2,24598 dscm

$$V_{mc(std)} = 0,3855 \times 2,24598 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$$

V_mc(std) = 2,39902 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	-1,2	mg
m_g	2	mg

m_n = 0 + -1,2 + 2

m_n = 0,8 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	0,8	mg
V_m(std)	2,399022	dscm

$$C_s = 0,001 \times \frac{0,8}{2,39902}$$

C_s = 0,00033 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,000333	g/dscm
c_r	4,94E-05	g/dscm
Q_std	6,629167	dscm/min
θ	313,8	min

E_T = (0 - 0) x 6,6 x 314

E_T = 0,5909 g

Measurements sample train 2 first hour of charge
E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	0,42249	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	60	min			

V_mc = 0,42249 - (0 - 0) x 60

V_mc = 0,42249 dcm

$$V\_mc(std) = 0,3855 \times 0,42249 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$$

V_mc(std) = 0,4525 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	-0,2	mg
m_g	0,8	mg

m_n = 0 + -0,2 + 0,8

m_n = 0,6 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	0,6	mg
V_m(std)	0,452503	dscm

$$C\_s = 0,001 \times \frac{0,6}{0,4525}$$

C_s = 0,00133 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,001326	g/dscm
c_r	4,94E-05	g/dscm
Q_std	6,629167	dscm/min
θ	60	min

E_T = (0 - 0) x 6,6 x 60

E_T = 0,50775 g

Measurements sample train 2 from 1 hour and rest of charge
E2515

$Equation\,(7_1)$ $Vmc = Vm - (Lp - La) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	1,82311	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	253,8	min			

V_mc = 1,82311 - (0 - 0) x 254

V_mc = 1,82311 dcm

$V_{mc(std)} = 0,3855 \times 1,82311 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$

V_mc(std) = 1,95262 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	-1,7	mg
m_g	1,9	mg

m_n = 0 + -1,7 + 1,9

m_n = 0,2 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	0,2	mg
V_m(std)	1,95262	dscm

$C_s = 0,001 \times \frac{0,2}{1,95262}$

C_s = 0,0001 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,000102	g/dscm
c_r	4,94E-05	g/dscm
Q_std	6,629167	dscm/min
θ	253,8	min

E_T = (0 - 0) x 6,6 x 254

E_T = 0,08919 g

Room blanc

E2515

$$Equation\,(8) \qquad Vmr(std) = K1 * Vmr * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$$

K_1	0,3855	K/mmHg			
V_mr	2,049859	dcm			
Y	1	Gasmåler Faktor			
P_bar	760,5608	mmHg	P_bar	1014	mBar
Delta_H	0	mmVS			
T_m	296,9807	K	T_Gasmåler	23,9807	°C

$$V\_mr(std) = 0{,}3855 \times 2{,}04986 \times 1 \times \left(\frac{760{,}6 + \frac{0}{13{,}6}}{297}\right)$$

V_mr(std) = 2,02374 dscm

$$Equation\,(14) \qquad C_r = K_2 * \frac{m_r}{Vm_{r(std)}}$$

K_2	0,001	g/mg
m_r	0,1	mg
V_m_r(std)	2,023737	dscm

$$C\_r = 0{,}001 \times \frac{0{,}1}{2{,}02374}$$

C_r = 4,9E-05 g/dscm

Proportional Rate first 10 minutes

E2515

$$Equation\,(16) \qquad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	313,80	min
V_mi	0,07871	l
V_s	6,59	m/s
T_m	300,7915	K
T_si	313,1231	K
V_m	2,47	l
V_si	6,67	m/s
T_s	302,7098	K
T_mi	300,9513	K

$$PR = \frac{313{,}80 \times (0{,}08 \times 6{,}59 \times 300{,}8 \times 313)}{10 \times (2 \times 6{,}67 \times 302{,}7 \times 301)} \times 100$$

PR = 102,013 -

Notation and units

E2780

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crip, excluding nails and spacers, wet basis, kg
	FM_CPn	avarage fuel moisture of test fuel piece n in fuel crip, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crip, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m3
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m3
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimentionless (assigned a value of 0.99)
	ΔP_avg	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m2	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m3/min	Leakage rate observed during the post-test leakcheck
	L_a	m3/min	Maximum acceptable leakage rate for either a oretest og post-test leak-check, equal to 0.0003 m3/min
	θ	Min	Total sampling time
	V_mc	-	V_m - (L_p - L_a) * θ
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Consentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute avarage dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 18

Title: HF2 ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E2780 and E2515

EN-NS-EPA-Ber 3-61 01-09-2020 MXB

Manufacturer:	Morsø Jernstøberi AS
Type:	2 B Classic 2020
ELAB no.:	2526
Order number:	#N/A
Testdate:	03-09-2020
File Name:	HF2 PM Calc
Testrun:	#3
Fil dato og tid (Start):	03-09-20 08:30:55

Weight of test fuel spacers, dry basis, kg

E2780

$Equation\,(1) \qquad M_{Sdb} = (M\_Swb) * (\frac{100}{100 + FM_S})$

M_swb	0	kg (wet basis)
FM_s	0	% (dry basis)

M_sdb = (0) x (100 / (100 + 0)) kg (dry basis)

M_sbd = 0 kg (dry basis)

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$Equation\,(2) \qquad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}}\right)$

M_CPnwb	#REF!	kg (wet basis)
FM_CPn	0	% (dry basis)

M_Cdb = Σ[(###) x (100 / (100 + 0))] kg (dry basis)

M_Cdb = #REF! kg (dry basis)

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$Equation\,(3) \qquad D_{Cdb} = \frac{M_{Cdb}}{V_C}$

M_Cdb	#REF!	kg (dry basis)
V_C	#N/A	m3

D_Cdb = #REF! / #N/A kg (dry) / m3

D_Cdb = #REF! kg (dry) / m3

Total weight of fuel crip excluding nails, dry basis, kg
E2780

$$Equation\ (4) \qquad M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

M_Sdb	0	kg (dry basis)
M_Cdb	#REF!	kg (dry basis)

M_FTAdb = 0 + #REF! kg (dry basis)

M_FTAdb = #REF! kg (dry basis)

Burn rate, kg (dry/h)
E2780

$$Equation\ (5) \qquad BR = \frac{60 * M\_FTAdb}{\theta}$$

M_FTAdb	#REF!	kg (dry basis)
θ	90,85	min

$$BR = \frac{60 \text{ x } \#REF!}{91}$$

BR = #REF!

Air velocity in tunnel at traverse measurements:

E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	1,00	(Direckt)					
K_p	34,97	-					
C_p	0,99	-					
ΔP_avg	3,21	mmVS	P_Dynamisk	31,50	Pa		
T_s	299,50	K	T_Kanal	26,50	°C		
P_s	758,64	mmHg	P_s	101152	Pa	Ps_Tryk	-48 Pa
M_s	29,00	g/g mole					

$$V_s = 1{,}00 \times 34{,}97 \times 0{,}99 \times \left(3{,}21\right)^{0{,}5} \times \left(\frac{299{,}50}{758{,}64 \times 29{,}00}\right)^{0{,}5}$$

V_s = 7,24 m/s (V_scent)

Pitot tube factor for center:

E2515

$$Equation\,(1) \qquad Fp = \frac{Vstrav}{Vscent}$$

V_strav	6,64	m/s	(Average)
V_scent	7,24	m/s	(Average)

$$F_p = \frac{6{,}64}{7{,}24}$$

F_p = 0,9176 -

Air velocity in dilution tunnel during test charge
E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	0,9176	-			
K_p	34,97	-			
C_p	0,99	-			
Delta P_avg	3,11	mmVS	P_Dynamisk	30,47	Pa
T_s	309,85	K			
P_s	758,65	mmHg			
M_s	29,00	g/g mole			

$$V_s = 0{,}9176 \times 34{,}97 \times 0{,}99 \times \left(3{,}11\right)^{0{,}5} \times \left(\frac{309{,}85}{758{,}65 \times 29{,}00}\right)^{0{,}5}$$

$$V_s = 6{,}65 \text{ m/s (V\_scent)}$$

Average gas flow rate in dilution tunnel:
E2515

$$Equation\,(3) \qquad Qstd = 60 * (1 - Bws) * Vs * A * \left(\frac{Tstd * Ps}{Ts * Pstd}\right)$$

B_ws	0,02	-					
V_s	6,645463	m/s					
A	0,017671	m2					
T_std	293	K					
P_s	758,6473	mmHg	P_s	####	Pa	Ps_Tryk	-47 Pa
T_s	309,8505	K	T_Kanal	36,9	°C		
P_std	760	mmHg					

$$Q_{std} = 60 \times \left(1 - 0{,}02\right) \times 6{,}6 \times 0 \times \left(\frac{293 \times 759}{309{,}85 \times 760}\right)$$

$$Q_{std} = 6{,}51803 \text{ dscm/min}$$

Measurements sample train 1 entire charge
E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	0,6479	dcm			
K_1	0,3855	K/mmHg			
Y	0,9953	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	90,85	min			

V_mc = 0,6479 - (0 - 0) x 91

V_mc = 0,6479 dscm

$$V_{mc(std)} = 0,3855 \times 0,6479 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$$

V_mc(std) = 0,69205 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0,3	mg
m_f	1,7	mg
m_g	0,9	mg

m_n = 0,3 + 1,7 + 0,9

m_n = 2,9 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	2,9	mg
V_m(std)	0,692048	dscm

$$C_s = 0,001 \times \frac{2,9}{0,69205}$$

C_s = 0,00419 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,00419	g/dscm
c_r	-1,94E-16	g/dscm
Q_std	6,518035	dscm/min
θ	90,85	min

E_T = (0 - -0) x 6,5 x 91

E_T = 2,48144 g

Measurements sample train 2 first hour of charge
E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	0,4273	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	60	min			

V_mc = 0,4273 - (0 - 0) x 60

V_mc = 0,4273 dcm

$V\_mc(std) = 0,3855 \times 0,4273 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$

V_mc(std) = 0,45765 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0,5	mg
m_f	1	mg
m_g	0,8	mg

m_n = 0,5 + 1 + 0,8

m_n = 2,3 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	2,3	mg
V_m(std)	0,457655	dscm

$C\_s = 0,001 \times \frac{2,3}{0,45765}$

C_s = 0,00503 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,005026	g/dscm	
c_r	-1,94E-16	g/dscm	
Q_std	6,518035	dscm/min	
θ	60	min	

E_T = (0 - -0) x 6,5 x 60

E_T = 1,96543 g

Measurements sample train 2 from 1 hour and rest of charge
E2515

$$Equation\,(7_1) \qquad Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$$

$$Equation\,(7) \qquad Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$$

V_m	0,22059	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	30,85	min			

V_mc = 0,22059 - (0 - 0) x 31

V_mc = 0,22059 dcm

$$V_{mc(std)} = 0{,}3855 \times 0{,}22059 \times 0{,}998 \times \left(\frac{760 + \frac{0}{13{,}6}}{273}\right)$$

V_mc(std) = 0,23626 dscm

$$Equation\,(12) \qquad m_n = m_p + m_f + m_g$$

m_p	0,4	mg
m_f	0,3	mg
m_g	0,3	mg

m_n = 0,4 + 0,3 + 0,3

m_n = 1 mg

$$Equation\,(13) \qquad C_s = K_2 * \frac{m_n}{V_{m(std)}}$$

K_2	0,001	g/mg
m_n	1	mg
V_m(std)	0,23626	dscm

$$C_s = 0{,}001 \times \frac{1}{0{,}23626}$$

C_s = 0,00423 g/dscm

$$Equation\,(15) \qquad E_T = (C_s - C_r) * Q_{std} * \theta$$

c_s	0,004233	g/dscm
c_r	-1,94E-16	g/dscm
Q_std	6,518035	dscm/min
θ	30,85	min

E_T = (0 - -0) x 6,5 x 31

E_T = 0,8511 g

Room blanc

E2515

$$Equation\,(8) \qquad Vmr(std) = K1 * Vmr * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$$

K_1	0,3855	K/mmHg			
V_mr	0,593645	dcm			
Y	1	Gasmåler Faktor			
P_bar	759,0607	mmHg	P_bar	1012	mBar
Delta_H	0	mmVS			
T_m	297,1364	K	T_Gasmåler	24,1364	°C

$$V\_mr(std) = 0{,}3855 \times 0{,}59364 \times 1 \times \left(\frac{759{,}1 + \frac{0}{13{,}6}}{297}\right)$$

V_mr(std) = 0,58462 dscm

$$Equation\,(14) \qquad C_r = K_2 * \frac{m_r}{Vm_{r(std)}}$$

K_2	0,001	g/mg
m_r	-1,14E-13	mg
V_m_r(std)	0,584617	dscm

$$C\_r = 0{,}001 \times \frac{-1E\text{-}13}{0{,}58462}$$

C_r = -1,9E-16 g/dscm

Proportional Rate first 10 minutes

E2515

$$Equation\,(16) \qquad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	90,85	min
V_mi	0,07927	l
V_s	6,65	m/s
T_m	300,7063	K
T_si	301,7788	K
V_m	0,71	l
V_si	6,61	m/s
T_s	309,8505	K
T_mi	301,0983	K

$$PR = \frac{90,85 \times (0,08 \times 6,65 \times 300,7 \times 302)}{10 \times (1 \times 6,61 \times 309,9 \times 301)} \times 100$$

$$PR = 98,7147 \; -$$

Notation and units

E2780

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crip, excluding nails and spacers, wet basis, kg
	FM_CPn	avarage fuel moisture of test fuel piece n in fuel crip, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crip, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m3
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m3
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimentionless (assigned a value of 0.99)
	ΔP_avg	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m2	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m3/min	Leakage rate observed during the post-test leakcheck
	L_a	m3/min	Maximum acceptable leakage rate for either a oretest og post-test leak-check, equal to 0.0003 m3/min
	θ	Min	Total sampling time
	V_mc	-	V_m - (L_p - L_a) * θ
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Consentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute avarage dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 19

Title: MF ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E2780 and E2515

EN-NS-EPA-Ber 3-61 01-09-2020 MXB

Manufacturer:	Morsø Jernstøberi AS
Type:	2 B Classic 2020
ELAB no.:	2526
Order number:	#N/A
Testdate:	03-09-2020
File Name:	MF PM Calc
Testrun:	#4
Fil dato og tid (Start):	03-09-20 08:30:55

Weight of test fuel spacers, dry basis, kg

E2780

$Equation\,(1) \qquad M_{Sdb} = (M\_Swb) * (\frac{100}{100 + FM_S})$

M_swb	0	kg (wet basis)
FM_s	0	% (dry basis)

M_sdb = (0) x (100 / (100 + 0)) kg (dry basis)

M_sbd = 0 kg (dry basis)

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$Equation\,(2) \qquad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}}\right)$

M_CPnwb	#REF!	kg (wet basis)
FM_CPn	0	% (dry basis)

M_Cdb = Σ[(###) x (100 / (100 + 0))] kg (dry basis)

M_Cdb = #REF! kg (dry basis)

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$Equation\,(3) \qquad D_{Cdb} = \frac{M_{Cdb}}{V_C}$

M_Cdb	#REF!	kg (dry basis)
V_C	#N/A	m3

D_Cdb = #REF! / #N/A kg (dry) / m3

D_Cdb = #REF! kg (dry) / m3

Total weight of fuel crip excluding nails, dry basis, kg
E2780

$$Equation\ (4) \qquad M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

M_Sdb	0	kg (dry basis)
M_Cdb	#REF!	kg (dry basis)

M_FTAdb = 0 + #REF! kg (dry basis)

M_FTAdb = #REF! kg (dry basis)

Burn rate, kg (dry/h)
E2780

$$Equation\ (5) \qquad BR = \frac{60 * M\_FTAdb}{\theta}$$

M_FTAdb	#REF!	kg (dry basis)
θ	203,63	min

$$BR = \frac{60 \text{ x } \#REF!}{204}$$

BR = #REF!

Air velocity in tunnel at traverse measurements:

E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	1,00	(Direckt)					
K_p	34,97	-					
C_p	0,99	-					
ΔP_avg	3,21	mmVS	P_Dynamisk	31,50	Pa		
T_s	299,50	K	T_Kanal	26,50	°C		
P_s	758,64	mmHg	P_s	101152	Pa	Ps_Tryk	-48 Pa
M_s	29,00	g/g mole					

$$V_s = 1{,}00 \times 34{,}97 \times 0{,}99 \times \left(3{,}21\right)^{0{,}5} \times \left(\frac{299{,}50}{758{,}64 \times 29{,}00}\right)^{0{,}5}$$

V_s = 7,24 m/s (V_scent)

Pitot tube factor for center:

E2515

$$Equation\,(1) \qquad Fp = \frac{Vstrav}{Vscent}$$

V_strav	6,64	m/s	(Average)
V_scent	7,24	m/s	(Average)

$$F_p = \frac{6{,}64}{7{,}24}$$

F_p = 0,9176 -

Air velocity in dilution tunnel during test charge
E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	0,9176	-			
K_p	34,97	-			
C_p	0,99	-			
Delta P_avg	3,03	mmVS	P_Dynamisk	29,70	Pa
T_s	304,80	K			
P_s	758,66	mmHg			
M_s	29,00	g/g mole			

$$V_s = 0{,}9176 \times 34{,}97 \times 0{,}99 \times (3{,}03)^{0{,}5} \times \left(\frac{304{,}80}{758{,}66 \times 29{,}00}\right)^{0{,}5}$$

$$V_s = 6{,}51 \text{ m/s (V\_scent)}$$

Average gas flow rate in dilution tunnel:
E2515

$$Equation\,(3) \qquad Qstd = 60 * (1 - Bws) * Vs * A * \left(\frac{Tstd * Ps}{Ts * Pstd}\right)$$

B_ws	0,02	-					
V_s	6,507038	m/s					
A	0,017671	m2					
T_std	293	K					
P_s	758,6565	mmHg	P_s	####	Pa	Ps_Tryk	-46 Pa
T_s	304,8028	K	T_Kanal	31,8	°C		
P_std	760	mmHg					

$$Q_{std} = 60 \times (1 - 0{,}02) \times 6{,}5 \times 0 \times \left(\frac{293 \times 759}{304{,}8 \times 760}\right)$$

$$Q_{std} = 6{,}48804 \text{ dscm/min}$$

Measurements sample train 1 entire charge

E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	1,42373	dcm			
K_1	0,3855	K/mmHg			
Y	0,9953	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	203,6333	min			

V_mc = 1,42373 - (0 - 0) x 204

V_mc = 1,42373 dscm

$V_{mc(std)} = 0,3855 \times 1,42373 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$

V_mc(std) = 1,52074 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	0,7	mg
m_g	0,5	mg

m_n = 0 + 0,7 + 0,5

m_n = 1,2 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	1,2	mg
V_m(std)	1,520744	dscm

$C_s = 0,001 \times \frac{1,2}{1,52074}$

C_s = 0,00079 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,000789	g/dscm
c_r	6,52E-17	g/dscm
Q_std	6,488037	dscm/min
θ	203,6333	min

E_T = (0 - 0) x 6,5 x 204

E_T = 1,04253 g

Measurements sample train 2 first hour of charge
E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$

V_m	0,42274	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	60	min			

V_mc = 0,42274 - (0 - 0) x 60

V_mc = 0,42274 dcm

$$V_{mc(std)} = 0{,}3855 \times 0{,}42274 \times 0{,}998 \times \left(\frac{760 + \frac{0}{13{,}6}}{273}\right)$$

V_mc(std) = 0,45277 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0,3	mg
m_f	0,8	mg
m_g	0,2	mg

m_n = 0,3 + 0,8 + 0,2

m_n = 1,3 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	1,3	mg
V_m(std)	0,452771	dscm

$$C_s = 0{,}001 \times \frac{1{,}3}{0{,}45277}$$

C_s = 0,00287 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,002871	g/dscm
c_r	6,52E-17	g/dscm
Q_std	6,488037	dscm/min
θ	60	min

E_T = (0 - 0) x 6,5 x 60

E_T = 1,11771 g

Measurements sample train 2 from 1 hour and rest of charge
E2515

$Equation\,(7_1)$ $Vmc = Vm - (Lp - La) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	1,00106	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	143,6333	min			

V_mc = 1,00106 - (0 - 0) x 144

V_mc = 1,00106 dcm

$V\_mc(std) = 0,3855 \times 1,00106 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$

V_mc(std) = 1,07217 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	-0,1	mg
m_g	0,2	mg

m_n = 0 + -0,1 + 0,2

m_n = 0,1 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	0,1	mg
V_m(std)	1,072173	dscm

$C\_s = 0,001 \times \frac{0,1}{1,07217}$

C_s = 9,3E-05 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	9,33E-05	g/dscm
c_r	6,52E-17	g/dscm
Q_std	6,488037	dscm/min
θ	143,6333	min

E_T = (0 - 0) x 6,5 x 144

E_T = 0,08692 g

Room blanc

E2515

$$Equation\,(8) \qquad Vmr(std) = K1 * Vmr * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$$

K_1	0,3855	K/mmHg			
V_mr	1,329355	dcm			
Y	1	Gasmåler Faktor			
P_bar	759,0607	mmHg	P_bar	1012	mBar
Delta_H	0	mmVS			
T_m	297,3879	K	T_Gasmåler	24,3879	°C

$$V\_mr(std) = 0{,}3855 \times 1{,}32935 \times 1 \times \left(\frac{759{,}1 + \frac{0}{13{,}6}}{297}\right)$$

V_mr(std) = 1,30803 dscm

$$Equation\,(14) \qquad C_r = K_2 * \frac{m_r}{Vm_{r(std)}}$$

K_2	0,001	g/mg
m_r	8,53E-14	mg
V_m_r(std)	1,308033	dscm

$$C\_r = 0{,}001 \times \frac{8{,}5E\text{-}14}{1{,}30803}$$

C_r = 6,5E-17 g/dscm

Proportional Rate first 10 minutes

E2515

$$Equation\,(16) \qquad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	203,63	min
V_mi	0,07623	l
V_s	6,51	m/s
T_m	300,9938	K
T_si	312,3815	K
V_m	1,57	l
V_si	6,66	m/s
T_s	304,8028	K
T_mi	301,185	K

$$PR = \frac{203{,}63 \times (0{,}08 \times 6{,}51 \times 301 \times 312)}{10 \times (2 \times 6{,}66 \times 304{,}8 \times 301)} \times 100$$

PR = 98,8951 -

Notation and units

E2780

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crip, excluding nails and spacers, wet basis, kg
	FM_CPn	avarage fuel moisture of test fuel piece n in fuel crip, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crip, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m3
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m3
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimentionless (assigned a value of 0.99)
	ΔP_avg	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m2	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m3/min	Leakage rate observed during the post-test leakcheck
	L_a	m3/min	Maximum acceptable leakage rate for either a oretest og post-test leak-check, equal to 0.0003 m3/min
	θ	Min	Total sampling time
	V_mc	-	V_m - (L_p - L_a) * θ
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Consentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute avarage dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 20

Title: HF3 ASTM PM calculations

Pages total: 11, excl this cover page

Calculations PM

ASTM E2780 and E2515

EN-NS-EPA-Ber 3-61 01-09-2020 MXB

Manufacturer:	Morsø Jernstøberi AS
Type:	2B Classic 2020
ELAB no.:	2526
Order number:	#N/A
Testdate:	04-09-2020
File Name:	HF3 PM Calc
Testrun:	#5
Fil dato og tid (Start):	04-09-20 09:16:54

Weight of test fuel spacers, dry basis, kg

E2780

$$Equation\,(1) \qquad M_{Sdb} = (M\_Swb) * (\frac{100}{100 + FM_S})$$

M_swb	0	kg (wet basis)
FM_s	0	% (dry basis)

M_sdb = (0) x (100 / (100 + 0)) kg (dry basis)

M_sbd = 0 kg (dry basis)

Weight of test fuel crip, excluding nails and spacers, dry basis, kg

E2780

$$Equation\,(2) \qquad M_{Cdb} = \Sigma(M_{CPnwb}) * \left(\frac{100}{100 + FM_{CPn}}\right)$$

M_CPnwb	#REF!	kg (wet basis)
FM_CPn	0	% (dry basis)

M_Cdb = Σ[(###) x (100 / (100 + 0))] kg (dry basis)

M_Cdb = #REF! kg (dry basis)

Density of fuel crip, excluding spacers and nails, dry basis, kg/m3

E2780

$$Equation\,(3) \qquad D_{Cdb} = \frac{M_{Cdb}}{V_C}$$

M_Cdb	#REF!	kg (dry basis)
V_C	#N/A	m3

D_Cdb = #REF! / #N/A kg (dry) / m3

D_Cdb = #REF! kg (dry) / m3

Total weight of fuel crip excluding nails, dry basis, kg
E2780

$$Equation\ (4) \qquad M_{FTAdb} = M_{Sdb} + M_{Cdb}$$

M_Sdb	0	kg (dry basis)
M_Cdb	#REF!	kg (dry basis)

M_FTAdb = 0 + #REF! kg (dry basis)

M_FTAdb = #REF! kg (dry basis)

Burn rate, kg (dry/h)
E2780

$$Equation\ (5) \qquad BR = \frac{60 * M\_FTAdb}{\theta}$$

M_FTAdb	#REF!	kg (dry basis)
θ	86,45	min

$$BR = \frac{60 \text{ x } \#REF!}{86}$$

BR = #REF!

Air velocity in tunnel at traverse measurements:

E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	1,00	(Direckt)					
K_p	34,97	-					
C_p	0,99	-					
ΔP_avg	2,94	mmVS	P_Dynamisk	28,80	Pa		
T_s	300,40	K	T_Kanal	27,40	°C		
P_s	759,04	mmHg	P_s	101205	Pa	Ps_Tryk	-45 Pa
M_s	29,00	g/g mole					

$$V_s = 1{,}00 \times 34{,}97 \times 0{,}99 \times \left(2{,}94\right)^{0{,}5} \times \left(\frac{300{,}40}{759{,}04 \times 29{,}00}\right)^{0{,}5}$$

V_s = 6,93 m/s (V_scent)

Pitot tube factor for center:

E2515

$$Equation\,(1) \qquad Fp = \frac{Vstrav}{Vscent}$$

V_strav	6,35	m/s	(Average)
V_scent	6,93	m/s	(Average)

$$F_p = \frac{6{,}35}{6{,}93}$$

F_p = 0,9167 -

Air velocity in dilution tunnel during test charge
E2515

$$Equation\,(9) \qquad Vs = Fp * Kp * Cp * \sqrt{\Delta Pavg} * \sqrt{\frac{Ts}{Ps * Ms}}$$

F_p	0,9167	-			
K_p	34,97	-			
C_p	0,99	-			
Delta P_avg	3,04	mmVS	P_Dynamisk	29,83	Pa
T_s	310,69	K			
P_s	759,03	mmHg			
M_s	29,00	g/g mole			

$$V_s = 0{,}9167 \times 34{,}97 \times 0{,}99 \times \left(3{,}04\right)^{0{,}5} \times \left(\frac{310{,}69}{759{,}03 \times 29{,}00}\right)^{0{,}5}$$

V_s = 6,58 m/s (V_scent)

Average gas flow rate in dilution tunnel:
E2515

$$Equation\,(3) \qquad Qstd = 60 * (1 - Bws) * Vs * A * \left(\frac{Tstd * Ps}{Ts * Pstd}\right)$$

B_ws	0,02	-					
V_s	6,576306	m/s					
A	0,017671	m2					
T_std	293	K					
P_s	759,0304	mmHg	P_s	####	Pa	Ps_Tryk	-46 Pa
T_s	310,6881	K	T_Kanal	37,7	°C		
P_std	760	mmHg					

$$Q_{std} = 60 \times (1 - 0{,}02) \times 6{,}6 \times 0 \times \left(\frac{293 \times 759}{310{,}69 \times 760}\right)$$

Q_std = 6,43606 dscm/min

Measurements sample train 1 entire charge

E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	0,60994	dcm			
K_1	0,3855	K/mmHg			
Y	0,9953	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	86,45	min			

V_mc = 0,60994 - (0 - 0) x 86

V_mc = 0,60994 dscm

$$V\_mc(std) = 0,3855 \times 0,60994 \times 0,9953 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$$

V_mc(std) = 0,6515 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	1	mg
m_g	0,8	mg

m_n = 0 + 1 + 0,8

m_n = 1,8 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	1,8	mg
V_m(std)	0,651502	dscm

$$C\_s = 0,001 \times \frac{1,8}{0,6515}$$

C_s = 0,00276 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,002763	g/dscm
c_r	-0,00018	g/dscm
Q_std	6,436065	dscm/min
θ	86,45	min

E_T = (0 - -0) x 6,4 x 86

E_T = 1,63728 g

Measurements sample train 2 first hour of charge
E2515

$Equation\,(7_1)$ $Vmc = \mathrm{Vm} - (\mathrm{Lp} - \mathrm{La}) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$

V_m	0,42757	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	60	min			

V_mc = 0,42757 - (0 - 0) x 60

V_mc = 0,42757 dcm

$$V_{mc(std)} = 0{,}3855 \times 0{,}42757 \times 0{,}998 \times \left(\frac{760 + \frac{0}{13{,}6}}{273}\right)$$

V_mc(std) = 0,45794 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0 mg
m_f	1,4 mg
m_g	-0,1 mg

m_n = 0 + 1,4 + -0,1

m_n = 1,3 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001 g/mg
m_n	1,3 mg
V_m(std)	0,457944 dscm

$$C_s = 0{,}001 \times \frac{1{,}3}{0{,}45794}$$

C_s = 0,00284 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,002839 g/dscm
c_r	-0,00018 g/dscm
Q_std	6,436065 dscm/min
θ	60 min

E_T = (0 - -0) x 6,4 x 60

E_T = 1,16566 g

Measurements sample train 2 from 1 hour and rest of charge
E2515

$Equation\,(7_1)$ $Vmc = Vm - (Lp - La) * \theta$

$Equation\,(7)$ $Vmc(std) = K1 * Vmc * Y * \left(\frac{Pbar + \frac{\Delta H}{13,6}}{Tm}\right)$

V_m	0,18293	dcm			
K_1	0,3855	K/mmHg			
Y	0,998	Gasmåler Faktor			
P_bar	759,9983	mmHg	P_bar	1013,25	mBar
Delta_H	0	mmVS			
T_m	273	K	T_Gasmåler	0	°C
L_p	0	m3/min			
L_a	0	m3/min			
θ	26,45	min			

V_mc = 0,18293 - (0 - 0) x 26

V_mc = 0,18293 dcm

$$V\_mc(std) = 0,3855 \times 0,18293 \times 0,998 \times \left(\frac{760 + \frac{0}{13,6}}{273}\right)$$

V_mc(std) = 0,19592 dscm

$Equation\,(12)$ $m_n = m_p + m_f + m_g$

m_p	0	mg
m_f	0,5	mg
m_g	0	mg

m_n = 0 + 0,5 + 0

m_n = 0,5 mg

$Equation\,(13)$ $C_s = K_2 * \frac{m_n}{V_{m(std)}}$

K_2	0,001	g/mg
m_n	0,5	mg
V_m(std)	0,195925	dscm

$$C\_s = 0,001 \times \frac{0,5}{0,19592}$$

C_s = 0,00255 g/dscm

$Equation\,(15)$ $E_T = (C_s - C_r) * Q_{std} * \theta$

c_s	0,002552	g/dscm
c_r	-0,00018	g/dscm
Q_std	6,436065	dscm/min
θ	26,45	min

E_T = (0 - -0) x 6,4 x 26

E_T = 0,46504 g

Room blanc

E2515

$$Equation\,(8) \qquad Vmr(std) = K1 * Vmr * Y * \left(\frac{Pbar + \frac{\Delta H}{13{,}6}}{Tm}\right)$$

K_1	0,3855	K/mmHg			
V_mr	0,564613	dcm			
Y	1	Gasmåler Faktor			
P_bar	759,4358	mmHg	P_bar	1012,5	mBar
Delta_H	0	mmVS			
T_m	297,1896	K	T_Gasmåler	24,1896	°C

$$V_{mr(std)} = 0{,}3855 \times 0{,}56461 \times 1 \times \left(\frac{759{,}4 + \frac{0}{13{,}6}}{297}\right)$$

$$V_{mr(std)} = 0{,}5562 \text{ dscm}$$

$$Equation\,(14) \qquad C_r = K_2 * \frac{m_r}{Vm_{r(std)}}$$

K_2	0,001	g/mg
m_r	-0,1	mg
V_m_r(std)	0,556202	dscm

$$C_r = 0{,}001 \times \frac{-0{,}1}{0{,}5562}$$

$$C_r = -0{,}00018 \text{ g/dscm}$$

Proportional Rate first 10 minutes

E2515

$$Equation\,(16) \qquad PR = \frac{\theta * (V_{mi} * V_s * T_m * T_{si})}{10 * (V_m * V_{si} * T_s * T_{mi})} * 100$$

θ	86,45	min
V_mi	0,077745	l
V_s	6,58	m/s
T_m	300,8502	K
T_si	302,4554	K
V_m	0,67	l
V_si	6,60	m/s
T_s	310,6881	K
T_mi	301,1909	K

$$PR = \frac{86,45 \times (0,08 \times 6,58 \times 300,9 \times 302)}{10 \times (1 \times 6,60 \times 310,7 \times 301)} \times 100$$

PR = 96,8647 -

Notation and units

E2780

Equation (1)	M_Swb	weight of all test fuel spacers, wet basis, kg
	FM_S	average fuel moisture of all test fuel spacers, % dry basis
	M_Sdb	weight of all test fuel spacers, dry basis, kg
Equation (2)	M_CPnwb	weight of each test fuel piece n in fuel crip, excluding nails and spacers, wet basis, kg
	FM_CPn	avarage fuel moisture of test fuel piece n in fuel crip, % dry basis,
	n	individual test fuel pieces that comprise the test fuel crip, as applicable
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
Equation (3)	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	V_C	Volume of fuel crib, m3
	D_Cdb	density of fuel, crib, excluding spacers and nails, dry basis, kg/m3
Equation (4)	M_Sdb	weight of all test fuel spacers, dry basis, kg
	M_Cdb	weight of fuel crib, excluding nails and spacers, dry basis, kg
	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
Equation (5)	M_FTAdb	total weight of fuel crip excluding nails, dry basis, kg
	θ	total length of test rin, min.
	BR	dry burn rate, kg/h

E2515

Equation (9)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	K_p	-	Pitot Tube Constant 34,97 m/sec
	C_p	-	Pitot tube coefficient, dimentionless (assigned a value of 0.99)
	ΔP_avg	mmVC	Average velocity pressure in dilution tunnel, mm water
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	M_s	g/g mole	The dilution tunnel dry gas molecular weight (may be assumed to be 29 g/g mole)
	V_s	m/s	Average gas velocity in the dilution tunnel
Equation (1)	F_p	-	Adjustment factor for center of tunnel pitot tube placement
	V_strav	m/s	Average gas velocity calculated after the multipoint Pitot traverse
	V_scent	m/s	Average gas velocity at the center of the dilution tunnel calculated after the Pitot tube traverse
Equation (3)	B_ws	-	Water vapor in the gas steam, proportion by volume (assumed to be 0.02 (2.0%))
	V_s	m/s	Average gas velocity in the dilution tunnel
	A	m2	Cross-sectional area of tunnel
	T_std	K	Standard absolute temperature, 293K
	P_s	mm Hg	Absolute average gas static pressure in dilution tunnel
	T_s	K	Absolute average gas temperature in the dilution tunnel
	P_std	mmHg	Standard absolute pressure, 760 mm Hg
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
Equation (7)	V_m	dcm	Volume of gas sample as measured by dry gas meter
	L_p	m3/min	Leakage rate observed during the post-test leakcheck
	L_a	m3/min	Maximum acceptable leakage rate for either a oretest og post-test leak-check, equal to 0.0003 m3/min
	θ	Min	Total sampling time
	V_mc	-	V_m - (L_p - L_a) * θ
	K_1	K/mm Hg	0.3855 K/mm Hg
	Y	-	Dry gas meter calibration factor
	P_Bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mc(std)	dscm	Volume of air sample measured by the dry gas meter, corrected to standard conditions
Equation (12)	m_p	mg	mass of particulate from probe
	m_f	mg	mass of particulate from filters
	m_g	mg	mass of particulate from gaskets
	m_n	mg	Total amount of particulate matter collected
Equation (13)	K_2	g/mg	0.001
	m_n	mg	Total amount of particulate matter collected
	V_m(std)	dscm	Volume of gas sample measured by the dry gas meter, corrected to standard conditions
	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
Equation (15)	c_s	g/dscm	Consentration of particulate matter in tunnel gas, dry basis, corrected to standard conditions
	c_r	g/dscm	Consentration of particulate matter room air, dry basis, corrected to standard conditions
	Q_std	dscm/min	Average gas flow rate in dilution tunnel
	θ	Min	Total sampling time
	E_T	g	Total particulate emissions
Equation (8)	K_1	K/mm Hg	0.3855 K/mm Hg
	V_mr	dcm	Volume of room air sampled as measured by dry gas meter
	Y	-	Dry gas meter calibration factor
	P_bar	mm Hg	Barometric pressure at the sampling site.
	ΔH	mmVC	Average pressure at the outlet of the dry gas meter or the avarage differential pressure across the orifice meter
	T_m	K	Absolute average dry gas meter temperature
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (14)	K_2	g/mg	0.001
	m_r	mg	mass of particulate from the filter, filter gasket, and probe assembly from the room air blank filter holder assembly
	V_mr(std)	dscm	Volume of room air sample measured by the dry gas meter, corrected to standard conditions
Equation (16)	θ	Min	Total sampling time
	V_mi	dcm	Volume of gas sample as measured by dry gas neter during each 10-min interval, i, of the test run
	V_s	m/s	Average gas velocity in the dilution tunnel
	T_m	K	Absolute average dry gas meter temperature
	T_si	K	Absolute average gas temperature in the dilution tunnel during each 10-min interval, i, of the test run
	V_m	dcm	Volume of gas sample as measured by dry gas meter
	V_si	dcm	Volume of gas sampled as measured by dry gas meter during each 10-min interval, i, of the test run
	T_s	K	Absolute average gas temperature in the dilution tunnel
	T_mi	K	Absolute avarage dry gas meter temperature during each 10-min interval, i, of the test run
	PR	-	Proportional Rate Variation - Calculated PR for each 10-min interval, i, of the test run

Annex 21

Title: HF1 logger data the 020920

Pages total: 25, excl this cover page

	Rum - [°C]	Filter-1-H - [°C]	Filter-2-D1 - [°C]	Filter-3-D2 - [°C	Filter-4-R - [°C]
	1	2	3	4	5
Time	Ambient temperature	Main train filter temp	Split train 1H filter temp	Split train rem. filter temp	Room blank filter temp
12:19:15	Start of test				
12:19:35	24,10	29,40	28,58	24,85	24,69
12:20:05	24,00	29,36	28,87	24,88	24,69
12:20:35	24,16	29,31	29,14	25,00	24,74
12:21:05	23,99	29,27	29,23	24,96	24,75
12:21:35	23,95	29,09	29,11	24,94	24,71
12:22:05	23,95	28,92	28,99	25,00	24,70
12:22:35	24,18	28,84	29,00	24,97	24,80
12:23:05	24,11	29,25	28,86	24,98	24,78
12:23:35	23,98	29,43	28,71	24,90	24,77
12:24:05	23,91	29,43	28,80	24,81	24,76
12:24:35	24,09	29,29	29,20	24,71	24,80
12:25:05	24,05	29,30	29,34	24,75	24,77
12:25:35	24,11	29,26	29,34	24,78	24,80
12:26:05	24,04	29,07	29,28	24,98	24,82
12:26:35	24,02	28,95	29,20	24,74	24,82
12:27:05	23,99	29,09	29,00	24,88	24,77
12:27:35	24,09	29,37	28,92	24,91	24,79
12:28:05	24,06	29,63	28,70	24,86	24,73
12:28:35	23,95	29,58	28,75	24,91	24,77
12:29:05	23,94	29,58	29,22	24,92	24,83
12:29:35	24,12	29,52	29,35	24,90	24,82
12:30:05	24,12	29,37	29,43	24,93	24,85
12:30:35	23,98	29,30	29,28	24,91	24,79
12:31:05	23,92	29,09	29,23	24,81	24,80
12:31:35	23,99	28,97	29,15	24,91	24,85
12:32:05	23,97	29,08	28,99	24,90	24,82
12:32:35	24,02	29,42	28,80	24,83	24,79
12:33:05	24,11	29,50	28,74	24,92	24,81
12:33:35	24,18	29,46	29,03	25,04	24,81
12:34:05	24,17	29,46	29,25	25,14	24,86
12:34:35	24,08	29,44	29,23	25,13	24,86
12:35:05	24,33	29,30	29,20	25,23	24,89
12:35:35	24,27	29,14	29,08	25,22	24,88
12:36:05	24,10	29,05	28,96	25,14	24,88
12:36:35	24,10	28,94	28,85	25,11	24,87
12:37:05	24,07	29,34	28,68	25,04	24,85
12:37:35	24,06	29,41	29,09	25,08	24,87
12:38:05	23,86	29,45	29,30	25,05	24,84
12:38:35	23,97	29,41	29,33	25,46	24,82
12:39:05	24,20	29,35	29,43	25,06	24,93
12:39:35	24,07	29,24	29,27	25,19	24,91
12:40:05	24,22	29,11	29,22	25,37	24,93

12:40:35	24,19	29,05	29,05	25,46	24,90
12:41:05	24,34	29,03	28,91	25,15	24,92
12:41:35	24,28	29,32	28,85	25,33	24,94
12:42:05	24,20	29,51	28,69	25,46	24,91
12:42:35	23,93	29,59	28,96	25,36	24,88
12:43:05	24,19	29,52	29,37	25,40	24,95
12:43:35	24,22	29,49	29,39	25,26	24,93
12:44:05	24,27	29,42	29,38	25,43	24,93
12:44:35	24,17	29,20	29,33	25,34	24,98
12:45:05	24,21	29,15	29,19	25,31	24,94
12:45:35	24,17	28,94	29,11	25,35	24,98
12:46:05	24,40	28,90	28,99	25,62	24,97
12:46:35	24,42	29,30	28,93	25,45	25,06
12:47:05	24,18	29,52	28,76	25,64	25,00
12:47:35	24,17	29,53	28,94	25,92	25,00
12:48:05	24,28	29,41	29,15	26,21	24,99
12:48:35	24,38	29,30	29,25	25,52	25,03
12:49:05	24,22	29,27	29,14	25,79	24,98
12:49:35	24,42	29,07	29,12	25,42	25,01
12:50:05	24,25	29,09	29,03	25,41	25,00
12:50:35	24,20	28,93	28,97	25,25	25,02
12:51:05	24,20	29,08	28,88	25,53	25,07
12:51:35	24,10	29,43	28,69	25,48	25,02
12:52:05	24,30	29,43	28,86	25,58	25,04
12:52:35	24,51	29,51	29,22	25,56	25,09
12:53:05	24,38	29,39	29,26	25,70	25,09
12:53:35	24,19	29,32	29,16	25,46	25,02
12:54:06	24,21	29,12	29,14	25,28	25,06
12:54:36	23,96	29,08	28,96	25,21	24,98
12:55:06	24,19	29,03	28,96	25,28	25,05
12:55:36	24,11	28,97	28,87	25,22	25,04
12:56:06	24,13	29,17	28,74	25,25	25,05
12:56:36	24,00	29,47	28,70	25,38	25,03
12:57:06	24,34	29,43	29,08	25,29	25,10
12:57:36	24,11	29,44	29,14	25,17	25,05
12:58:06	24,15	29,42	29,20	24,97	25,09
12:58:36	24,06	29,38	29,13	24,93	25,10
12:59:06	23,94	29,23	29,02	24,80	25,07
12:59:36	24,11	29,01	28,99	24,72	25,15
13:00:06	24,17	28,97	28,79	24,67	25,08
13:00:36	24,11	28,78	28,78	24,66	25,12
13:01:06	24,24	29,25	28,75	24,85	25,14
13:01:36	24,41	29,54	28,93	24,87	25,12
13:02:06	24,43	29,53	29,10	24,64	25,15
13:02:36	24,39	29,52	29,16	24,54	25,19
13:03:06	24,27	29,46	29,08	24,55	25,15
13:03:36	24,31	29,44	28,99	24,53	25,16
13:04:06	24,26	29,45	28,96	24,53	25,18

13:04:36	24,20	29,33	28,81	24,47	25,14
13:05:06	24,25	29,13	28,67	24,66	25,12
13:05:36	24,25	28,94	28,81	24,43	25,18
13:06:06	24,28	28,87	29,13	24,51	25,15
13:06:36	24,27	29,10	29,33	24,68	25,18
13:07:06	24,53	29,36	29,29	24,65	25,17
13:07:36	24,67	29,34	29,20	24,55	25,14
13:08:06	24,47	29,32	29,11	24,43	25,15
13:08:36	24,51	29,25	29,01	24,69	25,15
13:09:06	24,66	29,19	29,05	24,55	25,25
13:09:36	24,48	29,15	28,91	24,68	25,22
13:10:06	24,44	29,08	28,76	24,66	25,20
13:10:36	24,37	28,97	28,60	24,65	25,18
13:11:06	24,20	28,86	28,81	24,65	25,18
13:11:36	24,45	29,22	29,00	24,82	25,24
13:12:06	24,37	29,43	29,00	24,68	25,19
13:12:36	24,42	29,37	29,05	24,85	25,26
13:13:06	24,38	29,30	28,89	24,51	25,22
13:13:36	24,39	29,22	28,79	24,52	25,20
13:14:06	24,43	29,22	28,79	24,56	25,23
13:14:36	24,40	29,14	28,68	24,61	25,21
13:15:06	24,33	29,01	29,08	24,54	25,23
13:15:36	24,33	28,92	29,24	24,50	25,21
13:16:06	24,46	28,85	29,28	24,41	25,19
13:16:36	24,30	29,25	29,23	24,36	25,18
13:17:06	24,52	29,50	29,27	24,31	25,27
13:17:36	24,02	29,64	29,11	24,14	25,26
13:18:06	24,01	29,55	29,08	24,36	25,25
13:18:36	24,11	29,47	28,90	24,50	25,22
13:19:06	24,34	29,34	28,81	24,62	25,21
13:19:36	24,03	29,18	28,66	24,81	25,19
13:20:06	24,08	29,15	NaN	29,49	25,28
13:20:36	24,20	29,08	23,96	29,47	25,23
13:21:06	24,36	28,92	23,98	30,20	25,27
13:21:36	24,65	28,85	23,63	30,38	25,25
13:22:06	24,34	29,21	23,54	30,33	25,19
13:22:36	24,43	29,35	23,82	30,19	25,20
13:23:06	24,26	29,41	23,72	30,02	25,20
13:23:36	24,44	29,50	23,51	29,98	25,24
13:24:06	24,42	29,40	23,82	29,81	25,29
13:24:36	24,55	29,30	23,71	29,68	25,30
13:25:06	24,37	29,24	23,69	29,60	25,24
13:25:36	24,33	29,15	23,50	29,45	25,23
13:26:06	24,37	28,91	23,63	29,29	25,23
13:26:36	24,26	28,86	23,20	29,20	25,19
13:27:06	24,30	28,88	23,38	29,12	25,22
13:27:36	24,13	29,36	23,47	29,74	25,29
13:28:06	24,45	29,46	23,52	29,86	25,28

13:28:36	24,42	29,51	23,68	29,82	25,22
13:29:06	24,41	29,38	23,37	29,67	25,28
13:29:36	24,21	29,32	23,24	29,55	25,18
13:30:06	24,15	29,14	23,17	29,36	25,23
13:30:36	24,31	29,01	23,30	29,22	25,24
13:31:06	24,27	29,00	23,38	29,18	25,25
13:31:36	24,16	29,00	23,60	29,16	25,27
13:32:06	24,05	28,83	23,39	29,69	25,31
13:32:36	24,31	29,22	23,27	29,82	25,30
13:33:06	24,17	29,44	23,23	29,77	25,24
13:33:36	24,25	29,37	23,12	29,62	25,26
13:34:06	24,23	29,41	23,12	29,53	25,17
13:34:36	24,36	29,40	23,40	29,51	25,22
13:35:06	24,43	29,35	23,40	29,40	25,25
13:35:36	24,38	29,23	23,49	29,29	25,23
13:36:06	24,42	29,11	23,33	29,16	25,21
13:36:36	24,34	28,93	23,37	29,54	25,26
13:37:06	24,06	28,79	23,49	29,89	25,20
13:37:36	23,97	28,95	23,23	29,87	25,26
13:38:06	23,91	29,29	23,03	29,74	25,25
13:38:36	24,08	29,48	23,45	29,70	25,27
13:39:06	24,18	29,46	23,48	29,62	25,30
13:39:36	24,03	29,37	23,72	29,47	25,36
13:40:06	24,28	29,27	23,85	29,35	25,37
13:40:36	24,09	29,20	23,64	29,23	25,28
13:41:06	24,11	29,02	23,32	29,12	25,25
13:41:36	24,18	28,89	23,71	29,28	25,34
13:42:06	24,05	28,80	23,78	29,82	25,29
13:42:36	24,10	28,86	23,61	29,89	25,32
13:43:06	24,15	29,28	23,77	29,90	25,33
13:43:36	24,06	29,49	23,51	29,78	25,33
13:44:06	24,24	29,45	23,54	29,60	25,39
13:44:36	24,35	29,46	23,51	29,53	25,38
13:45:06	23,93	29,34	23,75	29,40	25,34
13:45:36	23,93	29,26	23,87	29,27	25,35
13:46:06	24,19	29,05	23,55	29,16	25,41
13:46:36	24,23	29,03	23,33	29,17	25,31
13:47:06	24,30	28,92	23,18	29,56	25,28
13:47:36	24,05	28,79	23,67	29,60	25,39
13:48:06	24,05	29,21	23,71	29,59	25,34
13:48:36	23,98	29,43	23,57	29,48	25,32
13:49:06	24,26	29,46	23,25	29,34	25,36
13:49:36	24,34	29,35	23,52	29,20	25,41
13:50:06	24,14	29,35	23,91	29,14	25,36
13:50:36	24,08	29,30	23,63	29,33	25,38
13:51:06	24,20	25,60	23,76	29,87	25,35
13:51:36	24,22	25,47	23,86	29,86	25,38
13:52:06	24,20	25,73	23,64	29,89	25,35

13:52:36	24,29	25,39	23,44	29,76	25,36
13:53:06	24,27	26,06	23,77	29,60	25,37
13:53:36	24,27	28,87	24,01	29,51	25,40
13:54:06	24,37	29,44	23,57	29,38	25,36
13:54:36	24,35	30,04	23,61	29,25	25,37
13:55:06	24,25	30,05	23,60	29,15	25,38
13:55:36	24,49	29,79	23,63	29,07	25,42
13:56:06	24,69	29,61	24,16	29,68	25,51
13:56:36	24,53	29,54	23,94	29,94	25,47
13:57:06	24,51	29,43	23,81	29,94	25,47
13:57:36	24,34	29,36	23,41	29,83	25,44
13:58:06	24,27	29,24	23,92	29,69	25,47
13:58:36	24,37	29,12	23,79	29,57	25,46
13:59:06	24,51	29,06	23,53	29,49	25,49
13:59:36	24,52	28,92	23,68	29,40	25,57
14:00:06	24,58	28,80	24,20	29,26	25,56
14:00:30	End of test				

Køler-1-H - [°C]	Køler-2-D - [°C]	Gasm-H - [°C]	Gasm-D - [°C]	Gasm-R - [°C]	Flow-H - [ln/min]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [ln/min]
20,47	22,35	27,74	27,44	23,81	7,10
19,93	22,09	28,05	27,64	23,80	7,11
19,67	21,94	28,13	27,66	23,83	7,12
19,46	21,63	28,18	27,71	23,83	7,10
19,31	21,34	28,18	27,72	23,85	7,13
19,14	21,13	28,15	27,70	23,83	7,13
18,98	21,02	28,13	27,73	23,84	7,14
18,96	20,87	28,16	27,74	23,84	7,13
18,85	20,74	28,13	27,72	23,84	7,13
18,72	20,66	28,14	27,77	23,83	7,14
18,60	20,58	28,05	27,72	23,83	7,14
18,55	20,50	28,09	27,74	23,83	7,14
18,52	20,44	28,12	27,75	23,83	7,13
18,44	20,36	28,05	27,70	23,83	7,09
18,35	20,31	28,01	27,71	23,81	7,08
18,36	20,21	28,05	27,70	23,80	7,06
18,25	20,23	27,99	27,71	23,82	7,04
18,28	20,13	28,02	27,67	23,81	7,23
18,20	20,09	27,98	27,64	23,83	7,20
18,20	20,10	27,98	27,70	23,80	7,19
18,22	20,05	27,97	27,66	23,83	7,17
18,13	20,03	27,94	27,67	23,80	7,17
18,17	19,96	27,93	27,62	23,81	7,17
18,11	19,95	27,90	27,62	23,78	7,22
18,04	19,92	27,88	27,61	23,76	7,20
18,02	19,88	27,87	27,61	23,78	7,20
18,04	19,85	27,87	27,60	23,78	7,20
17,95	19,85	27,83	27,58	23,78	7,21
17,97	19,83	27,77	27,55	23,77	7,20
17,99	19,85	27,81	27,57	23,78	7,16
18,04	19,84	27,84	27,57	23,80	7,25
18,00	19,84	27,80	27,56	23,78	7,23
17,99	19,80	27,78	27,50	23,80	7,23
17,95	19,78	27,77	27,50	23,78	7,23
17,90	19,79	27,71	27,47	23,78	7,22
17,93	19,69	27,73	27,43	23,78	7,20
17,81	19,70	27,69	27,45	23,75	7,22
17,81	19,70	27,70	27,48	23,74	7,23
17,84	19,68	27,70	27,43	23,78	7,21
17,78	19,77	27,68	27,46	23,78	7,21
17,81	19,74	27,67	27,42	23,79	7,21
17,74	19,77	27,64	27,43	23,75	7,20

17,82	19,72	27,67	27,41	23,75	7,20
17,79	19,68	27,66	27,40	23,75	7,19
17,72	19,72	27,60	27,39	23,75	7,19
17,72	19,71	27,61	27,39	23,75	7,20
17,75	19,70	27,65	27,39	23,76	7,20
17,74	19,75	27,60	27,40	23,77	7,18
17,80	19,69	27,64	27,38	23,78	7,19
17,79	19,68	27,65	27,39	23,75	7,18
17,77	19,69	27,60	27,37	23,78	7,18
17,79	19,67	27,63	27,38	23,75	7,19
17,74	19,69	27,56	27,36	23,75	7,17
17,75	19,73	27,54	27,35	23,75	7,17
17,78	19,74	27,57	27,37	23,81	7,19
17,79	19,72	27,61	27,38	23,79	7,18
17,77	19,72	27,58	27,35	23,79	7,18
17,79	19,69	27,57	27,32	23,80	7,16
17,71	19,74	27,52	27,32	23,79	7,16
17,78	19,67	27,57	27,30	23,79	7,17
17,71	19,72	27,55	27,31	23,79	7,16
17,83	19,74	27,61	27,35	23,83	7,15
17,79	19,73	27,60	27,36	23,82	7,21
17,75	19,76	27,54	27,34	23,83	7,19
17,83	19,73	27,58	27,33	23,81	7,19
17,77	19,73	27,51	27,30	23,81	7,21
17,82	19,78	27,56	27,32	23,82	7,21
17,78	19,77	27,57	27,35	23,85	7,20
17,85	19,74	27,58	27,35	23,84	7,21
17,75	19,77	27,54	27,33	23,82	7,21
17,83	19,73	27,58	27,33	23,83	7,21
17,85	19,77	27,59	27,32	23,87	7,22
17,83	19,77	27,60	27,35	23,84	7,22
17,80	19,78	27,56	27,31	23,87	7,21
17,85	19,74	27,58	27,32	23,86	7,20
17,77	19,77	27,55	27,32	23,85	7,22
17,83	19,73	27,56	27,30	23,86	7,21
17,87	19,77	27,58	27,32	23,85	7,20
17,91	19,80	27,60	27,31	23,89	7,18
17,91	19,80	27,64	27,35	23,88	7,19
17,81	19,82	27,57	27,33	23,88	7,21
17,88	19,77	27,57	27,31	23,87	7,19
17,78	19,79	27,56	27,34	23,85	7,19
17,90	19,81	27,61	27,37	23,89	7,17
17,90	19,75	27,63	27,34	23,90	7,18
17,84	19,76	27,59	27,38	23,90	7,17
17,79	19,76	27,57	27,38	23,89	7,18
17,78	19,72	27,58	27,37	23,88	7,17
17,78	19,66	27,60	27,37	23,88	7,19
17,82	19,68	27,63	27,38	23,91	7,18

17,82	19,61	27,64	27,36	23,89	7,17
17,80	19,58	27,61	27,36	23,91	7,18
17,71	19,55	27,60	27,39	23,88	7,20
17,72	19,54	27,60	27,39	23,88	7,24
17,77	19,55	27,64	27,42	23,91	7,22
17,81	19,47	27,64	27,38	23,91	7,23
17,76	19,47	27,62	27,38	23,92	7,24
17,74	19,44	27,60	27,37	23,89	7,23
17,72	19,43	27,61	27,37	23,90	7,22
17,76	19,49	27,61	27,41	23,91	7,21
17,75	19,46	27,63	27,40	23,90	7,22
17,77	19,43	27,63	27,41	23,89	7,22
17,76	19,44	27,63	27,40	23,90	7,22
17,74	19,43	27,64	27,40	23,90	7,19
17,80	19,47	27,67	27,41	23,94	7,21
17,80	19,43	27,67	27,41	23,93	7,20
17,69	19,43	27,61	27,42	23,92	7,19
17,72	19,41	27,60	27,38	23,91	7,16
17,71	19,42	27,59	27,40	23,92	7,17
17,77	19,46	27,64	27,45	23,93	7,12
17,80	19,38	27,64	27,41	23,93	7,13
17,73	19,42	27,64	27,42	23,91	7,13
17,81	19,37	27,64	27,41	23,91	7,11
17,80	19,37	27,64	27,41	23,93	7,11
17,80	19,36	27,65	27,41	23,92	7,03
17,83	19,43	27,63	27,43	23,94	7,04
17,88	19,41	27,68	27,44	23,94	7,05
17,79	19,42	27,66	27,46	23,91	7,21
17,83	19,38	27,64	27,41	23,93	7,18
17,80	19,41	27,63	27,44	23,92	7,19
17,82	19,39	27,68	27,44	23,93	7,15
17,82	19,46	27,67	27,46	23,96	7,13
17,87	19,44	27,69	27,46	23,96	7,20
17,84	19,49	27,66	27,46	23,93	7,17
17,82	19,49	27,66	27,47	23,93	7,12
17,85	19,44	27,70	27,45	23,92	7,06
17,81	19,45	27,67	27,44	23,97	6,96
17,81	19,46	27,68	27,47	23,93	6,88
17,89	19,47	27,72	27,48	23,97	6,59
17,86	19,51	27,70	27,49	23,96	6,55
17,85	19,51	27,71	27,47	23,96	6,56
17,87	19,47	27,70	27,46	23,96	6,57
17,88	19,49	27,72	27,47	23,94	6,34
17,81	19,52	27,70	27,49	23,96	6,36
17,88	19,49	27,72	27,49	23,98	6,37
17,80	19,49	27,69	27,49	23,94	7,43
17,87	19,53	27,75	27,53	23,98	7,25
17,83	19,54	27,74	27,52	23,98	7,23

17,84	19,51	27,76	27,52	23,97	7,22
17,78	19,57	27,73	27,53	23,97	7,19
17,81	19,49	27,76	27,52	23,97	7,21
17,75	19,51	27,72	27,54	23,96	7,20
17,75	19,49	27,72	27,54	23,95	7,16
17,79	19,49	27,77	27,54	23,97	7,13
17,85	19,50	27,75	27,51	24,01	7,15
17,79	19,55	27,77	27,55	23,98	7,14
17,81	19,54	27,75	27,55	23,96	7,14
17,82	19,51	27,76	27,53	23,95	7,14
17,78	19,53	27,72	27,55	23,96	7,13
17,86	19,47	27,75	27,53	23,94	7,10
17,93	19,48	27,79	27,55	23,97	7,09
17,93	19,50	27,80	27,54	23,98	7,09
17,92	19,47	27,78	27,54	23,97	7,07
17,90	19,46	27,78	27,54	23,97	7,06
17,84	19,51	27,78	27,58	23,94	7,02
17,85	19,45	27,79	27,56	23,95	7,22
17,83	19,49	27,75	27,54	23,96	7,16
17,83	19,47	27,76	27,56	23,94	7,05
17,92	19,48	27,80	27,58	23,98	6,89
17,89	19,50	27,79	27,56	23,97	7,33
17,86	19,52	27,77	27,55	23,95	6,99
17,86	19,54	27,76	27,58	23,95	6,63
17,88	19,49	27,80	27,57	23,95	7,15
17,81	19,52	27,77	27,56	23,96	7,19
17,78	19,58	27,76	27,55	23,95	6,91
17,80	19,56	27,75	27,55	23,95	6,64
17,80	19,61	27,79	27,59	23,96	6,20
17,91	19,61	27,80	27,57	23,99	6,05
17,85	19,56	27,81	27,58	23,97	7,58
17,77	19,59	27,81	27,61	23,97	7,51
17,82	19,58	27,79	27,55	23,99	7,30
17,80	19,56	27,85	27,58	23,98	7,58
17,77	19,55	27,83	27,60	24,00	7,52
17,69	19,57	27,79	27,59	23,95	7,28
17,73	19,49	27,83	27,58	24,02	7,57
17,68	19,50	27,82	27,59	23,99	7,19
17,62	19,57	27,84	27,62	23,97	6,95
17,69	19,54	27,87	27,60	24,04	7,16
17,68	19,52	27,90	27,63	24,08	7,11
17,66	19,55	27,87	27,65	24,02	7,04
17,60	19,57	27,85	27,63	24,02	7,09
17,64	19,51	27,86	27,59	24,04	6,84
18,02	19,53	27,82	27,63	24,03	7,22
17,82	19,53	27,82	27,61	24,03	7,23
17,76	19,56	27,81	27,63	24,03	7,24
17,82	19,55	27,86	27,61	24,07	7,26

17,81	19,58	27,90	27,66	24,10	7,28
17,80	19,59	27,89	27,67	24,11	7,28
17,76	19,59	27,87	27,65	24,12	6,22
17,80	19,55	27,89	27,64	24,11	7,20
17,80	19,56	27,86	27,64	24,11	7,15
17,81	19,53	27,88	27,62	24,09	7,10
17,80	19,58	27,86	27,64	24,11	7,07
17,84	19,65	27,89	27,70	24,16	7,23
17,88	19,61	27,94	27,70	24,16	7,22
17,90	19,62	27,91	27,67	24,17	7,21
17,92	19,59	27,93	27,69	24,15	7,18
17,91	19,61	27,92	27,68	24,16	7,16
17,90	19,60	27,93	27,69	24,14	7,14
17,92	19,63	27,92	27,69	24,15	7,13
17,90	19,67	27,95	27,75	24,19	7,12
17,90	19,66	27,94	27,75	24,19	7,11

Flow-D - [ln/min]	NS-Røgtemp -	Ovf-Top - [°C]	Ovf-Bag - [°C]	Ovf-Side-1 - [°C]	Ovf-Side-2 - [°C]
13	24	27	28	29	30
Split train flow rate Flow-D - [ln/min]	EPA Flue gas temperature	Surface temperature Top	Surface temperature Rear	Surface temperature Right side	Surface temperature Left side
7,09	26,8	24,1	23,8	25,9	25,4
7,09	28,0	24,2	23,9	25,9	25,4
7,07	27,8	24,3	24,0	25,9	25,4
7,09	28,1	24,3	24,1	25,9	25,4
7,13	28,9	24,4	24,2	25,9	25,5
7,13	29,6	24,5	24,3	26,0	25,5
7,14	29,3	24,6	24,3	26,0	25,5
7,14	31,1	24,7	24,4	26,1	25,7
7,13	32,9	24,9	24,5	26,1	25,7
7,15	36,4	25,2	24,7	26,2	25,9
7,12	40,4	25,6	24,9	26,3	25,9
7,12	37,0	26,0	25,3	26,4	26,1
7,09	39,0	27,0	26,4	26,6	26,3
7,09	41,3	28,2	27,6	26,9	26,7
7,08	45,4	29,5	29,1	27,4	27,3
7,06	55,6	31,6	31,1	28,1	28,1
7,07	66,1	34,1	33,4	29,0	29,1
7,27	90,8	37,8	36,4	30,2	30,3
7,29	113,8	42,3	40,3	31,6	31,8
7,23	114,7	46,4	44,3	33,3	33,6
7,25	117,7	49,6	47,9	35,6	35,8
7,24	118,2	52,2	51,0	38,2	38,4
7,23	115,4	53,8	53,7	41,1	41,2
7,25	125,2	55,4	56,4	44,3	44,2
7,24	132,8	56,8	59,7	47,7	47,4
7,23	137,2	58,6	63,3	51,3	50,9
7,23	140,5	60,0	67,1	54,8	54,5
7,22	142,8	62,1	70,7	58,5	58,3
7,20	145,1	65,2	74,3	62,2	62,0
7,20	143,8	67,9	78,0	66,0	65,8
7,22	144,5	70,3	81,2	70,0	69,6
7,21	148,2	72,8	84,5	74,1	73,3
7,21	148,9	75,1	87,6	78,3	77,0
7,21	146,8	77,3	90,6	82,4	80,8
7,18	147,3	79,4	93,3	86,6	84,5
7,18	151,3	81,5	96,0	90,7	88,4
7,21	150,6	84,1	98,2	94,9	92,1
7,18	151,5	86,4	100,7	99,0	95,8
7,19	154,0	88,6	102,8	103,0	99,6
7,20	156,6	90,7	105,0	106,9	103,3
7,19	157,6	92,8	107,2	110,8	107,1
7,19	158,6	94,7	109,3	114,5	110,9

7,18	163,8	96,5	111,5	118,1	114,8
7,19	162,7	98,3	113,7	121,7	118,6
7,19	162,1	100,3	115,6	125,2	122,4
7,19	160,3	102,2	117,7	128,6	126,3
7,18	163,9	104,1	119,5	132,0	130,0
7,18	167,1	106,1	121,3	135,4	133,6
7,18	165,7	107,7	123,0	138,6	137,2
7,16	167,8	109,4	125,0	141,8	140,8
7,16	167,5	111,4	126,6	144,8	144,2
7,18	164,8	113,1	128,4	147,6	147,5
7,19	154,4	114,9	130,5	150,5	150,7
7,18	147,0	116,4	132,4	153,3	154,0
7,16	137,8	117,8	134,2	156,0	157,2
7,18	134,6	119,1	135,7	158,6	160,4
7,15	135,3	120,5	136,5	161,1	163,3
7,16	139,6	121,1	136,8	163,4	166,0
7,13	141,1	122,5	137,8	165,7	168,5
7,15	144,3	123,4	138,7	167,7	170,7
7,16	148,5	124,3	139,5	169,5	172,7
7,15	148,5	125,2	140,2	171,2	174,7
7,22	149,8	126,0	141,0	172,8	176,4
7,21	150,0	127,1	141,8	174,3	178,0
7,22	149,0	128,2	142,8	175,7	179,5
7,20	149,1	129,5	144,1	177,0	181,0
7,22	148,6	130,8	145,6	178,3	182,4
7,21	147,3	132,1	146,8	179,6	184,0
7,22	146,2	133,2	148,4	180,8	185,6
7,20	145,5	134,6	150,0	182,0	187,1
7,20	144,9	135,8	151,8	183,1	188,7
7,21	143,1	137,2	153,6	184,3	190,2
7,21	148,1	138,5	155,7	185,6	191,8
7,20	149,6	139,8	157,5	187,0	193,5
7,22	152,4	140,7	159,1	188,5	195,2
7,21	153,8	141,6	160,3	189,9	196,8
7,20	152,5	142,6	161,4	191,2	198,3
7,21	154,3	143,6	162,7	192,4	199,7
7,20	153,3	144,4	163,7	193,5	200,9
7,20	153,4	145,1	164,9	194,5	202,0
7,19	155,2	145,7	165,7	195,5	203,1
7,19	154,6	146,0	166,1	196,4	204,3
7,18	155,8	146,2	166,1	197,3	205,2
7,19	155,7	146,3	165,9	198,0	206,2
7,19	158,7	146,4	165,9	198,5	206,8
7,17	159,1	146,7	165,7	199,0	207,2
7,17	158,5	147,0	165,4	199,3	207,5
7,19	158,3	147,1	165,5	199,6	207,7
7,19	158,1	147,0	165,5	199,7	208,0
7,17	157,7	146,9	165,0	199,8	208,1

7,18	157,6	146,5	164,6	199,9	208,2
7,18	157,6	146,2	164,1	199,8	208,2
7,21	158,4	145,8	163,4	199,6	208,1
7,21	158,2	145,6	162,8	199,3	207,9
7,22	156,5	145,3	162,1	198,9	207,6
7,20	154,9	144,9	161,6	198,5	207,3
7,24	153,6	144,6	161,0	198,0	207,0
7,22	155,2	144,2	160,5	197,6	206,6
7,22	156,3	143,5	160,0	197,1	206,2
7,21	155,7	144,5	160,0	196,5	205,7
7,21	157,1	144,3	160,0	195,9	205,2
7,21	157,5	144,4	160,1	195,4	204,8
7,22	156,6	144,2	160,0	195,0	204,4
7,21	157,5	144,1	159,9	194,7	204,1
7,19	155,6	143,9	159,6	194,4	203,8
7,21	155,8	143,9	159,4	194,1	203,4
7,20	156,3	143,7	159,1	193,8	203,0
7,19	157,1	143,9	158,9	193,5	202,6
7,19	156,8	143,5	158,5	193,2	202,2
7,16	156,4	143,4	158,0	193,0	201,9
7,19	156,3	143,3	157,7	192,8	201,5
7,18	155,3	143,3	157,6	192,5	201,1
7,19	156,7	142,9	157,3	192,3	200,8
7,18	157,6	142,5	157,0	192,1	200,5
7,14	158,2	142,7	156,9	192,0	200,2
7,14	159,0	142,5	156,8	191,8	199,9
7,14	159,6	142,0	156,7	191,6	199,5
7,21	159,6	142,8	156,8	191,4	199,2
7,22	159,2	142,7	157,3	191,3	198,9
7,21	158,3	142,6	157,3	191,3	198,8
7,19	158,1	142,2	157,4	191,3	198,8
7,16	158,1	141,9	157,5	191,5	198,7
7,20	157,9	141,4	157,1	191,6	198,8
7,20	159,2	141,1	156,7	191,7	198,7
7,20	160,1	140,5	156,1	191,8	198,6
7,20	162,2	140,1	155,7	191,9	198,5
7,20	160,2	139,5	155,1	191,9	198,2
7,20	161,3	138,9	154,4	191,8	198,0
7,18	160,9	139,5	153,9	191,6	197,6
7,20	159,7	139,5	153,7	191,3	197,3
7,19	159,2	139,3	153,7	191,1	196,9
7,18	160,0	139,0	153,4	191,0	196,7
7,18	160,9	139,1	153,1	190,8	196,5
7,19	159,7	139,2	153,1	190,6	196,2
7,18	158,9	139,4	153,3	190,5	196,1
7,19	160,1	139,7	153,6	190,3	196,0
7,18	160,6	139,9	154,1	190,2	196,0
7,19	159,2	140,1	154,7	190,3	196,1

7,18	159,2	140,1	155,1	190,5	196,4
7,19	159,6	140,3	155,7	190,9	196,7
7,19	161,2	140,5	156,2	191,3	197,2
7,19	159,6	141,1	156,9	191,9	197,7
7,19	158,7	141,7	157,8	192,6	198,2
7,19	160,3	142,2	158,7	193,4	198,9
7,19	158,9	142,7	159,5	194,2	199,6
7,20	160,0	143,0	160,5	195,0	200,3
7,17	159,6	143,5	161,2	195,9	201,2
7,17	159,3	144,1	161,9	196,6	202,0
7,19	160,1	144,5	162,7	197,5	202,7
7,17	161,1	144,8	163,7	198,4	203,6
7,18	160,6	145,0	164,7	199,3	204,5
7,18	162,2	145,6	165,6	200,2	205,4
7,19	160,8	146,0	166,5	201,1	206,3
7,18	160,4	146,3	167,4	202,0	207,2
7,19	160,6	146,5	168,3	202,9	208,1
7,28	160,4	146,9	169,1	203,8	209,0
7,28	161,2	147,3	170,3	204,8	210,0
7,27	160,6	148,0	171,2	205,8	211,0
7,27	160,6	148,4	172,1	206,7	212,0
7,28	160,8	149,0	172,9	207,6	212,9
7,27	162,0	149,6	174,2	208,5	213,8
7,28	161,6	150,2	175,2	209,4	214,9
7,26	162,3	150,6	176,2	210,2	215,9
7,28	163,8	151,2	177,2	211,1	216,9
7,27	161,9	151,6	178,1	212,0	217,8
7,27	162,5	152,2	179,1	212,9	218,9
7,27	163,3	152,8	180,0	213,6	220,1
7,27	163,1	153,3	181,0	214,6	221,1
7,27	163,9	153,7	182,0	215,4	222,2
7,27	165,9	154,3	183,0	216,2	223,3
7,26	166,4	154,6	184,1	217,2	224,4
7,27	167,5	154,9	185,0	218,0	225,6
7,28	165,7	155,4	185,9	218,9	226,8
7,26	166,8	155,8	187,1	219,8	227,7
7,25	167,8	156,4	188,0	220,7	228,8
7,27	167,1	157,2	188,8	221,5	229,9
7,27	168,0	157,8	190,0	222,4	230,9
7,27	167,6	158,4	190,9	223,2	232,0
7,24	167,4	159,0	192,0	224,1	233,1
7,25	168,3	159,6	193,3	225,0	234,2
7,26	168,3	160,4	194,3	226,0	235,3
7,25	167,3	161,0	195,5	226,9	236,4
7,22	169,4	161,7	196,9	227,9	237,6
7,24	170,1	162,2	198,3	229,1	238,3
7,21	168,9	162,8	199,4	230,1	239,2
7,21	170,3	163,3	200,8	231,2	240,1

7,22	171,3	164,0	202,0	232,2	241,1
7,22	169,5	164,6	203,3	233,3	242,0
7,17	169,5	165,2	204,5	234,4	242,9
7,17	169,2	165,7	205,6	235,6	244,0
7,16	169,7	166,2	207,0	236,7	245,1
7,13	169,0	166,9	208,0	237,8	246,2
7,13	170,7	167,6	208,9	239,0	247,4
7,15	168,4	167,8	209,8	240,0	248,6
7,18	166,6	168,4	210,9	241,2	249,7
7,15	167,8	168,8	211,8	242,3	250,8
7,18	167,7	169,3	212,9	243,4	251,5
7,17	166,4	169,9	213,9	244,4	252,7
7,16	165,8	170,1	214,7	245,5	253,6
7,16	165,9	170,8	215,6	246,4	254,5
7,14	165,8	171,3	216,5	247,3	255,3
7,13	165,1	171,5	217,3	248,1	256,3

Ovf-Bund - [°C]	Kanal-EPA - [°C]	Røgtræk - [Pa]	Pd Kanal - [Pa]	Ps Kanal - [Pa]	Vægt - [Kg]
31	36	38	39	40	43
Surface temperature Bottom	EPA Duct temperature	Flue draft Pascals	Duct dynamic pressure	Duct static pressure	Platform scale reading
24,7	25,5	1,2	30,1	46,0	1,234
24,7	25,5	1,0	30,5	46,0	1,545
24,7	25,6	0,9	30,4	45,3	1,544
24,7	25,6	1,1	30,2	45,0	1,543
24,7	25,6	0,8	30,2	46,2	1,541
24,7	25,6	1,4	30,1	45,3	1,540
24,7	25,6	1,1	29,8	45,3	1,535
24,7	25,6	1,3	29,1	46,4	1,534
24,7	25,6	1,6	30,2	44,9	1,530
24,7	25,6	2,0	30,1	45,6	1,527
24,7	25,6	2,4	29,8	45,8	1,483
24,7	25,6	1,5	30,1	44,5	1,518
24,7	25,6	2,0	29,8	46,0	1,509
24,7	25,6	1,9	29,4	45,1	1,502
24,7	25,6	2,7	28,8	44,8	1,492
24,7	25,6	3,4	29,6	45,3	1,478
24,7	25,6	4,5	29,9	45,9	1,463
24,7	25,7	6,6	29,0	45,2	1,438
24,7	25,7	7,8	29,9	45,1	1,412
24,8	25,6	7,8	29,8	44,9	1,397
24,7	25,6	8,3	29,6	44,9	1,371
24,7	25,6	8,2	29,7	45,1	1,352
24,7	25,7	8,5	29,6	45,2	1,328
24,7	25,9	8,6	29,9	45,8	1,303
24,7	26,0	9,2	30,4	45,4	1,281
24,7	26,2	9,2	30,5	45,5	1,243
24,7	26,4	9,6	29,7	45,3	1,216
24,7	26,7	9,6	29,6	45,3	1,182
24,7	27,1	9,8	29,1	45,3	1,151
24,7	27,5	9,7	29,3	46,0	1,132
24,7	27,4	9,7	30,8	46,3	1,103
24,7	27,3	9,7	30,7	47,1	1,075
24,7	27,2	10,1	30,7	46,4	1,049
24,7	27,1	9,7	30,8	47,7	1,026
24,7	27,2	9,8	30,6	47,2	1,006
24,7	27,5	10,0	31,3	46,4	0,979
24,8	27,7	9,8	31,3	47,0	0,960
24,8	28,0	10,2	31,2	46,7	0,939
24,7	28,4	10,2	31,0	47,1	0,913
24,8	28,7	10,2	30,6	47,2	0,891
24,7	29,2	9,9	30,5	46,7	0,867
24,8	29,4	10,1	30,7	47,0	0,846

24,8	29,6	10,7	31,0	47,2	0,821
24,8	29,6	10,8	30,8	47,2	0,799
24,8	29,6	10,3	30,8	47,0	0,788
24,9	29,5	10,3	31,0	47,3	0,765
24,9	29,5	10,7	30,4	47,1	0,742
24,9	29,5	10,8	31,1	47,0	0,716
25,0	29,5	11,0	31,7	48,4	0,693
25,0	29,8	10,8	31,2	47,4	0,671
25,1	29,9	10,7	31,0	48,0	0,649
25,2	30,0	10,9	31,2	47,5	0,626
25,2	30,1	10,9	30,7	47,7	0,602
25,3	30,1	10,7	31,2	47,8	0,582
25,4	30,3	10,8	31,3	46,9	0,562
25,5	30,4	11,1	31,1	47,9	0,792
25,5	30,4	11,4	31,4	46,8	1,997
25,6	30,6	11,6	30,2	47,1	3,655
25,8	30,7	11,3	30,1	47,6	3,631
25,9	30,9	11,2	30,6	47,3	3,609
26,0	30,9	11,3	32,3	48,5	3,591
26,1	31,0	10,4	30,8	48,2	3,578
26,3	31,1	10,8	31,1	47,3	3,559
26,4	31,1	11,0	30,9	46,7	3,541
26,5	31,1	11,3	30,9	48,1	3,517
26,6	31,2	11,5	30,8	47,2	3,498
26,7	31,3	11,2	31,1	46,9	3,479
26,8	31,6	11,8	30,8	47,5	3,459
26,9	31,7	11,6	30,5	47,4	3,436
27,0	31,9	11,7	31,0	47,6	3,416
27,1	32,0	11,1	31,9	48,2	3,393
27,2	32,0	11,4	30,3	46,6	3,368
27,4	32,1	11,8	31,6	47,4	3,344
27,5	32,1	11,7	31,5	47,2	3,324
27,7	32,2	11,7	31,2	47,2	3,308
27,8	32,6	11,3	31,4	47,5	3,294
28,0	32,7	11,4	30,5	47,1	3,274
28,1	33,6	11,5	31,1	47,8	3,252
28,3	37,1	11,3	30,7	48,2	3,238
28,5	37,4	11,4	30,9	48,1	3,224
28,7	36,1	11,2	30,7	47,7	3,230
28,8	35,1	10,9	31,4	47,9	3,214
29,1	34,4	10,8	31,1	46,8	3,202
29,3	34,1	10,8	30,8	46,6	3,192
29,5	34,0	11,1	30,2	47,6	3,177
29,7	33,9	11,0	30,2	47,1	3,162
29,9	33,9	10,6	30,8	47,3	3,148
30,1	34,0	10,7	30,4	46,2	3,132
30,3	34,0	10,9	31,0	47,4	3,121
30,5	34,0	10,7	31,0	47,8	3,109

30,8	34,0	10,6	31,3	47,7	3,099
31,0	34,0	10,3	30,2	47,7	3,090
31,3	34,1	10,4	32,0	48,0	3,080
31,6	34,0	10,3	31,2	47,1	3,066
31,8	34,0	10,3	30,3	47,7	3,054
32,1	34,0	10,3	30,9	47,2	3,043
32,3	34,1	9,9	30,4	46,8	3,031
32,6	34,2	9,6	30,1	46,2	3,020
32,8	34,3	11,7	30,9	47,2	3,005
32,9	34,4	10,5	29,5	46,6	2,968
33,2	34,6	12,7	31,0	48,2	2,942
33,5	34,5	10,5	30,2	46,2	2,936
33,8	34,5	10,4	30,6	46,2	2,925
34,1	34,6	10,0	30,6	47,5	2,917
34,5	34,6	11,0	30,6	48,0	2,903
34,9	34,6	10,6	31,2	47,4	2,884
35,3	34,5	10,1	30,5	47,1	2,821
35,6	34,6	10,6	30,4	47,7	2,852
36,1	34,6	10,3	30,4	46,4	2,837
36,5	34,7	10,7	30,8	47,2	2,825
36,9	34,9	10,5	30,1	47,2	2,847
37,4	35,0	10,5	31,6	48,3	2,792
37,9	35,1	10,4	30,3	47,9	2,776
38,4	34,9	10,1	30,5	47,9	2,764
38,8	35,0	11,4	30,9	47,9	2,747
39,3	34,9	10,6	31,1	47,8	2,727
39,9	34,8	10,2	30,2	46,8	2,712
40,1	34,8	11,7	30,9	47,4	2,693
40,7	34,9	10,7	29,8	46,9	2,665
41,3	34,9	10,6	31,0	48,0	2,646
41,8	35,0	10,5	31,1	47,7	2,629
42,4	35,0	10,5	31,0	47,3	2,612
43,0	35,0	10,2	31,3	47,8	2,599
43,5	35,0	10,1	30,2	47,1	2,587
44,0	35,2	9,9	32,1	48,4	2,576
44,6	35,2	9,9	30,2	47,5	2,567
45,0	35,3	9,9	31,4	47,8	2,559
45,5	35,3	9,4	30,0	47,0	2,553
45,3	35,2	11,4	31,8	47,6	2,521
45,8	35,1	10,1	31,0	46,6	2,497
46,3	35,2	10,1	31,3	47,7	2,483
46,8	35,1	9,8	31,6	48,7	2,470
46,9	34,9	10,3	31,7	48,1	2,464
47,4	35,0	10,6	30,7	47,6	2,437
47,9	35,1	10,7	31,4	47,3	2,412
48,4	35,2	10,6	30,8	47,0	2,391
48,9	35,0	10,6	31,0	47,5	2,371
49,3	35,0	10,9	31,9	48,3	2,348

49,8	35,0	10,9	31,1	47,9	2,328
50,3	35,1	11,0	30,8	47,8	2,307
50,6	35,2	10,9	32,1	48,6	2,282
51,1	35,3	11,0	30,9	47,9	2,257
51,5	35,4	10,8	31,4	48,0	2,239
51,8	35,5	10,8	29,9	47,4	2,213
52,1	35,5	11,2	31,1	47,8	2,189
52,6	35,5	11,1	30,3	47,1	2,167
52,9	35,6	11,3	30,9	48,2	2,144
53,2	35,6	10,9	31,4	48,3	2,120
53,4	35,5	11,4	31,8	48,1	2,095
53,7	35,5	10,9	30,1	47,2	2,075
53,9	35,4	11,3	29,6	47,5	2,050
54,2	35,6	11,4	30,9	46,8	2,026
54,4	35,6	11,1	30,9	46,9	2,003
54,6	35,7	11,3	31,6	47,6	1,980
54,9	35,7	11,2	31,2	47,4	1,957
55,1	35,8	11,4	31,1	47,9	1,935
55,3	35,7	11,4	30,6	46,8	1,911
55,6	35,8	11,5	30,4	47,4	1,886
55,8	35,8	11,6	30,9	48,3	1,861
56,0	35,8	11,5	29,9	47,2	1,838
56,2	35,7	11,5	31,3	47,7	1,814
56,5	35,7	11,2	29,5	46,6	1,794
56,6	35,9	11,3	30,5	47,6	1,770
56,8	36,0	11,5	31,1	48,0	1,747
57,0	35,9	11,6	31,1	47,6	1,723
57,1	35,9	11,2	31,1	47,0	1,698
57,3	35,9	11,4	31,2	47,3	1,676
57,4	36,0	11,3	30,5	47,3	1,653
57,6	36,0	11,5	30,7	46,9	1,631
57,8	36,1	11,7	31,1	47,6	1,607
58,0	36,2	11,9	30,9	47,5	1,585
58,2	36,4	11,6	30,1	46,6	1,563
58,4	36,3	11,7	28,8	47,1	1,541
58,5	36,2	11,7	30,4	46,4	1,518
58,7	36,2	11,2	30,4	46,2	1,494
58,8	36,2	11,9	29,3	47,3	1,467
59,0	36,1	11,7	30,1	46,4	1,445
59,1	36,2	11,8	31,1	48,4	1,419
59,2	36,3	11,5	31,0	47,7	1,394
59,5	36,4	11,9	31,5	48,4	1,369
59,6	36,5	11,8	29,6	47,3	1,343
59,7	36,3	11,8	30,8	47,0	1,320
59,9	36,2	11,9	30,6	46,9	1,295
60,0	36,2	11,8	30,5	47,8	1,270
60,2	36,3	11,6	31,6	47,8	1,248
60,3	36,3	12,0	29,9	46,8	1,225

60,5	36,2	11,9	31,0	47,9	1,200
60,7	36,2	11,8	30,4	47,2	1,178
60,8	36,2	12,0	30,9	46,9	1,151
61,0	36,3	12,4	30,9	47,5	1,125
61,2	36,3	12,2	30,6	47,0	1,104
61,3	36,3	12,0	30,6	47,0	1,080
61,5	36,3	12,0	31,2	47,3	1,059
61,8	36,4	12,2	30,5	47,2	1,036
62,0	36,3	12,0	30,0	46,7	1,013
62,2	36,4	12,2	32,0	48,1	0,994
62,4	36,5	11,9	30,5	46,6	0,974
62,6	36,6	11,5	30,5	47,5	0,952
62,8	36,5	11,7	30,2	47,5	0,933
63,0	36,4	12,1	31,0	47,3	0,911
63,2	36,4	12,1	30,5	47,1	0,890
63,4	36,4	12,0	31,0	47,6	0,868
					0,850

CO-Lav - [100ppm]	CO-Høj - [%]	CO2 - [%]
44	45	46
CO low range	CO high range	CO2 - [%]
-0,01	0,01	0,08
1,54	0,01	0,49
2,03	0,02	0,41
12,18	0,12	0,42
11,55	0,11	0,44
17,32	0,17	0,49
16,84	0,17	0,50
14,69	0,15	0,65
14,88	0,15	0,73
12,68	0,13	1,00
13,81	0,14	1,13
13,54	0,14	1,49
12,58	0,13	5,58
12,07	0,12	7,40
12,08	0,12	7,52
9,66	0,09	8,43
7,99	0,08	8,52
11,06	0,11	9,66
8,50	0,09	11,36
8,55	0,09	10,95
8,80	0,09	9,92
8,58	0,09	9,67
8,48	0,09	8,88
9,15	0,09	9,58
6,16	0,06	10,04
7,56	0,08	10,83
7,86	0,08	10,26
7,07	0,07	10,27
8,11	0,08	10,19
7,83	0,08	10,12
6,94	0,07	9,71
7,86	0,08	9,84
7,36	0,07	10,08
7,44	0,08	9,38
8,55	0,08	9,09
6,80	0,08	8,97
4,58	0,09	9,33
4,48	0,08	9,23
5,50	0,08	9,25
8,16	0,08	9,19
7,58	0,07	9,53
7,65	0,06	9,08

7,69	0,07	9,17
7,41	0,07	9,51
5,09	0,05	9,13
6,05	0,07	8,92
7,68	0,06	8,96
6,94	0,06	9,30
7,83	0,08	8,86
6,10	0,07	9,19
7,01	0,07	8,85
9,22	0,07	9,12
7,81	0,07	9,89
5,68	0,06	9,18
6,11	0,06	9,00
6,18	0,07	3,89
8,02	0,08	6,41
7,86	0,08	6,96
6,97	0,07	6,81
6,11	0,06	7,57
5,02	0,05	8,00
14,94	0,15	8,83
20,59	0,21	9,77
22,44	0,26	9,67
16,58	0,17	9,46
14,86	0,15	9,58
12,33	0,13	9,23
6,51	0,07	8,60
6,66	0,07	8,95
7,68	0,08	8,60
5,05	0,07	8,25
5,90	0,05	8,17
8,81	0,09	7,76
10,78	0,11	7,58
16,58	0,17	8,26
22,44	0,26	8,98
22,44	0,31	9,56
22,44	0,32	9,93
22,44	0,33	9,42
22,44	0,26	9,32
22,44	0,21	9,44
15,16	0,15	9,12
10,10	0,10	9,02
12,53	0,13	9,05
12,95	0,13	8,95
9,44	0,10	9,27
11,06	0,11	9,65
10,86	0,11	9,85
12,16	0,12	9,51
12,43	0,12	9,39

8,84	0,09	9,35
8,86	0,08	9,59
7,06	0,07	9,53
8,84	0,08	9,44
9,57	0,10	9,33
10,21	0,11	9,61
10,29	0,11	9,17
14,01	0,14	8,32
15,32	0,16	8,34
20,94	0,21	8,95
16,83	0,17	9,00
21,61	0,22	9,39
22,44	0,29	9,66
22,44	0,27	9,66
22,44	0,27	9,63
22,44	0,24	9,47
18,54	0,19	9,44
13,99	0,14	9,36
12,76	0,13	9,45
10,96	0,11	9,53
12,11	0,12	9,58
10,81	0,11	9,69
16,88	0,17	9,56
16,64	0,17	9,55
15,11	0,15	9,56
14,59	0,15	9,81
12,81	0,13	9,97
13,94	0,14	10,20
13,88	0,14	10,38
12,67	0,13	10,14
11,55	0,12	10,15
11,32	0,12	10,22
8,32	0,09	10,12
8,09	0,08	10,06
10,79	0,11	10,18
8,42	0,09	11,03
8,97	0,09	11,09
9,32	0,09	10,93
8,44	0,09	10,77
8,65	0,09	10,41
8,89	0,09	10,16
5,55	0,06	10,14
8,14	0,08	10,04
8,23	0,08	10,06
7,11	0,07	10,30
8,24	0,08	10,17
8,36	0,08	10,07
7,14	0,07	10,08

9,17	0,08	10,08
7,16	0,07	10,23
8,52	0,08	10,19
8,86	0,08	10,30
6,94	0,08	10,20
7,35	0,09	10,25
7,32	0,08	10,24
8,09	0,08	10,20
7,40	0,08	10,29
6,42	0,07	10,32
9,17	0,06	10,34
8,51	0,07	10,38
7,62	0,07	10,41
7,07	0,05	10,47
5,94	0,07	10,46
6,44	0,06	10,46
5,91	0,06	10,41
7,39	0,08	10,36
7,30	0,07	10,32
6,64	0,07	10,32
6,59	0,07	10,27
6,78	0,07	10,29
6,24	0,06	10,31
6,36	0,06	10,42
6,97	0,07	10,52
7,59	0,08	10,53
7,84	0,08	10,63
6,83	0,07	10,71
6,16	0,06	10,78
7,15	0,07	10,88
6,45	0,06	10,97
6,33	0,07	10,95
5,09	0,05	10,99
5,19	0,05	11,10
4,11	0,04	11,26
4,89	0,05	11,22
4,06	0,04	11,32
4,19	0,04	11,40
4,12	0,04	11,30
2,87	0,03	11,37
3,22	0,05	11,30
3,99	0,04	11,40
3,87	0,04	11,43
3,32	0,04	11,44
3,68	0,04	11,43
3,89	0,04	11,55
2,82	0,03	11,46
2,45	0,02	11,42

3,08	0,03	11,46
3,27	0,03	11,47
3,51	0,03	11,53
3,56	0,03	11,49
3,14	0,03	11,51
3,40	0,03	11,41
3,96	0,04	11,27
2,91	0,04	11,03
3,91	0,04	10,81
3,88	0,04	10,42
2,65	0,03	10,36
2,50	0,05	10,35
2,46	0,04	10,27
2,86	0,03	10,28
3,63	0,04	10,28
4,67	0,05	10,18

Annex 22

Title: LF logger data the 020920

Pages total: 65, excl this cover page

Datotid	Rum - [°C]	Filter-1-H - [°C]	Filter-2-D1 - [°C]	Filter-3-D2 - [°C]	Filter-4-R - [°C]
	1	2	3	4	5
Time	Ambient temperature	Main train filter temp	Split train 1H filter temp	Split train remain. filter temp	Room blank filter temp
14:06:00	Start of test				
14:06:20	24,46	29,88	30,00	25,02	25,44
14:06:50	24,43	29,75	29,58	24,97	25,44
14:07:20	24,48	29,58	29,48	24,94	25,49
14:07:50	24,40	29,61	29,41	25,12	25,62
14:08:20	24,31	29,58	29,24	24,90	25,60
14:08:50	24,15	29,26	29,19	24,75	25,64
14:09:20	24,44	29,35	29,05	24,93	25,60
14:09:50	24,33	29,14	29,03	24,90	25,70
14:10:20	24,22	29,03	28,90	25,16	25,69
14:10:50	24,32	29,06	29,21	24,83	25,67
14:11:20	24,32	28,90	29,44	24,95	25,72
14:11:50	24,47	29,41	29,31	24,90	25,67
14:12:20	24,41	29,70	29,23	25,06	25,67
14:12:50	24,33	29,75	29,29	25,28	25,79
14:13:20	24,25	29,78	29,08	25,00	25,72
14:13:50	24,19	29,75	28,94	25,02	25,69
14:14:20	24,44	29,66	28,86	24,89	25,71
14:14:50	24,46	29,61	29,35	24,96	25,76
14:15:20	24,33	29,56	29,49	25,13	25,71
14:15:50	24,44	29,42	29,43	25,28	25,71
14:16:20	24,71	29,14	29,43	25,05	25,77
14:16:50	24,72	29,20	29,33	25,07	25,75
14:17:20	24,59	29,21	29,21	25,02	25,74
14:17:50	24,32	29,01	29,14	25,14	25,76
14:18:20	24,55	28,80	29,02	24,90	25,79
14:18:50	24,46	29,18	28,94	24,81	25,78
14:19:20	24,62	29,64	29,23	24,88	25,77
14:19:50	24,63	29,73	29,32	24,86	25,76
14:20:20	24,53	29,66	29,25	24,84	25,73
14:20:50	24,34	29,61	29,12	25,14	25,69
14:21:20	24,41	29,59	29,09	24,93	25,73
14:21:50	24,23	29,53	29,00	25,17	25,78
14:22:20	24,26	29,42	28,89	24,98	25,75
14:22:50	24,27	29,23	29,28	24,96	25,76
14:23:20	24,53	29,02	29,56	24,89	25,78
14:23:50	24,19	28,94	29,64	24,81	25,80
14:24:20	24,41	28,96	29,60	24,96	25,80
14:24:50	24,39	29,14	29,44	24,83	26,49
14:25:20	24,64	29,54	29,36	25,05	26,61
14:25:50	24,38	29,56	29,26	24,83	26,66
14:26:20	24,46	29,61	29,10	24,77	26,58
14:26:50	24,46	29,67	28,96	24,81	26,52

14:27:20	24,66	29,51	29,00	24,84	26,57
14:27:50	24,72	29,47	29,28	25,20	26,53
14:28:20	24,54	29,34	29,51	25,00	26,51
14:28:50	24,46	29,18	29,54	24,87	26,49
14:29:21	24,44	29,18	29,42	24,93	26,44
14:29:50	24,56	29,11	29,33	24,90	26,38
14:30:21	24,59	28,96	29,26	24,83	26,41
14:30:51	24,62	28,94	29,21	24,81	26,42
14:31:21	24,43	29,08	29,06	24,79	26,36
14:31:51	24,33	29,31	28,90	24,76	26,27
14:32:21	24,57	29,23	29,18	24,73	26,26
14:32:51	24,51	29,16	29,59	24,82	26,24
14:33:21	24,50	29,22	29,67	24,91	26,20
14:33:51	24,48	29,19	29,67	25,01	26,24
14:34:21	24,31	28,99	29,58	24,79	26,22
14:34:51	24,45	28,99	29,42	24,74	26,16
14:35:21	24,68	29,12	29,34	24,85	26,21
14:35:51	24,54	29,32	29,17	24,94	26,15
14:36:21	24,55	29,31	29,11	24,85	26,16
14:36:51	24,73	29,29	28,99	24,85	26,16
14:37:21	24,69	29,23	29,00	24,77	26,17
14:37:51	24,63	29,13	29,40	24,83	26,13
14:38:21	24,67	29,05	29,64	24,82	26,12
14:38:51	24,32	29,03	29,56	24,82	26,06
14:39:21	24,18	28,97	29,48	24,74	26,04
14:39:51	24,30	29,23	29,41	24,73	26,06
14:40:21	24,46	29,46	29,23	24,79	26,01
14:40:51	24,57	29,55	29,15	24,87	26,01
14:41:21	24,64	29,34	29,15	24,85	26,12
14:41:51	24,71	29,25	29,03	24,82	26,10
14:42:21	24,66	29,26	29,07	24,83	26,02
14:42:51	24,42	29,23	29,41	24,80	25,99
14:43:21	24,47	28,99	29,55	24,74	26,03
14:43:51	24,61	28,96	29,47	24,73	26,00
14:44:21	24,74	28,99	29,37	24,81	25,97
14:44:51	24,55	29,38	29,23	24,83	25,92
14:45:21	24,49	29,36	29,16	24,80	25,97
14:45:51	24,53	29,52	29,03	24,88	25,96
14:46:21	24,62	29,33	29,00	24,82	26,01
14:46:51	24,46	29,25	29,32	24,77	26,01
14:47:21	24,53	29,15	29,61	24,77	26,00
14:47:51	24,80	29,07	29,64	24,76	25,99
14:48:21	24,59	28,95	29,58	24,90	25,96
14:48:51	24,59	28,98	29,42	24,95	25,92
14:49:21	24,51	29,04	29,31	24,84	25,92
14:49:51	24,60	29,38	29,13	24,87	25,88
14:50:21	24,70	29,47	29,12	24,90	25,94
14:50:51	24,89	29,56	29,05	25,05	25,98

14:51:21	24,41	29,61	28,98	25,01	25,94
14:51:51	24,62	29,38	29,44	24,90	25,98
14:52:21	24,50	29,42	29,54	25,02	25,93
14:52:51	24,52	29,22	29,52	24,99	25,98
14:53:21	24,45	29,24	29,37	24,99	25,91
14:53:51	24,45	29,10	29,30	24,92	25,92
14:54:21	24,45	28,93	29,24	24,85	25,99
14:54:51	24,28	28,93	29,02	24,87	25,90
14:55:21	24,44	29,37	28,89	25,12	25,90
14:55:51	24,60	29,62	28,97	25,02	25,91
14:56:21	24,75	29,75	29,27	24,94	25,96
14:56:51	24,54	29,71	29,38	24,90	26,00
14:57:21	24,65	29,62	29,27	24,93	25,96
14:57:51	24,70	29,55	29,21	24,96	25,95
14:58:21	24,74	29,36	29,12	24,92	25,97
14:58:51	24,45	29,36	28,96	24,93	25,92
14:59:21	24,42	29,26	29,08	24,94	25,91
14:59:51	24,62	29,08	29,41	25,00	25,90
15:00:21	24,72	28,94	29,49	24,98	25,92
15:00:51	24,72	28,84	29,44	25,06	25,93
15:01:21	24,81	28,99	29,38	25,10	25,96
15:01:51	24,79	29,30	29,27	25,19	25,96
15:02:21	24,69	29,26	29,17	25,15	25,97
15:02:51	24,67	29,32	29,04	25,19	25,93
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17:33:23	24,26	29,45	24,00	30,06	25,20
17:33:53	24,18	29,32	24,01	29,95	25,19
17:34:23	24,11	29,21	24,01	29,83	25,19
17:34:53	24,21	29,04	24,09	29,63	25,27
17:35:23	24,33	29,43	24,13	29,55	25,26
17:35:53	24,38	29,66	24,12	29,44	25,26
17:36:23	24,44	29,65	24,10	29,66	25,23
17:36:53	24,43	29,63	24,23	29,98	25,19
17:37:23	24,20	29,50	24,25	29,98	25,21
17:37:53	24,11	29,40	24,18	29,92	25,22
17:38:23	24,24	29,20	24,25	29,80	25,27
17:38:53	24,39	29,12	24,26	29,69	25,24

17:39:23	24,40	29,09	24,12	29,56	25,29
17:39:53	24,27	29,49	24,32	29,39	25,30
17:40:23	24,18	29,75	24,14	29,51	25,28
17:40:53	24,29	29,80	24,18	30,06	25,31
17:41:23	24,32	29,68	24,26	30,23	25,34
17:41:53	24,26	29,60	24,24	30,19	25,35
17:42:23	24,26	29,60	24,18	30,15	25,31
17:42:53	24,24	29,37	24,20	29,96	25,30
17:43:23	24,14	29,16	24,22	29,75	25,32
17:43:53	24,26	29,13	24,24	29,69	25,27
17:44:23	24,19	29,10	24,18	29,56	25,26
17:44:53	24,16	29,32	24,23	29,38	25,32
17:45:23	24,24	29,55	24,22	29,45	25,30
17:45:53	24,34	29,48	24,32	29,90	25,35
17:46:23	24,32	29,38	24,34	30,05	25,38
17:46:53	24,25	29,38	24,16	30,08	25,33
17:47:23	24,28	29,36	24,18	30,05	25,31
17:47:53	24,34	29,14	24,31	29,87	25,40
17:48:23	24,24	29,05	24,28	29,73	25,39
17:48:53	24,27	29,55	24,15	29,67	25,37
17:49:23	24,31	29,82	24,28	29,54	25,39
17:49:53	24,36	29,83	24,31	29,37	25,42
17:50:23	24,26	29,89	24,16	29,83	25,35
17:50:53	24,27	29,68	24,23	30,02	25,36
17:51:23	24,20	29,54	24,21	30,02	25,36
17:51:53	24,15	29,58	24,14	30,03	25,31
17:52:23	24,28	29,32	24,28	29,85	25,37
17:52:53	24,24	29,25	24,28	29,76	25,37
17:53:23	24,27	29,11	24,28	29,59	25,38
17:53:53	24,26	29,10	24,22	29,53	25,36
17:54:23	24,23	29,22	24,38	29,35	25,41
17:54:53	24,22	29,63	24,28	29,57	25,37
17:55:23	24,19	29,78	24,19	29,94	25,34
17:55:53	24,29	29,83	24,23	30,06	25,34
17:56:23	24,44	29,71	24,34	29,99	25,39
17:56:53	24,43	29,57	24,35	29,87	25,43
17:57:23	24,31	29,53	24,22	29,77	25,40
17:57:53	24,23	29,43	24,20	29,65	25,37
17:58:23	24,37	29,23	24,32	29,48	25,46
17:58:53	24,37	29,17	24,29	29,42	25,42
17:59:23	24,41	29,18	24,35	29,94	25,46
17:59:53	24,40	29,58	24,35	30,21	25,43
18:00:23	24,38	29,70	24,30	30,23	25,42
18:00:53	24,39	29,75	24,27	30,16	25,44
18:01:23	24,23	29,67	24,18	30,02	25,35
18:01:53	24,22	29,56	24,14	29,88	25,37
18:02:23	24,27	29,43	24,25	29,75	25,40
18:02:53	24,21	29,31	24,18	29,62	25,38

18:03:23	24,24	29,21	24,26	29,47	25,39
18:03:53	24,20	29,10	24,21	29,38	25,35
18:04:23	24,26	29,04	24,23	29,65	25,39
18:04:53	24,42	29,27	24,35	30,02	25,37
18:05:23	24,37	29,43	24,34	30,13	25,36
18:05:53	24,34	29,45	24,28	30,07	25,42
18:06:23	24,45	29,39	24,34	29,97	25,44
18:06:53	24,49	29,30	24,40	29,85	25,46
18:07:23	24,47	29,19	24,32	29,75	25,42
18:07:53	24,40	29,12	24,36	29,61	25,42
18:08:23	24,45	29,24	24,54	29,47	25,46
18:08:53	24,35	29,63	24,43	29,38	25,46
18:09:23	24,37	29,83	24,29	29,66	25,40
18:09:53	24,42	29,75	24,42	29,66	25,48
18:10:23	24,52	29,68	24,41	29,64	25,48
18:10:53	24,41	29,66	24,32	29,59	25,42
18:11:23	24,31	29,51	24,36	29,44	25,46
18:11:53	24,46	29,35	24,43	29,49	25,52
18:12:23	24,37	29,17	24,38	29,75	25,48
18:12:53	24,45	29,06	24,45	29,85	25,47
18:13:23	24,39	28,90	24,36	29,76	25,49
18:13:53	24,45	29,41	24,38	29,71	25,42
18:14:23	24,38	29,64	24,37	29,60	25,47
18:14:53	24,26	29,71	24,25	29,49	25,42
18:15:23	24,38	29,59	24,38	29,34	25,46
18:15:53	24,37	29,47	24,37	29,55	25,48
18:16:23	24,37	29,39	24,33	29,88	25,47
18:16:53	24,36	29,27	24,41	29,95	25,47
18:17:23	24,24	29,25	24,37	29,92	25,45
18:17:53	24,31	29,18	24,34	29,86	25,40
18:18:24	24,42	29,00	24,45	29,70	25,47
18:18:54	24,40	29,33	24,41	29,59	25,44
18:19:24	24,28	29,71	24,28	29,49	25,43
18:19:54	24,41	29,72	24,47	29,38	25,47
18:20:24	24,44	29,69	24,42	29,70	25,48
18:20:54	24,44	29,63	24,48	29,88	25,47
18:21:24	24,47	29,54	24,46	29,89	25,45
18:21:54	24,49	29,43	24,42	29,81	25,48
18:22:24	24,48	29,31	24,42	29,70	25,46
18:22:54	24,47	29,15	24,52	29,55	25,51
18:23:24	24,38	29,10	24,42	29,44	25,48
18:23:54	24,40	29,28	24,27	29,42	25,44
18:24:24	24,40	29,59	24,31	29,80	25,50
18:24:54	24,45	29,73	24,35	29,98	25,50
18:25:24	24,52	29,80	24,34	30,01	25,45
18:25:54	24,47	29,71	24,46	29,94	25,48
18:26:24	24,45	29,52	24,53	29,77	25,52
18:26:54	24,39	29,49	24,52	29,69	25,50

18:27:24	24,49	29,39	24,57	29,58	25,50
18:27:54	24,47	29,32	24,46	29,45	25,47
18:28:24	24,60	29,13	24,49	29,54	25,52
18:28:54	24,52	29,06	24,41	29,96	25,52
18:29:24	24,43	29,46	24,33	30,17	25,47
18:29:54	24,44	29,50	24,34	30,09	25,50
18:30:24	24,48	29,59	24,40	30,06	25,48
18:30:54	24,57	29,48	24,50	29,92	25,50
18:31:24	24,53	29,44	24,53	29,80	25,49
18:31:54	24,51	29,30	24,39	29,66	25,48
18:32:24	24,49	29,10	24,46	29,50	25,53
18:32:54	24,42	29,05	24,33	29,39	25,45
18:33:24	24,43	29,27	24,40	29,68	25,47
18:33:54	24,39	29,51	24,46	30,03	25,48
18:34:24	24,48	29,55	24,53	30,06	25,53
18:34:54	24,37	29,60	24,42	30,04	25,48
18:35:24	24,46	29,57	24,48	29,99	25,43
18:35:54	24,44	29,34	24,50	29,82	25,50
18:36:24	24,42	29,33	24,37	29,74	25,46
18:36:54	24,50	29,21	24,42	29,64	25,47
18:37:24	24,46	29,01	24,44	29,44	25,52
18:37:54	24,43	29,24	24,34	29,38	25,45
18:38:24	24,43	29,36	24,40	29,66	25,51
18:38:54	24,53	29,51	24,45	29,96	25,52
18:39:24	24,56	29,56	24,49	30,03	25,49
18:39:54	24,53	29,44	24,48	29,95	25,48
18:40:24	24,48	29,35	24,50	29,85	25,49
18:40:54	24,44	29,27	24,47	29,74	25,50
18:41:24	24,50	29,08	24,54	29,57	25,51
18:41:54	24,50	29,01	24,56	29,44	25,52
18:42:24	24,49	29,52	24,49	29,39	25,49
18:42:54	24,49	29,69	24,45	29,81	25,51
18:43:24	24,51	29,74	24,54	30,11	25,49
18:43:54	24,54	29,72	24,45	30,13	25,47
18:44:24	24,49	29,60	24,46	30,04	25,47
18:44:54	24,49	29,44	24,45	29,90	25,51
18:45:24	24,52	29,44	24,43	29,84	25,49
18:45:54	24,46	29,33	24,42	29,71	25,48
18:46:24	24,45	29,11	24,53	29,53	25,55
18:46:54	24,48	29,13	24,44	29,50	25,50
18:47:24	24,43	29,13	24,51	29,34	25,53
18:47:54	24,58	29,60	24,57	29,75	25,50
18:48:24	24,59	29,73	24,64	29,92	25,52
18:48:54	24,64	29,69	24,61	29,87	25,56
18:49:24	24,51	29,57	24,57	29,76	25,58
18:49:54	24,55	29,50	24,55	29,66	25,58
18:50:24	24,50	29,45	24,49	29,55	25,55
18:50:54	24,50	29,41	24,51	29,50	25,51

18:51:24	24,59	29,17	24,64	29,35	25,57
18:51:54	24,44	29,17	24,53	29,76	25,51
18:52:24	24,55	29,06	24,57	30,00	25,53
18:52:54	24,47	29,38	24,51	29,96	25,56
18:53:24	24,59	29,76	24,38	29,96	25,51
18:53:54	24,57	29,74	24,54	29,82	25,56
18:54:24	24,47	29,77	24,32	29,74	25,49
18:54:54	24,47	29,69	24,37	29,62	25,52
18:55:24	24,59	29,54	24,53	29,48	25,54
18:55:54	24,53	29,46	24,44	29,46	25,51
18:56:24	24,50	29,37	24,49	29,92	25,53
18:56:54	24,51	29,25	24,40	30,05	25,53
18:57:24	24,54	29,05	24,53	30,01	25,58
18:57:54	24,59	29,14	24,53	29,91	25,60
18:58:24	24,64	29,38	24,48	29,82	25,58
18:58:54	24,60	29,40	24,56	29,67	25,62
18:59:24	24,52	29,41	24,43	29,59	25,57
18:59:54	24,38	29,36	24,33	29,46	25,55
19:00:24	24,56	29,21	24,45	29,46	25,57
19:00:54	24,71	29,17	24,53	29,75	25,56
19:01:24	24,85	29,08	24,61	29,81	25,56
19:01:54	24,81	29,30	24,59	29,77	25,57
19:02:24	24,80	29,44	24,61	29,69	25,56
19:02:54	24,70	29,46	24,49	29,59	25,57
19:03:24	24,62	29,37	24,53	29,46	25,58
19:03:54	24,59	29,28	24,49	29,48	25,58
19:04:24	24,55	29,20	24,51	29,82	25,55
19:04:54	24,60	29,12	24,58	29,92	25,59
19:05:24	24,58	29,26	24,58	29,90	25,58
19:05:54	24,52	29,56	24,64	29,78	25,59
19:06:24	24,46	29,67	24,57	29,67	25,60
19:06:54	24,43	29,70	24,44	29,59	25,54
19:07:24	24,55	29,61	24,55	29,45	25,54
19:07:54	24,37	29,52	24,53	29,51	25,56
19:08:24	24,44	29,46	24,51	29,94	25,53
19:08:54	24,43	29,32	24,52	30,05	25,56
19:09:24	24,61	29,17	24,59	29,98	25,61
19:09:54	24,70	29,03	24,61	29,90	25,61
19:10:24	24,58	29,44	24,49	29,80	25,55
19:10:54	24,64	29,70	24,57	29,69	25,58
19:11:24	24,55	29,86	24,44	29,60	25,53
19:11:54	24,53	29,80	24,47	29,49	25,55
19:12:24	24,49	29,67	24,49	29,52	25,59
19:12:54	24,62	29,52	24,50	29,99	25,62
19:13:24	24,63	29,42	24,49	30,13	25,60
19:13:54	24,54	29,29	24,53	30,10	25,61
19:14:24	24,54	29,20	24,56	30,00	25,63
19:14:54	24,56	29,09	24,56	29,91	25,60

19:15:24	24,49	29,08	24,58	29,75	25,63
19:15:54	24,42	29,63	24,40	29,70	25,56
19:16:24	24,50	29,75	24,57	29,57	25,56
19:16:54	24,51	29,71	24,56	29,40	25,61
19:17:24	24,50	29,65	24,60	29,58	25,60
19:17:54	24,43	29,65	24,45	30,03	25,56
19:18:24	24,54	29,50	24,55	30,14	25,60
19:18:54	24,43	29,44	24,47	30,11	25,59
19:19:24	24,69	29,39	24,41	30,07	25,56
19:19:48	End of test				

Køler-1-H - [°C]	Køler-2-D - [°C]	Gasm-H - [°C]	Gasm-D - [°C]	Gasm-R - [°C]	Flow-H - [ln/min]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [ln/min]
20,27	22,36	27,29	27,24	24,12	7,17
20,36	22,41	27,28	27,20	24,10	7,18
20,37	22,52	27,26	27,23	24,10	7,19
19,88	21,92	27,86	27,70	24,17	7,19
19,54	21,37	27,99	27,74	24,19	7,22
19,20	21,06	28,01	27,82	24,19	7,25
19,12	20,79	28,06	27,81	24,20	7,24
18,91	20,63	28,05	27,82	24,21	7,27
18,78	20,49	28,08	27,85	24,21	7,26
18,72	20,38	28,06	27,84	24,23	7,30
18,61	20,30	28,08	27,87	24,21	7,27
18,61	20,21	28,10	27,86	24,24	7,30
18,51	20,13	28,08	27,83	24,24	7,14
18,46	20,12	28,10	27,88	24,21	7,16
18,45	20,07	28,12	27,89	24,22	7,19
18,40	19,97	28,11	27,87	24,22	7,18
18,34	19,94	28,11	27,85	24,20	7,21
18,35	19,94	28,11	27,88	24,22	7,19
18,35	19,91	28,14	27,88	24,22	7,19
18,30	19,88	28,14	27,88	24,20	7,19
18,17	19,93	28,07	27,86	24,21	7,18
18,26	19,90	28,09	27,87	24,21	7,17
18,26	19,89	28,14	27,90	24,21	7,26
18,18	19,88	28,11	27,91	24,21	7,27
18,15	19,87	28,08	27,88	24,22	7,27
18,13	19,84	28,07	27,89	24,19	7,27
18,20	19,85	28,11	27,89	24,23	7,25
18,19	19,82	28,09	27,88	24,22	7,26
18,14	19,80	28,11	27,89	24,23	7,09
18,11	19,77	28,11	27,89	24,21	7,21
18,15	19,79	28,15	27,89	24,23	7,20
18,11	19,81	28,14	27,89	24,20	7,19
18,07	19,76	28,12	27,89	24,20	7,18
18,02	19,78	28,13	27,92	24,20	7,15
17,98	19,76	28,09	27,89	24,20	7,17
17,94	19,77	28,08	27,93	24,18	7,16
18,03	19,73	28,12	27,88	24,22	7,16
18,05	19,67	28,12	27,88	24,20	7,13
18,05	19,66	28,13	27,90	24,18	7,14
18,02	19,70	28,09	27,91	24,18	7,14
18,07	19,68	28,08	27,86	24,17	7,14
18,09	19,65	28,09	27,88	24,15	7,13

18,05	19,70	28,07	27,89	24,18	7,14
18,09	19,71	28,09	27,87	24,18	7,12
18,07	19,73	28,09	27,90	24,17	7,13
18,02	19,74	28,07	27,88	24,17	7,14
18,03	19,70	28,07	27,88	24,16	7,15
18,03	19,70	28,08	27,88	24,14	7,15
18,02	19,74	28,06	27,86	24,14	7,13
18,02	19,75	28,11	27,92	24,15	7,14
18,03	19,71	28,09	27,89	24,17	7,13
18,08	19,65	28,10	27,87	24,16	7,14
18,03	19,62	28,08	27,83	24,15	7,12
18,00	19,61	28,05	27,86	24,15	7,22
18,08	19,60	28,09	27,87	24,15	7,23
18,11	19,63	28,11	27,89	24,15	7,20
18,07	19,69	28,08	27,89	24,15	7,20
18,07	19,64	28,10	27,88	24,15	7,21
18,01	19,69	28,03	27,85	24,13	7,21
18,04	19,65	28,07	27,84	24,14	7,21
17,97	19,66	28,05	27,85	24,10	7,19
18,02	19,67	28,05	27,82	24,13	7,18
17,99	19,70	28,08	27,90	24,14	7,21
17,99	19,69	28,06	27,85	24,15	7,20
17,95	19,66	28,04	27,88	24,13	7,18
18,01	19,61	28,09	27,86	24,13	7,18
18,00	19,59	28,08	27,85	24,12	7,17
17,95	19,57	28,03	27,83	24,11	7,19
18,00	19,55	28,04	27,82	24,11	7,18
18,00	19,58	28,06	27,84	24,10	7,17
17,97	19,67	28,07	27,86	24,15	7,17
17,99	19,66	28,06	27,85	24,13	7,15
18,03	19,61	28,06	27,84	24,15	7,16
18,03	19,60	28,07	27,85	24,14	7,15
17,95	19,65	28,04	27,86	24,12	7,14
17,93	19,64	28,03	27,84	24,13	7,12
17,92	19,64	28,01	27,80	24,10	7,13
17,96	19,64	28,05	27,83	24,11	7,12
17,91	19,70	28,02	27,82	24,16	7,10
17,98	19,71	28,11	27,86	24,17	7,11
17,91	19,76	28,04	27,87	24,18	7,11
17,89	19,77	28,04	27,86	24,17	7,11
17,87	19,71	28,04	27,85	24,15	7,10
17,89	19,69	28,00	27,84	24,16	7,10
17,88	19,69	28,01	27,82	24,13	7,10
17,94	19,65	28,05	27,84	24,13	7,10
17,93	19,64	28,04	27,83	24,12	7,09
17,95	19,65	28,04	27,81	24,15	7,09
17,94	19,69	28,05	27,81	24,17	7,10
17,96	19,74	28,06	27,86	24,18	7,22

18,00	19,72	28,09	27,86	24,17	7,20
17,96	19,77	28,06	27,84	24,17	7,20
18,02	19,75	28,07	27,85	24,17	7,21
17,93	19,78	28,03	27,83	24,17	7,21
17,95	19,74	28,07	27,84	24,16	7,21
17,94	19,78	28,04	27,80	24,16	7,21
17,90	19,79	28,03	27,83	24,16	7,19
17,94	19,75	28,06	27,86	24,17	7,20
17,92	19,72	28,08	27,84	24,15	7,19
17,95	19,74	28,08	27,85	24,14	7,19
18,00	19,77	28,10	27,86	24,19	7,21
17,96	19,78	28,08	27,88	24,17	7,20
18,00	19,74	28,08	27,83	24,18	7,19
17,97	19,77	28,07	27,87	24,15	7,21
17,98	19,77	28,02	27,83	24,16	7,21
18,00	19,75	28,07	27,87	24,16	7,20
18,02	19,75	28,08	27,84	24,16	7,19
18,02	19,75	28,06	27,83	24,18	7,19
18,00	19,76	28,05	27,82	24,17	7,19
17,99	19,76	28,02	27,83	24,16	7,20
17,99	19,75	28,04	27,85	24,15	7,17
18,10	19,77	28,11	27,87	24,18	7,16
18,08	19,77	28,07	27,84	24,19	7,17
18,11	19,75	28,09	27,86	24,16	7,17
18,05	19,80	28,06	27,84	24,17	7,15
18,10	19,78	28,05	27,82	24,17	7,16
18,08	19,79	28,07	27,87	24,18	7,15
18,13	19,80	28,09	27,84	24,18	7,14
18,04	19,83	28,04	27,83	24,18	7,18
18,05	19,86	28,02	27,85	24,19	7,16
18,10	19,91	28,06	27,86	24,21	7,15
18,14	19,91	28,12	27,89	24,21	7,14
18,14	19,85	28,08	27,90	24,17	7,13
18,19	19,79	28,09	27,85	24,21	7,17
18,18	19,78	28,09	27,86	24,18	7,20
18,14	19,83	28,05	27,85	24,19	7,20
18,17	19,80	28,06	27,86	24,18	7,21
18,15	19,79	28,06	27,85	24,15	7,18
18,20	19,73	28,07	27,87	24,15	7,21
18,13	19,77	28,05	27,87	24,12	7,19
18,17	19,78	28,07	27,87	24,15	7,19
18,17	19,79	28,08	27,89	24,14	7,19
18,18	19,75	28,08	27,84	24,14	7,20
18,17	19,76	28,06	27,85	24,12	7,19
18,15	19,78	28,09	27,88	24,10	7,19
18,10	19,79	28,07	27,88	24,13	7,20
18,14	19,74	28,08	27,87	24,11	7,20
18,06	19,77	28,08	27,89	24,09	7,21

18,14	19,69	28,10	27,87	24,07	7,22
18,17	19,71	28,11	27,89	24,07	7,19
18,15	19,72	28,15	27,90	24,08	7,19
18,12	19,74	28,12	27,91	24,06	7,19
18,11	19,75	28,10	27,91	24,06	7,19
18,09	19,74	28,10	27,91	24,06	7,19
18,15	19,70	28,13	27,90	24,10	7,18
18,06	19,78	28,10	27,91	24,08	7,17
18,09	19,77	28,09	27,89	24,06	7,18
18,11	19,74	28,10	27,90	24,04	7,26
18,12	19,75	28,09	27,91	24,04	7,23
18,14	19,74	28,09	27,89	24,04	7,24
18,10	19,76	28,10	27,88	24,07	7,25
18,10	19,80	28,12	27,93	24,05	7,25
18,11	19,77	28,10	27,89	24,06	7,25
18,11	19,76	28,14	27,91	24,05	7,25
18,07	19,80	28,12	27,88	24,06	7,25
18,06	19,77	28,13	27,92	24,04	7,24
18,06	19,78	28,12	27,88	24,04	7,25
18,01	19,77	28,09	27,88	24,05	7,25
18,03	19,73	28,10	27,90	24,02	7,25
18,03	19,72	28,08	27,87	24,03	7,24
17,99	19,73	28,07	27,89	24,00	7,24
18,06	19,68	28,11	27,89	24,01	7,23
18,04	19,76	28,09	27,90	24,02	7,21
18,05	19,74	28,10	27,90	24,02	7,21
18,05	19,75	28,10	27,91	24,01	7,21
18,04	19,74	28,09	27,89	24,02	7,22
18,03	19,75	28,09	27,90	24,03	7,17
18,07	19,72	28,13	27,89	24,00	7,28
18,06	19,74	28,10	27,89	24,01	7,27
18,11	19,72	28,11	27,90	24,00	7,27
18,07	19,79	28,08	27,88	24,02	7,27
18,10	19,74	28,09	27,88	24,00	7,28
18,05	19,76	28,12	27,90	23,98	7,30
18,04	19,73	28,11	27,87	23,99	7,28
18,01	19,71	28,10	27,87	23,99	7,28
17,98	19,71	28,10	27,87	23,99	7,29
17,94	19,73	28,12	27,89	23,99	7,26
17,96	19,71	28,13	27,90	24,01	7,27
17,99	19,71	28,14	27,89	24,01	7,27
17,96	19,71	28,13	27,88	24,02	7,27
17,92	19,72	28,12	27,92	24,03	7,23
17,98	19,68	28,12	27,91	24,03	7,24
18,00	19,66	28,14	27,93	24,04	7,24
17,98	19,66	28,13	27,93	24,03	7,26
17,99	19,65	28,14	27,91	24,04	7,26
18,01	19,64	28,12	27,88	24,03	7,28

17,99	19,66	28,15	27,89	24,02	7,25
18,01	19,65	28,11	27,87	24,04	7,27
18,01	19,69	28,10	27,88	24,04	7,28
17,96	19,72	28,10	27,89	24,04	7,27
17,96	19,70	28,10	27,91	24,04	7,28
18,02	19,69	28,11	27,88	24,03	7,28
17,96	19,72	28,08	27,88	24,03	7,28
17,90	19,71	28,06	27,87	24,04	7,28
17,94	19,67	28,09	27,85	24,05	7,23
17,86	19,70	28,06	27,89	24,04	7,24
17,95	19,65	28,14	27,88	24,06	7,23
17,93	19,67	28,10	27,89	24,05	7,23
17,91	19,65	28,09	27,85	24,08	7,24
17,93	19,64	28,12	27,89	24,06	7,21
17,90	19,64	28,09	27,87	24,07	7,22
17,94	19,61	28,10	27,87	24,09	7,23
17,96	19,59	28,12	27,88	24,11	7,25
17,93	19,64	28,14	27,91	24,08	7,23
17,93	19,65	28,11	27,87	24,11	7,23
17,92	19,69	28,11	27,90	24,08	7,22
17,95	19,70	28,09	27,88	24,10	7,22
17,93	19,73	28,07	27,88	24,10	7,22
17,94	19,75	28,08	27,89	24,10	7,22
17,99	19,72	28,07	27,87	24,11	7,21
18,01	19,75	28,10	27,89	24,10	7,22
17,98	19,76	28,08	27,87	24,10	7,23
17,99	19,75	28,09	27,89	24,12	7,23
17,99	19,74	28,08	27,88	24,11	7,22
18,00	19,74	28,10	27,91	24,10	7,22
17,97	19,75	28,08	27,90	24,10	7,19
17,99	19,74	28,09	27,89	24,12	7,23
18,02	19,72	28,13	27,92	24,11	7,20
18,02	19,70	28,13	27,89	24,10	7,21
18,02	19,68	28,09	27,88	24,14	7,21
18,02	19,68	28,11	27,91	24,09	7,21
17,98	19,69	28,08	27,88	24,09	7,21
18,01	19,66	28,11	27,87	24,11	7,23
17,99	19,71	28,08	27,88	24,11	7,23
18,04	19,69	28,12	27,91	24,10	7,21
18,03	19,64	28,12	27,90	24,11	7,23
18,05	19,64	28,12	27,90	24,13	7,23
18,01	19,66	28,12	27,90	24,13	7,22
17,95	19,70	28,10	27,91	24,12	7,22
18,03	19,66	28,15	27,90	24,12	7,20
17,94	19,66	28,10	27,86	24,11	7,22
17,89	19,65	28,07	27,87	24,10	7,23
17,89	19,66	28,10	27,91	24,07	7,24
17,91	19,63	28,10	27,88	24,08	7,22

17,89	19,63	28,10	27,90	24,09	7,22
17,90	19,62	28,11	27,89	24,10	7,23
17,91	19,61	28,13	27,88	24,11	7,23
17,93	19,60	28,13	27,90	24,10	7,25
17,91	19,58	28,12	27,87	24,09	7,23
17,83	19,59	28,10	27,89	24,12	7,26
17,87	19,60	28,12	27,92	24,10	7,25
17,88	19,55	28,11	27,87	24,11	7,27
17,80	19,55	28,06	27,84	24,09	7,26
17,84	19,55	28,10	27,85	24,08	7,24
17,78	19,56	28,05	27,86	24,10	7,24
17,84	19,51	28,10	27,86	24,08	7,26
17,80	19,54	28,09	27,84	24,10	7,26
17,82	19,52	28,12	27,87	24,12	7,28
17,84	19,52	28,12	27,86	24,11	7,25
17,79	19,58	28,09	27,87	24,12	7,23
17,84	19,53	28,15	27,91	24,13	7,25
17,79	19,57	28,10	27,88	24,13	7,23
17,83	19,48	28,11	27,84	24,13	7,23
17,77	19,49	28,11	27,89	24,09	7,24
17,74	19,52	28,10	27,88	24,11	7,24
17,76	19,53	28,07	27,86	24,10	7,24
17,79	19,50	28,07	27,85	24,12	7,24
17,83	19,50	28,10	27,84	24,13	7,26
17,81	19,52	28,13	27,87	24,11	7,24
17,76	19,57	28,13	27,89	24,11	7,27
17,76	19,55	28,12	27,88	24,14	7,26
17,73	19,53	28,08	27,84	24,12	7,26
17,76	19,45	28,11	27,85	24,11	7,26
17,79	19,45	28,11	27,83	24,11	7,25
17,72	19,51	28,10	27,88	24,12	7,26
17,72	19,52	28,09	27,86	24,12	7,25
17,80	19,44	28,11	27,86	24,13	7,23
17,82	19,44	28,14	27,85	24,12	7,25
17,82	19,42	28,13	27,84	24,13	7,23
17,85	19,45	28,15	27,85	24,14	7,26
17,81	19,39	28,12	27,84	24,13	7,23
17,73	19,40	28,10	27,84	24,09	7,25
17,73	19,41	28,11	27,87	24,11	7,24
17,82	19,37	28,10	27,85	24,11	7,26
17,85	19,38	28,13	27,85	24,13	7,25
17,83	19,41	28,12	27,85	24,13	7,25
17,79	19,44	28,11	27,88	24,13	7,24
17,80	19,45	28,11	27,86	24,11	7,24
17,79	19,49	28,11	27,87	24,10	7,25
17,81	19,47	28,11	27,86	24,11	7,27
17,76	19,43	28,05	27,84	24,08	7,26
17,76	19,39	28,07	27,83	24,10	7,26

17,79	19,36	28,10	27,80	24,09	7,26
17,72	19,41	28,08	27,83	24,11	7,25
17,79	19,35	28,12	27,84	24,10	7,26
17,75	19,40	28,09	27,84	24,11	7,26
17,79	19,33	28,10	27,82	24,11	7,24
17,82	19,34	28,12	27,83	24,13	7,23
17,71	19,36	28,06	27,82	24,09	7,26
17,69	19,36	28,05	27,80	24,09	7,24
17,78	19,32	28,07	27,81	24,10	7,24
17,77	19,34	28,08	27,81	24,10	7,25
17,72	19,39	28,08	27,83	24,12	7,24
17,74	19,39	28,08	27,85	24,10	7,25
17,81	19,37	28,09	27,82	24,15	7,25
17,84	19,36	28,12	27,84	24,13	7,23
17,80	19,38	28,11	27,84	24,10	7,25
17,78	19,35	28,08	27,81	24,08	7,25
17,80	19,30	28,07	27,80	24,05	7,23
17,82	19,32	28,08	27,79	24,08	7,24
17,78	19,35	28,08	27,78	24,08	7,26
17,82	19,34	28,09	27,80	24,09	7,26
17,81	19,35	28,11	27,81	24,08	7,23
17,84	19,34	28,12	27,81	24,09	7,25
17,84	19,36	28,13	27,83	24,10	7,25
17,76	19,42	28,09	27,81	24,10	7,26
17,77	19,42	28,09	27,83	24,06	7,23
17,68	19,34	28,03	27,78	24,04	7,24
17,77	19,27	28,07	27,77	24,06	7,23
17,75	19,25	28,06	27,77	24,02	7,22
17,79	19,28	28,07	27,77	24,04	7,21
17,79	19,26	28,09	27,80	24,04	7,21
17,74	19,31	28,07	27,79	24,04	7,21
17,84	19,26	28,10	27,81	24,04	7,20
17,70	19,26	28,05	27,78	23,99	7,21
17,66	19,27	27,99	27,75	24,01	7,22
17,74	19,22	28,05	27,75	23,98	7,23
17,67	19,28	28,01	27,75	23,99	7,22
17,70	19,29	28,02	27,77	23,99	7,20
17,73	19,28	28,04	27,77	23,98	7,22
17,72	19,30	28,01	27,78	24,01	7,22
17,74	19,31	28,05	27,78	23,99	7,22
17,74	19,31	28,03	27,76	24,00	7,22
17,75	19,24	28,00	27,73	23,96	7,20
17,72	19,26	28,01	27,72	23,96	7,20
17,70	19,29	27,98	27,71	23,96	7,21
17,70	19,32	27,99	27,75	23,97	7,21
17,73	19,32	27,98	27,73	23,97	7,22
17,78	19,31	28,00	27,72	23,99	7,19
17,76	19,28	28,03	27,73	23,99	7,20

17,77	19,26	28,04	27,76	23,96	7,21
17,70	19,29	28,00	27,73	23,99	7,22
17,72	19,22	27,96	27,69	23,97	7,21
17,77	19,19	27,98	27,69	23,96	7,20
17,75	19,21	28,00	27,70	23,95	7,21
17,77	19,21	27,98	27,70	23,95	7,22
17,68	19,27	27,96	27,71	23,95	7,21
17,78	19,22	28,00	27,72	23,98	7,20
17,73	19,28	27,97	27,72	23,97	7,22
17,79	19,23	28,00	27,71	23,98	7,23
17,74	19,29	27,94	27,71	23,97	7,24
17,76	19,20	27,95	27,65	23,95	7,25
17,71	19,26	27,92	27,66	23,95	7,23
17,72	19,29	27,94	27,68	23,94	7,22
17,75	19,26	27,93	27,69	23,94	7,23
17,81	19,27	27,95	27,66	23,95	7,23
17,77	19,29	27,94	27,66	23,95	7,23
17,76	19,31	27,94	27,67	23,96	7,23
17,76	19,36	27,96	27,71	23,96	7,23
17,79	19,33	27,94	27,69	23,96	7,22
17,72	19,32	27,92	27,67	23,94	7,24
17,70	19,30	27,91	27,63	23,94	7,23
17,74	19,30	27,92	27,66	23,93	7,25
17,70	19,33	27,90	27,66	23,93	7,24
17,69	19,31	27,91	27,65	23,93	7,25
17,73	19,29	27,93	27,65	23,93	7,23
17,75	19,28	27,93	27,66	23,92	7,22
17,76	19,32	27,95	27,68	23,91	7,22
17,74	19,35	27,92	27,67	23,93	7,20
17,69	19,32	27,89	27,66	23,91	7,20
17,74	19,24	27,90	27,64	23,89	7,20
17,74	19,24	27,89	27,65	23,86	7,21
17,70	19,25	27,87	27,62	23,88	7,22
17,74	19,26	27,88	27,63	23,89	7,21
17,75	19,23	27,91	27,65	23,87	7,21
17,77	19,26	27,90	27,65	23,90	7,21
17,75	19,24	27,91	27,64	23,90	7,22
17,63	19,27	27,88	27,62	23,91	7,22
17,65	19,21	27,87	27,61	23,88	7,21
17,64	19,22	27,90	27,59	23,87	7,23
17,61	19,27	27,88	27,62	23,86	7,24
17,57	19,29	27,86	27,61	23,87	7,21
17,60	19,26	27,90	27,62	23,88	7,22
17,52	19,31	27,88	27,63	23,90	7,22
17,60	19,22	27,90	27,61	23,93	7,23
17,63	19,22	27,92	27,64	23,91	7,22
17,61	19,22	27,90	27,63	23,92	7,22
17,63	19,21	27,93	27,64	23,90	7,22

17,59	19,19	27,86	27,59	23,90	7,23
17,68	19,16	27,86	27,56	23,88	7,22
17,62	19,17	27,88	27,59	23,88	7,24
17,56	19,22	27,86	27,61	23,87	7,23
17,63	19,20	27,84	27,57	23,89	7,23
17,67	19,23	27,86	27,57	23,91	7,24
17,71	19,20	27,88	27,58	23,89	7,22
17,73	19,22	27,89	27,59	23,90	7,22
17,69	19,28	27,88	27,61	23,90	7,22
17,69	19,28	27,88	27,64	23,91	7,22
17,68	19,29	27,83	27,57	23,90	7,21
17,74	19,22	27,83	27,56	23,87	7,21
17,72	19,26	27,83	27,53	23,86	7,22
17,67	19,29	27,81	27,57	23,87	7,22
17,68	19,30	27,82	27,56	23,89	7,23
17,69	19,30	27,83	27,60	23,88	7,22
17,74	19,28	27,85	27,57	23,88	7,23
17,67	19,33	27,85	27,61	23,89	7,23
17,71	19,30	27,85	27,58	23,92	7,24
17,75	19,31	27,89	27,60	23,90	7,23
17,67	19,31	27,80	27,56	23,88	7,23
17,68	19,28	27,79	27,54	23,86	7,20
17,61	19,32	27,81	27,55	23,85	7,23
17,67	19,32	27,81	27,55	23,88	7,22
17,67	19,29	27,84	27,53	23,86	7,22
17,67	19,33	27,80	27,54	23,89	7,21
17,64	19,34	27,81	27,57	23,88	7,20
17,63	19,35	27,80	27,58	23,88	7,19
17,69	19,32	27,83	27,56	23,87	7,20
17,77	19,29	27,83	27,54	23,87	7,24
17,68	19,29	27,83	27,54	23,83	7,21
17,58	19,28	27,76	27,50	23,83	7,20
17,64	19,17	27,78	27,53	23,81	7,20
17,59	19,20	27,79	27,54	23,80	7,20
17,58	19,18	27,78	27,53	23,81	7,21
17,68	19,13	27,78	27,52	23,82	7,22
17,69	19,15	27,81	27,51	23,83	7,18
17,67	19,17	27,80	27,51	23,83	7,19
17,70	19,15	27,82	27,51	23,82	7,19
17,66	19,23	27,81	27,56	23,81	7,19
17,67	19,20	27,78	27,53	23,82	7,21
17,70	19,22	27,78	27,52	23,81	7,23
17,66	19,16	27,74	27,47	23,80	7,20
17,67	19,16	27,78	27,47	23,79	7,20
17,67	19,18	27,76	27,47	23,78	7,23
17,68	19,20	27,76	27,51	23,76	7,21
17,63	19,25	27,70	27,47	23,77	7,21
17,67	19,24	27,73	27,49	23,76	7,19

17,67	19,22	27,71	27,49	23,78	7,20
17,64	19,23	27,75	27,51	23,75	7,21
17,71	19,21	27,72	27,50	23,78	7,19
17,73	19,24	27,73	27,48	23,77	7,19
17,66	19,25	27,71	27,49	23,75	7,20
17,66	19,26	27,71	27,50	23,73	7,20
17,73	19,21	27,70	27,46	23,74	7,21
17,66	19,18	27,70	27,46	23,74	7,19
17,58	19,13	27,67	27,47	23,71	7,22
17,61	19,07	27,65	27,41	23,71	7,21
17,55	19,08	27,69	27,46	23,73	7,20
17,52	19,11	27,67	27,48	23,71	7,20
17,57	19,08	27,67	27,45	23,73	7,20
17,50	19,12	27,65	27,46	23,73	7,21
17,49	19,13	27,66	27,48	23,72	7,21
17,54	19,10	27,69	27,47	23,72	7,21
17,59	19,10	27,67	27,43	23,73	7,21
17,54	19,14	27,67	27,45	23,70	7,21
17,56	19,15	27,66	27,48	23,71	7,22
17,65	19,10	27,68	27,44	23,70	7,21
17,63	19,16	27,67	27,45	23,72	7,19
17,60	19,19	27,65	27,46	23,73	7,21
17,63	19,11	27,64	27,43	23,71	7,19
17,57	19,13	27,60	27,42	23,68	7,20
17,55	19,12	27,62	27,45	23,67	7,21
17,64	19,09	27,61	27,40	23,69	7,19
17,60	19,13	27,63	27,44	23,68	7,19
17,64	19,13	27,61	27,42	23,70	7,20
17,62	19,15	27,62	27,42	23,68	7,20
17,68	19,13	27,62	27,41	23,72	7,20
17,63	19,17	27,64	27,46	23,70	7,20
17,66	19,15	27,63	27,43	23,70	7,18
17,70	19,12	27,64	27,43	23,68	7,21
17,74	19,14	27,62	27,41	23,71	7,18
17,71	19,17	27,62	27,41	23,71	7,16
17,69	19,18	27,61	27,42	23,72	7,20
17,74	19,13	27,63	27,41	23,70	7,18
17,74	19,14	27,65	27,42	23,69	7,17
17,69	19,22	27,62	27,44	23,71	7,19
17,76	19,17	27,61	27,40	23,72	7,19
17,73	19,22	27,63	27,43	23,71	7,19
17,72	19,21	27,60	27,42	23,69	7,18
17,69	19,19	27,58	27,38	23,71	7,19
17,72	19,19	27,60	27,42	23,72	7,16
17,69	19,14	27,61	27,38	23,71	7,17
17,66	19,13	27,61	27,42	23,69	7,18
17,62	19,14	27,56	27,40	23,70	7,18
17,60	19,11	27,60	27,39	23,70	7,20

17,56	19,13	27,59	27,42	23,70	7,19
17,60	19,07	27,61	27,39	23,70	7,21
17,53	19,07	27,60	27,39	23,71	7,21
17,49	19,08	27,58	27,37	23,72	7,19
17,52	19,07	27,59	27,40	23,71	7,20
17,53	19,11	27,60	27,40	23,68	7,19
17,52	19,12	27,57	27,36	23,71	7,20
17,55	19,13	27,58	27,37	23,71	7,20
17,55	19,13	27,59	27,37	23,72	7,21
17,54	19,12	27,60	27,39	23,71	7,22
17,51	19,14	27,57	27,40	23,73	7,22
17,52	19,15	27,59	27,41	23,72	7,20
17,61	19,09	27,61	27,40	23,73	7,22
17,57	19,19	27,58	27,42	23,72	7,21
17,55	19,16	27,58	27,39	23,73	7,22
17,64	19,13	27,59	27,40	23,73	7,22
17,62	19,17	27,59	27,40	23,72	7,22
17,58	19,20	27,58	27,42	23,73	7,23
17,57	19,17	27,54	27,39	23,71	7,22
17,59	19,19	27,53	27,38	23,74	7,22
17,56	19,20	27,54	27,38	23,69	7,23
17,62	19,15	27,55	27,35	23,73	7,22
17,62	19,16	27,55	27,39	23,73	7,22
17,66	19,09	27,57	27,39	23,74	7,23
17,60	19,11	27,55	27,39	23,73	7,24
17,60	19,09	27,55	27,40	23,72	7,20
17,62	19,09	27,56	27,40	23,75	7,23
17,62	19,08	27,54	27,40	23,75	7,23
17,68	19,06	27,56	27,37	23,74	7,22
17,74	19,06	27,55	27,36	23,75	7,21
17,68	19,13	27,54	27,38	23,72	7,22
17,72	19,12	27,55	27,36	23,75	7,22
17,76	19,11	27,58	27,38	23,73	7,21
17,71	19,17	27,54	27,38	23,74	7,22
17,70	19,18	27,55	27,38	23,76	7,22
17,72	19,18	27,53	27,39	23,76	7,21
17,74	19,18	27,54	27,38	23,76	7,20
17,75	19,18	27,55	27,37	23,75	7,20
17,75	19,19	27,57	27,37	23,76	7,22
17,70	19,21	27,55	27,42	23,75	7,21
17,71	19,19	27,57	27,40	23,76	7,22
17,69	19,18	27,59	27,38	23,77	7,23
17,62	19,22	27,58	27,41	23,76	7,21
17,58	19,24	27,56	27,41	23,78	7,21
17,63	19,19	27,58	27,39	23,79	7,20
17,64	19,23	27,58	27,39	23,79	7,22
17,60	19,27	27,59	27,42	23,79	7,21
17,63	19,23	27,59	27,42	23,79	7,21

17,68	19,27	27,58	27,41	23,80	7,22
17,71	19,25	27,61	27,41	23,82	7,22
17,68	19,30	27,59	27,40	23,81	7,23
17,69	19,31	27,60	27,42	23,81	7,23
17,76	19,27	27,58	27,39	23,83	7,22
17,72	19,33	27,61	27,44	23,83	7,23
17,79	19,30	27,59	27,40	23,84	7,21
17,78	19,32	27,60	27,42	23,84	7,22
17,80	19,32	27,63	27,43	23,84	7,21
17,80	19,32	27,60	27,39	23,85	7,21
17,76	19,35	27,60	27,44	23,83	7,20
17,81	19,30	27,57	27,40	23,83	7,19
17,78	19,29	27,58	27,40	23,82	7,22
17,75	19,28	27,56	27,41	23,83	7,21
17,74	19,26	27,56	27,42	23,82	7,22
17,79	19,19	27,57	27,39	23,81	7,22
17,79	19,15	27,56	27,37	23,83	7,22
17,75	19,21	27,59	27,42	23,83	7,23
17,81	19,16	27,58	27,39	23,82	7,22
17,82	19,20	27,58	27,39	23,84	7,20
17,76	19,25	27,58	27,42	23,83	7,19
17,84	19,22	27,59	27,37	23,85	7,19
17,78	19,28	27,58	27,42	23,85	7,19
17,81	19,28	27,58	27,41	23,83	7,20
17,84	19,25	27,59	27,40	23,86	7,21
17,85	19,23	27,59	27,40	23,86	7,19
17,84	19,23	27,58	27,41	23,86	7,20
17,86	19,24	27,58	27,41	23,87	7,20
17,83	19,25	27,60	27,44	23,86	7,20
17,83	19,27	27,59	27,42	23,86	7,19
17,83	19,26	27,59	27,42	23,87	7,21
17,80	19,28	27,60	27,43	23,88	7,19
17,82	19,28	27,60	27,42	23,87	7,19
17,82	19,28	27,61	27,42	23,89	7,20
17,83	19,31	27,62	27,43	23,89	7,20
17,82	19,38	27,61	27,47	23,88	7,19
17,85	19,34	27,61	27,42	23,90	7,20
17,85	19,36	27,61	27,43	23,90	7,18
17,79	19,42	27,62	27,45	23,89	7,20
17,83	19,36	27,62	27,42	23,91	7,20
17,78	19,39	27,63	27,47	23,91	7,21
17,85	19,33	27,63	27,42	23,91	7,19
17,83	19,34	27,66	27,44	23,91	7,19
17,82	19,38	27,63	27,43	23,92	7,19
17,81	19,39	27,64	27,46	23,91	7,21
17,83	19,41	27,63	27,48	23,90	7,20
17,85	19,38	27,64	27,46	23,91	7,22
17,85	19,37	27,64	27,44	23,91	7,23

17,77	19,42	27,66	27,46	23,92	7,21
17,79	19,38	27,64	27,47	23,91	7,21
17,80	19,42	27,65	27,45	23,92	7,21
17,77	19,44	27,67	27,49	23,91	7,21
17,85	19,41	27,65	27,45	23,93	7,23
17,80	19,43	27,65	27,48	23,92	7,22
17,87	19,38	27,67	27,46	23,92	7,23
17,86	19,38	27,67	27,47	23,93	7,24
17,85	19,39	27,67	27,47	23,94	7,23
17,84	19,36	27,69	27,46	23,92	7,23
17,85	19,37	27,68	27,46	23,94	7,23
17,86	19,38	27,68	27,47	23,94	7,22
17,81	19,42	27,66	27,49	23,95	7,21
17,77	19,43	27,66	27,52	23,92	7,22
17,83	19,42	27,66	27,48	23,94	7,20
17,82	19,42	27,68	27,50	23,94	7,22
17,85	19,39	27,68	27,47	23,94	7,23
17,89	19,38	27,69	27,50	23,92	7,22
17,85	19,38	27,65	27,49	23,96	7,22
17,87	19,37	27,69	27,49	23,96	7,21
17,87	19,34	27,68	27,48	23,93	7,21
17,87	19,34	27,67	27,48	23,94	7,21
17,88	19,33	27,66	27,48	23,94	7,21
17,91	19,34	27,68	27,49	23,91	7,23
17,92	19,34	27,69	27,51	23,92	7,20
17,92	19,35	27,69	27,52	23,90	7,20
17,87	19,33	27,69	27,50	23,93	7,20
17,85	19,35	27,67	27,49	23,92	7,19
17,85	19,35	27,67	27,50	23,92	7,19
17,84	19,38	27,68	27,49	23,93	7,18
17,83	19,37	27,67	27,50	23,90	7,20
17,87	19,32	27,70	27,51	23,92	7,18
17,86	19,38	27,67	27,48	23,93	7,19
17,87	19,36	27,70	27,49	23,91	7,19
17,90	19,33	27,69	27,48	23,92	7,17
17,87	19,34	27,70	27,51	23,93	7,19
17,85	19,37	27,69	27,51	23,91	7,18
17,85	19,40	27,64	27,51	23,91	7,19
17,94	19,35	27,70	27,48	23,91	7,19
17,87	19,33	27,69	27,47	23,90	7,17
17,91	19,28	27,69	27,48	23,91	7,19
17,87	19,28	27,70	27,47	23,91	7,20
17,83	19,31	27,70	27,51	23,91	7,20
17,81	19,32	27,65	27,50	23,90	7,20
17,81	19,32	27,66	27,49	23,90	7,20
17,81	19,34	27,66	27,50	23,88	7,20
17,82	19,34	27,66	27,51	23,89	7,20
17,83	19,34	27,67	27,50	23,89	7,19

17,82	19,35	27,65	27,52	23,88	7,19
17,90	19,30	27,69	27,49	23,88	7,20
17,90	19,36	27,68	27,48	23,88	7,20
17,84	19,38	27,65	27,50	23,88	7,20
17,85	19,40	27,67	27,52	23,88	7,20
17,90	19,37	27,69	27,50	23,88	7,18
17,88	19,38	27,67	27,50	23,88	7,20
17,90	19,38	27,68	27,48	23,88	7,19
17,94	19,37	27,68	27,47	23,88	7,20

Flow-D - [ln/min]	NS-Røgten	Ovf-Top - ['	Ovf-Bag - ['	Ovf-Side-1	Ovf-Side-2	Ovf-Bund -	Kanal-EPA	Røgtræk - [
13	24	27	28	29	30	31	36	38
Split train flow rate Flow-D - [ln/min]	EPA Flue gas temperatur	Surface temperatur Top	Surface temperatur Rear	Surface temperatur Right side	Surface temperatur Left side	Surface temperatur Bottom	EPA Duct temperatur	Flue draft Pascals
7,21	211	173	226	256	266	66	40,4	11,8
7,24	201	171	225	257	266	67	45,5	11,9
7,25	220	171	224	257	267	67	48,5	13,2
7,26	215	173	224	256	266	67	46,5	13,4
7,25	205	175	226	256	266	67	44,4	12,5
7,27	196	176	228	255	265	68	42,6	12,5
7,27	194	177	231	255	265	68	41,4	12,6
7,27	188	178	233	255	264	68	40,4	12,5
7,27	180	179	234	255	264	69	39,5	12,3
7,30	178	179	235	255	264	69	38,8	12,0
7,28	174	179	236	255	264	69	38,2	11,9
7,27	173	178	236	255	264	69	37,9	11,7
7,28	173	178	237	255	265	70	37,7	11,8
7,28	180	179	237	256	265	70	37,6	11,9
7,27	181	179	238	256	265	70	37,6	11,9
7,28	174	179	239	256	265	70	37,5	11,5
7,26	171	179	239	255	265	71	37,2	11,4
7,24	165	179	239	255	265	71	37,1	11,3
7,26	160	178	239	255	265	71	36,9	11,1
7,26	153	178	239	255	265	71	36,6	11,1
7,26	149	177	239	255	265	72	36,2	11,0
7,27	146	176	238	256	265	72	35,9	10,4
7,27	144	175	237	256	265	72	35,7	10,4
7,23	145	174	236	255	264	72	35,4	11,1
7,24	160	174	235	255	264	72	35,6	10,8
7,26	162	174	234	255	263	73	35,8	11,0
7,26	164	174	234	254	263	73	35,9	11,1
7,24	164	173	233	254	263	73	35,9	11,0
7,27	163	174	233	252	262	73	36,1	11,0
7,25	164	174	232	252	262	74	36,1	11,3
7,25	165	174	232	251	261	74	36,1	11,3
7,24	167	173	232	250	261	74	36,1	11,4
7,24	159	174	232	250	260	74	36,1	10,3
7,25	147	173	231	250	260	74	35,8	10,5
7,25	142	172	231	249	259	75	35,6	10,5
7,21	140	171	230	249	259	75	35,3	10,1
7,24	138	171	230	249	259	75	35,2	10,2
7,24	137	170	229	249	259	75	35,0	9,9
7,21	136	169	228	249	259	75	34,8	10,0
7,24	134	168	227	249	258	76	34,6	10,1
7,23	132	167	226	249	258	76	34,5	9,6
7,23	131	166	225	249	258	76	34,3	9,8

7,22	129	166	224	249	258	76	34,1	9,5
7,22	128	165	223	249	258	76	34,1	9,6
7,22	127	164	221	249	257	76	34,1	9,5
7,22	126	163	220	248	257	77	34,1	9,5
7,23	125	162	219	248	256	77	33,9	9,2
7,23	124	161	218	248	256	77	33,9	9,4
7,21	123	160	217	248	256	77	33,8	9,3
7,22	123	160	215	247	255	77	33,7	9,4
7,23	121	159	214	247	255	77	33,5	9,2
7,24	121	158	213	246	254	77	33,4	9,1
7,25	121	157	212	246	254	77	33,4	9,4
7,21	119	157	211	246	253	78	33,3	9,2
7,23	118	156	210	245	253	78	33,2	9,0
7,24	117	155	210	245	253	78	33,2	9,0
7,23	118	154	209	245	252	78	33,2	9,1
7,23	117	154	208	245	252	78	33,0	9,1
7,23	118	153	208	244	252	78	33,1	8,8
7,23	115	153	207	244	251	78	33,0	9,1
7,23	116	152	206	244	251	78	33,0	8,9
7,21	115	151	205	244	251	78	33,0	8,9
7,21	115	151	204	243	250	78	33,0	9,2
7,23	114	150	204	243	250	78	32,9	8,6
7,23	114	150	203	243	250	78	32,9	8,9
7,23	114	149	203	243	250	78	32,8	8,7
7,20	114	149	202	242	250	78	32,7	8,5
7,22	114	148	201	242	250	79	32,7	9,0
7,21	114	148	201	242	250	79	32,6	8,7
7,20	113	147	200	242	250	79	32,6	8,6
7,21	111	147	200	242	250	79	32,5	8,4
7,21	111	147	200	242	250	79	32,6	8,7
7,20	111	146	200	242	250	79	32,6	8,8
7,19	112	146	199	242	250	79	32,5	8,6
7,20	112	145	199	242	250	79	32,4	8,6
7,20	111	145	199	242	250	79	32,5	8,5
7,18	112	145	199	242	250	79	32,4	8,4
7,20	111	144	198	242	251	79	32,4	8,6
7,17	110	144	198	242	251	79	32,4	8,4
7,15	110	144	198	243	251	79	32,3	8,4
7,20	109	144	198	243	251	79	32,3	8,6
7,17	108	143	198	243	251	79	32,3	8,3
7,18	109	143	197	243	251	79	32,2	8,5
7,18	108	143	197	243	251	79	32,2	8,0
7,18	107	142	197	243	252	79	32,3	8,2
7,18	108	142	197	244	252	79	32,3	8,3
7,16	107	142	196	244	252	79	32,3	8,2
7,18	107	142	196	244	252	79	32,3	8,1
7,16	107	141	196	244	252	79	32,3	8,3
7,29	107	141	196	244	252	79	32,3	8,1

7,30	106	141	196	245	253	79	32,3	8,1
7,29	105	141	196	245	253	79	32,2	8,1
7,30	105	140	196	245	253	79	32,2	8,1
7,30	105	140	196	245	253	79	32,2	8,1
7,29	106	140	195	245	253	79	32,2	8,0
7,28	105	140	195	246	253	79	32,2	7,9
7,25	104	140	195	246	254	79	32,1	8,0
7,28	104	139	195	246	254	79	32,1	7,9
7,28	104	139	195	246	254	79	32,0	8,1
7,28	103	139	195	246	254	79	32,0	7,9
7,27	104	139	195	246	254	78	32,0	7,8
7,26	104	138	195	247	254	78	32,1	8,0
7,29	103	138	195	247	254	78	32,1	7,9
7,29	104	138	194	247	255	78	32,1	8,0
7,28	103	138	194	247	255	78	32,1	7,8
7,27	103	138	194	248	255	78	32,1	7,9
7,29	104	138	194	248	255	78	32,1	7,9
7,26	104	138	194	248	255	78	32,1	8,0
7,25	104	138	194	248	255	78	32,2	7,9
7,27	103	138	194	249	256	78	32,2	7,9
7,28	104	138	194	249	256	78	32,2	8,2
7,27	104	138	194	249	256	78	32,2	8,0
7,26	104	138	194	249	256	78	32,3	8,0
7,26	104	138	194	250	257	78	32,3	8,0
7,25	105	138	194	250	257	78	32,3	8,2
7,28	104	138	194	250	257	78	32,3	8,0
7,27	104	138	194	251	258	78	32,3	8,2
7,26	105	138	195	251	258	78	32,3	8,2
7,27	103	138	195	251	259	78	32,3	8,1
7,25	103	138	195	251	259	78	32,2	7,9
7,25	103	138	195	252	259	78	32,3	8,1
7,46	103	138	195	252	260	78	32,2	7,7
7,44	103	138	195	252	260	78	32,1	7,7
7,24	103	138	196	253	260	78	32,1	8,0
7,24	103	138	196	253	261	78	32,0	7,7
7,22	102	138	196	253	261	78	32,0	7,9
7,23	103	138	196	254	262	78	32,0	7,6
7,21	103	138	196	254	262	78	32,0	7,7
7,21	102	138	196	254	262	78	32,0	7,9
7,22	103	138	196	254	262	77	32,2	7,7
7,23	103	137	196	255	263	77	32,2	7,7
7,21	103	138	196	255	263	77	32,2	7,6
7,22	102	138	196	255	263	77	32,2	7,6
7,21	102	138	196	255	263	77	32,2	7,6
7,23	103	137	196	255	264	77	32,1	7,4
7,23	101	137	196	256	264	77	32,0	7,6
7,21	102	137	195	256	264	77	32,0	7,5
7,22	101	137	195	256	264	77	32,0	7,8

7,20	101	138	195	256	264	77	31,9	7,6
7,22	101	137	195	256	265	77	31,9	7,8
7,23	102	137	195	257	265	77	31,9	7,3
7,23	101	138	195	257	265	77	31,9	7,4
7,22	101	137	195	257	265	77	31,9	7,3
7,21	101	137	195	257	265	77	31,9	7,4
7,21	101	137	195	257	265	77	31,9	7,6
7,23	100	137	195	257	265	77	31,8	7,6
7,21	101	137	195	257	265	76	31,7	7,4
7,22	99	137	195	258	265	76	31,7	7,7
7,23	100	137	195	258	265	76	31,6	7,7
7,21	101	137	195	258	265	76	31,7	7,7
7,20	100	137	195	258	265	76	31,7	7,5
7,23	100	137	195	258	265	77	31,8	7,5
7,21	101	137	196	258	265	77	31,7	7,7
7,21	101	137	196	259	265	77	31,7	7,8
7,21	101	137	195	259	265	76	31,7	7,9
7,23	101	137	196	259	266	76	31,6	7,7
7,21	101	137	196	259	266	76	31,6	7,7
7,23	100	137	196	259	266	76	31,6	7,7
7,22	102	137	196	260	266	76	31,7	7,7
7,21	102	137	196	260	266	76	31,8	7,7
7,22	102	137	196	260	266	76	31,8	7,9
7,18	101	137	197	260	266	76	31,7	7,8
7,17	99	137	196	261	267	76	31,7	7,7
7,21	100	137	196	261	267	76	31,6	7,5
7,21	99	137	196	261	267	76	31,5	7,3
7,20	96	137	196	261	267	76	31,5	7,5
7,20	96	137	196	261	267	76	31,5	7,1
7,19	96	136	196	261	268	76	31,5	6,8
7,19	94	136	195	262	268	76	31,6	7,1
7,17	94	136	195	262	268	76	31,6	6,8
7,20	94	136	195	262	268	76	31,5	6,8
7,19	94	135	194	261	268	76	31,4	6,9
7,20	93	135	194	261	268	76	31,4	7,1
7,19	92	135	193	261	267	76	31,4	6,8
7,19	93	135	193	261	267	76	31,3	6,7
7,19	92	134	192	260	267	76	31,2	6,9
7,18	91	134	192	260	267	76	31,2	6,8
7,19	89	134	191	260	266	76	31,2	6,6
7,18	89	133	191	259	266	76	31,2	6,4
7,19	88	133	190	259	266	76	31,1	6,5
7,18	87	132	190	258	265	76	31,1	6,2
7,18	86	132	189	258	265	76	31,1	6,3
7,17	86	131	189	257	264	76	31,2	6,5
7,17	85	131	188	257	263	76	31,2	6,1
7,19	84	130	188	256	263	76	31,2	6,0
7,17	84	130	187	256	262	76	31,2	5,8

7,18	85	129	186	255	261	76	31,1	6,2
7,18	84	129	185	254	261	76	31,1	6,0
7,18	82	128	184	253	260	76	31,0	5,9
7,18	82	128	184	252	259	76	30,9	5,8
7,18	81	127	183	252	258	76	30,9	5,8
7,18	81	127	182	251	257	76	30,9	5,8
7,18	80	126	182	250	256	76	30,8	5,6
7,18	80	126	181	249	255	76	30,7	5,8
7,29	78	125	180	248	254	76	30,7	5,7
7,29	78	124	179	247	253	76	30,7	5,8
7,29	78	124	179	246	252	76	30,7	5,8
7,28	76	123	179	245	251	76	30,7	5,4
7,28	76	123	178	244	250	76	30,7	5,6
7,30	75	122	177	243	249	76	30,7	5,7
7,30	75	121	176	242	248	75	30,5	5,8
7,29	75	121	175	241	247	75	30,4	5,3
7,29	74	120	175	240	246	75	30,4	5,3
7,26	73	119	174	239	245	75	30,3	5,5
7,30	73	119	173	238	244	75	30,3	5,5
7,28	72	118	173	237	243	75	30,2	4,9
7,26	72	117	172	236	242	76	30,3	5,1
7,29	71	116	171	234	240	76	30,3	4,9
7,28	71	115	170	233	239	75	30,3	4,9
7,28	70	115	169	232	238	75	30,2	5,1
7,27	70	114	168	231	236	75	30,1	4,7
7,29	70	113	168	229	235	75	30,1	4,7
7,29	70	113	167	228	234	75	30,1	4,7
7,28	69	112	166	227	233	75	30,1	4,8
7,29	69	112	166	226	232	75	30,0	4,7
7,29	68	111	165	225	230	75	30,0	4,8
7,29	67	110	165	223	229	75	29,9	4,7
7,29	67	110	165	222	228	75	29,8	4,6
7,29	67	109	164	221	227	75	29,6	4,6
7,29	67	108	164	220	226	75	29,6	4,6
7,29	66	108	163	219	225	75	29,5	4,5
7,30	65	107	162	218	224	75	29,5	4,3
7,28	65	106	162	217	223	75	29,6	4,4
7,26	65	106	161	216	222	75	29,6	4,4
7,30	64	105	160	215	221	75	29,6	4,3
7,21	63	104	159	214	219	75	29,6	4,3
7,20	63	104	158	213	218	75	29,5	4,4
7,20	63	103	157	212	217	75	29,5	4,3
7,21	63	102	157	211	216	75	29,4	4,2
7,21	63	102	156	209	215	75	29,4	4,3
7,19	62	101	155	208	214	75	29,4	3,9
7,20	61	101	154	207	213	75	29,3	4,0
7,21	61	100	154	206	212	75	29,3	4,3
7,19	61	99	153	205	211	75	29,3	4,1

7,20	60	99	152	204	210	75	29,3	4,0
7,21	60	98	152	203	210	75	29,3	4,0
7,22	60	98	151	203	209	75	29,3	4,0
7,22	59	97	150	202	208	74	29,2	4,0
7,21	59	97	149	201	207	74	29,2	3,9
7,21	59	96	149	200	206	74	29,2	3,7
7,21	59	96	148	199	205	74	29,2	3,8
7,21	59	95	147	198	204	74	29,1	3,9
7,21	57	95	147	197	204	74	29,1	3,9
7,18	58	94	146	197	203	74	29,1	3,9
7,21	57	93	146	196	202	74	29,1	3,6
7,21	57	93	145	195	201	74	29,0	3,7
7,23	56	92	145	194	201	74	29,0	3,7
7,21	56	92	145	194	200	74	28,9	3,7
7,21	56	91	144	193	199	74	29,0	3,4
7,19	55	91	144	192	198	74	29,0	3,3
7,22	55	90	143	191	198	74	28,9	3,6
7,20	55	90	142	191	197	74	29,0	3,4
7,20	55	89	142	190	196	74	28,9	3,6
7,22	54	89	141	189	195	74	28,9	3,6
7,21	54	88	140	189	195	74	28,8	3,5
7,20	54	88	140	188	194	73	28,8	3,5
7,21	54	88	139	187	193	73	28,8	3,3
7,19	54	87	139	187	193	73	28,8	3,5
7,22	53	87	138	186	192	73	28,8	3,1
7,21	53	86	138	186	191	73	28,8	3,2
7,22	53	86	137	185	191	73	28,7	3,3
7,22	53	85	137	184	190	73	28,7	3,3
7,20	53	85	137	184	190	73	28,7	3,1
7,21	53	84	137	183	189	73	28,7	3,2
7,20	52	84	137	183	189	73	28,7	3,3
7,20	52	84	136	182	188	73	28,6	3,4
7,21	51	83	136	182	187	73	28,6	3,4
7,20	51	83	136	181	187	73	28,5	3,1
7,21	51	82	135	181	186	73	28,5	3,0
7,21	50	82	135	180	186	73	28,5	3,2
7,19	51	82	135	180	185	73	28,5	3,2
7,20	51	81	134	179	185	73	28,5	3,1
7,20	50	81	134	179	184	73	28,5	3,1
7,20	50	80	134	178	184	73	28,5	2,9
7,20	50	80	133	178	183	73	28,5	2,9
7,21	50	80	133	177	183	73	28,5	2,9
7,19	50	79	132	177	182	73	28,5	2,9
7,21	50	79	132	176	182	73	28,4	3,1
7,22	49	79	131	176	181	73	28,4	3,1
7,20	49	78	131	175	181	72	28,4	2,6
7,21	49	78	130	175	181	72	28,4	2,8
7,22	48	78	130	174	180	72	28,4	2,8

7,20	49	77	129	174	180	72	28,4	2,9
7,21	48	77	128	174	179	72	28,4	2,9
7,22	48	77	128	173	179	72	28,4	3,1
7,18	48	76	128	173	178	72	28,4	2,6
7,22	48	76	128	172	178	72	28,3	2,8
7,21	48	76	128	172	177	72	28,4	2,8
7,20	47	75	127	172	177	72	28,4	2,9
7,21	47	75	127	171	177	72	28,4	2,7
7,21	47	75	127	171	176	72	28,3	2,7
7,19	47	74	126	170	176	72	28,3	2,8
7,19	47	74	126	170	175	72	28,4	2,9
7,18	47	74	125	170	175	72	28,3	2,8
7,21	47	74	125	169	174	72	28,4	2,4
7,21	46	73	124	169	174	71	28,4	2,5
7,17	46	73	124	168	174	71	28,4	2,6
7,18	45	73	124	168	173	71	28,4	2,5
7,20	45	72	124	168	173	71	28,3	2,5
7,20	46	72	123	167	173	71	28,3	2,4
7,20	45	72	123	167	172	71	28,2	2,5
7,20	45	72	123	167	172	71	28,2	2,4
7,19	45	71	123	166	172	71	28,1	2,4
7,19	45	71	123	166	171	71	28,1	2,5
7,19	44	71	123	166	171	71	28,1	2,5
7,21	44	71	122	165	171	71	28,2	2,6
7,19	44	71	122	165	170	71	28,2	2,5
7,22	45	70	121	165	170	71	28,2	2,3
7,21	44	70	121	164	169	71	28,1	2,4
7,21	44	70	120	164	169	71	28,2	2,3
7,21	44	70	120	163	169	71	28,2	2,4
7,22	44	69	120	163	168	71	28,1	2,4
7,23	44	69	119	163	168	71	28,0	2,4
7,21	43	69	119	163	168	71	28,0	2,3
7,20	44	69	119	162	167	71	28,0	2,3
7,22	43	68	119	162	167	70	28,0	2,4
7,19	44	68	119	162	167	70	28,0	2,1
7,21	43	68	118	161	167	70	28,1	2,3
7,21	43	68	118	161	166	70	28,0	2,3
7,23	43	68	117	161	166	70	28,0	2,3
7,22	43	67	117	160	166	70	28,0	2,3
7,22	43	67	117	160	165	70	28,0	2,3
7,22	42	67	116	160	165	70	28,0	2,3
7,20	43	67	116	159	165	70	27,9	2,4
7,20	43	67	116	159	164	70	28,0	2,2
7,22	42	66	116	159	164	70	28,0	2,2
7,22	42	66	116	159	164	70	28,0	2,1
7,22	42	66	116	158	164	70	27,9	2,0
7,21	42	66	116	158	163	70	28,0	2,1
7,21	42	66	115	158	163	70	28,0	2,2

7,20	42	65	115	157	163	70	28,0	2,2
7,23	42	65	115	157	163	70	27,9	2,2
7,21	42	65	114	157	162	69	27,9	2,1
7,22	41	65	114	157	162	69	27,9	2,0
7,21	41	65	114	156	162	69	28,0	2,2
7,23	41	65	113	156	162	69	28,0	2,0
7,22	41	64	113	156	161	69	27,9	2,1
7,22	41	64	113	155	161	69	28,0	2,2
7,22	41	64	112	155	161	69	28,0	2,2
7,23	41	64	112	155	160	69	27,9	2,0
7,21	41	64	112	155	160	69	28,0	2,0
7,22	41	64	112	154	160	69	27,9	2,2
7,22	41	64	111	154	160	69	27,9	2,2
7,22	40	63	112	154	159	69	27,9	2,0
7,21	40	63	111	154	159	69	27,9	2,2
7,22	40	63	111	153	159	69	27,9	2,0
7,19	41	63	111	153	158	69	27,8	2,1
7,21	40	63	111	153	158	68	27,8	2,1
7,21	40	63	111	153	158	68	27,8	2,0
7,23	40	62	110	153	158	68	27,8	2,0
7,20	40	62	110	152	157	68	27,8	2,0
7,20	40	62	110	152	157	68	27,8	2,2
7,23	40	62	110	152	157	68	27,7	1,9
7,22	40	62	110	152	156	68	27,7	1,8
7,23	40	62	109	151	156	68	27,7	1,9
7,20	40	62	109	151	156	68	27,7	2,0
7,23	39	61	109	151	156	68	27,7	1,9
7,21	40	61	109	151	155	68	27,7	1,9
7,20	40	61	109	151	155	68	27,7	1,8
7,21	40	61	108	150	155	68	27,7	1,7
7,21	39	61	108	150	155	68	27,8	1,7
7,21	39	61	108	150	154	67	27,7	1,8
7,20	39	61	107	150	154	67	27,7	2,0
7,24	39	61	107	150	154	67	27,7	2,1
7,19	39	60	107	149	153	67	27,7	2,0
7,22	39	60	107	149	153	67	27,7	2,1
7,21	39	60	107	149	153	67	27,6	2,0
7,21	39	60	107	149	153	67	27,7	1,8
7,22	39	60	107	149	152	67	27,7	1,9
7,21	39	60	107	148	152	67	27,7	1,8
7,22	39	60	106	148	152	67	27,6	1,9
7,21	39	60	106	148	152	67	27,6	1,9
7,20	38	59	106	148	151	67	27,6	1,7
7,22	38	59	106	148	151	67	27,6	1,8
7,23	38	59	106	147	151	67	27,6	1,9
7,22	38	59	106	147	151	67	27,6	1,9
7,22	38	59	105	147	151	66	27,6	1,8
7,22	38	59	105	147	150	66	27,5	1,9

7,23	38	59	105	147	150	66	27,6	1,9
7,21	38	59	105	146	150	66	27,6	1,5
7,21	37	58	104	146	149	66	27,6	1,8
7,22	38	58	104	146	149	66	27,7	1,7
7,20	38	58	104	146	149	66	27,7	1,6
7,20	38	58	104	146	149	66	27,7	1,8
7,22	37	58	104	146	148	66	27,7	1,9
7,22	38	58	104	145	148	66	27,6	1,5
7,21	38	58	104	145	148	66	27,7	1,5
7,22	37	58	104	145	148	66	27,6	1,7
7,22	38	58	103	145	148	66	27,6	1,8
7,22	37	58	103	145	148	66	27,6	1,7
7,21	37	58	103	145	147	66	27,6	1,7
7,21	37	58	103	145	147	66	27,6	1,6
7,22	37	57	103	144	147	65	27,5	1,6
7,22	37	57	103	144	147	65	27,5	1,8
7,21	37	57	103	144	147	65	27,5	1,8
7,21	37	57	103	144	146	65	27,5	1,8
7,22	37	57	103	144	146	65	27,5	1,7
7,23	37	57	103	144	146	65	27,5	1,7
7,19	37	57	103	144	146	65	27,5	1,9
7,21	37	57	103	144	146	65	27,5	1,5
7,21	37	57	102	143	146	65	27,6	2,0
7,22	37	57	102	143	146	65	27,6	1,7
7,21	36	57	102	143	146	65	27,5	1,7
7,21	36	57	102	143	145	65	27,5	1,6
7,21	36	57	101	143	145	65	27,5	1,6
7,19	37	56	101	142	145	65	27,5	1,7
7,19	36	56	101	142	145	65	27,5	1,4
7,21	36	56	101	142	144	64	27,5	1,3
7,20	36	56	100	142	144	64	27,5	1,3
7,20	36	56	100	142	144	64	27,6	1,5
7,23	36	56	100	142	144	64	27,6	1,3
7,22	36	56	100	141	144	64	27,6	1,2
7,22	36	56	100	141	144	64	27,6	1,6
7,20	36	56	100	141	144	64	27,6	1,6
7,22	36	56	99	141	143	64	27,6	1,4
7,22	36	56	99	141	143	64	27,6	1,5
7,23	36	56	99	141	143	64	27,6	1,5
7,21	36	55	99	141	143	64	27,6	1,4
7,21	36	55	99	140	143	64	27,6	1,4
7,22	35	55	98	140	143	64	27,6	1,5
7,21	35	55	98	140	143	64	27,7	1,3
7,21	35	55	98	140	143	64	27,7	1,4
7,22	35	55	98	140	143	64	27,7	1,6
7,21	35	55	98	140	142	63	27,7	1,3
7,21	35	55	98	140	142	63	27,7	1,5
7,20	35	55	98	140	142	63	27,7	1,4

7,22	35	55	98	139	142	63	27,7	1,5
7,21	36	55	98	139	142	63	27,7	1,5
7,21	36	55	98	139	142	63	27,7	1,2
7,19	35	55	98	139	142	63	27,7	1,4
7,21	35	55	97	139	142	63	27,7	1,6
7,19	35	55	97	139	142	63	27,7	1,3
7,21	35	54	97	138	141	63	27,7	1,3
7,20	35	54	97	138	141	63	27,7	1,4
7,20	35	54	97	138	141	63	27,7	1,3
7,20	35	54	97	138	141	63	27,7	1,4
7,18	35	54	97	138	141	63	27,8	1,5
7,19	35	54	97	138	141	63	27,8	1,3
7,21	35	54	97	138	141	63	27,7	1,5
7,22	35	54	97	137	141	63	27,7	1,4
7,21	35	54	97	137	141	63	27,7	1,4
7,19	35	54	97	137	141	63	27,6	1,5
7,19	35	54	97	137	141	63	27,7	1,4
7,18	35	54	97	137	141	63	27,6	1,3
7,20	35	54	96	137	141	62	27,6	1,2
7,18	35	54	96	137	141	62	27,6	1,1
7,20	35	54	96	136	140	62	27,6	1,3
7,19	35	54	96	136	140	62	27,7	1,6
7,19	35	54	96	136	140	62	27,7	1,2
7,19	35	54	96	136	140	62	27,7	1,4
7,22	35	54	96	136	140	62	27,7	1,3
7,21	35	54	96	136	140	62	27,7	1,1
7,20	35	54	96	136	140	62	27,7	1,2
7,21	35	54	96	136	140	62	27,7	1,1
7,21	35	53	96	135	140	62	27,7	1,1
7,20	35	53	95	135	140	62	27,8	1,2
7,21	35	53	95	135	140	62	27,8	1,4
7,20	35	53	95	135	139	62	27,7	1,3
7,20	35	53	95	135	139	62	27,7	1,2
7,18	35	53	95	135	139	62	27,7	1,5
7,18	35	53	95	135	139	62	27,7	1,2
7,20	35	53	95	135	139	62	27,7	1,3
7,21	34	53	95	134	139	62	27,7	1,4
7,20	34	53	95	134	139	62	27,7	1,3
7,17	34	53	94	134	139	62	27,7	1,3
7,19	34	53	95	134	139	62	27,7	1,3
7,20	34	53	94	134	139	62	27,7	1,2
7,21	34	53	94	134	138	62	27,6	1,1
7,19	34	53	95	134	138	61	27,7	1,5
7,21	34	53	94	134	138	61	27,6	1,4
7,19	34	53	94	134	138	61	27,7	1,4
7,18	34	53	94	134	138	61	27,7	1,1
7,20	34	53	94	133	138	61	27,7	1,3
7,21	34	53	94	133	138	61	27,7	1,3

7,19	34	53	94	133	138	61	27,7	1,4
7,19	34	53	94	133	138	61	27,6	1,1
7,20	34	52	94	133	137	61	27,6	1,1
7,19	34	52	93	133	137	61	27,7	1,2
7,18	34	52	93	133	137	61	27,7	1,2
7,20	34	52	93	133	137	61	27,7	1,2
7,20	34	52	93	132	137	61	27,7	1,3
7,21	34	52	93	132	137	61	27,7	0,9
7,21	34	52	93	132	137	61	27,7	1,0
7,19	34	52	93	132	137	61	27,7	1,1
7,20	34	52	93	132	137	61	27,7	1,3
7,20	34	52	93	132	136	61	27,7	1,2
7,19	34	52	93	132	136	60	27,7	1,2
7,18	34	52	92	132	136	60	27,7	1,2
7,18	34	52	92	132	136	60	27,7	1,2
7,20	34	52	92	131	136	60	27,7	1,3
7,19	34	52	92	131	136	60	27,6	1,1
7,20	34	52	93	131	136	60	27,6	1,3
7,18	34	52	92	131	136	60	27,6	1,3
7,18	34	52	92	131	136	60	27,6	1,2
7,20	34	52	92	131	136	60	27,6	1,4
7,19	34	52	93	131	136	60	27,5	1,1
7,21	34	52	92	131	136	60	27,6	1,2
7,21	33	52	92	131	135	60	27,6	1,1
7,22	34	52	92	131	135	60	27,7	1,2
7,22	34	52	92	131	135	60	27,7	1,1
7,23	34	52	92	130	135	60	27,7	1,3
7,22	34	51	92	130	135	60	27,7	1,2
7,20	34	51	92	130	135	60	27,7	1,2
7,22	33	51	91	130	135	60	27,7	1,0
7,21	34	51	91	130	134	60	27,7	1,2
7,21	33	51	91	130	134	60	27,7	1,2
7,21	33	51	91	130	134	60	27,7	1,1
7,21	34	51	91	130	134	60	27,7	1,2
7,20	34	51	91	130	134	60	27,8	1,2
7,20	34	51	91	130	134	60	27,7	1,3
7,21	34	51	91	129	134	60	27,7	1,4
7,22	33	51	91	129	134	59	27,7	1,3
7,21	33	51	91	129	134	59	27,6	1,3
7,21	34	51	91	129	134	59	27,6	1,2
7,21	34	51	91	129	134	59	27,6	1,2
7,21	33	51	91	129	134	59	27,6	1,1
7,22	34	51	91	129	133	59	27,6	1,1
7,20	34	51	91	129	133	59	27,7	1,0
7,18	33	51	91	129	133	59	27,7	1,1
7,19	33	51	91	128	133	59	27,7	1,1
7,22	34	51	90	128	133	59	27,7	1,3
7,19	34	51	90	128	133	59	27,6	1,2

7,20	34	51	90	128	133	59	27,6	1,2
7,20	33	51	91	128	133	59	27,7	1,3
7,21	33	51	90	128	133	59	27,7	1,1
7,21	33	51	90	128	133	59	27,7	1,1
7,21	34	51	90	128	133	59	27,8	1,1
7,21	34	51	90	128	133	59	27,8	1,1
7,21	34	51	90	127	132	59	27,7	1,2
7,22	33	51	90	127	132	59	27,8	1,1
7,21	33	51	90	127	132	59	27,7	1,2
7,20	33	51	90	127	132	58	27,7	1,3
7,20	33	51	90	127	132	58	27,7	1,3
7,19	33	51	89	127	132	58	27,8	1,0
7,19	33	50	89	127	132	58	27,7	1,5
7,21	33	50	89	127	132	58	27,7	1,0
7,21	33	50	89	127	132	58	27,8	1,1
7,19	34	50	90	126	132	58	27,7	1,2
7,21	33	50	89	126	131	58	27,7	1,3
7,20	33	50	89	126	131	58	27,8	1,3
7,19	33	50	89	126	131	58	27,7	1,2
7,22	33	50	89	126	131	58	27,7	1,1
7,21	33	50	89	126	131	58	27,7	1,1
7,20	33	50	89	126	131	58	27,7	1,1
7,21	33	50	89	126	131	58	27,7	1,5
7,22	33	50	88	126	130	58	27,7	0,9
7,20	33	50	89	126	130	58	27,7	1,4
7,19	33	50	89	126	130	58	27,7	1,1
7,21	33	50	88	126	130	58	27,7	1,2
7,21	33	50	88	126	130	58	27,7	1,2
7,22	33	50	88	126	130	58	27,7	1,2
7,21	33	50	88	126	130	58	27,8	1,3
7,21	33	50	88	126	130	58	27,8	1,0
7,22	33	50	88	126	129	57	27,8	1,1
7,22	33	50	88	125	129	57	27,8	1,1
7,21	33	50	88	125	129	57	27,8	1,4
7,20	33	50	88	125	129	57	27,7	1,1
7,21	33	50	88	125	129	57	27,7	1,2
7,21	33	50	88	125	129	57	27,7	1,2
7,20	33	50	88	125	129	57	27,7	1,2
7,22	33	50	88	125	128	57	27,7	1,2
7,20	33	50	88	125	128	57	27,7	1,1
7,21	33	50	88	125	128	57	27,7	1,2
7,21	33	50	88	125	128	57	27,7	1,4
7,22	33	50	88	125	128	57	27,7	1,2
7,21	33	50	88	125	128	57	27,7	1,2
7,21	33	50	88	125	128	57	27,7	1,2
7,19	33	50	88	125	128	57	27,7	1,0
7,18	33	50	87	125	127	57	27,7	0,9
7,20	33	50	87	125	127	57	27,8	1,2

7,21	33	50	87	125	127	57	27,7	0,9
7,20	33	49	87	125	127	57	27,7	1,0
7,18	33	49	87	125	127	57	27,8	1,1
7,19	33	49	87	125	127	57	27,7	1,1
7,20	33	49	87	125	127	56	27,7	1,2
7,21	33	49	87	124	126	56	27,7	1,2
7,21	33	49	87	124	126	56	27,7	1,1
7,21	33	49	87	124	126	56	27,7	1,1
7,21	33	49	87	124	126	56	27,7	0,9
7,19	33	49	87	124	126	56	27,7	1,1
7,20	33	49	87	124	126	56	27,7	1,0
7,21	33	49	87	124	126	56	27,8	1,5
7,21	33	49	87	124	126	56	27,7	1,3
7,21	33	49	86	124	126	56	27,7	1,3
7,19	33	49	87	124	126	56	27,7	1,1
7,20	33	49	86	124	126	56	27,7	1,1
7,20	33	49	86	124	125	56	27,7	1,1
7,21	33	49	86	124	125	56	27,7	1,1
7,20	33	49	86	124	125	56	27,7	1,2
7,20	33	49	86	124	125	56	27,7	1,0
7,20	33	49	86	124	125	56	27,7	1,0
7,19	33	49	86	124	125	56	27,7	1,2
7,19	33	49	86	124	125	56	27,8	1,3
7,20	33	49	86	124	125	56	27,7	1,1
7,19	33	49	86	124	125	56	27,8	1,2
7,19	33	49	86	123	125	56	27,7	1,2
7,19	33	49	86	123	125	55	27,7	1,2
7,19	33	49	86	123	124	55	27,7	1,3
7,20	33	49	86	123	124	55	27,7	1,1
7,19	33	49	86	123	124	55	27,7	1,1
7,21	33	49	86	123	124	55	27,7	1,0
7,19	33	49	86	123	124	55	27,7	1,1
7,19	33	49	86	123	124	55	27,7	1,1
7,20	33	49	86	123	124	55	27,7	1,0
7,21	33	49	86	123	124	55	27,7	1,3
7,21	32	49	86	123	124	55	27,7	1,1
7,18	33	49	86	123	124	55	27,7	1,1
7,21	33	49	86	123	124	55	27,7	0,9
7,21	33	49	85	123	124	55	27,7	1,1
7,20	33	49	85	123	124	55	27,7	1,1
7,21	33	49	85	123	124	55	27,7	0,8
7,19	32	49	85	123	124	55	27,6	1,0
7,20	33	49	85	123	124	55	27,6	1,0
7,21	33	49	85	122	124	55	27,6	1,2
7,21	33	49	85	122	123	55	27,6	1,0
7,21	33	49	85	122	123	55	27,6	1,1
7,21	33	49	85	122	123	55	27,6	1,3
7,20	33	49	85	122	123	55	27,6	1,3

7,20	33	49	85	122	123	55	27,6	1,4
7,20	33	49	85	122	123	55	27,6	1,0
7,21	33	49	85	122	123	55	27,6	1,4
7,18	33	49	85	122	123	55	27,6	1,2
7,22	33	49	85	122	123	55	27,7	1,1
7,21	33	49	85	122	123	55	27,7	1,4
7,19	33	49	85	122	123	55	27,6	1,3
7,20	33	49	85	122	123	55	27,6	1,3
7,20	33	49	85	122	123	54	27,6	1,3

Pd Kanal - 39	Ps Kanal - 40	Vægt - [Kg] 43	CO-Lav - [1 44	CO-Høj - [% 45	CO2 - [%] 46
Duct dynamic pressure	Duct static pressure	Platform scale reading	CO low range [100ppm]	CO high range [%]	CO2 - [%]
30,5	48,3	1,557	6,91	0,07	4,90
31,2	47,8	4,695	14,93	0,15	2,63
30,4	49,3	4,408	22,44	0,28	2,65
30,9	47,7	4,355	8,95	0,11	12,43
30,3	48,2	4,323	8,47	0,10	13,38
31,3	47,6	4,287	19,29	0,21	14,14
30,4	46,3	4,255	13,66	0,15	14,04
30,6	47,6	4,224	15,32	0,16	13,62
30,2	46,8	4,198	19,47	0,21	13,68
30,7	47,3	4,171	17,71	0,19	13,36
29,3	46,8	4,145	22,43	0,24	13,61
30,3	46,6	4,121	15,01	0,17	13,14
31,2	47,5	4,096	13,35	0,15	12,95
30,6	46,6	4,074	6,33	0,08	12,06
30,2	46,5	4,050	6,72	0,08	12,35
30,8	47,4	4,024	10,60	0,10	12,68
30,6	47,7	3,994	18,81	0,20	13,45
30,4	46,8	3,975	14,45	0,16	12,88
29,8	46,1	3,951	21,80	0,23	12,98
30,6	46,7	3,930	16,40	0,17	12,52
30,7	46,7	3,911	15,21	0,17	12,72
30,7	47,1	3,891	8,91	0,11	12,15
30,8	47,2	3,876	7,98	0,08	11,29
30,5	47,3	3,860	14,32	0,14	10,63
30,4	46,4	3,856	22,44	0,44	8,27
32,3	49,5	3,839	22,44	0,27	8,92
30,1	46,2	3,823	17,12	0,19	9,33
30,3	45,7	3,803	12,10	0,13	9,79
31,4	47,8	3,779	8,61	0,10	10,23
29,9	47,6	3,757	4,56	0,07	10,76
31,9	49,7	3,732	6,49	0,08	11,32
30,4	47,1	3,703	7,71	0,10	12,08
31,0	47,3	3,678	9,18	0,10	12,60
30,4	46,1	3,646	22,44	0,89	14,65
30,8	48,0	3,624	22,44	0,64	14,71
30,7	46,7	3,604	22,44	0,37	14,32
30,1	46,2	3,583	19,93	0,21	13,90
30,2	46,1	3,564	14,50	0,17	13,38
30,1	46,6	3,546	10,50	0,13	13,08
30,1	46,2	3,530	8,35	0,10	12,85
30,5	46,8	3,512	6,98	0,08	12,72
31,3	46,8	3,493	6,32	0,08	12,56

30,2	46,5	3,478	5,00	0,06	12,35
30,2	46,8	3,460	5,25	0,06	12,24
30,7	46,0	3,442	5,11	0,06	12,21
31,1	47,2	3,427	4,55	0,06	12,11
30,0	46,9	3,411	4,22	0,06	12,12
31,2	47,1	3,393	4,07	0,05	12,25
31,3	47,1	3,377	5,08	0,07	12,31
30,3	47,0	3,359	4,53	0,06	12,30
30,2	46,9	3,340	3,28	0,04	12,30
29,5	44,3	3,325	3,54	0,05	12,38
31,4	47,7	3,307	4,17	0,06	12,59
30,1	46,3	3,289	3,25	0,05	12,61
29,9	46,1	3,273	3,60	0,05	12,68
30,6	46,9	3,253	4,61	0,06	12,87
30,7	47,1	3,238	7,25	0,08	13,01
30,5	47,9	3,218	6,03	0,07	13,13
29,9	46,1	3,202	5,74	0,07	13,21
30,2	46,3	3,181	5,39	0,07	13,33
30,9	47,1	3,163	7,98	0,10	13,48
29,9	47,2	3,145	6,86	0,08	13,45
30,5	46,3	3,127	5,66	0,07	13,44
29,6	46,1	3,111	6,40	0,08	13,39
30,4	46,9	3,093	9,01	0,10	13,65
31,3	47,3	3,076	9,93	0,11	13,67
29,7	46,5	3,058	8,57	0,10	13,85
32,0	47,9	3,039	10,21	0,11	13,86
30,2	46,6	3,021	11,29	0,13	13,95
30,8	46,8	3,002	15,47	0,17	13,95
30,3	46,9	2,984	18,41	0,20	14,04
30,8	46,5	2,967	22,44	0,24	14,32
31,4	47,0	2,949	22,44	0,25	14,30
31,7	47,6	2,930	22,44	0,28	14,40
30,8	47,0	2,912	22,44	0,29	14,46
30,5	46,9	2,894	22,44	0,30	14,45
30,1	46,9	2,876	22,44	0,28	14,44
29,7	46,2	2,859	22,44	0,28	14,50
30,4	45,8	2,841	22,44	0,34	14,65
30,5	46,5	2,821	22,44	0,31	14,57
31,4	47,6	2,807	22,44	0,28	14,58
30,2	46,9	2,790	22,44	0,29	14,51
30,5	46,0	2,772	22,44	0,28	14,53
30,7	47,1	2,755	22,44	0,28	14,39
29,4	47,0	2,738	22,44	0,29	14,39
31,0	46,8	2,723	22,44	0,26	14,41
28,9	45,8	2,708	22,44	0,26	14,46
30,8	46,9	2,689	22,44	0,29	14,60
33,6	49,7	2,672	22,44	0,27	14,47
31,1	46,5	2,656	22,44	0,25	14,48

30,5	46,7	2,641	22,44	0,28	14,54
31,1	46,9	2,623	22,44	0,26	14,45
31,3	47,5	2,608	22,44	0,27	14,57
30,6	47,3	2,590	22,44	0,28	14,58
30,3	46,0	2,575	22,44	0,27	14,58
31,5	47,0	2,559	22,44	0,29	14,63
30,3	47,0	2,542	22,44	0,29	14,69
30,5	47,2	2,526	22,44	0,29	14,68
29,9	46,6	2,512	22,44	0,31	14,81
31,4	46,3	2,496	22,44	0,36	14,86
31,5	47,4	2,481	22,44	0,36	14,89
30,6	48,0	2,462	22,44	0,38	15,07
31,4	47,0	2,447	22,44	0,44	15,16
30,1	47,2	2,428	22,44	0,42	15,15
29,8	46,2	2,412	22,44	0,48	15,27
31,1	47,0	2,395	22,44	0,50	15,17
30,6	47,3	2,379	22,44	0,55	15,22
30,3	46,2	2,361	22,44	0,64	15,22
30,5	47,8	2,342	22,44	0,72	15,34
31,2	47,2	2,327	22,44	0,79	15,35
30,8	47,2	2,309	22,44	0,90	15,30
30,7	47,0	2,292	22,44	0,98	15,32
30,6	47,1	2,273	22,44	0,97	15,43
31,0	47,1	2,254	22,44	1,15	15,39
30,3	46,7	2,238	22,44	1,17	15,38
31,3	47,8	2,220	22,44	1,19	15,44
29,7	47,5	2,203	22,44	1,34	15,33
31,5	47,7	2,186	22,44	1,25	15,40
30,6	46,7	2,171	22,44	1,28	15,31
30,2	46,6	2,153	22,44	1,16	15,35
30,6	48,9	2,135	22,44	1,01	15,29
30,4	46,4	2,123	22,44	0,87	15,39
29,8	46,6	2,105	22,44	0,79	15,37
30,6	46,3	2,090	22,44	0,76	15,41
31,6	45,9	2,075	22,44	0,92	15,36
30,6	46,8	2,060	22,44	0,95	15,17
29,8	46,4	2,043	22,44	0,97	15,33
29,8	45,9	2,028	22,44	0,94	15,33
31,4	46,8	2,011	22,44	0,99	15,45
29,7	46,9	1,995	22,44	0,99	15,36
30,3	47,7	1,980	22,44	0,98	15,37
30,4	46,3	1,963	22,44	0,98	15,28
31,0	47,8	1,947	22,44	0,96	15,37
31,0	46,6	1,934	22,44	0,93	15,38
29,6	45,9	1,919	22,44	0,92	15,31
30,1	47,0	1,902	22,44	0,93	15,33
30,8	47,1	1,887	22,44	0,92	15,35
30,8	46,8	1,870	22,44	0,95	15,37

30,1	46,1	1,856	22,44	0,92	15,23
30,0	45,7	1,841	22,44	0,97	15,42
31,2	46,5	1,825	22,44	0,95	15,33
30,1	47,4	1,810	22,44	0,97	15,36
30,7	46,2	1,796	22,44	0,94	15,26
30,4	46,7	1,780	22,44	0,95	15,31
30,3	46,3	1,764	22,44	0,98	15,26
29,8	46,6	1,752	22,44	0,98	15,29
29,8	45,8	1,738	22,44	0,94	15,22
29,7	46,2	1,719	22,44	1,07	15,42
30,8	46,8	1,704	22,44	1,10	15,34
30,1	46,3	1,688	22,44	1,13	15,39
30,6	47,1	1,673	22,44	1,17	15,34
31,2	46,9	1,657	22,44	1,25	15,38
30,2	45,8	1,640	22,44	1,32	15,32
30,8	46,6	1,625	22,44	1,46	15,37
31,9	48,2	1,609	22,44	1,56	15,36
29,8	47,7	1,594	22,44	1,73	15,33
31,5	47,4	1,575	22,44	1,99	15,37
31,5	48,3	1,556	22,44	2,18	15,36
31,5	47,2	1,541	22,44	2,31	15,31
30,2	46,8	1,524	22,44	2,41	15,28
30,3	48,3	1,508	22,44	2,56	15,17
31,1	48,1	1,491	22,44	2,41	15,20
31,0	47,5	1,477	22,44	1,96	15,29
30,8	47,5	1,466	22,44	1,37	15,17
30,5	47,0	1,454	22,44	0,93	14,93
30,8	48,1	1,444	22,44	0,60	14,92
30,8	48,1	1,434	22,44	0,38	14,45
29,6	48,1	1,425	22,44	0,26	14,18
31,5	48,1	1,415	16,24	0,18	14,01
31,7	48,3	1,410	12,35	0,14	13,65
31,6	47,7	1,402	11,95	0,14	13,39
31,7	48,3	1,392	11,83	0,14	13,36
30,6	48,6	1,384	9,50	0,10	13,27
31,7	48,0	1,375	8,89	0,10	13,09
31,1	47,3	1,368	8,29	0,09	12,72
31,1	48,1	1,360	6,52	0,08	12,49
31,4	48,0	1,355	6,37	0,08	12,44
31,5	48,1	1,346	3,65	0,05	12,33
31,9	47,9	1,342	3,03	0,05	12,20
31,5	48,2	1,334	2,55	0,04	12,18
31,4	47,5	1,328	2,94	0,05	11,64
30,7	47,4	1,324	2,46	0,04	11,10
30,4	47,7	1,317	2,68	0,04	10,79
31,6	47,7	1,315	3,82	0,05	10,67
31,4	47,8	1,306	4,49	0,06	10,41
31,1	47,6	1,304	5,51	0,07	10,19

31,8	47,4	1,299	6,46	0,08	10,18
31,3	47,7	1,293	5,82	0,07	10,22
30,5	47,7	1,291	6,40	0,08	10,16
30,9	47,4	1,285	6,97	0,09	10,04
31,9	48,3	1,280	7,58	0,09	9,99
30,7	48,4	1,277	9,33	0,11	10,00
30,1	46,8	1,271	7,90	0,09	9,93
30,3	47,3	1,258	9,10	0,11	9,72
31,4	48,4	1,257	8,83	0,11	9,64
30,7	47,4	1,252	8,26	0,10	9,57
30,1	47,4	1,252	12,31	0,13	9,15
30,3	47,0	1,250	17,58	0,18	8,91
31,3	47,6	1,240	22,44	0,36	8,15
31,1	47,5	1,246	22,44	1,04	6,84
30,8	47,5	1,240	22,44	1,05	6,66
31,5	47,3	1,238	22,44	1,04	6,73
31,4	47,3	1,234	22,44	1,02	6,76
31,0	48,3	1,229	22,44	1,00	6,77
31,2	46,9	1,229	22,44	0,97	6,70
30,6	48,0	1,228	22,44	0,95	6,69
30,5	46,8	1,224	22,44	0,94	6,76
31,2	47,5	1,222	22,44	0,92	6,95
31,5	47,8	1,217	22,44	0,86	6,90
31,5	47,7	1,215	22,44	0,85	6,78
31,1	47,7	1,214	22,44	0,83	6,78
30,8	49,2	1,211	22,44	0,82	6,80
29,9	47,2	1,208	22,44	0,81	6,79
30,7	47,1	1,207	22,44	0,80	6,80
31,5	47,8	1,205	22,44	0,79	6,83
30,8	46,9	1,203	22,44	0,78	6,77
30,8	47,4	1,202	22,44	0,76	6,76
31,2	48,0	1,202	22,44	0,75	6,80
30,7	47,6	1,201	22,44	0,75	6,77
31,5	46,9	1,198	22,44	0,74	6,80
31,2	48,0	1,197	22,44	0,74	6,77
30,7	46,8	1,196	22,44	0,74	6,81
30,3	47,2	1,196	22,44	0,74	6,89
31,6	47,7	1,193	22,44	0,73	6,86
31,7	47,8	1,192	22,44	0,74	6,95
31,5	47,0	1,191	22,44	0,74	7,05
30,1	47,8	1,187	22,44	0,72	6,93
31,6	48,3	1,187	22,44	0,72	6,90
30,7	46,2	1,184	22,44	0,72	6,99
31,0	48,0	1,184	22,44	0,71	6,92
31,7	47,3	1,183	22,44	0,70	6,89
31,6	47,5	1,182	22,44	0,71	6,95
31,2	47,3	1,170	22,44	0,70	6,95
30,3	47,7	1,171	22,44	0,70	6,96

31,7	48,3	1,169	22,44	0,70	6,97
31,4	48,4	1,168	22,44	0,70	6,95
30,6	48,6	1,167	22,44	0,70	7,02
30,9	47,8	1,164	22,44	0,69	6,97
31,2	47,4	1,163	22,44	0,69	6,95
31,6	48,5	1,162	22,44	0,69	6,99
31,2	48,5	1,160	22,44	0,69	6,99
31,7	47,9	1,159	22,44	0,70	6,91
31,6	47,5	1,159	22,44	0,71	7,05
31,4	47,9	1,157	22,44	0,71	7,06
31,5	47,7	1,154	22,44	0,70	7,05
30,0	48,4	1,153	22,44	0,69	6,99
31,1	46,8	1,152	22,44	0,70	7,02
30,8	47,6	1,151	22,44	0,70	7,05
32,1	49,2	1,149	22,44	0,70	7,03
31,3	47,8	1,137	22,44	0,70	7,00
31,4	48,6	1,136	22,44	0,70	7,08
32,1	48,1	1,136	22,44	0,71	7,07
31,8	49,6	1,134	22,44	0,71	7,08
31,0	48,7	1,134	22,44	0,71	7,12
32,6	48,7	1,132	22,44	0,72	7,11
31,7	48,4	1,130	22,44	0,70	7,04
31,4	47,8	1,130	22,44	0,72	7,11
31,1	48,1	1,129	22,44	0,72	7,10
32,1	48,9	1,128	22,44	0,72	7,12
31,8	47,2	1,126	22,44	0,72	7,10
31,7	47,3	1,126	22,44	0,72	7,11
31,7	49,0	1,124	22,44	0,71	7,08
31,9	48,5	1,122	22,44	0,73	7,11
31,3	47,9	1,119	22,44	0,72	7,14
32,1	48,9	1,119	22,44	0,74	7,19
32,3	48,7	1,117	22,44	0,72	7,07
31,5	47,4	1,116	22,44	0,73	7,12
32,2	48,1	1,114	22,44	0,73	7,16
31,9	47,8	1,111	22,44	0,73	7,17
31,8	48,0	1,110	22,44	0,74	7,28
31,1	48,6	1,109	22,44	0,75	7,30
31,4	47,2	1,107	22,44	0,74	7,20
31,4	47,6	1,106	22,44	0,73	7,14
31,1	47,8	1,106	22,44	0,74	7,27
31,6	48,7	1,103	22,44	0,75	7,23
31,4	48,6	1,102	22,44	0,75	7,19
30,7	47,3	1,099	22,44	0,76	7,27
31,7	49,1	1,099	22,44	0,75	7,20
32,0	48,2	1,098	22,44	0,75	7,19
32,1	48,7	1,097	22,44	0,75	7,18
31,5	48,2	1,096	22,44	0,75	7,24
31,1	48,8	1,092	22,44	0,75	7,22

31,2	46,9	1,092	22,44	0,75	7,13
31,8	48,5	1,091	22,44	0,75	7,14
31,9	48,9	1,088	22,44	0,75	7,11
31,7	48,1	1,088	22,44	0,75	7,20
31,9	48,4	1,086	22,44	0,76	7,20
31,7	48,3	1,085	22,44	0,76	7,19
32,0	48,6	1,084	22,44	0,76	7,19
32,3	47,8	1,082	22,44	0,75	7,19
31,0	47,5	1,081	22,44	0,76	7,17
32,5	48,7	1,080	22,44	0,77	7,25
31,0	47,8	1,077	22,44	0,76	7,17
30,9	48,1	1,077	22,44	0,77	7,24
30,5	48,0	1,075	22,44	0,76	7,13
31,7	48,2	1,074	22,44	0,77	7,28
32,3	48,4	1,072	22,44	0,78	7,28
31,9	48,2	1,071	22,44	0,79	7,31
31,3	47,8	1,070	22,44	0,77	7,22
31,0	48,3	1,069	22,44	0,77	7,25
31,5	48,3	1,059	22,44	0,78	7,26
32,1	47,8	1,058	22,44	0,77	7,20
30,5	47,6	1,056	22,44	0,78	7,21
31,6	48,2	1,056	22,44	0,78	7,30
31,6	48,4	1,054	22,44	0,78	7,27
31,6	48,6	1,053	22,44	0,78	7,26
31,2	48,0	1,053	22,44	0,79	7,23
32,2	49,2	1,052	22,44	0,78	7,26
31,2	47,7	1,050	22,44	0,78	7,22
31,5	47,7	1,048	22,44	0,80	7,34
31,7	48,5	1,047	22,44	0,80	7,34
31,9	47,4	1,044	22,44	0,80	7,30
31,8	47,5	1,045	22,44	0,79	7,26
31,8	48,2	1,043	22,44	0,80	7,31
31,5	48,1	1,043	22,44	0,80	7,32
31,5	47,6	1,041	22,44	0,81	7,36
30,9	47,7	1,040	22,44	0,79	7,24
32,2	49,3	1,038	22,44	0,80	7,37
31,5	47,6	1,037	22,44	0,80	7,29
32,1	49,6	1,036	22,44	0,80	7,29
31,2	48,4	1,033	22,44	0,80	7,23
31,3	47,6	1,032	22,44	0,81	7,32
31,7	48,9	1,032	22,44	0,80	7,21
32,4	50,2	1,030	22,44	0,80	7,25
31,4	48,2	1,029	22,44	0,79	7,19
31,2	48,4	1,028	22,44	0,81	7,32
32,0	47,9	1,027	22,44	0,81	7,32
31,9	48,2	1,027	22,44	0,81	7,28
31,7	47,6	1,026	22,44	0,78	7,20
32,6	48,5	1,022	22,44	0,78	7,16

32,0	48,5	1,020	22,44	0,77	7,14
32,0	48,9	1,020	22,44	0,77	7,16
31,0	48,9	1,018	22,44	0,77	7,07
31,1	47,4	1,018	22,44	0,77	7,10
31,5	47,1	1,016	22,44	0,78	7,19
31,8	47,6	1,015	22,44	0,79	7,17
30,7	47,8	1,013	22,44	0,81	7,25
31,9	48,0	1,011	22,44	0,81	7,14
31,3	48,0	1,010	22,44	0,82	7,17
31,3	47,4	1,009	22,44	0,83	7,26
31,9	48,2	1,008	22,44	0,83	7,25
32,5	48,7	1,007	22,44	0,82	7,23
32,2	48,6	1,006	22,44	0,83	7,22
31,7	48,2	1,005	22,44	0,84	7,34
31,0	48,3	1,004	22,44	0,85	7,33
31,6	47,3	1,001	22,44	0,85	7,25
31,0	46,5	0,999	22,44	0,85	7,23
32,1	48,4	0,999	22,44	0,86	7,25
33,7	50,5	0,996	22,44	0,85	7,18
32,0	48,8	0,996	22,44	0,86	7,21
31,4	49,0	0,995	22,44	0,85	7,14
31,5	48,2	0,993	22,44	0,86	7,21
31,4	47,4	0,991	22,44	0,87	7,26
31,2	46,8	0,990	22,44	0,87	7,30
32,0	47,5	0,990	22,44	0,87	7,33
31,6	48,6	0,988	22,44	0,88	7,29
30,2	47,7	0,987	22,44	0,88	7,32
31,3	48,0	0,985	22,44	0,87	7,32
31,9	49,7	0,983	22,44	0,88	7,35
31,1	47,0	0,983	22,44	0,89	7,35
30,5	47,8	0,982	22,44	0,90	7,37
31,1	47,7	0,979	22,44	0,90	7,41
31,5	47,8	0,979	22,44	0,90	7,46
31,6	47,6	0,978	22,44	0,90	7,38
31,2	47,6	0,977	22,44	0,90	7,37
32,0	49,3	0,975	22,44	0,90	7,38
32,1	48,4	0,973	22,44	0,90	7,41
30,6	48,2	0,972	22,44	0,90	7,36
31,1	47,8	0,971	22,44	0,91	7,46
31,8	48,1	0,969	22,44	0,92	7,48
31,6	47,3	0,967	22,44	0,92	7,43
30,6	47,5	0,967	22,44	0,92	7,45
31,2	47,2	0,966	22,44	0,92	7,44
31,5	48,2	0,966	22,44	0,91	7,41
31,2	47,8	0,965	22,44	0,91	7,41
30,6	48,1	0,964	22,44	0,90	7,33
32,2	48,0	0,962	22,44	0,92	7,40
30,6	46,8	0,960	22,44	0,92	7,43

31,3	46,7	0,960	22,44	0,93	7,54
31,5	48,2	0,957	22,44	0,94	7,61
31,3	46,6	0,957	22,44	0,94	7,60
31,1	47,7	0,955	22,44	0,94	7,63
32,1	48,3	0,955	22,44	0,94	7,63
33,0	49,7	0,953	22,44	0,94	7,61
31,7	48,0	0,950	22,44	0,95	7,60
31,9	48,6	0,950	22,44	0,94	7,58
31,8	48,4	0,949	22,44	0,96	7,68
32,2	48,2	0,947	22,44	0,97	7,70
31,0	48,2	0,946	22,44	0,97	7,66
30,9	47,6	0,944	22,44	0,97	7,65
31,6	48,4	0,943	22,44	0,97	7,65
30,5	47,6	0,941	22,44	0,97	7,65
32,0	48,4	0,940	22,44	0,97	7,60
32,1	48,8	0,938	22,44	0,98	7,67
31,7	47,9	0,938	22,44	0,99	7,73
31,4	47,9	0,936	22,44	0,98	7,69
31,2	47,5	0,934	22,44	0,99	7,72
31,4	47,6	0,928	22,44	0,97	7,59
30,9	47,8	0,927	22,44	0,97	7,64
31,2	47,7	0,925	22,44	0,98	7,70
31,3	47,3	0,924	22,44	0,97	7,59
32,1	48,6	0,923	22,44	0,97	7,61
31,2	47,8	0,922	22,44	0,96	7,56
32,1	48,3	0,922	22,44	0,96	7,59
30,4	48,9	0,920	22,44	0,95	7,58
31,5	46,7	0,919	22,44	0,95	7,61
27,6	43,3	0,918	22,44	0,95	7,64
28,6	43,3	0,915	22,44	0,94	7,63
28,4	42,5	0,914	22,44	0,96	7,72
29,8	44,0	0,913	22,44	0,94	7,65
27,6	43,3	0,912	22,44	0,97	7,89
27,0	43,6	0,911	22,44	0,97	7,94
28,3	43,0	0,910	22,44	0,97	8,00
28,1	43,7	0,907	22,44	0,97	7,93
28,8	44,1	0,907	22,44	0,96	7,87
28,3	43,2	0,906	22,44	0,96	7,88
27,9	43,7	0,904	22,44	0,97	7,98
28,6	43,5	0,902	22,44	0,96	7,94
28,0	43,4	0,901	22,44	0,98	8,07
28,6	42,8	0,902	22,44	0,97	8,04
28,9	43,1	0,900	22,44	0,97	8,04
30,9	46,9	0,898	22,44	0,97	7,97
30,4	47,1	0,897	22,44	0,96	7,95
31,0	47,1	0,895	22,44	0,96	7,94
31,4	47,2	0,893	22,44	0,96	7,89
31,1	47,1	0,893	22,44	0,95	7,84

31,0	48,4	0,891	22,44	0,95	7,91
31,2	47,0	0,890	22,44	0,96	7,86
31,8	47,3	0,889	22,44	0,97	7,94
29,5	46,8	0,889	22,44	0,96	7,86
30,6	46,8	0,888	22,44	0,97	7,94
31,2	46,9	0,886	22,44	0,97	7,89
30,8	47,5	0,884	22,44	0,96	7,91
31,2	47,3	0,884	22,44	0,97	7,90
30,1	46,7	0,881	22,44	0,97	7,91
30,4	46,7	0,879	22,44	0,96	7,91
30,4	47,1	0,879	22,44	0,97	7,91
30,3	46,9	0,878	22,44	0,96	7,84
30,5	46,8	0,877	22,44	0,97	7,89
31,0	47,2	0,877	22,44	0,96	7,83
30,6	46,8	0,875	22,44	0,95	7,79
30,9	46,5	0,874	22,44	0,95	7,78
29,9	46,9	0,873	22,44	0,95	7,76
30,8	46,4	0,872	22,44	0,94	7,66
30,8	47,3	0,870	22,44	0,96	7,80
30,4	47,0	0,870	22,44	0,96	7,80
28,9	46,9	0,868	22,44	0,96	7,83
30,8	46,6	0,866	22,44	0,97	7,86
30,9	46,6	0,866	22,44	0,96	7,81
30,7	46,6	0,865	22,44	0,96	7,80
31,2	46,2	0,864	22,44	0,96	7,79
30,4	46,0	0,863	22,44	0,97	7,84
31,2	46,6	0,862	22,44	0,97	7,76
29,8	46,9	0,859	22,44	0,96	7,72
30,3	46,6	0,859	22,44	0,98	7,80
30,7	46,3	0,858	22,44	0,98	7,78
30,2	46,9	0,857	22,44	0,98	7,80
31,1	46,4	0,856	22,44	0,97	7,76
31,3	47,4	0,855	22,44	0,99	7,82
30,3	46,6	0,854	22,44	0,98	7,85
30,8	46,3	0,853	22,44	0,99	7,85
30,4	45,9	0,851	22,44	1,00	7,87
30,1	46,1	0,851	22,44	0,98	7,78
30,5	47,2	0,849	22,44	0,98	7,81
31,1	46,9	0,848	22,44	0,98	7,76
30,1	47,0	0,847	22,44	0,98	7,76
29,4	46,9	0,846	22,44	0,99	7,79
30,5	46,8	0,845	22,44	0,99	7,75
31,0	46,8	0,843	22,44	0,98	7,77
30,7	46,8	0,843	22,44	0,99	7,73
31,0	46,8	0,842	22,44	0,98	7,74
31,0	46,7	0,840	22,44	0,98	7,74
30,6	46,7	0,838	22,44	0,98	7,70
31,3	46,7	0,837	22,44	0,99	7,72

30,0	46,7	0,837	22,44	0,99	7,77
30,7	46,2	0,835	22,44	0,98	7,64
31,4	47,6	0,835	22,44	0,99	7,72
30,9	46,5	0,834	22,44	1,00	7,75
29,8	46,3	0,833	22,44	1,00	7,79
30,3	46,8	0,832	22,44	1,00	7,78
30,4	46,8	0,830	22,44	1,00	7,79
30,3	46,8	0,830	22,44	0,99	7,70
30,8	46,4	0,827	22,44	0,98	7,65
30,8	45,7	0,826	22,44	0,99	7,71
30,2	46,5	0,826	22,44	1,00	7,73
30,0	46,1	0,824	22,44	0,99	7,70
30,2	46,9	0,823	22,44	0,99	7,73
30,5	46,9	0,823	22,44	0,99	7,67
30,9	46,9	0,821	22,44	0,99	7,63
30,8	47,0	0,820	22,44	1,00	7,73
31,0	47,6	0,819	22,44	0,99	7,72
31,0	46,8	0,817	22,44	1,00	7,64
31,3	45,8	0,816	22,44	0,98	7,61
30,9	47,0	0,815	22,44	1,00	7,64
31,1	46,7	0,814	22,44	0,99	7,57
30,1	46,4	0,814	22,44	1,00	7,62
29,2	45,9	0,813	22,44	1,00	7,59
30,9	46,2	0,812	22,44	1,00	7,59
30,6	45,9	0,811	22,44	1,01	7,62
30,5	46,4	0,810	22,44	1,01	7,65
30,2	46,9	0,808	22,44	1,01	7,63
31,1	46,8	0,806	22,44	1,01	7,62
31,2	46,6	0,804	22,44	1,02	7,69
30,7	46,3	0,804	22,44	1,01	7,63
31,1	46,2	0,804	22,44	1,02	7,64
29,5	45,8	0,802	22,44	1,02	7,69
30,8	46,7	0,801	22,44	1,01	7,62
30,9	46,1	0,800	22,44	1,03	7,62
30,8	46,4	0,799	22,44	1,01	7,50
30,5	46,7	0,797	22,44	1,02	7,54
29,5	46,1	0,797	22,44	1,03	7,55
30,6	46,5	0,795	22,44	1,02	7,51
30,9	46,2	0,795	22,44	1,02	7,50
29,5	46,5	0,793	22,44	1,02	7,47
30,2	46,8	0,793	22,44	1,01	7,48
30,3	46,1	0,792	22,44	1,01	7,42
30,7	46,0	0,791	22,44	1,01	7,46
30,6	46,4	0,789	22,44	1,01	7,46
30,4	47,0	0,789	22,44	1,02	7,47
30,6	46,2	0,788	22,44	1,02	7,43
30,6	46,4	0,787	22,44	1,01	7,47
30,5	46,6	0,784	22,44	1,02	7,45

31,2	46,1	0,783	22,44	1,01	7,42
29,6	46,3	0,782	22,44	1,01	7,45
30,6	46,0	0,781	22,44	1,02	7,43
29,7	46,7	0,781	22,44	1,01	7,42
30,8	46,5	0,780	22,44	1,02	7,40
30,6	47,4	0,778	22,44	1,01	7,41
31,6	46,3	0,778	22,44	1,03	7,48
30,6	46,2	0,777	22,44	1,02	7,43
30,7	46,1	0,775	22,44	1,02	7,45
30,9	45,8	0,775	22,44	1,02	7,44
30,6	45,8	0,773	22,44	1,02	7,42
30,5	46,7	0,771	22,44	1,02	7,43
31,3	46,6	0,770	22,44	1,01	7,37
29,9	46,5	0,770	22,44	1,02	7,40
30,5	46,5	0,769	22,44	1,02	7,42
30,6	46,4	0,768	22,44	1,03	7,41
29,1	46,4	0,767	22,44	1,02	7,40
30,7	46,5	0,766	22,44	1,02	7,40
30,4	46,3	0,764	22,44	1,03	7,45
30,6	45,8	0,764	22,44	1,03	7,47
30,1	46,1	0,762	22,44	1,03	7,45
30,9	46,6	0,761	22,44	1,02	7,41
29,0	46,4	0,759	22,44	1,03	7,45
30,5	45,7	0,759	22,44	1,02	7,41
29,5	46,5	0,758	22,44	1,03	7,40
31,0	46,4	0,757	22,44	1,02	7,39
30,5	46,1	0,756	22,44	1,04	7,44
30,0	46,0	0,757	22,44	1,03	7,39
30,4	45,9	0,755	22,44	1,04	7,46
30,3	46,4	0,753	22,44	1,04	7,49
30,6	46,0	0,753	22,44	1,05	7,49
30,7	45,7	0,751	22,44	1,04	7,46
30,2	45,3	0,750	22,44	1,04	7,46
31,0	46,3	0,748	22,44	1,05	7,48
30,6	46,4	0,748	22,44	1,03	7,35
30,6	46,2	0,747	22,44	1,04	7,37
30,3	46,6	0,746	22,44	1,05	7,36
30,4	46,4	0,744	22,44	1,05	7,35
30,4	46,4	0,744	22,44	1,05	7,33
31,2	46,0	0,743	22,44	1,05	7,30
30,7	47,3	0,740	22,44	1,06	7,32
29,9	46,9	0,740	22,44	1,05	7,26
30,9	46,8	0,739	22,44	1,06	7,32
30,8	46,6	0,739	22,44	1,05	7,27
30,8	47,0	0,737	22,44	1,05	7,30
30,5	46,8	0,737	22,44	1,05	7,27
30,4	46,5	0,734	22,44	1,05	7,31
30,6	46,7	0,734	22,44	1,06	7,33

31,0	46,0	0,733	22,44	1,05	7,34
30,6	45,9	0,732	22,44	1,05	7,32
30,9	46,5	0,729	22,44	1,05	7,32
30,7	46,5	0,728	22,44	1,06	7,33
31,3	46,4	0,728	22,44	1,06	7,35
30,1	46,9	0,726	22,44	1,06	7,36
30,5	46,5	0,726	22,44	1,05	7,33
30,8	46,2	0,724	22,44	1,06	7,36
31,3	47,0	0,724	22,44	1,05	7,33
29,8	46,2	0,723	22,44	1,04	7,29
31,0	46,1	0,722	22,44	1,05	7,40
30,8	45,9	0,721	22,44	1,05	7,43
29,9	46,7	0,719	22,44	1,05	7,44
30,3	46,8	0,718	22,44	1,05	7,46
29,7	46,8	0,717	22,44	1,04	7,42
30,4	46,2	0,716	22,44	1,04	7,40
30,5	46,5	0,715	22,44	1,03	7,35
30,5	46,0	0,715	22,44	1,03	7,34
31,2	46,4	0,713	22,44	1,02	7,26
30,5	46,7	0,712	22,44	1,03	7,26
31,0	46,8	0,712	22,44	1,02	7,21
31,0	46,6	0,711	22,44	1,03	7,28
31,0	47,0	0,708	22,44	1,04	7,30
30,3	46,6	0,708	22,44	1,03	7,32
30,8	46,5	0,706	22,44	1,02	7,23
30,2	46,4	0,705	22,44	1,03	7,30
31,1	46,5	0,705	22,44	1,02	7,21
31,2	46,9	0,704	22,44	1,02	7,22
30,2	46,4	0,703	22,44	1,01	7,11
30,5	46,2	0,702	22,44	1,02	7,20
31,2	46,6	0,701	22,44	1,02	7,23
30,3	47,0	0,700	22,44	1,01	7,22
31,1	47,3	0,697	22,44	1,02	7,25
30,8	46,6	0,697	22,44	1,03	7,32
30,4	46,5	0,695	22,44	1,02	7,21
30,6	46,4	0,695	22,44	1,02	7,29
31,4	46,8	0,694	22,44	1,01	7,16
30,9	46,7	0,693	22,44	1,01	7,17
31,2	46,9	0,693	22,44	1,02	7,23
30,8	46,3	0,692	22,44	1,01	7,16
29,6	46,0	0,691	22,44	1,01	7,15
30,3	46,3	0,690	22,44	1,02	7,19
30,1	46,7	0,689	22,44	1,02	7,14
29,8	46,4	0,688	22,44	0,99	6,85
30,4	46,6	0,686	22,44	0,97	6,57
31,0	46,2	0,685	22,44	0,97	6,41
30,6	46,2	0,684	22,44	0,96	6,36
30,9	46,5	0,683	22,44	0,96	6,33

30,4	46,0	0,683	22,44	0,95	6,32
31,1	46,3	0,682	22,44	0,94	6,28
29,1	45,9	0,682	22,44	0,94	6,26
30,1	47,2	0,680	22,44	0,93	6,28
30,8	46,3	0,680	22,44	0,92	6,21
31,5	46,8	0,678	22,44	0,92	6,23
30,7	46,5	0,678	22,44	0,91	6,21
32,2	48,3	0,678	22,44	0,90	6,16
30,5	46,7	0,675	22,44	0,89	6,18
		0,675			

Annex 23

Title: HF2 logger data 030920

Pages total: 24, excl this cover page

Datotid	Rum - [°C]	Side-1 - [°C]	Side-2 - [°C]	Side-3 - [°C]	Side-4 - [°C]
	1	2	3	4	5
Time	Ambient temperature	Main train filter temp	Split train 1H filter temp	Split train rem. filter temp	Room blank filter temp
11:34:00	Start of test				
11:33:58	23,85	29,48	28,62	24,05	24,76
11:34:28	23,79	29,44	28,90	24,18	24,74
11:34:58	23,83	29,30	29,13	24,11	24,76
11:35:28	23,83	29,14	29,19	24,08	24,78
11:35:58	23,76	29,20	29,16	24,28	24,79
11:36:28	23,71	29,00	29,07	24,21	24,77
11:36:58	23,75	28,82	28,94	24,05	24,75
11:37:28	23,69	29,05	28,79	23,97	24,73
11:37:58	23,78	29,50	28,77	24,03	24,80
11:38:28	23,87	29,64	28,83	24,22	24,75
11:38:58	23,82	29,56	29,25	24,21	24,77
11:39:28	23,82	29,41	29,39	24,05	24,76
11:39:58	23,88	29,39	29,43	24,12	24,80
11:40:28	23,86	29,36	29,31	24,23	24,76
11:40:58	24,00	29,15	29,24	24,41	24,78
11:41:28	23,94	28,98	29,14	24,31	24,80
11:41:58	23,90	28,81	29,00	24,22	24,81
11:42:28	23,89	29,09	28,87	24,36	24,79
11:42:58	23,93	29,37	28,75	24,71	24,83
11:43:28	24,01	29,60	28,86	24,69	24,86
11:43:58	23,92	29,62	29,26	24,52	24,83
11:44:28	23,93	29,53	29,45	24,32	24,83
11:44:58	24,15	29,33	29,51	24,44	24,87
11:45:28	23,96	29,19	29,45	24,73	24,88
11:45:58	24,06	29,03	29,29	24,78	24,86
11:46:28	23,88	28,96	29,10	24,67	24,81
11:46:58	23,94	29,05	28,95	24,75	24,78
11:47:28	23,99	29,34	28,98	24,58	24,88
11:47:58	24,16	29,44	28,87	24,65	24,89
11:48:28	24,04	29,52	28,69	24,70	24,84
11:48:58	23,99	29,44	28,96	24,65	24,85
11:49:28	23,99	29,31	29,22	24,65	24,84
11:49:58	24,01	29,21	29,31	24,63	24,87
11:50:28	24,00	29,07	29,25	24,61	24,87
11:50:58	23,97	28,95	29,11	24,64	24,85
11:51:28	24,08	29,14	29,08	24,66	24,88
11:51:58	24,06	29,42	29,02	24,62	24,90
11:52:28	24,07	29,63	28,86	24,76	24,91
11:52:58	24,12	29,65	28,78	24,77	24,93
11:53:28	24,27	29,48	28,81	24,70	24,93
11:53:58	24,14	29,35	29,15	24,67	24,92
11:54:28	24,08	29,20	29,30	24,63	24,92

11:54:58	24,15	29,23	29,33	25,13	24,97
11:55:28	24,17	29,14	29,23	24,85	24,98
11:55:58	24,21	28,93	29,22	24,82	25,00
11:56:28	24,03	28,88	29,07	24,86	25,00
11:56:58	24,18	29,23	29,02	24,89	25,08
11:57:28	24,17	29,53	28,98	24,83	25,12
11:57:58	24,13	29,64	28,77	24,90	25,09
11:58:28	24,16	29,61	28,65	24,97	25,05
11:58:58	24,19	29,55	28,62	24,80	25,07
11:59:28	24,07	29,41	28,93	25,20	25,09
11:59:58	24,27	29,28	29,27	25,06	25,17
12:00:28	24,16	29,22	29,28	24,94	25,14
12:00:58	24,32	29,11	29,17	24,90	25,10
12:01:28	24,25	29,01	29,08	24,93	25,08
12:01:58	24,38	28,90	29,00	24,85	25,06
12:02:28	24,35	29,22	29,03	24,93	25,13
12:02:58	24,47	29,44	28,95	25,36	25,16
12:03:28	24,39	29,49	28,81	25,17	25,15
12:03:58	24,32	29,50	28,62	25,21	25,12
12:04:28	24,28	29,32	28,86	25,09	25,15
12:04:58	24,41	29,39	29,15	25,05	25,19
12:05:28	24,43	29,20	29,28	25,20	25,19
12:05:58	24,35	29,02	29,24	25,04	25,25
12:06:28	24,29	28,97	29,16	24,93	25,20
12:06:58	24,33	28,93	29,18	24,87	25,26
12:07:28	24,29	28,94	29,03	24,96	25,23
12:07:58	24,33	29,13	28,93	24,95	25,24
12:08:28	24,12	29,35	28,74	25,17	25,17
12:08:58	24,26	29,43	28,72	25,31	25,23
12:09:28	24,26	29,38	28,77	25,13	25,26
12:09:58	24,36	29,24	29,09	25,02	25,24
12:10:28	24,27	29,13	29,26	24,85	25,21
12:10:58	24,14	29,08	29,24	24,88	25,17
12:11:28	24,27	29,03	29,29	25,06	25,25
12:11:58	24,20	28,93	29,21	25,01	25,24
12:12:28	24,29	29,03	29,12	24,98	25,23
12:12:58	24,21	29,18	28,98	24,96	25,25
12:13:28	24,42	29,31	28,97	25,13	25,32
12:13:58	24,22	29,29	28,89	25,32	25,30
12:14:28	24,25	29,24	28,76	25,43	25,32
12:14:58	24,25	29,14	28,64	25,39	25,28
12:15:28	24,42	29,04	28,84	25,47	25,32
12:15:58	24,48	29,00	29,11	25,69	25,41
12:16:28	24,53	28,94	29,14	25,39	25,39
12:16:58	24,59	28,88	29,12	25,12	25,40
12:17:28	24,71	29,23	29,11	25,12	25,42
12:17:58	24,52	29,45	29,09	25,21	25,48
12:18:28	24,37	29,55	28,92	25,41	25,42

12:18:58	24,49	29,44	28,89	25,24	25,47
12:19:28	24,31	29,38	28,70	25,10	25,40
12:19:58	24,39	29,32	28,71	25,01	25,48
12:20:29	24,21	29,30	28,69	25,13	25,44
12:20:59	24,03	29,14	29,01	25,25	25,46
12:21:29	24,32	29,03	29,05	25,23	25,42
12:21:59	24,43	28,94	29,18	24,98	25,52
12:22:29	24,19	28,89	29,06	24,95	25,43
12:22:59	24,27	29,00	29,03	24,87	25,50
12:23:29	24,10	29,38	28,85	24,93	25,44
12:23:59	24,00	29,46	28,75	24,90	25,43
12:24:29	24,25	29,46	28,81	25,02	25,53
12:24:59	24,47	29,38	28,71	25,26	25,54
12:25:29	24,45	29,27	28,73	24,90	25,53
12:25:59	24,56	29,16	29,07	25,18	25,53
12:26:29	24,47	29,11	29,30	25,02	25,54
12:26:59	24,55	29,13	29,31	25,27	25,51
12:27:29	24,62	28,97	29,28	25,39	25,53
12:27:59	24,56	28,84	29,22	25,19	25,51
12:28:29	24,65	28,72	29,13	25,07	25,50
12:28:59	24,40	29,08	29,08	25,25	25,55
12:29:29	24,49	29,23	29,00	25,07	25,56
12:29:59	24,40	29,33	28,84	24,99	25,51
12:30:29	24,36	29,31	28,79	25,03	25,51
12:30:59	24,42	29,15	28,66	25,05	25,47
12:31:29	24,48	29,16	28,67	25,18	25,55
12:31:59	24,39	29,09	28,95	25,18	25,51
12:32:29	24,39	28,99	29,13	25,14	25,46
12:32:59	24,54	28,79	29,24	25,15	25,49
12:33:29	24,67	28,82	29,13	25,14	25,44
12:33:59	24,60	28,95	29,13	29,18	25,49
12:34:29	24,50	28,95	28,84	29,03	25,54
12:34:59	24,55	28,82	25,18	29,06	25,53
12:35:29	24,62	28,84	25,12	30,22	25,52
12:35:59	24,48	28,92	25,13	30,42	25,55
12:36:29	24,65	29,20	25,17	30,03	25,58
12:36:59	24,45	29,26	25,02	29,78	25,57
12:37:29	24,39	29,24	25,12	29,70	25,55
12:37:59	24,46	29,18	25,12	29,59	25,55
12:38:29	24,37	29,19	25,07	29,52	25,57
12:38:59	24,45	29,01	25,23	29,41	25,63
12:39:29	24,34	29,00	25,18	29,32	25,54
12:39:59	24,36	28,84	25,26	29,18	25,60
12:40:29	24,51	28,75	25,07	29,08	25,61
12:40:59	24,49	28,92	24,98	29,54	25,56
12:41:29	24,38	29,28	24,92	29,96	25,60
12:41:59	24,48	29,38	24,88	29,96	25,57
12:42:29	24,46	29,41	25,05	29,90	25,53

12:42:59	24,52	29,30	25,06	29,72	25,62
12:43:29	24,55	29,19	25,04	29,62	25,59
12:43:59	24,61	29,19	25,03	29,55	25,68
12:44:29	24,64	29,03	25,18	29,41	25,68
12:44:59	24,53	28,99	25,14	29,33	25,62
12:45:29	24,63	28,84	25,20	29,24	25,65
12:45:59	24,53	28,80	25,15	29,14	25,59
12:46:29	24,53	28,91	25,19	29,20	25,64
12:46:59	24,56	29,24	25,20	29,54	25,60
12:47:29	24,62	29,36	25,35	29,57	25,60
12:47:59	24,43	29,26	25,28	29,39	25,63
12:48:29	24,56	29,21	25,28	29,32	25,60
12:48:59	24,53	29,30	25,16	29,29	25,63
12:49:29	24,52	29,19	25,16	29,22	25,63
12:49:59	24,46	29,06	25,30	29,11	25,68
12:50:29	24,29	28,98	25,13	29,33	25,58
12:50:59	24,43	28,84	25,21	29,77	25,64
12:51:29	24,66	28,82	25,34	29,86	25,69
12:51:59	24,70	28,89	25,30	29,76	25,69
12:52:29	24,70	29,19	25,28	29,65	25,69
12:52:59	24,50	29,36	25,17	29,52	25,62
12:53:29	24,68	29,49	25,26	29,51	25,66
12:53:59	24,59	29,42	25,33	29,35	25,72
12:54:29	24,66	29,40	25,14	29,30	25,66
12:54:59	24,73	29,20	25,24	29,15	25,69
12:55:29	24,68	29,15	25,07	29,05	25,65
12:55:59	24,87	29,12	25,17	29,30	25,74
12:56:29	24,68	29,03	25,15	29,43	25,76
12:56:59	24,60	28,93	25,04	29,42	25,70
12:57:29	24,56	28,81	25,07	29,33	25,68
12:57:59	24,65	28,69	25,23	29,23	25,71
12:58:29	24,60	28,89	25,25	29,17	25,77
12:58:59	24,76	28,92	25,30	29,10	25,76
12:59:29	24,38	28,87	25,16	29,08	25,75
12:59:59	24,49	28,92	25,06	29,71	25,69
13:00:29	24,63	28,86	25,16	29,83	25,80
13:00:59	24,64	28,83	25,26	29,80	25,78
13:01:29	24,70	28,80	25,30	29,74	25,75
13:01:59	24,50	28,85	25,12	29,59	25,73
13:02:29	24,59	28,92	25,05	29,44	25,75
13:02:59	24,71	29,14	25,07	29,49	25,76
13:03:29	24,53	29,01	25,11	29,35	25,77
13:03:59	24,64	28,93	25,14	29,24	25,81
13:04:29	24,41	28,91	25,02	29,19	25,75
13:04:51	End of test				

Side-5 - [°C]	Side-6 - [°C]	Bag-7 - [°C]	Bag-8 - [°C]	Bag-9 - [°C]	Bag-11 - [°C]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [ln/min]
21,16	23,43	27,32	27,19	23,97	7,16
20,10	22,33	28,04	27,70	23,98	7,18
19,56	21,70	28,17	27,79	23,98	7,17
19,23	21,23	28,18	27,78	23,98	7,17
19,09	20,92	28,25	27,85	23,99	7,23
18,86	20,68	28,20	27,85	23,99	7,24
18,70	20,44	28,19	27,86	23,96	7,21
18,58	20,25	28,14	27,81	23,96	7,16
18,46	20,15	28,17	27,83	23,98	7,14
18,41	19,98	28,16	27,83	23,99	7,21
18,24	19,91	28,13	27,83	23,98	7,21
18,18	19,82	28,08	27,80	23,95	7,18
18,13	19,77	28,10	27,81	23,97	7,17
18,10	19,66	28,11	27,79	23,97	7,14
17,98	19,58	28,05	27,77	23,97	7,10
17,90	19,51	28,02	27,76	23,94	7,08
17,85	19,48	28,01	27,77	23,92	7,05
17,78	19,42	27,99	27,75	23,95	7,32
17,75	19,39	27,96	27,75	23,93	7,29
17,82	19,36	27,99	27,73	23,98	7,25
17,79	19,33	28,01	27,74	23,98	7,24
17,72	19,29	27,99	27,73	23,96	7,23
17,63	19,22	27,95	27,70	23,95	7,20
17,60	19,19	27,90	27,69	23,93	7,21
17,56	19,15	27,86	27,66	23,93	7,20
17,60	19,08	27,91	27,68	23,94	7,20
17,61	19,03	27,89	27,64	23,95	7,17
17,58	19,07	27,87	27,67	23,96	7,18
17,56	19,03	27,84	27,64	23,96	7,17
17,55	18,97	27,85	27,63	23,95	7,13
17,52	18,95	27,83	27,60	23,94	7,14
17,48	18,94	27,80	27,58	23,90	7,14
17,44	18,93	27,79	27,59	23,92	7,14
17,45	18,91	27,79	27,59	23,92	7,14
17,46	18,89	27,78	27,56	23,94	7,14
17,47	18,91	27,81	27,58	23,97	7,13
17,40	18,90	27,76	27,56	23,98	7,15
17,43	18,88	27,78	27,55	23,97	7,12
17,41	18,89	27,75	27,54	23,94	7,14
17,37	18,91	27,69	27,52	23,95	7,14
17,33	18,92	27,69	27,51	23,94	7,13
17,30	18,91	27,67	27,51	23,92	7,14

17,39	18,92	27,72	27,53	23,97	7,16
17,41	18,87	27,70	27,50	23,97	7,15
17,33	18,90	27,66	27,49	23,96	7,11
17,34	18,87	27,66	27,46	23,93	7,09
17,29	18,91	27,64	27,49	23,94	7,08
17,32	18,97	27,66	27,49	23,96	7,19
17,36	18,93	27,68	27,49	23,99	7,18
17,38	18,88	27,67	27,47	23,98	7,16
17,34	18,89	27,65	27,44	23,98	7,24
17,34	18,88	27,64	27,44	23,96	7,24
17,34	18,94	27,62	27,46	23,97	7,22
17,37	18,92	27,65	27,49	24,00	7,23
17,36	18,91	27,66	27,44	24,00	7,24
17,32	18,88	27,66	27,44	24,00	7,23
17,28	18,85	27,61	27,40	23,99	7,25
17,24	18,87	27,60	27,44	24,01	7,23
17,26	18,88	27,61	27,46	24,02	7,16
17,26	18,88	27,62	27,44	24,02	7,14
17,32	18,86	27,62	27,43	24,02	7,16
17,29	18,90	27,59	27,41	24,01	7,15
17,35	18,94	27,65	27,43	24,04	7,16
17,31	18,96	27,62	27,43	24,03	7,15
17,28	18,97	27,60	27,46	24,04	7,14
17,32	18,96	27,61	27,44	24,03	7,16
17,32	18,99	27,61	27,47	24,04	7,14
17,33	18,93	27,63	27,43	24,04	7,14
17,27	18,94	27,57	27,43	24,05	7,14
17,30	18,91	27,62	27,45	24,05	7,15
17,33	18,94	27,65	27,44	24,08	7,18
17,26	18,97	27,64	27,45	24,07	7,16
17,25	18,94	27,59	27,40	24,08	7,17
17,22	18,95	27,61	27,43	24,09	7,14
17,27	18,89	27,64	27,43	24,06	7,16
17,31	18,93	27,65	27,45	24,09	7,13
17,28	18,93	27,65	27,45	24,07	7,18
17,25	18,91	27,65	27,44	24,08	7,15
17,24	18,91	27,65	27,45	24,08	7,17
17,27	18,97	27,65	27,47	24,11	7,17
17,26	18,97	27,65	27,48	24,08	7,17
17,29	18,97	27,64	27,43	24,11	7,17
17,28	18,99	27,63	27,47	24,10	7,16
17,31	19,06	27,65	27,47	24,12	7,17
17,38	19,11	27,69	27,47	24,12	7,17
17,41	19,12	27,66	27,45	24,12	7,17
17,34	19,12	27,62	27,44	24,11	7,18
17,32	19,16	27,62	27,47	24,13	7,16
17,34	19,19	27,63	27,48	24,14	7,15
17,41	19,14	27,67	27,46	24,14	7,16

17,34	19,19	27,62	27,45	24,13	7,16
17,41	19,17	27,66	27,48	24,12	7,15
17,41	19,21	27,66	27,47	24,19	7,13
17,46	19,18	27,69	27,47	24,16	7,14
17,40	19,19	27,66	27,48	24,13	7,15
17,44	19,16	27,67	27,46	24,14	7,15
17,43	19,28	27,69	27,53	24,17	7,15
17,45	19,22	27,70	27,51	24,18	7,15
17,37	19,23	27,65	27,48	24,16	7,14
17,43	19,17	27,69	27,47	24,17	7,15
17,43	19,15	27,70	27,49	24,17	7,11
17,39	19,21	27,70	27,52	24,20	7,13
17,42	19,16	27,68	27,49	24,19	7,13
17,40	19,16	27,68	27,51	24,17	7,11
17,39	19,16	27,66	27,49	24,16	7,12
17,48	19,22	27,70	27,53	24,20	7,11
17,52	19,20	27,73	27,54	24,21	7,11
17,49	19,21	27,71	27,50	24,22	7,11
17,46	19,22	27,67	27,52	24,18	7,12
17,44	19,22	27,68	27,50	24,17	7,13
17,52	19,23	27,75	27,56	24,21	7,12
17,50	19,26	27,74	27,54	24,19	7,13
17,52	19,20	27,75	27,52	24,21	7,12
17,45	19,18	27,73	27,52	24,18	7,11
17,42	19,18	27,71	27,50	24,18	7,12
17,44	19,22	27,73	27,57	24,22	7,13
17,43	19,18	27,76	27,56	24,24	7,11
17,42	19,14	27,74	27,53	24,22	7,13
17,38	19,15	27,70	27,56	24,22	7,12
17,42	19,12	27,73	27,53	24,21	7,13
17,47	19,16	27,81	27,59	24,25	7,11
17,40	19,21	27,79	27,62	24,24	7,11
17,42	19,18	27,77	27,58	24,23	7,12
17,47	19,15	27,74	27,55	24,24	7,12
17,47	19,17	27,77	27,57	24,21	7,11
17,54	19,21	27,83	27,60	24,29	7,09
17,51	19,25	27,81	27,62	24,26	7,09
17,51	19,21	27,82	27,61	24,25	7,09
17,49	19,22	27,79	27,56	24,25	7,08
17,52	19,23	27,83	27,61	24,26	7,08
17,47	19,28	27,83	27,63	24,30	7,06
17,53	19,21	27,82	27,63	24,28	7,07
17,44	19,26	27,80	27,61	24,27	7,06
17,46	19,26	27,78	27,60	24,25	7,06
17,49	19,23	27,81	27,60	24,27	7,05
17,54	19,25	27,87	27,66	24,28	7,06
17,54	19,25	27,85	27,65	24,29	7,07
17,53	19,19	27,86	27,60	24,29	7,16

17,48	19,22	27,82	27,63	24,27	7,14
17,51	19,19	27,86	27,63	24,30	7,13
17,57	19,27	27,87	27,69	24,30	7,14
17,54	19,32	27,85	27,64	24,30	7,12
17,55	19,25	27,85	27,65	24,30	7,12
17,47	19,29	27,83	27,65	24,27	7,11
17,54	19,26	27,88	27,65	24,30	7,12
17,55	19,29	27,91	27,69	24,31	7,11
17,54	19,26	27,91	27,66	24,31	7,11
17,52	19,28	27,89	27,65	24,29	7,09
17,45	19,31	27,89	27,72	24,29	7,10
17,43	19,28	27,87	27,67	24,30	7,10
17,56	19,31	27,92	27,71	24,31	7,12
17,59	19,33	27,91	27,70	24,31	7,10
17,55	19,35	27,89	27,68	24,30	7,11
17,60	19,30	27,91	27,71	24,30	7,09
17,55	19,34	27,91	27,69	24,31	7,07
17,61	19,37	27,92	27,71	24,32	7,09
17,60	19,35	27,91	27,72	24,31	7,08
17,58	19,36	27,91	27,70	24,31	7,08
17,60	19,32	27,93	27,73	24,32	7,10
17,67	19,35	27,96	27,75	24,34	7,08
17,65	19,41	27,96	27,76	24,33	7,12
17,68	19,37	27,96	27,72	24,34	7,10
17,64	19,40	27,93	27,75	24,34	7,11
17,69	19,41	27,95	27,76	24,32	7,09
17,74	19,44	27,98	27,76	24,35	7,10
17,73	19,47	27,98	27,77	24,33	7,08
17,75	19,42	27,99	27,77	24,35	7,05
17,71	19,43	27,97	27,77	24,34	7,07
17,66	19,47	27,97	27,77	24,34	7,06
17,73	19,48	28,01	27,83	24,36	7,05
17,71	19,48	27,98	27,77	24,36	7,04
17,70	19,51	27,97	27,82	24,34	7,05
17,75	19,48	27,99	27,79	24,36	7,06
17,76	19,58	28,05	27,83	24,37	7,03
17,80	19,58	28,02	27,81	24,36	7,05
17,79	19,54	28,00	27,80	24,36	7,07
17,76	19,57	28,02	27,81	24,36	7,05
17,76	19,56	28,01	27,82	24,34	7,06
17,86	19,58	28,04	27,82	24,37	7,04
17,80	19,59	28,04	27,82	24,37	7,05
17,77	19,57	28,02	27,83	24,35	7,04
17,79	19,52	28,00	27,82	24,37	7,04

Bag-12 - [°C]	NS-Røgtemp - [°C]	Ovf-Top - [°C]	Ovf-Bag - [°C]	Ovf-Side-1 - [°C]	Ovf-Side-2 - [°C]
13	24	27	28	29	30
Split train flow rate Flow-D - [ln/min]	EPA Flue gas temperature	Surface temperature Top	Surface temperature Rear	Surface temperature Right side	Surface temperature Left side
7,20	23	23,9	23,3	25,5	24,8
7,21	26	24,0	23,3	25,5	24,8
7,19	30	24,1	23,4	25,5	24,8
7,18	29	24,2	23,5	25,5	24,8
7,25	30	24,3	23,7	25,5	24,9
7,23	32	24,5	23,8	25,5	24,9
7,25	40	24,9	24,0	25,6	25,0
7,20	47	25,7	24,5	25,6	25,1
7,20	76	28,0	26,3	25,7	25,3
7,24	103	31,5	29,3	25,9	25,6
7,23	116	35,3	32,7	26,3	26,1
7,22	127	39,2	36,1	26,9	26,7
7,21	133	43,8	40,0	27,6	27,6
7,21	141	49,7	45,0	28,6	28,7
7,19	152	54,7	50,2	29,8	30,0
7,16	157	58,7	55,1	31,4	31,7
7,15	155	61,4	59,8	33,3	33,8
7,29	165	65,2	64,4	35,6	36,3
7,26	173	69,8	69,4	38,2	39,1
7,27	173	74,2	74,6	41,2	42,3
7,24	175	77,8	79,7	44,4	45,8
7,25	176	81,3	84,6	47,7	49,4
7,25	171	84,8	89,1	51,2	53,3
7,25	171	88,1	93,3	54,7	57,3
7,24	173	91,2	97,2	58,3	61,5
7,24	174	94,2	100,7	62,0	66,0
7,24	175	96,6	104,3	65,8	70,5
7,22	174	99,1	107,7	69,7	75,0
7,20	175	101,6	110,6	73,6	79,5
7,20	175	104,0	113,7	77,6	83,8
7,21	174	106,0	116,3	81,7	87,8
7,20	172	107,6	118,6	85,9	91,7
7,22	176	109,3	120,8	90,0	95,4
7,21	181	111,6	123,1	94,1	99,0
7,19	185	114,4	125,6	98,1	102,4
7,20	185	117,4	128,4	102,0	105,8
7,18	187	120,0	130,8	105,9	109,2
7,19	188	122,2	133,2	109,6	112,8
7,18	192	124,7	135,5	113,3	116,3
7,18	190	127,0	137,8	116,8	119,8
7,19	187	129,0	139,7	120,2	123,2
7,06	187	131,0	141,6	123,5	126,7

7,07	189	132,9	143,5	126,7	130,2
7,07	190	134,8	145,3	129,9	133,6
7,07	194	135,8	146,4	132,9	137,0
7,05	178	135,8	146,4	135,8	140,3
7,04	182	135,9	145,9	138,5	143,5
7,24	189	137,3	146,4	141,1	146,6
7,22	194	139,2	148,1	143,6	149,5
7,22	199	141,6	149,9	146,0	152,1
7,20	203	143,9	152,6	148,4	154,8
7,21	205	146,2	154,9	150,8	157,5
7,23	208	148,6	157,3	153,3	160,2
7,20	208	151,1	159,8	155,7	162,9
7,21	207	153,1	162,1	158,1	165,6
7,21	206	155,1	164,2	160,5	168,3
7,20	203	157,0	166,3	162,9	170,9
7,21	205	158,7	168,0	165,3	173,5
7,13	204	160,2	169,9	167,6	176,1
7,10	205	161,2	171,6	170,0	178,7
7,12	204	162,3	173,2	172,3	181,2
7,12	203	163,2	174,7	174,6	183,6
7,12	203	164,0	176,1	176,8	186,1
7,11	205	165,0	177,7	179,1	188,3
7,12	202	165,9	179,0	181,2	190,6
7,10	203	166,7	180,4	183,3	193,0
7,12	201	167,5	181,8	185,3	195,1
7,13	200	168,2	182,4	187,2	197,3
7,10	200	168,8	183,1	189,1	199,3
7,09	198	169,3	183,5	190,8	201,4
7,10	196	169,9	183,8	192,4	203,2
7,11	196	170,3	183,9	193,8	204,8
7,11	195	170,6	184,1	195,1	206,3
7,10	194	170,9	184,3	196,2	207,6
7,11	195	171,2	184,2	197,2	209,1
7,10	194	171,3	184,6	198,2	210,2
7,09	194	171,3	184,8	199,1	211,4
7,10	192	171,4	185,0	200,0	212,5
7,11	190	171,0	185,0	200,8	213,5
7,10	190	171,1	184,9	201,6	214,6
7,11	190	170,9	185,2	202,3	215,3
7,10	190	170,9	185,2	203,1	216,2
7,10	189	170,9	185,1	203,7	216,9
7,10	186	171,0	185,3	204,3	217,4
7,08	186	170,8	185,3	204,9	218,0
7,10	185	170,5	184,8	205,5	218,6
7,10	184	170,4	184,6	206,0	219,0
7,09	185	170,2	184,4	206,4	219,4
7,10	183	169,9	184,0	206,8	219,8
7,08	183	169,6	183,5	207,1	220,2

7,09	182	169,5	183,2	207,3	220,5
7,10	182	169,3	182,7	207,4	220,7
7,12	183	169,1	182,3	207,6	221,0
7,10	182	168,7	181,8	207,6	221,2
7,10	180	168,5	181,6	207,6	221,5
7,10	181	168,2	181,4	207,7	221,7
7,12	180	168,0	180,8	207,7	221,9
7,10	180	167,7	180,4	207,6	222,1
7,09	179	167,6	180,0	207,7	222,2
7,09	179	167,4	179,8	207,7	222,4
7,09	178	167,1	179,5	207,7	222,6
7,10	179	166,8	179,3	207,8	222,7
7,09	178	166,5	179,1	207,8	222,8
7,17	179	166,3	179,0	207,9	222,9
7,14	180	166,1	179,1	207,9	223,0
7,15	179	166,0	178,8	207,9	223,0
7,13	180	166,0	178,9	208,0	223,1
7,15	181	166,1	179,1	208,2	223,3
7,16	181	166,1	179,3	208,4	223,4
7,16	182	166,1	179,5	208,7	223,6
7,16	184	166,3	180,0	209,1	223,8
7,13	184	166,5	180,3	209,6	224,1
7,15	185	166,6	180,9	209,9	224,5
7,15	186	166,7	181,6	210,5	225,0
7,15	186	166,9	182,1	211,1	225,4
7,14	187	167,3	182,7	211,7	225,9
7,14	187	167,4	183,1	212,2	226,4
7,16	188	167,6	183,8	212,9	226,8
7,16	189	167,9	184,3	213,6	227,4
7,15	189	168,2	185,0	214,4	227,9
7,15	189	168,5	185,8	215,1	228,4
7,18	189	168,5	186,8	216,0	229,0
7,12	192	168,5	187,8	217,1	229,6
7,14	193	168,6	188,8	218,2	230,4
7,15	190	168,8	189,7	219,2	231,3
7,15	192	168,8	190,8	220,3	232,0
7,12	190	169,1	191,6	221,4	232,8
7,11	191	169,4	192,3	222,4	233,5
7,09	191	169,6	193,1	223,5	234,3
7,09	191	169,6	193,9	224,5	235,0
7,08	191	169,8	194,3	225,5	235,6
7,05	192	170,0	195,2	226,4	236,4
7,05	190	170,3	195,8	227,4	237,1
7,04	190	170,7	196,5	228,4	237,7
7,04	191	170,6	197,3	229,4	238,4
7,03	188	170,9	197,8	230,2	239,1
7,20	188	171,2	198,2	230,9	239,6
7,12	189	171,5	199,1	231,8	240,2

7,14	189	171,7	199,8	232,8	241,0
7,13	189	172,0	200,7	233,8	241,7
7,12	188	172,3	201,3	234,7	242,6
7,13	190	172,6	201,9	235,6	243,2
7,12	189	172,8	202,6	236,4	243,8
7,13	190	172,5	203,1	237,3	244,3
7,09	189	172,2	203,7	238,0	245,0
7,12	188	172,2	204,3	238,7	245,6
7,12	187	172,3	204,7	239,3	246,0
7,12	186	172,5	205,2	239,9	246,4
7,12	187	172,7	205,4	240,4	246,8
7,10	185	172,6	205,9	241,0	247,4
7,08	185	172,6	206,4	241,5	247,9
7,08	186	172,7	206,7	242,0	248,5
7,09	183	172,8	207,0	242,4	248,9
7,09	185	172,7	207,3	242,7	249,4
7,09	184	172,8	207,9	243,2	249,8
7,09	185	172,6	208,4	243,6	250,1
7,08	184	172,5	209,1	243,9	250,6
7,10	183	172,5	209,2	244,2	251,1
7,07	184	172,5	209,8	244,6	251,5
7,09	183	172,7	210,1	245,0	251,8
7,17	183	172,6	210,5	245,4	252,1
7,16	182	172,5	211,0	245,7	252,3
7,15	182	172,5	211,6	246,1	252,6
7,13	184	172,5	212,1	246,5	252,9
7,13	183	172,5	212,8	246,9	253,1
7,14	183	172,3	213,2	247,2	253,5
7,15	182	172,3	213,8	247,7	253,7
7,14	182	172,3	214,2	248,1	253,9
7,13	183	172,3	214,8	248,5	254,2
7,12	182	172,3	215,6	249,0	254,5
7,13	182	172,4	215,6	249,4	255,0
7,11	181	172,4	216,3	249,9	255,2
7,14	181	172,3	216,5	250,3	255,5
7,12	181	172,0	216,6	250,7	255,7
7,13	180	171,7	216,9	251,1	255,9
7,12	180	171,6	216,9	251,4	256,2
7,11	179	171,4	217,4	251,8	256,5
7,11	178	171,2	217,7	252,1	256,6
7,11	177	170,9	218,0	252,4	256,7
7,10	177	170,4	218,3	252,7	256,9
7,12	176	169,9	218,5	252,9	257,0
7,10	176	169,8	218,5	253,1	257,1

Ovf-Bund - [°C]	Kanal-EPA - [°C]	Røgtræk - [Pa]	Pd Kanal - [Pa]	Ps Kanal - [Pa]	Vægt - [Kg]
31	36	38	39	40	43
Surface temperature Bottom	EPA Duct temperature	Flue draft Pascals	Duct dynamic pressure	Duct static pressure	Platform scale reading
24,5	26,5	0,6	30,7	47,9	1,774
24,5	26,4	1,1	32,4	48,1	1,771
24,5	26,5	1,6	31,3	47,9	1,769
24,6	26,5	1,2	31,7	48,8	1,534
24,5	26,6	1,2	31,6	48,1	1,534
24,6	26,6	1,7	32,1	47,9	1,531
24,5	26,7	2,5	31,2	48,4	1,522
24,5	27,0	3,5	32,0	48,5	1,506
24,5	27,1	6,4	31,7	48,6	1,488
24,5	27,5	7,2	29,0	47,1	1,473
24,5	28,0	8,1	30,9	47,7	1,455
24,5	28,6	9,0	30,3	47,6	1,432
24,5	29,2	9,0	29,7	47,0	1,410
24,5	29,5	9,8	29,5	47,1	1,380
24,5	29,9	10,4	30,9	47,2	1,346
24,5	30,4	10,1	30,1	46,9	1,313
24,5	30,8	11,0	30,9	47,8	1,286
24,5	31,2	11,3	31,0	47,6	1,251
24,5	31,8	11,1	31,3	47,4	1,216
24,5	32,3	11,0	30,9	47,5	1,184
24,5	32,9	11,2	30,0	47,5	1,149
24,5	33,2	11,1	30,8	46,7	1,118
24,5	33,5	11,1	31,1	46,9	1,089
24,5	33,6	11,0	31,5	47,1	1,060
24,5	33,9	11,0	30,5	47,1	1,030
24,5	34,1	11,4	30,8	47,0	1,002
24,5	34,3	11,1	30,7	47,7	0,978
24,5	34,5	11,0	30,7	46,1	0,951
24,5	34,7	11,1	31,1	46,9	0,924
24,5	34,9	11,1	30,3	46,9	0,899
24,5	34,9	11,0	30,6	47,3	0,873
24,5	35,0	11,0	30,6	46,1	0,852
24,6	35,1	11,1	30,6	46,6	0,826
24,6	35,3	11,7	30,5	46,7	0,799
24,6	35,5	11,7	30,4	47,6	0,769
24,5	35,7	11,4	30,5	46,8	0,742
24,6	35,9	11,6	30,7	46,6	0,716
24,6	36,1	11,6	30,8	46,3	0,697
24,6	36,3	11,9	31,0	47,3	0,670
24,6	36,5	11,7	30,4	46,7	0,645
24,6	36,5	11,7	30,8	46,4	0,622
24,6	36,6	11,3	30,3	46,9	0,596

24,6	36,6	11,8	31,3	47,0	0,573
24,7	36,7	11,7	30,5	47,1	0,548
24,8	39,1	11,7	31,3	47,2	0,757
24,8	43,5	10,3	30,9	47,3	4,362
24,8	44,9	11,4	30,1	47,6	3,660
24,9	42,7	11,9	31,7	47,6	3,632
24,9	41,0	11,9	30,4	47,2	3,602
25,0	40,0	12,4	31,1	46,7	3,572
25,0	39,5	12,9	30,3	47,4	3,544
25,1	39,1	12,5	30,6	46,9	3,519
25,2	39,0	12,7	30,6	46,4	3,485
25,2	39,0	12,5	30,8	47,1	3,455
25,3	39,0	11,9	30,4	47,0	3,428
25,4	39,1	12,2	29,6	47,4	3,401
25,5	39,1	12,4	30,6	46,7	3,375
25,6	39,1	12,2	29,7	47,0	3,349
25,7	39,1	12,6	30,3	47,6	3,324
25,7	39,0	12,2	30,2	46,8	3,299
25,8	39,0	12,2	29,8	45,9	3,275
25,9	39,0	12,4	30,2	46,3	3,252
26,0	39,0	12,2	29,5	47,4	3,227
26,1	39,0	12,5	29,9	46,5	3,203
26,3	39,0	12,5	29,5	46,6	3,179
26,4	39,0	12,2	29,8	46,3	3,156
26,5	38,9	12,1	29,8	45,9	3,134
26,6	38,9	12,3	30,2	45,9	3,111
26,7	38,8	12,2	30,4	46,8	3,093
26,9	38,7	12,0	30,7	46,5	3,069
27,0	38,5	12,1	30,4	46,8	3,048
27,1	38,5	11,6	30,8	47,8	3,030
27,3	38,4	11,9	30,7	47,2	3,008
27,4	38,5	12,0	30,4	47,0	2,989
27,6	38,6	11,8	30,9	47,3	2,971
27,7	38,5	12,0	30,9	46,9	2,952
27,9	38,5	12,0	30,6	46,8	2,933
28,0	38,5	11,8	30,3	47,2	2,914
28,2	38,4	11,8	30,1	47,5	2,895
28,4	38,4	11,7	30,3	47,7	2,876
28,6	38,4	11,6	29,6	47,4	2,858
28,7	38,4	11,7	30,6	47,2	2,839
28,9	38,4	11,5	30,4	46,2	2,821
29,1	38,4	11,4	29,9	46,4	2,803
29,3	38,4	11,5	30,2	47,1	2,785
29,5	38,4	11,5	30,3	46,3	2,766
29,7	38,2	11,5	30,5	47,0	2,752
29,9	38,1	11,4	30,0	46,1	2,733
30,1	38,1	11,5	29,9	47,1	2,716
30,3	38,0	11,5	29,9	47,1	2,699

30,4	37,8	11,5	31,1	47,5	2,682
30,6	37,8	11,5	31,0	47,3	2,664
30,9	37,7	11,2	30,3	46,7	2,647
31,1	37,7	11,3	29,4	47,0	2,632
31,3	37,7	11,6	30,9	46,4	2,613
31,5	37,6	11,3	30,6	47,3	2,597
31,7	37,6	11,4	29,8	46,6	2,581
31,9	37,5	11,3	30,2	47,7	2,562
32,2	37,5	11,4	31,6	48,4	2,546
32,4	37,4	11,6	30,5	46,5	2,530
32,6	37,4	11,3	29,9	46,2	2,513
32,9	37,4	11,2	30,1	46,4	2,496
33,1	37,4	11,1	30,7	46,9	2,476
33,4	37,4	11,5	30,6	47,0	2,457
33,6	37,3	11,4	29,7	47,6	2,438
33,8	37,3	11,5	30,4	47,5	2,417
34,0	37,4	11,4	30,6	46,7	2,394
34,2	37,4	11,4	29,8	47,4	2,371
34,4	37,4	11,4	29,3	46,4	2,349
34,7	37,4	11,3	30,7	46,4	2,327
34,9	37,6	11,6	30,8	47,2	2,305
35,2	37,6	11,6	30,7	47,0	2,282
35,4	37,7	11,7	30,5	46,6	2,259
35,6	37,8	11,4	30,3	46,5	2,232
35,9	37,8	11,8	31,2	46,9	2,209
36,1	37,7	11,8	30,8	45,9	2,184
36,3	37,8	11,8	30,5	47,3	2,162
36,5	37,8	11,9	30,4	47,1	2,135
36,8	37,9	12,4	31,0	47,7	2,113
36,9	38,0	11,7	29,6	46,7	2,090
37,2	38,0	11,9	30,9	47,4	2,062
37,4	38,0	11,6	30,5	46,4	2,037
37,7	38,1	11,8	31,0	47,9	2,013
37,9	38,2	11,6	30,2	47,3	1,989
38,1	38,4	11,5	30,0	47,4	1,966
38,3	38,4	12,0	29,4	47,4	1,941
38,6	38,4	12,2	30,5	46,7	1,916
38,8	38,4	12,1	31,0	47,3	1,894
39,0	38,5	11,7	30,5	46,5	1,869
39,2	38,5	11,8	30,8	47,0	1,846
39,5	38,5	11,9	30,4	47,3	1,823
39,7	38,5	12,0	29,5	47,1	1,799
39,9	38,4	11,7	30,3	46,8	1,778
40,1	38,3	11,8	30,9	47,4	1,755
40,3	38,2	11,8	31,1	47,9	1,734
40,5	38,2	11,7	30,7	47,6	1,710
40,7	38,1	11,3	30,9	46,2	1,688
40,9	38,2	11,8	29,6	47,5	1,664

41,2	38,2	11,9	30,2	46,9	1,643
41,4	38,4	11,8	30,2	47,6	1,621
41,7	38,4	11,5	30,2	46,6	1,601
41,9	38,3	11,8	30,6	47,5	1,578
42,1	38,3	11,6	30,5	46,5	1,557
42,3	38,3	11,6	29,9	46,7	1,538
42,5	38,2	11,5	31,0	47,2	1,519
42,8	38,2	11,6	30,5	46,8	1,498
42,9	38,1	11,4	30,2	47,0	1,477
43,2	38,0	11,4	29,0	47,1	1,457
43,4	38,0	11,6	30,3	47,2	1,436
43,6	37,9	11,3	30,7	47,1	1,415
43,8	38,0	11,4	31,0	47,6	1,397
44,0	38,0	11,6	30,9	47,3	1,377
44,2	38,0	11,3	30,9	47,3	1,358
44,4	38,0	11,4	30,9	46,0	1,339
44,6	38,0	11,4	30,0	46,2	1,320
44,8	38,1	11,8	30,4	46,7	1,301
45,1	38,1	11,4	29,4	47,2	1,282
45,3	38,1	11,5	30,3	47,0	1,263
45,5	38,0	11,7	30,3	47,5	1,247
45,7	37,9	11,7	31,5	47,4	1,226
45,9	37,9	11,5	29,8	46,7	1,208
46,1	37,9	11,4	30,2	46,8	1,191
46,3	37,9	11,7	30,0	46,5	1,172
46,5	37,8	11,6	29,9	46,1	1,153
46,7	37,7	11,6	30,7	47,0	1,132
47,0	37,7	11,7	30,2	47,0	1,115
47,1	37,7	11,6	29,1	47,3	1,097
47,3	37,7	11,4	29,7	46,5	1,082
47,6	37,7	11,2	30,3	46,8	1,063
47,8	37,9	11,3	30,3	46,7	1,043
48,0	37,8	11,2	30,9	47,0	1,028
48,3	37,8	11,1	30,3	46,0	1,011
48,4	37,8	11,2	30,6	46,1	0,995
48,7	37,7	11,2	31,4	46,8	0,978
48,9	37,7	11,3	29,6	47,6	0,963
49,0	37,7	11,3	30,1	46,6	0,947
49,3	37,6	11,4	30,1	46,7	0,932
49,5	37,6	11,1	31,2	47,1	0,915
49,7	37,6	11,1	30,3	47,0	0,901
49,9	37,6	10,9	30,0	47,2	0,887
50,1	37,5	11,1	30,3	47,5	0,873
50,3	37,5	11,2	30,2	46,6	0,860
					0,850

CO-Lav - [100ppı	CO-Høj - [%]	CO2 - [%]
44	45	46
CO low range	CO high range	CO2 - [%]
0,02	0,00	0,09
0,04	0,00	0,16
0,32	0,00	0,61
0,65	0,01	0,67
0,77	0,01	0,72
1,27	0,00	0,82
2,16	0,02	1,04
7,96	0,07	1,47
22,44	0,27	4,98
9,72	0,10	5,61
9,14	0,09	6,06
10,82	0,10	6,66
9,85	0,09	7,30
16,60	0,16	11,91
22,44	0,28	12,71
22,44	0,52	12,27
22,44	0,40	11,33
22,44	0,37	11,69
22,44	0,50	12,31
22,44	0,33	11,53
22,44	0,23	11,59
12,38	0,12	11,09
6,14	0,06	10,52
6,60	0,07	10,14
6,07	0,06	10,57
7,75	0,07	10,51
14,97	0,13	9,99
22,44	0,30	9,45
22,44	0,35	9,46
22,44	0,31	9,40
22,44	0,32	8,97
22,44	0,42	8,00
22,44	0,37	8,40
22,44	0,25	9,18
15,80	0,15	10,10
15,34	0,15	10,56
15,12	0,15	9,82
15,74	0,16	9,53
10,65	0,11	10,20
18,36	0,17	10,00
22,44	0,27	9,38
19,06	0,19	9,58

14,29	0,14	9,73
14,17	0,14	9,49
12,20	0,12	4,43
14,10	0,14	2,99
17,79	0,16	3,27
22,44	0,27	8,35
22,14	0,22	9,19
15,28	0,15	10,62
12,60	0,12	10,69
17,26	0,15	10,76
16,26	0,16	11,38
10,68	0,10	11,62
10,65	0,10	11,14
12,29	0,12	10,65
10,57	0,10	10,56
7,92	0,08	10,40
6,61	0,07	10,39
6,15	0,05	10,30
7,22	0,06	9,81
7,46	0,07	9,58
7,48	0,08	9,58
6,58	0,06	10,38
7,17	0,06	9,81
9,46	0,08	9,29
11,08	0,11	9,15
15,93	0,15	8,78
16,64	0,16	8,72
20,83	0,20	8,49
22,44	0,23	8,17
22,44	0,24	8,12
22,44	0,26	7,83
22,44	0,25	7,74
22,44	0,23	7,72
22,44	0,24	7,73
22,44	0,24	7,76
22,44	0,27	7,57
22,44	0,29	7,41
22,41	0,23	7,67
22,44	0,23	7,74
21,23	0,21	7,79
22,44	0,24	7,72
22,44	0,30	7,32
22,44	0,33	7,07
22,44	0,34	6,92
22,44	0,35	6,95
22,44	0,36	6,91
22,44	0,32	6,93
22,44	0,34	6,87

22,44	0,34	6,93
22,44	0,34	6,94
22,44	0,33	6,97
22,44	0,33	7,00
22,44	0,32	6,97
22,44	0,32	7,06
22,44	0,31	6,98
22,44	0,32	7,02
22,44	0,31	6,98
22,44	0,29	6,98
22,44	0,28	6,96
22,44	0,24	7,12
18,30	0,19	7,68
15,48	0,16	8,06
14,77	0,15	8,35
11,62	0,11	8,70
9,86	0,10	8,80
7,77	0,08	9,00
6,69	0,06	9,23
6,50	0,06	9,46
5,50	0,06	9,60
4,97	0,05	9,70
5,09	0,05	9,78
4,31	0,05	9,77
4,25	0,04	9,86
4,19	0,04	10,19
4,29	0,04	10,29
4,29	0,04	10,13
4,53	0,04	10,37
4,04	0,04	10,58
4,45	0,05	10,62
4,05	0,03	10,42
4,31	0,04	10,48
4,70	0,04	10,44
3,94	0,04	10,19
3,58	0,04	10,08
3,56	0,03	10,14
3,87	0,03	10,13
3,43	0,03	10,07
3,64	0,04	10,00
3,87	0,04	10,07
3,86	0,04	10,03
4,05	0,04	9,92
4,05	0,04	9,91
4,04	0,04	9,82
3,84	0,03	9,96
4,26	0,04	9,95
3,81	0,04	9,85

4,10	0,04	9,72
4,21	0,04	9,76
3,79	0,04	9,70
3,99	0,04	9,75
3,63	0,04	9,68
4,03	0,03	9,55
4,10	0,03	9,50
4,46	0,05	9,53
4,04	0,04	9,53
4,06	0,04	9,51
4,03	0,04	9,50
4,52	0,04	9,36
4,86	0,05	9,27
4,91	0,04	9,26
4,00	0,04	9,20
3,70	0,04	9,22
3,69	0,03	9,18
3,81	0,04	9,11
3,86	0,04	9,19
3,75	0,03	9,23
3,84	0,04	9,28
3,89	0,04	9,27
3,76	0,04	9,29
3,54	0,04	9,34
3,47	0,03	9,33
3,70	0,03	9,30
3,65	0,03	9,30
3,59	0,04	9,28
3,69	0,04	9,32
4,14	0,04	9,26
3,90	0,04	9,21
3,64	0,03	9,21
3,75	0,03	9,17
3,64	0,03	8,98
3,54	0,03	9,01
3,24	0,03	8,94
3,03	0,03	8,78
2,80	0,02	8,69
2,61	0,03	8,59
2,38	0,03	8,50
2,43	0,02	8,44
2,60	0,03	8,20
3,09	0,03	8,14
3,17	0,03	8,02

Annex 24

Title: MF logger data 030920

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Datotid	Rum - [°C]	Filter-1-H - [°C]	Filter-2-D1 - [°C]	Filter-3-D2 - [°C]	Filter-4-R - [°C]
	1	2	3	4	5
Time	Ambient temperature	Main train filter temp	Split train 1H filter temp	Split train rem. filter temp	Room blank filter temp
13:14:40	Begin of test				
13:14:59	24,56	29,30	29,36	25,76	26,47
13:15:29	24,51	29,49	29,35	25,76	26,50
13:15:59	24,52	29,44	29,20	25,87	26,45
13:16:29	24,38	29,42	29,03	25,97	26,36
13:16:59	24,40	29,36	28,90	25,74	26,33
13:17:29	24,48	29,38	28,88	26,00	26,33
13:17:59	24,37	29,18	29,25	25,80	26,32
13:18:29	24,37	29,02	29,52	25,56	26,31
13:18:59	24,39	29,12	29,63	25,88	26,30
13:19:29	24,42	28,95	29,50	25,94	26,25
13:19:59	24,31	28,94	29,34	25,90	26,18
13:20:29	24,42	29,24	29,25	25,87	26,18
13:20:59	24,56	29,45	29,29	25,92	26,25
13:21:29	24,41	29,49	29,09	25,83	26,21
13:21:59	24,48	29,41	28,99	25,77	26,19
13:22:29	24,30	29,33	28,91	25,69	26,19
13:22:59	24,45	29,16	29,13	25,73	26,18
13:23:29	24,32	29,22	29,30	25,88	26,17
13:23:59	24,28	29,12	29,34	25,74	26,20
13:24:29	24,31	28,93	29,23	25,90	26,18
13:24:59	24,29	28,96	29,08	25,93	26,10
13:25:29	24,39	29,05	29,00	25,88	26,12
13:25:59	24,31	29,17	28,88	25,83	26,06
13:26:29	24,45	29,05	29,22	25,74	26,11
13:26:59	24,58	29,08	29,41	25,93	26,12
13:27:29	24,54	29,05	29,39	25,98	26,09
13:27:59	24,41	28,96	29,39	25,91	26,08
13:28:29	24,47	29,22	29,23	25,87	26,05
13:28:59	24,51	29,56	29,18	25,93	26,05
13:29:29	24,45	29,62	29,08	25,86	26,10
13:29:59	24,42	29,68	28,92	25,85	26,07
13:30:29	24,38	29,69	28,93	25,82	26,06
13:30:59	24,58	29,51	29,54	25,66	26,14
13:31:29	24,57	29,54	29,59	25,75	26,09
13:31:59	24,61	29,30	29,65	25,61	26,15
13:32:29	24,51	29,26	29,54	25,80	26,14
13:32:59	24,45	29,24	29,35	25,77	26,05
13:33:29	24,42	29,09	29,22	25,40	26,04
13:33:59	24,43	29,00	29,13	25,33	26,02
13:34:29	24,44	29,00	29,04	25,50	26,05
13:34:59	24,50	29,22	28,95	25,72	26,03
13:35:29	24,35	29,51	28,98	25,76	26,03

13:36:00	24,48	29,51	29,38	25,65	26,06
13:36:30	24,47	29,60	29,41	25,58	25,99
13:37:00	24,49	29,45	29,38	25,73	26,00
13:37:30	24,31	29,32	29,27	25,55	25,97
13:38:00	24,40	29,28	29,09	25,51	25,94
13:38:30	24,42	29,14	29,09	25,73	25,97
13:39:00	24,50	29,20	28,95	25,74	25,98
13:39:30	24,50	29,15	28,97	25,77	25,98
13:40:00	24,48	28,99	29,02	25,70	26,02
13:40:30	24,55	29,08	28,92	25,81	26,00
13:41:00	24,38	29,46	29,13	25,76	25,97
13:41:30	24,48	29,50	29,28	25,67	25,98
13:42:00	24,39	29,52	29,26	25,63	25,96
13:42:30	24,52	29,41	29,21	25,60	25,97
13:43:00	24,42	29,51	29,17	25,68	26,02
13:43:30	24,50	29,43	29,05	25,69	26,00
13:44:00	24,45	29,32	28,95	25,60	26,01
13:44:30	24,48	29,17	29,24	25,52	26,00
13:45:00	24,70	29,03	29,53	25,49	25,99
13:45:30	24,42	28,91	29,51	25,43	25,96
13:46:00	24,20	28,91	29,42	25,42	25,95
13:46:30	24,20	29,29	29,28	25,48	25,90
13:47:00	24,47	29,46	29,27	25,46	25,94
13:47:30	24,60	29,61	29,16	25,69	25,93
13:48:00	24,46	29,57	29,08	25,67	25,94
13:48:30	24,29	29,53	28,94	25,57	25,89
13:49:00	24,48	29,37	29,17	25,63	25,88
13:49:30	24,42	29,21	29,41	25,50	25,92
13:50:00	24,38	29,17	29,35	25,52	25,89
13:50:30	24,36	29,08	29,34	25,59	25,87
13:51:00	24,53	28,91	29,25	25,55	25,90
13:51:30	24,49	28,87	29,13	25,55	25,88
13:52:00	24,50	29,21	28,99	25,67	25,87
13:52:30	24,61	29,54	28,99	25,57	25,95
13:53:00	24,58	29,70	29,23	25,49	25,96
13:53:30	24,32	29,75	29,41	25,54	25,93
13:54:00	24,27	29,66	29,40	25,57	25,89
13:54:30	24,26	29,55	29,31	25,64	25,88
13:55:00	24,28	29,41	29,23	25,57	25,85
13:55:30	24,29	29,34	29,06	25,56	25,83
13:56:00	24,28	29,19	28,99	25,49	25,83
13:56:30	24,37	29,09	28,97	25,51	25,86
13:57:00	24,51	29,11	29,21	25,65	25,84
13:57:30	24,47	29,06	29,48	25,59	25,84
13:58:00	24,44	28,95	29,57	25,63	25,90
13:58:30	24,40	29,46	29,41	25,69	25,84
13:59:00	24,31	29,54	29,30	25,37	25,86
13:59:30	24,18	29,67	29,19	25,31	25,80

14:00:00	24,26	29,52	29,06	25,46	25,83
14:00:30	24,11	29,57	28,96	25,49	25,81
14:01:00	24,45	29,41	29,00	25,70	25,93
14:01:30	24,38	29,40	29,38	25,48	25,88
14:02:00	24,41	29,23	29,51	25,41	25,88
14:02:30	24,35	29,10	29,48	25,57	25,85
14:03:00	24,43	29,05	29,32	25,51	25,82
14:03:30	24,29	28,92	29,23	25,59	25,82
14:04:00	24,37	28,84	29,18	25,62	25,87
14:04:30	24,57	29,25	29,02	25,77	25,83
14:05:00	24,57	29,31	29,05	25,80	25,91
14:05:30	24,67	29,36	28,96	25,74	25,91
14:06:00	24,67	29,40	29,36	25,82	25,86
14:06:30	24,73	29,32	29,59	25,80	25,85
14:07:00	24,66	29,10	29,59	25,73	25,87
14:07:30	24,66	28,98	29,52	25,83	25,89
14:08:00	24,61	29,00	29,36	25,92	25,89
14:08:30	24,83	28,86	29,30	25,82	25,92
14:09:00	25,05	29,07	29,30	25,83	26,01
14:09:30	24,99	29,47	29,11	25,89	25,92
14:10:00	24,81	29,55	29,05	25,83	25,95
14:10:30	24,76	29,52	28,95	25,93	25,98
14:11:00	24,71	29,45	29,09	25,79	25,94
14:11:30	24,73	29,29	29,37	25,70	25,96
14:12:00	24,49	29,21	29,41	25,60	25,96
14:12:30	24,59	29,17	29,33	25,76	25,96
14:13:00	24,82	29,15	29,27	25,99	25,99
14:13:30	24,74	29,07	29,25	26,00	26,05
14:14:00	24,89	29,06	29,07	26,02	26,01
14:14:30	24,96	28,95	28,99	26,04	26,04
14:15:00	25,04	29,06	28,90	26,05	26,04
14:15:30	25,01	29,35	29,16	29,79	26,06
14:16:00	24,89	29,45	29,31	29,70	26,05
14:16:30	25,08	29,57	25,00	29,65	26,04
14:17:00	24,88	29,61	24,45	29,62	26,08
14:17:30	25,02	29,56	24,34	29,51	26,09
14:18:00	25,04	29,38	24,13	29,54	26,13
14:18:30	24,97	29,32	23,80	29,58	26,07
14:19:00	24,71	29,21	23,65	29,48	26,11
14:19:30	24,90	29,10	23,69	29,37	26,09
14:20:00	25,09	29,10	24,31	29,34	26,11
14:20:30	24,97	29,10	24,09	29,66	26,14
14:21:00	24,95	28,98	23,80	29,87	26,18
14:21:30	24,87	28,84	23,76	29,86	26,18
14:22:00	24,84	28,91	23,72	29,82	26,15
14:22:30	24,76	29,29	23,30	29,72	26,14
14:23:00	24,78	29,37	23,88	29,63	26,13
14:23:30	24,87	29,50	24,30	29,58	26,17

14:24:00	24,92	29,51	24,32	29,48	26,20
14:24:30	24,74	29,34	24,24	29,35	26,24
14:25:00	24,66	29,26	24,53	29,28	26,20
14:25:30	24,68	29,22	24,39	29,68	26,14
14:26:00	24,68	29,07	24,39	29,79	26,17
14:26:30	24,70	29,01	24,62	29,80	26,18
14:27:00	24,96	29,01	24,80	29,81	26,26
14:27:30	24,97	29,00	24,60	29,73	26,21
14:28:00	24,93	28,87	23,79	29,59	26,26
14:28:30	24,87	29,24	24,39	29,51	26,21
14:29:00	24,93	29,41	24,81	29,36	26,25
14:29:30	24,82	29,51	24,57	29,29	26,21
14:30:00	24,77	29,52	24,34	29,46	26,22
14:30:30	24,80	29,52	23,93	29,65	26,31
14:31:00	24,97	29,45	24,47	29,67	26,29
14:31:30	24,89	29,42	24,27	29,64	26,25
14:32:00	25,05	29,23	23,90	29,50	26,26
14:32:30	24,71	29,10	24,19	29,37	26,28
14:33:00	24,77	29,10	23,65	29,31	26,23
14:33:30	24,77	29,07	23,67	29,33	26,22
14:34:00	24,79	28,95	23,85	29,61	26,25
14:34:30	24,89	28,89	24,10	29,73	26,23
14:35:00	24,64	28,89	23,40	29,67	26,28
14:35:30	24,86	29,16	23,92	29,68	26,33
14:36:00	25,01	29,16	24,17	29,62	26,35
14:36:30	24,89	29,06	24,11	29,47	26,36
14:37:00	24,77	29,05	23,98	29,39	26,31
14:37:30	24,74	29,01	24,05	29,31	26,30
14:38:00	24,84	28,90	24,21	29,38	26,34
14:38:30	24,80	28,85	24,31	29,59	26,29
14:39:00	24,85	28,85	23,92	29,59	26,32
14:39:30	24,83	28,93	24,05	29,57	26,26
14:40:00	24,89	28,90	24,23	29,50	26,26
14:40:30	24,78	28,85	23,91	29,39	26,28
14:41:00	24,80	29,16	24,21	29,30	26,35
14:41:30	24,81	29,47	23,81	29,32	26,35
14:42:00	24,88	29,48	24,28	29,61	26,39
14:42:30	24,87	29,40	24,63	29,73	26,44
14:43:00	24,77	29,40	24,38	29,77	26,41
14:43:30	24,64	29,36	24,28	29,71	26,38
14:44:00	24,72	29,21	24,58	29,60	26,43
14:44:30	24,61	29,15	24,15	29,49	26,39
14:45:00	24,63	29,07	23,82	29,39	26,35
14:45:30	24,56	29,05	23,54	29,32	26,29
14:46:00	24,53	28,96	23,69	29,43	26,29
14:46:30	24,59	28,94	24,13	29,70	26,34
14:47:00	24,40	29,14	23,88	29,83	26,29
14:47:30	24,31	29,20	23,44	29,79	26,28

14:48:00	24,45	29,18	23,86	29,73	26,24
14:48:30	24,40	29,13	23,88	29,62	26,21
14:49:00	24,33	29,00	24,25	29,48	26,22
14:49:30	24,38	28,88	23,79	29,35	26,24
14:50:00	24,45	28,83	23,74	29,29	26,18
14:50:31	24,36	29,24	23,92	29,48	26,16
14:51:01	24,49	29,48	23,90	29,82	26,20
14:51:31	24,49	29,56	23,71	29,90	26,20
14:52:01	24,59	29,54	23,90	29,86	26,17
14:52:31	24,43	29,52	23,57	29,79	26,16
14:53:01	24,43	29,42	23,94	29,71	26,14
14:53:31	24,51	29,30	23,85	29,56	26,17
14:54:01	24,24	29,24	23,93	29,48	26,13
14:54:31	24,45	29,15	24,19	29,39	26,11
14:55:01	24,44	29,03	23,67	29,28	26,14
14:55:31	24,25	28,98	23,91	29,65	26,16
14:56:01	24,37	28,97	23,39	30,02	26,15
14:56:31	24,39	29,16	23,46	30,07	26,13
14:57:01	24,33	29,20	23,26	30,00	26,07
14:57:31	24,33	29,17	23,32	29,92	26,10
14:58:01	24,25	29,10	23,66	29,78	26,09
14:58:31	24,23	29,01	23,59	29,64	26,05
14:59:01	24,19	28,88	23,52	29,50	26,00
14:59:31	24,16	29,18	23,59	29,38	25,98
15:00:01	24,27	29,46	23,36	29,32	25,97
15:00:31	24,48	29,51	23,96	29,58	26,01
15:01:01	24,36	29,51	23,77	29,89	25,98
15:01:31	24,22	29,49	23,78	29,98	25,95
15:02:01	24,34	29,39	23,67	29,94	25,96
15:02:31	24,34	29,18	23,95	29,77	25,99
15:03:01	24,41	29,16	24,27	29,72	25,96
15:03:31	24,31	28,99	23,98	29,55	26,00
15:04:01	24,21	28,90	23,65	29,40	25,90
15:04:31	24,29	29,29	23,60	29,31	25,91
15:05:01	24,16	29,48	23,67	29,44	25,91
15:05:31	24,12	29,60	23,32	29,76	25,87
15:06:01	24,16	29,57	23,31	29,83	25,89
15:06:31	24,16	29,53	23,93	29,78	25,90
15:07:01	24,14	29,48	23,86	29,72	25,85
15:07:31	24,21	29,34	24,12	29,60	25,86
15:08:01	24,30	29,18	23,92	29,46	25,89
15:08:31	24,40	29,09	23,38	29,34	25,91
15:09:01	24,31	29,03	23,22	29,44	25,89
15:09:31	24,33	29,00	23,78	29,73	25,83
15:10:01	24,32	29,33	24,15	29,79	25,83
15:10:31	24,31	29,41	23,98	29,72	25,81
15:11:01	24,42	29,43	23,32	29,64	25,79
15:11:31	24,32	29,45	22,92	29,55	25,77

15:12:01	24,45	29,31	23,13	29,43	25,81
15:12:31	24,55	29,28	23,26	29,38	25,79
15:13:01	24,62	29,22	23,36	29,42	25,80
15:13:31	24,63	29,13	23,46	29,78	25,81
15:14:01	24,55	29,02	23,47	29,88	25,79
15:14:31	24,50	29,25	23,18	29,79	25,76
15:15:01	24,54	29,66	23,55	29,72	25,77
15:15:31	24,63	29,75	23,69	29,58	25,79
15:16:01	24,52	29,72	23,52	29,49	25,81
15:16:31	24,55	29,63	23,44	29,34	25,81
15:17:01	24,50	29,65	23,40	29,29	25,80
15:17:31	24,38	29,58	23,76	29,77	25,79
15:18:01	24,40	29,43	23,95	30,14	25,82
15:18:31	24,61	29,35	23,76	30,20	25,83
15:19:01	24,38	29,22	23,44	30,15	25,83
15:19:31	24,42	29,04	23,23	30,02	25,79
15:20:01	24,35	28,96	23,43	29,89	25,77
15:20:31	24,71	29,04	23,97	29,78	25,81
15:21:01	24,53	29,50	23,04	29,65	25,80
15:21:31	24,63	29,63	23,49	29,53	25,86
15:22:01	24,58	29,70	24,42	29,45	25,86
15:22:31	24,54	29,73	24,71	29,39	25,82
15:23:01	24,53	29,64	24,55	29,46	25,81
15:23:31	24,61	29,50	24,67	29,78	25,85
15:24:01	24,76	29,37	24,80	29,87	25,87
15:24:31	24,54	29,32	24,61	29,87	25,83
15:25:01	24,64	29,20	24,73	29,79	25,87
15:25:31	24,54	29,04	24,68	29,62	25,79
15:26:01	24,40	28,98	24,59	29,51	25,77
15:26:31	24,51	29,18	24,65	29,40	25,77
15:27:01	24,44	29,50	24,74	29,26	25,81
15:27:31	24,54	29,66	24,69	29,57	25,83
15:28:01	24,52	29,63	24,72	29,81	25,87
15:28:31	24,49	29,58	24,77	29,85	25,86
15:29:01	24,47	29,55	24,71	29,82	25,83
15:29:31	24,47	29,44	24,62	29,72	25,84
15:30:01	24,54	29,38	24,70	29,67	25,83
15:30:31	24,50	29,29	24,82	29,57	25,84
15:31:01	24,53	29,16	24,81	29,44	25,91
15:31:31	24,43	29,01	24,54	29,29	25,82
15:32:01	24,47	29,16	24,46	29,64	25,80
15:32:31	24,59	29,40	24,57	29,92	25,81
15:33:01	24,67	29,50	24,61	30,00	25,83
15:33:31	24,74	29,42	24,70	29,91	25,87
15:34:01	24,83	29,38	24,72	29,82	25,85
15:34:31	24,59	29,25	24,73	29,70	25,88
15:35:01	24,61	29,14	24,67	29,59	25,87
15:35:31	24,49	29,12	24,60	29,51	25,85

15:36:01	24,62	28,96	24,65	29,38	25,90
15:36:31	24,70	29,26	24,68	29,44	25,87
15:37:01	24,70	29,45	24,72	29,73	25,87
15:37:31	24,49	29,53	24,53	29,81	25,83
15:38:01	24,40	29,61	24,59	29,82	25,79
15:38:31	24,56	29,53	24,63	29,78	25,81
15:39:01	24,58	29,43	24,65	29,67	25,83
15:39:31	24,60	29,30	24,64	29,54	25,85
15:40:01	24,61	29,16	24,73	29,41	25,88
15:40:31	24,52	29,18	24,63	29,35	25,84
15:41:01	24,51	29,08	24,68	29,62	25,84
15:41:31	24,68	29,15	24,73	29,93	25,87
15:42:01	24,63	29,37	24,79	29,95	25,85
15:42:31	24,55	29,52	24,65	29,94	25,78
15:43:01	24,61	29,42	24,70	29,80	25,84
15:43:31	24,56	29,38	24,76	29,70	25,82
15:44:01	24,55	29,29	24,66	29,61	25,83
15:44:31	24,59	29,26	24,76	29,54	25,81
15:45:01	24,61	29,18	24,81	29,44	25,81
15:45:31	24,55	29,05	24,82	29,31	25,84
15:46:01	24,58	28,96	24,86	29,71	25,88
15:46:31	24,59	29,42	24,88	29,97	25,88
15:47:01	24,64	29,56	24,90	29,97	25,90
15:47:31	24,68	29,66	24,84	29,97	25,84
15:48:01	24,49	29,64	25,02	29,85	25,86
15:48:31	24,67	29,51	25,15	29,73	25,87
15:49:01	24,52	29,46	24,78	29,63	25,87
15:49:31	24,52	29,28	24,80	29,48	25,84
15:50:01	24,55	29,19	24,72	29,35	25,85
15:50:31	24,45	29,11	24,72	29,41	25,81
15:51:01	24,58	28,96	24,85	29,73	25,90
15:51:31	24,42	29,26	24,68	29,88	25,84
15:52:01	24,28	29,43	24,63	29,85	25,86
15:52:31	24,34	29,54	24,58	29,77	25,84
15:53:01	24,55	29,46	24,85	29,67	25,86
15:53:31	24,40	29,44	24,83	29,56	25,84
15:54:01	24,49	29,28	24,83	29,43	25,91
15:54:31	24,59	29,20	24,89	29,36	25,91
15:55:01	24,49	29,15	24,71	29,56	25,84
15:55:31	24,39	29,02	24,76	29,80	25,81
15:56:01	24,46	29,23	24,81	29,83	25,87
15:56:31	24,55	29,62	24,81	29,80	25,85
15:57:01	24,48	29,77	24,79	29,72	25,85
15:57:31	24,47	29,73	24,84	29,59	25,86
15:58:01	24,47	29,71	24,76	29,50	25,89
15:58:31	24,45	29,65	24,73	29,42	25,87
15:59:01	24,32	29,57	24,67	29,33	25,87
15:59:31	24,45	29,43	24,80	29,73	25,86

16:00:01	24,33	29,34	24,63	29,87	25,79
16:00:31	24,32	29,08	24,66	29,78	25,80
16:01:01	24,54	29,07	24,51	29,75	25,78
16:01:31	24,55	29,11	24,59	29,68	25,77
16:02:02	24,55	29,55	24,58	29,57	25,79
16:02:32	24,59	29,75	24,62	29,47	25,78
16:03:02	24,64	29,68	24,79	29,34	25,86
16:03:32	24,55	29,65	24,72	29,56	25,88
16:04:02	24,69	29,57	24,72	29,92	25,86
16:04:32	24,69	29,50	24,79	30,03	25,87
16:05:02	24,69	29,35	24,83	29,95	25,88
16:05:32	24,58	29,23	24,76	29,83	25,84
16:06:02	24,60	29,07	24,80	29,70	25,83
16:06:32	24,62	28,99	24,73	29,59	25,83
16:07:02	24,64	29,17	24,75	29,48	25,82
16:07:32	24,75	29,53	24,78	29,39	25,80
16:08:02	24,49	29,70	24,75	29,32	25,78
16:08:32	24,49	29,77	24,72	29,72	25,79
16:09:02	24,54	29,60	24,79	29,85	25,86
16:09:32	24,52	29,52	24,78	29,86	25,84
16:10:02	24,46	29,39	24,70	29,77	25,84
16:10:32	24,45	29,28	24,79	29,68	25,86
16:11:02	24,39	29,12	24,76	29,51	25,81
16:11:32	24,41	29,04	24,69	29,42	25,74
16:12:02	24,36	28,99	24,63	29,32	25,72
16:12:32	24,42	29,41	24,74	29,57	25,81
16:13:02	24,38	29,71	24,59	29,87	25,75
16:13:32	24,36	29,72	24,63	29,89	25,77
16:14:02	24,45	29,65	24,79	29,83	25,83
16:14:32	24,40	29,60	24,64	29,72	25,80
16:15:02	24,58	29,49	24,62	29,64	25,80
16:15:32	24,48	29,43	24,57	29,54	25,77
16:16:02	24,33	29,22	24,52	29,34	25,73
16:16:32	24,35	29,00	24,69	29,39	25,77
16:17:02	24,58	28,90	24,72	29,72	25,79
16:17:32	24,68	29,28	24,75	29,85	25,75
16:18:02	24,56	29,54	24,65	29,81	25,79
16:18:32	24,57	29,65	24,66	29,75	25,74
16:19:02	24,65	29,65	24,85	29,67	25,74
16:19:32	24,60	29,56	24,81	29,56	25,78
16:20:02	24,48	29,46	24,78	29,47	25,76
16:20:32	24,49	29,33	24,95	29,37	25,81
16:21:02	24,47	29,15	24,92	29,79	25,85
16:21:32	24,51	29,12	24,73	30,08	25,82
16:22:02	24,44	29,09	24,59	30,06	25,78
16:22:32	24,41	29,23	24,50	29,97	25,75
16:23:02	24,56	29,22	24,60	29,86	25,79
16:23:32	24,53	29,21	24,71	29,76	25,77

16:24:02	24,41	29,14	24,66	29,63	25,78
16:24:32	24,31	29,14	24,63	29,57	25,76
16:25:02	24,27	29,08	24,51	29,47	25,72
16:25:32	24,31	29,30	24,60	29,36	25,79
16:26:02	24,16	29,61	24,44	29,51	25,72
16:26:32	24,11	29,66	24,41	29,56	25,72
16:27:02	24,10	29,65	24,38	29,53	25,71
16:27:32	24,23	29,59	24,29	29,48	25,70
16:28:02	24,12	29,43	24,30	29,35	25,67
16:28:32	24,05	29,18	24,24	29,74	25,65
16:29:02	24,22	29,07	24,41	29,99	25,65
16:29:32	24,25	29,03	24,35	30,04	25,61
16:30:02	24,31	29,23	24,45	29,95	25,64
16:30:32	24,25	29,56	24,47	29,89	25,63
16:31:02	24,39	29,63	24,56	29,77	25,68
16:31:32	24,30	29,61	24,47	29,66	25,66
16:32:02	24,35	29,48	24,56	29,53	25,72
16:32:32	24,33	29,41	24,51	29,40	25,70
16:33:02	24,41	29,30	24,67	29,56	25,70
16:33:32	24,37	29,17	24,61	29,90	25,73
16:34:02	24,26	29,06	24,40	30,02	25,63
16:34:32	24,26	29,23	24,40	29,89	25,65
16:35:02	24,46	29,37	24,46	29,78	25,67
16:35:32	24,18	29,47	24,29	29,70	25,61
16:36:02	24,37	29,39	24,58	29,59	25,65
16:36:32	24,30	29,41	24,50	29,49	25,61
16:37:02	24,30	29,28	24,52	29,36	25,65
16:37:32	24,45	29,13	24,82	29,61	25,68
16:38:02	24,41	29,00	24,70	29,92	25,72
16:38:18	End of test				

Køler-1-H - [°C]	Køler-2-D - [°C]	Gasm-H - [°C]	Gasm-D - [°C]	Gasm-R - [°C]	Flow-H - [ln/min]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [ln/min]
20,6	22,7	27,4	27,4	24,3	7,12
20,7	22,8	27,5	27,5	24,3	7,16
20,0	22,1	28,1	27,9	24,3	7,18
19,6	21,6	28,2	28,0	24,3	7,17
19,3	21,2	28,2	28,0	24,3	7,21
19,2	21,0	28,3	28,0	24,4	7,13
19,0	20,8	28,3	28,1	24,4	7,14
18,8	20,6	28,3	28,1	24,3	7,17
18,8	20,4	28,3	28,1	24,4	7,16
18,7	20,3	28,3	28,1	24,4	7,17
18,6	20,2	28,3	28,0	24,4	7,19
18,5	20,1	28,3	28,0	24,4	7,20
18,4	20,0	28,3	28,1	24,4	7,16
18,3	20,0	28,3	28,1	24,4	7,16
18,3	19,9	28,3	28,1	24,4	7,15
18,3	19,9	28,3	28,1	24,4	7,17
18,2	19,9	28,2	28,1	24,4	7,17
18,3	19,9	28,3	28,1	24,4	7,17
18,2	19,9	28,3	28,1	24,4	7,17
18,2	19,9	28,3	28,1	24,4	7,16
18,2	19,8	28,3	28,1	24,4	7,16
18,1	19,7	28,2	28,1	24,4	7,14
18,1	19,7	28,3	28,1	24,4	7,15
18,1	19,7	28,2	28,1	24,4	7,15
18,2	19,8	28,3	28,1	24,4	7,13
18,2	19,8	28,3	28,1	24,4	7,14
18,1	19,8	28,3	28,1	24,4	7,14
18,2	19,8	28,3	28,1	24,4	7,13
18,1	19,7	28,2	28,1	24,3	7,14
18,1	19,8	28,2	28,0	24,3	7,15
18,2	19,8	28,2	28,0	24,4	7,13
18,2	19,8	28,3	28,0	24,4	7,11
18,2	19,8	28,3	28,1	24,4	7,14
18,2	19,8	28,2	28,1	24,4	7,12
18,1	19,8	28,2	28,1	24,4	7,16
18,2	19,9	28,2	28,1	24,4	7,14
18,2	19,8	28,2	28,0	24,4	7,12
18,2	19,8	28,2	28,0	24,4	7,14
18,2	19,8	28,2	28,0	24,4	7,15
18,2	19,8	28,2	28,0	24,4	7,14
18,2	19,8	28,2	28,0	24,4	7,13
18,2	19,8	28,2	28,0	24,3	7,13

18,1	19,8	28,2	28,0	24,4	7,13
18,1	19,8	28,2	28,0	24,3	7,14
18,1	19,8	28,2	28,0	24,3	7,13
18,0	19,8	28,2	28,0	24,3	7,12
18,1	19,7	28,2	28,0	24,3	7,13
18,0	19,7	28,2	28,0	24,3	7,12
18,1	19,7	28,2	28,0	24,3	7,11
18,1	19,6	28,2	28,0	24,3	7,11
18,0	19,7	28,2	28,0	24,3	7,13
18,0	19,6	28,2	28,0	24,3	7,12
18,0	19,6	28,2	28,0	24,3	7,09
18,0	19,6	28,2	28,0	24,3	7,08
18,0	19,6	28,2	28,0	24,3	7,07
17,9	19,6	28,2	28,0	24,3	7,05
18,0	19,7	28,2	28,0	24,3	7,09
18,0	19,7	28,2	28,0	24,3	7,09
18,0	19,7	28,2	28,0	24,3	7,07
18,0	19,6	28,2	28,0	24,3	7,04
17,9	19,6	28,2	28,0	24,3	7,19
17,9	19,6	28,2	28,0	24,3	7,16
17,9	19,6	28,2	28,0	24,3	7,16
17,9	19,6	28,2	28,0	24,3	7,14
17,9	19,6	28,2	28,0	24,3	7,14
17,9	19,6	28,2	28,0	24,3	7,13
17,9	19,6	28,2	28,0	24,3	7,09
17,9	19,5	28,2	28,0	24,3	7,09
17,9	19,5	28,2	27,9	24,3	7,09
17,9	19,6	28,2	28,0	24,3	7,07
17,9	19,5	28,2	28,0	24,3	7,07
17,9	19,5	28,2	28,0	24,2	7,06
17,8	19,5	28,1	27,9	24,2	7,08
17,9	19,5	28,1	28,0	24,2	7,08
17,9	19,5	28,2	27,9	24,3	7,09
18,0	19,6	28,1	27,9	24,3	7,07
18,0	19,6	28,2	28,0	24,3	7,07
18,0	19,6	28,2	28,0	24,3	7,06
18,0	19,6	28,2	28,0	24,2	7,07
18,0	19,5	28,2	28,0	24,3	7,08
18,0	19,5	28,2	28,0	24,2	7,05
17,9	19,5	28,2	27,9	24,2	7,07
17,9	19,5	28,1	27,9	24,2	7,06
17,9	19,6	28,1	27,9	24,2	7,07
18,0	19,6	28,2	27,9	24,3	7,07
17,9	19,5	28,2	27,9	24,3	7,05
17,9	19,6	28,1	27,9	24,2	7,04
17,9	19,5	28,2	27,9	24,2	7,04
17,9	19,6	28,1	27,9	24,2	7,04
17,9	19,5	28,2	27,9	24,2	7,03

17,9	19,5	28,1	27,9	24,2	7,05
17,9	19,5	28,2	27,9	24,2	7,10
17,8	19,6	28,2	27,9	24,2	7,11
17,9	19,6	28,2	28,0	24,2	7,08
17,8	19,6	28,1	27,9	24,2	7,07
17,8	19,6	28,1	27,9	24,2	7,06
17,8	19,5	28,2	27,9	24,2	7,09
17,8	19,6	28,2	27,9	24,2	7,05
17,7	19,6	28,1	28,0	24,2	7,07
17,8	19,6	28,2	27,9	24,2	7,06
17,8	19,6	28,1	28,0	24,2	7,05
17,8	19,6	28,2	27,9	24,2	7,03
17,9	19,5	28,2	27,9	24,2	7,03
17,9	19,5	28,1	27,9	24,2	7,03
17,9	19,6	28,1	27,9	24,2	7,03
17,9	19,6	28,1	27,9	24,2	7,01
17,9	19,6	28,1	27,9	24,2	7,00
17,9	19,6	28,1	27,9	24,2	7,00
17,9	19,6	28,1	27,9	24,2	7,00
18,0	19,6	28,1	27,9	24,3	6,99
18,0	19,6	28,2	27,9	24,2	6,97
17,9	19,6	28,1	27,9	24,2	6,97
18,0	19,6	28,1	27,9	24,2	6,97
17,9	19,6	28,1	27,9	24,2	7,02
17,9	19,6	28,1	27,9	24,2	7,03
17,9	19,6	28,1	27,9	24,2	7,00
18,0	19,6	28,1	27,9	24,2	7,02
18,0	19,7	28,1	27,9	24,2	7,00
18,1	19,6	28,1	27,9	24,2	6,99
18,1	19,6	28,1	27,9	24,2	7,00
18,0	19,6	28,1	27,9	24,2	7,00
18,0	19,6	28,1	27,9	24,2	7,00
18,0	19,6	28,1	27,9	24,2	7,01
18,0	19,6	28,1	27,9	24,2	6,99
18,1	19,6	28,1	27,9	24,2	7,10
18,1	19,6	28,1	27,9	24,2	7,10
18,0	19,7	28,1	27,9	24,2	7,12
18,1	19,7	28,1	27,9	24,2	7,13
18,1	19,7	28,1	27,9	24,2	7,11
18,0	19,7	28,1	27,9	24,2	7,13
18,1	19,7	28,1	27,9	24,2	7,12
18,1	19,7	28,1	27,9	24,2	7,13
18,1	19,7	28,1	27,9	24,2	7,14
18,0	19,7	28,1	27,9	24,2	7,14
18,0	19,7	28,1	27,9	24,3	7,14
18,0	19,7	28,1	27,9	24,2	7,11
18,0	19,6	28,1	27,9	24,2	7,03
18,1	19,7	28,1	27,9	24,3	7,07

18,1	19,7	28,1	27,9	24,3	7,06
18,1	19,7	28,1	27,9	24,2	7,04
18,1	19,7	28,1	27,9	24,3	7,05
18,1	19,7	28,1	27,9	24,2	7,02
18,0	19,7	28,1	27,9	24,2	7,05
18,0	19,7	28,1	27,9	24,2	7,03
18,0	19,7	28,1	27,9	24,3	7,05
18,1	19,7	28,1	27,9	24,3	7,04
18,1	19,8	28,1	27,9	24,3	7,03
18,1	19,7	28,1	27,9	24,3	7,03
18,1	19,8	28,1	27,9	24,3	7,03
18,2	19,7	28,1	27,9	24,3	7,01
18,2	19,8	28,1	27,8	24,2	7,02
18,2	19,8	28,1	27,9	24,3	7,02
18,2	19,8	28,1	27,9	24,3	7,02
18,2	19,8	28,1	27,9	24,3	7,06
18,2	19,8	28,1	27,9	24,3	7,04
18,1	19,8	28,1	27,9	24,3	7,05
18,1	19,8	28,0	27,9	24,3	7,01
18,2	19,7	28,1	27,8	24,3	7,04
18,1	19,7	28,1	27,8	24,3	7,05
18,1	19,7	28,0	27,8	24,3	7,02
18,0	19,7	28,1	27,9	24,2	7,05
18,1	19,8	28,1	27,9	24,3	7,04
18,2	19,8	28,1	27,9	24,3	7,03
18,2	19,9	28,1	27,9	24,3	7,04
18,2	19,8	28,1	27,9	24,3	7,04
18,2	19,8	28,1	27,9	24,3	7,03
18,1	19,8	28,1	27,9	24,3	7,02
18,1	19,7	28,1	27,9	24,3	7,05
18,1	19,8	28,0	27,9	24,3	7,04
18,1	19,7	28,1	27,9	24,3	7,02
18,1	19,7	28,0	27,8	24,3	7,04
18,1	19,7	28,1	27,9	24,3	7,03
18,1	19,7	28,1	27,9	24,3	7,03
18,2	19,7	28,1	27,9	24,3	7,04
18,1	19,7	28,1	27,9	24,4	7,03
18,1	19,7	28,1	27,9	24,3	7,01
18,2	19,6	28,1	27,9	24,4	7,03
18,2	19,6	28,1	27,9	24,4	7,02
18,2	19,7	28,1	27,9	24,4	7,02
18,2	19,7	28,1	27,9	24,3	7,03
18,1	19,7	28,1	27,9	24,3	7,05
18,1	19,6	28,1	27,9	24,3	7,06
18,1	19,6	28,1	27,9	24,3	7,06
18,0	19,6	28,1	27,9	24,3	7,06
18,0	19,6	28,1	27,9	24,3	7,05
18,0	19,7	28,1	27,9	24,3	7,05

18,0	19,7	28,1	27,9	24,3	7,06
18,0	19,7	28,1	27,9	24,3	7,06
18,0	19,7	28,1	27,9	24,4	7,07
17,9	19,7	28,1	27,9	24,3	7,04
18,0	19,7	28,1	27,9	24,3	7,05
18,0	19,7	28,1	27,9	24,3	7,05
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17,9	19,7	28,1	27,9	24,4	7,07
17,9	19,7	28,1	27,9	24,4	7,07
17,9	19,7	28,1	27,9	24,4	7,07
17,9	19,7	28,1	27,9	24,3	7,08
17,9	19,7	28,1	27,9	24,3	7,06
17,9	19,7	28,1	27,9	24,3	7,06
17,9	19,7	28,1	27,9	24,4	7,06
17,9	19,7	28,1	27,9	24,4	7,05
17,9	19,7	28,1	27,9	24,3	7,06
17,9	19,7	28,1	27,9	24,4	7,07
17,9	19,6	28,1	27,9	24,4	7,04
17,9	19,7	28,1	27,9	24,4	7,07
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17,9	19,6	28,1	27,9	24,4	7,05
17,8	19,7	28,1	27,9	24,3	7,07
17,8	19,7	28,1	27,9	24,4	7,05
17,8	19,7	28,1	28,0	24,3	7,06
17,8	19,6	28,1	27,9	24,3	7,05
17,8	19,7	28,1	27,9	24,3	7,06
17,8	19,7	28,1	27,9	24,3	7,05
17,8	19,7	28,1	27,9	24,3	7,05
17,7	19,7	28,1	27,9	24,3	7,04
17,7	19,7	28,1	27,9	24,3	7,07
17,8	19,6	28,1	27,9	24,3	7,06
17,7	19,7	28,1	27,9	24,3	7,06
17,7	19,7	28,1	27,9	24,3	7,05
17,7	19,7	28,1	27,9	24,3	7,04
17,7	19,7	28,1	28,0	24,3	7,06
17,7	19,6	28,1	27,9	24,3	7,04
17,6	19,6	28,1	27,9	24,3	7,05
17,6	19,6	28,1	27,9	24,3	7,06
17,7	19,5	28,1	27,9	24,3	7,06
17,7	19,5	28,1	27,9	24,3	7,06

17,7	19,5	28,1	27,9	24,3	7,05
17,7	19,5	28,1	27,9	24,3	7,06
17,8	19,5	28,1	27,9	24,3	7,06
17,8	19,5	28,1	27,9	24,3	7,06
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17,7	19,5	28,1	27,9	24,3	7,05
17,8	19,5	28,1	27,9	24,3	7,05
17,8	19,5	28,1	27,9	24,3	7,03
17,8	19,5	28,1	27,9	24,3	7,04
17,8	19,5	28,1	27,9	24,3	7,05
17,8	19,5	28,1	27,9	24,3	7,03
17,8	19,5	28,1	27,9	24,3	7,04
17,8	19,5	28,1	27,9	24,3	7,04
17,8	19,5	28,1	27,9	24,3	7,04
17,8	19,5	28,1	27,9	24,3	7,04
17,8	19,5	28,1	27,9	24,3	7,05
17,8	19,5	28,1	27,9	24,3	7,05
17,8	19,5	28,0	27,8	24,3	7,03
17,8	19,4	28,1	27,9	24,3	7,04
17,8	19,5	28,0	27,9	24,3	7,05
17,8	19,5	28,1	27,9	24,3	7,05
17,8	19,4	28,0	27,8	24,3	7,03
17,9	19,4	28,1	27,8	24,3	7,04
17,8	19,5	28,1	27,9	24,3	7,06
17,8	19,5	28,0	27,8	24,3	7,05
17,8	19,5	28,1	27,9	24,3	7,05
17,8	19,5	28,0	27,9	24,3	7,03
17,8	19,4	28,0	27,8	24,3	7,04
17,8	19,4	28,0	27,8	24,4	7,05
17,8	19,4	28,0	27,8	24,3	7,05
17,8	19,4	28,0	27,9	24,4	7,05
17,8	19,4	28,0	27,9	24,4	7,04
17,8	19,4	28,0	27,9	24,3	7,04
17,8	19,4	28,0	27,8	24,4	7,04
17,8	19,4	28,0	27,8	24,4	7,03
17,8	19,4	28,0	27,8	24,4	7,03
17,8	19,4	28,0	27,8	24,4	7,04
17,9	19,4	28,1	27,8	24,4	7,03
17,8	19,4	28,0	27,9	24,4	7,03
17,8	19,3	28,0	27,8	24,4	7,02
17,8	19,3	28,0	27,8	24,4	7,02
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17,8	19,3	28,0	27,8	24,4	7,03
17,8	19,4	28,0	27,8	24,4	7,01
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17,8	19,4	28,0	27,8	24,4	7,02
17,8	19,4	28,0	27,8	24,5	7,02
17,9	19,3	28,0	27,8	24,5	7,02

17,8	19,4	28,0	27,8	24,5	7,02
17,8	19,4	28,0	27,8	24,5	7,01
17,8	19,4	28,0	27,8	24,5	7,00
17,8	19,3	28,0	27,8	24,5	7,00
17,8	19,3	28,0	27,8	24,4	7,01
17,8	19,3	28,0	27,8	24,5	7,01
17,8	19,3	28,0	27,8	24,5	7,02
17,7	19,3	28,0	27,8	24,5	7,01
17,7	19,3	28,0	27,8	24,5	7,02
17,8	19,3	28,0	27,8	24,5	7,02
17,8	19,3	28,0	27,8	24,5	7,02
17,8	19,3	28,0	27,8	24,5	7,01
17,8	19,3	28,0	27,8	24,5	7,00
17,9	19,2	28,0	27,8	24,5	7,02
17,8	19,2	28,0	27,8	24,5	7,02
17,8	19,2	28,0	27,8	24,5	7,01
17,8	19,2	28,0	27,8	24,5	7,02
17,8	19,2	28,0	27,8	24,5	7,02
17,8	19,2	28,0	27,8	24,5	7,03
17,8	19,3	28,0	27,8	24,5	7,02
17,8	19,3	28,0	27,8	24,5	7,01
17,9	19,3	28,1	27,8	24,5	7,01
17,9	19,4	28,0	27,8	24,5	7,02
18,0	19,4	28,1	27,8	24,5	7,03
18,0	19,4	28,1	27,8	24,5	7,02
17,9	19,4	28,0	27,8	24,5	7,01
18,0	19,4	28,0	27,8	24,5	7,02
18,0	19,4	28,0	27,8	24,5	7,02
18,0	19,5	28,0	27,8	24,4	7,00
18,0	19,3	28,0	27,8	24,5	7,03
17,9	19,4	28,0	27,8	24,5	7,00
18,0	19,3	28,0	27,8	24,5	7,00
18,0	19,3	28,0	27,8	24,5	7,01
18,0	19,3	28,0	27,8	24,5	7,01
18,0	19,3	28,0	27,8	24,5	7,01
18,0	19,3	28,0	27,8	24,5	7,01
18,0	19,3	28,0	27,9	24,5	7,01
18,0	19,3	28,0	27,8	24,5	7,02
18,0	19,3	28,0	27,8	24,5	7,00
17,9	19,3	28,0	27,8	24,5	7,02
17,9	19,3	28,0	27,8	24,5	6,99
17,9	19,3	28,0	27,8	24,5	6,99
17,9	19,3	28,0	27,8	24,5	6,98
17,9	19,3	28,0	27,8	24,5	7,01
17,8	19,3	28,0	27,8	24,5	7,01
17,9	19,3	28,0	27,8	24,6	7,02
17,9	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,6	7,03

17,8	19,2	28,0	27,8	24,6	7,02
17,7	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,5	7,02
17,8	19,1	28,0	27,8	24,6	7,03
17,8	19,1	28,0	27,8	24,6	7,02
17,8	19,1	28,0	27,8	24,6	7,00
17,7	19,2	28,0	27,8	24,6	7,02
17,7	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,9	24,6	7,03
17,8	19,2	28,0	27,8	24,6	7,01
17,8	19,2	28,0	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,6	7,03
17,9	19,2	28,0	27,8	24,6	7,04
17,9	19,2	28,0	27,8	24,6	7,02
17,9	19,2	28,0	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,02
17,9	19,2	28,0	27,9	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,01
17,7	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,6	7,03
17,7	19,2	28,0	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,7	7,03
17,8	19,2	28,1	27,8	24,7	7,03
17,9	19,2	28,1	27,8	24,7	7,03
17,8	19,2	28,1	27,8	24,7	7,02
17,8	19,2	28,1	27,8	24,6	7,02
17,7	19,3	28,0	27,8	24,6	7,03
17,7	19,3	28,0	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,7	7,02
17,8	19,2	28,1	27,8	24,7	7,00
17,8	19,2	28,1	27,8	24,7	7,02
17,8	19,2	28,1	27,8	24,7	7,02
17,9	19,3	28,1	27,8	24,7	7,02
17,8	19,3	28,1	27,8	24,6	7,00
17,8	19,3	28,1	27,8	24,6	7,02
17,8	19,3	28,1	27,9	24,6	7,01
17,9	19,3	28,1	27,9	24,6	7,01
17,8	19,3	28,1	27,8	24,6	7,01
17,8	19,3	28,1	27,8	24,6	7,03
17,8	19,3	28,0	27,8	24,6	7,02
17,8	19,3	28,0	27,8	24,6	7,03

17,8	19,3	28,0	27,8	24,6	7,02
17,8	19,3	28,0	27,8	24,6	7,03
17,9	19,3	28,0	27,8	24,6	7,02
17,8	19,3	28,0	27,8	24,6	7,00
17,9	19,2	28,1	27,8	24,6	7,02
17,8	19,2	28,1	27,8	24,6	7,03
17,8	19,2	28,1	27,8	24,6	7,05
17,8	19,2	28,1	27,8	24,6	7,03
17,8	19,2	28,1	27,8	24,6	7,02
17,7	19,1	28,0	27,8	24,6	7,04
17,7	19,1	28,0	27,8	24,6	7,02
17,8	19,1	28,1	27,8	24,6	7,03
17,7	19,1	28,0	27,8	24,6	7,03
17,8	19,1	28,0	27,8	24,6	7,03
17,8	19,1	28,0	27,8	24,6	7,02
17,8	19,1	28,1	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,02
17,8	19,2	28,1	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,03
17,8	19,2	28,0	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,01
17,8	19,2	28,0	27,8	24,5	7,00
17,8	19,2	28,0	27,8	24,6	7,02
17,8	19,2	28,0	27,8	24,6	7,01
17,8	19,2	28,0	27,8	24,6	7,01
17,8	19,2	28,0	27,8	24,6	7,00
17,8	19,2	28,0	27,8	24,6	7,01
17,8	19,2	28,0	27,8	24,6	7,01
17,8	19,3	28,0	27,8	24,6	7,00

Flow-D - [ln/min]	NS-Røgtemp - [°	Ovf-Top - [°C]	Ovf-Bag - [°C]	Ovf-Side-1 - [°C]	Ovf-Side-2 - [°C]
13	24	27	28	29	30
Split train flow rate Flow-D - [ln/min]	EPA Flue gas temperature	Surface temperature Top	Surface temperature Rear	Surface temperature Right side	Surface temperature Left side
7,11	170,0	158,6	213,0	245,6	250,2
7,14	156,6	156,5	210,9	244,9	249,6
7,16	167,7	155,6	209,4	244,0	248,7
7,17	185,1	155,8	208,2	242,8	247,6
7,18	182,1	156,8	208,3	241,4	246,4
7,11	182,0	157,8	209,1	240,0	245,3
7,10	191,0	158,8	210,4	238,6	244,3
7,14	197,7	159,7	211,4	237,3	243,3
7,14	205,4	161,6	212,9	236,0	242,5
7,15	205,0	162,9	215,3	234,9	241,9
7,13	200,7	164,0	217,2	233,8	241,4
7,14	195,5	165,0	219,4	233,0	240,9
7,13	192,2	165,7	221,4	232,5	240,6
7,16	190,6	166,5	223,5	232,2	240,6
7,14	192,8	167,1	225,0	232,2	240,7
7,13	188,7	167,8	226,7	232,2	240,9
7,15	183,6	168,4	228,2	232,3	241,1
7,14	174,0	168,7	229,2	232,8	241,5
7,14	166,2	169,0	229,7	233,3	242,2
7,15	162,0	169,0	230,6	234,1	242,7
7,13	159,0	168,9	230,2	234,8	243,5
7,13	157,1	168,8	230,2	235,5	244,0
7,15	157,3	168,6	230,1	236,2	244,7
7,15	155,9	168,3	229,9	236,9	245,2
7,13	155,7	168,0	229,8	237,5	245,5
7,12	153,3	167,7	229,6	237,9	246,0
7,15	153,2	167,5	229,5	238,4	246,4
7,14	153,7	167,2	229,2	238,9	246,7
7,14	153,4	167,0	228,8	239,3	246,9
7,12	151,6	166,8	229,0	239,7	247,1
7,13	149,5	166,5	229,2	240,3	247,5
7,14	149,6	166,3	228,8	240,8	247,9
7,15	151,1	166,3	228,6	241,3	248,1
7,14	151,2	166,1	228,6	241,7	248,5
7,12	148,8	165,9	228,3	242,1	248,7
7,14	149,3	165,8	228,2	242,6	249,0
7,14	148,8	165,8	228,5	243,1	249,4
7,13	149,7	165,7	228,5	243,6	249,8
7,12	149,1	165,5	227,9	244,0	250,1
7,12	146,8	165,5	227,4	244,4	250,3
7,12	146,7	165,4	227,2	244,7	250,6
7,13	146,8	165,4	226,8	244,9	250,8

7,14	145,7	165,4	226,5	245,1	251,0
7,12	145,4	165,3	226,3	245,3	251,2
7,13	143,3	165,3	225,8	245,4	251,3
7,15	144,2	165,1	225,6	245,5	251,5
7,12	146,0	165,0	225,0	245,6	251,6
7,13	145,0	164,9	224,8	245,8	251,7
7,11	144,4	164,9	224,7	245,9	251,8
7,14	144,1	164,8	224,4	246,1	252,0
7,12	144,1	164,8	224,1	246,2	252,1
7,13	144,8	164,8	223,6	246,4	252,3
7,13	143,8	164,9	223,4	246,5	252,4
7,12	142,9	164,9	223,3	246,7	252,5
7,11	142,2	164,9	223,2	246,9	252,8
7,09	142,9	164,9	223,0	247,1	252,9
7,12	144,1	164,8	223,3	247,4	253,2
7,11	144,1	164,7	223,2	247,6	253,5
7,10	144,2	164,8	223,5	247,8	253,7
7,09	144,4	164,8	223,3	248,0	254,0
7,15	143,1	164,6	223,4	248,3	254,2
7,13	143,8	164,5	223,0	248,6	254,5
7,13	142,4	164,5	223,0	248,8	254,8
7,13	143,2	164,5	222,9	249,1	254,8
7,11	142,9	164,3	222,8	249,3	254,9
7,12	140,1	164,0	222,7	249,7	255,1
7,11	142,0	163,8	222,5	249,9	255,4
7,10	142,4	163,4	222,5	250,3	255,7
7,10	142,3	163,2	222,3	250,5	255,9
7,12	143,0	163,0	222,4	250,8	256,2
7,09	141,4	163,0	222,3	251,1	256,7
7,08	142,8	163,1	222,4	251,4	257,0
7,17	142,3	163,1	222,4	251,8	257,3
7,18	141,1	163,0	222,5	252,2	257,6
7,17	142,1	162,8	222,4	252,6	258,0
7,03	142,0	162,7	222,6	253,0	258,3
7,08	141,4	162,9	222,8	253,5	258,9
7,09	142,7	162,9	222,7	254,0	259,3
7,09	141,3	163,1	222,4	254,5	259,7
7,09	141,1	163,2	222,3	254,8	260,2
7,06	140,9	163,5	222,3	255,2	260,6
7,06	142,0	163,7	222,3	255,7	261,1
7,06	141,8	163,8	222,0	256,1	261,4
7,09	141,1	163,9	222,0	256,5	262,0
7,07	141,1	164,1	222,0	256,9	262,5
7,06	142,4	164,2	222,1	257,3	263,0
7,07	141,3	164,4	222,2	257,8	263,6
7,06	142,6	164,5	222,5	258,2	264,0
7,06	142,1	164,8	222,7	258,7	264,5
7,08	143,5	165,0	222,7	259,2	265,0

7,09	141,6	165,2	223,3	259,7	265,6
7,17	142,7	165,2	223,9	260,2	266,2
7,14	143,0	165,5	224,2	260,9	266,9
7,16	142,8	165,4	224,6	261,5	267,7
7,13	142,7	165,6	224,8	262,0	268,2
7,13	142,0	165,9	224,9	262,5	268,9
7,11	142,9	166,2	225,2	263,0	269,5
7,12	144,3	166,5	225,7	263,5	270,1
7,12	144,2	166,6	226,1	264,1	270,6
7,14	143,3	166,8	226,6	264,6	271,2
7,10	143,1	167,1	226,9	265,1	271,6
7,10	143,7	167,4	227,0	265,4	272,3
7,04	143,4	167,6	227,2	265,8	272,7
7,05	143,9	167,9	227,7	266,3	273,2
7,04	143,6	168,0	228,2	266,8	273,5
7,04	145,1	168,1	228,6	267,2	274,0
7,03	144,3	168,4	229,1	267,6	274,4
7,04	143,7	168,8	229,5	267,9	274,6
7,03	141,5	169,3	230,0	268,3	275,0
7,03	144,3	169,4	230,5	268,6	275,4
7,03	142,8	169,7	230,8	268,9	275,7
7,04	143,2	170,1	231,0	269,1	275,9
7,03	143,1	170,2	231,3	269,3	276,1
7,02	142,9	170,5	231,4	269,5	276,4
7,02	141,4	171,0	231,9	269,8	276,7
7,04	140,5	171,2	232,1	270,1	276,8
7,00	142,5	171,7	232,4	270,3	277,1
7,02	143,4	172,0	232,6	270,6	277,2
7,03	142,1	172,2	232,7	270,9	277,5
7,04	142,5	172,5	232,7	271,1	277,6
7,01	141,3	172,5	232,7	271,4	277,9
6,93	139,6	172,4	232,6	271,5	278,0
7,06	138,4	172,4	232,6	271,6	278,2
7,04	136,7	172,3	232,0	271,7	278,3
7,06	137,2	172,0	231,8	271,7	278,6
7,10	134,3	171,9	231,3	271,8	278,8
7,11	134,4	171,6	231,0	271,9	278,8
7,11	134,3	171,2	230,5	271,9	279,0
7,09	136,7	170,8	230,0	271,9	279,1
7,08	134,7	170,7	229,5	272,0	279,0
7,09	134,6	170,6	229,2	272,0	279,3
7,10	133,7	170,3	228,5	272,0	279,4
7,10	133,5	170,1	228,5	272,1	279,5
7,08	132,1	169,8	228,2	272,1	279,5
7,08	131,5	169,5	227,6	272,0	279,7
7,10	131,6	169,2	227,4	272,0	279,8
7,01	133,4	169,0	226,9	272,1	279,9
7,01	132,4	168,8	226,9	272,1	280,0

7,01	132,9	168,5	226,7	272,3	280,1
7,01	131,8	168,1	226,7	272,4	280,2
7,00	133,0	168,1	226,5	272,5	280,1
7,01	130,9	167,9	226,4	272,6	280,2
7,00	132,7	167,8	226,5	272,8	280,2
7,00	131,9	167,7	226,4	273,0	280,4
7,00	131,9	167,5	226,4	273,3	280,3
6,98	129,3	167,4	226,3	273,5	280,5
6,98	127,5	167,2	226,4	273,8	280,5
6,98	126,9	166,7	226,4	274,1	280,7
6,98	127,1	166,2	225,7	274,3	280,9
6,99	124,1	165,5	225,1	274,4	280,9
6,98	121,8	164,8	224,3	274,4	280,9
6,97	120,4	164,2	223,3	274,3	280,7
7,06	120,0	163,7	222,5	274,1	280,5
7,07	119,3	163,1	221,5	273,7	280,3
7,06	118,3	162,4	220,6	273,3	279,9
7,06	117,9	161,8	219,4	272,9	279,1
7,03	117,5	161,0	218,5	272,3	278,5
7,05	116,3	160,2	218,0	271,7	278,0
7,04	116,9	159,6	217,0	271,1	277,2
7,06	114,6	158,8	215,8	270,5	276,5
7,06	114,0	158,2	215,0	269,9	275,9
7,05	114,2	157,5	213,9	269,2	275,2
7,05	113,8	156,6	213,1	268,5	274,5
7,04	112,5	155,9	212,2	267,8	273,7
7,05	112,0	155,1	211,2	267,0	272,8
7,05	111,4	154,4	210,5	266,2	272,0
7,05	111,4	153,8	209,5	265,5	271,3
7,06	111,0	153,1	208,6	264,8	270,4
7,05	108,9	152,4	208,0	264,1	269,7
7,06	107,4	151,7	206,9	263,4	269,0
7,06	107,6	151,0	206,0	262,8	268,1
7,04	105,5	150,1	205,1	262,0	267,4
7,05	104,9	149,2	204,6	261,4	266,7
7,04	104,0	148,4	203,7	260,6	265,9
7,07	103,7	147,5	203,1	259,7	265,1
7,06	102,6	146,6	202,1	259,0	264,0
7,07	102,0	145,7	201,2	258,2	263,2
7,05	102,1	144,6	200,5	257,2	262,2
7,03	101,2	143,6	199,3	256,2	261,2
7,04	99,6	142,8	198,1	255,1	260,2
7,07	97,8	141,9	197,0	253,9	259,0
7,06	98,5	141,0	196,1	252,8	257,9
7,04	97,2	140,1	195,1	251,7	256,8
7,06	95,8	139,2	194,2	250,7	255,6
7,05	95,3	138,3	193,3	249,6	254,5
7,06	94,9	137,5	192,1	248,3	253,6

7,04	94,5	136,7	191,4	247,2	252,5
7,06	93,3	135,7	190,5	246,0	251,3
7,07	92,8	134,7	189,6	244,9	250,3
7,05	92,0	133,9	188,9	243,8	249,2
7,06	92,0	133,1	188,0	242,7	248,3
7,06	92,0	132,3	187,1	241,6	247,3
7,04	92,2	131,4	186,1	240,4	246,1
7,05	89,8	130,7	185,1	239,2	244,9
7,07	89,6	129,8	184,4	238,1	243,9
7,06	90,3	128,9	183,4	237,0	242,8
7,06	88,4	128,0	182,8	235,9	241,6
7,05	87,5	127,2	181,9	234,8	240,6
7,07	87,0	126,4	181,0	233,7	239,6
7,04	87,8	125,6	180,2	232,6	238,5
7,03	87,0	124,8	179,1	231,6	237,5
7,04	86,1	123,9	178,2	230,5	236,4
7,03	85,0	123,1	177,4	229,5	235,4
7,04	84,8	122,3	176,6	228,5	234,5
7,04	84,2	121,5	175,8	227,5	233,3
7,06	83,2	120,8	175,0	226,5	232,3
7,05	83,9	120,0	174,2	225,4	231,4
7,03	82,0	119,3	173,3	224,4	230,5
7,05	81,8	118,5	172,7	223,3	229,5
7,05	81,5	117,7	172,0	222,4	228,6
7,04	80,8	117,0	171,0	221,5	227,8
7,04	81,2	116,4	170,5	220,6	226,8
7,04	81,2	115,6	169,6	219,5	225,9
7,04	79,6	114,8	169,2	218,6	224,8
7,06	80,0	114,2	168,3	217,8	223,9
7,04	78,5	113,5	167,6	216,9	222,9
7,04	78,9	112,7	166,9	216,0	222,0
7,04	77,9	112,0	166,2	215,1	221,1
7,04	78,0	111,2	165,4	214,2	220,3
7,04	77,2	110,7	164,4	213,4	219,4
7,05	76,0	110,0	163,6	212,5	218,5
7,04	75,1	109,4	162,8	211,7	217,7
7,05	75,7	108,7	162,2	210,9	216,8
7,04	75,5	108,1	161,6	210,0	216,1
7,04	75,5	107,5	160,9	209,2	215,3
7,05	74,5	106,9	160,3	208,4	214,5
7,06	74,4	106,3	159,7	207,6	213,9
7,06	74,2	105,7	159,0	206,8	213,1
7,04	72,9	105,1	158,5	206,0	212,4
7,05	72,4	104,5	157,7	205,3	211,7
7,05	73,0	103,9	157,2	204,6	211,0
7,06	72,5	103,5	156,6	203,8	210,3
7,04	72,0	102,9	156,1	203,1	209,6
7,03	71,5	102,3	155,5	202,4	209,0

7,04	71,2	101,8	154,8	201,7	208,4
7,05	70,2	101,2	154,2	201,0	207,7
7,04	71,0	100,7	153,6	200,3	207,1
7,04	70,3	100,2	153,0	199,7	206,5
7,03	69,8	99,7	152,3	199,0	205,7
7,05	69,8	99,2	152,0	198,3	205,0
7,04	68,8	98,6	151,6	197,7	204,4
7,04	68,8	98,1	151,0	197,1	203,7
7,05	68,2	97,6	150,6	196,4	203,1
7,04	68,2	97,1	150,2	195,8	202,4
7,04	67,5	96,7	149,4	195,2	201,9
7,04	68,0	96,3	148,9	194,6	201,4
7,03	67,5	95,9	148,3	194,1	200,8
7,03	66,6	95,5	147,9	193,5	200,3
7,05	66,9	95,1	147,3	192,9	199,7
7,04	66,4	94,8	147,0	192,3	199,1
7,04	66,6	94,3	146,4	191,8	198,6
7,04	66,3	94,0	145,9	191,3	198,0
7,03	65,3	93,6	145,6	190,9	197,5
7,04	64,6	93,1	145,5	190,4	196,9
7,03	64,4	92,7	145,2	189,9	196,4
7,04	65,1	92,3	145,0	189,5	195,9
7,04	64,9	91,9	144,5	189,0	195,5
7,04	65,2	91,4	144,4	188,6	194,9
7,03	65,1	91,1	143,8	188,1	194,4
7,05	64,3	90,8	143,6	187,6	194,0
7,03	63,6	90,5	143,3	187,2	193,6
7,05	63,6	90,2	142,8	186,8	193,2
7,05	62,5	89,9	142,2	186,3	192,8
7,06	62,5	89,5	141,8	185,8	192,3
7,04	62,7	89,2	141,2	185,4	191,9
7,02	62,8	88,9	140,7	185,0	191,5
7,04	62,5	88,6	140,2	184,6	191,2
7,04	62,4	88,3	139,8	184,3	190,7
7,05	62,3	88,0	139,8	183,9	190,5
7,07	62,4	87,7	139,4	183,6	190,0
7,04	62,4	87,5	139,2	183,3	189,6
7,03	61,3	87,1	139,1	183,0	189,2
7,03	62,1	86,9	138,7	182,8	188,8
7,02	61,4	86,6	138,7	182,4	188,5
7,05	61,2	86,3	138,3	182,1	188,2
7,04	61,5	86,0	137,9	181,7	187,8
7,04	61,6	85,7	137,3	181,3	187,3
7,03	60,4	85,4	136,9	181,0	187,0
7,04	59,9	85,1	136,4	180,6	186,6
7,04	60,0	84,8	136,0	180,3	186,3
7,03	59,5	84,5	135,7	180,0	185,9
7,04	59,1	84,3	135,5	179,6	185,5

7,04	59,0	84,0	135,3	179,4	185,3
7,03	59,5	83,8	134,9	179,1	184,9
7,04	58,7	83,6	134,5	178,9	184,6
7,04	58,3	83,2	134,1	178,6	184,3
7,04	59,1	83,0	133,8	178,2	184,0
7,04	58,8	82,8	133,9	178,0	183,7
7,04	58,7	82,5	133,3	177,8	183,4
7,05	57,9	82,4	133,1	177,6	183,2
7,05	58,0	82,1	132,9	177,4	182,9
7,03	57,6	81,8	132,4	177,0	182,7
7,05	58,7	81,7	132,3	176,8	182,4
7,05	58,4	81,5	132,1	176,6	182,1
7,03	58,5	81,2	131,7	176,4	181,9
7,04	58,2	81,0	131,3	176,1	181,7
7,03	57,2	80,7	131,0	175,9	181,5
7,02	57,2	80,5	130,8	175,7	181,2
7,04	56,9	80,3	130,5	175,5	181,0
7,04	57,3	80,1	130,4	175,3	180,7
7,04	57,2	79,9	130,0	175,1	180,4
7,02	56,5	79,7	130,0	174,9	180,3
7,02	56,9	79,6	129,8	174,8	180,1
7,02	56,8	79,4	129,9	174,6	179,9
7,04	56,9	79,2	129,7	174,5	179,7
7,02	56,6	79,0	129,6	174,3	179,5
7,02	56,6	78,7	129,7	174,1	179,4
7,04	56,5	78,6	129,4	174,0	179,2
7,04	55,9	78,4	129,1	173,8	179,1
7,03	55,7	78,2	129,0	173,6	178,8
7,04	55,5	78,1	128,8	173,5	178,7
7,05	55,4	77,9	129,0	173,3	178,6
7,03	55,4	77,8	128,3	173,1	178,3
7,04	55,3	77,6	128,0	173,0	178,1
7,03	55,4	77,4	127,8	172,8	178,0
7,04	55,3	77,2	127,5	172,6	177,9
7,04	55,2	77,0	127,1	172,5	177,8
7,04	54,7	76,8	126,8	172,3	177,6
7,04	54,9	76,7	126,5	172,1	177,4
7,03	54,6	76,5	126,2	172,0	177,3
7,03	54,5	76,4	125,8	171,9	177,1
7,03	54,1	76,2	125,5	171,7	177,0
7,03	54,4	76,0	125,4	171,6	176,8
7,04	53,5	75,9	125,1	171,4	176,7
7,04	53,9	75,7	124,9	171,3	176,6
7,03	54,0	75,5	124,6	171,2	176,4
7,04	54,1	75,4	124,5	171,0	176,3
7,05	54,3	75,3	124,4	171,0	176,2
7,03	53,9	75,2	124,3	170,8	176,1
7,03	54,0	75,0	124,1	170,7	175,9

7,04	53,8	74,8	123,8	170,5	175,7
7,04	53,7	74,7	123,6	170,3	175,5
7,04	53,2	74,6	123,2	170,1	175,2
7,03	53,0	74,5	123,1	169,9	175,0
7,04	53,1	74,3	122,8	169,7	174,9
7,03	53,1	74,2	122,8	169,6	174,7
7,03	52,9	74,1	122,7	169,4	174,6
7,03	52,9	73,9	122,9	169,2	174,3
7,04	52,8	73,7	122,7	169,0	174,1
7,03	52,4	73,6	122,7	168,9	173,9
7,04	52,4	73,5	122,9	168,7	173,6
7,04	52,5	73,3	122,7	168,6	173,4
7,06	51,6	73,2	122,4	168,4	173,3
7,04	52,3	73,1	122,8	168,3	173,1
7,03	52,0	73,0	122,4	168,1	172,9
7,06	51,9	72,9	122,3	167,9	172,6
7,02	51,6	72,7	122,1	167,7	172,5
7,04	51,7	72,6	121,9	167,4	172,3
7,04	51,8	72,4	121,7	167,2	172,0
7,03	51,7	72,3	121,2	167,0	171,8
7,02	51,8	72,2	121,0	166,7	171,5
7,05	51,4	72,0	120,8	166,6	171,4
7,04	51,5	71,8	120,9	166,4	171,2
7,04	51,5	71,7	120,8	166,2	171,0
7,04	51,9	71,5	120,7	166,1	170,9
7,04	51,0	71,4	120,4	165,9	170,7
7,05	50,9	71,2	120,3	165,6	170,6
7,05	51,0	71,1	120,0	165,4	170,4
7,06	51,1	71,0	119,9	165,2	170,1
7,05	51,0	70,8	119,6	165,1	170,0
7,03	50,5	70,7	119,5	164,9	169,8
7,03	50,1	70,6	119,1	164,7	169,7
7,02	50,5	70,5	118,7	164,4	169,4
7,03	50,7	70,4	118,6	164,2	169,1
7,04	50,9	70,4	118,4	164,1	168,9
7,04	50,3	70,3	118,4	164,0	168,7
7,04	50,1	70,2	118,2	163,7	168,5
7,04	50,3	70,1	118,0	163,5	168,4
7,03	50,1	69,9	118,0	163,3	168,3
7,02	49,4	69,9	117,6	163,1	168,1
7,03	49,5	69,8	117,3	162,9	168,0
7,03	50,0	69,8	117,3	162,8	167,8
7,04	49,7	69,7	117,0	162,6	167,7
7,04	49,6	69,5	116,9	162,4	167,5
7,03	49,8	69,4	116,6	162,2	167,2
7,02	49,3	69,3	116,6	162,0	167,0
7,04	49,7	69,3	116,5	161,9	166,8
7,04	49,7	69,2	116,4	161,7	166,6

7,04	49,1	69,1	116,3	161,6	166,5
7,01	49,4	69,0	116,4	161,5	166,4
7,02	49,5	68,9	116,5	161,4	166,3
7,03	49,6	68,9	116,4	161,3	166,1
7,02	49,6	68,9	116,4	161,2	166,0
7,03	49,6	68,8	116,5	161,1	165,9
7,04	49,7	68,7	116,6	161,0	165,8
7,05	49,6	68,6	116,3	160,8	165,6
7,05	49,4	68,5	115,9	160,6	165,5
7,05	48,5	68,4	115,6	160,4	165,2
7,04	48,5	68,3	115,3	160,3	165,0
7,05	49,0	68,2	115,1	160,1	164,9
7,02	48,6	68,1	114,8	159,9	164,8
7,04	49,2	68,0	114,6	159,8	164,6
7,04	48,9	68,0	114,6	159,7	164,4
7,05	49,0	67,9	114,8	159,7	164,4
7,04	48,6	67,9	114,7	159,7	164,3
7,03	48,6	67,8	114,7	159,5	164,2
7,03	48,6	67,8	114,6	159,5	164,0
7,04	48,2	67,7	114,6	159,4	163,9
7,03	48,4	67,6	114,7	159,3	163,7
7,05	48,3	67,6	114,6	159,3	163,7
7,04	48,2	67,5	114,4	159,2	163,5
7,03	48,1	67,4	114,6	159,1	163,3
7,04	48,6	67,4	114,2	159,0	163,1
7,02	48,1	67,3	113,9	158,9	163,1
7,03	48,5	67,2	113,6	158,8	162,9
7,03	48,6	67,2	113,6	158,7	162,7
7,02	48,4	67,1	113,5	158,6	162,5

Ovf-Bund - [°C]	Kanal-EPA - [°C]	Røgtræk - [Pa]	Pd Kanal - [Pa]	Ps Kanal - [Pa]	Vægt - [Kg]
31	36	38	39	40	43
Surface temperature Bottom	EPA Duct temperature	Flue draft Pascals	Duct dynamic pressure	Duct static pressure	Platform scale reading
54,9	39,0	9,6	31,2	47,1	2,755
55,2	42,6	10,6	30,0	47,5	4,351
55,3	42,8	11,1	31,0	48,2	4,328
55,6	41,7	12,3	31,1	48,2	4,125
55,8	40,7	12,1	31,1	48,4	4,272
55,9	39,8	12,0	30,0	48,6	4,243
56,2	39,2	12,5	31,4	48,6	4,216
56,4	39,1	12,5	30,2	47,8	4,149
56,6	39,5	12,5	30,5	47,5	4,153
56,8	39,4	12,5	30,6	47,0	4,121
56,9	39,3	12,2	31,0	46,8	4,087
57,1	39,2	12,4	30,0	46,6	4,057
57,3	38,9	12,2	28,3	47,7	4,025
57,5	38,7	12,2	30,4	47,4	3,995
57,7	38,7	12,0	29,7	46,9	3,966
57,9	38,5	12,0	30,4	47,9	3,939
58,1	38,2	11,6	31,1	47,9	3,914
58,3	37,9	11,4	29,7	47,4	3,885
58,6	37,5	11,3	30,1	47,3	3,859
58,9	37,1	11,1	30,1	47,1	3,836
59,1	36,8	11,1	30,8	47,6	3,818
59,3	36,5	10,8	31,3	48,8	3,796
59,5	36,3	11,0	29,9	46,3	3,775
59,8	36,2	10,8	29,7	47,6	3,755
60,0	36,0	11,1	30,7	47,4	3,732
60,1	35,9	10,9	31,2	48,3	3,711
60,4	35,8	10,7	30,6	47,4	3,689
60,5	35,7	10,7	30,4	47,7	3,668
60,7	35,5	10,7	30,7	47,8	3,645
60,9	35,4	10,6	31,5	47,6	3,625
61,2	35,3	10,6	31,1	46,9	3,603
61,5	35,3	10,9	32,0	49,0	3,580
61,7	35,2	10,6	29,6	47,6	3,559
61,9	35,2	10,5	31,6	48,3	3,535
62,2	35,1	10,5	30,6	47,4	3,515
62,4	35,1	10,5	32,1	49,5	3,492
62,6	35,0	10,6	31,0	47,8	3,470
62,9	35,1	10,5	29,9	47,4	3,447
63,1	35,1	10,2	31,4	47,8	3,427
63,3	35,1	10,3	29,6	47,9	3,406
63,5	35,0	10,3	31,5	47,6	3,384
63,7	34,9	10,1	30,3	47,9	3,365

63,9	34,9	10,1	30,2	47,0	3,343
64,1	34,8	10,4	31,2	47,1	3,324
64,3	34,8	10,2	31,5	47,1	3,303
64,4	34,7	10,4	31,2	46,8	3,284
64,5	34,7	10,4	31,3	47,7	3,262
64,7	34,7	10,4	29,4	48,2	3,241
64,8	34,6	10,4	29,4	47,2	3,220
64,9	34,6	10,3	29,6	47,6	3,200
65,1	34,6	10,5	30,7	46,9	3,178
65,2	34,5	10,2	31,4	47,8	3,156
65,3	34,5	10,1	30,6	46,7	3,136
65,4	34,4	10,4	30,8	47,1	3,114
65,6	34,4	10,4	31,1	47,7	3,093
65,7	34,3	10,3	30,2	47,0	3,071
65,9	34,3	10,3	31,0	47,5	3,048
66,0	34,3	10,0	30,8	47,7	3,026
66,2	34,3	10,4	31,2	47,4	3,004
66,3	34,3	10,2	30,8	46,9	2,984
66,4	34,3	10,2	31,1	46,9	2,960
66,5	34,4	10,0	29,8	47,2	2,939
66,6	34,3	10,0	30,1	46,8	2,916
66,7	34,2	10,0	30,6	47,2	2,894
66,8	34,3	10,0	30,3	47,5	2,874
66,9	34,3	9,8	31,3	48,7	2,854
66,9	34,3	10,0	31,1	48,8	2,831
67,0	34,3	10,1	30,7	47,5	2,811
67,0	34,4	10,1	30,3	48,0	2,787
67,2	34,3	9,9	30,0	47,4	2,766
67,2	34,3	10,2	30,8	47,7	2,745
67,4	34,3	10,0	30,9	46,1	2,722
67,5	34,3	10,3	30,3	46,9	2,699
67,6	34,3	9,9	30,1	46,7	2,679
67,6	34,4	10,0	29,0	46,3	2,655
67,7	34,4	10,1	30,5	46,6	2,634
67,8	34,3	10,1	30,5	47,4	2,613
67,9	34,3	10,1	31,0	46,6	2,591
68,0	34,3	10,3	28,4	46,7	2,570
68,1	34,3	10,3	29,9	46,4	2,551
68,2	34,3	10,3	30,7	45,9	2,526
68,2	34,3	10,0	30,7	47,0	2,507
68,3	34,3	10,1	31,3	47,4	2,483
68,4	34,2	10,1	30,8	46,8	2,462
68,5	34,3	10,2	29,6	46,9	2,440
68,5	34,2	10,4	30,6	46,7	2,420
68,7	34,2	9,8	30,4	46,8	2,398
68,7	34,2	10,1	30,6	46,9	2,374
68,8	34,2	10,1	30,5	47,2	2,353
68,8	34,1	10,0	31,0	46,7	2,329

68,9	34,1	10,2	30,8	46,8	2,308
69,0	34,1	10,2	29,8	45,8	2,285
69,1	34,2	9,9	30,2	46,2	2,264
69,2	34,2	9,8	29,1	45,8	2,243
69,2	34,2	10,1	30,0	46,2	2,221
69,3	34,2	9,8	27,4	43,4	2,200
69,4	34,2	10,0	30,0	46,2	2,178
69,4	34,3	10,1	30,3	46,7	2,156
69,4	34,3	9,9	30,9	47,7	2,135
69,4	34,3	10,1	31,4	47,1	2,110
69,4	34,4	10,0	31,3	48,2	2,089
69,4	34,4	9,8	30,2	45,2	2,068
69,5	34,5	10,1	29,5	45,8	2,046
69,5	34,4	10,0	29,5	46,2	2,026
69,6	34,5	10,2	28,7	45,5	2,004
69,6	34,5	10,0	30,3	45,8	1,984
69,6	34,6	10,0	28,0	45,5	1,966
69,6	34,6	10,1	29,9	45,2	1,944
69,6	34,6	10,0	29,1	45,4	1,925
69,7	34,7	9,8	29,7	46,4	1,902
69,8	34,6	9,8	29,9	46,6	1,883
69,8	34,6	10,1	30,0	46,2	1,864
69,8	34,6	10,1	30,0	46,1	1,845
69,9	34,5	9,7	29,3	45,0	1,826
69,9	34,6	9,6	30,5	45,7	1,806
69,9	34,6	9,6	30,0	45,7	1,786
69,9	34,6	9,7	29,0	46,0	1,768
70,0	34,6	9,5	29,9	45,2	1,749
70,0	34,7	9,6	29,5	44,5	1,734
70,1	34,7	9,6	29,9	45,6	1,715
70,1	34,7	9,6	29,9	45,8	1,698
70,1	34,6	9,5	29,9	45,5	1,683
70,1	34,5	9,7	30,0	45,6	1,666
70,1	34,5	9,5	29,2	45,9	1,652
70,1	34,5	9,3	29,9	45,3	1,637
70,2	34,4	9,2	28,6	45,6	1,621
70,2	34,4	9,5	30,1	46,2	1,605
70,3	34,4	9,3	29,1	46,4	1,590
70,3	34,4	9,3	30,6	46,0	1,575
70,3	34,3	9,1	30,4	47,4	1,561
70,4	34,4	9,1	29,4	45,9	1,545
70,4	34,4	9,1	27,8	45,8	1,530
70,5	34,4	9,2	29,4	45,9	1,516
70,5	34,4	9,1	29,7	46,6	1,500
70,5	34,2	9,0	30,6	46,2	1,486
70,5	34,2	8,8	29,5	44,9	1,470
70,6	34,2	9,2	29,4	45,2	1,456
70,6	34,1	9,1	28,9	45,9	1,441

70,7	34,1	8,6	29,3	44,9	1,425
70,7	34,1	9,2	29,4	44,6	1,411
70,7	34,1	9,3	29,2	45,6	1,394
70,7	34,1	9,2	29,2	45,7	1,379
70,8	34,1	9,1	30,1	45,3	1,364
70,8	34,1	9,1	29,3	44,6	1,347
70,8	34,2	9,0	28,7	44,7	1,334
70,9	34,2	8,7	28,8	44,5	1,320
70,9	34,2	8,6	29,0	45,4	1,307
71,0	34,2	8,8	28,7	45,0	1,299
71,1	34,2	8,7	28,5	44,9	1,292
71,1	34,1	8,5	30,0	44,8	1,283
71,1	34,1	8,4	29,2	45,1	1,274
71,1	34,0	8,2	29,6	45,0	1,268
71,1	34,0	8,2	31,3	46,1	1,259
71,1	34,0	8,3	29,1	44,9	1,252
71,1	33,9	8,2	29,4	44,5	1,245
71,1	33,8	8,1	28,6	44,6	1,237
71,1	33,7	8,1	28,0	45,5	1,229
71,2	33,6	8,0	29,2	45,3	1,222
71,3	33,6	7,9	30,0	45,1	1,216
71,3	33,6	8,1	29,0	45,5	1,206
71,4	33,5	7,9	29,5	44,9	1,200
71,4	33,5	8,0	29,6	45,7	1,192
71,4	33,3	7,8	29,5	45,1	1,184
71,4	33,2	7,8	29,8	45,8	1,175
71,4	33,1	7,4	28,9	44,3	1,171
71,5	33,1	7,5	29,5	45,0	1,163
71,5	33,1	7,7	29,7	45,0	1,154
71,5	32,9	7,8	29,1	45,0	1,147
71,5	32,9	7,5	28,9	44,4	1,143
71,5	32,8	7,5	28,9	45,3	1,137
71,6	32,8	7,5	29,6	45,0	1,136
71,6	32,8	7,4	28,7	45,3	1,129
71,6	32,8	7,3	32,0	48,3	1,128
71,7	32,7	7,2	31,2	48,3	1,128
71,7	32,5	7,1	32,1	50,2	1,124
71,8	32,4	7,3	29,9	45,3	1,121
71,9	32,2	7,2	29,9	45,8	1,119
71,9	32,1	6,9	29,9	45,5	1,113
71,9	32,0	6,7	30,0	45,9	1,111
71,9	32,0	6,9	30,1	45,6	1,110
71,9	32,0	6,9	29,9	45,7	1,106
71,9	31,9	6,5	29,1	45,7	1,105
71,9	31,9	6,8	29,5	45,8	1,103
72,0	31,8	6,9	28,9	45,7	1,100
72,0	31,7	6,7	29,6	46,2	1,097
72,0	31,6	6,6	29,8	46,4	1,095

72,0	31,5	6,7	30,7	46,5	1,093
72,0	31,4	6,6	30,7	45,9	1,089
72,1	31,5	6,6	29,9	45,6	1,087
72,2	31,4	6,5	30,6	46,7	1,085
72,2	31,3	6,5	29,5	45,9	1,085
72,2	31,3	6,4	29,3	46,4	1,080
72,2	31,3	6,2	29,3	45,2	1,074
72,1	31,2	6,2	29,9	45,0	1,074
72,1	31,2	6,2	30,0	46,4	1,071
72,1	31,1	6,3	30,2	45,7	1,070
72,0	31,1	6,1	29,9	45,9	1,066
72,1	31,0	6,0	30,7	45,4	1,066
72,0	31,0	6,1	30,1	46,1	1,063
72,0	31,0	6,3	29,4	46,0	1,061
72,0	31,0	6,2	29,8	46,1	1,055
72,0	31,0	6,0	29,9	46,6	1,054
72,0	30,9	5,9	29,9	46,0	1,053
72,0	30,9	5,8	28,3	45,2	1,052
72,0	30,8	5,9	30,0	45,7	1,049
72,0	30,7	5,8	30,3	46,0	1,047
72,0	30,6	5,7	29,3	46,4	1,044
72,0	30,5	5,8	30,2	47,3	1,041
72,0	30,5	5,8	29,4	46,4	1,038
72,0	30,4	5,8	28,9	45,3	1,037
72,0	30,4	5,8	30,1	46,1	1,034
72,0	30,4	5,8	29,3	46,7	1,033
72,0	30,4	5,4	29,9	46,3	1,031
72,0	30,4	5,5	29,2	44,9	1,033
71,9	30,3	5,5	29,7	46,1	1,031
72,0	30,3	5,3	30,3	46,4	1,028
72,0	30,2	5,1	30,5	46,5	1,027
72,0	30,2	5,4	30,6	46,6	1,024
71,9	30,2	5,4	30,3	45,7	1,022
71,9	30,2	5,2	30,4	45,7	1,022
71,9	30,1	5,2	29,9	46,0	1,019
71,8	30,1	5,4	30,1	45,9	1,016
71,8	30,1	5,2	30,0	46,0	1,015
71,8	30,1	5,0	29,6	45,6	1,013
71,8	30,0	5,3	29,8	46,2	1,006
71,8	29,9	5,2	28,0	41,9	1,004
71,9	29,9	4,9	29,9	44,3	1,004
71,8	29,9	4,9	27,6	42,7	1,001
71,8	29,8	5,2	27,1	42,7	0,999
71,7	29,8	4,9	27,3	41,5	0,998
71,7	29,7	5,1	27,6	42,2	0,996
71,7	29,7	4,9	27,6	42,6	0,996
71,7	29,7	4,9	27,4	43,4	0,991
71,7	29,7	4,9	28,6	45,6	0,991

71,6	29,8	4,7	27,9	42,7	0,990
71,6	29,7	4,7	27,2	42,8	0,987
71,6	29,7	4,7	28,1	42,7	0,985
71,5	29,7	4,5	27,9	42,8	0,985
71,5	29,6	4,7	32,3	48,3	0,979
71,4	29,6	4,7	31,1	47,8	0,978
71,4	29,6	4,5	32,1	48,7	0,977
71,3	29,6	4,4	29,9	47,3	0,975
71,3	29,7	4,5	31,4	47,9	0,973
71,4	29,6	4,7	30,0	47,7	0,972
71,4	29,6	4,7	30,2	46,8	0,969
71,3	29,6	4,5	30,9	47,9	0,968
71,3	29,7	4,4	31,6	47,5	0,966
71,3	29,6	4,6	31,2	47,6	0,965
71,3	29,6	4,5	30,7	47,5	0,956
71,2	29,6	4,6	31,9	48,2	0,957
71,2	29,6	4,4	28,4	44,0	0,954
71,2	29,5	4,5	29,4	44,4	0,954
71,2	29,5	4,3	28,8	44,2	0,951
71,2	29,5	4,3	28,0	43,8	0,949
71,1	29,6	4,5	29,9	44,8	0,947
71,1	29,5	4,3	29,3	44,9	0,945
71,0	29,4	4,2	29,3	44,8	0,945
71,0	29,4	4,2	28,3	44,2	0,941
70,9	29,5	4,3	28,9	43,6	0,940
70,9	29,5	4,5	29,5	44,6	0,938
70,9	29,4	4,3	29,6	45,4	0,936
70,9	29,3	4,2	29,4	44,2	0,934
70,8	29,4	4,2	29,3	44,5	0,932
70,8	29,3	4,2	28,9	44,6	0,930
70,8	29,3	4,2	28,0	44,0	0,928
70,8	29,3	4,1	29,9	44,2	0,927
70,8	29,3	4,0	28,9	43,8	0,923
70,7	29,3	4,1	28,9	44,9	0,922
70,7	29,3	4,1	29,6	45,2	0,920
70,8	29,3	4,0	29,2	44,8	0,918
70,7	29,3	4,0	27,4	44,7	0,917
70,7	29,3	4,0	28,9	44,8	0,913
70,7	29,3	3,9	29,7	44,9	0,912
70,7	29,3	3,9	28,9	44,6	0,910
70,7	29,3	3,9	27,7	44,4	0,908
70,7	29,3	3,9	29,3	44,9	0,906
70,6	29,3	4,1	29,2	44,3	0,903
70,6	29,3	3,9	30,1	44,5	0,902
70,6	29,3	3,8	28,1	44,1	0,901
70,6	29,2	3,8	29,1	44,6	0,899
70,6	29,2	3,9	28,8	45,1	0,896
70,5	29,3	3,9	29,5	45,2	0,896

70,6	29,3	4,1	29,3	45,7	0,891
70,6	29,2	3,7	28,7	44,6	0,889
70,5	29,2	3,7	29,9	45,6	0,889
70,5	29,2	3,9	28,9	44,6	0,887
70,5	29,2	3,8	28,4	44,3	0,889
70,4	29,1	3,7	29,0	44,8	0,888
70,4	29,1	3,5	29,5	44,3	0,886
70,4	29,1	3,6	29,6	44,7	0,882
70,4	29,1	3,5	28,0	45,2	0,880
70,4	29,1	3,6	28,3	44,3	0,878
70,3	29,1	3,7	28,5	44,3	0,878
70,3	29,1	3,6	28,1	45,1	0,876
70,3	29,1	3,5	29,5	44,8	0,875
70,3	29,1	3,5	29,4	44,8	0,871
70,2	29,1	3,6	30,2	44,9	0,869
70,2	29,2	3,4	28,8	44,4	0,868
70,1	29,2	3,4	29,1	45,2	0,866
70,1	29,2	3,3	29,1	45,0	0,863
70,0	29,2	3,3	27,2	44,6	0,862
70,0	29,2	3,3	29,9	45,8	0,860
70,0	29,1	3,4	29,2	44,4	0,858
70,0	29,1	3,5	29,0	44,1	0,856
70,0	29,1	3,3	29,1	44,7	0,854
69,9	29,1	3,3	29,2	45,2	0,852
69,9	29,1	3,2	28,0	44,5	0,849
69,9	29,1	3,4	28,7	45,0	0,847
69,9	29,1	3,2	28,9	44,8	0,847
69,9	29,0	3,3	29,3	44,3	0,845
69,9	29,1	3,2	28,3	44,4	0,842
69,9	29,0	3,6	28,9	45,1	0,840
69,9	28,9	3,3	29,7	45,2	0,840
69,8	28,9	3,3	29,2	44,8	0,835
69,8	28,9	3,3	29,3	44,8	0,835
69,8	28,9	3,4	29,3	44,6	0,833
69,7	28,9	3,1	29,0	44,2	0,832
69,7	29,0	3,5	29,4	44,8	0,829
69,7	29,0	3,3	28,0	44,4	0,827
69,7	29,1	3,2	29,4	44,8	0,825
69,7	29,0	3,2	29,0	45,0	0,823
69,7	29,0	3,2	29,9	45,2	0,822
69,7	29,0	3,0	29,2	44,8	0,820
69,6	29,0	3,0	30,0	45,0	0,817
69,6	29,0	3,5	29,0	44,0	0,817
69,6	28,9	3,1	28,9	44,4	0,814
69,6	28,9	3,1	29,7	45,6	0,813
69,6	28,9	3,3	29,2	45,0	0,811
69,6	28,8	3,1	29,5	45,6	0,809
69,6	28,8	3,2	29,4	45,0	0,808

69,5	28,7	3,0	29,8	45,1	0,806
69,5	28,7	3,0	28,6	45,5	0,803
69,4	28,7	3,1	29,4	44,8	0,803
69,4	28,7	3,2	28,5	44,2	0,801
69,3	28,7	3,0	28,7	44,7	0,800
69,3	28,7	3,0	31,1	47,2	0,799
69,3	28,8	3,3	30,0	46,0	0,795
69,3	28,9	3,1	29,9	44,8	0,794
69,2	28,9	3,0	31,4	46,3	0,793
69,2	28,8	3,1	28,2	44,2	0,792
69,2	28,9	2,9	29,9	45,3	0,790
69,2	28,8	3,1	29,1	45,8	0,789
69,2	28,9	3,2	29,4	44,1	0,787
69,2	28,8	3,1	28,6	44,8	0,787
69,2	28,8	3,0	30,0	45,7	0,783
69,2	28,8	3,2	29,5	44,4	0,781
69,1	28,8	3,2	28,3	44,5	0,780
69,1	28,8	3,1	28,7	45,0	0,778
69,0	28,8	2,9	29,9	45,7	0,777
69,0	28,8	3,0	29,8	44,6	0,775
69,0	28,8	3,1	29,5	43,8	0,775
68,9	28,8	3,0	28,6	45,4	0,771
68,9	28,8	2,9	29,4	44,8	0,771
68,9	28,8	2,9	29,1	45,1	0,768
68,9	28,8	3,0	29,1	45,1	0,767
68,9	28,8	3,2	29,6	45,6	0,765
68,9	28,8	3,0	29,2	45,7	0,764
68,9	28,8	3,1	29,1	46,7	0,760
68,8	28,7	2,9	29,6	44,6	0,759
68,9	28,7	2,8	29,8	44,9	0,759
68,8	28,6	3,1	29,1	45,2	0,756
68,8	28,7	2,8	27,7	45,6	0,755
68,7	28,7	2,8	29,4	45,5	0,753
68,6	28,6	3,1	28,5	44,2	0,751
68,6	28,6	2,9	29,5	44,7	0,749
68,5	28,7	2,6	29,6	44,4	0,749
68,5	28,7	2,8	28,7	44,4	0,747
68,4	28,7	3,0	29,9	46,6	0,745
68,4	28,6	2,6	28,9	45,5	0,744
68,4	28,7	2,8	29,0	45,6	0,738
68,3	28,7	2,8	29,8	44,8	0,737
68,3	28,7	3,0	29,3	44,1	0,734
68,3	28,6	2,7	29,8	44,8	0,733
68,2	28,6	2,8	29,1	45,0	0,732
68,1	28,6	2,5	29,9	44,6	0,731
68,1	28,6	2,8	28,6	45,3	0,729
68,0	28,6	2,8	29,3	44,6	0,728
67,9	28,6	2,7	29,0	45,8	0,725

67,9	28,6	2,6	32,5	48,7	0,723
67,9	28,5	3,0	32,8	49,7	0,721
67,8	28,5	2,8	31,8	48,4	0,719
67,8	28,5	3,0	31,6	48,2	0,717
67,8	28,5	2,7	32,4	47,8	0,716
67,8	28,4	2,8	30,9	48,3	0,715
67,8	28,4	3,1	29,2	44,0	0,714
67,7	28,4	2,9	28,9	44,3	0,712
67,6	28,4	2,7	28,8	44,3	0,710
67,5	28,5	2,5	28,6	44,4	0,707
67,4	28,4	2,9	29,9	44,9	0,705
67,4	28,5	2,7	30,4	46,7	0,705
67,3	28,4	2,6	28,9	45,0	0,704
67,2	28,4	2,7	29,1	44,8	0,701
67,2	28,4	2,7	29,5	44,8	0,700
67,2	28,4	2,5	28,8	44,8	0,697
67,1	28,4	2,9	28,9	44,6	0,696
67,1	28,4	2,9	28,4	44,8	0,695
67,0	28,4	2,7	29,1	44,9	0,692
67,0	28,3	2,7	28,9	44,6	0,691
66,9	28,2	2,5	29,1	44,9	0,689
66,9	28,2	2,7	29,7	45,2	0,688
66,8	28,2	2,7	29,0	43,8	0,686
66,8	28,2	2,7	30,0	44,9	0,685
66,7	28,3	2,9	28,3	45,2	0,682
66,6	28,3	2,7	29,9	45,8	0,682
66,6	28,3	2,8	27,8	45,0	0,681
66,5	28,3	2,8	29,3	44,5	0,679
66,5	28,3	2,8	28,8	44,5	0,675
					0,675

CO-Lav - [100ppı	CO-Høj - [%]	CO2 - [%]
44	45	46
CO low range	CO high range	CO2 - [%]
8,14	0,09	2,17
14,44	0,14	1,62
22,44	0,28	2,94
22,44	0,37	4,25
22,44	0,38	8,08
22,44	0,36	8,87
22,44	0,34	8,96
22,44	0,33	8,38
12,45	0,14	9,23
5,94	0,06	11,57
5,47	0,05	11,48
5,69	0,05	11,24
6,11	0,05	11,56
6,01	0,06	11,32
5,63	0,06	11,35
6,46	0,07	11,09
9,13	0,09	11,82
11,49	0,10	12,30
15,12	0,15	12,09
22,44	0,23	12,44
21,78	0,21	12,03
22,44	0,24	11,76
22,44	0,25	11,62
19,45	0,20	11,67
20,27	0,20	11,59
18,54	0,19	11,72
18,48	0,18	11,77
17,58	0,18	11,72
18,74	0,18	11,81
22,44	0,25	11,70
20,18	0,21	11,90
19,76	0,20	12,01
19,83	0,19	12,09
22,44	0,23	12,23
22,27	0,22	12,33
21,30	0,22	12,34
20,91	0,21	12,43
19,53	0,19	12,42
21,73	0,22	12,42
20,40	0,20	12,37
18,58	0,19	12,28
18,02	0,18	12,17

17,74	0,18	12,28
17,62	0,18	12,26
16,33	0,17	12,15
18,25	0,18	12,32
17,83	0,18	12,29
19,93	0,19	12,48
22,44	0,24	12,64
22,44	0,23	12,78
22,44	0,24	12,81
22,44	0,31	12,83
22,44	0,37	12,90
22,44	0,33	12,95
22,44	0,42	12,96
22,44	0,44	12,98
22,44	0,45	13,15
22,44	0,44	13,30
22,44	0,45	13,55
22,44	0,49	13,58
22,44	0,48	13,54
22,44	0,49	13,42
22,44	0,46	13,43
22,44	0,53	13,42
22,44	0,48	13,45
22,44	0,42	13,40
22,44	0,48	13,46
22,44	0,42	13,52
22,44	0,42	13,60
22,44	0,43	13,57
22,44	0,41	13,73
22,44	0,50	13,72
22,44	0,47	13,85
22,44	0,44	13,87
22,44	0,46	14,01
22,44	0,53	14,02
22,44	0,43	13,99
22,44	0,43	13,99
22,44	0,40	14,03
22,44	0,44	14,04
22,44	0,43	14,07
22,44	0,44	14,10
22,44	0,45	14,28
22,44	0,49	14,37
22,44	0,48	14,50
22,44	0,52	14,54
22,44	0,53	14,63
22,44	0,65	14,65
22,44	0,64	14,79
22,44	0,66	14,88

22,44	0,69	15,04
22,44	0,71	14,95
22,44	0,65	15,00
22,44	0,59	15,02
22,44	0,72	14,99
22,44	0,80	14,95
22,44	0,83	15,03
22,44	0,78	15,10
22,44	0,73	15,31
22,44	0,74	15,26
22,44	1,02	14,99
22,44	1,02	15,01
22,44	1,01	15,03
22,44	0,94	15,07
22,44	0,95	15,01
22,44	0,93	15,05
22,44	0,89	14,99
22,44	0,80	14,99
22,44	0,77	14,97
22,44	0,74	14,95
22,44	0,60	14,89
22,44	0,61	14,99
22,44	0,65	14,95
22,44	0,56	14,99
22,44	0,57	15,04
22,44	0,48	15,12
22,44	0,41	15,17
22,44	0,41	15,16
22,44	0,38	15,18
22,44	0,32	14,88
22,27	0,23	14,52
10,70	0,11	13,99
12,08	0,12	13,79
10,00	0,10	13,46
9,16	0,09	13,31
10,17	0,11	13,38
10,00	0,09	13,38
10,60	0,11	13,54
10,41	0,10	13,40
8,24	0,09	13,45
7,19	0,08	13,45
8,16	0,09	13,47
7,92	0,08	13,51
7,77	0,07	13,58
9,21	0,09	13,66
9,17	0,09	13,69
11,22	0,12	13,77
8,33	0,09	13,83

11,12	0,10	13,91
10,84	0,11	14,00
12,18	0,12	14,11
13,67	0,14	14,24
14,55	0,14	14,25
16,66	0,16	14,33
12,34	0,13	14,24
10,05	0,10	13,98
5,27	0,06	13,41
2,86	0,03	12,62
1,81	0,01	11,89
0,99	0,01	11,18
0,85	0,01	10,76
0,81	0,01	10,53
0,79	0,01	10,39
0,83	0,01	10,19
0,93	0,02	10,00
1,49	0,02	9,64
1,74	0,02	9,61
1,60	0,02	9,61
1,75	0,02	9,66
1,77	0,02	9,94
1,88	0,02	9,68
2,00	0,02	9,79
2,02	0,02	9,80
2,12	0,02	9,87
1,81	0,02	9,98
1,94	0,02	9,96
1,87	0,02	9,93
1,98	0,02	9,68
2,18	0,03	9,39
6,28	0,06	8,60
7,52	0,08	8,19
3,76	0,03	8,01
9,67	0,09	7,52
13,84	0,14	7,34
15,62	0,16	7,23
21,04	0,21	7,08
21,37	0,21	6,97
22,44	0,24	6,93
22,44	0,27	6,88
22,44	0,31	6,77
22,44	0,33	6,73
22,44	0,34	6,72
22,44	0,35	6,72
22,44	0,36	6,62
22,44	0,36	6,62
22,44	0,36	6,62

22,44	0,36	6,55
22,44	0,38	6,54
22,44	0,38	6,51
22,44	0,39	6,55
22,44	0,39	6,51
22,44	0,39	6,48
22,44	0,42	6,44
22,44	0,42	6,45
22,44	0,42	6,48
22,44	0,43	6,36
22,44	0,44	6,34
22,44	0,46	6,29
22,44	0,47	6,27
22,44	0,47	6,25
22,44	0,50	6,16
22,44	0,52	6,17
22,44	0,52	6,13
22,44	0,52	6,05
22,44	0,53	6,07
22,44	0,53	6,05
22,44	0,53	6,01
22,44	0,53	5,99
22,44	0,54	5,98
22,44	0,55	5,99
22,44	0,54	5,96
22,44	0,54	5,93
22,44	0,54	5,93
22,44	0,55	5,98
22,44	0,54	5,96
22,44	0,54	5,94
22,44	0,55	6,01
22,44	0,54	5,94
22,44	0,54	5,99
22,44	0,54	5,99
22,44	0,54	6,07
22,44	0,54	6,03
22,44	0,54	6,08
22,44	0,53	6,08
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22,44	0,53	6,10
22,44	0,54	6,16
22,44	0,55	6,10
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22,44	0,53	6,09
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22,44	0,51	6,04
22,44	0,52	6,03
22,44	0,52	6,16

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22,44	0,51	6,24
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22,44	0,58	6,27
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22,44	0,61	6,33
22,44	0,61	6,34
22,44	0,60	6,41
22,44	0,61	6,35
22,44	0,60	6,29
22,44	0,61	6,31
22,44	0,61	6,31
22,44	0,61	6,35
22,44	0,61	6,38
22,44	0,61	6,39
22,44	0,59	6,34

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22,44	0,58	6,44
22,44	0,58	6,47
22,44	0,57	6,48
22,44	0,57	6,52
22,44	0,57	6,53
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22,44	0,58	6,60
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22,44	0,60	6,65
22,44	0,60	6,59
22,44	0,60	6,69
22,44	0,60	6,67
22,44	0,60	6,70
22,44	0,61	6,74
22,44	0,63	6,71
22,44	0,63	6,77
22,44	0,64	6,79
22,44	0,64	6,70
22,44	0,65	6,75
22,44	0,65	6,75
22,44	0,65	6,79
22,44	0,65	6,81
22,44	0,65	6,72
22,44	0,66	6,79
22,44	0,67	6,85
22,44	0,67	6,86
22,44	0,66	6,78
22,44	0,68	6,89
22,44	0,67	6,90
22,44	0,68	6,93
22,44	0,68	6,92
22,44	0,62	6,88
22,44	0,52	6,44
22,44	0,55	6,33
22,44	0,56	6,24
22,44	0,55	6,21
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22,44	0,53	6,23
22,44	0,52	6,24

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22,44	0,52	6,18
22,44	0,51	6,20
22,44	0,51	6,20
22,44	0,51	6,27
22,44	0,51	6,21
22,44	0,51	6,21
22,44	0,51	6,24
22,44	0,53	6,27
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22,44	0,49	6,27
22,44	0,49	6,25
22,44	0,49	6,26
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22,44	0,52	6,39
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22,44	0,55	6,56
22,44	0,54	6,50
22,44	0,55	6,52
22,44	0,55	6,52
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22,44	0,55	6,59
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22,44	0,55	6,58
22,44	0,55	6,58
22,44	0,55	6,63
22,44	0,56	6,68
22,44	0,56	6,64
22,44	0,56	6,62
22,44	0,55	6,60
22,44	0,56	6,65
22,44	0,56	6,63
22,44	0,56	6,62

22,44	0,57	6,64
22,44	0,58	6,63
22,44	0,57	6,57
22,44	0,56	6,61
22,44	0,57	6,66
22,44	0,56	6,68
22,44	0,56	6,70
22,44	0,54	6,60
22,44	0,56	6,72
22,44	0,55	6,77
22,44	0,57	6,70
22,44	0,58	6,63
22,44	0,59	6,62
22,44	0,58	6,61
22,44	0,58	6,65
22,44	0,58	6,66
22,44	0,57	6,62
22,44	0,57	6,60
22,44	0,57	6,66
22,44	0,59	6,67
22,44	0,58	6,61
22,44	0,57	6,58
22,44	0,58	6,60
22,44	0,57	6,49
22,44	0,55	6,33
22,44	0,56	6,32
22,44	0,57	5,97
22,44	0,56	5,89
22,44	0,56	5,84

Annex 25

Title: HF3 logger data 040920

Pages total: 28, excl this cover page

Datotid	Rum - [°C]	Side-1 - [°C]	Side-2 - [°C]	Side-3 - [°C]	Side-4 - [°C]
	1	2	3	4	5
Time	Ambient temperature	Main train filter temp	Split train 1H filter temp	Split train rem. filter temp	Room blank filter temp
10:05:58	Start of test				
10:05:55	24,17	28,98	29,16	25,03	25,28
10:06:25	24,26	29,23	28,95	25,04	25,21
10:06:55	24,29	29,35	28,92	24,93	25,23
10:07:25	24,29	29,45	28,85	24,91	25,24
10:07:55	24,27	29,31	28,65	24,86	25,20
10:08:25	24,28	29,25	28,66	24,91	25,17
10:08:55	24,37	29,23	29,19	24,91	25,24
10:09:25	24,26	29,07	29,38	24,92	25,20
10:09:55	24,24	28,86	29,43	24,91	25,22
10:10:25	24,37	28,94	29,45	25,22	25,26
10:10:55	24,29	29,30	29,36	25,20	25,26
10:11:25	24,26	29,45	29,19	25,26	25,22
10:11:55	24,23	29,44	29,09	25,08	25,20
10:12:25	24,18	29,35	28,96	25,04	25,21
10:12:55	24,32	29,29	28,91	25,39	25,23
10:13:25	24,41	29,24	28,80	25,38	25,25
10:13:55	24,39	29,13	28,74	25,50	25,23
10:14:25	24,47	28,99	29,17	25,46	25,23
10:14:55	24,31	28,91	29,32	25,37	25,16
10:15:25	24,40	29,12	29,41	25,30	25,22
10:15:55	24,42	29,48	29,32	25,70	25,20
10:16:25	24,40	29,67	29,25	25,77	25,20
10:16:55	24,37	29,66	29,14	25,56	25,19
10:17:25	24,39	29,57	29,05	25,60	25,21
10:17:55	24,42	29,40	29,01	25,52	25,24
10:18:25	24,38	29,24	28,87	25,48	25,24
10:18:55	24,32	29,13	28,67	25,41	25,17
10:19:25	24,35	29,08	28,92	25,34	25,25
10:19:55	24,59	28,94	29,29	25,70	25,28
10:20:25	24,47	29,11	29,42	25,54	25,26
10:20:55	24,48	29,39	29,46	25,63	25,27
10:21:25	24,52	29,49	29,36	25,64	25,26
10:21:55	24,42	29,45	29,26	25,49	25,24
10:22:25	24,39	29,44	29,14	25,55	25,23
10:22:55	24,42	29,38	29,04	25,90	25,28
10:23:25	24,53	29,26	28,98	25,98	25,30
10:23:55	24,55	29,20	28,89	25,88	25,28
10:24:25	24,54	29,05	28,76	25,88	25,26
10:24:55	24,60	28,87	28,81	25,91	25,28
10:25:25	24,46	29,05	29,14	26,11	25,25
10:25:55	24,49	29,46	29,31	26,05	25,30

10:26:25	24,68	29,62	29,41	25,94	25,35
10:26:55	24,62	29,68	29,26	26,10	25,30
10:27:25	24,60	29,53	29,24	26,00	25,33
10:27:55	24,55	29,49	29,05	26,21	25,29
10:28:25	24,55	29,37	29,00	26,18	25,34
10:28:55	24,52	29,32	28,97	26,13	25,36
10:29:25	24,60	29,20	28,86	26,24	25,37
10:29:55	24,57	29,09	28,72	26,18	25,33
10:30:25	24,47	28,91	28,78	26,33	25,38
10:30:55	24,70	28,90	29,19	26,44	25,42
10:31:25	24,73	29,26	29,35	26,49	25,44
10:31:55	24,71	29,49	29,34	26,50	25,45
10:32:25	24,65	29,66	29,25	26,67	25,42
10:32:55	24,62	29,57	29,18	26,96	25,46
10:33:25	24,66	29,60	29,13	26,96	25,48
10:33:55	24,63	29,45	29,02	26,81	25,46
10:34:25	24,69	29,30	28,96	26,71	25,47
10:34:55	24,87	29,25	28,87	26,75	25,52
10:35:25	24,72	29,24	28,75	26,79	25,49
10:35:55	24,67	29,02	28,72	26,93	25,53
10:36:25	24,43	28,97	28,89	26,74	25,49
10:36:55	24,52	28,95	29,26	26,75	25,54
10:37:25	24,71	29,04	29,45	26,94	25,58
10:37:55	24,47	29,28	29,30	26,81	25,52
10:38:25	24,55	29,36	29,25	26,60	25,54
10:38:55	24,73	29,45	29,27	26,79	25,62
10:39:25	24,80	29,38	29,15	26,72	25,58
10:39:55	24,79	29,25	29,06	27,07	25,56
10:40:25	24,75	29,16	28,93	27,13	25,52
10:40:55	24,68	29,07	28,83	27,06	25,50
10:41:25	24,80	29,08	28,79	27,44	25,58
10:41:55	24,81	28,87	28,72	27,63	25,60
10:42:25	24,88	28,78	28,77	27,45	25,60
10:42:55	24,87	29,03	29,22	27,49	25,65
10:43:25	24,93	29,17	29,37	27,79	25,63
10:43:55	24,99	29,16	29,35	27,76	25,65
10:44:25	24,89	29,09	29,26	27,91	25,64
10:44:55	24,98	29,08	29,36	27,87	25,75
10:45:25	24,95	29,00	29,25	27,86	25,73
10:45:55	24,81	28,95	29,17	27,60	25,72
10:46:25	24,98	28,82	29,05	27,73	25,71
10:46:55	25,09	28,85	29,06	28,08	25,76
10:47:25	25,02	28,89	28,99	28,02	25,76
10:47:55	24,92	28,95	28,89	27,95	25,74
10:48:25	24,93	29,09	28,83	28,04	25,74
10:48:55	25,00	29,08	28,79	27,95	25,77
10:49:25	25,01	29,01	28,72	28,08	25,79
10:49:55	24,94	28,88	28,62	28,12	25,79

10:50:25	24,98	28,99	28,85	28,05	25,84
10:50:55	24,88	28,89	29,08	27,93	25,84
10:51:25	25,08	28,74	29,17	28,04	25,85
10:51:55	24,99	28,99	29,24	28,26	25,87
10:52:25	24,93	29,18	29,19	28,20	25,86
10:52:55	24,90	29,26	29,08	27,96	25,86
10:53:25	25,00	29,24	29,03	27,47	25,86
10:53:55	25,03	29,25	29,01	27,81	25,89
10:54:25	25,01	29,18	28,89	27,91	25,87
10:54:55	24,92	29,06	28,87	27,67	25,91
10:55:25	24,95	29,02	28,85	27,71	25,95
10:55:55	24,94	28,98	28,75	28,06	25,91
10:56:25	24,92	28,93	28,65	28,11	25,88
10:56:55	24,86	28,93	28,60	27,73	25,91
10:57:26	24,87	28,79	28,91	28,19	25,98
10:57:56	24,84	28,83	29,08	27,81	25,93
10:58:26	24,81	29,06	29,14	27,92	25,95
10:58:56	24,75	29,35	29,16	28,21	25,97
10:59:26	24,90	29,30	29,11	28,11	25,96
10:59:56	24,85	29,27	29,07	27,67	25,96
11:00:26	24,83	29,29	29,04	27,77	26,00
11:00:56	24,83	29,17	28,97	28,08	25,99
11:01:26	24,83	29,13	28,82	27,91	25,95
11:01:56	24,94	29,12	28,84	27,94	25,98
11:02:26	24,92	29,02	28,74	28,01	25,98
11:02:56	24,96	28,87	28,72	27,96	25,99
11:03:26	24,86	28,88	28,62	27,68	25,98
11:03:56	24,97	28,86	28,69	27,81	25,98
11:04:26	24,87	28,79	28,72	27,80	25,95
11:04:56	24,92	28,94	28,73	27,88	25,94
11:05:26	24,99	29,05	28,75	27,72	25,97
11:05:56	24,95	29,08	28,68	29,28	25,99
11:06:26	24,77	29,13	28,60	29,19	25,95
11:06:56	24,66	29,05	24,70	29,51	25,91
11:07:26	24,73	29,08	23,52	30,34	25,98
11:07:56	24,68	28,92	23,36	30,30	26,00
11:08:26	24,71	28,88	23,17	29,91	25,95
11:08:56	24,71	28,78	23,20	29,74	25,98
11:09:26	24,70	28,80	23,16	29,68	25,96
11:09:56	24,80	28,83	23,11	29,60	25,97
11:10:26	24,93	28,83	23,17	29,46	25,99
11:10:56	24,89	28,92	23,10	29,39	26,01
11:11:26	24,73	28,85	23,13	29,29	26,01
11:11:56	24,68	28,78	23,16	29,19	26,00
11:12:26	24,80	28,71	22,98	29,12	25,95
11:12:56	24,81	28,87	23,24	29,08	25,97
11:13:26	24,80	29,11	23,17	29,66	26,06
11:13:56	24,84	29,19	23,20	29,75	26,05

11:14:26	24,74	29,16	23,12	29,68	26,02
11:14:56	24,77	29,09	23,48	29,59	26,02
11:15:26	25,00	29,07	23,49	29,57	26,11
11:15:56	24,84	29,01	23,51	29,47	26,08
11:16:26	24,85	28,93	23,31	29,35	26,08
11:16:56	25,02	28,85	23,40	29,26	26,06
11:17:26	25,07	28,82	23,45	29,23	26,09
11:17:56	24,79	28,77	23,37	29,11	26,08
11:18:26	24,90	28,80	23,45	29,04	26,06
11:18:56	24,85	29,15	23,41	29,55	26,08
11:19:26	24,87	29,45	23,33	29,94	26,09
11:19:56	24,94	29,51	23,46	29,94	26,08
11:20:26	24,92	29,48	23,34	29,86	26,07
11:20:56	24,86	29,41	23,27	29,72	26,07
11:21:26	24,90	29,40	23,40	29,70	26,12
11:21:56	24,83	29,36	23,52	29,65	26,07
11:22:26	24,84	29,20	23,51	29,49	26,13
11:22:56	24,87	29,17	23,45	29,43	26,06
11:23:26	24,79	29,10	23,81	29,35	26,16
11:23:56	24,81	29,07	23,85	29,28	26,09
11:24:26	24,76	28,93	23,73	29,17	26,13
11:24:56	24,72	28,89	23,49	29,10	26,08
11:25:26	24,85	28,85	23,58	29,10	26,11
11:25:56	25,09	28,78	23,80	29,39	26,21
11:26:26	24,90	28,74	23,77	29,44	26,16
11:26:56	24,94	28,94	23,77	29,41	26,17
11:27:26	24,79	29,14	23,84	29,28	26,16
11:27:56	24,81	29,31	23,87	29,27	26,20
11:28:26	24,90	29,30	23,86	29,18	26,20
11:28:56	25,00	29,25	23,88	29,10	26,15
11:29:26	24,86	29,13	23,84	29,03	26,13
11:29:56	24,85	29,18	23,88	29,35	26,25
11:30:26	24,97	29,12	23,83	29,75	26,18
11:30:56	24,94	29,04	23,86	29,74	26,15
11:31:26	24,89	28,91	23,76	29,66	26,15
11:31:56	25,12	28,96	23,93	29,67	26,24
11:32:26	24,97	28,90	24,13	29,60	26,23
11:32:25 End of test					

Side-5 - [°C]	Side-6 - [°C]	Bag-7 - [°C]	Bag-8 - [°C]	Bag-9 - [°C]	Bag-11 - [°C]
6	7	8	9	10	12
Main train dryer outlet temperature	Split train dryer outlet temperature	Main train dry gas meter temperature	Split train dry gas meter temperature	Room blank dry gas meter temperature	Main train flow rate Flow-H - [ln/min]
20,74	22,97	27,86	27,65	23,95	7,07
20,29	22,30	28,15	27,78	23,98	7,08
19,91	21,86	28,18	27,81	23,97	7,07
19,71	21,54	28,24	27,87	23,98	7,09
19,48	21,21	28,23	27,86	24,02	7,06
19,28	20,96	28,26	27,85	24,00	7,06
19,14	20,82	28,27	27,91	24,02	7,03
18,99	20,63	28,24	27,86	24,00	7,01
18,84	20,52	28,21	27,90	24,01	7,03
18,82	20,45	28,22	27,90	24,04	7,02
18,71	20,36	28,21	27,92	24,03	6,99
18,68	20,20	28,21	27,87	24,02	6,99
18,57	20,11	28,17	27,87	24,01	6,94
18,49	20,04	28,17	27,88	24,03	7,08
18,47	19,94	28,17	27,90	24,04	7,09
18,47	19,91	28,19	27,91	24,05	7,10
18,46	19,84	28,17	27,88	24,04	7,08
18,42	19,86	28,14	27,85	24,04	7,07
18,42	19,76	28,18	27,87	24,06	7,05
18,26	19,74	28,10	27,86	24,04	7,06
18,28	19,69	28,11	27,86	24,06	7,04
18,30	19,67	28,15	27,85	24,08	7,03
18,26	19,65	28,13	27,83	24,09	7,03
18,23	19,60	28,12	27,84	24,06	7,03
18,13	19,60	28,08	27,82	24,06	7,02
18,11	19,57	28,04	27,79	24,07	7,02
18,11	19,50	28,04	27,78	24,08	7,02
18,04	19,56	28,06	27,81	24,11	7,05
18,07	19,56	28,04	27,79	24,12	7,02
18,06	19,54	28,06	27,81	24,09	7,02
18,01	19,55	28,02	27,78	24,10	7,00
17,98	19,49	27,98	27,75	24,10	7,01
17,94	19,50	27,98	27,76	24,11	6,99
18,00	19,45	28,01	27,78	24,13	6,99
17,99	19,43	28,01	27,77	24,14	7,16
17,98	19,44	27,98	27,74	24,16	7,14
17,98	19,46	27,99	27,78	24,14	7,16
17,97	19,45	27,96	27,71	24,16	7,14
17,91	19,43	27,93	27,72	24,16	7,12
17,95	19,40	27,95	27,74	24,14	7,13
17,98	19,39	27,95	27,71	24,18	7,13

17,94	19,45	27,94	27,72	24,19	7,13
17,99	19,39	27,96	27,71	24,18	7,11
17,88	19,41	27,89	27,69	24,17	7,12
17,91	19,37	27,93	27,71	24,20	7,10
17,90	19,40	27,91	27,68	24,24	7,10
17,88	19,44	27,92	27,70	24,23	7,11
17,86	19,44	27,91	27,70	24,22	7,09
17,84	19,40	27,91	27,69	24,21	7,10
17,82	19,37	27,87	27,64	24,24	7,11
17,88	19,42	27,92	27,70	24,29	7,05
17,86	19,45	27,91	27,70	24,26	7,06
17,83	19,42	27,88	27,65	24,29	7,03
17,83	19,36	27,89	27,66	24,25	7,14
17,79	19,36	27,86	27,66	24,27	7,14
17,85	19,41	27,93	27,71	24,31	7,12
17,82	19,40	27,88	27,67	24,30	7,14
17,76	19,42	27,86	27,66	24,30	7,14
17,81	19,41	27,88	27,66	24,30	7,14
17,86	19,44	27,93	27,68	24,33	7,14
17,78	19,46	27,86	27,68	24,33	7,13
17,83	19,41	27,90	27,68	24,34	7,11
17,88	19,45	27,92	27,69	24,35	7,12
17,80	19,48	27,86	27,69	24,36	7,10
17,85	19,44	27,89	27,68	24,38	7,12
17,78	19,42	27,87	27,65	24,38	7,11
17,79	19,47	27,90	27,69	24,39	7,11
17,77	19,48	27,89	27,68	24,39	7,10
17,73	19,47	27,88	27,69	24,41	7,09
17,71	19,41	27,91	27,70	24,38	7,12
17,73	19,36	27,88	27,70	24,38	7,09
17,81	19,37	27,94	27,72	24,42	7,11
17,75	19,38	27,89	27,69	24,43	7,09
17,73	19,36	27,88	27,68	24,41	7,09
17,81	19,39	27,93	27,73	24,44	7,08
17,85	19,44	27,94	27,74	24,42	7,14
17,91	19,45	27,94	27,73	24,43	7,15
17,90	19,46	27,94	27,71	24,42	7,13
17,92	19,58	27,93	27,75	24,45	7,14
17,95	19,53	27,91	27,73	24,44	7,14
17,93	19,53	27,95	27,72	24,41	7,16
17,92	19,52	27,90	27,70	24,44	7,14
17,98	19,57	27,94	27,73	24,45	7,14
17,93	19,56	27,91	27,73	24,43	7,13
17,90	19,55	27,91	27,71	24,42	7,12
17,96	19,54	27,98	27,76	24,43	7,12
18,01	19,51	27,96	27,74	24,44	7,11
18,02	19,50	27,93	27,72	24,43	7,13
18,00	19,52	27,93	27,74	24,43	7,12

18,11	19,57	28,01	27,79	24,43	7,11
18,10	19,56	27,99	27,77	24,41	7,14
18,04	19,56	27,92	27,73	24,40	7,12
18,08	19,63	27,98	27,80	24,45	7,12
18,08	19,63	27,97	27,79	24,40	7,14
18,11	19,57	27,96	27,76	24,40	7,12
18,13	19,56	27,99	27,79	24,40	7,13
18,10	19,56	27,99	27,79	24,40	7,11
18,13	19,54	27,96	27,76	24,41	7,10
18,06	19,57	27,92	27,75	24,36	7,11
18,08	19,60	27,96	27,79	24,39	7,11
18,08	19,58	27,97	27,79	24,36	7,11
18,11	19,53	27,97	27,76	24,33	7,09
18,14	19,55	28,00	27,80	24,35	7,00
18,10	19,57	27,96	27,79	24,36	6,97
18,14	19,53	27,97	27,76	24,34	6,99
18,12	19,53	27,94	27,75	24,30	6,96
18,16	19,58	28,01	27,79	24,31	6,95
18,16	19,56	27,94	27,75	24,28	6,94
18,14	19,57	27,91	27,74	24,26	6,97
18,21	19,59	27,98	27,78	24,28	6,94
18,20	19,59	27,96	27,78	24,23	6,95
18,18	19,51	27,95	27,74	24,23	6,94
18,22	19,56	27,98	27,78	24,23	6,94
18,21	19,54	27,98	27,77	24,24	6,94
18,17	19,52	27,92	27,77	24,20	6,91
18,20	19,49	27,93	27,74	24,19	7,01
18,26	19,51	27,96	27,76	24,22	7,02
18,24	19,49	27,96	27,74	24,20	7,03
18,18	19,48	27,92	27,72	24,18	7,03
18,15	19,48	27,91	27,71	24,17	7,03
18,18	19,47	27,93	27,74	24,19	7,03
18,17	19,41	27,94	27,74	24,16	7,02
18,15	19,39	27,91	27,70	24,13	7,03
18,19	19,42	27,96	27,72	24,16	7,00
18,14	19,44	27,92	27,71	24,15	7,03
18,17	19,41	27,91	27,73	24,11	7,01
18,14	19,44	27,90	27,72	24,12	6,99
18,18	19,46	27,94	27,74	24,12	6,96
18,15	19,44	27,92	27,71	24,11	6,97
18,07	19,46	27,87	27,71	24,09	6,98
18,14	19,46	27,89	27,73	24,09	6,98
18,14	19,44	27,94	27,75	24,12	6,99
18,09	19,42	27,90	27,72	24,09	7,00
18,09	19,39	27,89	27,68	24,08	7,01
18,06	19,41	27,87	27,65	24,08	6,98
18,10	19,48	27,90	27,72	24,11	6,99
18,10	19,46	27,91	27,72	24,09	6,98

18,12	19,46	27,87	27,71	24,05	6,99
18,10	19,47	27,86	27,68	24,04	6,94
18,12	19,53	27,91	27,72	24,09	6,95
18,14	19,50	27,87	27,70	24,07	7,04
18,11	19,51	27,88	27,69	24,04	7,04
18,11	19,48	27,85	27,67	24,05	7,02
18,16	19,52	27,89	27,72	24,08	7,00
18,14	19,50	27,88	27,69	24,05	7,03
18,13	19,46	27,84	27,67	24,03	7,02
18,11	19,46	27,85	27,68	24,00	7,02
18,19	19,47	27,92	27,70	24,07	7,03
18,19	19,46	27,91	27,69	24,05	7,00
18,14	19,44	27,90	27,69	24,02	7,00
18,11	19,46	27,87	27,70	24,03	7,00
18,15	19,54	27,92	27,71	24,06	6,99
18,18	19,51	27,90	27,70	24,04	7,00
18,10	19,55	27,86	27,67	24,02	6,97
18,13	19,47	27,87	27,64	24,02	6,96
18,14	19,52	27,88	27,69	24,05	6,99
18,18	19,47	27,90	27,69	24,04	6,97
18,11	19,52	27,87	27,67	24,05	6,95
18,14	19,44	27,88	27,67	24,01	6,97
18,17	19,46	27,90	27,70	24,06	6,95
18,15	19,56	27,89	27,71	24,06	6,94
18,18	19,49	27,89	27,69	24,03	6,95
18,16	19,52	27,86	27,66	24,03	6,94
18,15	19,55	27,87	27,69	24,05	6,93
18,21	19,57	27,91	27,72	24,05	6,92
18,21	19,54	27,91	27,70	24,02	6,93
18,23	19,52	27,90	27,71	24,05	6,92
18,21	19,55	27,88	27,66	24,05	6,91
18,25	19,61	27,90	27,72	24,05	6,90
18,27	19,58	27,91	27,69	24,04	6,86
18,25	19,55	27,91	27,69	24,02	6,87
18,26	19,54	27,92	27,68	24,05	7,05
18,31	19,59	27,92	27,70	24,08	7,05
18,35	19,64	27,88	27,67	24,06	7,05

Bag-12 - [°C]	NS-Røgtemp - [°C]	Ovf-Top - [°C]	Ovf-Bag - [°C]	Ovf-Side-1 - [°C]	Ovf-Side-2 - [°C]
13	24	27	28	29	30
Split train flow rate Flow-D - [ln/min]	EPA Flue gas temperature	Surface temperature Top	Surface temperature Rear	Surface temperature Right side	Surface temperature Left side
7,13	23	24,2	23,6	25,8	25,2
7,12	27	24,3	23,6	25,8	25,1
7,11	35	24,6	23,8	25,8	25,1
7,12	41	25,0	24,2	25,8	25,2
7,12	43	25,7	24,6	25,9	25,3
7,09	44	26,1	25,1	26,0	25,4
7,17	49	26,7	25,7	26,2	25,6
7,06	59	27,5	26,4	26,5	25,9
7,07	69	28,6	27,4	26,9	26,3
7,08	78	29,9	28,7	27,3	26,9
7,05	103	32,0	30,4	27,8	27,6
7,05	102	34,2	32,5	28,4	28,5
7,03	121	38,5	35,4	29,2	29,7
7,19	114	42,9	39,0	30,2	31,2
7,15	119	47,3	43,2	31,5	33,0
7,15	134	51,9	47,6	33,3	35,2
7,12	139	55,7	52,2	35,6	37,9
7,12	137	58,0	56,5	38,2	40,9
7,11	134	59,9	60,3	41,2	44,4
7,12	134	62,5	63,8	44,4	47,9
7,10	132	65,4	67,1	47,8	51,6
7,10	132	67,8	70,2	51,3	55,4
7,09	132	70,0	73,1	54,8	59,2
7,09	130	72,0	75,6	58,2	63,0
7,07	136	74,2	78,1	61,5	66,7
7,07	138	76,4	80,5	64,7	70,3
7,08	144	78,6	83,0	67,8	73,9
7,08	145	81,1	85,9	70,8	77,6
7,09	147	83,5	88,5	73,9	81,3
7,08	148	85,7	91,1	77,0	85,0
7,07	150	87,9	93,4	80,1	88,7
7,07	155	90,3	95,9	83,2	92,4
7,05	159	92,5	98,7	86,3	96,1
7,06	162	94,8	102,1	89,4	99,7
7,14	165	97,1	105,2	92,6	103,3
7,14	168	99,7	108,7	95,9	106,9
7,14	169	102,3	111,8	99,3	110,5
7,13	170	105,0	115,0	102,8	114,1
7,14	169	107,4	117,8	106,4	117,8
7,13	168	109,4	120,4	110,1	121,4
7,13	169	111,2	123,0	113,8	125,0

7,12	168	113,1	125,5	117,4	128,4
7,13	172	114,8	127,8	121,1	131,8
7,12	172	116,6	130,2	124,6	135,1
7,11	173	118,2	132,3	128,2	138,4
7,12	172	120,0	134,2	131,7	141,5
7,12	172	121,6	136,0	135,1	144,7
7,11	174	123,4	137,5	138,4	147,7
7,11	172	125,0	139,1	141,6	150,6
7,11	171	126,4	140,4	144,7	153,5
7,10	189	127,2	141,2	147,3	156,3
7,09	177	127,6	141,3	150,2	158,8
7,08	173	127,8	141,1	153,0	161,3
7,00	184	128,8	141,1	155,4	163,8
7,16	190	130,2	141,8	157,7	165,9
7,14	199	131,8	142,9	159,6	167,9
7,15	200	133,6	144,2	161,4	169,6
7,13	197	135,1	145,6	163,1	171,2
7,15	200	136,4	146,9	164,6	172,7
7,14	204	138,1	148,4	166,2	174,2
7,14	212	140,6	150,2	167,8	175,7
7,14	214	142,9	151,7	169,4	177,1
7,13	209	144,7	153,6	171,0	178,5
7,13	210	147,2	155,7	172,6	179,8
7,12	207	149,7	158,4	174,1	181,3
7,14	203	151,3	161,3	175,8	183,0
7,12	203	152,8	163,7	177,6	184,9
7,13	207	154,5	165,7	179,3	186,8
7,12	211	156,4	168,2	181,1	188,7
7,12	213	158,5	170,8	183,0	190,7
7,12	212	160,5	173,2	184,7	192,7
7,13	208	162,3	175,5	186,7	194,8
7,12	204	163,3	177,3	188,5	196,8
7,10	207	164,5	178,8	190,3	198,7
7,11	210	165,8	180,6	192,0	200,6
7,12	210	167,3	182,5	193,7	202,6
7,11	211	168,7	184,6	195,6	204,5
7,12	210	170,0	186,6	197,3	206,4
7,11	207	171,1	188,3	199,1	208,2
7,10	206	171,9	189,6	200,8	210,0
7,12	207	172,6	190,8	202,4	211,7
7,11	205	173,4	191,8	204,0	213,5
7,09	204	174,1	192,8	205,5	215,1
7,09	204	174,7	193,7	206,9	216,6
7,08	204	175,2	194,5	208,2	218,0
7,11	202	175,6	195,1	209,3	219,3
7,11	202	176,2	195,7	210,4	220,6
7,10	201	176,8	196,3	211,4	221,7
7,08	203	177,4	196,8	212,4	222,7

7,10	205	177,9	197,5	213,4	223,8
7,07	208	178,6	198,1	214,3	224,7
7,09	206	179,2	198,9	215,1	225,4
7,09	205	179,7	199,3	215,9	226,0
7,10	204	180,0	200,0	216,7	226,7
7,09	203	180,3	200,2	217,5	227,4
7,10	203	180,2	200,5	218,3	228,0
7,09	202	179,8	200,7	219,0	228,3
7,09	202	179,3	200,8	219,8	228,7
7,08	202	179,1	200,9	220,6	228,9
7,07	201	179,0	200,9	221,4	229,2
7,09	200	179,0	200,8	222,1	229,4
7,09	198	178,8	200,6	222,8	229,5
7,03	198	178,4	200,3	223,4	229,4
7,03	196	178,0	200,3	224,1	229,6
7,03	196	177,6	199,8	224,7	229,5
7,03	195	177,4	199,5	225,3	229,5
7,02	197	177,2	199,4	225,8	229,5
7,02	195	177,0	199,3	226,4	229,5
7,05	195	176,9	198,9	226,9	229,3
7,02	195	176,6	198,6	227,3	229,2
7,04	194	176,5	198,4	227,8	229,1
7,04	194	176,4	198,3	228,3	229,1
7,02	194	176,1	198,2	228,8	228,9
7,04	194	175,7	198,0	229,2	228,8
7,02	195	175,2	197,8	229,6	228,7
7,02	193	175,2	197,6	230,0	228,8
7,03	194	175,3	197,6	230,3	228,8
7,02	195	175,3	197,7	230,7	228,7
7,03	196	175,1	197,9	231,1	228,7
7,05	195	175,3	198,0	231,5	228,8
7,04	195	175,6	198,2	232,0	228,9
7,09	197	175,8	198,6	232,3	229,0
7,05	196	176,0	199,1	232,7	229,3
7,04	198	176,0	199,8	233,2	229,8
7,03	200	176,3	200,8	233,8	230,3
7,03	201	176,7	201,4	234,4	231,0
7,03	201	177,1	202,1	235,0	231,6
6,99	201	177,4	202,8	235,6	232,3
6,98	200	177,7	203,4	236,3	233,2
6,98	201	178,1	204,1	236,9	234,2
6,96	201	178,5	204,6	237,5	235,1
6,96	202	178,6	205,0	238,1	236,1
6,95	202	178,6	205,9	238,8	237,1
6,93	201	178,8	206,5	239,5	238,1
6,94	201	179,0	207,1	240,2	239,0
6,92	201	179,1	207,8	240,9	240,0
6,91	199	179,2	208,4	241,6	241,0

6,91	200	179,4	208,8	242,3	242,0
6,89	199	179,7	209,4	243,0	242,9
6,88	200	179,6	209,9	243,7	243,7
7,10	199	179,4	210,3	244,3	244,5
7,03	201	179,4	211,0	244,9	245,4
7,01	201	179,5	211,5	245,6	246,3
7,02	201	179,6	211,9	246,3	247,1
7,03	203	179,9	212,5	246,9	247,9
7,01	201	180,0	212,9	247,5	248,6
7,00	203	180,2	213,5	248,2	249,4
6,99	203	180,3	214,2	248,9	250,3
6,99	201	180,4	214,8	249,5	251,0
6,99	203	180,5	215,6	250,3	251,9
6,99	202	180,7	216,2	250,9	252,7
6,98	203	181,0	217,0	251,6	253,5
7,02	201	181,5	217,7	252,3	254,2
6,98	203	181,7	218,4	253,0	255,1
6,97	202	182,0	219,3	253,7	255,8
6,98	203	182,3	219,7	254,3	256,5
6,96	204	182,7	220,8	254,9	257,2
6,95	203	183,2	221,8	255,5	258,1
6,97	203	183,5	222,8	256,1	258,9
6,94	205	183,8	223,8	256,8	259,7
6,96	205	184,1	224,8	257,5	260,5
6,94	203	184,2	225,9	258,2	261,2
6,93	203	184,6	226,9	259,0	261,9
6,94	202	184,7	227,7	259,8	262,6
6,94	203	184,9	228,6	260,6	263,3
6,94	202	185,0	229,4	261,4	263,9
6,94	202	185,2	230,1	262,1	264,5
6,92	202	185,2	230,9	262,9	265,1
6,91	200	185,4	231,5	263,6	265,6
6,91	200	185,5	232,1	264,3	266,1
6,93	199	185,1	232,6	264,9	266,4
6,96	198	185,0	233,2	265,4	266,9
7,04	197	184,9	233,8	265,9	267,4
7,04	198	184,9	234,0	266,3	267,8

Ovf-Bund - [°C]	Kanal-EPA - [°C]	Røgtræk - [Pa]	Pd Kanal - [Pa]	Ps Kanal - [Pa]	Vægt - [Kg]
31	36	38	39	40	43
Surface temperature Bottom	EPA Duct temperature	Flue draft Pascals	Duct dynamic pressure	Duct static pressure	Platform scale reading
24,6	27,1	0,7	32,7	48,7	1,774
24,6	27,0	0,9	31,7	48,5	3,191
24,6	27,1	1,8	31,1	48,7	1,513
24,7	27,3	2,6	31,7	48,1	1,529
24,6	27,5	1,9	28,9	48,6	1,523
24,7	27,6	2,7	32,7	49,2	1,514
24,7	27,8	2,9	31,3	47,3	1,507
24,7	28,0	4,0	30,9	47,3	1,491
24,7	28,4	5,0	30,2	46,7	1,475
24,7	29,1	5,5	30,0	47,1	1,458
24,7	30,0	7,4	31,8	48,5	1,435
24,7	31,3	7,1	30,8	47,5	1,414
24,7	31,3	7,4	29,7	47,3	1,400
24,7	30,8	8,2	30,6	47,0	1,379
24,7	30,4	8,3	31,2	46,5	1,356
24,7	30,4	9,5	31,4	47,2	1,331
24,7	30,6	9,6	32,1	48,1	1,303
24,7	30,8	9,2	30,4	47,3	1,281
24,7	31,0	9,4	30,6	47,6	1,256
24,7	31,2	8,9	29,6	45,7	1,233
24,7	31,3	9,0	30,9	47,4	1,206
24,7	31,4	9,1	31,4	47,4	1,181
24,7	31,5	9,0	31,1	48,4	1,159
24,7	31,6	9,4	30,6	48,1	1,139
24,7	31,7	9,4	30,7	48,5	1,118
24,7	31,8	9,2	30,7	47,4	1,095
24,7	32,0	9,7	30,9	46,9	1,071
24,8	32,2	9,7	30,5	46,6	1,048
24,7	32,4	9,8	31,2	46,8	1,029
24,8	32,6	9,7	29,6	45,7	1,007
24,8	32,8	10,2	29,8	45,8	0,982
24,7	33,0	10,4	30,7	46,2	0,955
24,8	33,3	10,7	30,2	45,6	0,929
24,8	33,6	10,7	31,2	47,6	0,904
24,8	33,8	10,6	31,0	46,7	0,878
24,8	34,1	11,0	29,6	45,5	0,852
24,9	34,3	11,0	30,7	46,7	0,826
24,8	34,5	11,3	31,0	47,0	0,800
24,9	34,7	10,6	29,1	46,9	0,783
25,0	34,8	11,1	29,7	46,1	0,760
25,0	34,9	10,6	30,6	46,7	0,738

25,1	35,0	10,9	29,7	46,6	0,716
25,1	35,1	11,0	30,4	46,3	0,694
25,2	35,2	10,9	30,4	45,8	0,673
25,3	35,3	10,9	30,6	46,3	0,651
25,3	35,4	11,2	30,4	46,8	0,631
25,4	35,5	11,0	31,0	46,9	0,612
25,5	35,6	10,7	30,5	45,8	0,592
25,6	35,6	10,9	30,9	46,7	0,573
25,7	35,7	11,0	30,2	46,2	0,553
25,8	38,2	10,9	30,6	46,8	0,870
25,9	42,6	10,6	31,0	47,1	3,697
26,0	43,7	11,3	30,1	46,8	3,578
26,2	42,9	11,6	29,4	46,3	3,641
26,3	41,6	12,0	30,3	47,2	3,615
26,4	40,8	12,2	30,3	46,2	3,590
26,5	40,4	12,2	30,6	46,3	3,566
26,6	40,0	12,0	29,8	46,3	3,542
26,7	39,9	12,0	29,5	45,7	3,519
26,8	39,8	12,2	30,5	46,5	3,495
27,0	40,0	12,8	29,6	45,9	3,466
27,1	40,2	12,5	30,0	46,1	3,439
27,2	40,3	12,2	30,3	46,7	3,415
27,3	40,0	12,4	30,1	45,9	3,382
27,4	39,8	12,4	29,7	45,7	3,353
27,5	39,6	12,5	30,5	45,8	3,326
27,7	39,4	12,3	29,6	45,9	3,298
27,8	39,3	12,3	29,5	46,5	3,270
27,9	39,4	12,5	24,8	39,7	3,241
28,1	39,7	12,6	26,4	40,6	3,210
28,2	39,9	12,6	35,2	52,9	3,180
28,3	39,8	12,4	30,5	47,0	3,152
28,5	39,7	12,1	30,6	47,4	3,130
28,7	39,6	12,4	30,1	46,4	3,103
28,9	39,7	12,5	29,4	46,6	3,076
29,1	39,7	12,6	30,1	46,6	3,048
29,3	39,9	12,1	30,1	46,2	3,021
29,5	39,9	12,2	29,3	45,2	2,994
29,7	39,9	12,2	29,5	45,9	2,972
29,9	39,9	12,4	29,4	46,1	2,948
30,2	39,9	12,0	29,4	45,5	2,927
30,4	40,0	12,3	29,3	45,9	2,905
30,6	40,1	12,2	29,9	46,3	2,884
30,9	40,2	12,3	30,7	46,6	2,862
31,1	40,1	12,1	32,3	50,6	2,841
31,4	40,1	12,1	29,5	47,8	2,818
31,7	40,2	12,0	30,0	45,9	2,797
31,9	40,1	12,2	31,0	49,0	2,777
32,2	40,1	12,5	30,1	45,6	2,753

32,5	40,2	12,6	29,7	46,4	2,731
32,8	40,2	12,4	29,7	47,2	2,706
33,1	40,3	12,2	30,5	47,3	2,682
33,3	40,1	12,5	30,3	46,1	2,660
33,7	40,1	12,4	33,0	49,4	2,636
34,0	40,1	12,1	30,8	46,7	2,614
34,3	40,1	12,2	31,2	46,6	2,594
34,5	40,1	12,1	27,3	43,7	2,571
34,8	40,2	12,1	28,3	44,3	2,551
35,2	40,2	11,9	28,7	46,1	2,529
35,5	40,2	12,3	29,3	45,4	2,507
35,8	40,2	12,0	29,0	45,0	2,488
36,0	40,1	11,9	28,2	43,4	2,469
36,3	40,1	12,0	29,4	44,5	2,450
36,7	40,1	11,7	30,0	45,2	2,429
37,0	40,0	11,9	28,5	44,1	2,410
37,3	39,9	11,7	28,3	44,0	2,391
37,6	39,8	11,7	27,9	42,8	2,371
37,9	39,8	12,0	28,4	45,1	2,351
38,3	39,7	11,5	29,2	43,8	2,331
38,6	39,6	11,9	28,2	45,2	2,312
38,9	39,6	11,7	28,3	43,2	2,294
39,2	39,6	11,9	28,6	42,8	2,272
39,5	39,5	11,5	28,2	43,3	2,255
39,8	39,3	11,8	31,7	49,8	2,237
40,1	39,2	12,1	32,3	48,0	2,215
40,4	39,2	12,0	28,1	44,0	2,195
40,7	39,1	11,8	27,4	43,2	2,175
41,0	39,1	12,0	28,5	43,7	2,153
41,2	39,1	11,7	28,4	43,4	2,131
41,6	39,3	12,0	29,2	44,5	2,108
41,8	39,4	11,7	28,5	42,8	2,084
42,1	39,4	11,8	28,3	43,1	2,057
42,4	39,5	12,0	28,4	42,6	2,035
42,7	39,6	12,1	28,2	42,8	2,008
43,1	39,7	12,1	27,8	43,6	1,984
43,4	39,7	12,0	27,2	43,2	1,959
43,7	39,7	12,1	28,5	43,6	1,932
44,0	39,8	12,2	28,1	43,0	1,906
44,3	39,8	12,2	28,2	42,9	1,880
44,6	39,9	11,8	33,3	49,7	1,855
44,9	39,9	12,4	27,5	44,0	1,828
45,2	39,9	12,0	28,1	43,4	1,802
45,5	39,8	11,8	28,3	43,3	1,777
45,8	39,8	12,0	29,7	45,8	1,749
46,0	39,8	12,3	29,2	46,4	1,724
46,3	39,8	12,4	28,6	46,9	1,698
46,6	39,8	11,9	29,3	45,4	1,673

46,9	39,8	12,3	29,9	45,7	1,650
47,1	39,7	12,0	30,1	45,6	1,622
47,3	39,7	12,2	29,9	45,6	1,599
47,6	39,7	12,3	31,0	46,0	1,576
47,8	39,7	12,0	28,8	44,8	1,552
48,1	39,8	11,8	29,0	45,1	1,528
48,4	39,8	11,9	29,9	45,3	1,501
48,6	39,9	12,2	30,2	46,4	1,476
48,9	39,9	12,1	29,1	45,4	1,453
49,2	39,9	12,1	29,5	45,1	1,426
49,4	39,8	12,2	29,7	45,4	1,403
49,7	39,9	12,3	29,6	45,3	1,380
50,0	39,9	11,7	28,1	45,5	1,354
50,2	39,9	11,8	29,9	45,7	1,332
50,5	39,9	12,1	29,7	45,4	1,304
50,8	39,9	12,1	31,1	45,9	1,281
51,1	39,9	12,0	30,3	45,1	1,258
51,4	39,9	12,2	29,4	45,6	1,234
51,7	39,9	12,2	29,8	45,1	1,208
52,0	40,0	12,2	29,1	45,6	1,185
52,3	40,1	12,0	29,7	45,0	1,163
52,6	40,0	12,1	29,9	45,6	1,138
52,9	40,1	12,2	27,9	45,5	1,114
53,3	40,1	11,8	29,9	45,1	1,092
53,6	40,2	12,1	29,7	45,4	1,069
53,9	40,2	12,1	29,0	44,7	1,048
54,2	40,1	12,2	30,0	45,0	1,024
54,6	40,1	12,1	28,4	44,5	1,006
54,9	40,1	12,0	29,8	44,9	0,984
55,2	40,1	12,1	29,6	44,9	0,964
55,5	40,0	12,2	29,6	46,0	0,945
55,9	40,0	12,1	29,6	45,8	0,925
56,2	40,0	12,0	29,5	45,6	0,907
56,5	40,0	11,9	28,6	44,4	0,889
56,9	40,0	11,7	29,7	44,8	0,874
57,2	40,0	11,5	31,2	52,0	0,857
57,7	40,0	11,6	28,9	45,8	0,837
					0,840

CO-Lav - [100ppı	CO-Høj - [%]	CO2 - [%]
44	45	46
CO low range	CO high range	CO2 - [%]
0,00	0,00	0,07
0,40	0,01	0,32
2,49	0,02	0,84
3,84	0,04	1,19
4,79	0,04	1,32
5,39	0,06	1,36
14,65	0,14	1,71
10,08	0,10	1,91
6,69	0,07	2,01
7,21	0,07	2,41
4,09	0,04	2,89
3,02	0,03	3,09
7,41	0,07	7,16
22,44	0,21	9,86
22,44	0,37	10,62
22,44	0,52	11,70
16,74	0,18	11,53
16,23	0,15	10,58
15,43	0,15	9,77
14,61	0,14	9,29
18,35	0,18	9,12
15,47	0,16	8,70
15,93	0,15	8,29
22,44	0,29	7,92
22,44	0,30	8,08
22,44	0,29	8,47
22,44	0,31	8,65
22,44	0,26	9,05
22,44	0,27	9,22
22,44	0,31	8,82
22,44	0,30	8,91
18,04	0,18	9,55
15,66	0,15	9,93
13,08	0,13	10,16
11,52	0,11	10,42
13,22	0,14	10,55
15,45	0,16	10,60
11,31	0,11	10,51
21,38	0,19	9,73
21,43	0,20	9,15
17,50	0,17	9,09

17,97	0,18	9,05
18,38	0,17	9,15
12,83	0,13	9,12
12,21	0,12	9,14
11,36	0,11	9,04
11,64	0,11	8,97
11,99	0,11	9,19
12,91	0,12	8,83
13,77	0,13	8,65
13,31	0,13	3,75
20,95	0,20	2,92
22,44	0,29	4,34
22,44	0,33	5,78
22,44	0,29	6,21
16,45	0,17	6,87
15,27	0,14	7,06
19,75	0,20	6,65
17,95	0,18	6,68
15,41	0,15	6,82
10,84	0,11	7,73
9,89	0,09	7,98
10,94	0,10	7,47
6,48	0,06	11,45
8,95	0,09	11,80
10,13	0,09	10,21
11,18	0,11	9,90
9,38	0,09	10,08
6,59	0,07	11,50
6,16	0,06	12,08
8,72	0,07	11,75
15,87	0,15	10,75
22,44	0,26	9,18
16,89	0,18	9,35
8,63	0,09	10,91
10,57	0,10	10,99
10,12	0,10	10,84
10,97	0,11	10,63
21,31	0,20	9,58
22,44	0,24	9,01
21,48	0,22	9,04
22,44	0,23	8,96
22,44	0,24	8,83
22,44	0,29	8,54
22,44	0,32	8,37
22,44	0,34	8,19
22,44	0,35	8,21
22,44	0,36	8,19
22,44	0,38	8,26

22,44	0,25	8,99
19,75	0,21	9,44
20,34	0,19	9,46
22,44	0,22	8,99
22,44	0,26	8,72
22,44	0,27	8,51
22,44	0,25	8,57
22,44	0,25	8,53
22,44	0,24	8,43
22,44	0,25	8,37
19,27	0,19	8,63
21,98	0,22	8,29
22,44	0,24	8,02
22,44	0,26	7,86
22,44	0,26	7,90
22,44	0,27	7,90
22,44	0,25	7,95
22,44	0,26	7,95
22,44	0,23	8,02
22,44	0,23	8,00
21,63	0,21	8,12
21,56	0,22	8,21
20,04	0,20	8,20
21,52	0,21	8,08
20,46	0,20	8,04
18,73	0,19	8,22
15,60	0,16	8,43
12,54	0,12	8,76
7,42	0,08	9,02
7,05	0,07	9,46
4,67	0,05	9,87
3,78	0,04	9,92
4,63	0,04	9,94
3,86	0,04	10,22
3,87	0,03	10,34
4,51	0,04	10,60
4,77	0,05	10,86
4,51	0,04	10,98
4,73	0,05	11,15
4,17	0,04	11,00
3,86	0,03	11,04
4,42	0,04	11,36
3,76	0,03	11,07
3,58	0,04	11,15
4,05	0,04	11,20
3,72	0,03	11,38
3,13	0,03	10,99
2,92	0,03	10,86

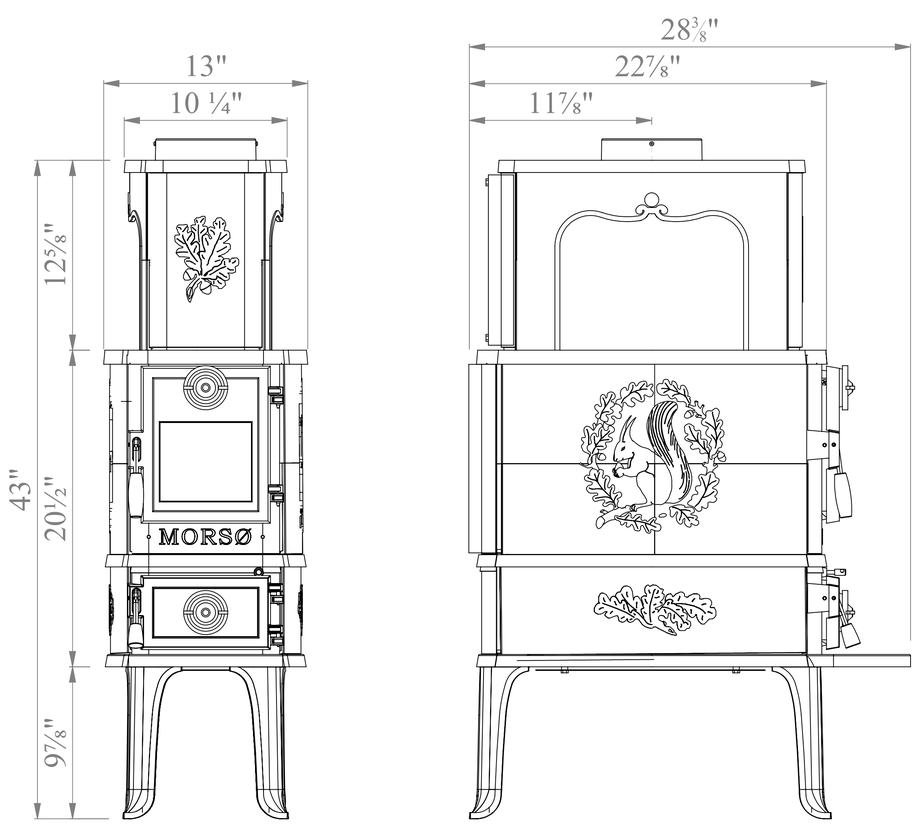
2,60	0,02	10,72
3,02	0,03	10,88
2,89	0,02	10,87
3,37	0,03	11,02
3,32	0,02	10,89
3,17	0,04	11,03
3,75	0,04	11,14
3,59	0,04	11,23
3,88	0,03	11,35
3,30	0,04	11,07
3,39	0,03	11,16
3,57	0,03	11,22
4,77	0,04	11,44
3,85	0,04	11,27
4,02	0,04	11,30
3,79	0,04	11,28
3,88	0,04	11,47
3,67	0,03	11,25
3,59	0,03	11,24
3,95	0,04	11,46
3,82	0,04	11,50
3,44	0,03	11,33
3,21	0,03	11,46
3,29	0,03	11,41
2,81	0,02	11,30
2,98	0,02	11,25
2,83	0,03	11,10
2,26	0,01	10,82
2,02	0,02	10,74
2,29	0,02	10,70
2,22	0,02	10,70
2,23	0,02	10,63
1,73	0,02	10,27
1,57	0,01	9,80
1,69	0,02	9,68
1,61	0,01	9,49
1,77	0,01	9,32

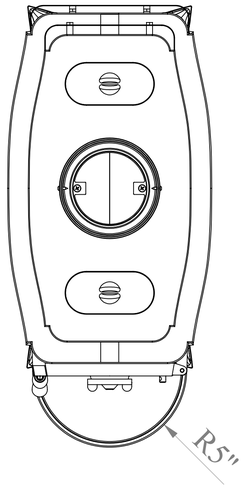
Annex 26

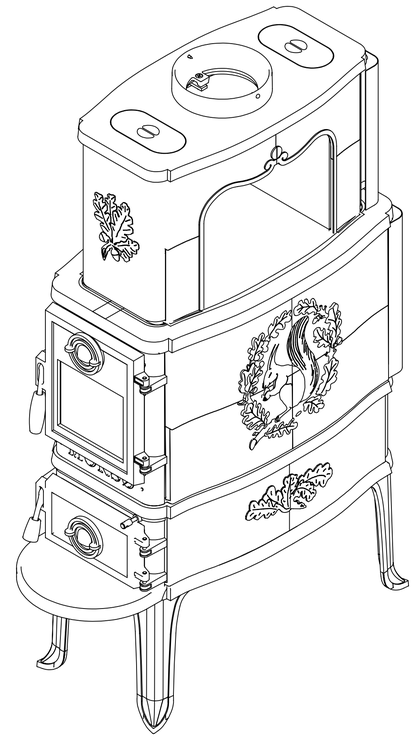
Title: Assembly drawings, Morsø 2B Classic 2020

(Revised June 2021 release)

Pages total: 7, excl this cover page

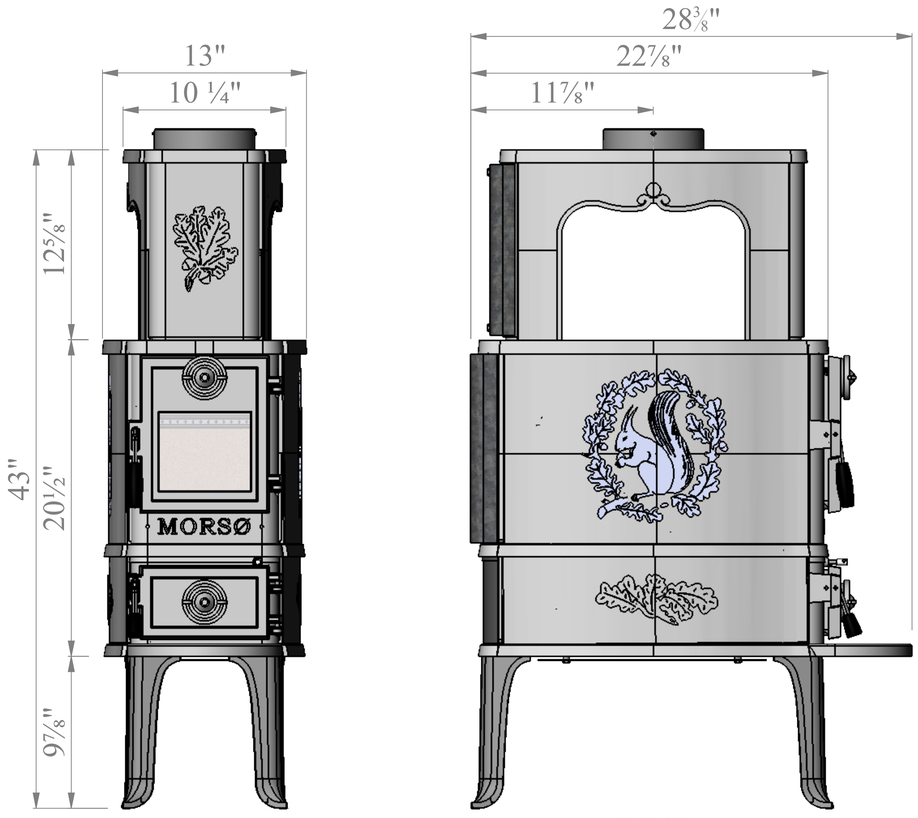


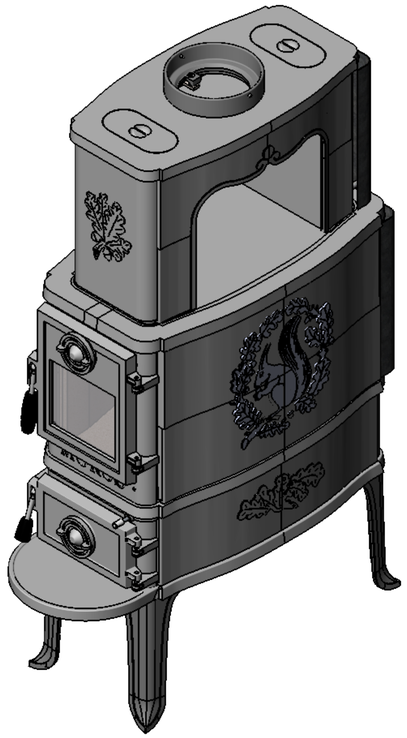


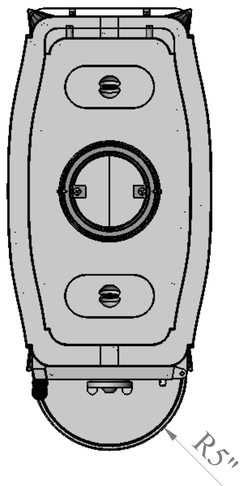


b	Added inches and two more views.		RSV	09.07.2010
Rev.	Revisions		Sign.:	Date:
	Title:	Construction:	RSV	13.11.08
	Maalskitse	Released:		
Material:	**2B Classic NA**	Format:		**A1**
Weight:		Scale:		**1:5**
Model no.	**Morsø 2B Classic**	Itemno.:		
Drawingtype:	Dimension Skecth	Drawing no.:		**2B-129 b**
Location of file:	U:\cadx\tegninger\Ma\2B-2B Classic & 2B Standard Assembly.SLDASM			

Date of print: 07-10-2020

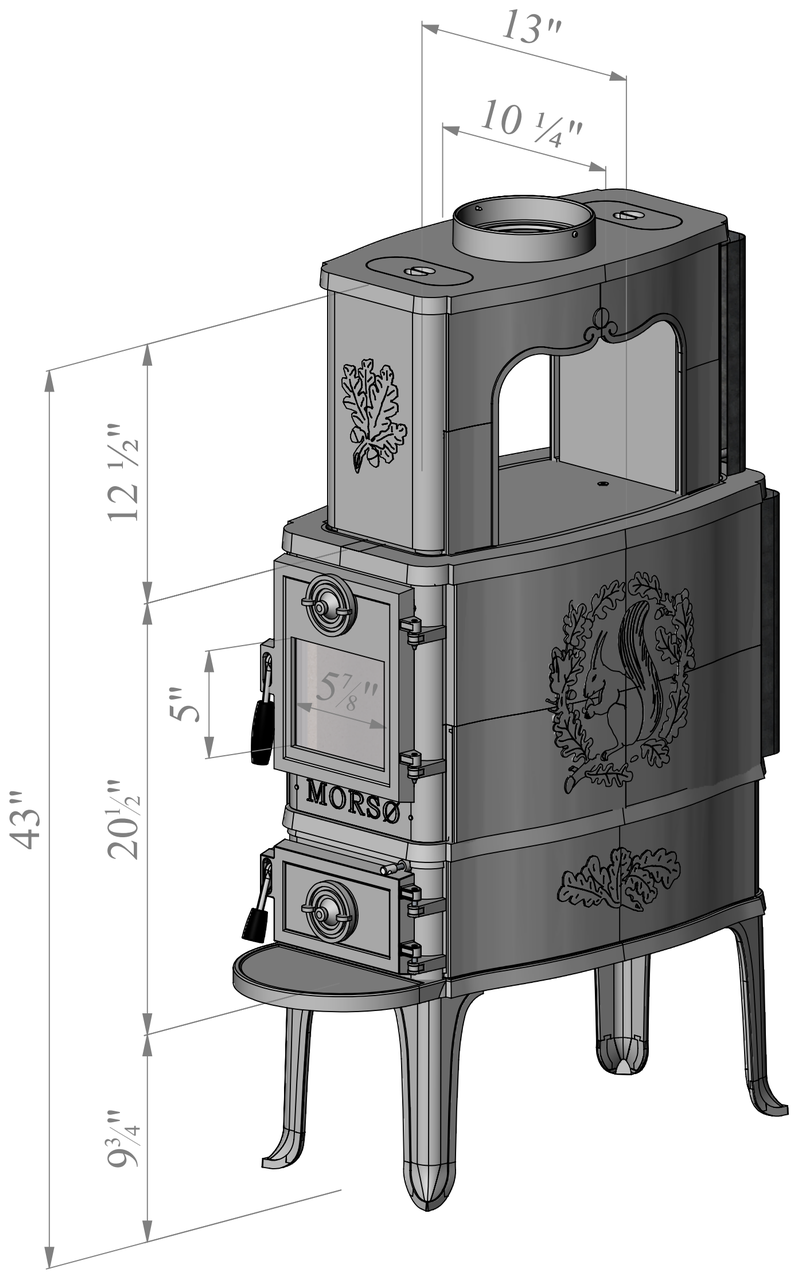


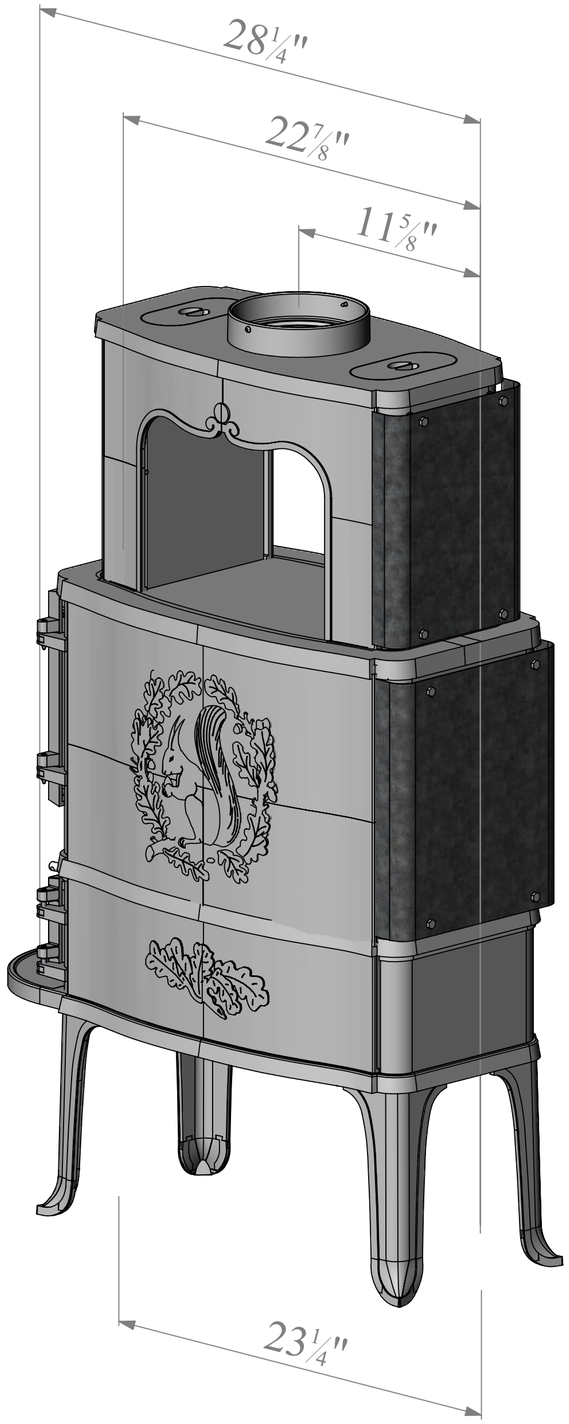




b	Added inches and two more views.		RSV	09.07.2010
Rev.	Revisions		Sign.:	Date:
	Title:	Construction:	RSV	13.11.08
	Maalskitse	Released:		
Material:	**2B Classic NA**	Format:		**A1**
Weight:		Scale:		**1:5**
Model no.	**Morsø 2B Classic**	Itemno.:		
Drawingtype:	Dimension Skecth	Drawing no.:		**2B-129 b**
Location of file:	S:\cadv3\tegninger\1862B-2B Classic & 2B Standard Assembly.SLDASM			

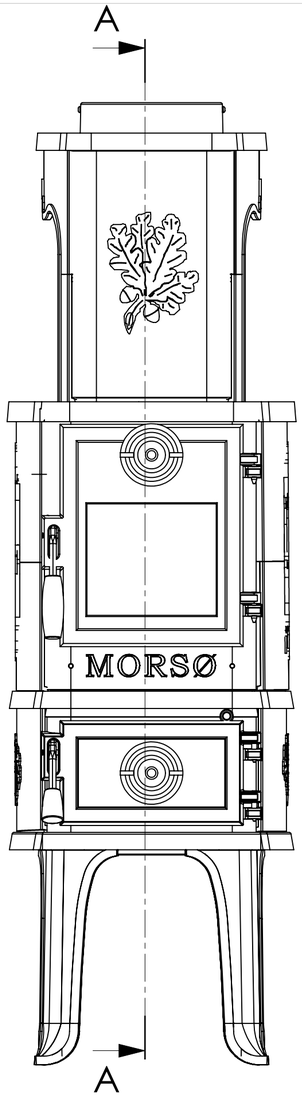
Date of print: 07-10-2020

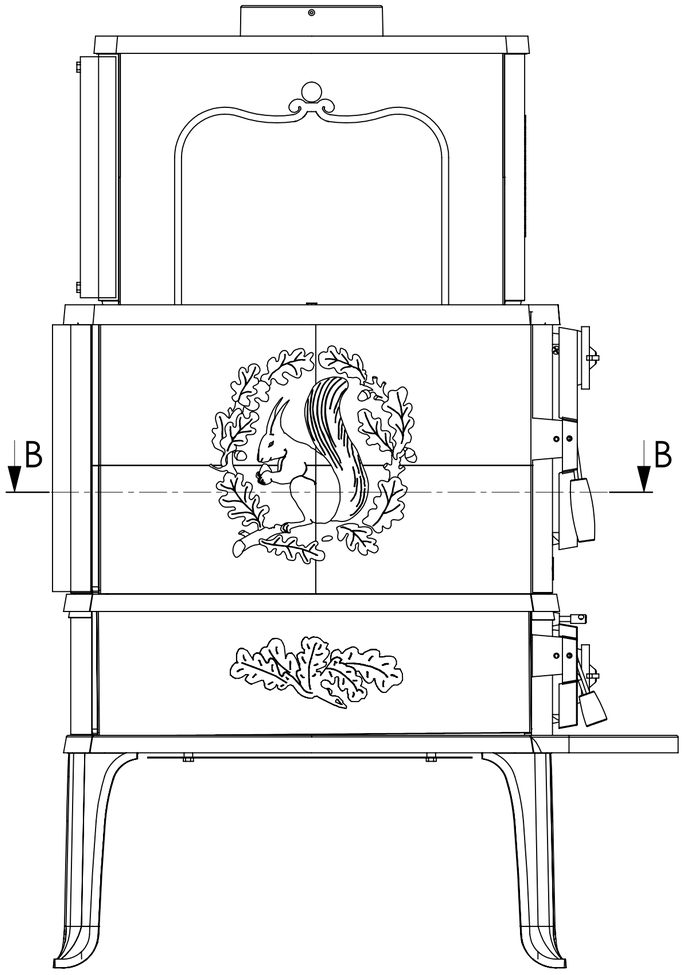


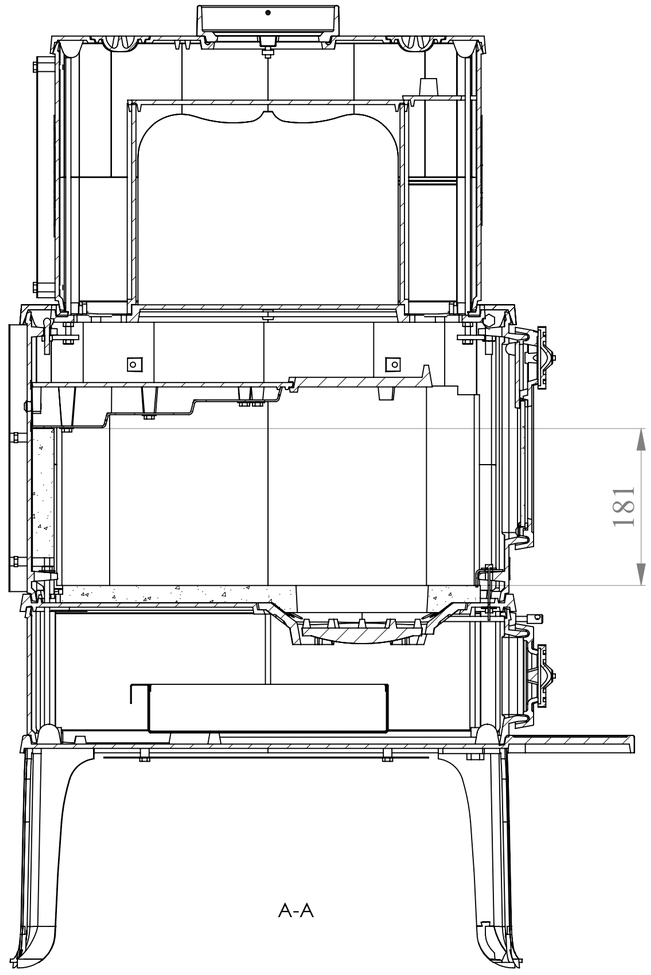


Date of print: 07-10-2020

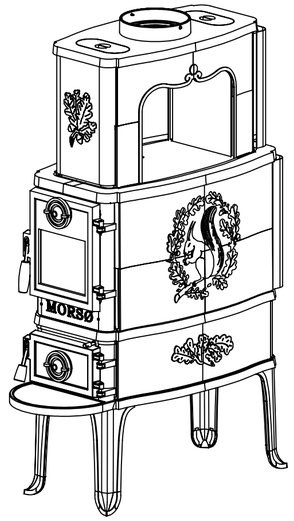
		Rev.	Revisions	Sign.:	Date:
		Title:		Construction:	RSV 17.06.2009
			Isometrisk målskitse	Released:	
Material:			**2B Classic NA**	Format:	**A2**
Weight:				Scale:	**1:5**
Model no.			**Morsø 2B Classic**	Itemno.:	
Drawingtype:	Dimension Skecth			Drawing no.:	
Location of file:	U:\vdv\Tegninger\1B&2B\2B Classic & 2B Standard Assembly.SLDASM		morsø	**2B-134 a**	

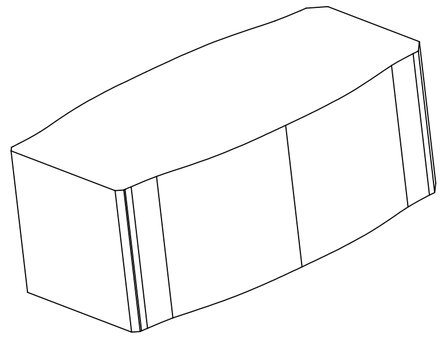






A-A

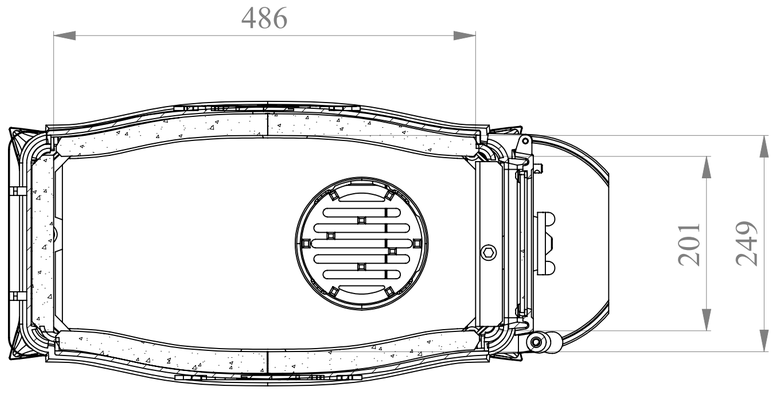




Firebox Volume

0.019431 m³
0.686199 ft³

(Solidworks CAD Calculation)

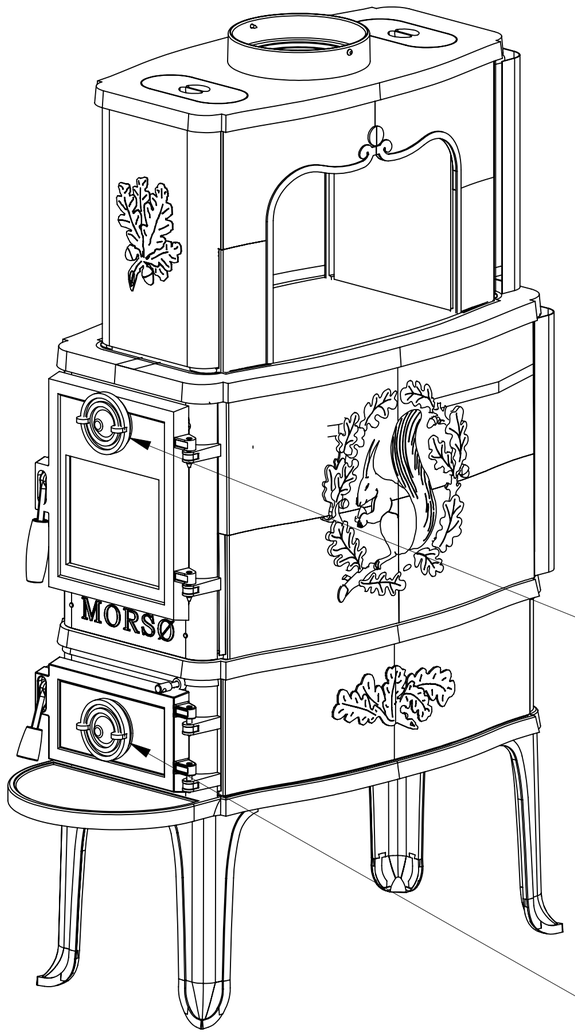


B-B

Firebox width : Side insulation stone to side insulation stone
Firebox height : Hearth to top end of back insulation stone
Firebox depth : Back insulation stone to front door frame

Rev.	Revisions	Sign.:	Date:
	Title:	Construction: FJN	30.08.2020
	Morsø 2B Classic 2020 Firebox Volume	Released:	
Material:		Format:	**A2**
Weight:		Scale:	**1:5**
Model no.		Itemno.:	
Drawingtype:		Drawing no.:	**2B-147**
Location of file:			

Date of print: 08-10-2020



Controls maximum setting

Controls minimum setting

M8 DIN 934 nut

Door (Part 2B-59)

Bushing Ø12 x 11

Air controller end cap (Part 2B-96)

M8 x 45 DIN 7985 bolt

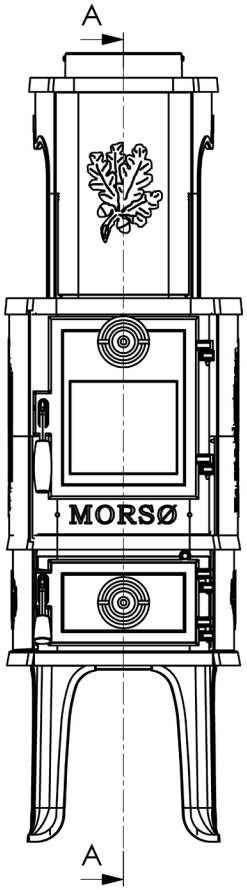
Primary Air
Max.: 3.25 turns = 4 mm gap between spinner and frame = 918 mm²
Min.: 0.75 turn = 1 mm gap between spinner and frame = 212 mm²

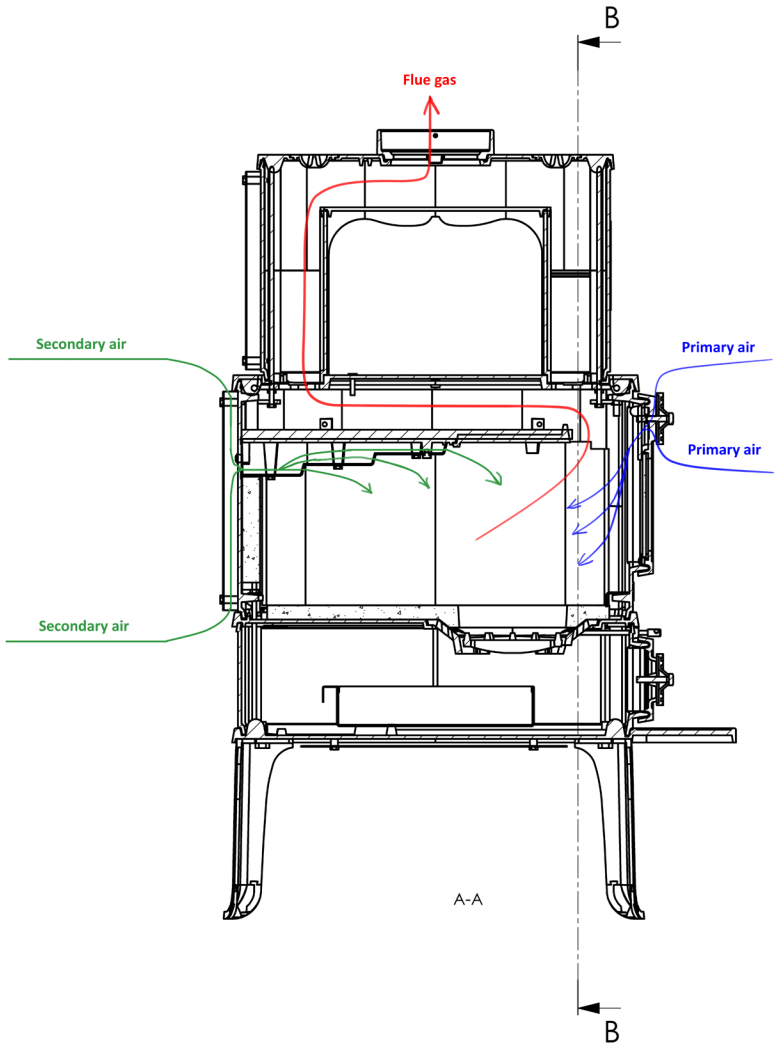
Ash door spinner. Only for decoration. Locked in closed position.

Primary air controller assembly

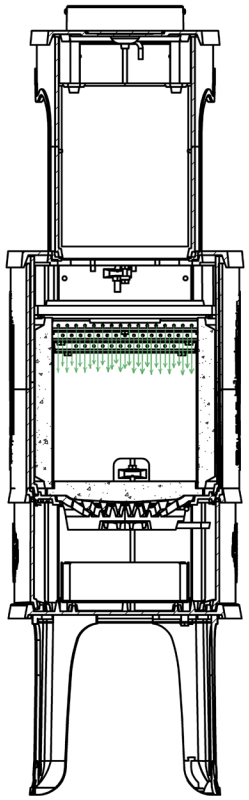
Date of print: 05-10-2020

Rev.	Revisions	Sign.:	Date:
	Title:	Construction:	FJN 02.10.2020
	Morsø 2B Classic 2020 Primary air controller assembly	Released:	
Material:		Format:	A2
Weight:		Scale:	1:5
Model no.		Itemno.:	
Drawingtype:		Drawing no.:	
Location of file:	morsø		2B-148

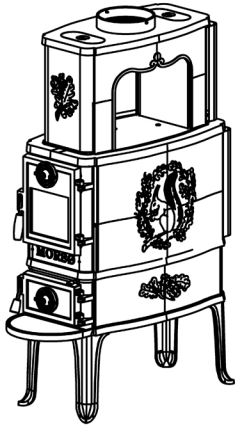




A-A



B-B



Rev.	Revisions	Sign.:	Date:
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	Air flow diagram Morsø 2B Classic 2020	Released:	
Material:		Format:	A2
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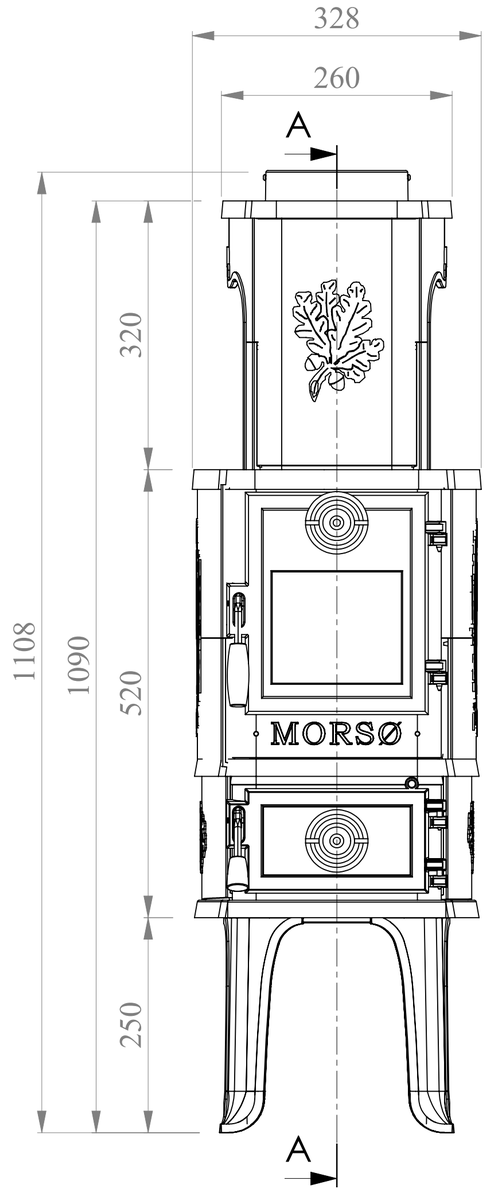
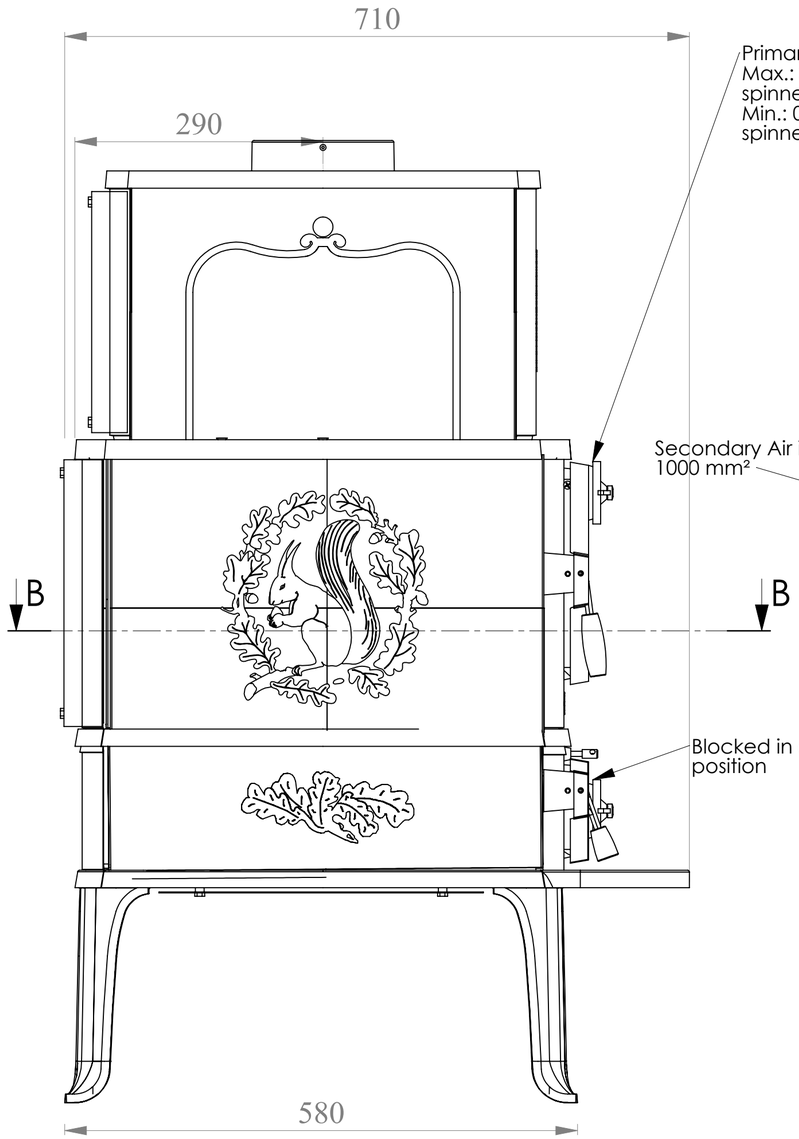
Location of file:	morsø		

Date of print: 07.10.2020

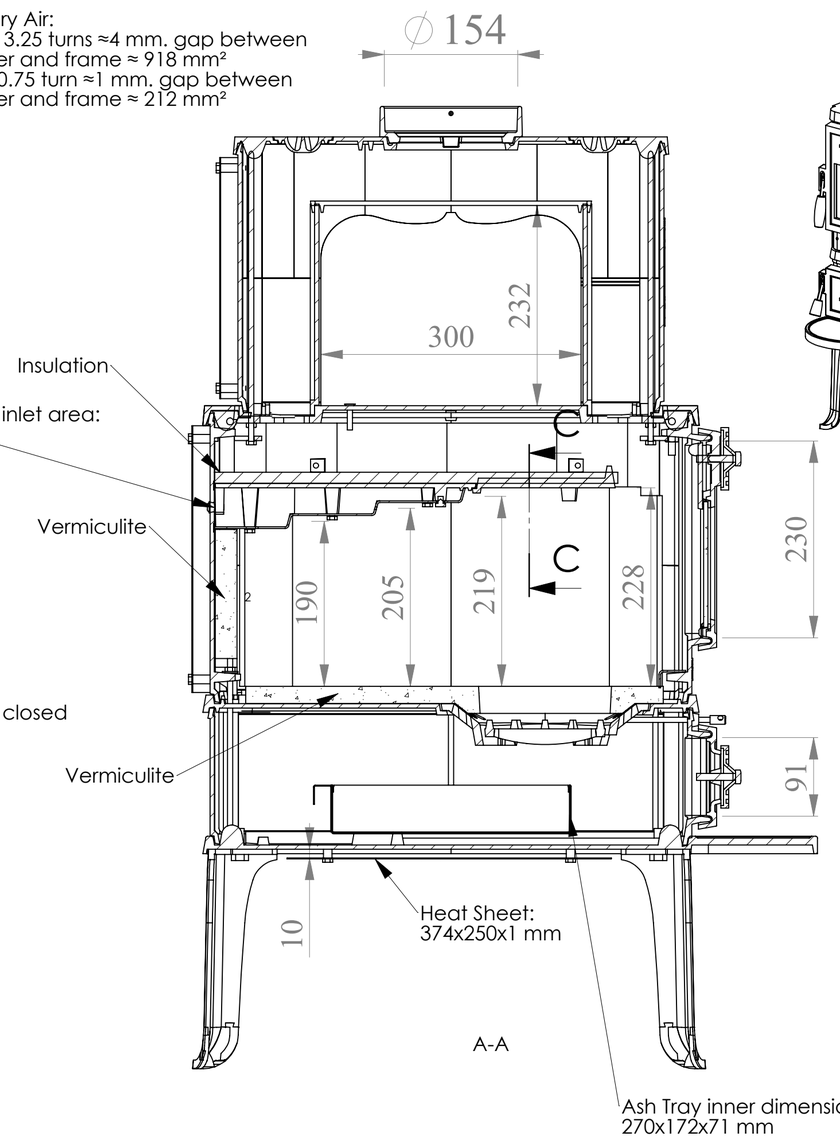


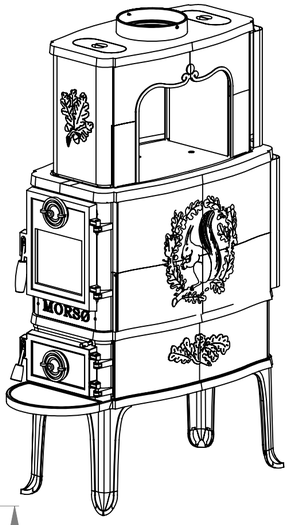


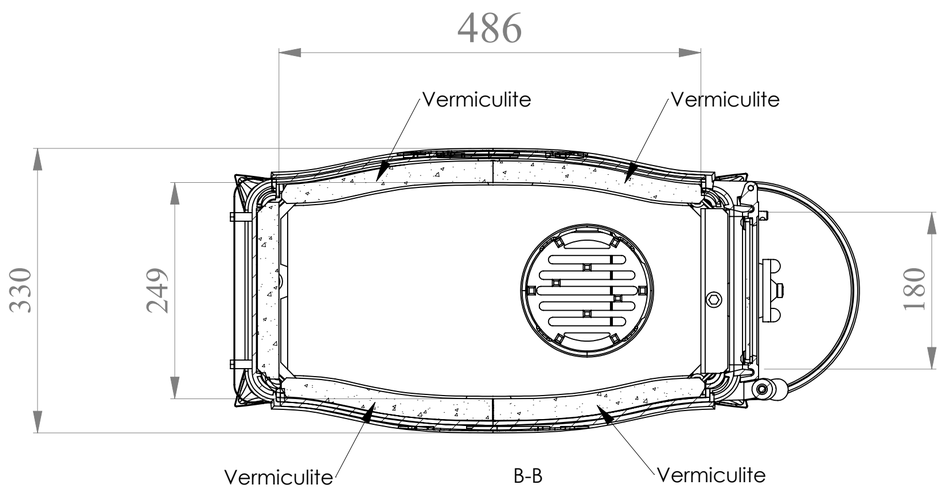
Primary Air:
Max.: 3.25 turns ≈4 mm. gap between spinner and frame ≈ 918 mm²
Min.: 0.75 turn ≈1 mm. gap between spinner and frame ≈ 212 mm²

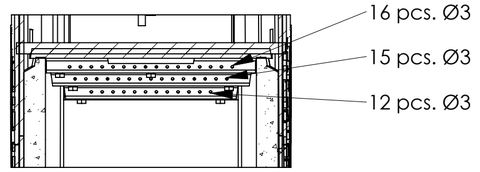
Secondary Air inlet area:
1000 mm²

Blocked in closed position









C-C

Rev.	Revisions	Sign.:	Date:
	Title:	Construction: FJN	07.10.2020
Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m	**Main assembly drawing Morsø 2B Classic 2020**	Released:	
Material:		Format:	**A2**
Weight:		Scale:	**1:5**
Model no.		Itemno.:	
Drawingtype:		Drawing no.:	
Location of file:			**2B-511**

Morsø Jernstøberi A/S

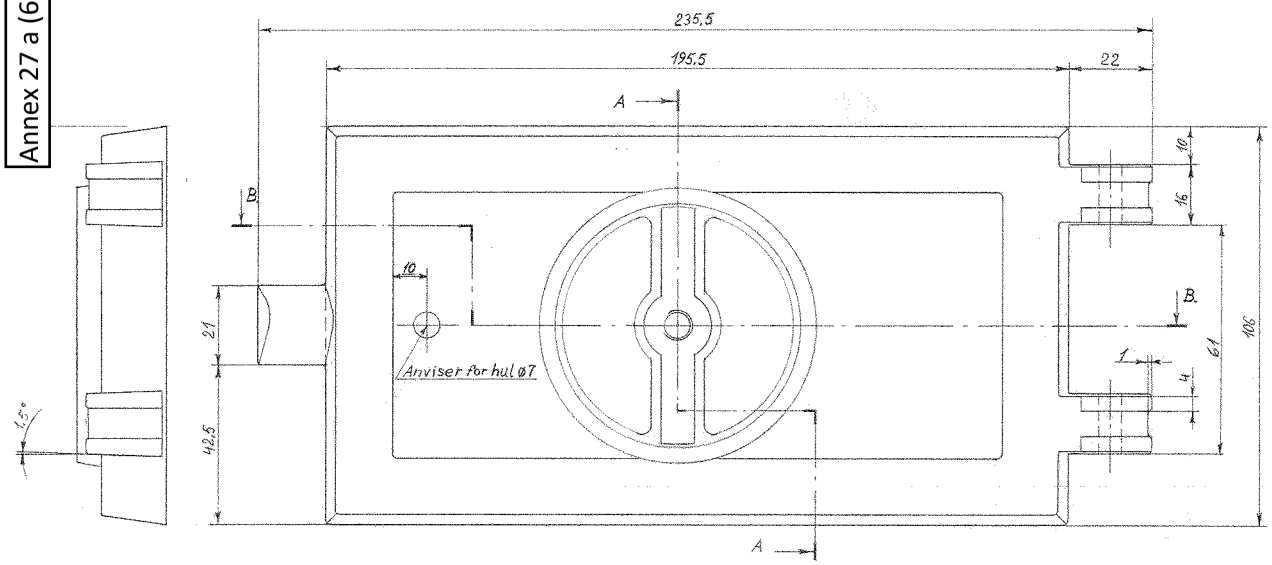
Date of print: 08-10-2020

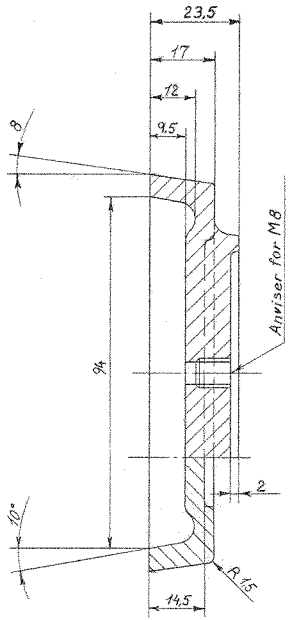
Annex 27a

Title: Parts drawings

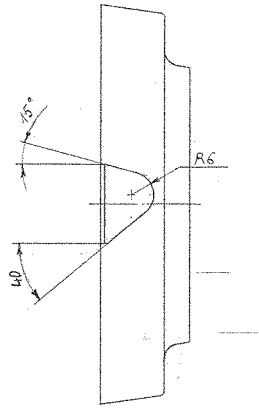
Pages total: 60, excl this cover page

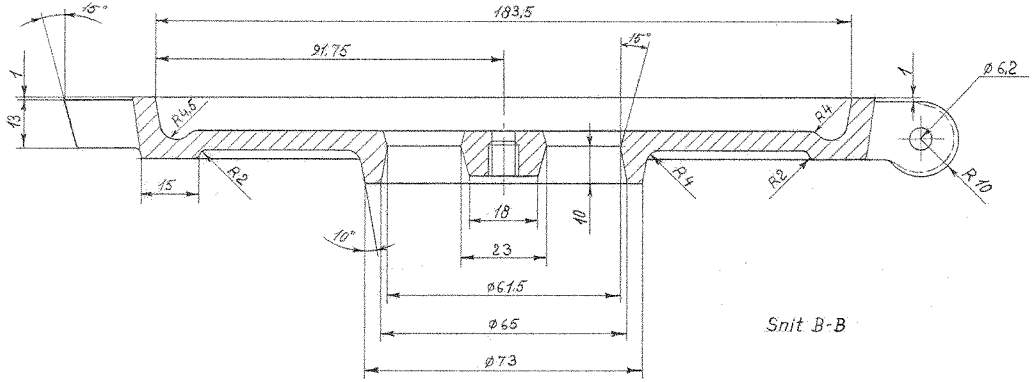
Annex 27 a (60 pages)





Snit A-A





Snit B-B

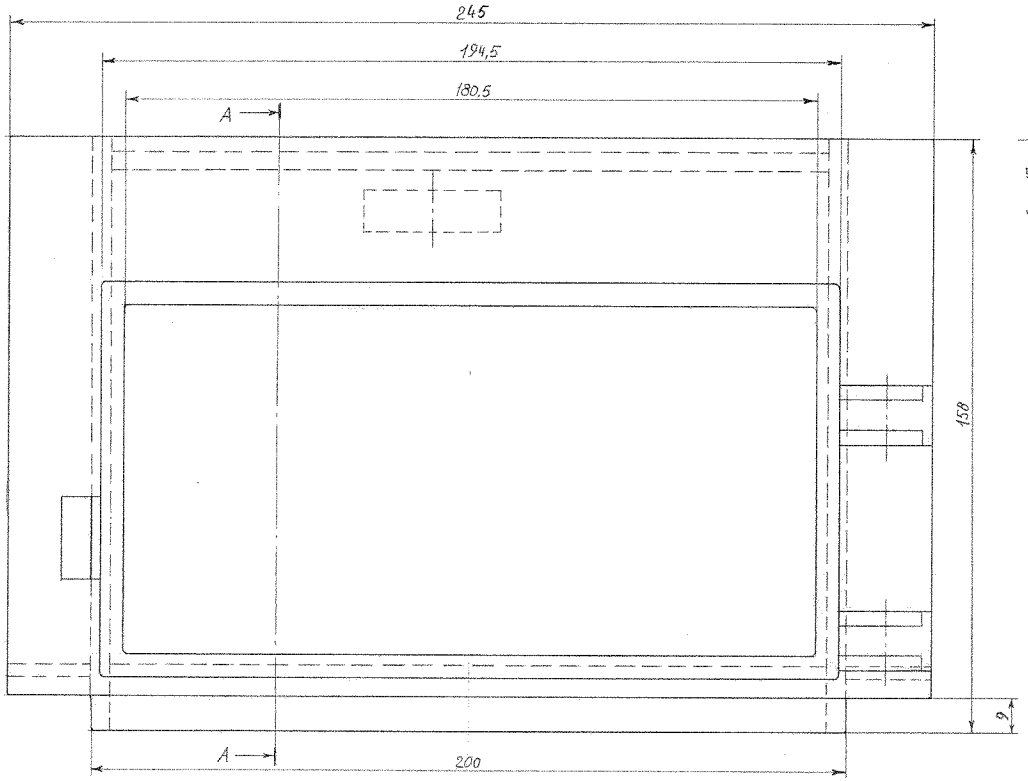
Nb! Alle rundinger ligesom på dør 2B.(Model nr. 2006.)

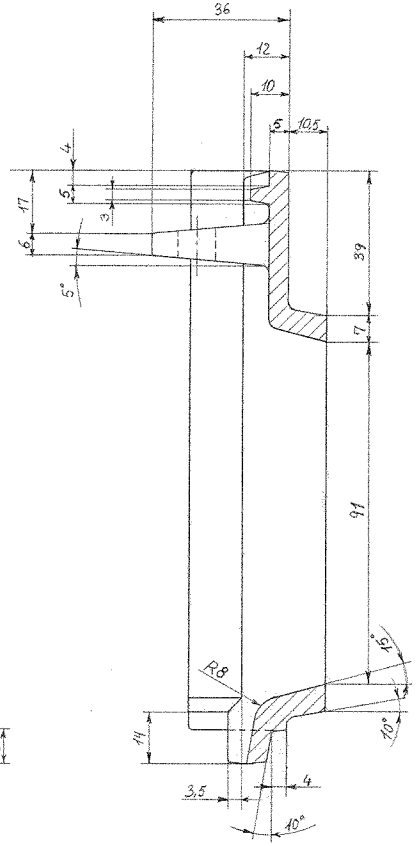
Vaterc. 342028

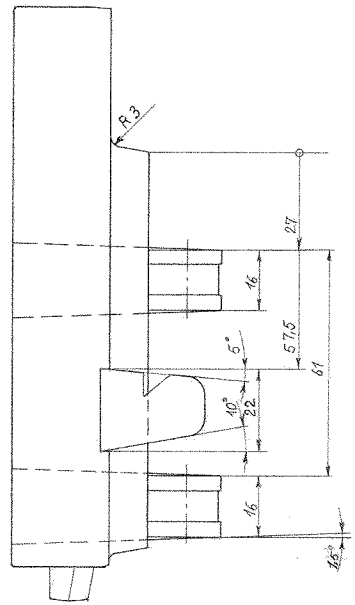
Askedør 2BU.	Benævnelse:	Ændret Mål 1:1 Tegn. 30-11-82 V.L. Model nr.: 2028
% N. A. Christensen & Co. MORSØ JERNSTØBERI Nykøbing Mors Telf. (07) 72 13 00	Materiale: Antal/Anlæg Vægt 1405 g	Erst. for: Tegn nr.: 2B-19-2 Erst. af:

A B C D E F G H J K L M

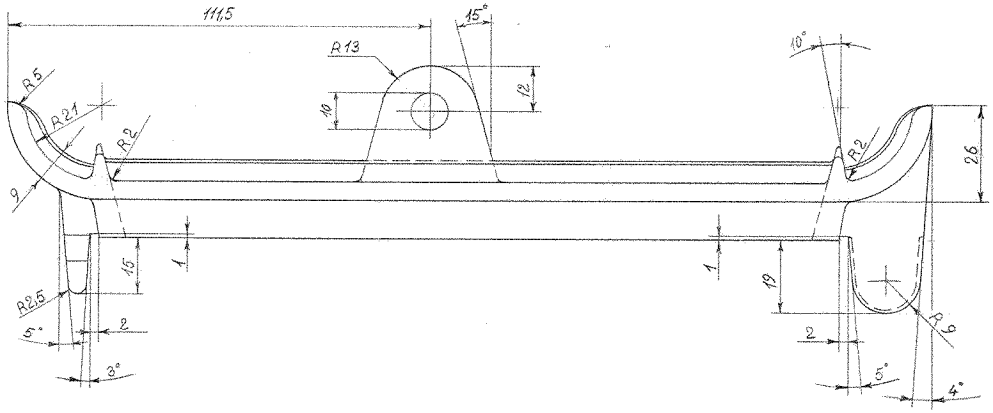
1 2 3 4 5 6 7 8





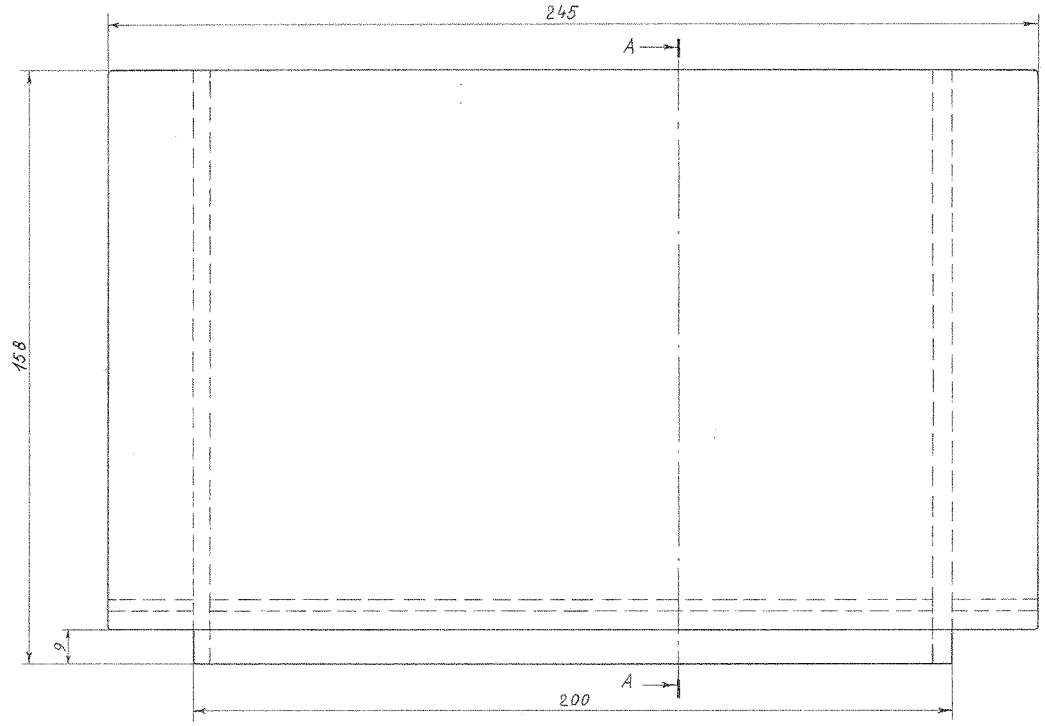


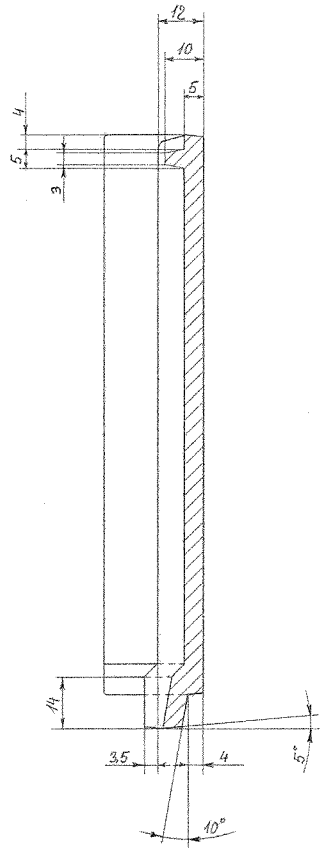
Snit A-A.



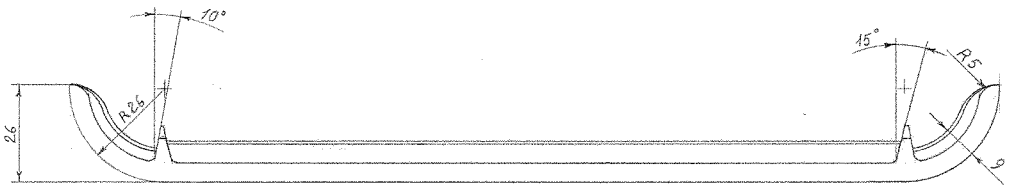
Vaknr. 342027

Forramme. 2BU.	Benævnelse:	Ændret
		Mål: 1:1 Tegn. 7-12-82 JJ
		Model nr.: 2027
% N. A. Christensen & Co. MORSØ JERNSTØBERI Nykøbing Mors Telf. (07) 72 13 00	Materiale:	Erst. for:
		Tegn nr.: 2B-20-2
	Antal/Anlæg: Vægt: 175 kg	Trst. af:



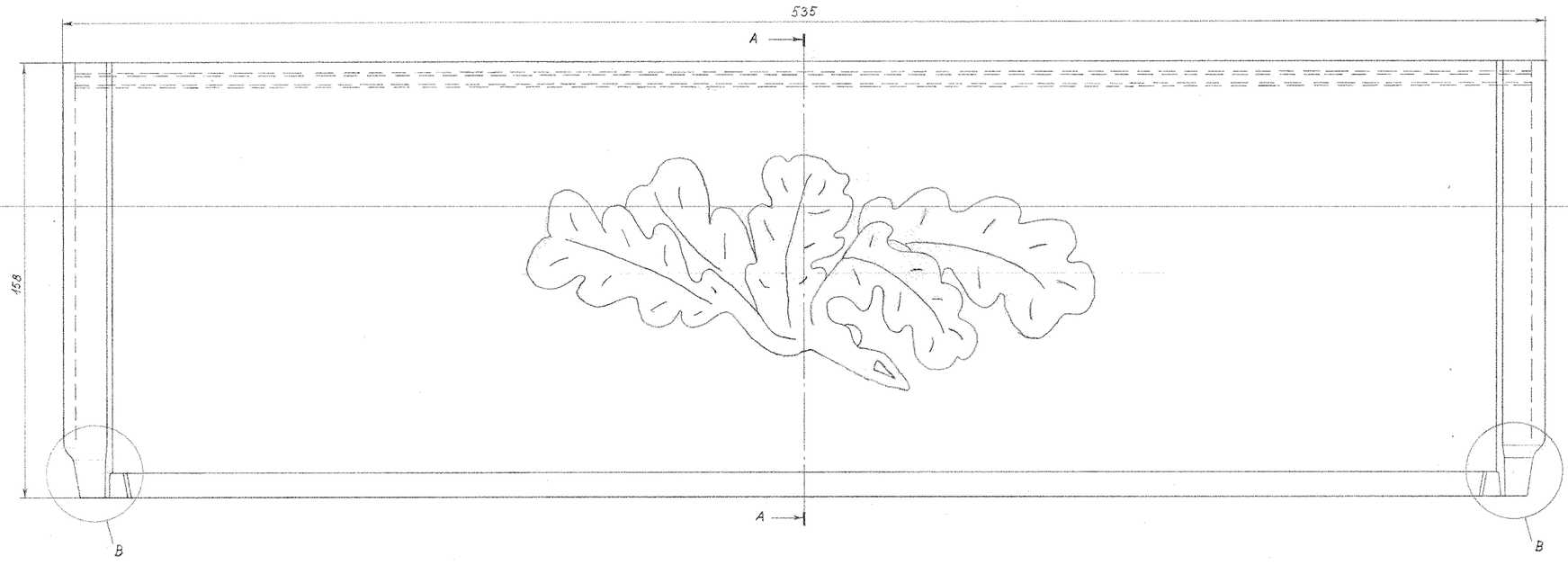


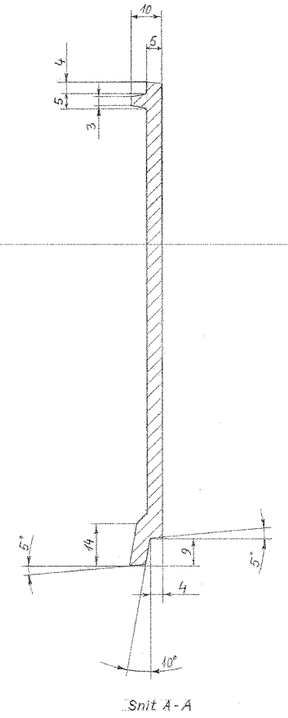
Snit A-A.



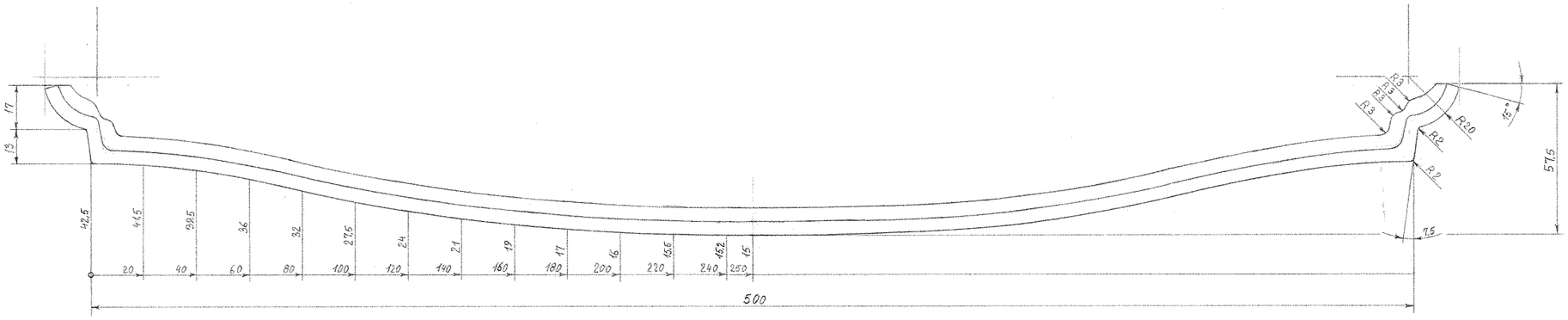
Varenr 342026

Bagplade. 2Bll.	Bestsvnsbkst:	Ændret
		Mål 1:1 Tegn. 8-12-82 LH Model nr.: 2026
½ N. A. Christensen & Co. MORSØ JERNSTØBERI Nykøbing Mors Telf. (07) 72 13 00	Materiale:	Erst. for:
	Antal/Anlæg: Vægt: 140 g	Tegn nr.: 2B-21-2 Erst. af:





Snit A-A

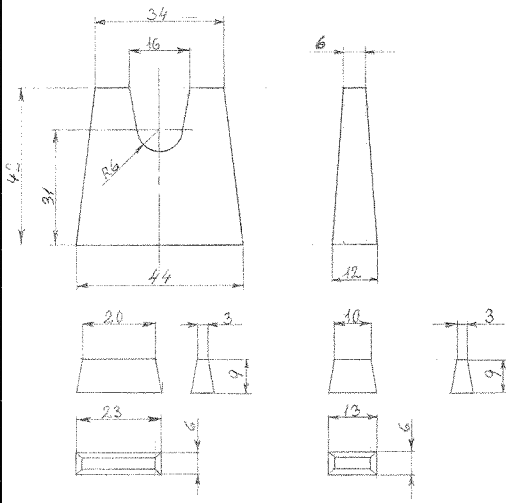


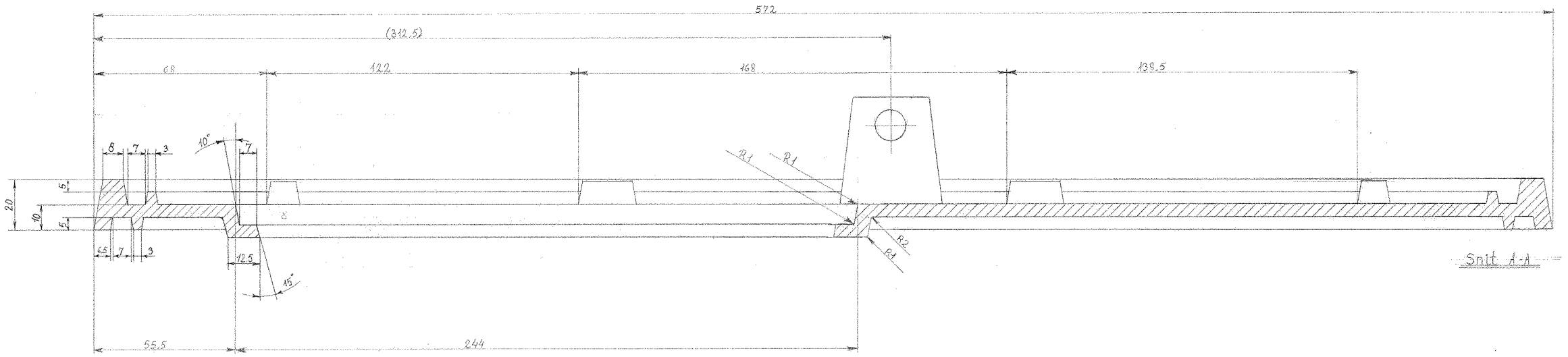
Nbl „B" laves ligesom sideplade til 2B.

Vaknr. 342025

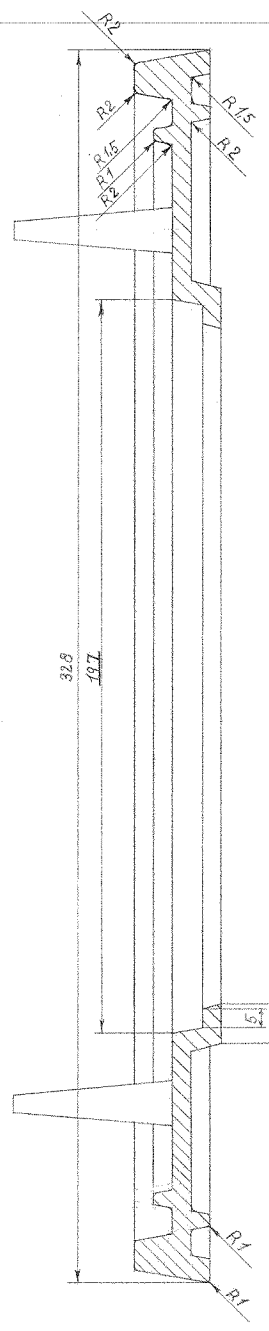
Sideplade. 2BU.	Benævnelse:	Ændret
		Mål: 1:1 Tegn: 9-12-82 LL Model nr.: 2025
⅋ N. A. Christensen & Co. MORSØ JERNSTØBERI Nykøbing Mors Telf. (07) 72 13 00	Materiale:	Erst. for:
	Antal/Anlæg: Vægt: 3,50 kg	Tegn nr.: 2B-22-1 Erst. af:

A B C D E F G H J K L M

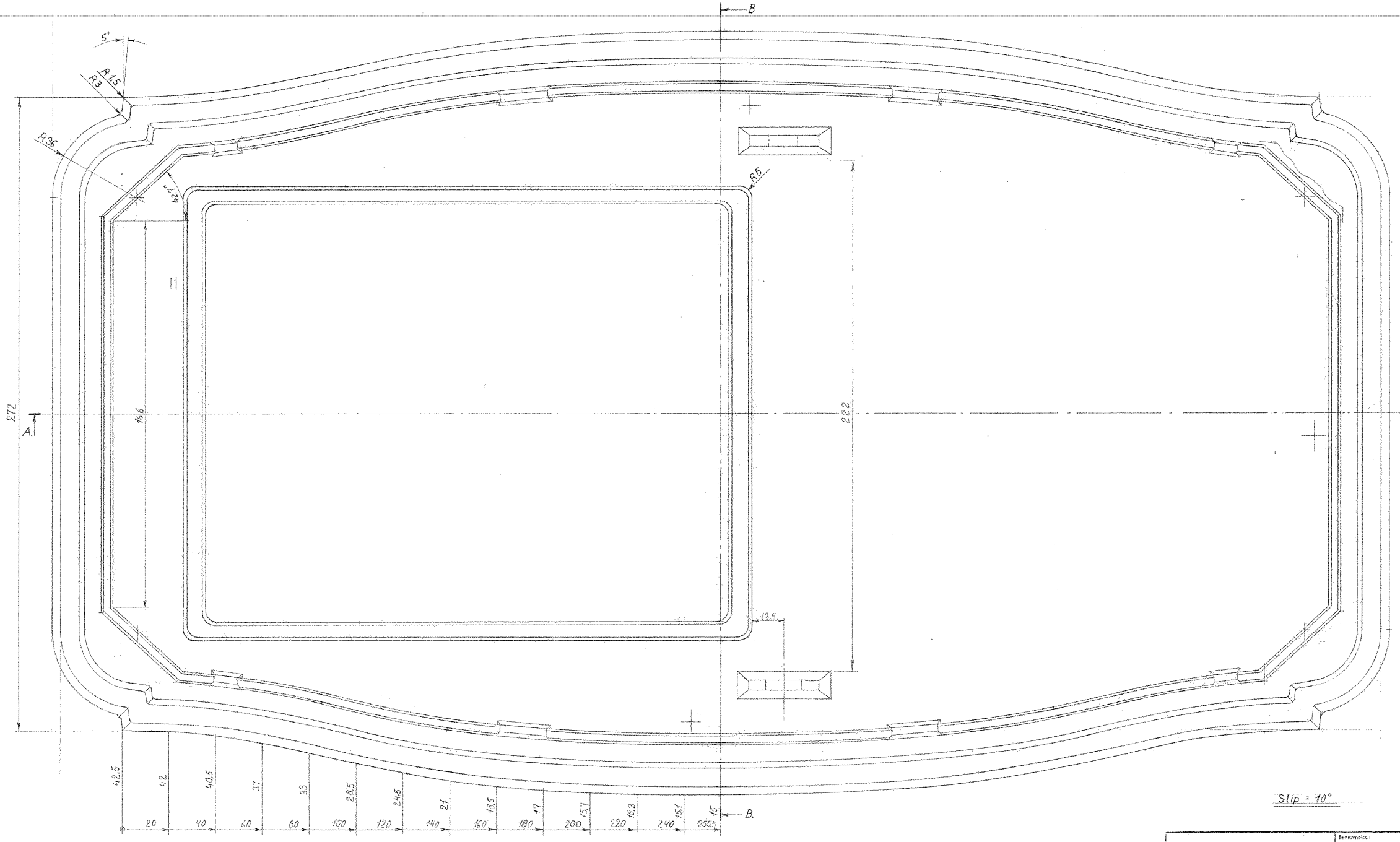




Snit A-A



Snit B-B

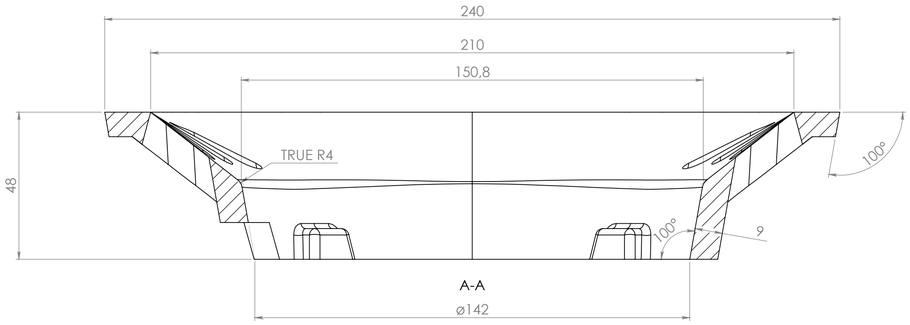


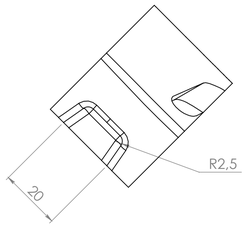
Bagende.

Slip = 10°

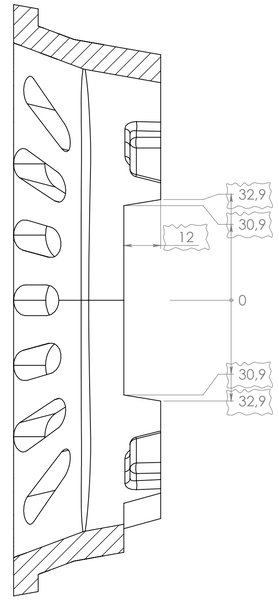
Vaerk. 342029

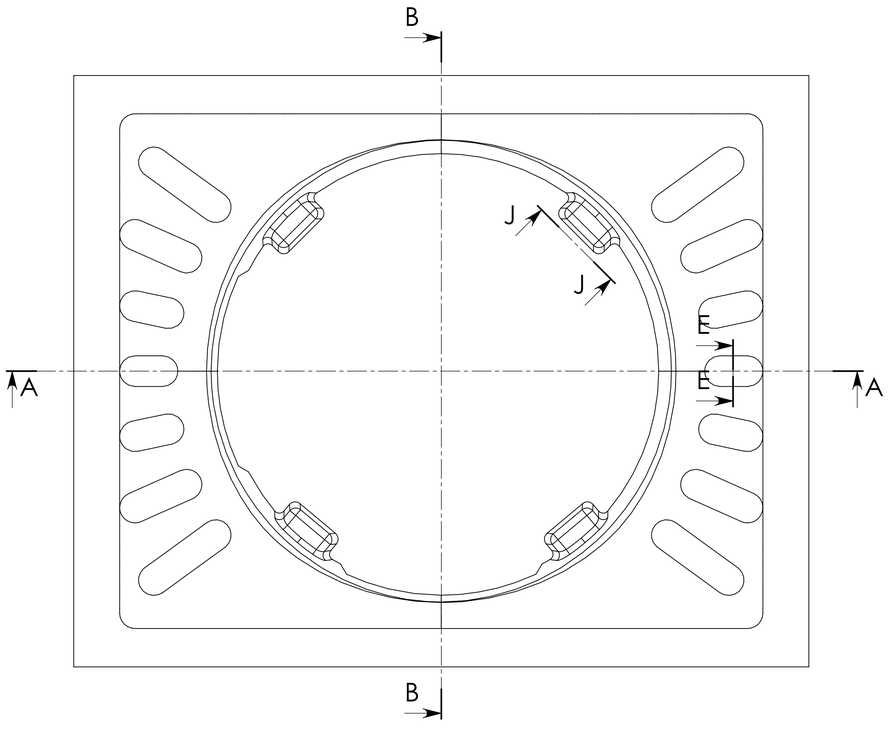
Mellemramme. 2 BU.	Benævnelse:	Ændret 20-5-83 BM 2/6-83 NTH.
		Mål 1:1 Tegn. 13-12-82 YB.
		Model nr.: 2029
½ N. A. Christensen & Co MORSØ JERNSTØBERI Nykøbing Mors Telf. (07) 72 13 00	Materiale:	Erst. for:
		Tegn nr.: 2B-23-1
	Vægt: 740 kg	Erst. af:

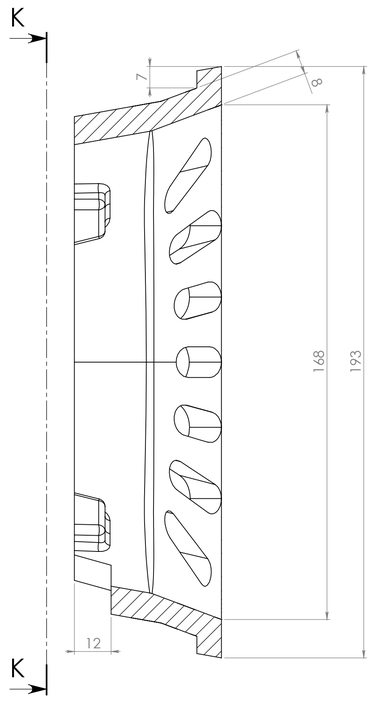




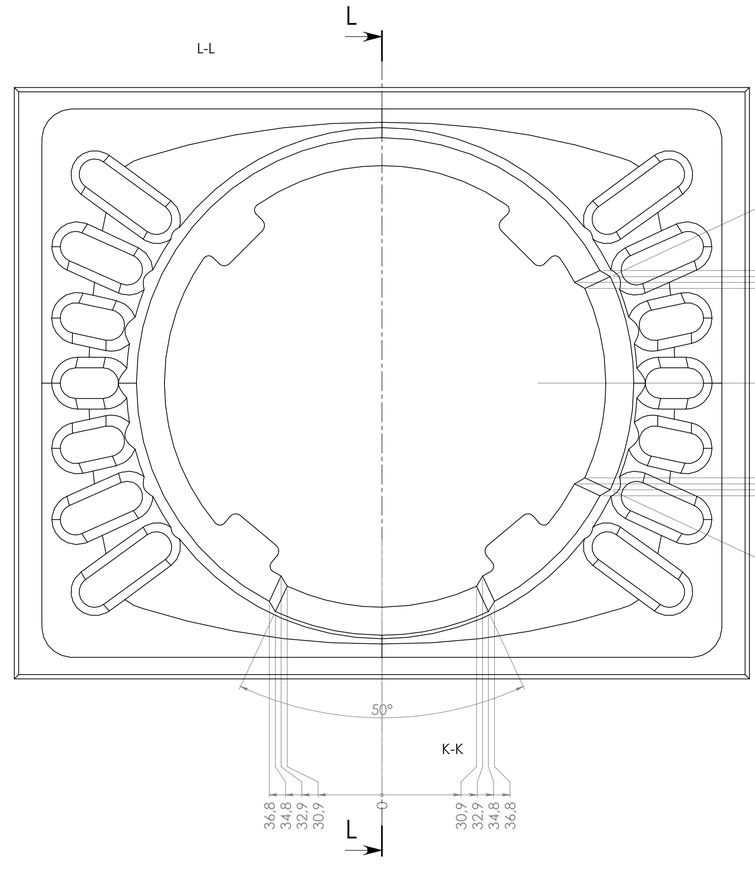
J-J





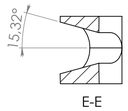


B-B



L-L

K-K



E-E

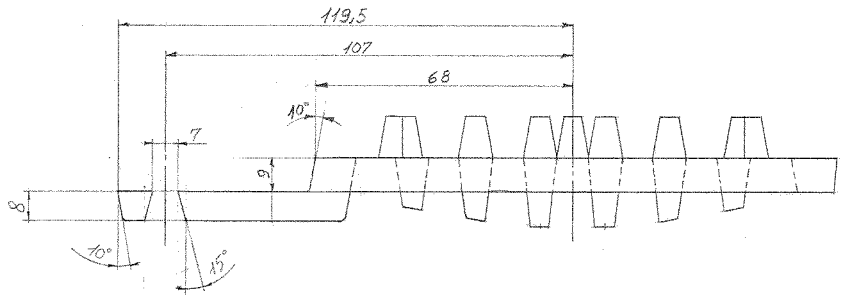
Cast Iron GG15 Crome

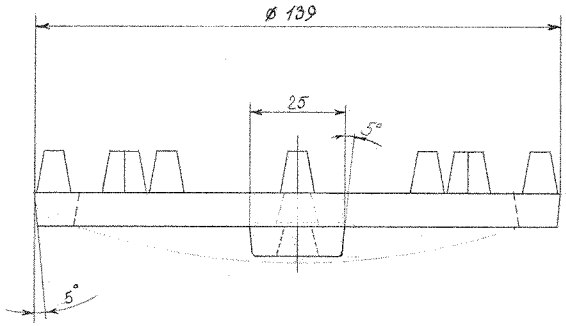
Rev.	Revisions	Sign.	Date:
b	Tilføjet udskæring for rysterist på den korte side.	KDU	02.12.10

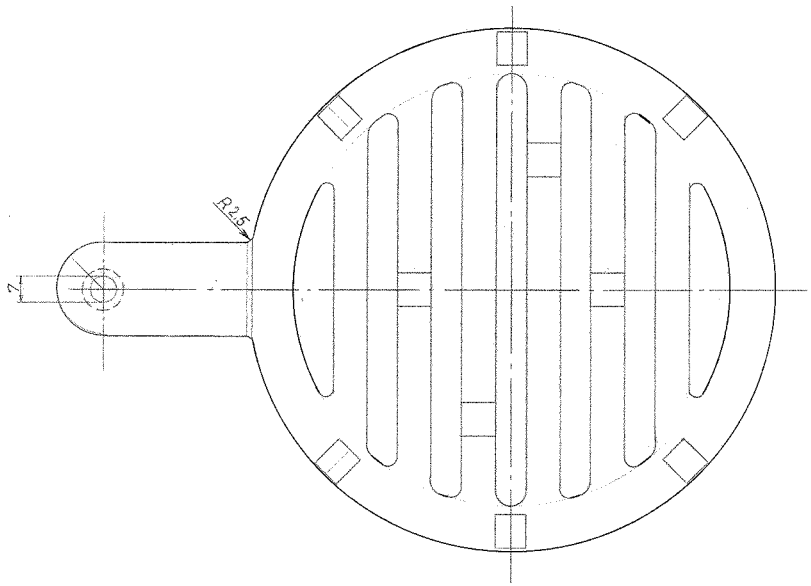
Dim. without indication of margin acc. to ISO Norm No.: 8062 CT9		Title:	Ristekurv 2B
Material:	Cast Iron GG15 Crome	Construction:	KDU 13.09.02
Weight:	2,31 kg	Released:	
Model no.	2031	Format:	A1
Drawingtype:	Casting Drawing	Scale:	1:1
Location of file:	U:\cadv3\eigninger\186281\2B-25 Ristekurv SLOPE\	Itemno.:	44203100
	Morsø 2B	Drawing no.:	2B-25 b

morsø

Date of print: 30-08-2019







Rysteristen laves efter rysterist, model nr. 3213.

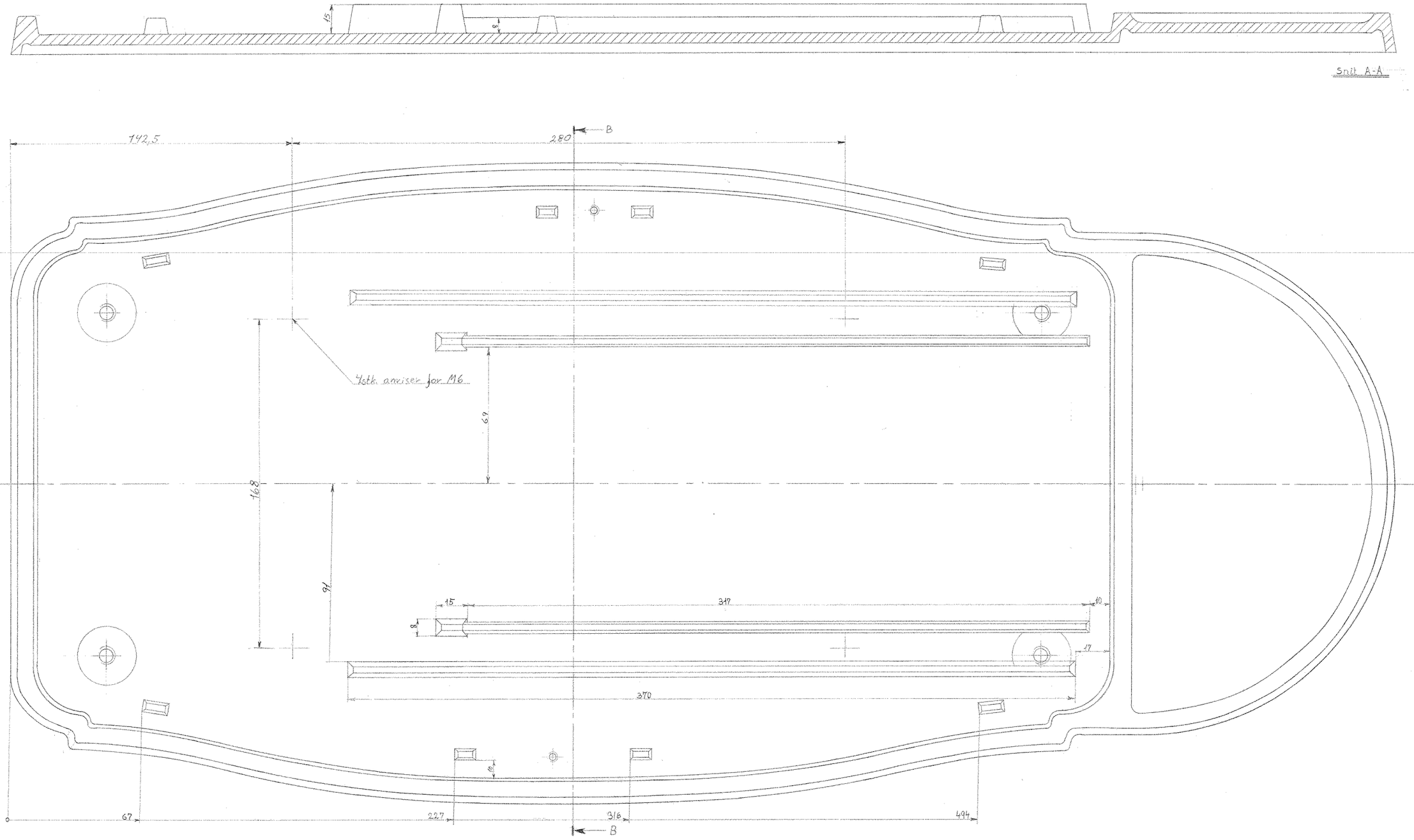
Varenr. 342030

Rysterist, 2 BU.	Bunsvinkler:	Ændret 14/12-83 + 21/11-84 K Målt 1:1 Tegn. 23-12-82 LO Model nr.: 2030
N. A. Christensen & Co. MORSØ JERNSTØBERI Nykøbing Mors Telf. (07) 72 13 00	Materiale:	Erst. for: Tegn nr.: 2B-26 - 2
	Antal/Anlæg: Vægt: 9,95 kg	Erst. af:

Material: GG15 Crome

A B C D E F G H J K L M

8 7 6 5 4 3 2 1



slap 10°

Varenr. 342011

Rev.	Revisionstekst	Dato	Sign
b	Påført anvisere	05.04.00	RSV
c	Fjernet 2 stk. knaster.	09.10.06	RSV

Bündplade for 2BU.

Dimensioner i:

Målestok: 1:1

Vægt: 8,50 kg

Antal/Artikel

Ændret: Tegn. 20-5-93 BM; Model nr.: 2011

Erst. for:

Tegn. nr.: 2B - 42 c

Erst. af:

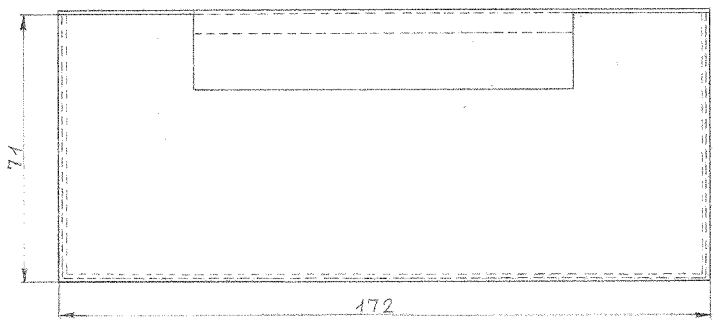
% N. A. Christensen & Co.
MORSØ JERNSTØBERI
Nykøbing Mors Telf. (07) 72 13 00

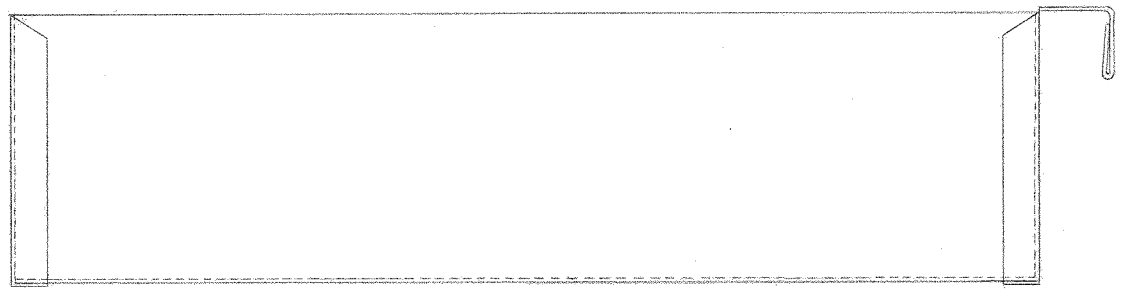
A B C D E F G H J K L M

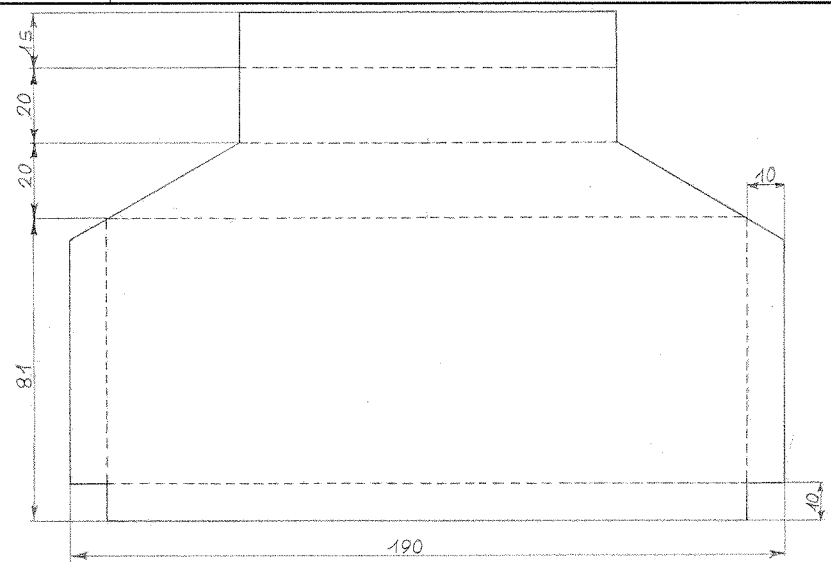
Rev.	Revisions	Sign.:	Date:

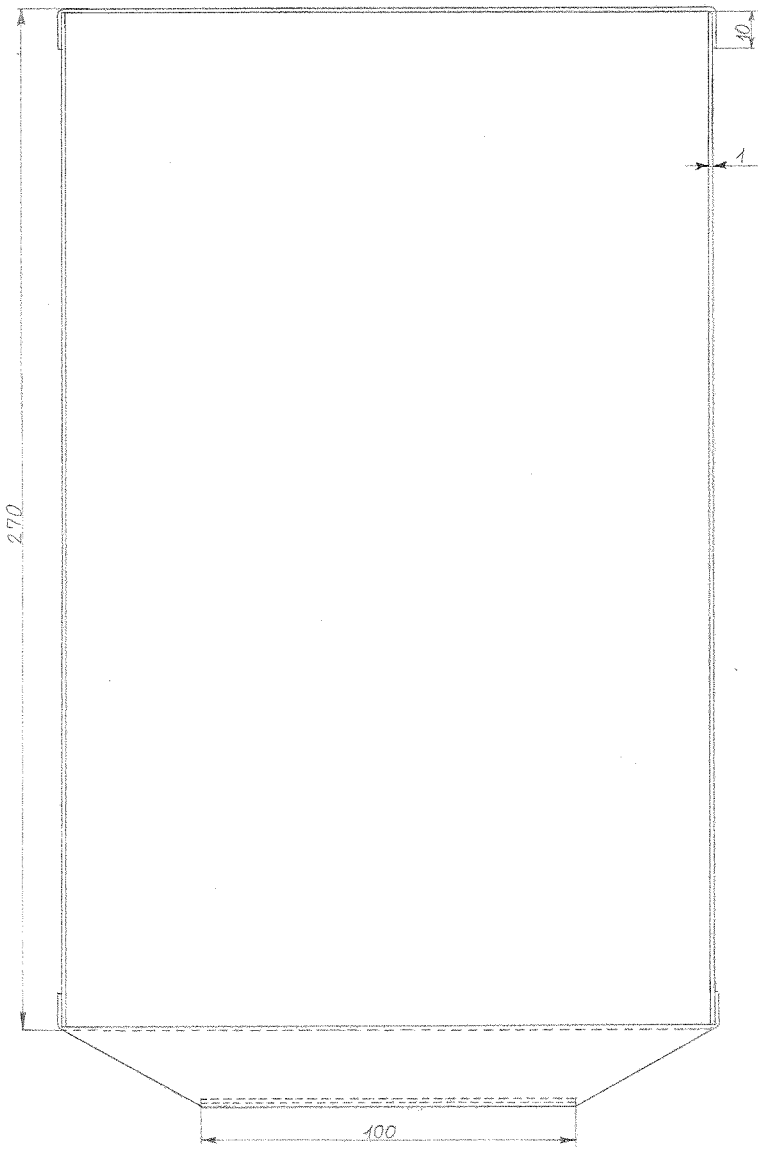
	Title:	Construction:	RSV	26.05.03
Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m	**Rystestang**	Released:		
Material: Rustfri Automatstål	**2 BU**	Format:	A3	
Weight: 0,06 kg	**Morsø 2B**	Scale:	**1:1**	
Model no. -		Itemno.:	**542052**	
Drawingtype: Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	Side 1 of 1	
Location of file: U:\udv\Tegninger\1B&2B\2B-44 Rystestang.SLDPRT		**2B-44 a**		

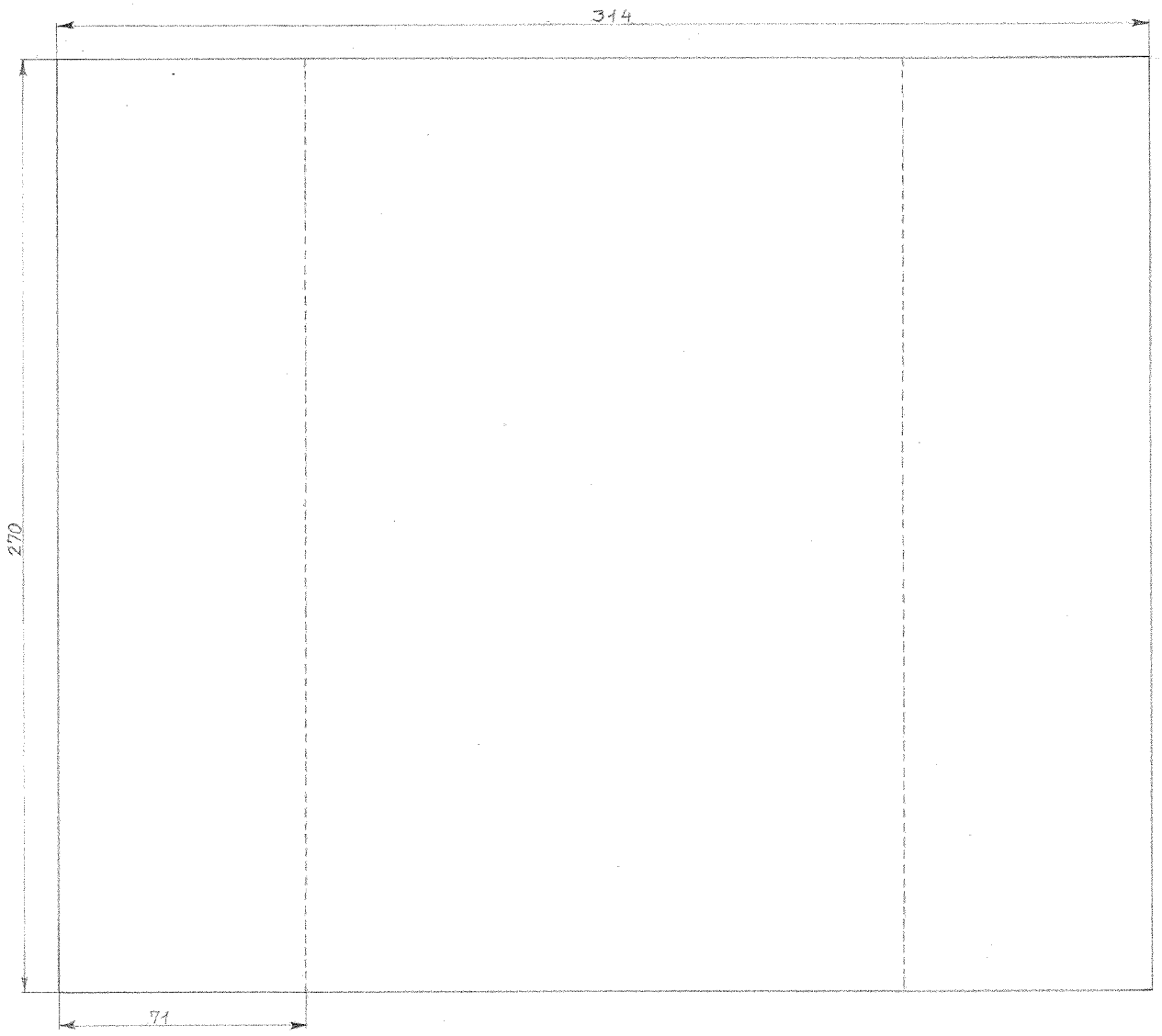
Date of print: 29-03-2017









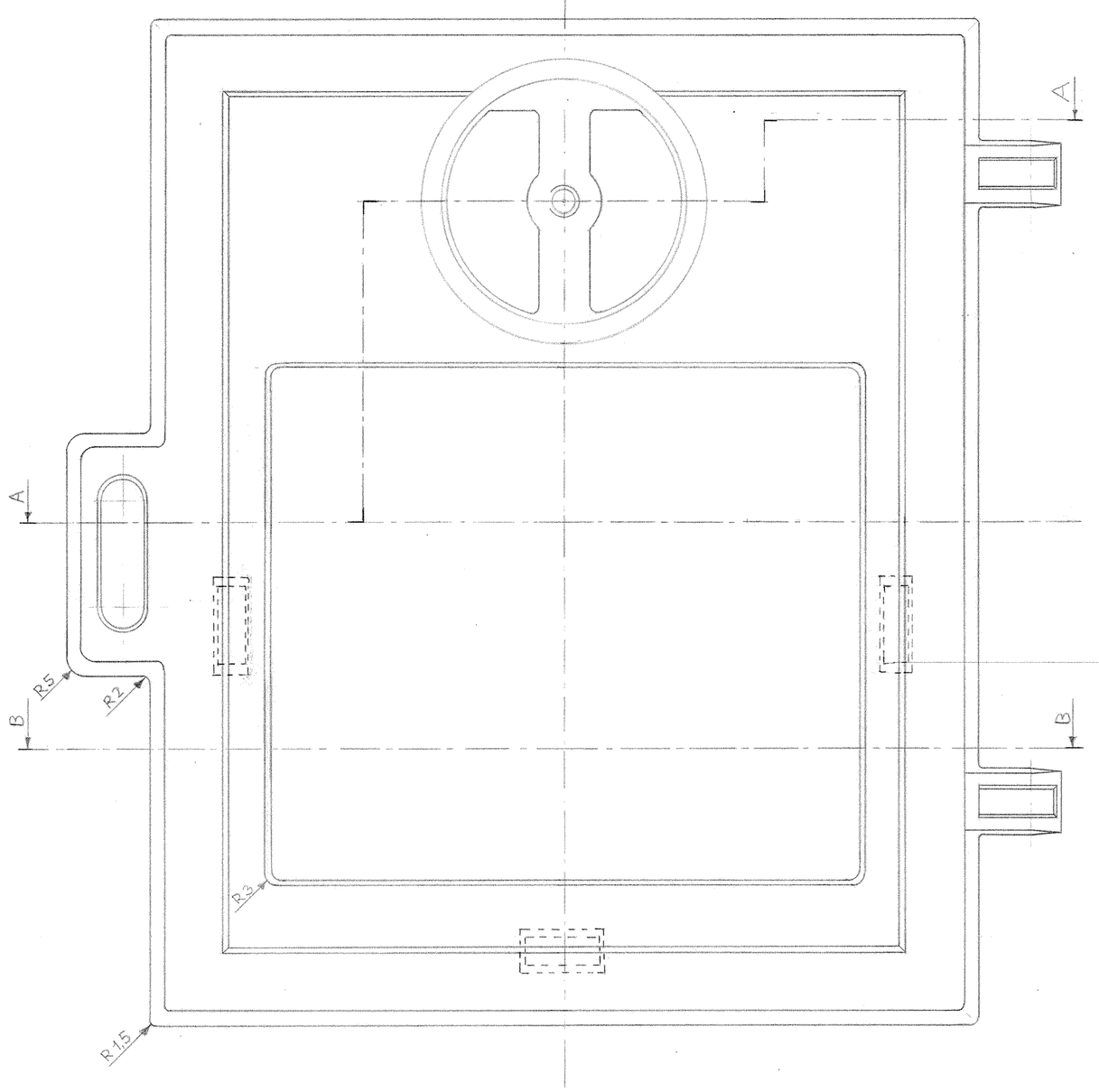


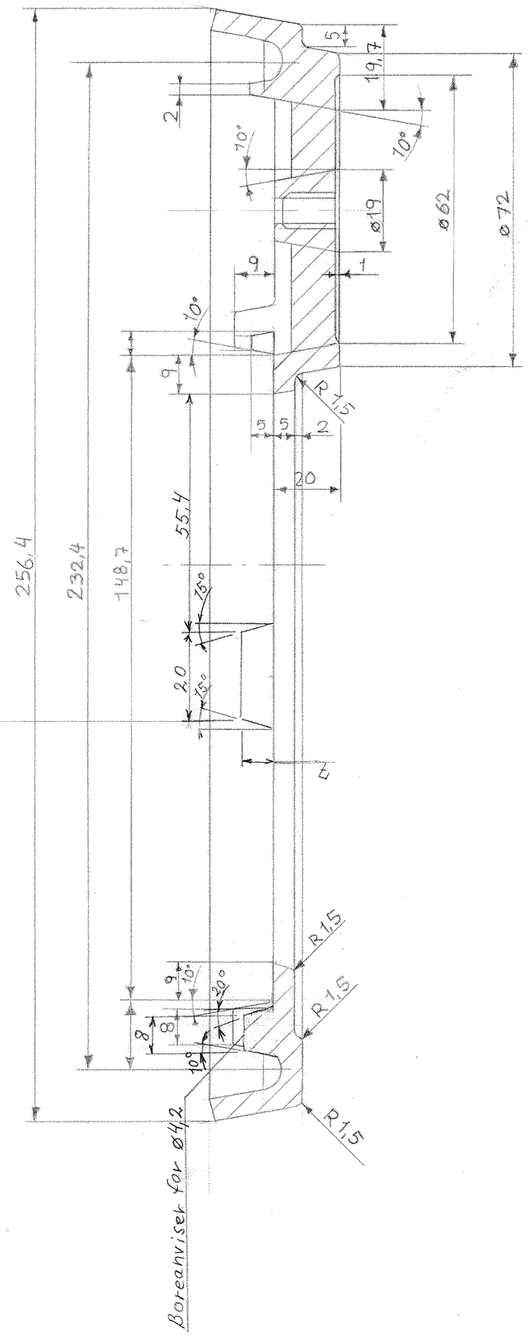
LEVERANDØR TIL DET KGL. DANSKE HOF
morsø
AKTIESELSKABET N.A. CHRISTENSEN & CO.
DK-7900 NYKØBING MORS
TLF. 97-72 13 00

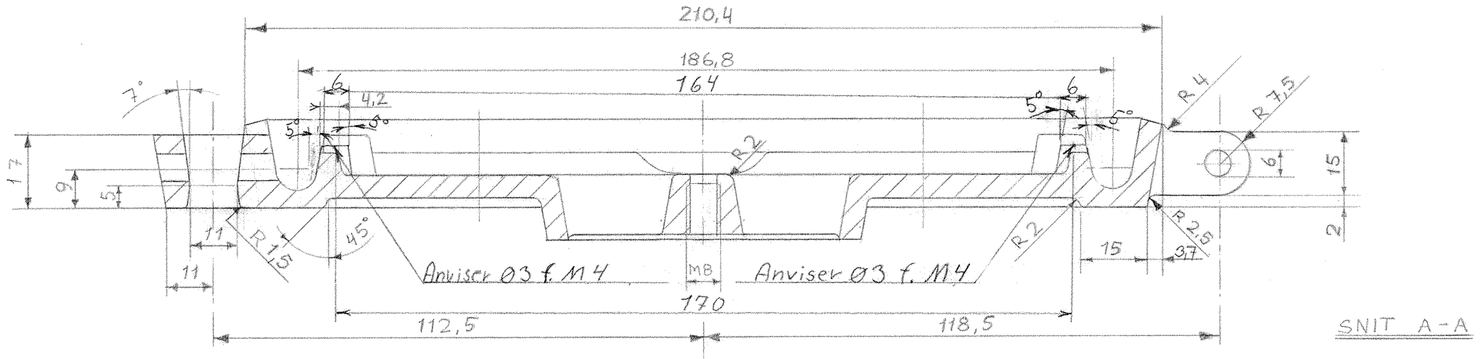
NY ASKESKUFFE

DATO	SIGN.
6-1-88	HR
MÅL: 1:1	ÆNDRET: 6-1-88 HR
	MODELNR.
TEGNINGSNR. 2B-88-1	

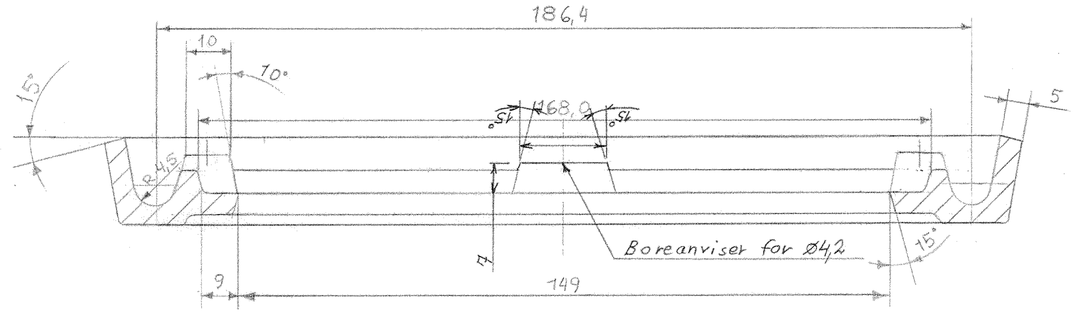
A B C D E F G H J K L M







SNIT A-A



SNIT B-B

IKKE ANGIVNE RUNDINGER: R 1

Vægt 20 kg Varenr. 342034

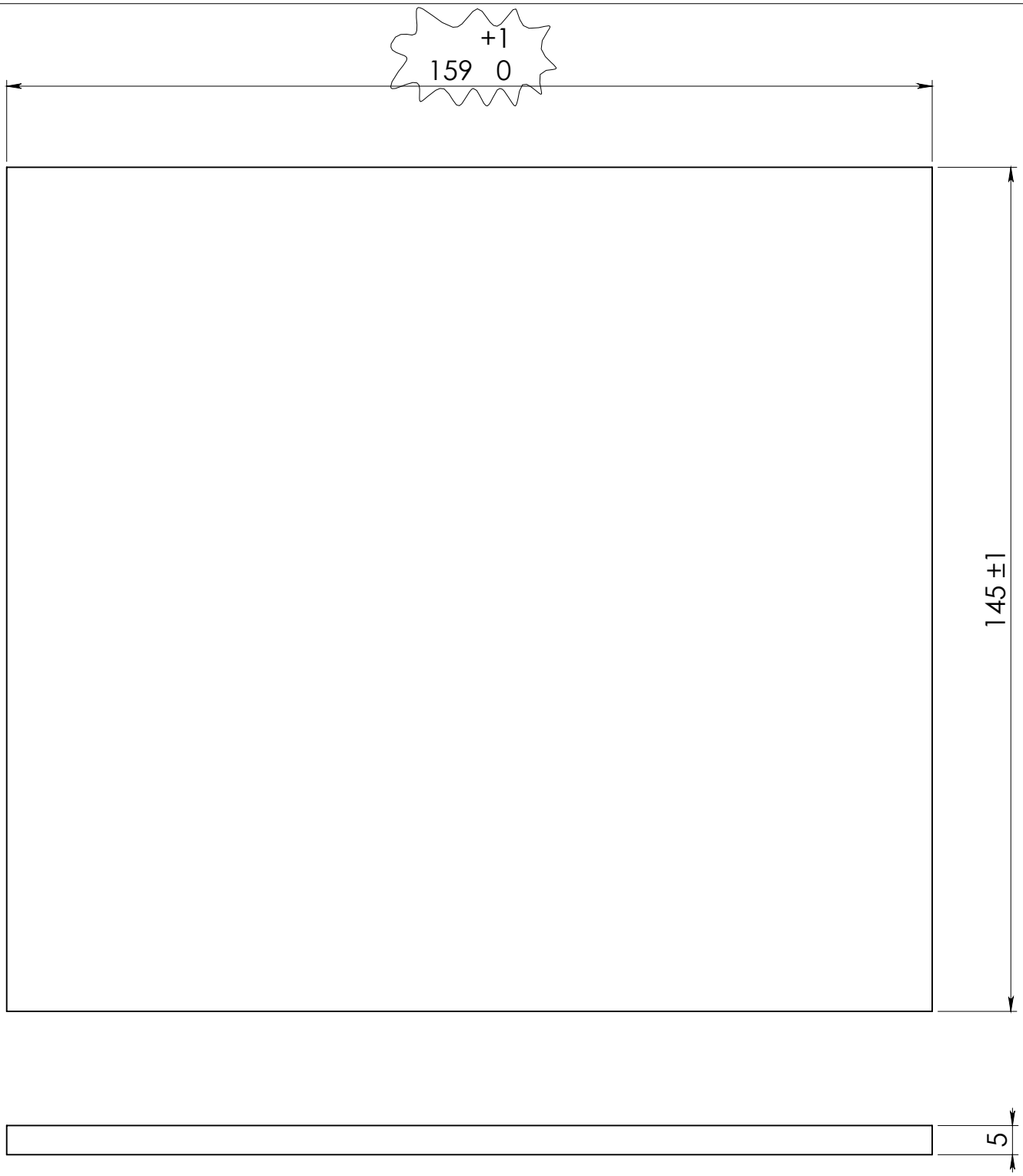
Rev.:	Revision:	Sign:	Dato:
b	Patent 3 knaster	RSV	25.10.2005
c	Ændret 2 knaster —n— og flyttet 2 anviser	RSV	07.02.2006

LEVERANDØR TIL DET KGL. DANSKE HOF
morsø
AKTIESELSKABET N.A. CHRISTENSEN & CO.
DK-7900 NYKØBING MORS
TLF. 07-72 13 00

2 B DØR M. GLAS

(Ændring af eksist. model)

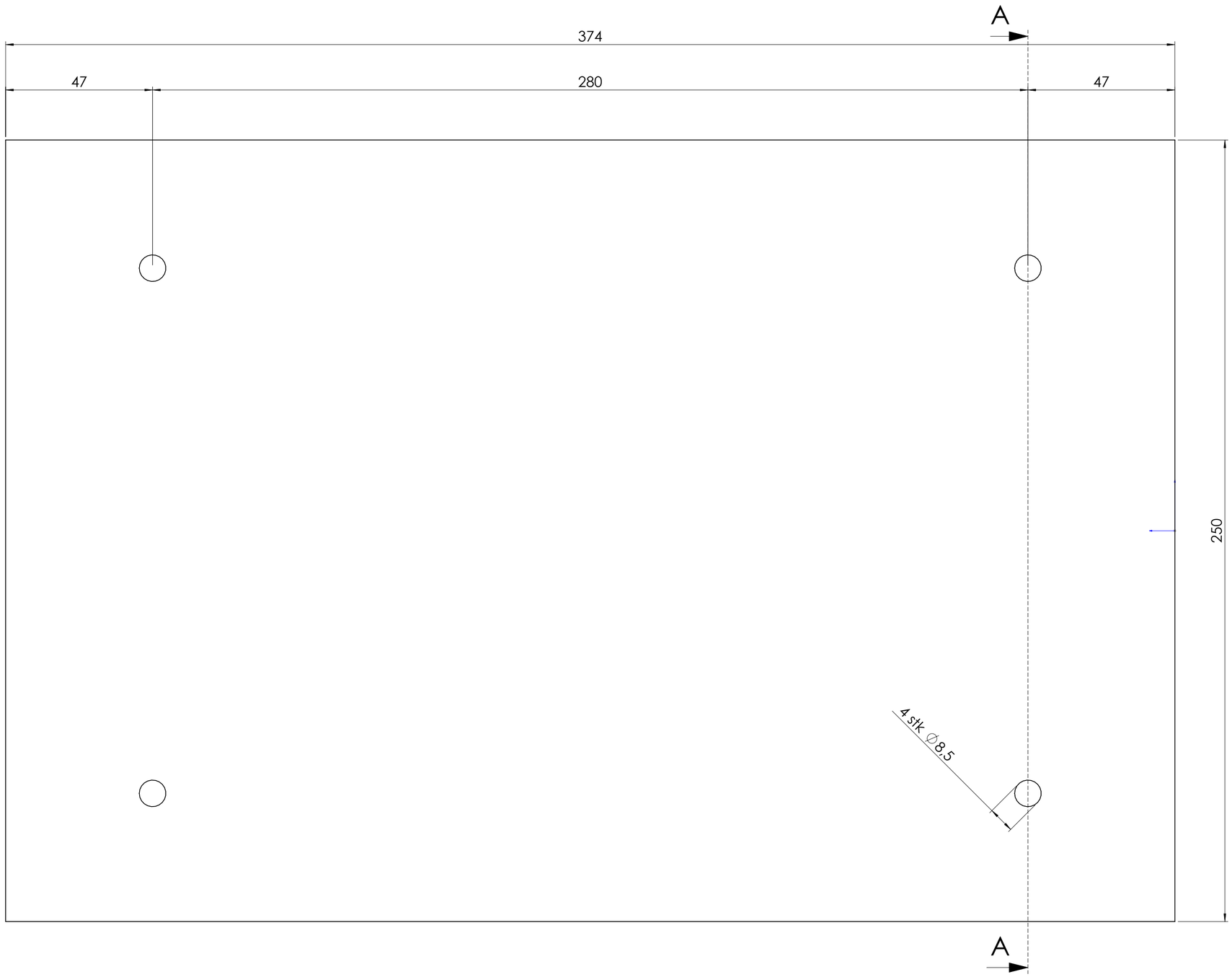
DATO	SIGN.
20.01.88	HN
MÅL: 1:1	ÆNDRET:
MODELNR.: 2034	
TEGNINGSNR.: 2B-59 C	

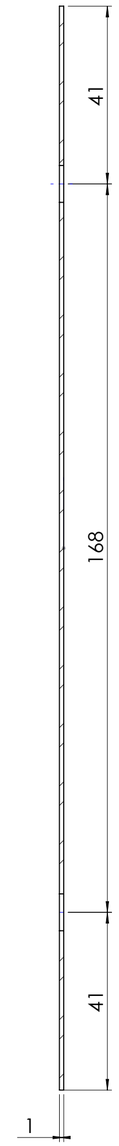


Rev.	Revisions	Sign.:	Date:
e	Ændret breddemålet for 2B Classic	RSV	15.11.05
d	Ændret tolerancer.	RSV	13.03.97
c	Filnavn rettet.	RSV	28.01.97
b	Gamdrup Tegne teknik	HCH	April 96

Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m		Title: **Glas til 2B Classic Morsø 2B**	Construction:	Aa.GJ 12.02.93
			Released:	
Material:	Keramisk glas		Format:	A4
Weight:	0,29 kg		Scale:	1:1
Model no.			Itemno.:	790715
Drawingtype:	Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	2B-64 e
Location of file:	U:\udv\Tegninger\1B&2B\2B Glas.SLDPRT			

Date of print: 04-09-2009



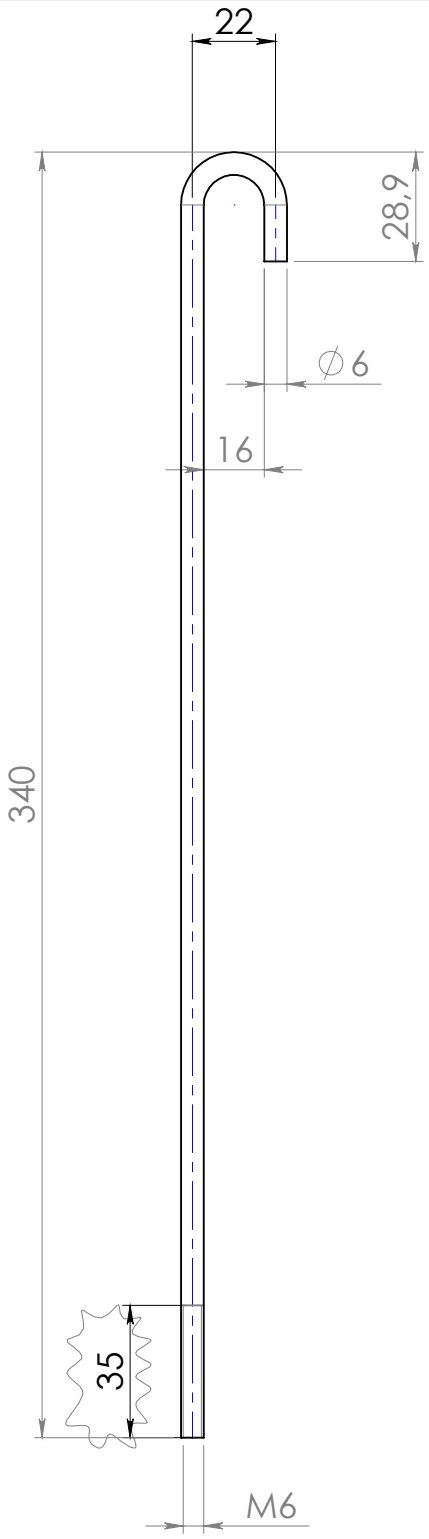


A-A

Rev.	Revisionstekst:	Sign.:	Dato:

Materiale:	1 mm varmgalv. plade			Titel:	
Vægt:	0,75 kg.	Bearbejdes:		**Stråleplade**	
Overfladebeh.:			m²	**Bund**	
Måltolerance:	Mål uden toleranceangivelse DS/ISO 2768-1 m			**2B**	
Ruhedstolerance:					
Værktøjsnr.:					
Tegningstype:	Emnetegning				

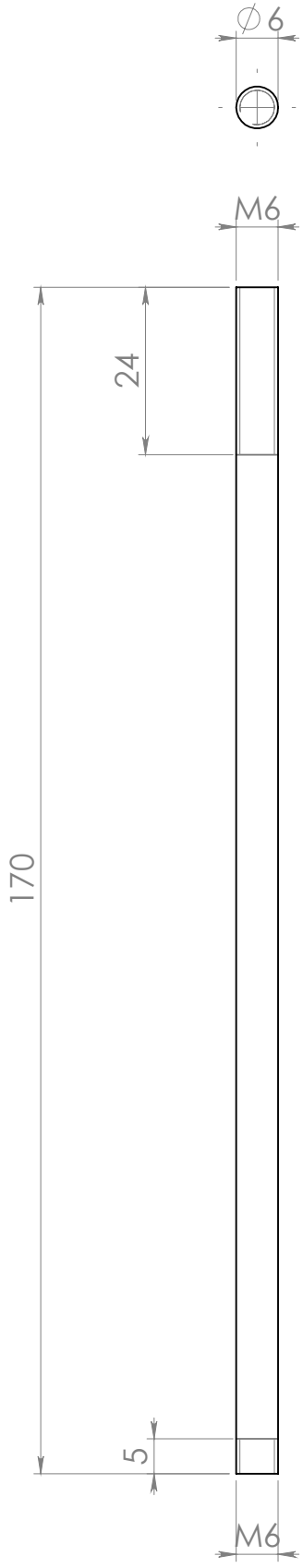
Konstr.:	RSV 10.01.2000
Frigivet:	
Tegn.format:	A2
Målforhold:	**1:1**
Varenr.:	**54137000**
Tegningsnr.:	**2b-70**



Rev.	Revisions	Sign.:	Date:
e	Ændret længde på gevindstykket.	RSV	14.06.05
d	Ændret total længde og længde på gevindstykket.	RSV	31.05.05
c	Ændret længde på gevindstykket.	RSV	27.05.05
b	Ændret tykkelse og øget længde.	RSV	13.05.05

Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m		Title: **Krogbolt 2 BO overdel Morsø 2B**	Construction:	RSV 20.10.03
			Released:	
Material:	SVL. AUTO.STÅL 37.1		Format:	A4
Weight:	0,08 kg		Scale:	**1:2**
Model no.	-		Itemno.:	**542146**
Drawingtype:	Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	**2B-76 e**
Location of file:	U:\udv\Tegninger\1B&2B\2B-76 Krogbolt 2BO overdel.SLDPRT			

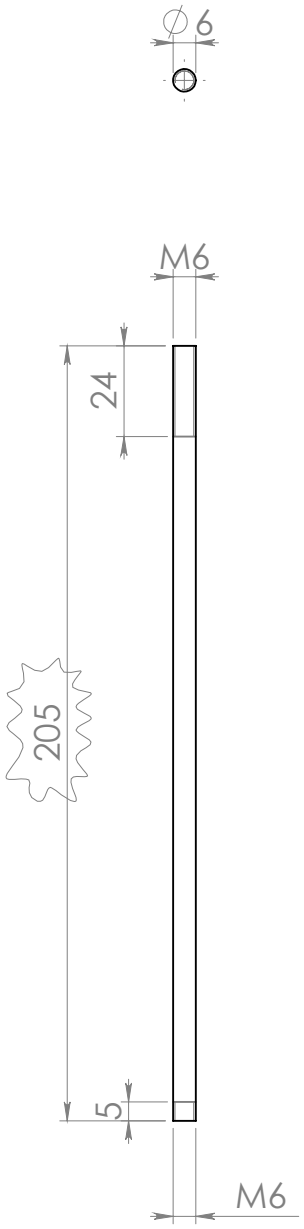
Date of print: 09-06-2016



Rev.	Revisions	Sign.:	Date:

	Title:	Construction:	RSV	20.11.03
Dim. without indication of margin acc. to DS/ISO 2768-1 m	**Stagbolt**	Released:		
Material: Automatic steel		Format:	A4	
Weight: 0,04 kg		Scale:	**1:1**	
Model no. -	**Morsø 2B**	Itemno.:	**542053**	
Drawingtype: Product drawing	morsø By appointment to the Royal Danish Court	Drawing no.:	**2B-77 a**	
Location of file: U:\udv\Tegninger\1B&2B\2B stagbolte.SLDPRT				

Date of print: 09-06-2016

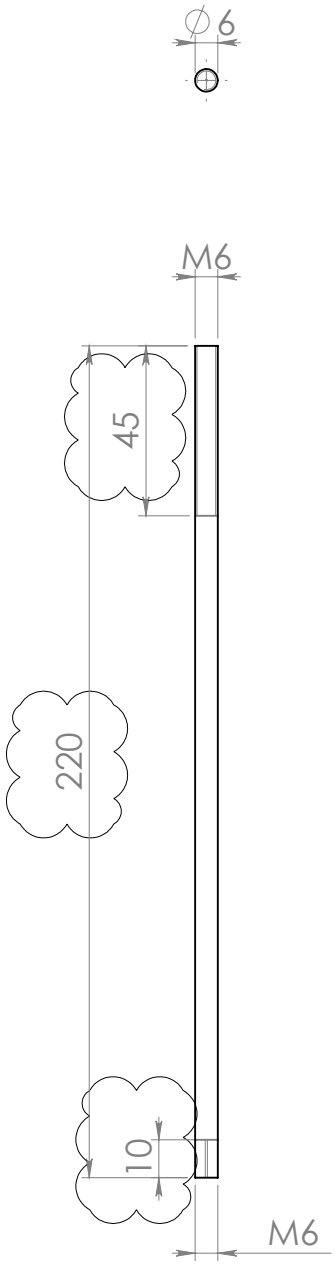


Rev.	Revisions	Sign.:	Date:
b	Ændret længdemål	RSV	11.12.03

Title:		Construction:	RSV	20.11.03
Stagbolt		Released:		
Dim. without indication of margin acc. to DS/ISO 2768-1 m		Format:	A4	
Material:	Automatic steel	Scale:	**1:2**	
Weight:	0,05 kg	Itemno.:	**542054**	
Model no.	-	Drawing no.:		
Morsø 2B			**2B-78 b**	
Drawingtype:	Product drawing			
Location of file:	U:\udv\Tegninger\1B&2B\2B stagbolte.SLDPRT			

morsø
By appointment to the Royal Danish Court

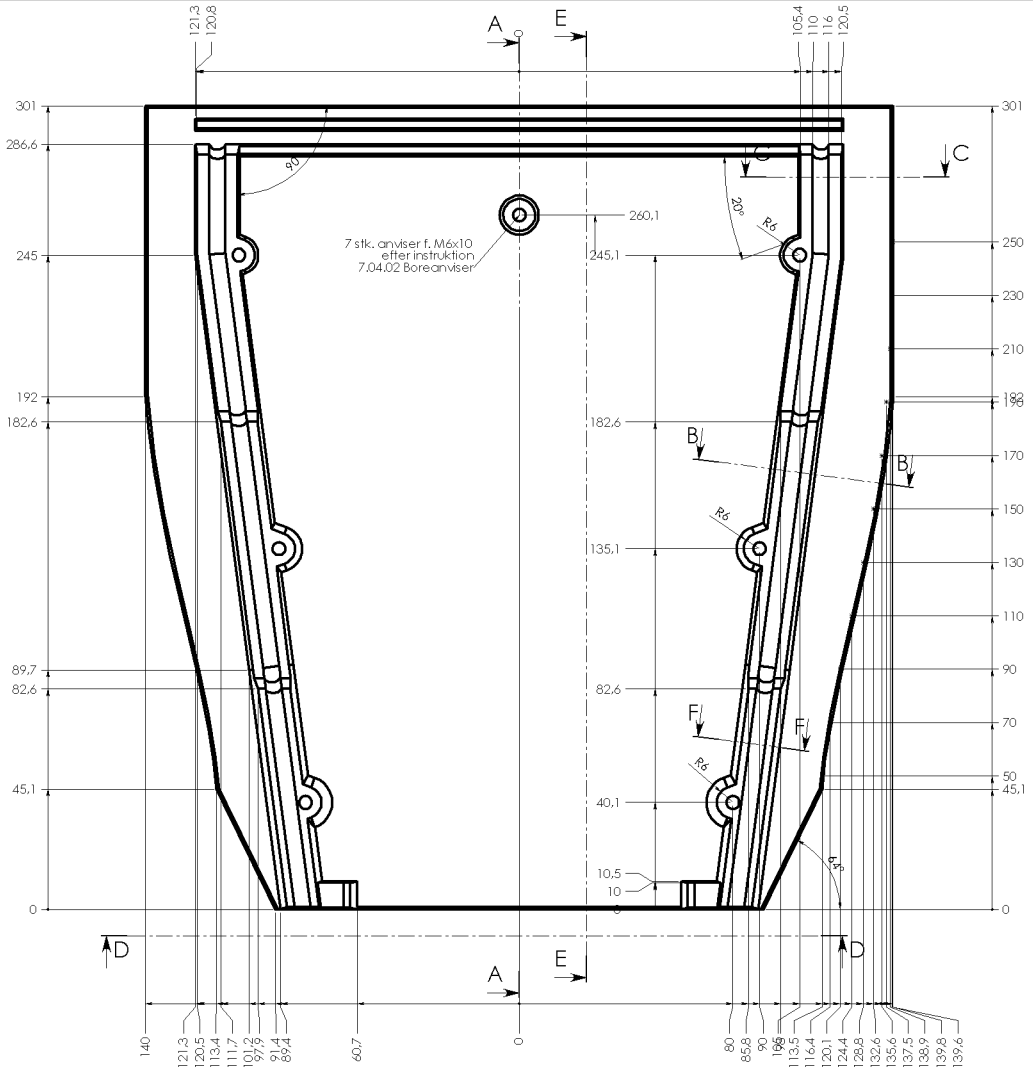
Date of print: 09-06-2016

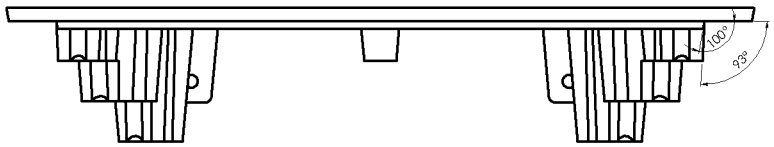


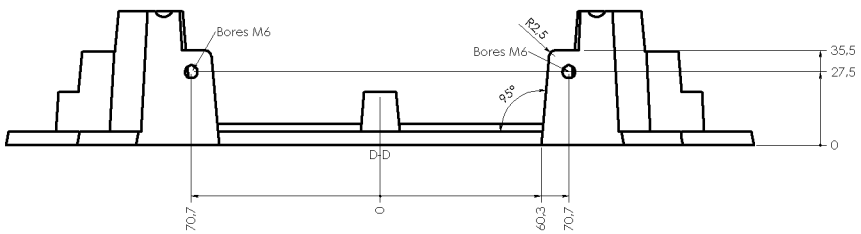
Rev.	Revisions	Sign.:	Date:
b	Changed lenght and threads at both ends.	RSV	08.06.2016

Dim. without indication of margin acc. to DS/ISO 2768-1 m	Title:	Construction:	RSV 20.11.03
Material: Automatic steel	**Stagbolt**	Released:	
Weight kg.: 0.05	**Staybolt**	Format:	A4
Model no. -	**Morsø 2B**	Scale:	**1:2**
Drawingtype: Product drawing		Itemno.:	**542055**
Location of file: U:\udv\Tegninger\1B&2B\2B stagbolte.SLDPRT	morsø	Drawing no.:	**2B-79 b**

Date of print: 09-06-2016

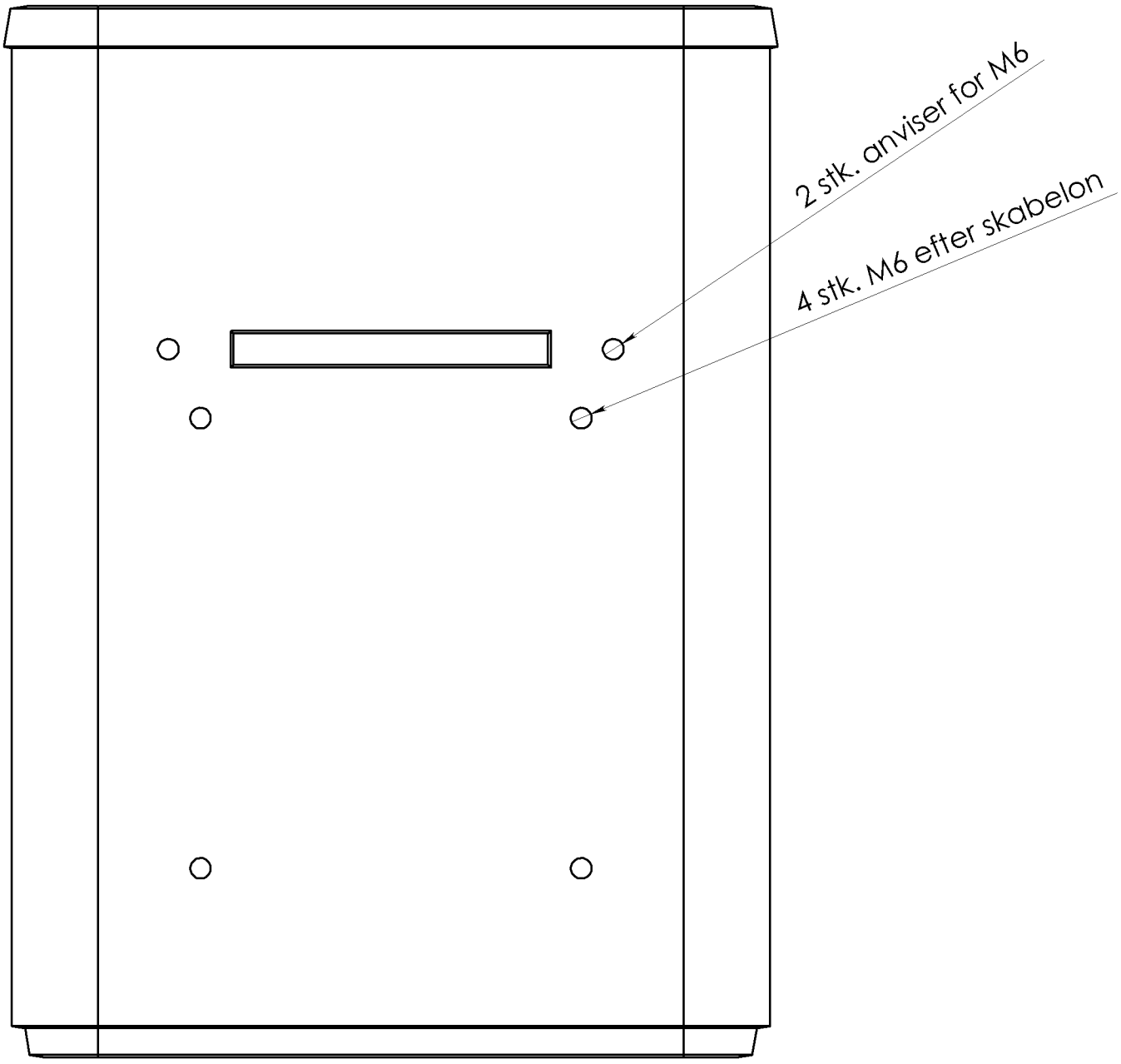






Anviser efter instruktion: 7.04.02 Boreanviser		Rev.	Revisions	Sign.:	Date:
Mål uden toleranceangivelse i h.t. ISO-norm nr. 8062 CT9		Title:	Røgledeplade 2B	Construction: KDU	12.05.05
Material:	Stebejern GG-15			Released: RSV	25.01.2006
Weight:	4,76 kg			Format:	A1
Model no.:	2036		Morsø 2B	Scale:	1:1
Drawingtype:	Stebetegning			Item no.:	34203600
Location of file:			morsø	Drawing no.:	2B-82 a

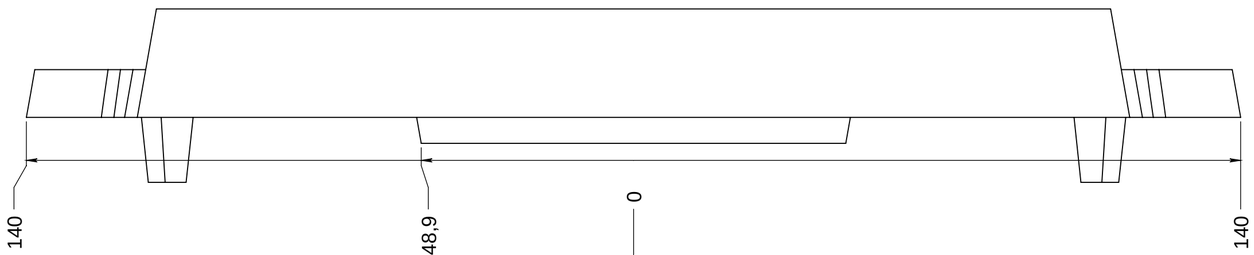
Date created: 25-01-2006

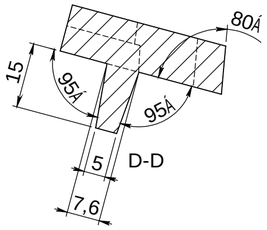


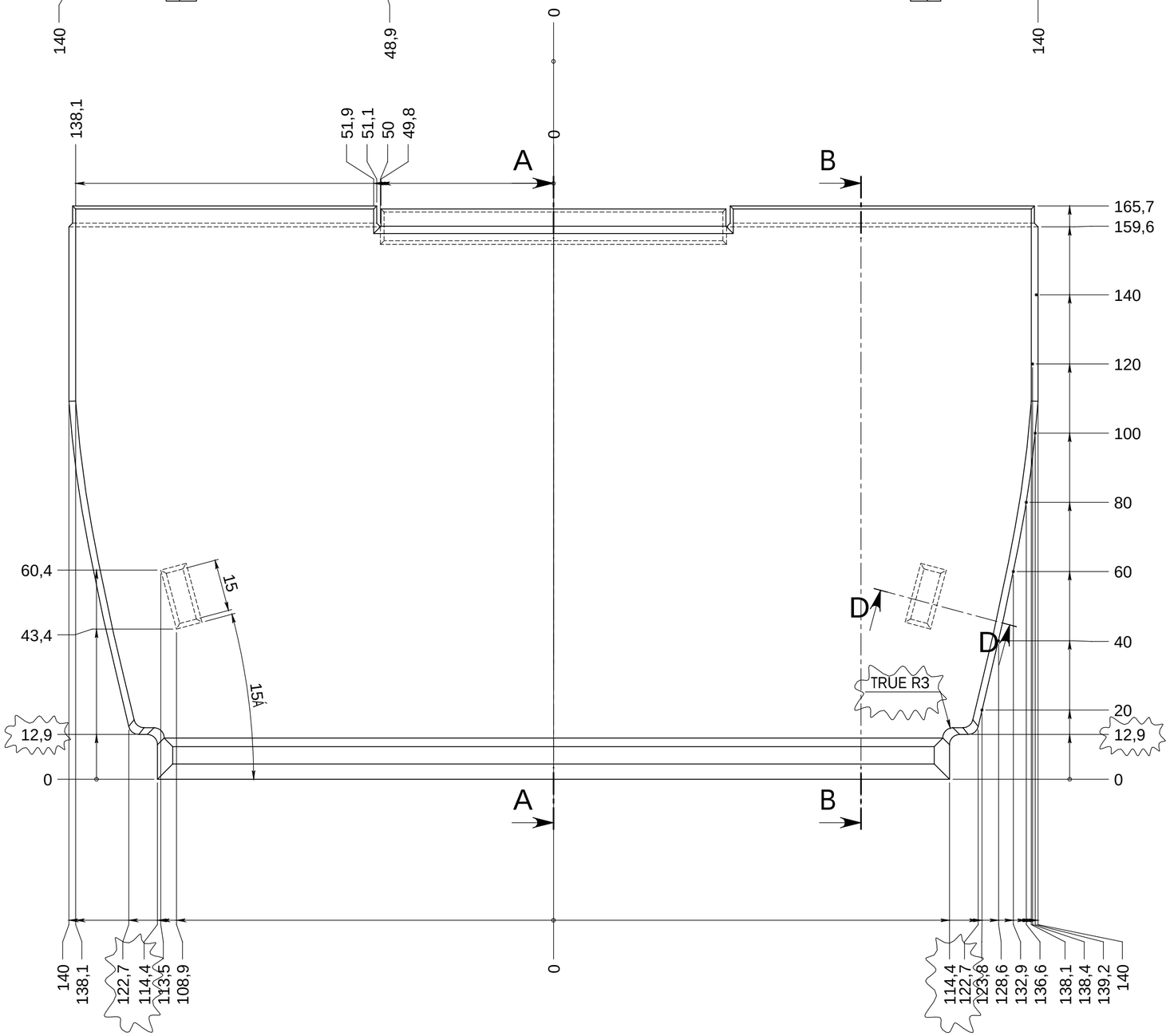
Rev.	Revisions	Sign.:	Date:

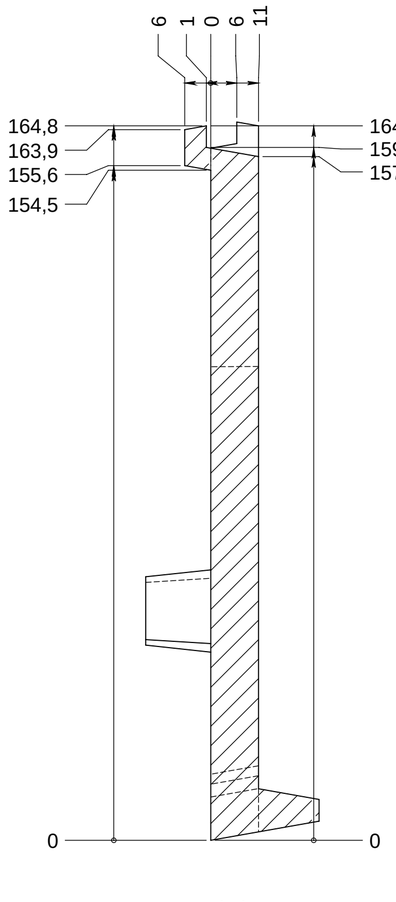
Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9	Title:	Construction:	RSV	03.03.2006
Material: Støbejern GG 15	**Bagplade**	Released:		
Weight: 3,28 kg	**2B Classic**	Format:	A4	
Model no. **2037**	**Morsø 2B**	Scale:	**1:2**	
Borefixturer: **2037**		Itemno.:	**44203700**	
Drawingtype: Bearbejdningstegning	morsø By appointment to the Royal Danish Court	Drawing no.:	**44203700 a**	
Location of file: U:\udv\Tegninger\1B&2B\2B-83 Bagplade.SLDPRT				

Date of print: 03-03-2006

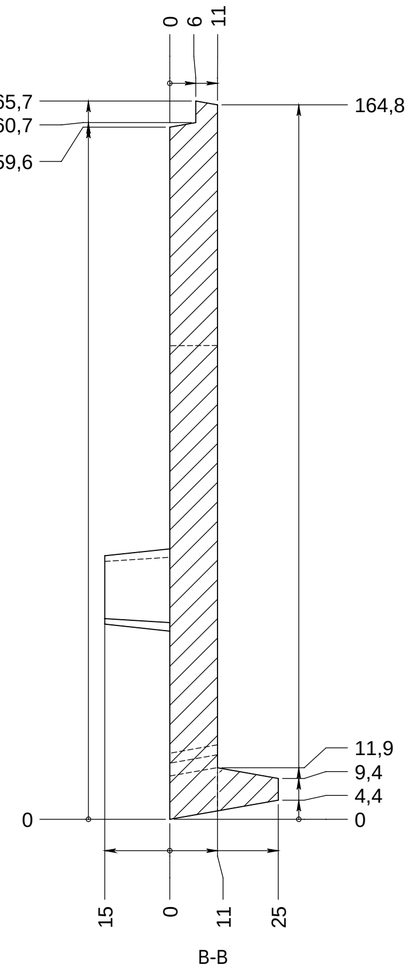




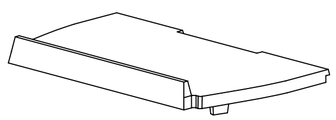




A-A



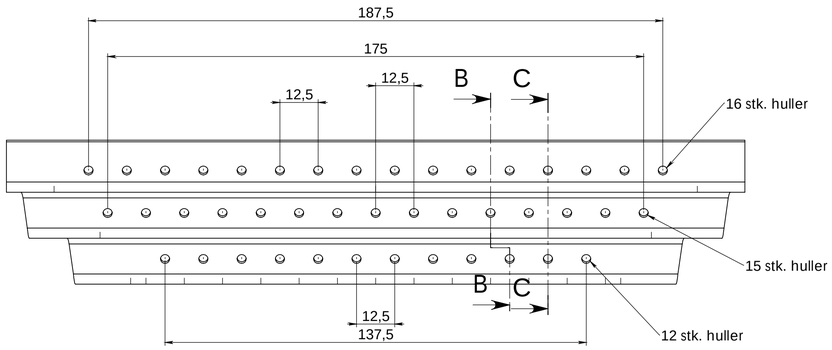
B-B

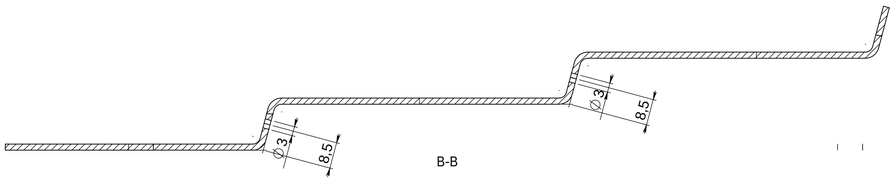


Material: GG15 Crome

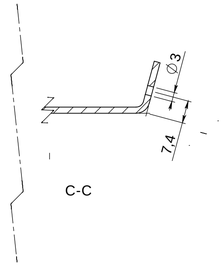
Rev.	Revisions		Sign.:	Date:
d	Fjernet matriale fra begge hjßrner i front.		RSV	05.05.2009
c	Ï get tykkelse fra 8 til 11mm og tilfßjet ribbe.		RSV	10.02.2009
b	Ï get tykkelse fra 5 til 8 mm p¬ den store flade.		RSV	08.05.2007
Drilling Instuctions 7.04.02		Title:	Construction:	KDU	12.05.05
Dim. without indication of margin acc. to ISO Norm No.: 8062 CT9		**Renseklap 2B Classic**	Released:	RSV	25.01.2006
Material:	Cast Iron GG15 Crom	**Access door 2B Classic**	Format:	**A2**	
Weight:	3,62 kg	**Morsß 2B**	Scale:	**1:1**	
Model no.	**2038**		Itemno.:	**34203800**	
Drawingtype:	Casting Drawing	morsø	Drawing no.:	**2B-84 d**	
Location of file:	U:\udv\Tegninger\1B&2B\2B-84 Renseklap.SLDPRT				

Date of print: 05-05-2009

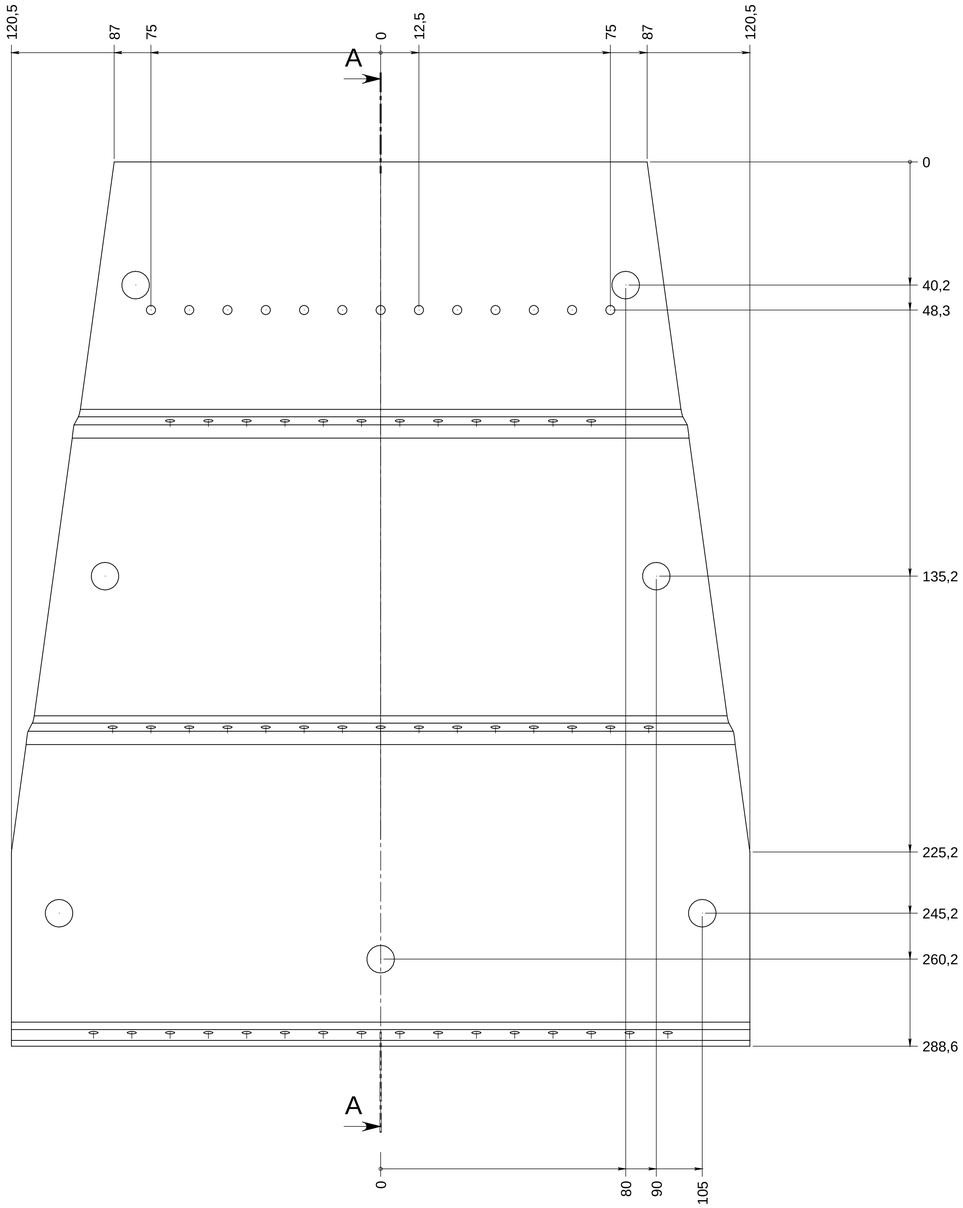


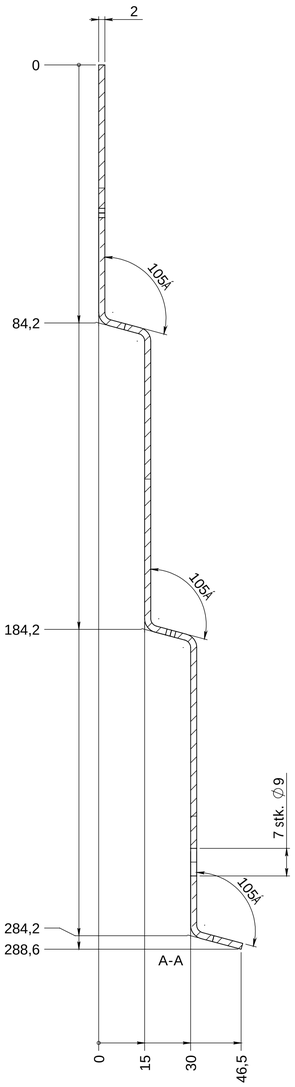


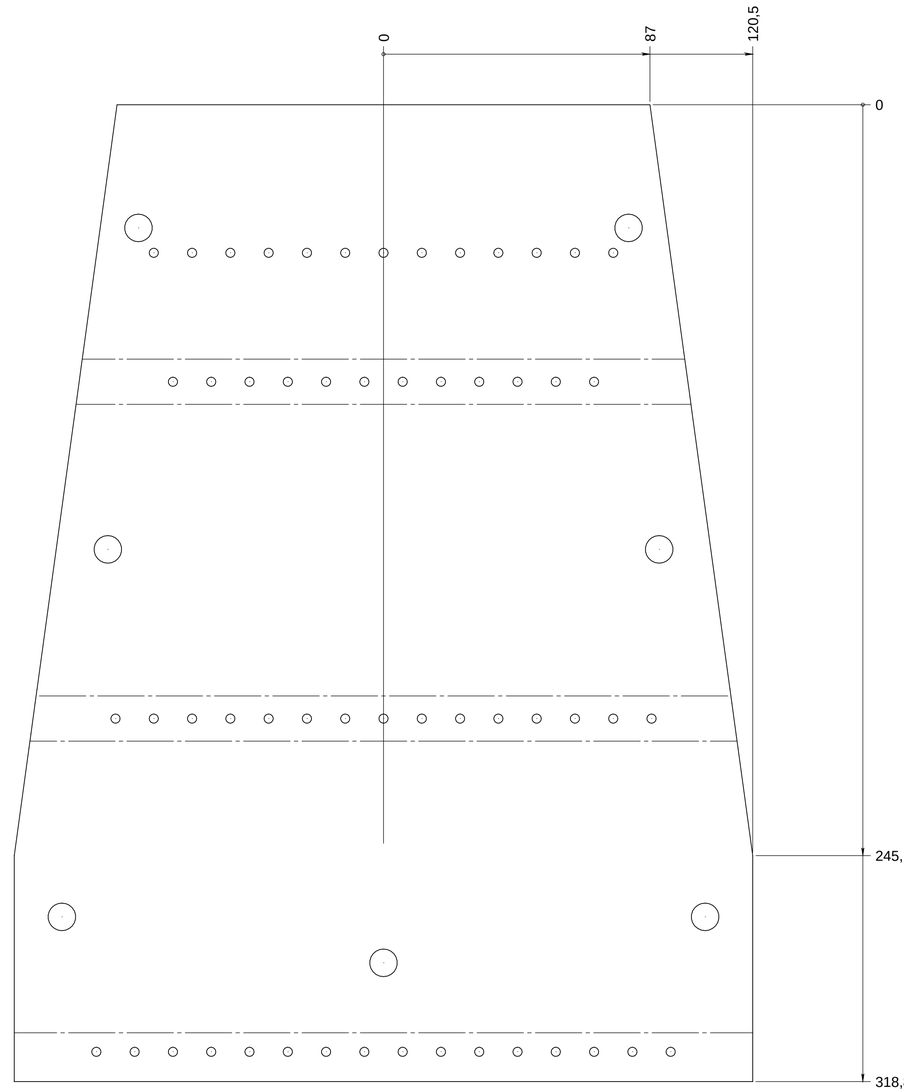
B-B



C-C







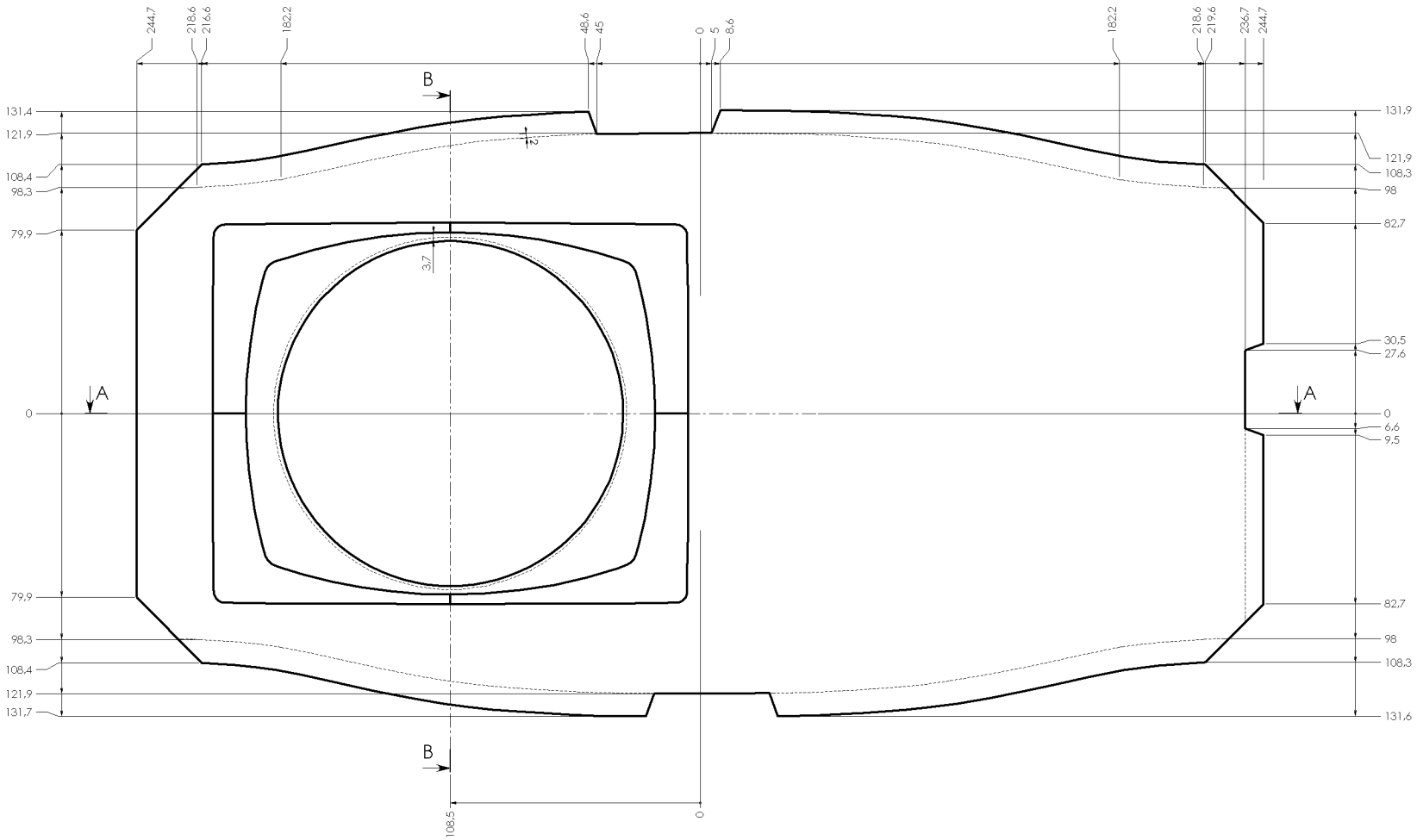
Udfoldet

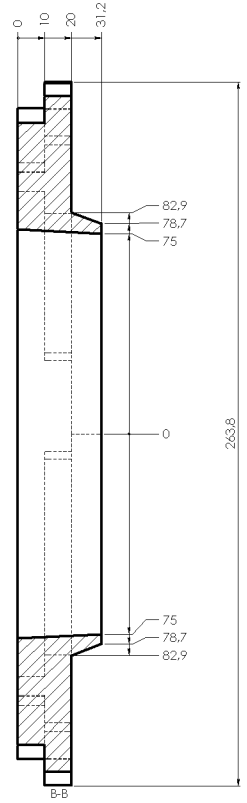
c	P~ßrt matriale (ASIS 304)		RSV	18.12.2007
b	Ï get 7 stk. huller fra Ï 7,5 til Ï 9		RSV	26.06.2007
Rev.	Revisions		Sign.:	Date:
		Construction:	KDU	17.05.05
Dim. without indication of margin acc. to DS/ISO 2768-1 m		Released:	RSV	30.01.2006
Material:	Rustfri st~l/Stainless steel (ASIS 304)	Format:	A1	
Weight:	1,06 kg	Scale:	1:1	
Model no.	-	Itemno.:	71209061	
Drawingtype:	Product Drawing	Drawing no.:	2B-85 c	
Location of file:	U:\cdv\Tegninger\2B\2B-85 Rustfri rißgledeplade.SLDPRT			

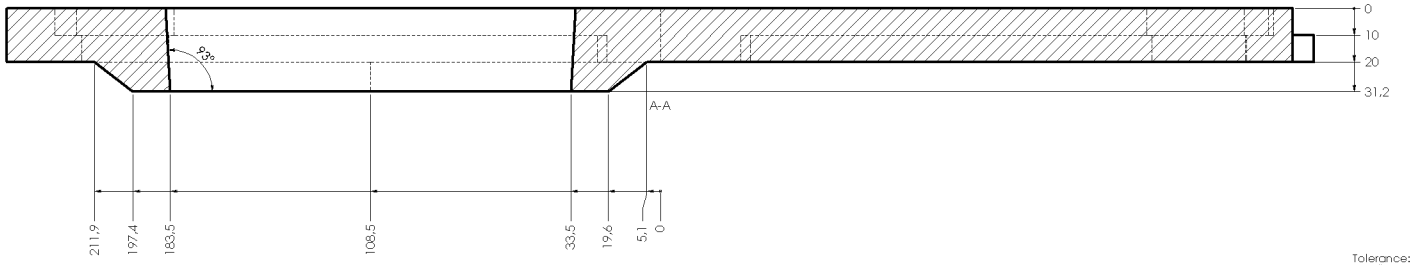
Title: **Rustfri rßgledeplade**
Baffle stainless
Morsß 2B Classic

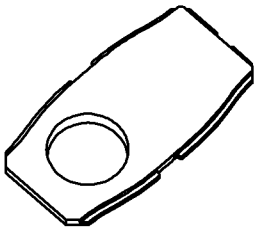
morsø By appointments to the Royal Danish Court

Date of print: 27-11-2008







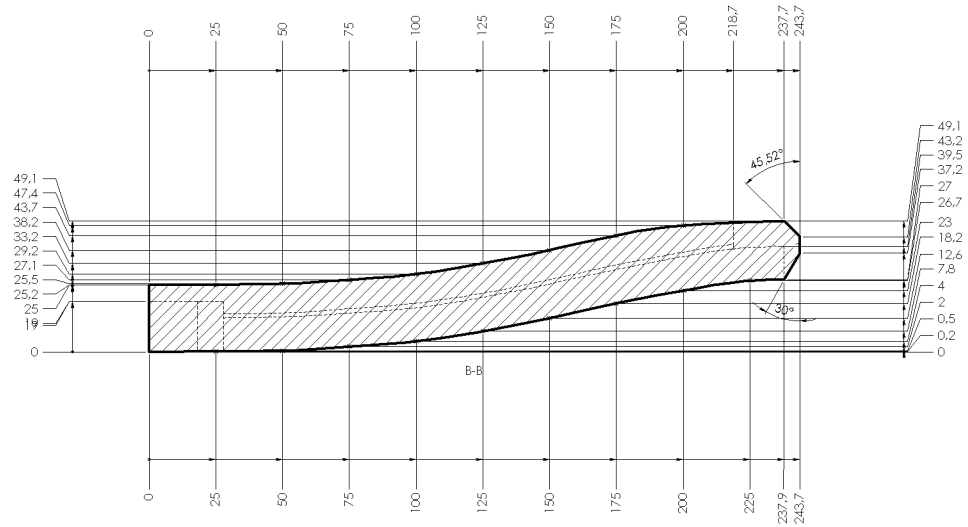


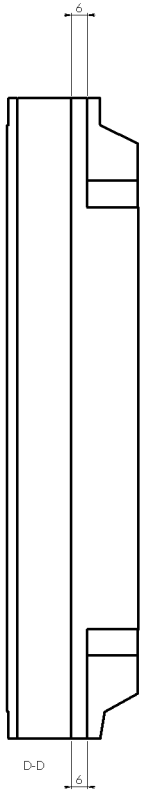
Tolerance:

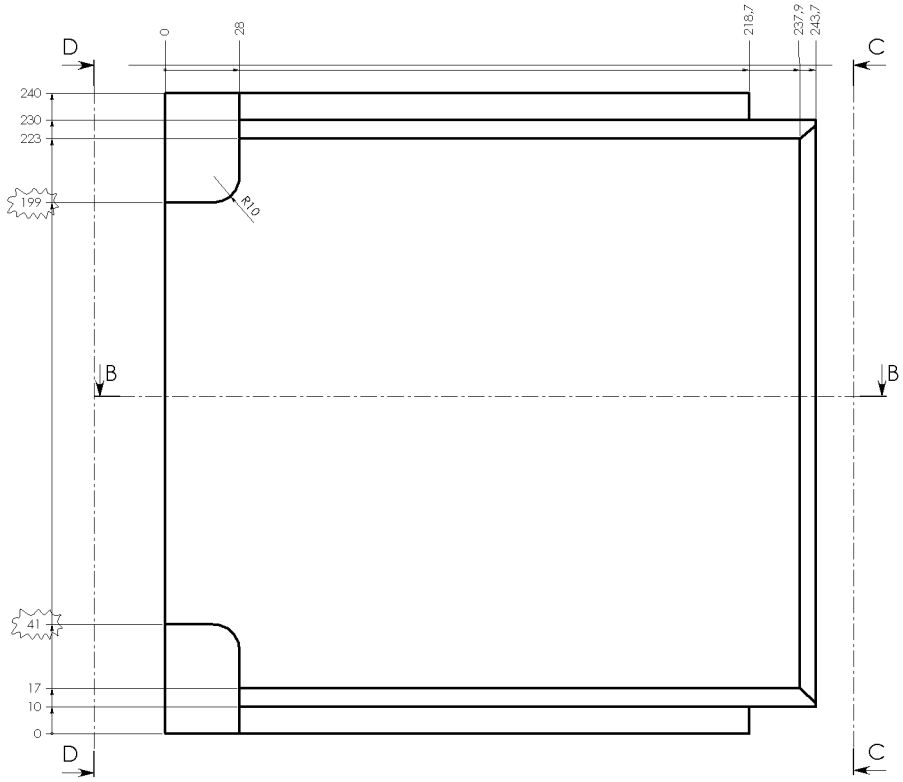
0 < dim < 10	± 0,5 mm
10 < dim < 120	± 1,0 mm
120 < dim < 400	± 1,5 mm
400 < dim < 600	± 2,0 mm
600< dim < 1400	± 2,5 mm

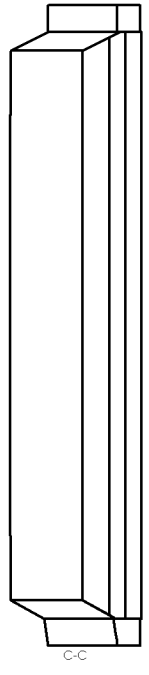
Tolerance:	Se tegning
Material:	Vermiculite V-1100 Mk.2
Weight:	1,2 kg
Model no.:	-
Drawing type:	Emnetegning
Location of file:	

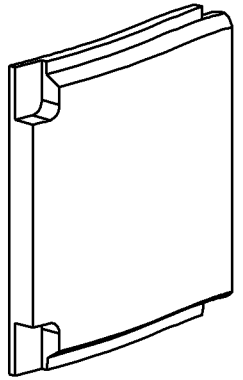
Rev.	Revisions	Sign.:	Date:
	Title:	Construction:	KDU 18.05.05
	Sten bund	Released:	RSV 27.01.2006
	Vermiculite	Format:	**A1**
	Morsø 2B	Scale:	**1:1**
		Item no.:	**79209200**
	morsø	Drawing no.:	**2B-86 a**











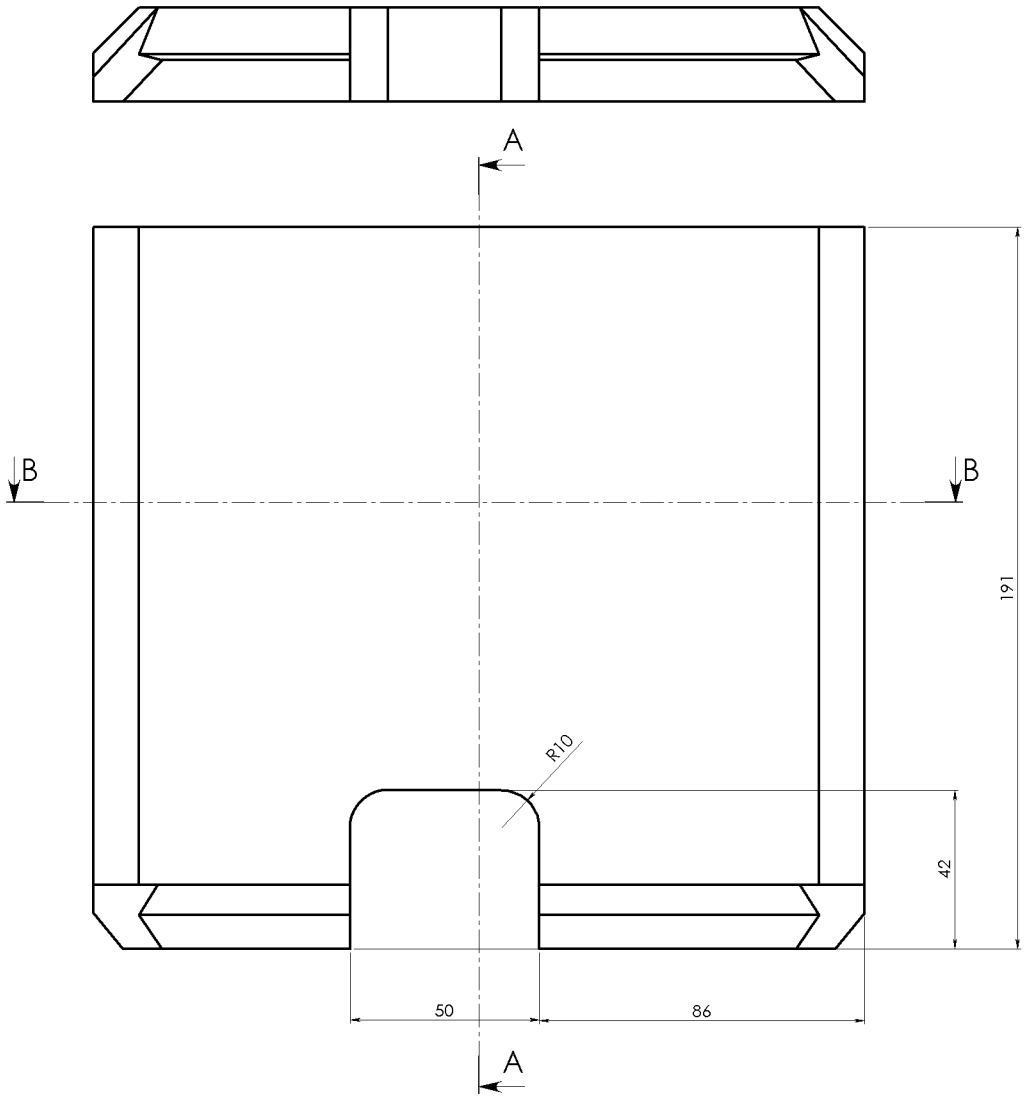
Tolerance:

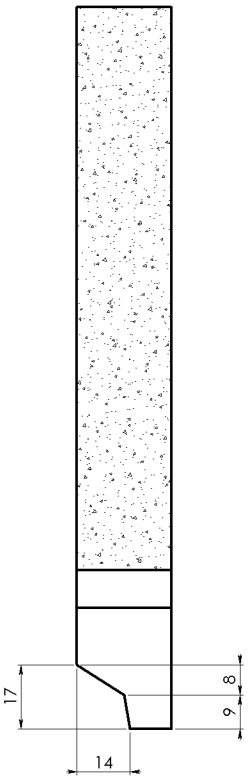
0 < dim < 10	± 0,5 mm
10 < dim < 120	± 1,0 mm
120 < dim < 400	± 1,5 mm
400 < dim < 600	± 2,0 mm
600< dim < 1400	± 2,5 mm

b	Øget højde påbegge udskæringerne.	RSV	5.09.2006
Rev.	Revisions	Sign.:	Date:

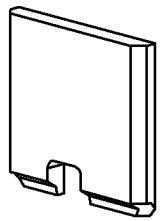
Tolerance:	Se tegning	Title:	Sten side 2B
Material:	Vermiculite V-1100 Mk.2		Vermiculite
Weight:	0,79 kg		Morsø 2B
Model no.:	-		
Drawingtype:	Emnetegning		
Location of file:			

Construction:	KDU	18.05.05	
Released:	RSV	27.01.2006	
Format:	A1		
Scale:	1:1		
Itemno.:	79209000		
Drawing no.:	2B-87 b		





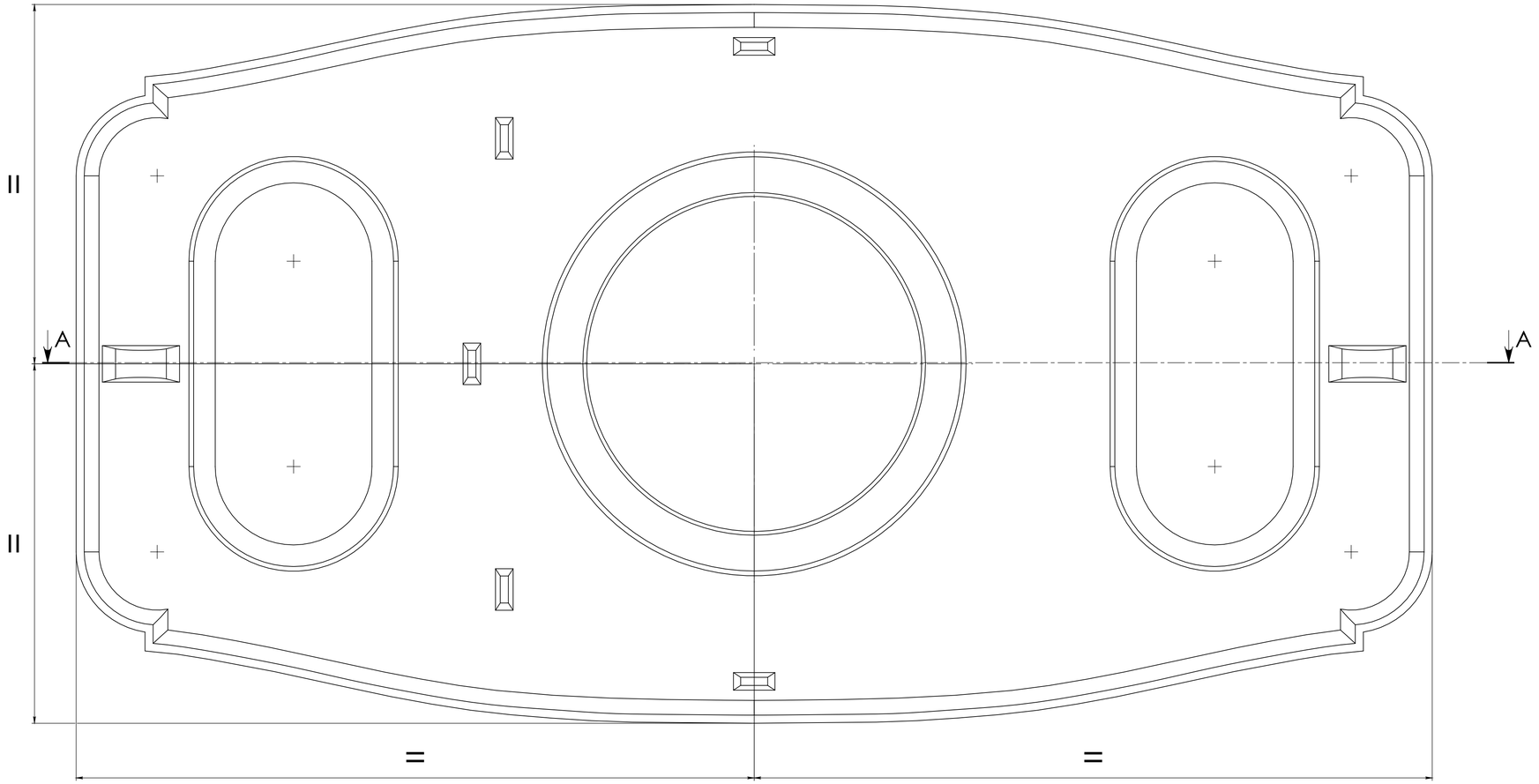
A-A

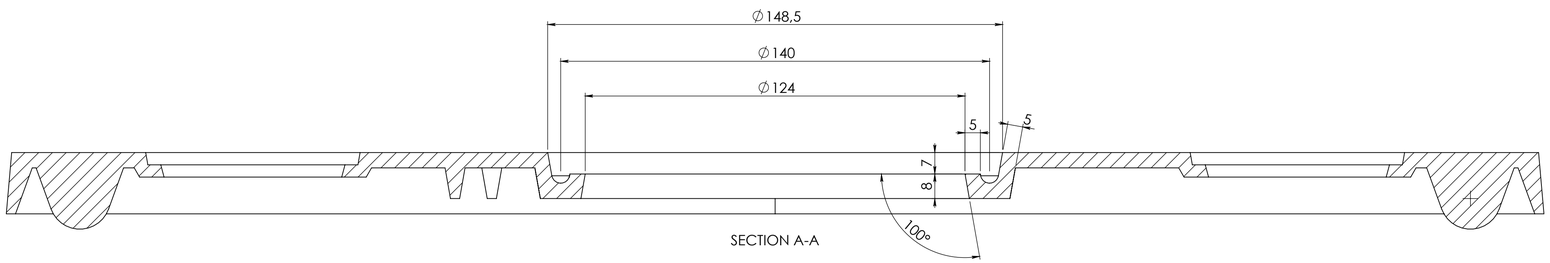


Tolerance:

0 < dim < 10	± 0,5 mm
10 < dim < 120	± 1,0 mm
120 < dim < 400	± 1,5 mm
400 < dim < 600	± 2,0 mm
600< dim < 1400	± 2,5 mm

		Rev.	Revisions	Sign.:	Date:
		Title:		Construction: KDU	18.05.05
Tolerance:	Se tegning	**Sten bag 2B**		Released: RSV	27.01.2006
Material:	Vermiculite v-1100 Mk.2	**Vermiculite**		Format:	**A2**
Weight:	0,52 kg			Scale:	**1:1**
Model no.	-	**Morsø 2B**		Itemno.:	**79209100**
Drawingtype:	Emnetegning	morsø		Drawing no.:	**2B-88 a**
Location of file:					





SECTION A-A

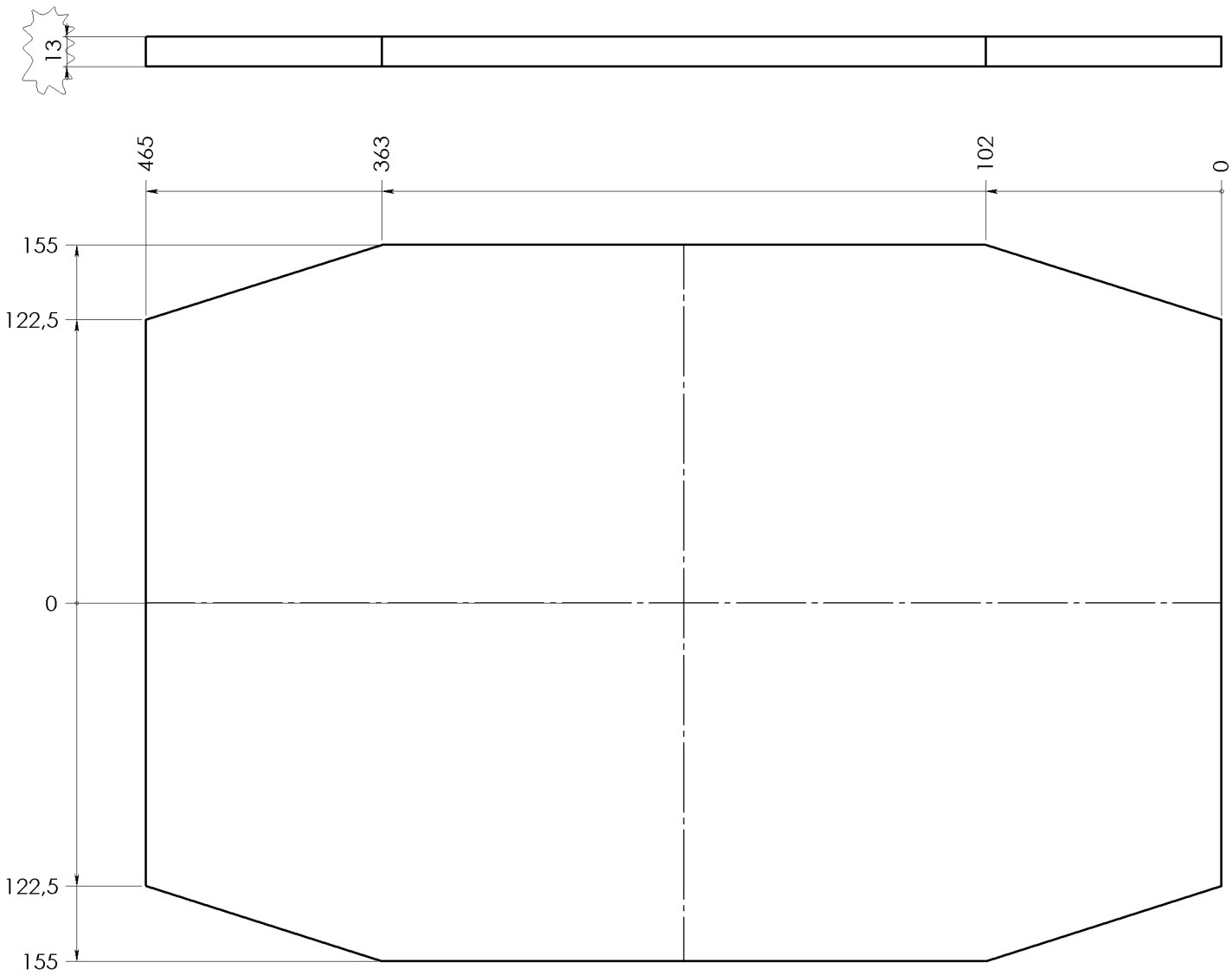
Revision af eksisterende modelnr. 2117
Øvrige mål, som eksisterende emne.

Rev.	Revisions	Sign.:	Date:

	Title:	Construction:	KDU 02.06.05
Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9	**Topplade 2BO**	Released:	KDU 07.10.05
Material:		Format:	**A1**
Weight:	4.4 kg	Scale:	**1:1**
Model no.	**2117**		**Morsø 2BO**
Itemno.:	**342117**		
Drawingtype:	Støbetegning	Drawing no.:	**2B-89 a**
Location of file:	C:\Working\2B-89 topplade overdel 2BO.SLDPRT		

morsø By appointment to HM Royal Danish Court

Date of print: 10-11-2014



Rev.	Revisions	Sign.:	Date:
b	Ændret tykkelsen fra 10 mm til 13 mm.	RSV	07.02.2006

Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m		Construction:	KDU 12.09.05
Material:	Iso glas (Therm's)	Released:	RSV 03.02.2006
Weight:		Format:	A3
Model no.	-	Scale:	1:2
Drawingtype:	Emnetegning	Itemno.:	79077100
Location of file:	U:\vdA Tegninger\18&2b\2B-90 isoleringsmåtte 2B Classic.SLDPRT	Drawing no.:	2B-90 b

Title:

Isoleringsmåtte

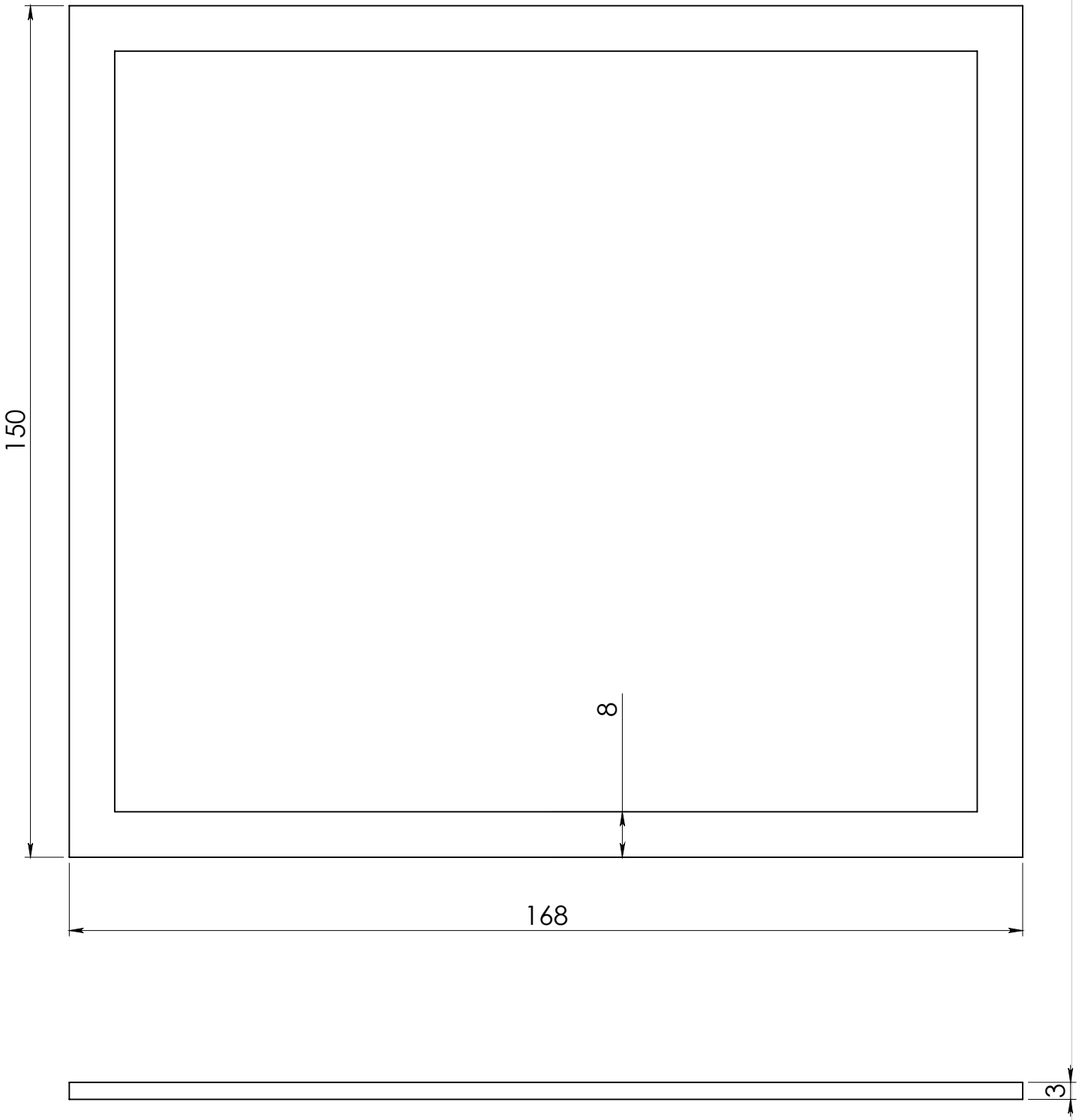
2B Classic

Morsø 2B

morsø

By appointment to the Royal Danish Court

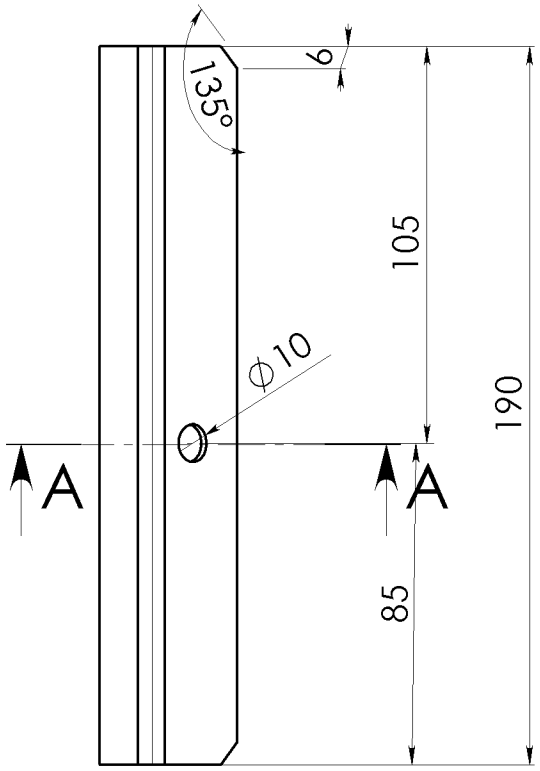
Date of print: 07-02-2006

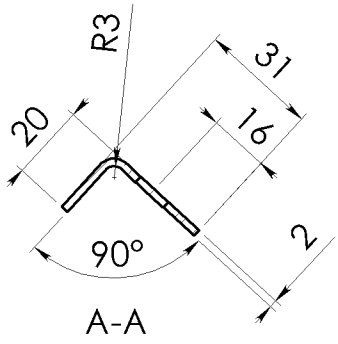


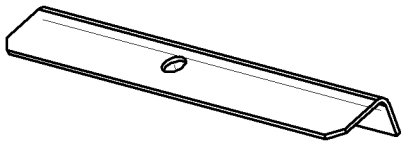
Rev.	Revisions	Sign.:	Date:

Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m	Title: **Glasbånd 2B**	Construction:	RSV	14.11.05
		Released:		
Material: 8x4mm Glasbånd m. tape		Format:	A4	
Weight: 0,11 kg		Scale:	**1:1**	
Model no.	**Morsø 2B**	Itemno.:	**79074500**	
Drawingtype: Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	**2B-94 a**	
Location of file: U:\udv\Tegninger\1B&2B\2B-94 Glasbånd 2B Classic.SLDPRT				

Date of print: 19-03-2020



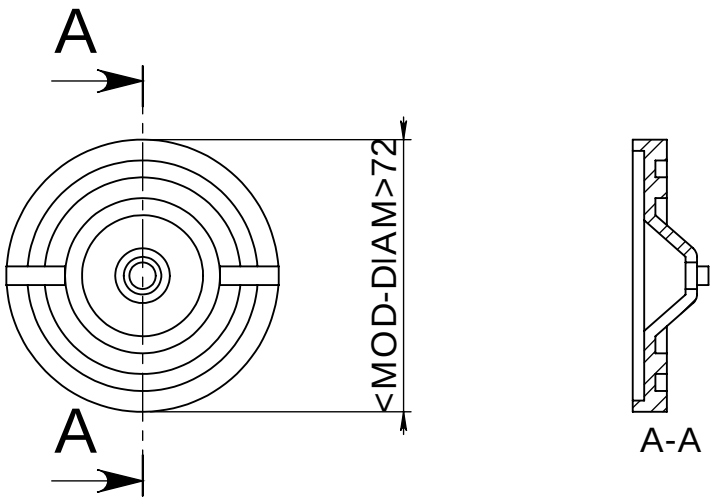


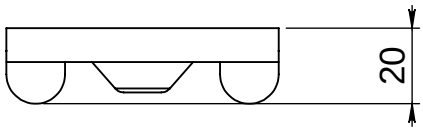


b	Diverse ændringer.		RSV	31.01.2006
Rev.	Revisions		Sign.:	Date:

	Title:	Construction:	RSV	04.11.05
Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m	**Varmeskjold front**	Released:	RSV	30.01.2006
Material: Rustfri stål	**2B Classic**	Format:	A4	
Weight: 0,13 kg		Scale:	1:2	
Model no.	**Morsø 2B**	Itemno.:	71209161	
Drawingtype: Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	2B-95 b	
Location of file: U:\udv\Tegninger\1B&2B\2B-95 Varmeskjold front 2B Classic.SLDPRT				

Date of print: 09-02-2006



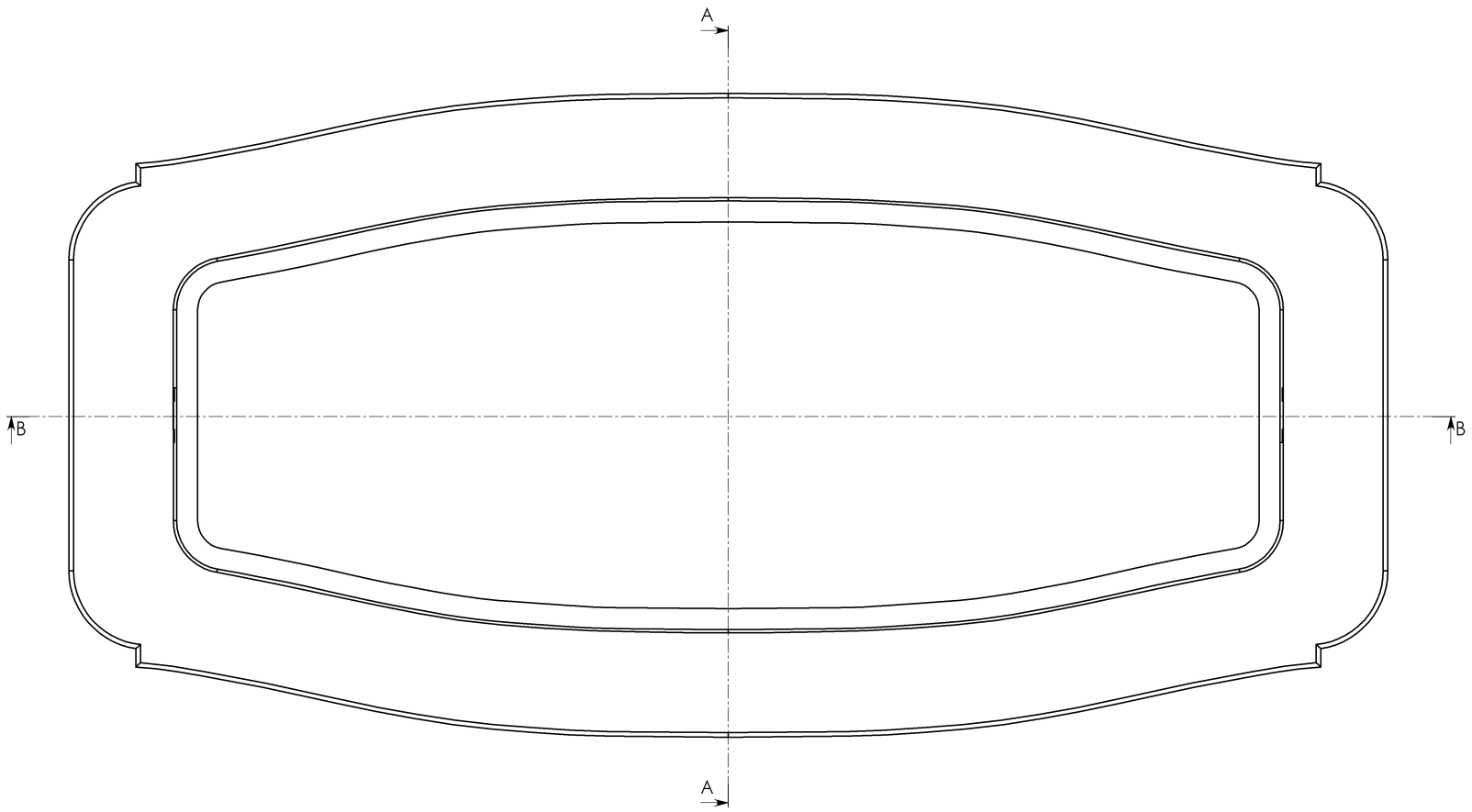


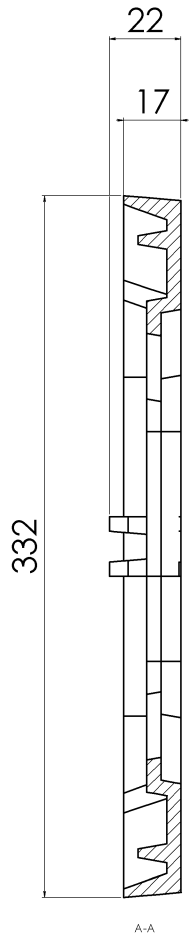
Konstruktionstegning
15.11.05

Rev.	Revisions	Sign.:	Date:

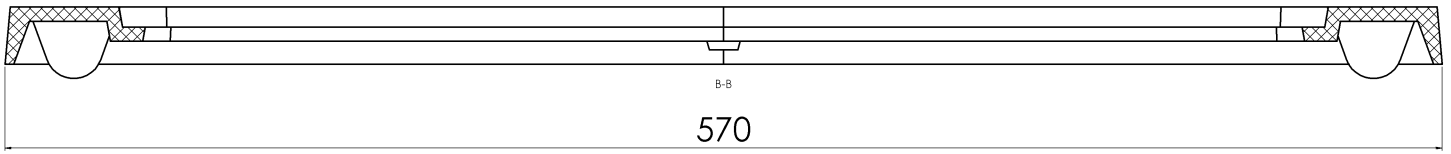
	Title:	Construction:	RSV	15.11.05
M¬l uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9	**Tr Þ kventil**	Released:		
Material:	Cast iron GG15	Format:	A4	
Weight:	0,17 kg	Scale:	**1:2**	
Model no.	**2022**	**Morsß 2B**	Itemno.:	**342022**
Drawingtype:	Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	**2B-96**
Location of file:	U:\udv\Tegninger\1B&2B\2B-96 Tr Þ kventil 2B.SLDPRT			

Date of print: 11-02-2009





A-A

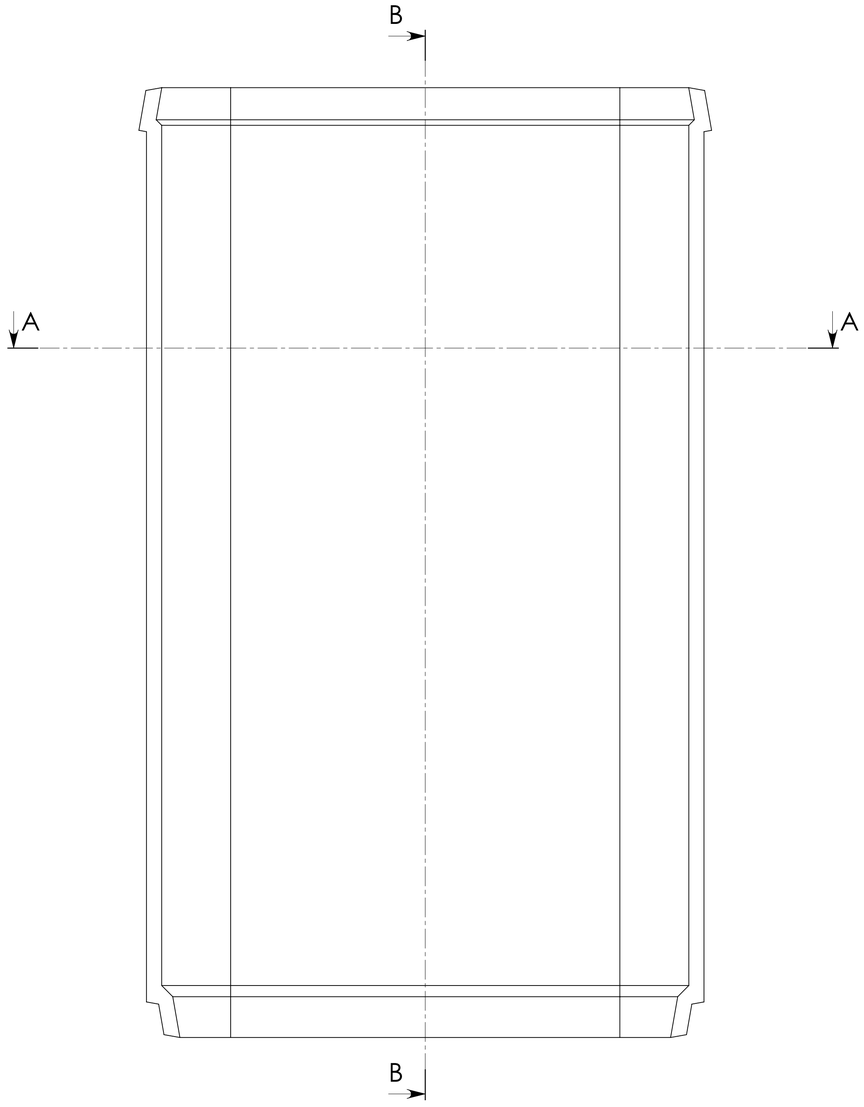


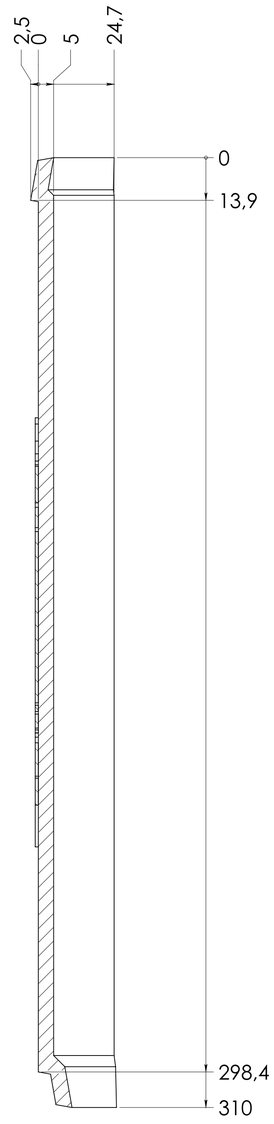
Konstruktionstegning
16.11.05

Rev.	Revisions	Sign.:	Date:
	Title: **Topplade 2BO**	Construction: RSV	16.11.05
		Released:	
		Format:	**A1**
		Scale:	**1:1**
	Morsø 2BO	Item no.:	**342111**
		Drawing no.:	**2B-97**

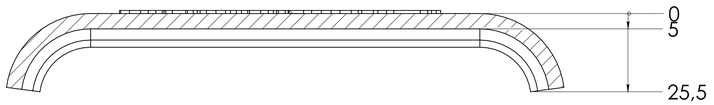
Mål iflg. tolerancegivelse Ch.1, ISO-norm nr. 8062 CT9	
Material:	Støbejern GG-15
Weight:	4,66 kg
Model no.:	**2111**
Drawing type:	Støbetegning
Location of file:	

Date of print 16-12-2005





B-B

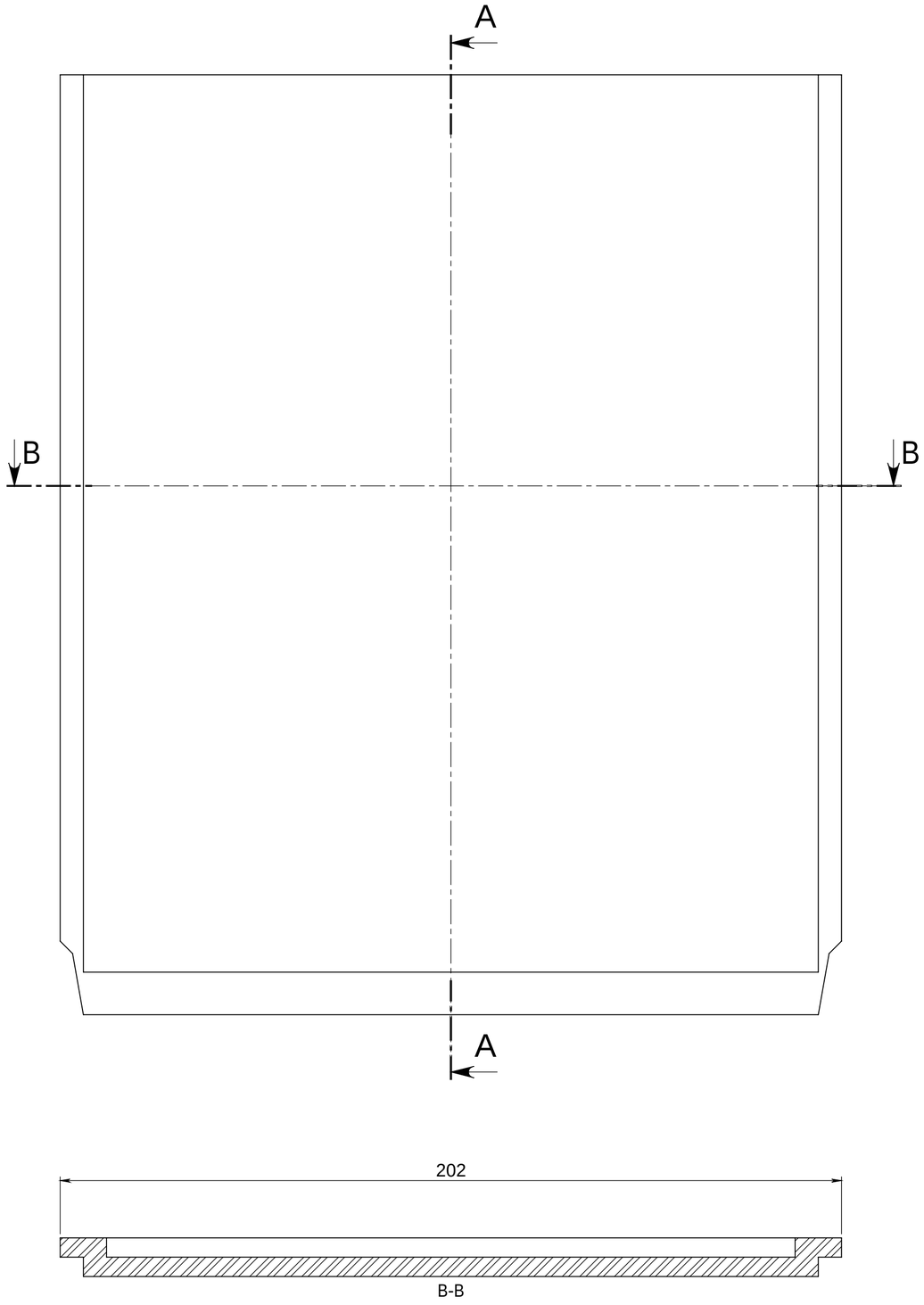


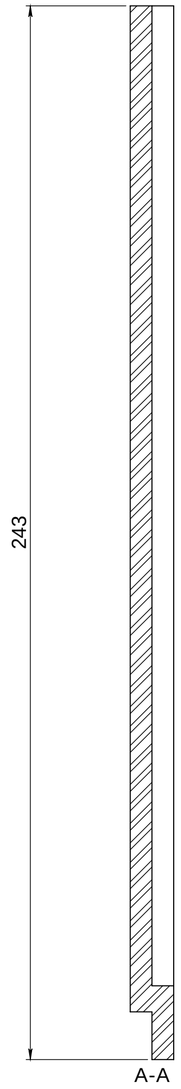
A-A

Rev. Revisions		Sign.:	Date:
Title: For og bagplade overdel Morsø 2B	Construction:	RSV	17.11.05
	Released:	RSV	2011.11.30
Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9	Format:	A1	
Material: Cast Iron GG15	Scale:	1:1	
Weight: 2,32 kg	Itemno.:	44211400	
Model no. 2114	Drawing no.:	2B-99 a	
Drawingtype: Støbetegning			
Location of file:			

morsø
By appointment to HM The Queen of Denmark

Date of print: 30-11-2011



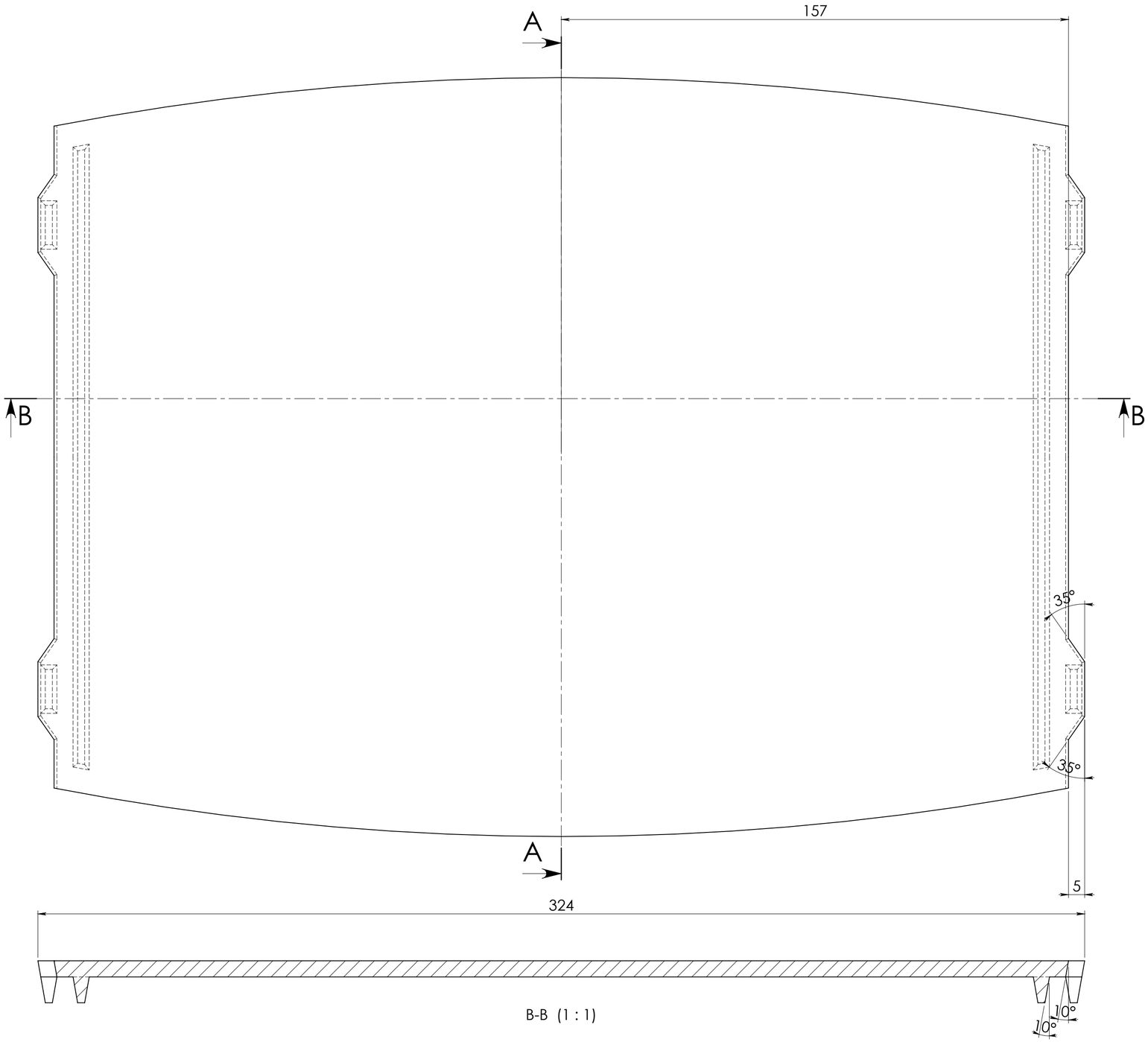


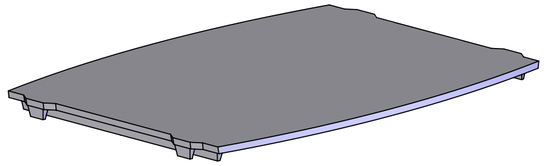
Konstruktionstegning
15.11.05

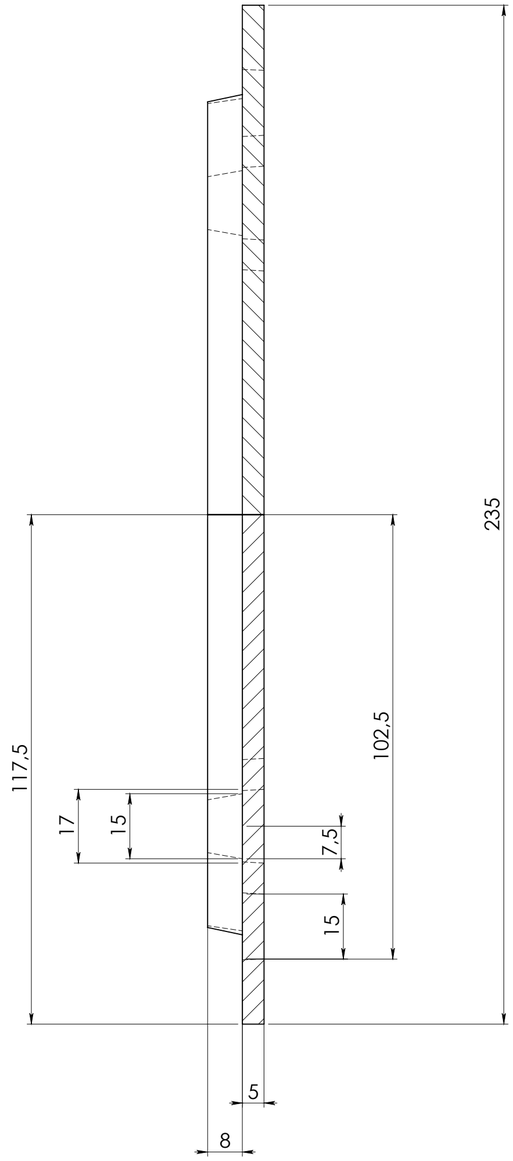
Rev.	Revisions	Sign.:	Date:
		RSV	15.11.05

	Title:	Construction:	
M¬l uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9	**Indvendig gavl overdel Morsß 2B**	Released:	
Material: Cast iron GG15		Format:	**A2**
Weight: 1,91 kg		Scale:	**1:1**
Model no. **2115**		Itemno.:	**342115**
Drawingtype: Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	**2B-100**
Location of file: U:\udv\Tegninger\1B&2B\2B-100 indv. for og bagplade overdel.SLDPRT			

Date of print: 11-02-2009



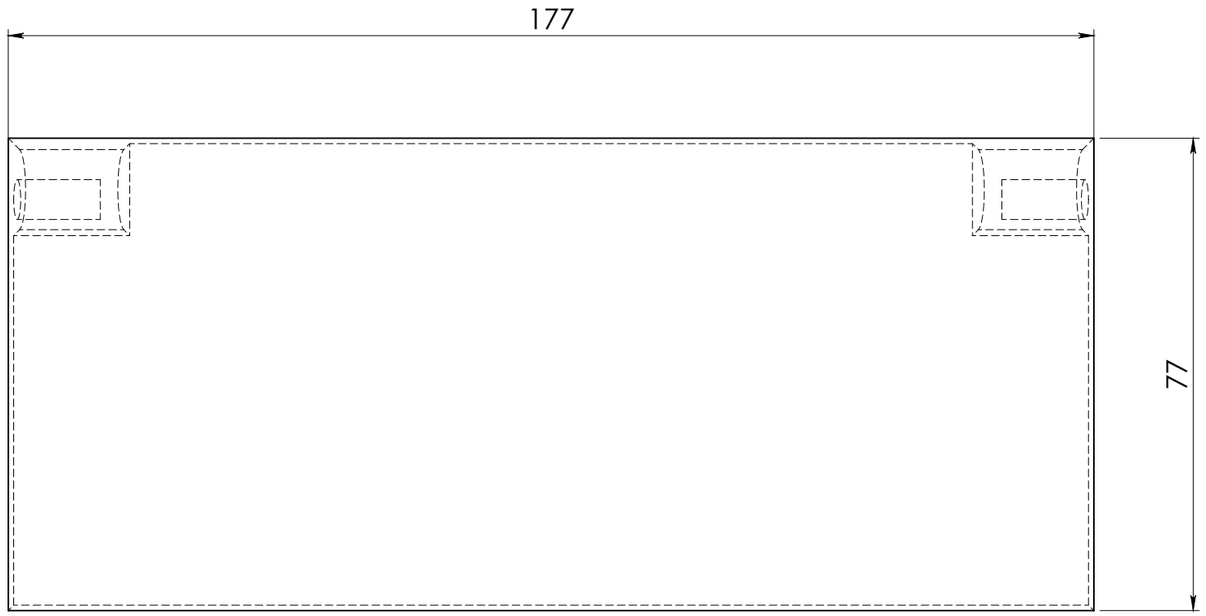


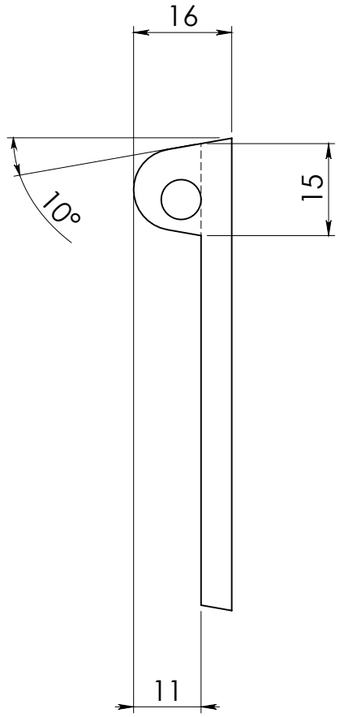


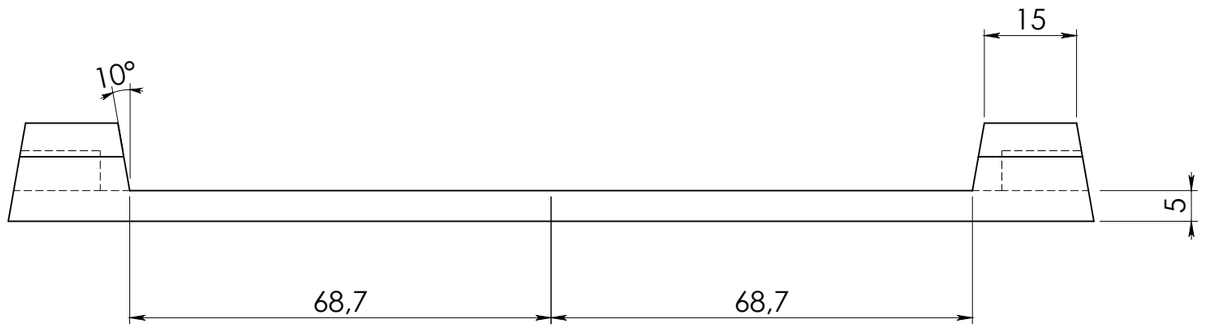
A-A (1 : 1)

		Rev.	Revisions	Sign.:	Date:
			Title:	Construction: RSV	16.11.05
Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9			Indvendig top	Released: RSV	2011.11.30
Material:	Cast Iron GG15			Format:	A2
Weight:	2,66 kg			Scale:	1:5
Model no.	2116		Morsø 2B	Itemno.:	44211600
Drawingtype:	Støbetegning		morsø By appointment to the Royal Danish Court	Drawing no.:	2B-101 a
Location of file:	U:\ucdv\Tegninger\1B&2B\2B-101 indv. top-overdel 2B.SLDPRT				

Date of print: 30-11-2011





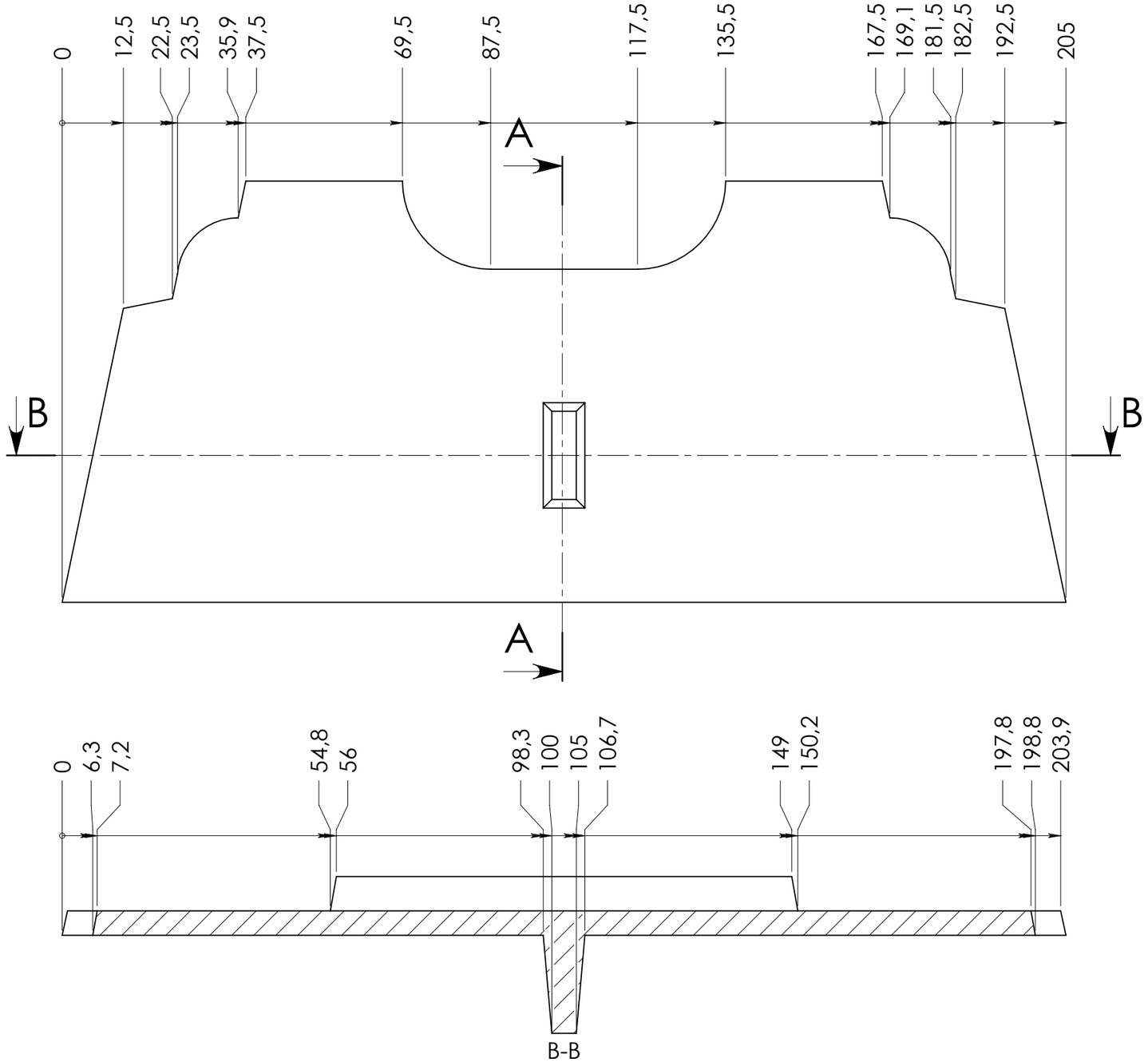


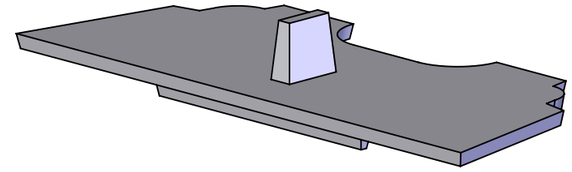
Konstruktionstegning
16.11.05

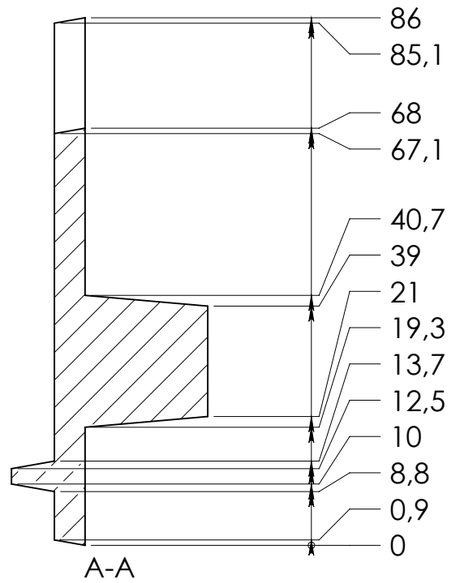
Date of print: 14-02-2012

Rev.	Revisions	Sign.:	Date:
		RSV	16.11.05

Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9		Title: **Klap til dør**	Construction:
Material:	Cast iron GG15		Released:
Weight:	0,51 kg		Format: A3
Model no.	**2008**	**Morsø 2B**	Scale: **1:1**
Drawingtype:	Støbetegning	morsø By appointment to the Royal Danish Court	Itemno.: **342008**
Location of file:	U:\udv\Tegninger\1B&2B\2B-102 Klap til dør.SLDPRT		Drawing no.: **2B-102**

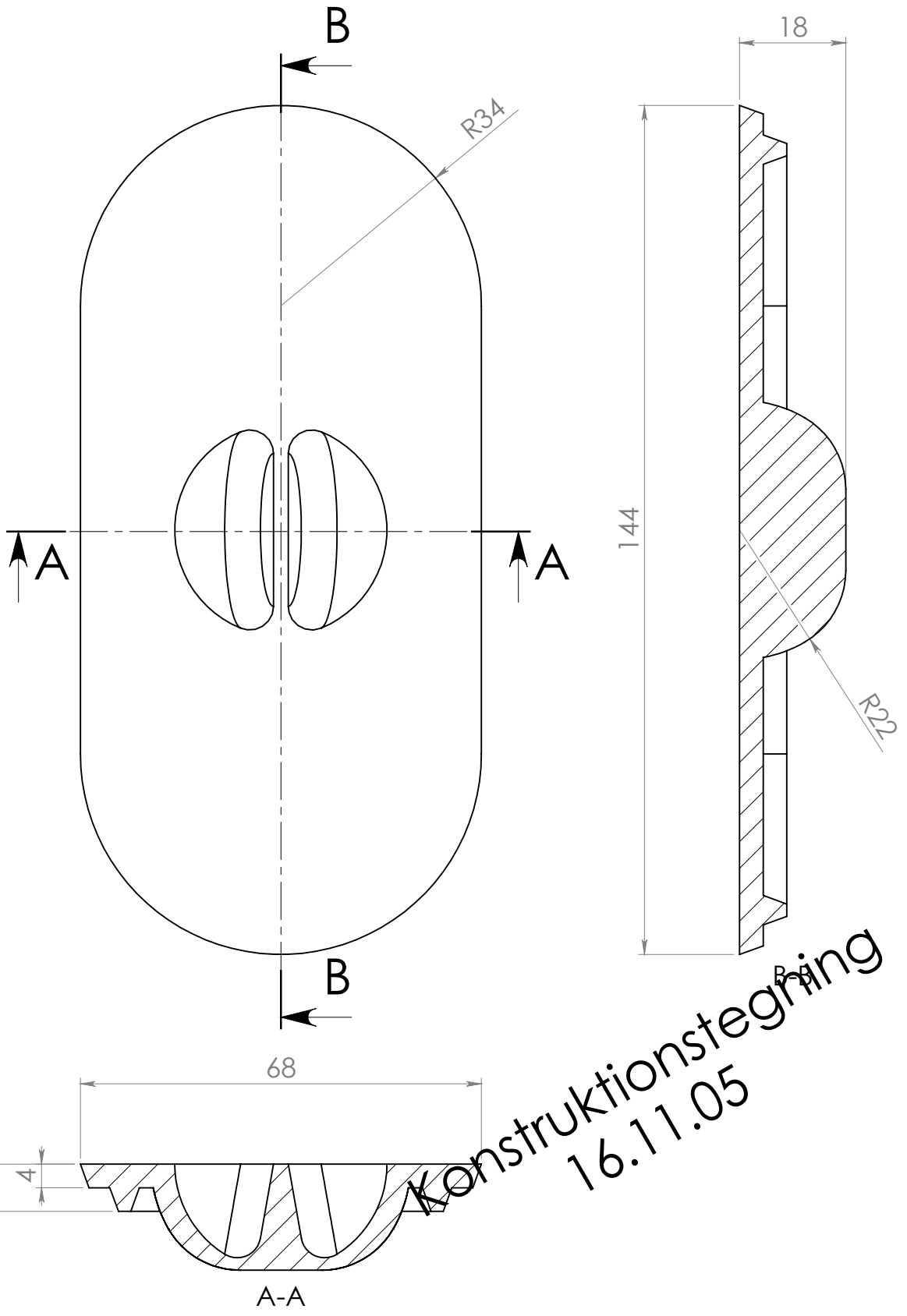






Rev.	Revisions		Sign.:	Date:
		Title:	Construction:	RSV 16.11.05
Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9		Dæksel 2B overdel	Released:	RSV 2011.11.30
Material:	Cast Iron GG15		Format:	A3
Weight:	0,55 kg		Scale:	1:1
Model no.	2118	Morsø 2B	Itemno.:	44211800
Drawingtype:	Støbetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	2B-103 a
Location of file:	U:\udv\Tegninger\18&2B\2B-103 Dæksel overdel 2B.SLDPRT			

Date of print: 30-11-2011

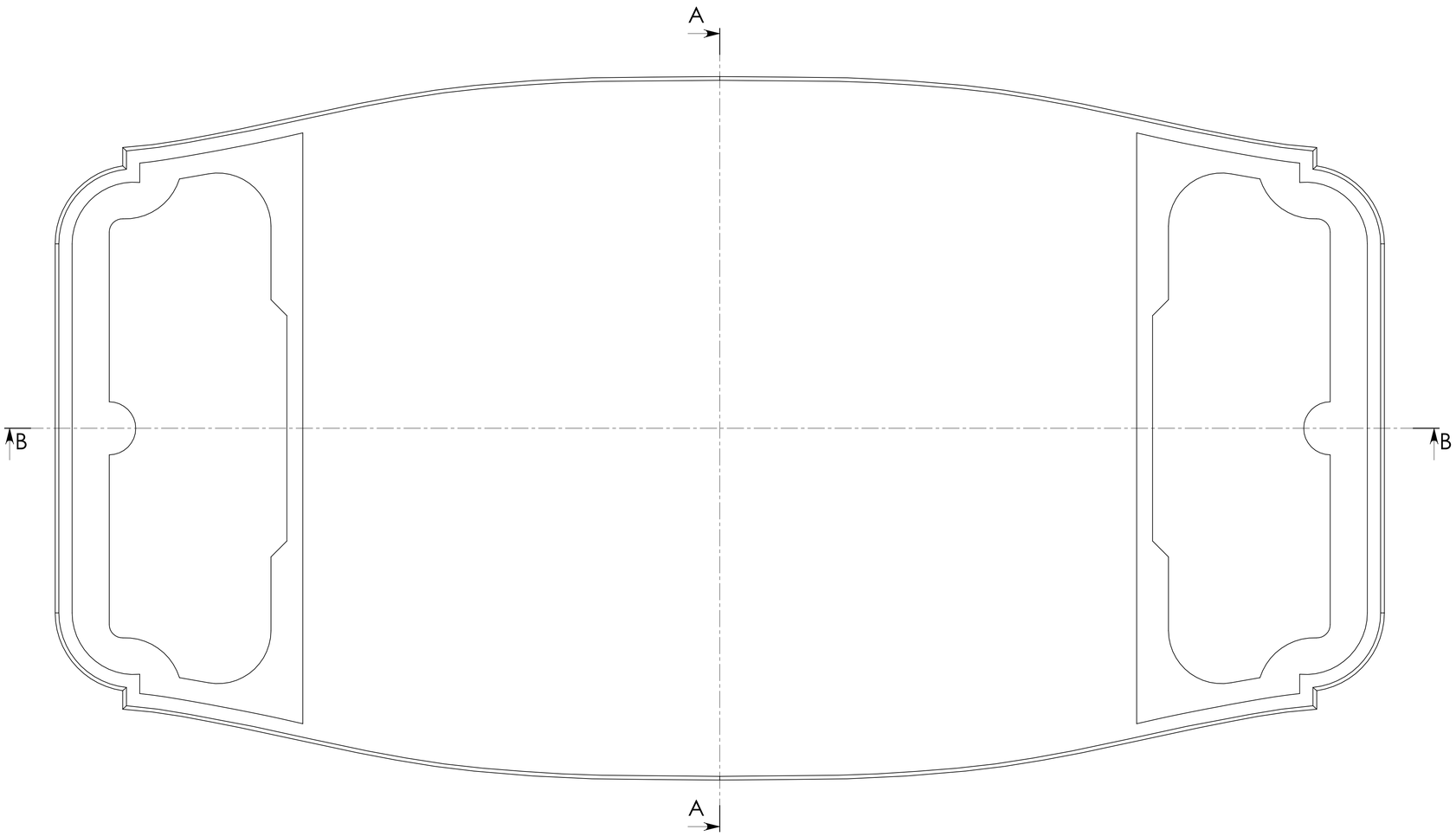


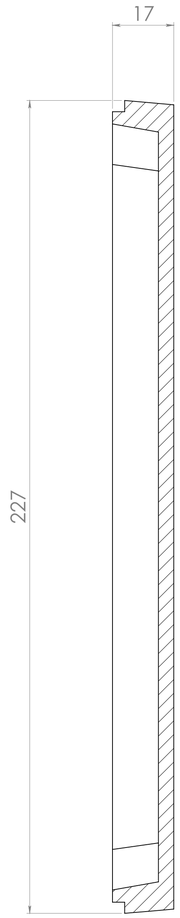
Konstruktionstegning
16.11.05

Rev.	Revisions	Sign.:	Date:

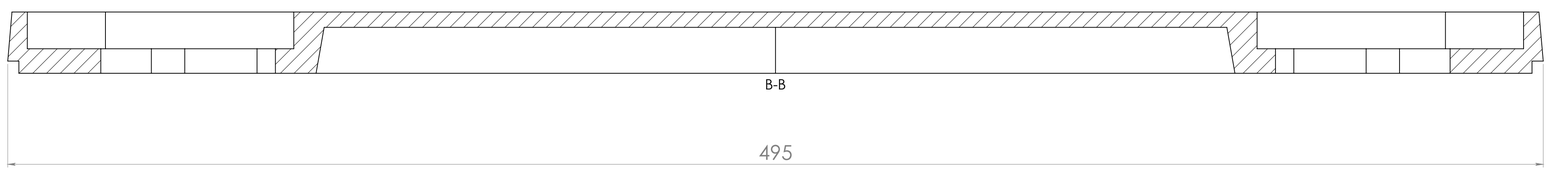
Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9		Title: **Rensedæksel**	Construction:	RSV 16.11.05
			Released:	
Material:	Cast iron GG15		Format:	A4
Weight:	0,32 kg		Scale:	**1:1**
Model no.	**2119**	**Morsø 2B**	Itemno.:	**342119**
Drawingtype:	Støbetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	**2B-104**
Location of file:	U:\udv\Tegninger\1B&2B\2B-103 Dæksel overdel 2B.SLDPRT			

Date of print: 09-10-2020





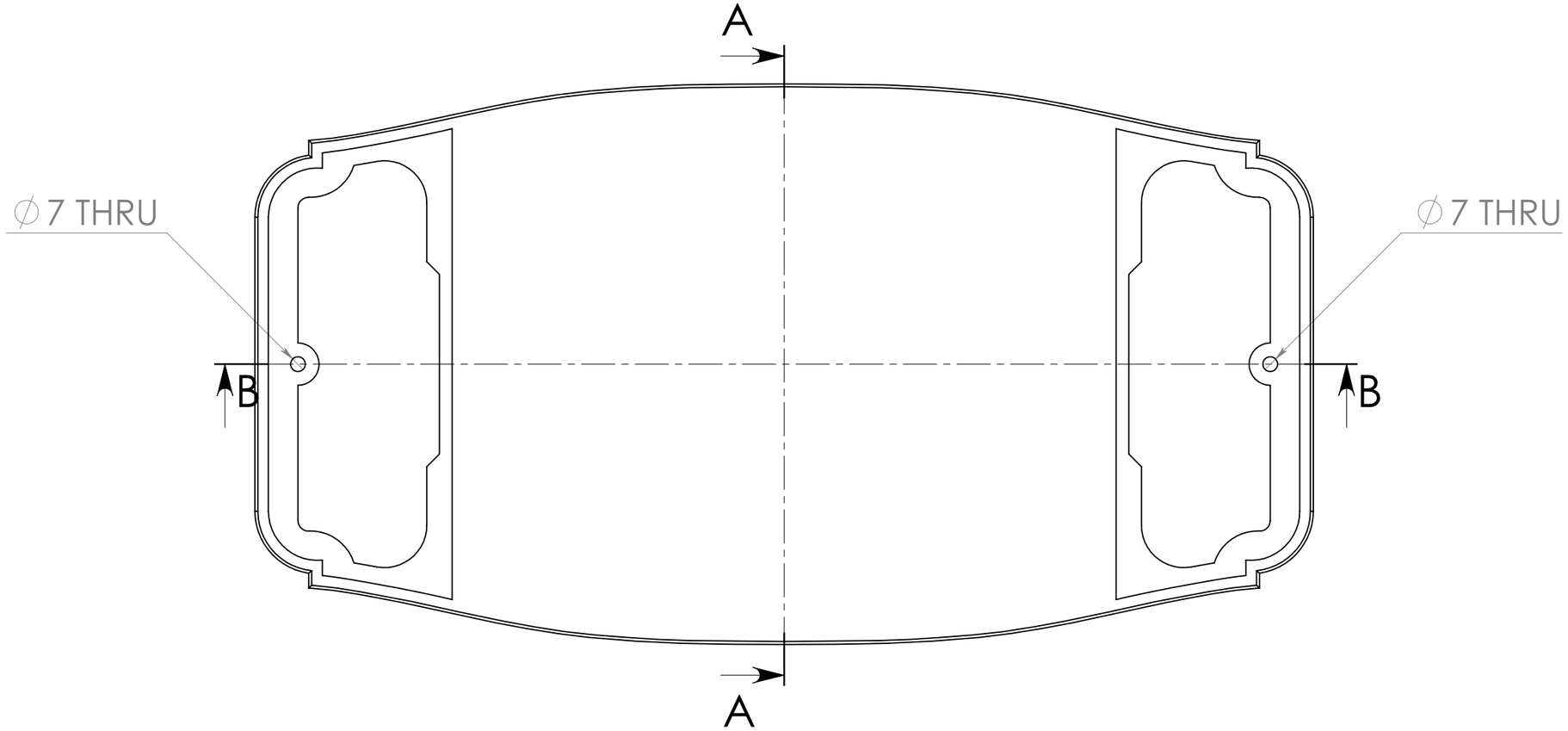
A-A

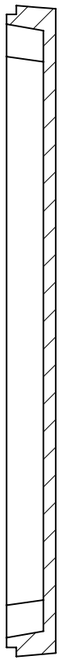


Konstruktionstegning
16.11.05

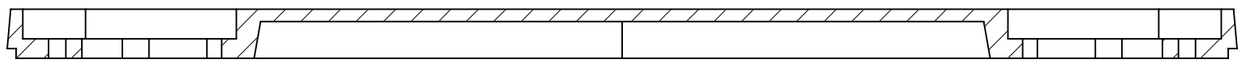
Rev., Revisions			Sign.:	Date:
		Title:	Construction:	RSV 16.11.05
Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9		**Mellembund**	Released:	
Material:			Format:	**A1**
Weight:	5,1 kg		Scale:	**1:1**
Model no.	**2112**	**Morsø 2B**	Itemno.:	**342112**
Drawingtype:	Støbetegning	morsø By appointment to HM Royal Danish Court	Drawing no.:	**2B-105**
Location of file:	C:\Working\2B-105 Mellembund 28.SLDPRT			

Date of print: 09-10-2020





A-A

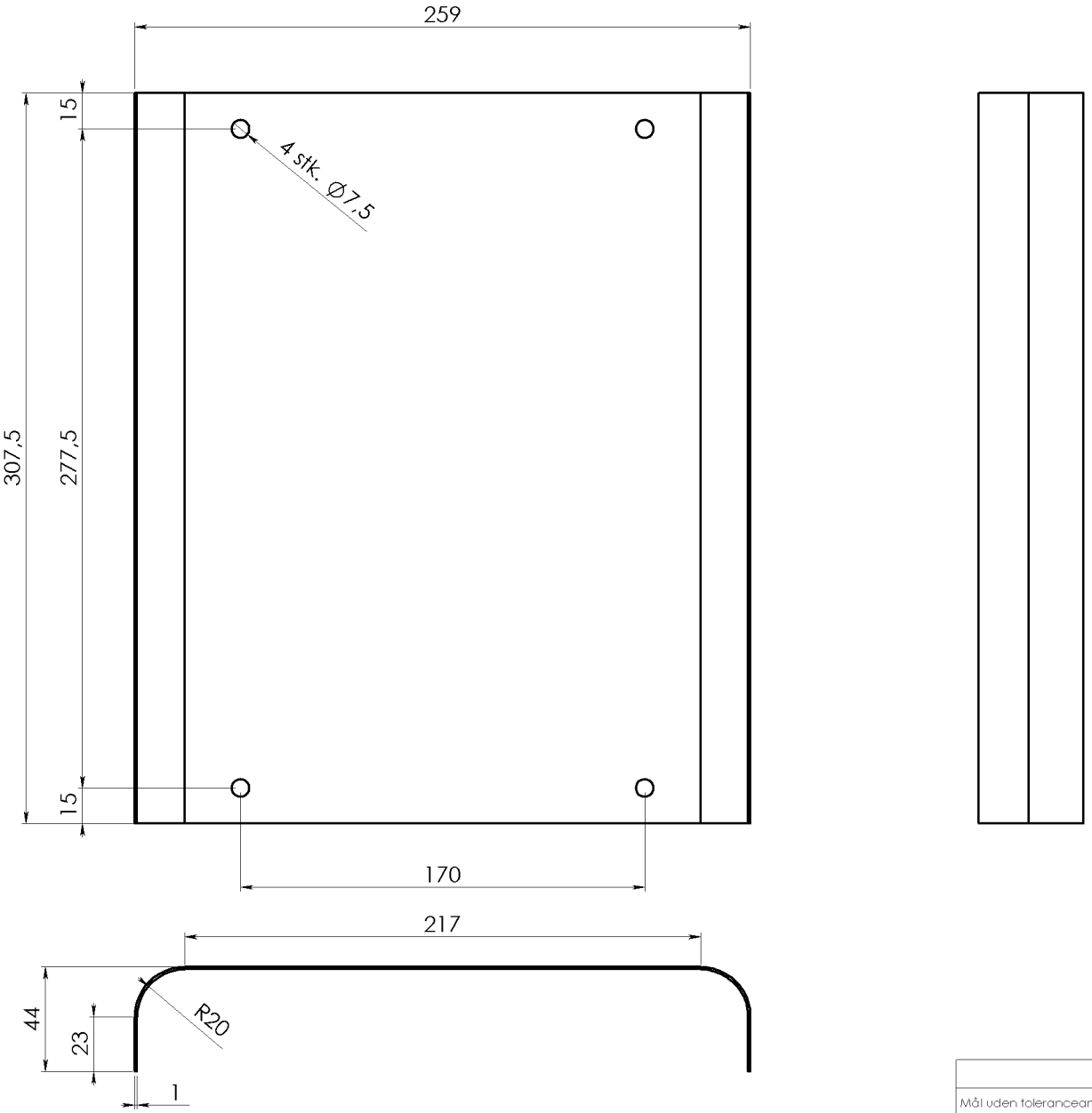


B-B

Rev.	Revisions	Sign.:	Date:

		Title:	Construction: RSV 16.11.05
Dim. without indication of margin acc. to DS/ISO 2768-1 m		**Mellembund**	Released:
Material:	Cast Iron GG15	**Bearbejdet**	Format: **A3**
Weight kg:	5,10	**Morsø 2B**	Scale: **1:2.5**
Model no.	**2112**		Itemno.: **342112**
Drawingtype:	Work up drawing	morsø	Drawing no.: **105-44211200 a**
Location of file:	C:\Working\2B-105 Mellembund 2B.SLDPRT		

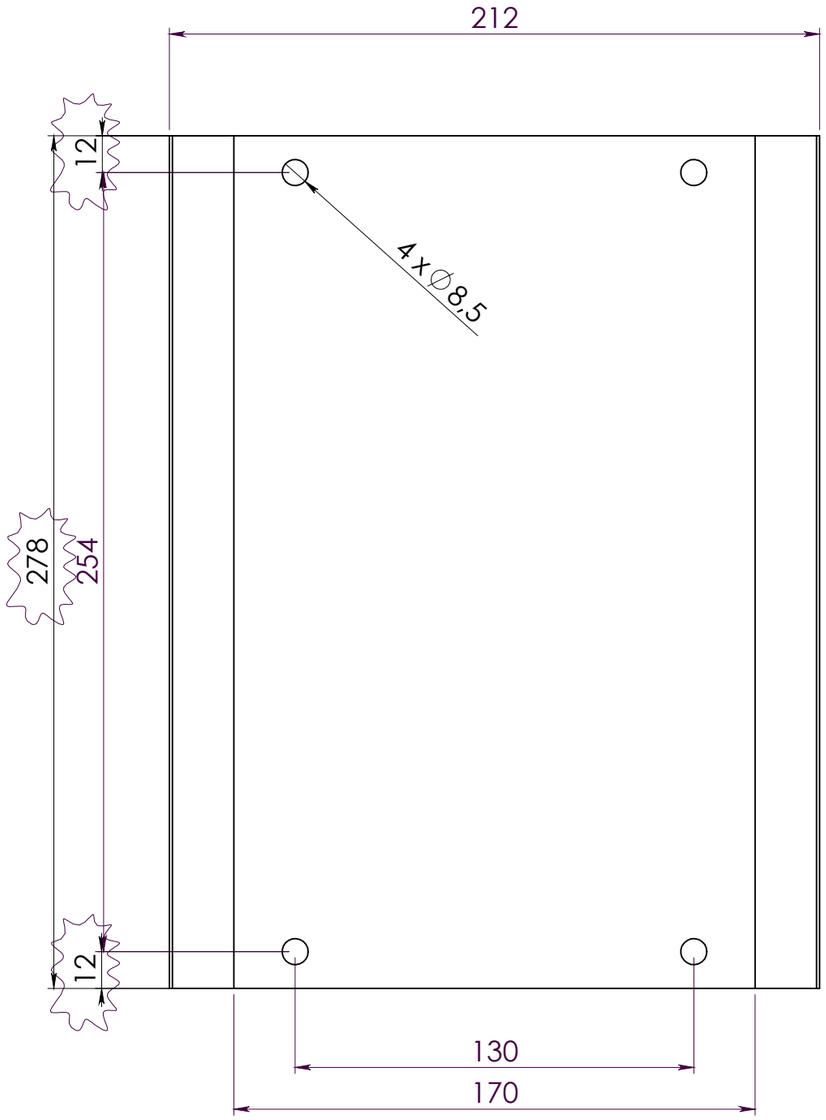
Date of print: 09-10-2020

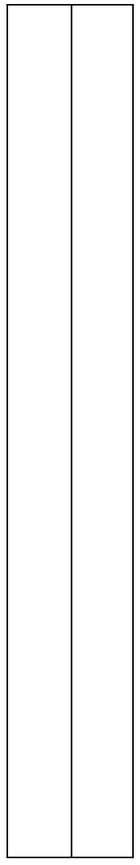


Rev.	Revisions	Sign.:	Date:

	Title:	Construction:	RSV	22.03.06
Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m	**Stråleplade**	Released:	RSV	21.04.2006
Material: Galvaniseret plade	**bag**	Format:	A3	
Weight: 0,79 kg	**Morsø 2B**	Scale:	**1:2**	
Model no.		Itemno.:	**54201200**	
Drawingtype: Emnetegning	morsø	Drawing no.:	**2B-108 a**	
Location of file: U:\vdA Tegninger\18826\2B-108 Stråleplade bag 2B.SLDPRT				

Date of print: 21-04-2006





Klippemål: 274 x 278

Rev.	Revisions	Sign.:	Date:
b	Ændret mål.	RSV	01.05.2006

Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m

Material:	Galvaniseret plade
Weight:	0,6 kg
Model no.	
Drawingtype:	Emnetegning
Location of file:	U:\udv\Tegninger\18&28\2B-109 Stråleplade bag overdel 2B.SLDPRT

Title:

Stråleplade

bag overdel

Morsø 2B

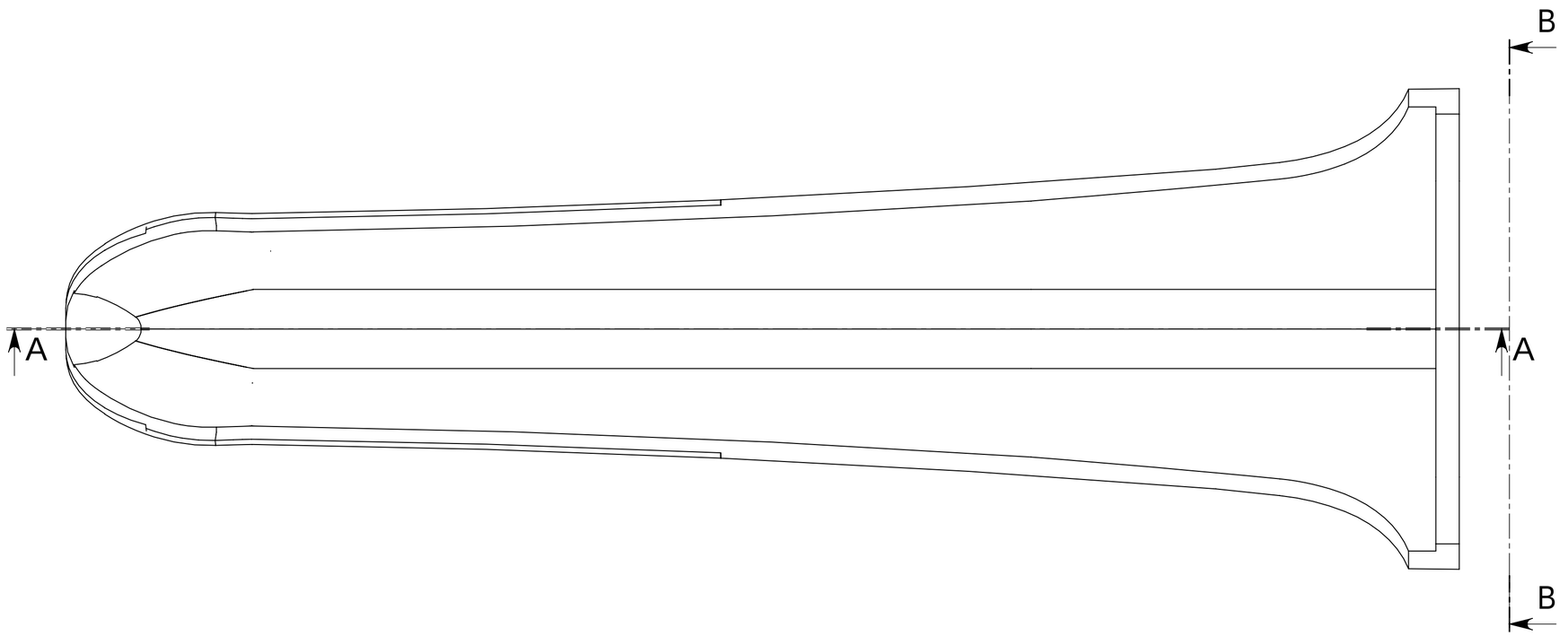
Construction:	RSV	26.04.2006
Released:	RSV	26.04.2006
Format:	A3	
Scale:	**1:2**	
Itemno.:	**54202900**	

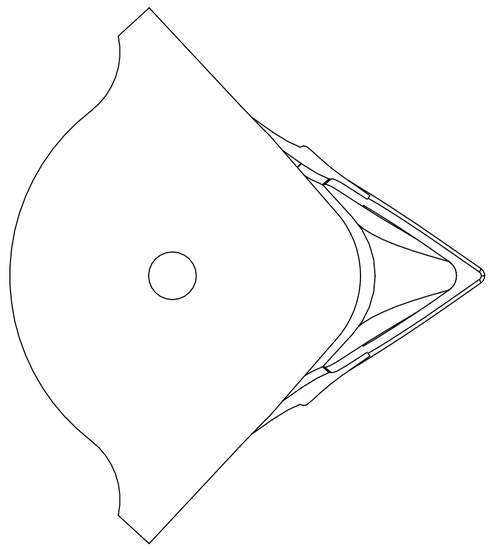
morsø
By appointment to the Royal Danish Court

Drawing no.:

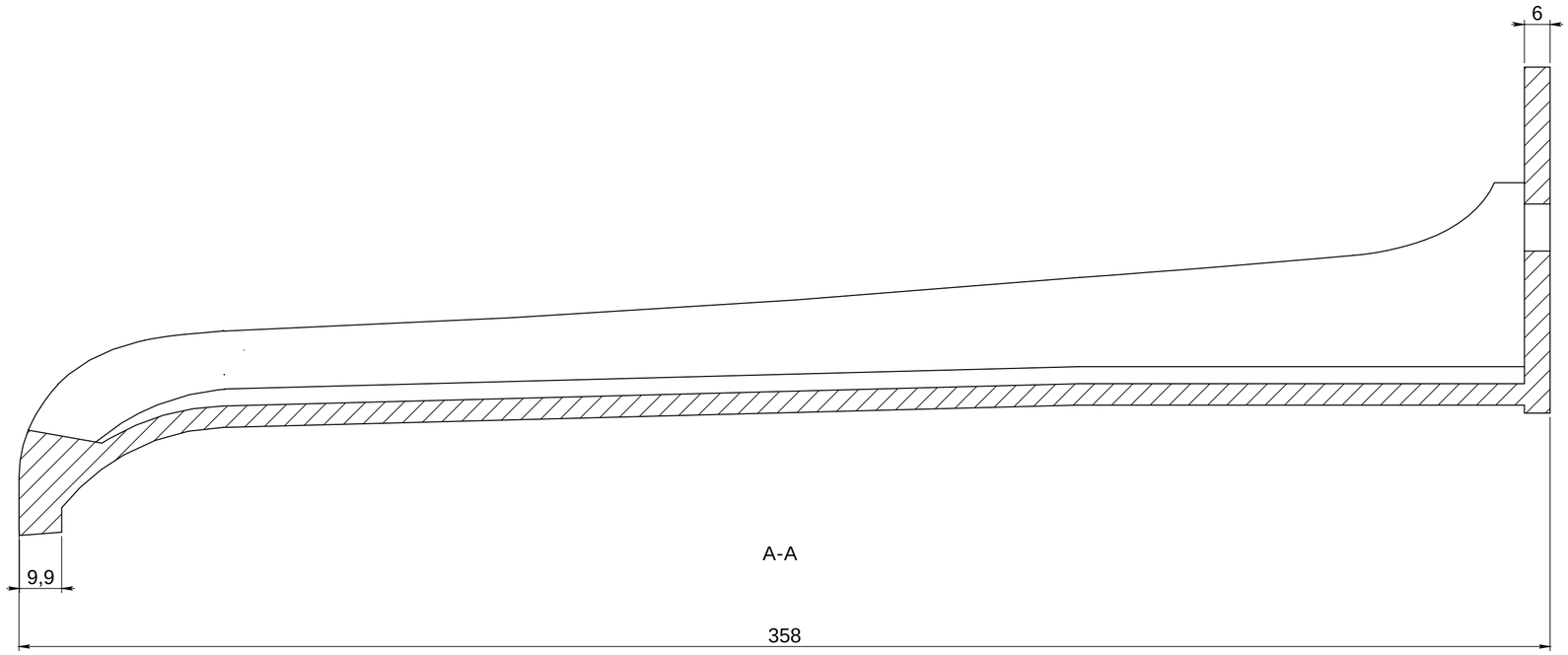
2B-109 b

Date of print: 23-09-2020





B-B

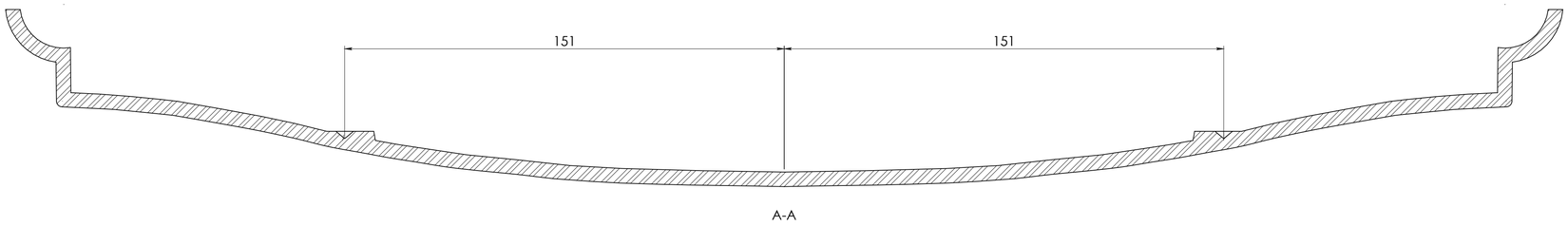


Konstruktionstegning
05.07.2006

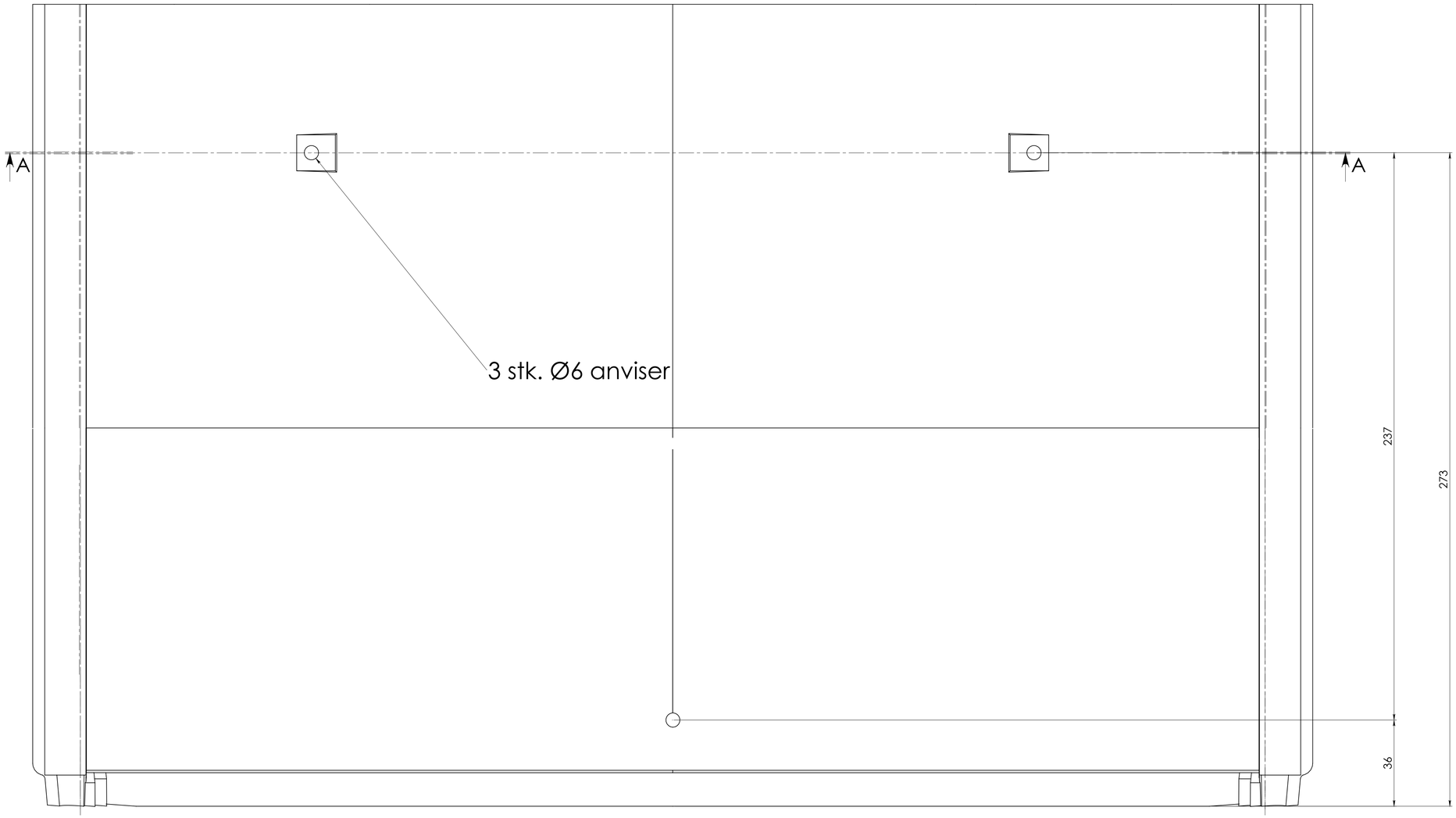
Rev.	Revisions	Sign.:	Date:
		RSV	05.07.2006

M¬l uden toleranceangivelse i.h.t. DS/ISO 2768-1 m		Title: **Ben 2BU**	Construction:
			Released:
Material:	Stßbejern GG 15		Format: **A2**
Weight:	1,42 kg		Scale: **1:1**
Model no.	**2001**	**Morsß 2B**	Itemno.: **342001**
Drawingtype:	Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.: **2B-114**
Location of file:	U:\udv\Tegninger\1B&2B\2B-114 Ben 358 mm 2B.SLDPRT		

Date of print: 11-02-2009

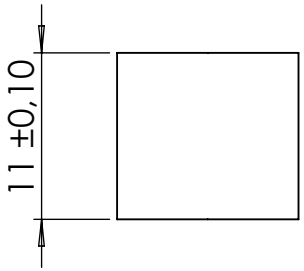


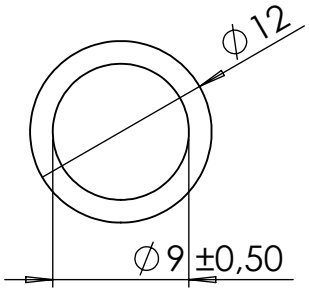
A-A

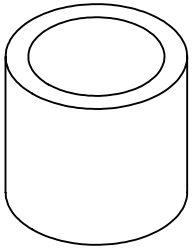


			Rev.	Revisions	Sign.:	Date:
		Title:			Construction:	RSV 21.12.06
Dim. without indication of margin acc. to DS/ISO 2768-1 m		**Sideplade egern**			Released:	RSV 02.02.2007
Material:	Støbejern GG 15	**2B**			Format:	**A1**
Weight:	7,1 kg	**Morsø 2B**			Scale:	**1:1**
Model no.	**2003**				Itemno.:	**342003**
Drawingtype:	Product Drawing	morsø			Drawing no.:	**2B-124 a**
Location of file:	U:\cad\1.Tegninger\1.05\2B\2B-124 Sideplade egern.SLDPRT					

Date of print: 13-10-2008







Rev.:	Description	Date	Sign.:
	Revisions		

Date of print: 23-09-2020

No Burrs or Sharp edges	
Material:	AISI 304
Weight kg.:	0,004
Model no.	
Drawingtype:	
Location of file:	

Title:

Afstandstykke f. luftregulering

bushing f. air valve

Morsø 2B

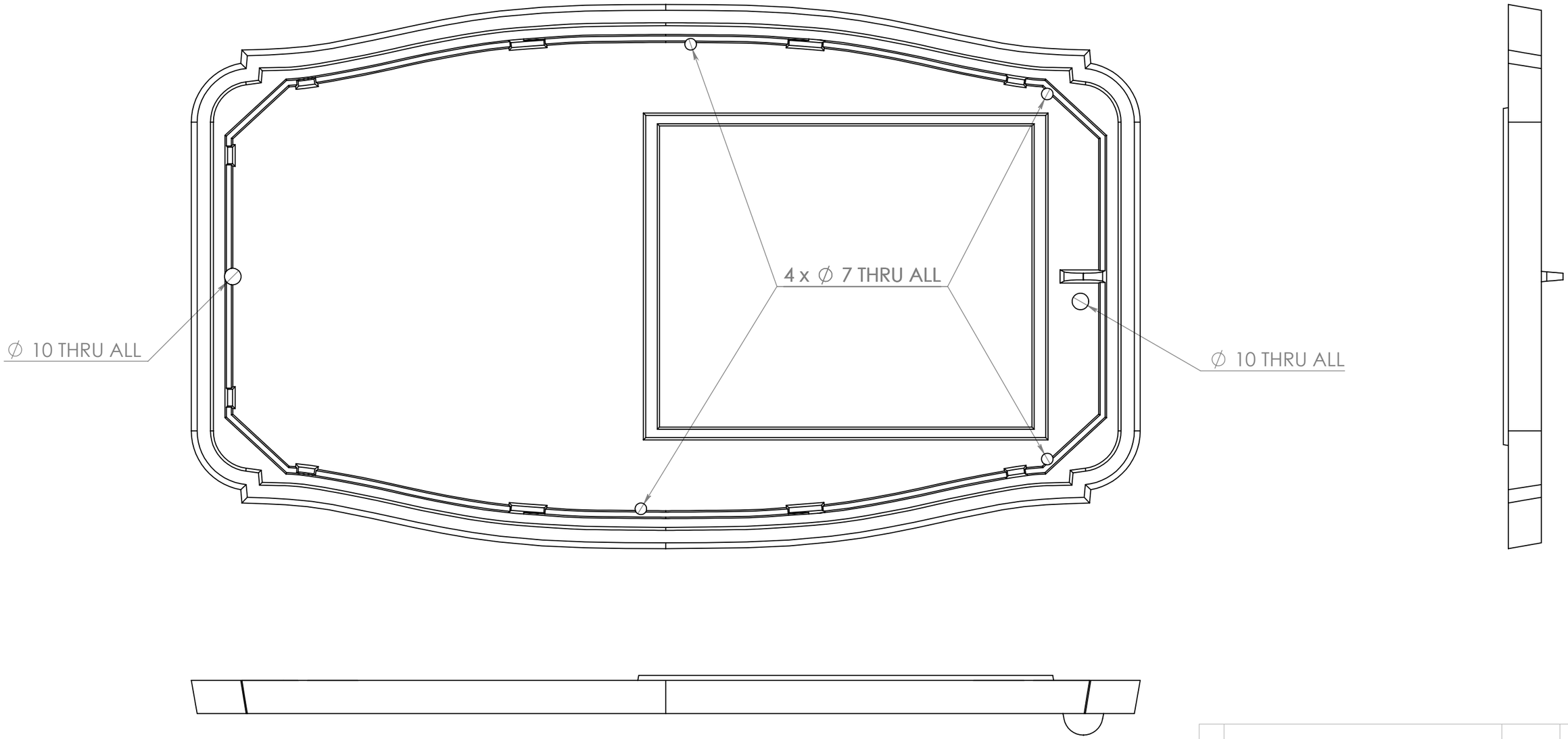
Construction:	NRN	22-09-2020
Released:		
Format:	A4	
Scale:	**2:1**	
Itemno.:	**71208700**	

By appointment to The Royal Danish Court

morsø

Drawing no.:

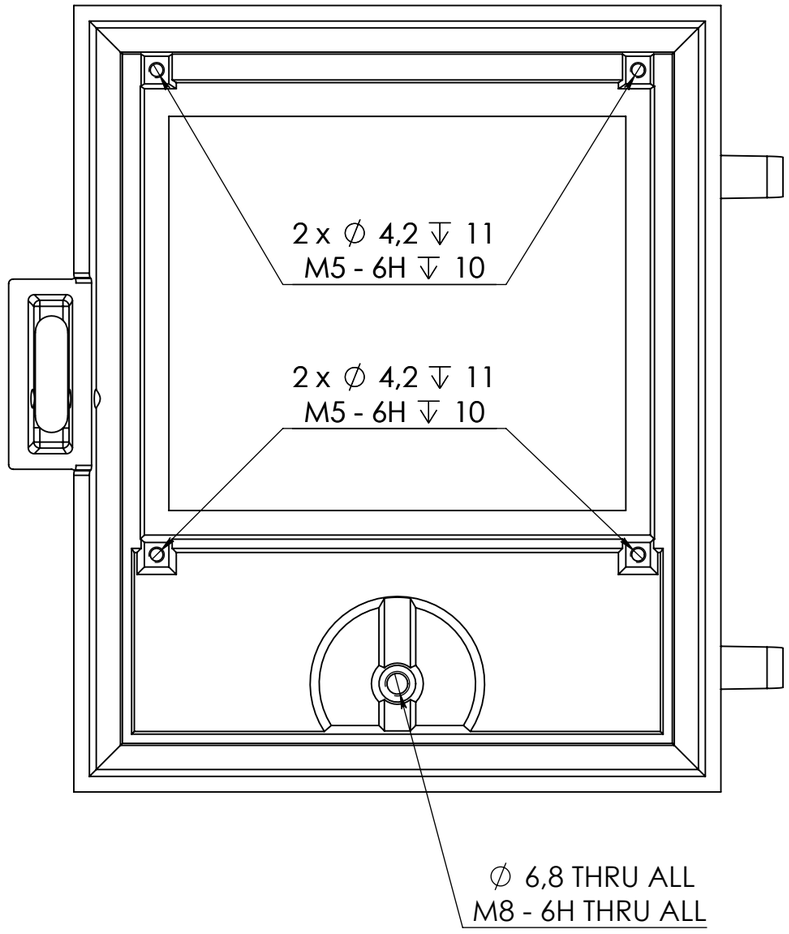
2B-146

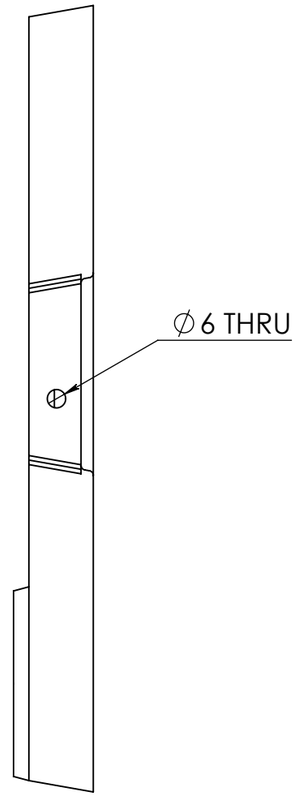


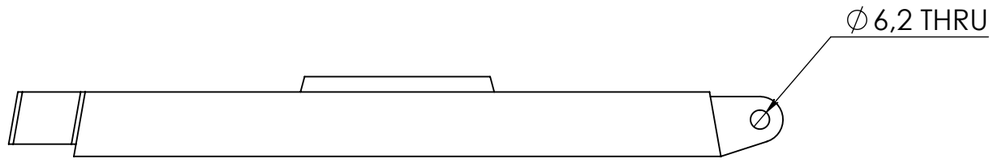
Rev.	Revisions	Sign.:	Date:
b	Changed Ø7 hole to Ø10.	RSV	09.06.2016

Dim. without indication of margin acc. to DS/ISO 2768-1 m	Title: **Mellemramme 2BU**	Construction:	RSV 25.09.2015
Material: Cast Iron GG15	**Bearbejdet**	Released:	
Weight kg: 6.75	**Morsø 2B**	Format:	**A3**
Model no. **2029**		Scale:	**1:2.5**
Drawingtype: Work up drawing		Itemno.:	**342029**
Location of file: C:\Working\2B-23 Mellemramme 2BU.SLDPRT	morsø	Drawing no.:	**23-44204900 b**

Date of print: 09-06-2016



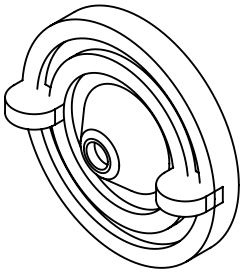


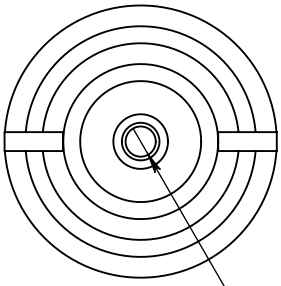


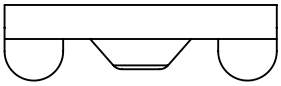
Rev.	Revisions	Sign.:	Date:

Date of print: 29-09-2015

Dim. without indication of margin acc. to DS/ISO 2768-1 m		Title:	Construction:	RSV 13.09.02
Material:	Cast Iron GG15	**Fyrdør 2B**	Released:	
Weight kg:	2.13	**Bearbejdet**	Format:	**A3**
Model no.	**2034**	**Morsø 2B**	Scale:	**1:2**
Drawingtype:	Work up drawing		Itemno.:	**44204421**
Location of file:	C:\Working\2B-59 - Fyrdør 342034.SLDPRT	morsø	Drawing no.:	**59-44204421 a**





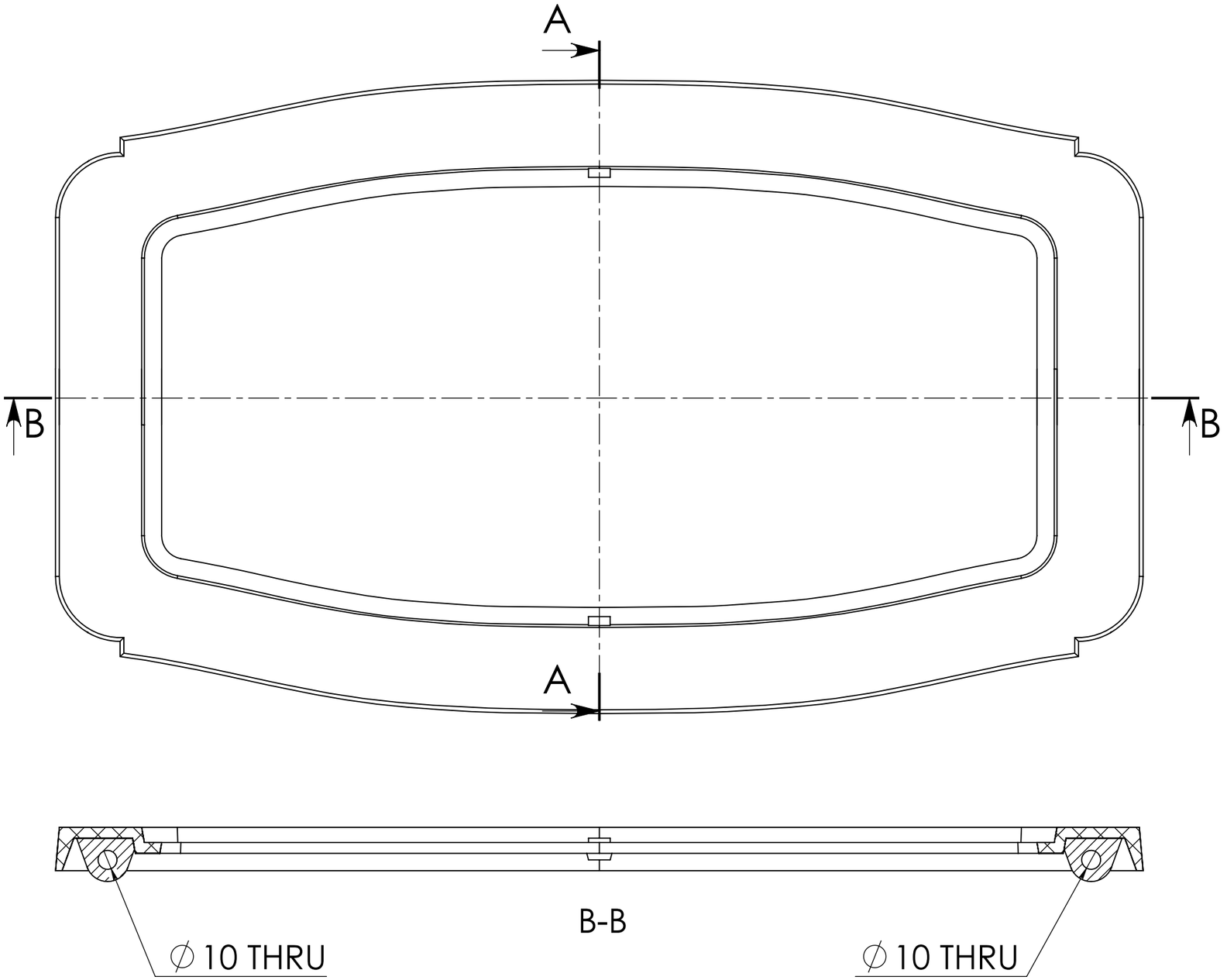


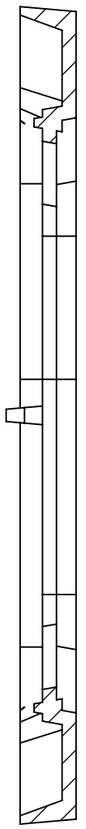
Konstruktionstegning
15.11.05

Rev.	Revisions	Sign.:	Date:

Mål uden toleranceangivelse i.h.t. ISO-norm nr. 8062 CT9	Title: **Trækventil**	Construction:	RSV	15.11.05
		Released:		
Material:		Format:	A4	
Weight:	0,17 kg	Scale:	**1:2**	
Model no.	**2022**	Itemno.:	**342022**	
Drawingtype:	Emnetegning	**Morsø 2B**	Drawing no.: **2B-96**	
Location of file:	C:\Working\2B-96 Trækventil 2B.SLDPRT	morsø By appointment to the Royal Danish Court		

Date of print: 28-09-2015



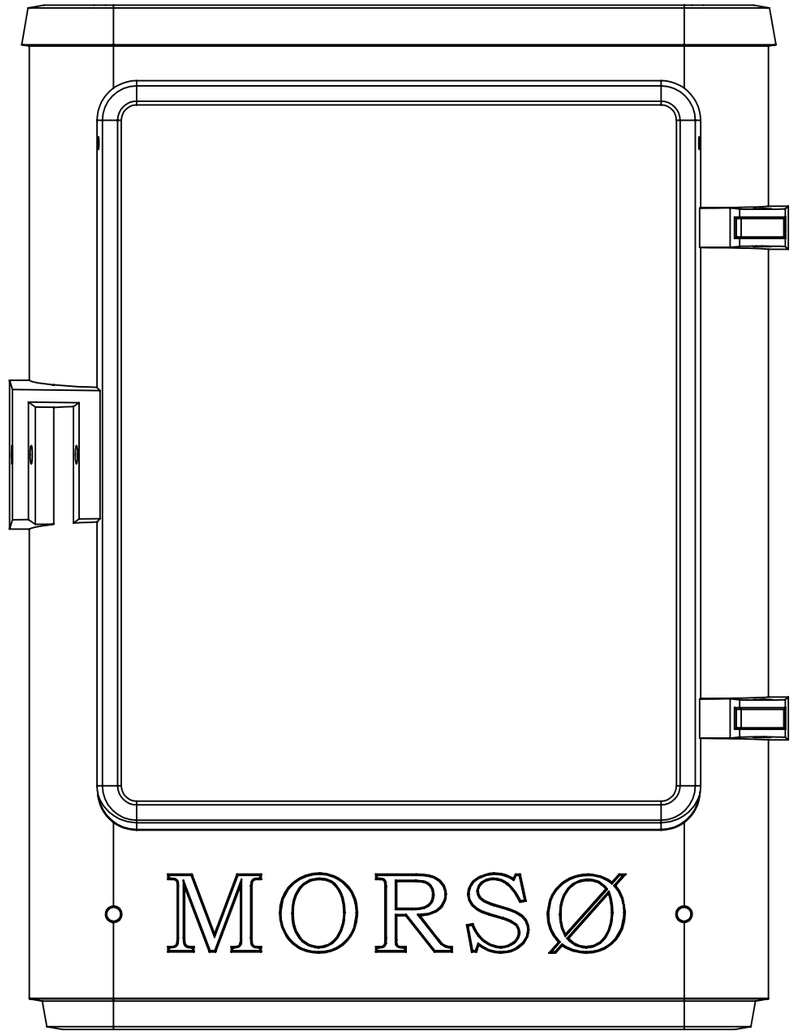


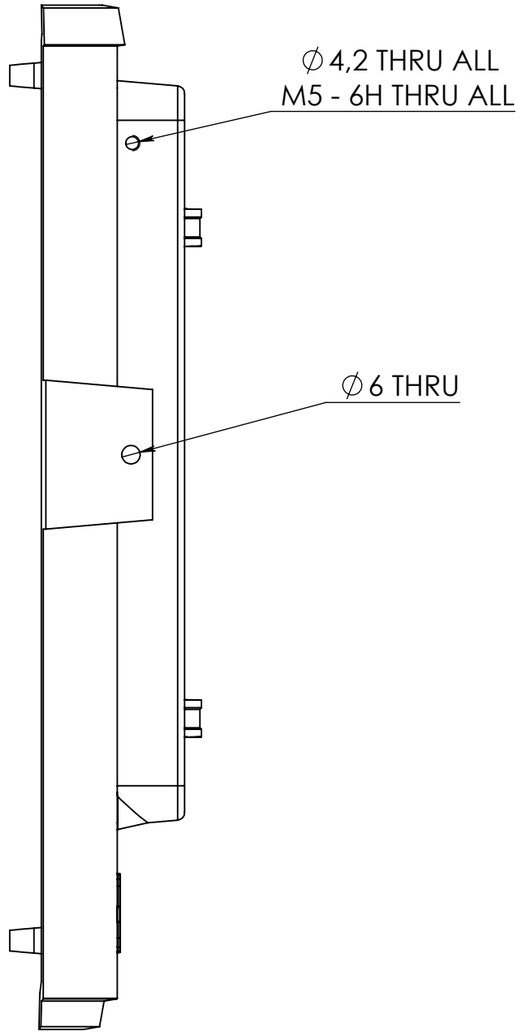
A-A

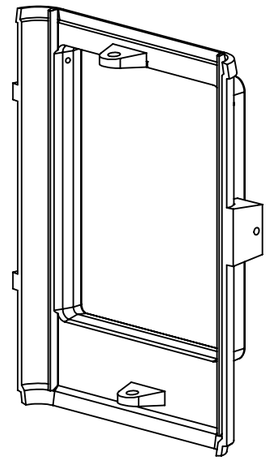
Rev.	Revisions	Sign.:	Date:

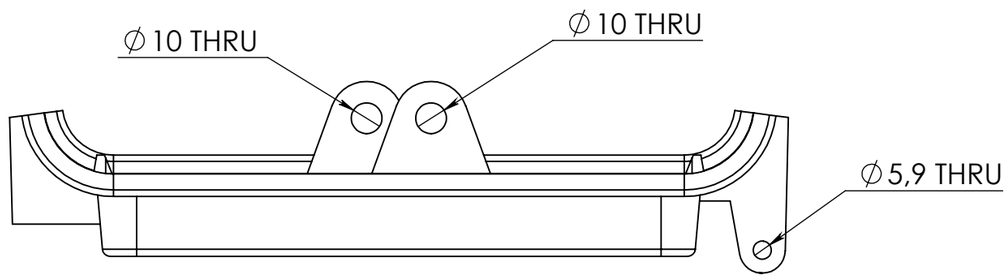
		Title:	Construction:	RSV 16.11.05
Dim. without indication of margin acc. to DS/ISO 2768-1 m		**Topplade 2BO**	Released:	
Material:	Cast Iron GG15	**Bearbejdet**	Format:	**A3**
Weight kg:	4.95		Scale:	**1:2.5**
Model no.	**2111**	**Morsø 2BO**	Itemno.:	**342111**
Drawingtype:	Work up drawing	morsø	Drawing no.:	**97-44211100 a**
Location of file:	C:\Working\2B-97 Ramme 2B.SLDPRT			

Date of print: 30-09-2015





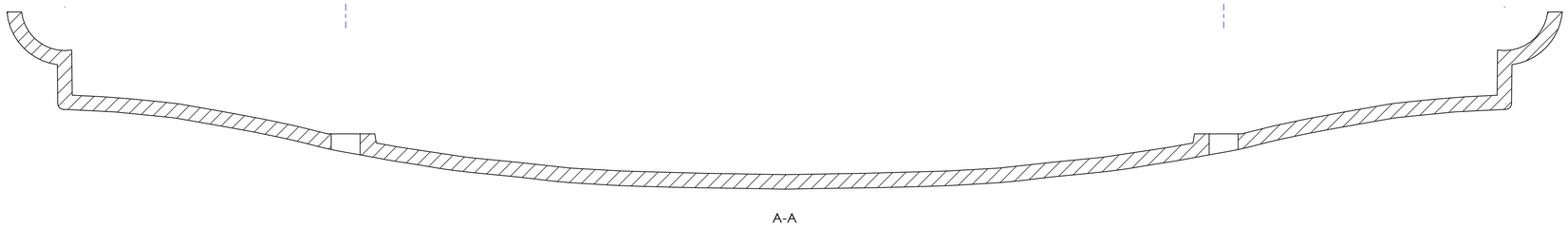




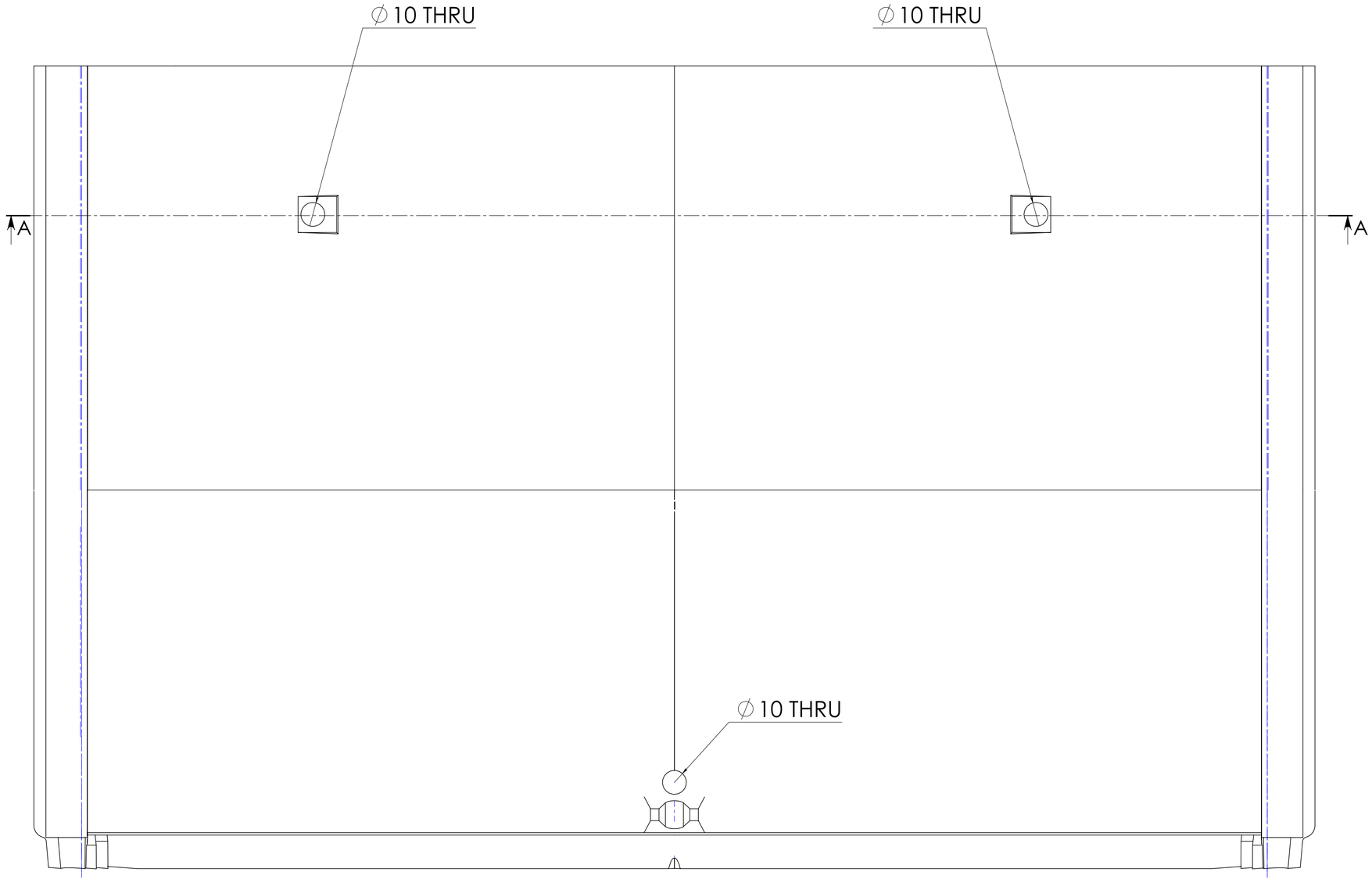
Rev.	Revisions	Sign.:	Date:

Dim. without indication of margin acc. to DS/ISO 2768-1 m		Title: **Bagplade** **2B Classic NA** **Morsø 2B**	Construction:	RSV 03.03.2006
			Released:	RSV 21.04.2006
Material:	Cast Iron GG15		Format:	**A3**
Weight kg:	2.87		Scale:	**1:2**
Model no.	**2015**		Itemno.:	**44201500**
Drawingtype:	Work up drawing	morsø	Drawing no.:	**123-44201500 a**
Location of file:	C:\Working\2B-123 Forramme.SLDPRT			

Date of print: 04-11-2015



A-A

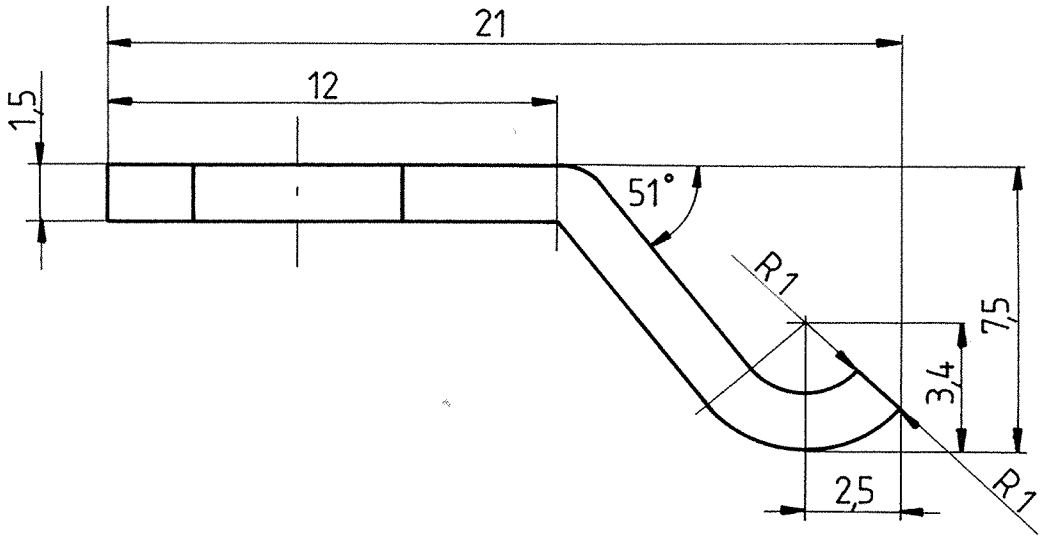


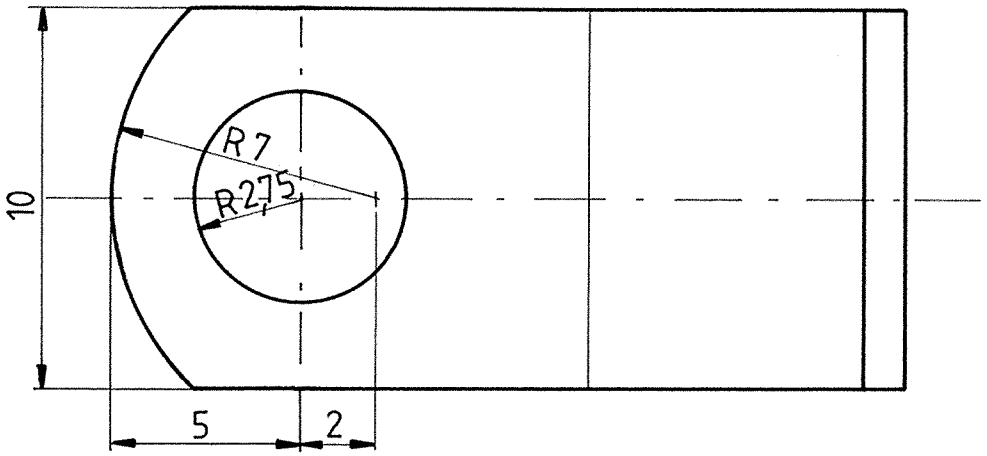
Rev.	Revisions	Sign.:	Date:
b	Ændret dimension fra Ø8 til Ø10 huller.	RSV	02.02.2015

Dim. without indication of margin acc. to DS/ISO 2768-1 m		Title: Indv. sideplade egern 2B Morsø 2B	Construction: RSV 21.12.06
Material:	Cast Iron GG15		Released:
Weight kg.:	7.16		Format: A1
Model no.	2003		Scale: 1:1
Drawingtype:	Work up Drawing		Itemno.: 44200500
Location of file:	C:\Working\2B-124 Sideplade egern.SLDPRT	morsø	Drawing no.: 124-44200500 a

Date of print: 29-09-2015

Dato	Kg. 10 stk.





NB! Findes som solidworkspart
1124 / 1124-29 glasclips.prt.
24/7-00 / kou.

edbnr. 790743

LEVERANDØR TIL
DET KGL. DANSKE HOF
morsø
AKTIESELSKABET
N. A. CHRISTENSEN & CO
7900 NYKØBING MORS
TLF. 97 72 13 00

GLASKLIPS.

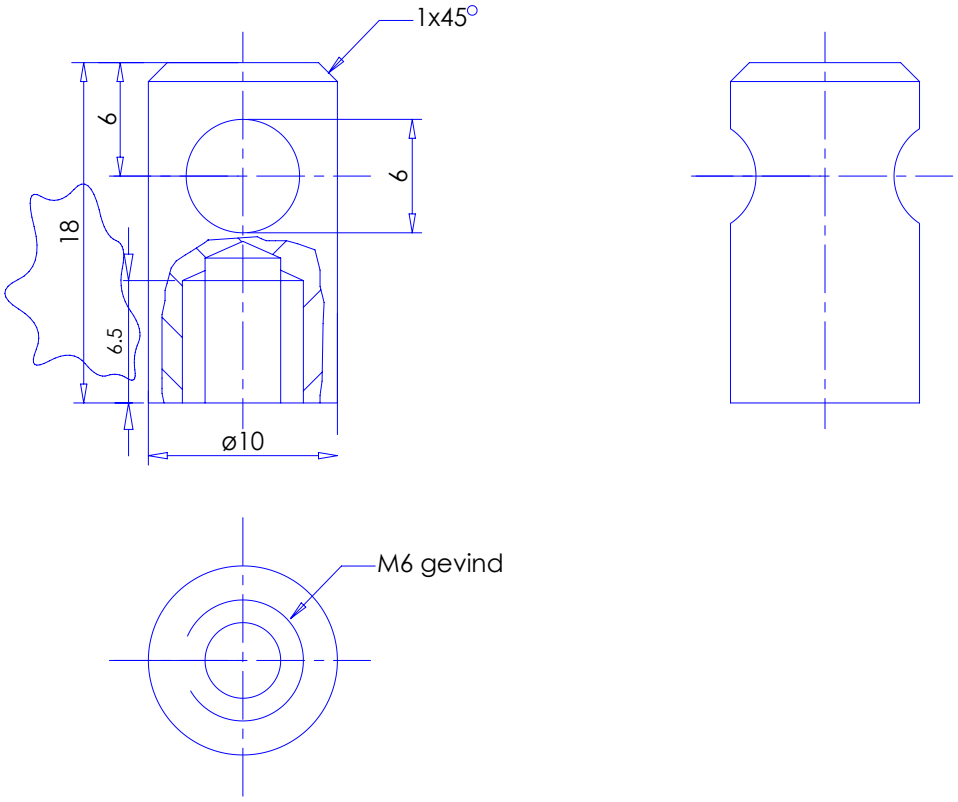
1,5mm rf.plade

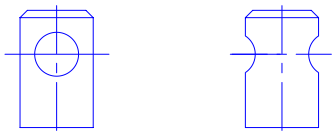
werkstoff nr. 1.4301

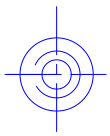
DATO	SIGN.
23-2-93	AaGJ
MÅL: 5:1	ÆNDRET: 5-12-84
	MODELNR.
TEGNINGSNR. 1124-29-4	

RESTO 5526 - MI 8080

2,5:1







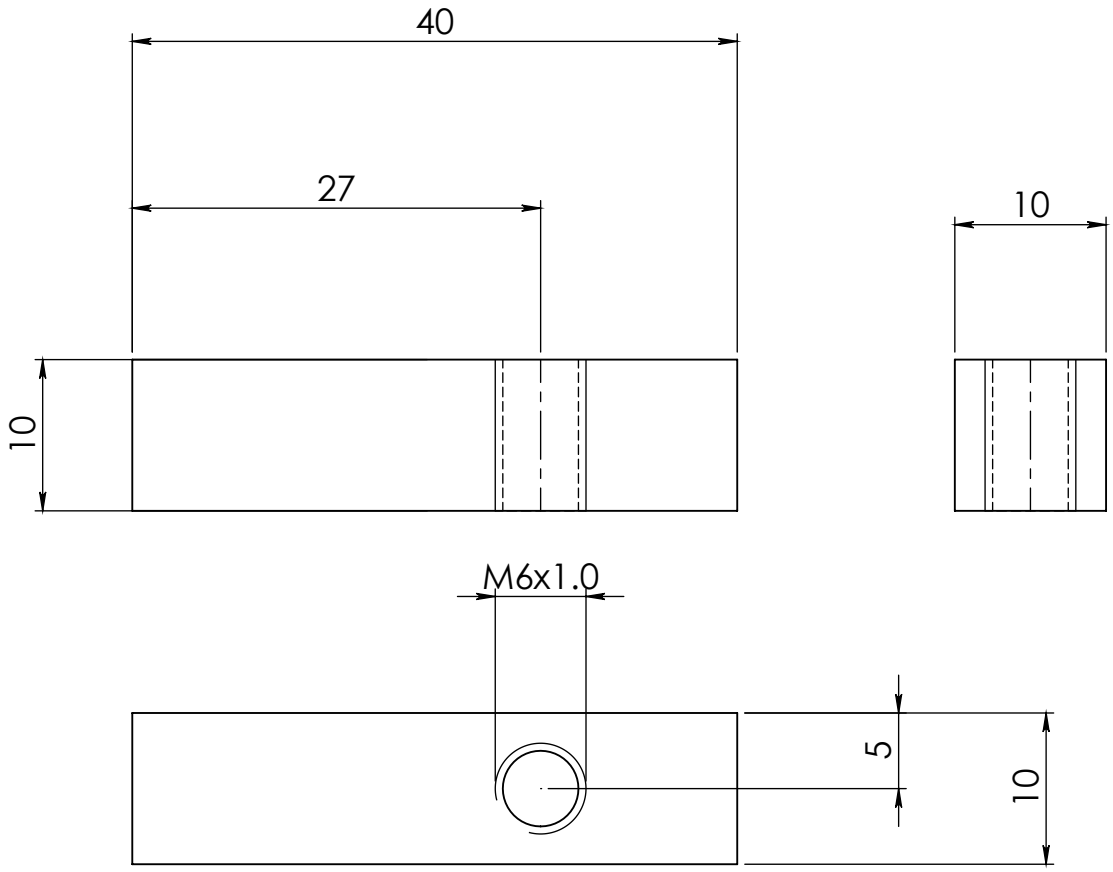
1:1

Matr.: Automatstål

Rev.	Revision	Sign.	Dato
b	Gamdrup TegneTeknik	HCH	April 96
c	Tilføjet tegn.nr.	KD	20.12.96
d	Varenr. ændret fra 752620	KD	01.07.99
e	Længdemål ændret	KDU	10.08.99

Titel:
Knop til
rystestang 1126

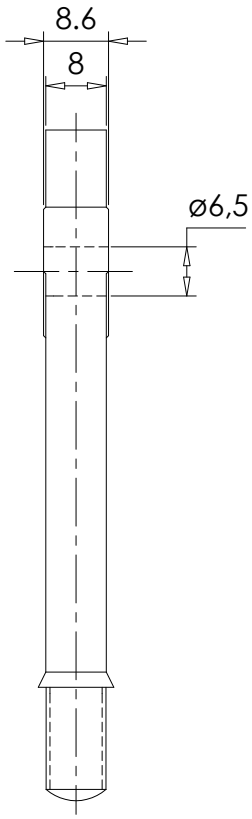
Sign.: ZZ
Dato: XXXXX
Tegn.form.: A4
Målforhold: 1:1/2.5:1
Filnavn: 1126-26
Varenummer: 752619
morsø
Jernstøberi A/S
Tegningsnummer: 1126-26 e

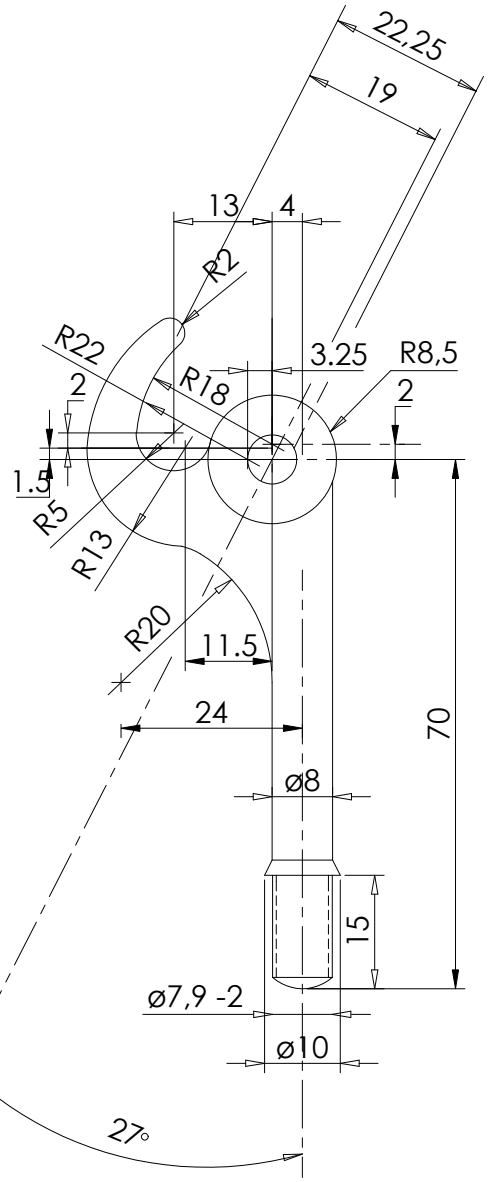


b	Spændstykke m. frihul 542631udgået.		RSV	15.06.04
Rev.	Revisions		Sign.:	Date:

		Title:	Construction:	NAA 02.03.88
Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m		**Spændstykke**	Released:	
Material:	Firkant stål		Format:	A4
Weight:	0,03 kg		Scale:	**2:1**
Model no.		**Morsø 1126**	Itemno.:	**542630**
Drawingtype:	Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	**1126-55 b**
Location of file:	U:\udv\Tegninger\1126\1126-55 Spændstykke m. gevind.SLDPRT			

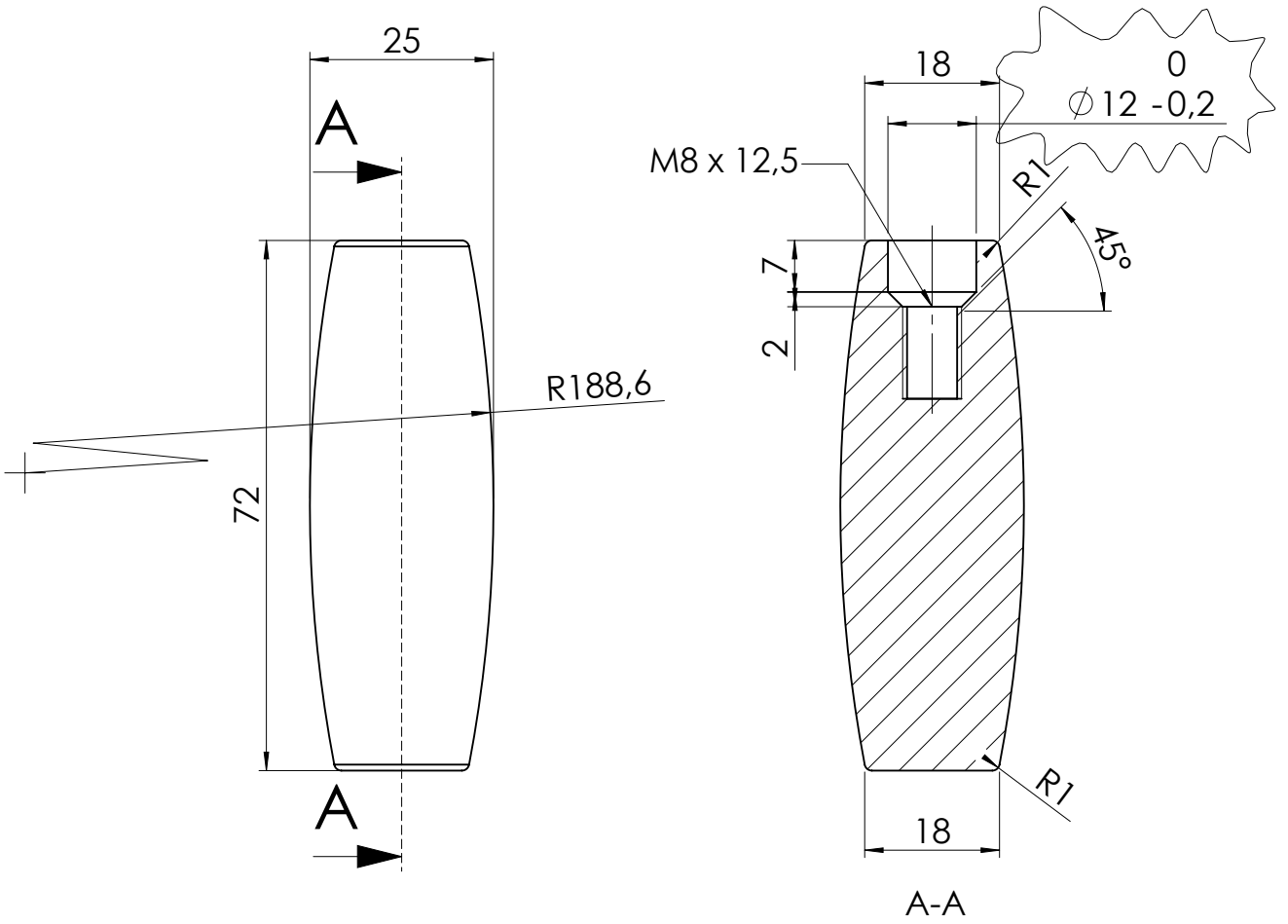
Date of print: 10-11-2014

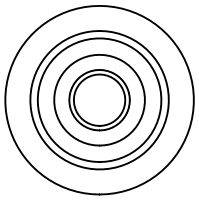




Afrettet, afgratet, kuglerenset.
Matr.: DIN1680 Teil 2 GTA 1315

Titel:	Sign.:	Dato:	Revision	Sign.	Dato
Lukkehage	Aa.GJ	04.02.93			
	Tegn.form.:	Målforhold	Gamdrup TegneTeknik	HCH	April 96
	A4	1:1			
Tegningsnummer:	Varenummer:				
1400-42-4	791271				
morsø By appointment to the Royal Danish Court	Filnavn: 1400-42				

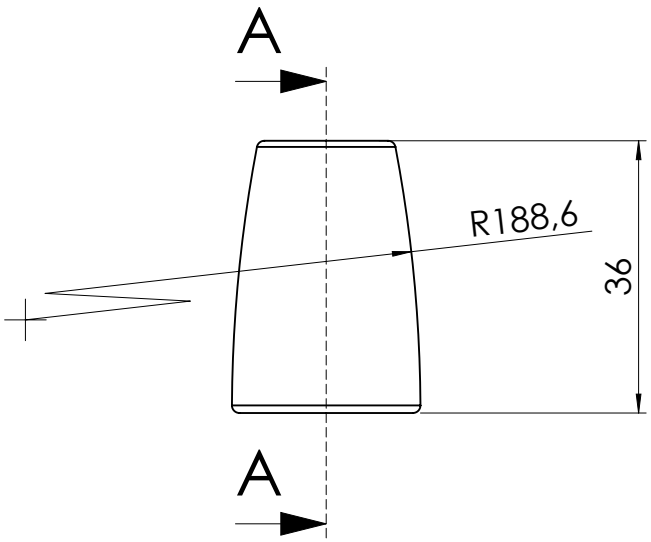


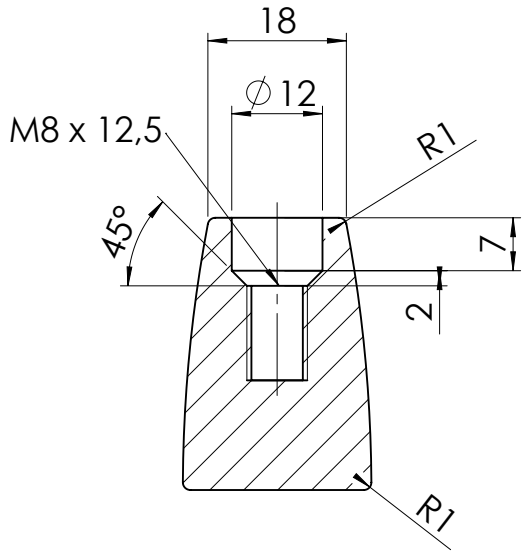


Rev.	Revisions	Sign.:	Date:
b	Påført tolerance ø12 hul	RSV	23.03.04

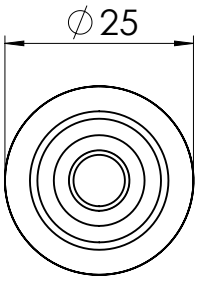
Mål uden toleranceangivelse i.h.t. DS/ISO 2768-1 m		Title: **Greb 1400** **Barkelite handle** **Morsø 1400**	Construction:	RSV 23.02.00
			Released:	RSV 02.08.00
Material:	Material <not specified>		Format:	A4
Weight:	0,08 kg		Scale:	1:1
Model no.	-		Itemno.:	79118300
Drawingtype:	Emnetegning	morsø By appointment to the Royal Danish Court	Drawing no.:	1400-193 b
Location of file:	U:\udv\Tegninger\1400\1400-193 greb.SLDPRT			

Date of print: 10-12-2013





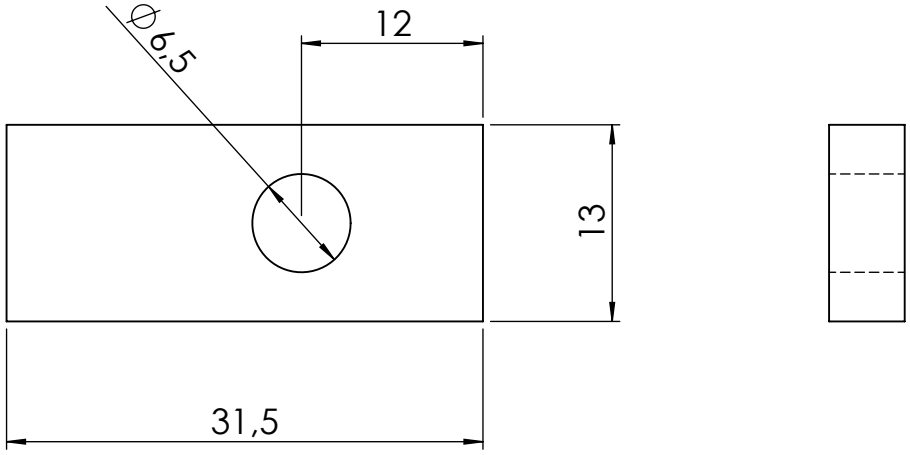
A-A



Rev.	Revisionstekst:	Sign.:	Dato:

Materiale:	Bakelite			Titel:	Konstr.:	RSV	23.02.2000
Vægt:	kg.	Bearbejdes:		**Greb lille**	Frigivet:	RSV	02.08.2000
Overfladebeh.:			m²		Tegn.format:	A4	
Måltolerance:	Mål uden toleranceangivelse DS/ISO 2768-1 m				Målforhold:	**1:1**	
Ruhedstolerance:				**Morsø 1410**	Varenr.:	**79118200**	
Værktøjsnr.:					Tegningsnr.:	**1400-194 a**	
Tegningstype:	Emnetegning						

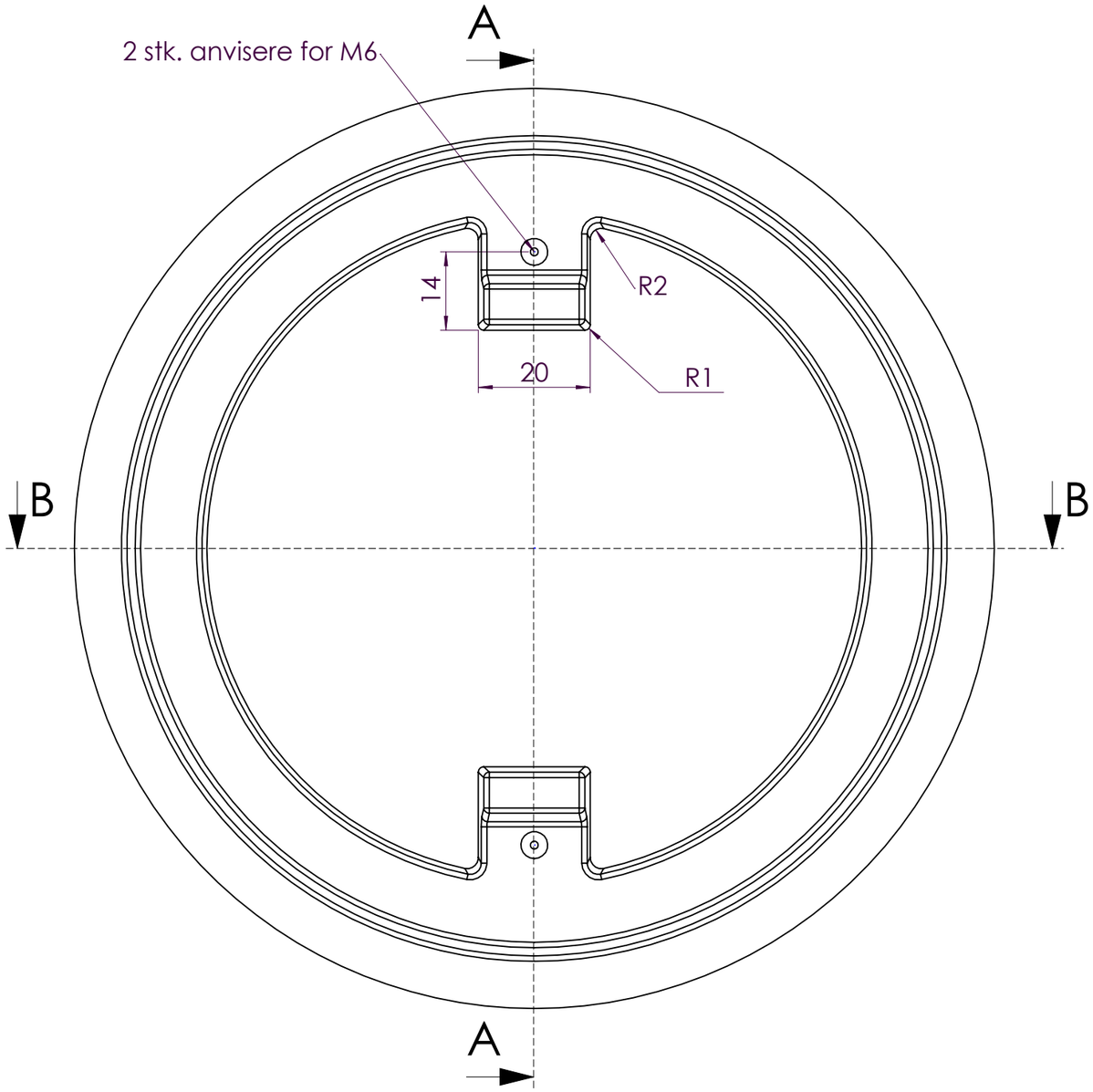
1400-194 greb lille - Sheet1

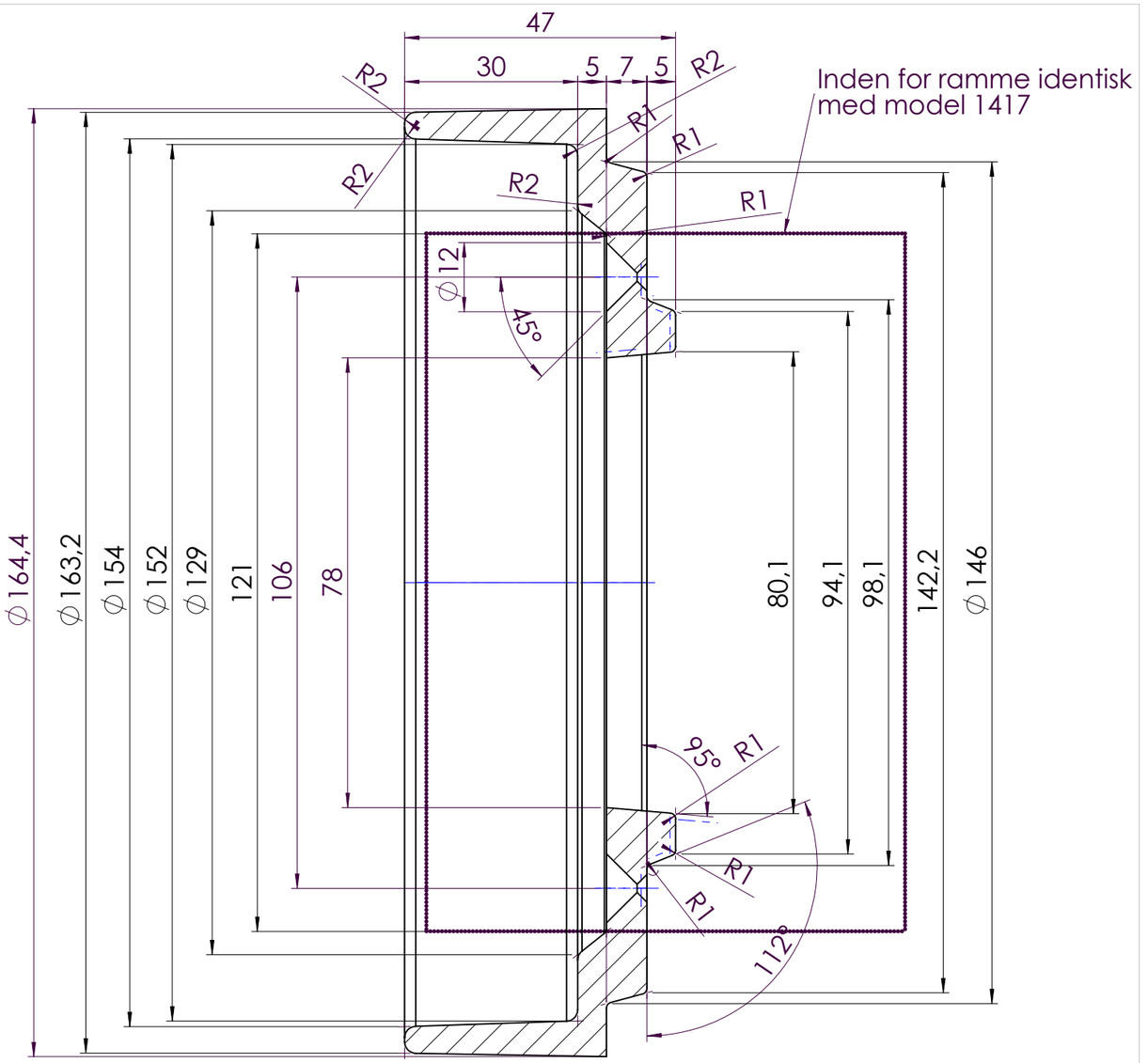


Rev.	Revisionstekst:	Sign.:	Dato:

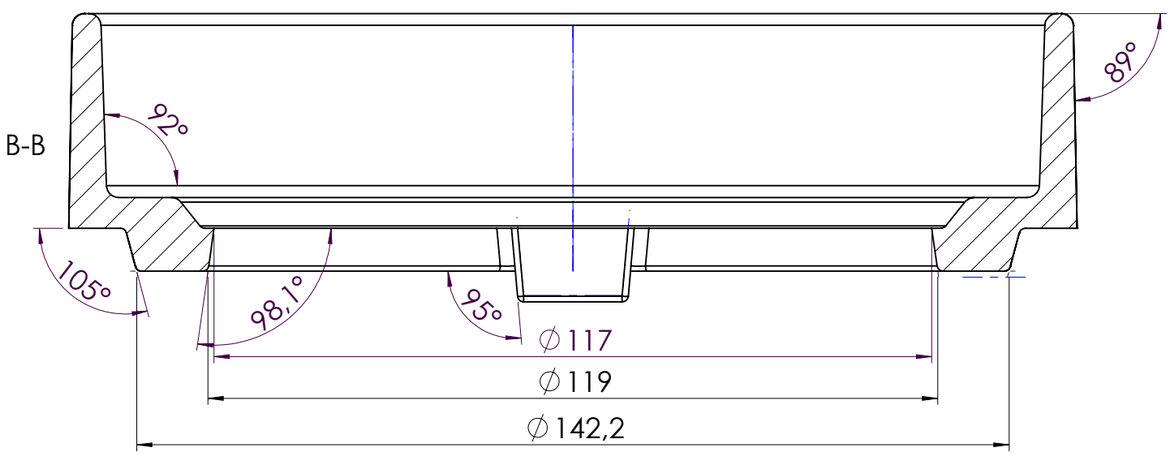
Materiale:	Sort fladjern			Titel:	Konstr.:	RSV	03.03.2000
Vægt:	0,015 kg.	Bearbejdes:		**Lus uden gevind**	Frigivet:		
Overfladebeh.:			m²		Tegn.format:	A4	
Måltolerance:	Mål uden toleranceangivelse DS/ISO 2768-1 m				Målforhold:	**2:1**	
Ruhedstolerance:				**Morsø 1400**	Varenr.:	**44256800**	
Værktøjsnr.:				morsø By appointment to the Royal Danish Court	Tegningsnr.:	**1400-199 a**	
Tegningstype:	Emnetegning						

1400-199 lus uden gevind - Sheet1



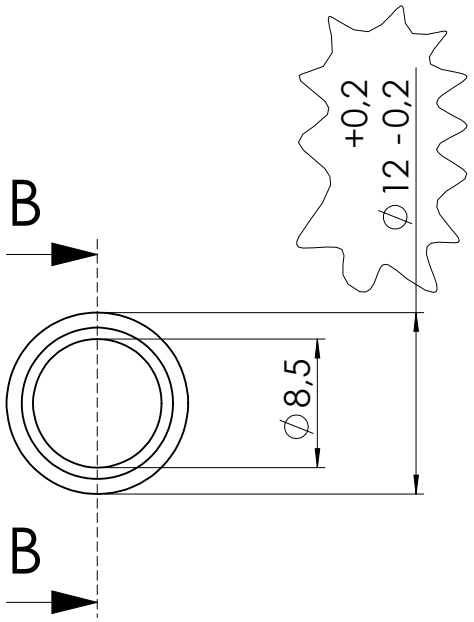


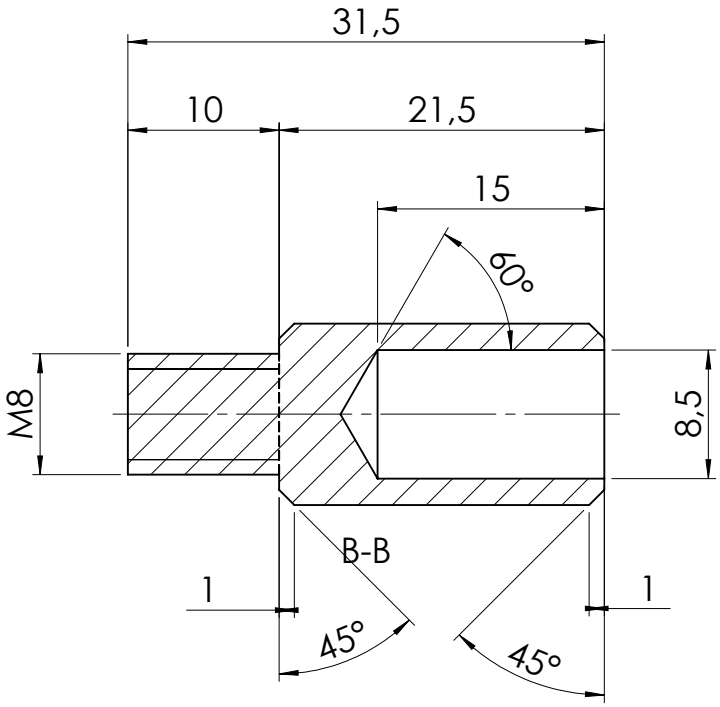
A-A



Rev.	Revisionstekst:	Sign.:	Dato:

Materiale:	GG15			Titel:	Konstr.:	RSV	13.12.2000
Vægt:	1.22 kg	Bearbejdes:		**Røgtud USA**	Frigivet:	RSV	24.09.2001
Overfladebeh.:			m²		Tegn.format:	A3	
Måltolerance:	Mål uden toleranceangivelse ISO-norm nr. 8062 CT8				Målforhold:	**1:1**	
Ruhedstolerance:				**Morsø 1400**	Varenr.:	**34145900**	
Værktøjsnr.:	**Modelnr.: 1459**			morsø By appointment to the Royal Danish Court	Tegningsnr.:	**1400-219 a**	
Tegningstype:	Støbetegning						





Rev.	Revisionstekst:	Sign.:	Dato:
b	Ændret yderdiameter + påført tolerance.	RSV	23.03.04

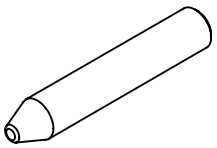
Materiale:	Rustfri stål			Konstr.:	RSV 30.04.2002
Vægt:	14.5 g	Bearbejdes:		Frigivet:	
Overfladebeh.:			m²	Tegn.format:	A4
Måltolerance:	Mål uden toleranceangivelse DS/ISO 2768-1 m			Målforhold:	**2:1**
Ruhedstolerance:				Varenr.:	**75140161**
Værktøjsnr.:				Tegningsnr.:	**1400-227 b**
Tegningstype:	Emnetegning				

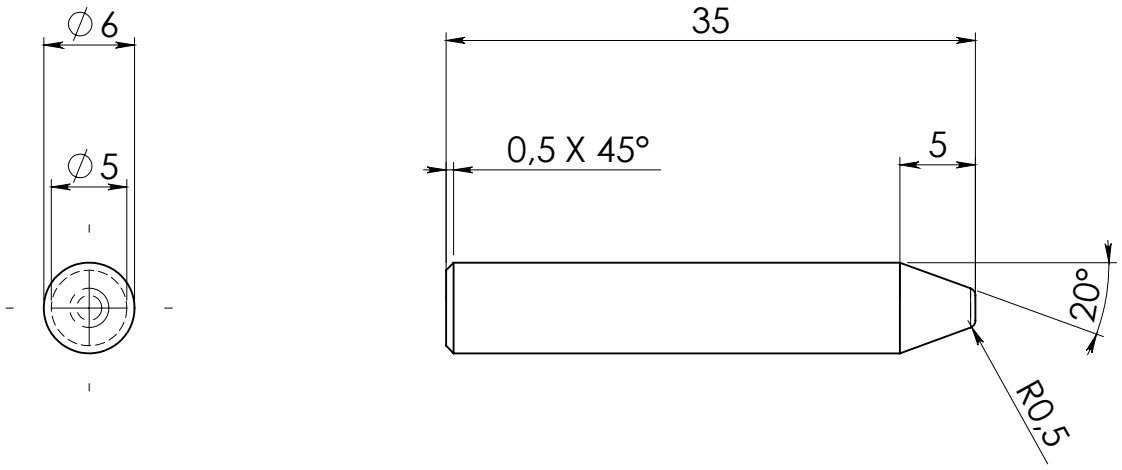
Titel:

Overgangsstykke til greb Morsø 1400

morsø
By appointment to the Royal Danish Court

1400-227 overgangsstykke til greb m gevind - Sheet1

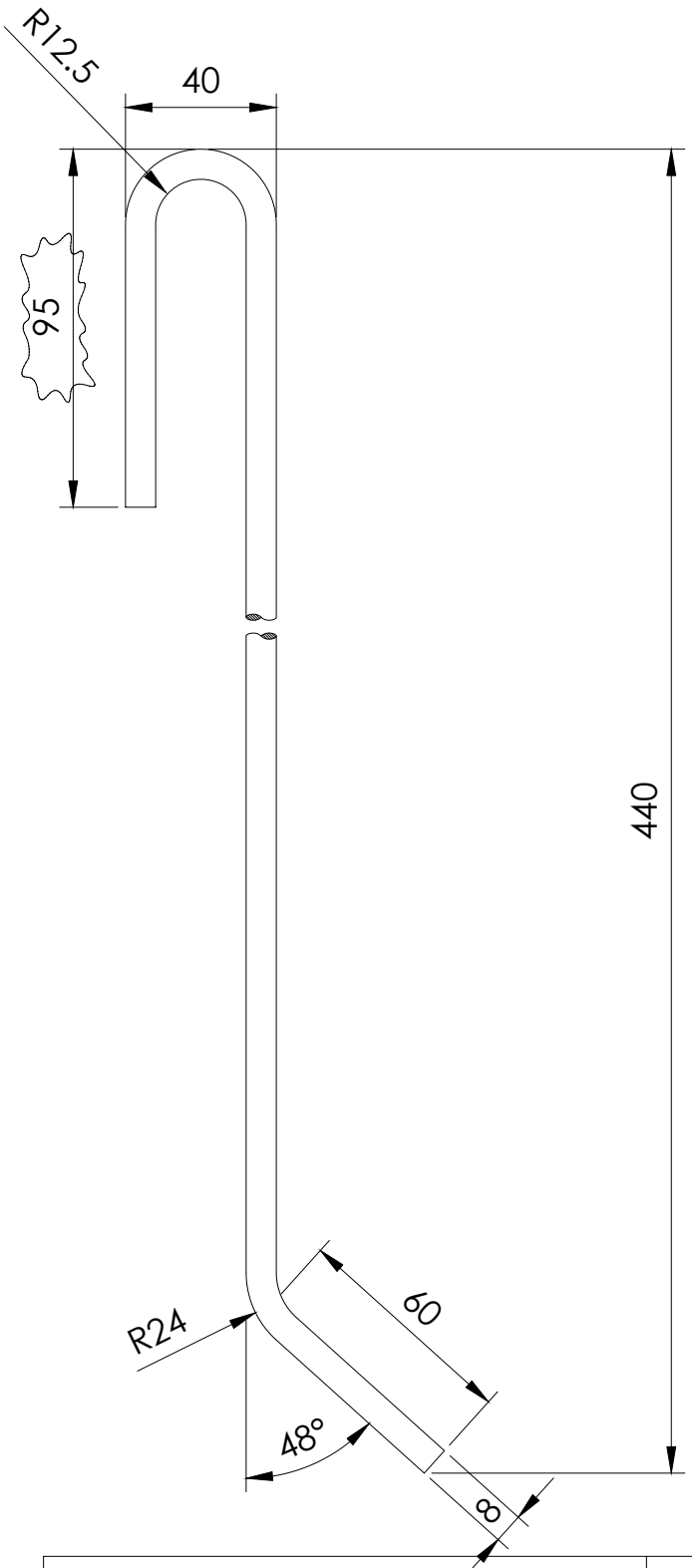




Rev.	Revisions	Sign.:	Date:

Dim. without indication of margin acc. to DS/ISO 2768-1 m	Title: **Ø6x35 Hængselstift** **Hinge Pin** **Morsø 2100**	Construction:	RSV	26.01.04
		Released:		
Material: ERROR!:materiale		Format:	A4	
Weight: 0,07 kg		Scale:	**2:1**	
Model no. -		Itemno.:	**541808**	
Drawingtype: Product Drawing	morsø By appointment to the Royal Danish Court	Drawing no.:	**2100-174 a**	
Location of file: U:\UDV\tegninger\standardbibliotek\ø6 Hængselsstift.SLDPRT				

Date of print: 12-01-2010



Matr.: ø8 mm automatstål | Vægt: 0,2 Kg.

Rev.	Revision	Sign.	Dato
b	Ombuk forlænget 70 mm	KDU	11.06.99

Titel:

Ildrager

New Generation/Classic

Sign.:	Dato:
KAA	30.07.98
Tegn.form.:	Målforhold
A4	1:2

Filnavn: 9000-05

Varenummer: 79900321

morsø
Jernstøberi A/S

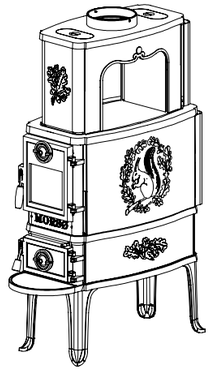
Tegningsnummer: 9000-05 b

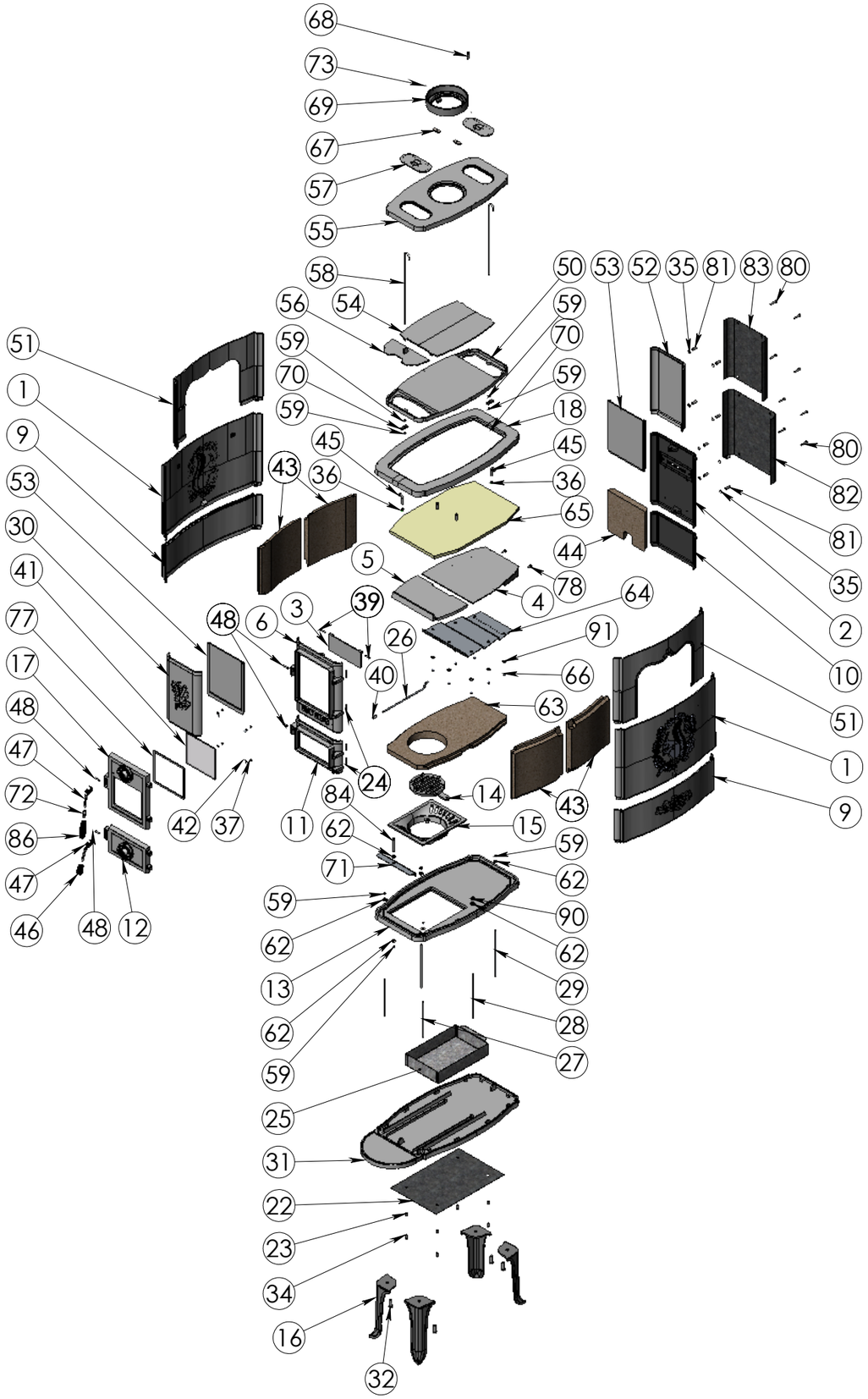
Annex 27b

Title: Spare parts

Pages total: 2, excl this cover page

Annex 27 b (2 pages)





Rev.	Revisions	Sign.:	Date:
c	Skiver tilføjet til pos. nr. 91	TOL	17.04.2012
b	Tilføjet pos. 56 dæksel til overdel.	RSV	25.11.2009

Material:		Title: **Reservedelstegning 2B Classic Morsø 2B Classic**	Construction: RSV 13.11.08
Weight kg:			Released:
Model no.			Format: **A3**
Drawingtype:	Exploded Diagram		Scale: **1:20**
Location of file:	U:\udv\Tegninger\1B&2B\2B Classic & 2B Standard Assembly.SLDASM		Itemno.:
		morsø	Drawing no.: **2b-509 c**

Date of print: 06-10-2020

Morsø 2B Classic 2020

		2B Classic 2020	
Pos.No.	**Discription**	**SKU no.**	**Drawing no.**
1	Squirrel Side Panel	54200321	2B-124
2	Rear Plate	44203821	2B-83
3	Smoke Valve	44200800	2B-102
4	Horizontal Baffle	44203600	2B-82
5	Front Baffle	34203800	2B-84
6	Front	44201521	2B-123
9	Side Panel for Upper Part	44202521	2B-22
10	Rear Plate for Lower Part	44202621	2B-21
11	Front for Lower Part	44202721	2B-20
12	Ash Door	44204821	2B-19
13	Intermediate Grate Frame	44204921	2B-23
14	Riddling Grate	44203000	2B-26
15	Inner Grate Frame	44203100	2B-25
16	Leg	44200121	2B-114
17	Door assembly	44204421	2B-148
18	Frame	44211121	2B-97
20	Poker	541075	9000-05
22	Radiation Shield - Base	54137000	2B-70
23	Distance Tube Ø10x1 L=10mm	541439	*
24	Hinge Pin Ø6x45	541808	2100-174
25	Ash pan	541405	2B-58
26	Riddling Handle	542052	2B-44
27	Bolt M6x170	542053	2B-77
28	Bolt M6x205	542054	2B-78
29	Bolt M6x215	542055	2B-79
30	Rear Panel for Upper Part	44211421	2B-99
31	Base	54209400	2B-42
32	M10x16 DIN 933 screw (black)	73111600	*
34	M6x25 DIN 933 Screw (black)	731616	*
35	Vistop lock washer 6 mm	746206	*
36	M8 DIN 934 bolt	735008	*
37	M85x08 ISO 7380 button head screw	73850800	*
39	M5x25 DIN 965A fzb screw	743525	*
40	Knob for riddling handle	752619	1126-26
41	Door Glass	790715	2B-64
42	Glass Clips	790743	1124-29
43	Side Brick	79209000	2B-87
44	Rear Brick	79209100	2B-88
45	M8x50 DIN 931 angled screw	791172	*
46	Bakelite Handle 36 mm	79118200	1400-194
47	Clasp	79127000	1400-42
48	Ø6x32mm Pin	791868	*
50	Intermediate Frame	44211200	2B-105
51	Side Panel for Upper Part	44211321	2B-98
52	Rear Panel for Upper Part	44203921	2B-99
53	Inside rear panel upper part	44211521	2B-100
54	Inside top - upper part	44211621	2B-101
55	Top - upper part	44200721	2B-89
56	Cover - upper part	44211800	2B-103
57	Access Door Upper Part	44211921	2B-104
58	Bolt - Ø5 360 mm	542146	2B-76
59	M6 DIN 934 black steel nut	735006	*
62	06 mm DIN 9021 fzb washer	791891	*
63	Brick - Base	79209200	2B-86
64	Baffle - stainless steel	71209061	2B-85
65	Insulation	79077100	2B-90
66	M6x08 DIN 933 A2 screw	74160804	*
67	Fitting for Cover w. thread	44256700	1126-55
68	M6x30 DIN 7991 screw (black)	74241900	*
69	Flue Collar	44145921	1400-219
70	Fitting w/o thread	44256800	1400-199
71	Radiation Shield - Front	71209161	2B-95
72	Fitting for handle	75140161	1400-227
73	3,5x13 DIN 7981 fzb screw	79183600	*
77	Gasket for glass	79074200	2B-94
78	M6x16 buttonhead A2 Screw	73861300	*
80	M6x30 DIN 933 Screw (black)	731630	*
81	Distance Tube Ø10x1 L=20mm	542635	*
82	Conv. back rear plate	54201221	2B-108
83	Radiation Shield - Back	54202921	2B-109
84	M6x60 DIN 933 Screw (black)	731645	*
86	Bakelite Handle 72 mm	79118300	1400-193
90	M6 nut Verbus Ribb - BN2798-HFC851	735306	*
91	06 mm 6.5x16x1 fzb DIN 522-A washer	766106	*

*Standard commercial items

Annex 28

Title: Materials data sheets

Pages total: 32, excl this cover page

STEFFCA®
– sealing and service under pressure

High temperature packing

Basic/material

E-glass.

Description

The basic material of the packing consists of 6-9 micron E-glass fiber strands, which are textured. The product is inorganic, sterile, refractory, and contains no toxins or heavy metals.
Thanks to a high-temperature treatment, the packing can be used up to 650 °C.
This treatment makes the packing retain its flexibility even with high temperature effects. At the same time, the black coating binds the loose fibers, and the packing retains its color throughout its lifetime.

Dimensions and technical data

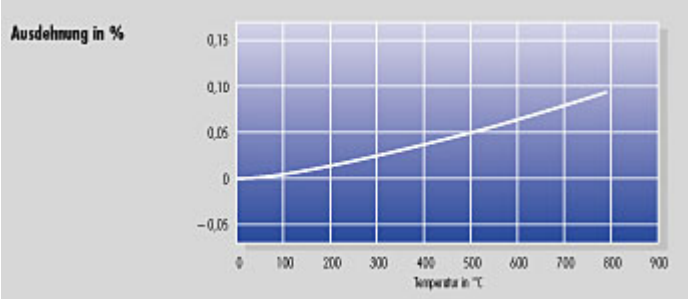
Dimensions:	Ø 6-16 mm
Length:	50-150 mm
Temperature:	650 °C
Colour:	Black
Application:	Packing/sealing
Flammability:	Inflammable

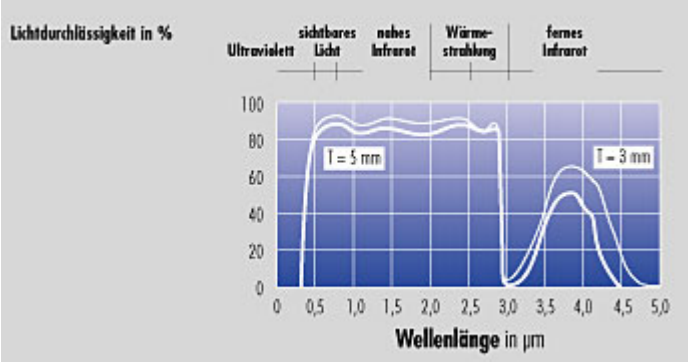
Glaskeramik NEOCERAM N-0
Technische Daten
Wärmeausdehnung
Lichtdurchlässigkeit

Oberflächenbeschaffenheit
Flache Scheiben/Beschichtete Glaskeramik/Einbaurichtlinien

Technische Daten

Ausdehnungs-koeffizient	· 10-7/K	(30 - 380° C) – 6 (30 - 750° C) – 3
Temperatur-wechselbeständigkeit	°C	800
Maximale Betriebstemperatur	°C	kontinuierlich 700 kurzzeitig 800
Wärmeleitfähigkeit	W/m · K (25° C)	1,51
Spezifische Wärme	J/kg · K	712
Dichte	g/cm3	2,51
Biege- und Schlagfestigkeit	entsprechen den Eigenschaften von Gussglas	





ROBAX® Glass Ceramic Panels

Technical Delivery Specification TL 1 00 05 51 - 00

SCHOTT ROBAX®

ROBAX® Glass Ceramic Panels

Home Tech
SCHOTT AG
ROBAX® Division
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www.schott.com/robax

SCHOTT
glass made of ideas

ROBAX® Glass Ceramic Panels

Table of Contents:

1. Description, Range of Application and Validity

1.1 Description

ROBAX® glass ceramic panels consist of a transparent glass ceramic material. Because of its material characteristics the product is designed for the use as thermal window in fireplaces. Other technical applications and shapes have to be proved separately.

1.2 Range of Application

This technical delivery specification applies to ROBAX® glass ceramic panels (delivery form: flat stock-size sheets, cut-to-size-panels and bent panels) for applications which require a low thermal expansion and transparency:

- electric, oil or gas stoves
- conventional heated fireplaces and room heaters (wood, coal, pellets, …)
- baking ovens
- special applications on request

1.3 Range of Validity

This technical delivery specification applies to the commercial relationship between the Business Unit Home Tech and its customers.

2. Technical Features

2.1 General Remarks

All data stated in this technical delivery specification are to be seen as guideline values.

Those values, for which no generally valid measuring method exist or which are not generally defined (e.g. by a technical standard), are specified and explained.

2.2 Appearance

- Transparent, slightly coloured due to the material composition and production process
- Surface appearance: plane, slightly textured due to the production process

2.3 Mechanical Characteristics

2.3.1 Density

ρ	approx. 2.6 g / cm^3

2.3.2 Modulus of Elasticity

E	approx. 93×10^3 MPa

2.3.3 Poisson's Ratio

μ	approx. 0.25

2.3.4 Bending Strength

The bending strength testing is to be accomplished according to DIN EN 1288 part 5 (R45).

$\overline{\sigma}_{bB}$	approx. 35 MPa

2.3.5 Impact Resistance

The impact resistance of ROBAX® depends on the kind of installation, the size and thickness of the panel, the kind of impact, the geometry of the panel and especially here on the drilled holes and their position on the ROBAX® panel.

Therefore information regarding the impact resistance can only be given with knowledge of the respective application (especially in combination with the technical standards regarding impact resistance that have to be met for single applications). Corresponding guideline values on request.

2.4 Thermal Characteristics

2.4.1 Coefficient of Mean Linear Expansion

$\alpha_{(20 - 700°C)}$ $(0 \pm 0.5) \times 10^{-6}$ /K

2.4.2 Mean Specific Thermal Capacity

$c_{p(20 - 100°C)}$ approx. 0.8×10^{3} J / (kg · K)

2.4.3 Thermal Conductivity

$\lambda_{(90°C)}$ approx. 1.6 W / (m · K)

2.4.4 Resistance to Temperature Differences (RTD)

Resistance of the panel to temperature differences between heated zone and cold panel edge (room temperature).

No cracking due to thermal stress at $T_{es, max}$ [1)] ≤ 700°C

2.4.5 Thermal Shock Resistance

Resistance of the panel to thermal shock when the hot panel is quenched with cold water (room temperature).

No cracking due to thermal stress at $T_{es, max}$ [1)] ≤ 700°C

2.4.6 Temperature / Time Load Capacity (under consideration of items 2.4.4 and 2.4.5)

The temperature / time load capacity specifies the maximum permissible temperature for given load times for the fireplace panels, below which no cracking due to thermal stress occurs.

The value pairs specified in the following table 2.1 are relevant to the practical use of the glass ceramic material as fireplace panel. The temperature values refer to the hottest point on the exterior side of the panel ($T_{es, max}$) because this temperature can be measured more easily and more reliably.

[1)] $T_{es, max}$: Maximum temperature on the exterior side of the panel, that means the reverse side of the heat source, at the hottest point

Load temperature $T_{es, max}$ [1)]	Load time
560°C (1040°F)	5000 hr
610°C (1130°F)	1000 hr
660°C (1220°F)	100 hr
710°C (1310°F)	10 hr
760°C (1400°F)	5 hr

Table 2.1: Temperature / time load capacity for ROBAX® panels

Note:

For ROBAX® fireplace panels the temperature / time load capacity specified in table 2.1 must be maintained. It must be ensured that this temperature / time load capacity is not exceeded during use, to prevent cracking due to thermal stress.

The temperature / time load data for even temperature distributions within an entire glass ceramic panel (e.g. homogeneous heating conditions in a testing furnace) are given in table 2.2. This data is to be seen purely as characteristic data for the glass ceramic material itself. It is not typical for use of the glass ceramic material as fireplace panels, which have a temperature distribution totally different from evenness. The temperatures refer to the homogeneous heating of the ROBAX® panel (T_{hom}).

Load temperature T_{hom} [2)]	Load time
700°C (1292°F)	6000 hr
750°C (1382°F)	750 hr
775°C (1427°F)	275 hr
800°C (1472°F)	100 hr
825°C (1517°F)	35 hr

Table 2.2: Temperature / time load capacity for uniformly heated ROBAX® panels

1) $T_{es, max}$: Maximum temperature on the exterior side of the panel, that means the reverse side of the heat source, at the hottest point

2) T_{hom}: Homogenous temperature, i.e. material temperature under homogeneous heating conditions

2.5 Chemical Characteristics of Base Material

2.5.1 Acid Resistance

DIN 12116	at least class S3

2.5.2 Alkaline Resistance

based on ISO 695	at least class A2

2.5.3 Hydrolytic Class

DIN ISO 719	class HGB 1

2.5.4 Change of Surface due to Use

ROBAX® has a good resistance against chemical surface attack. In isolated cases and under special critical conditions, e.g. aggressive exhaust gases (acidification at high temperatures) changes of the surface may occur. For such applications practice tests have to be carried out before being used.

3. General Dimensional Tolerances and Material Characteristics

The following describes characteristics which are valid for all four product groups (stock-size sheets, cut-to-size panels, round bent and angular bent panels). With regard to stock-size sheets all of the following characteristics (with exception of flatness, see item 4.1) refer to the net-size as agreed on with the customer.

3.1 Dimensional Tolerances

Characteristics / Areas / Location	Tolerance
Thickness *t* ***t*** = 3.0 / 4.0 / 5.0 mm	± 0.2 mm

Table 3.1: Dimensional tolerances

3.2 Material Characteristics

Visual inspection in the normal installation position without visual aids and illumination of approx. 800 Lux when viewed from a minimum distance of 1 m.

The inspection shall be executed with a background in the colour of fireclay bricks:

Light ivory RAL-1015.

3.2.1 Bubbles

Bubbles are gaseous inclusions within the glass ceramic material. Closed bubbles can appear as low-spots on the surface depending on their size and position within the glass. Open bubbles are open towards the panel surface and are not permissible if bigger than 1 mm. The production of material totally free of bubbles is not possible due to the production process. Table 3.2 contains the permissible number of closed bubbles in dependence of their length and the panel size.

Characteristic's Length *L* [mm]	Panel Size *A*			
	A ≤ 20 dm²	20 dm² < *A* ≤ 40 dm²	40 dm² < *A* ≤ 80 dm²	80 dm² < *A* ≤ 150 dm²
L ≤ 1.0	unconsidered	unconsidered	unconsidered	unconsidered
1.0 < *L* ≤ 2.0	2[1)]	6[1)]	12[1)]	33
2.0 < *L* ≤ 4.0	1[1)]	2[1)]	4[1)]	20
4.0 < *L* ≤ 8.0	0	0	0	13
8.0 < *L*	0	0	0	0

[1)] The distance between two adjacent characteristics must be minimum 200 mm.

Table 3.2: Permissible number of closed bubbles per panel

3.2.2 Solid Inclusions and Stains

Solid inclusions are inhomogeneities within the glass ceramic material. Stains are deviations of the surface which are easily visible under normal inspection conditions. Both characteristics cannot be completely avoided due to the production process. Table 3.3 contains the permissible number of solid inclusions and stains in dependence of their length and the panel size.

Characteristic's Length *L* [mm]	Panel Size *A*			
	A ≤ 20 dm²	20 dm² < *A* ≤ 40 dm²	40 dm² < *A* ≤ 80 dm²	80 dm² < *A* ≤ 150 dm²
L ≤ 0.5	unconsidered	unconsidered	unconsidered	unconsidered
0.5 < *L* ≤ 2.0	0	3[1)]	6[1)]	30
2.0 < *L* ≤ 4.0	0	0	1[1)]	3
4.0 < *L*	0	0	0	0

[1)] The distance between two adjacent characteristics must be minimum 200 mm.

Table 3.3: Permissible number of solid inclusions and stains per panel

3.2.3 Scratches

The delivery of ROBAX® panels totally free of scratches is not possible due to technical reasons. It has to be distinguished between slight scratches (scratches not detectable with finger nail) and strong scratches (scratches detectable with finger nail). Table 3.4 contains the permissible number of scratches in dependence of their length and the panel size.

Characteristic's Length *L* [mm]	**Panel Size *A***			
	A ≤ 20 dm²	20 dm² < ***A*** ≤ 40 dm²	40 dm² < ***A*** ≤ 80 dm²	80 dm² < ***A*** ≤ 150 dm²
Slight Scratches:				
L ≤ 10	unconsidered	unconsidered	unconsidered	unconsidered
10 < ***L***	1[1)]	2[1)]	4[1)]	20
Strong Scratches:				
L ≤ 10	1[1)]	2[1)]	4[1)]	20
10 < ***L***	0	0	0	0

[1)] The distance between two adjacent characteristics must be minimum 200 mm.

Table 3.4: Permissible number of scratches per panel

3.2.4 Pits

ROBAX® panels may show pits. These pits must not be recognizable during a visual inspection according to the conditions for visual inspections as described in item 3.2.

3.2.5 Other Characteristics

If the panel - when inspected according to the conditions for visual inspections as described in item 3.2 - shows a number of defects which impair the aesthetic appearance SCHOTT and the customer will agree on limit values for the respective characteristics and, if necessary, limit samples will be defined.

4. Stock-Size Sheets

Stock-size sheets are large-size glass ceramic panels without any further processing, especially without edge processing. They serve as base material for cut-to-size panels.

4.1 Dimensional Tolerances

Characteristics / Areas / Location	Tolerance
Edge length of stock-size sheet	
Usable length:	at least 1580 mm
Usable width:	at least 840 mm
Flatness of stock-size sheet	
Flatness	≤ 0.3 % × measuring length (Measuring length at least 500 mm)

Table 4.1: Dimensional tolerances for stock-size sheets

4.2 Material Characteristics

The material characteristics comply with the specifications of item 3.2, incl. subitems.

5. Cut-to-Size Panels

5.1 Dimensional Tolerances

Characteristics / Areas / Location	Tolerance
Edge length *l*	
l ≤ 500 mm	± 1.0 mm
l > 500 mm	± 1.5 mm
Special designs (contour shapes)	as per separate agreement
Corner radius *r*	
r ≤ 20 mm	± 1.5 mm
r > 20 mm	± 2.0 mm
Squareness of cut-to-size panels *a* (according to fig. 5.1)	
Edge length ≤ 500 mm	*a* ≤ 1.0 mm
Edge length > 500 mm	*a* ≤ 1.5 mm
Flatness of cut-to-size panels	
Flatness	≤ 0.3% × *D* *D*: diagonal of cut-to-size panel
Drilled hole diameter d_H	
4 mm ≤ d_H ≤ 20 mm	± 0.2 mm
20 mm < d_H ≤ 60 mm	± 0.5 mm
Position of drilled hole	
• Deviation between drilled hole centre axis and panel centre axis	± 1.5 mm
• Deviation between drilled hole centre axis of adjacent drilled holes (max. distance 500 mm)	± 1.0 mm

Table 5.1: Dimensional tolerances for cut-to-size panels

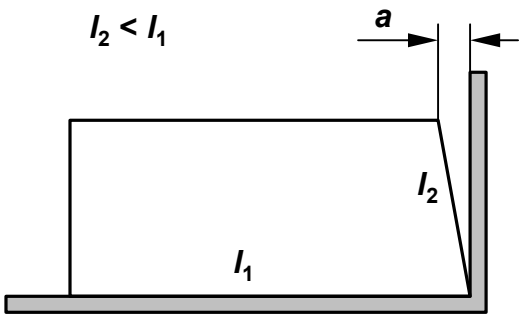

Fig. 5.1: Squareness measurement

5.2 Edge Finish

The edges of flat cut-to-size panels are processed according to DIN 1249, e.g. either arrissed or round ground to size.

ROBAX® panels may show small chippings at the edges. The maximum permissible size of these chippings is 1.5 mm when measured from the outer edge of the panel.

ROBAX® panels with V-shaped edge defects are not permissible.

5.3 Material Characteristics

The material characteristics comply with the specifications of item 3.2, incl. subitems.

6. Round Bent Panels

6.1 Dimensional and Form Tolerances

Characteristics / Areas / Location	Tolerance
Panel height *h*	
$h \leq 500$ mm	± 1.0 mm
500 mm < $h \leq 600$ mm	± 1.5 mm
600 mm < h	Determination according to initial sample
Arc length l_A	
$l_A \leq 500$ mm	± 1.5 mm
$l_A > 500$ mm	± 2.0 mm
Corner radius *r*	
$r \leq 20$ mm	± 1.5 mm
$r > 20$ mm	± 2.0 mm
Sagging at panel edge s_h	
$h \leq 500$ mm	$s_h \leq 1.5$ mm
500 mm < $h \leq 600$ mm	$s_h \leq 2.0$ mm
600 mm < h	Determination according to initial sample
Drilled hole diameter d_H	
4 mm $\leq d_H \leq$ 20 mm	± 0.2 mm
20 mm < $d_H \leq$ 60 mm	± 0.5 mm
Position of drilled hole	
• Deviation between drilled hole centre axis and panel centre axis	± 1.5 mm
• Deviation between drilled hole centre axis of adjacent drilled holes (max. distance 500 mm)	± 1.0 mm

Table 6.1: Dimensional and form tolerances for round bent panels (see also fig. 6.1)

Table 6.2 contains the permissible overall torsion values of round bent panels.

	Panel Size *A*		
	A ≤ 20 dm²	20 dm² < ***A*** ≤ 40 dm²	40 dm² < ***A***
Permissible overall torsion s_T [mm]	2.5	4	5

Table 6.2: Permissible overall torsion of round bent panels (see also fig. 6.1)

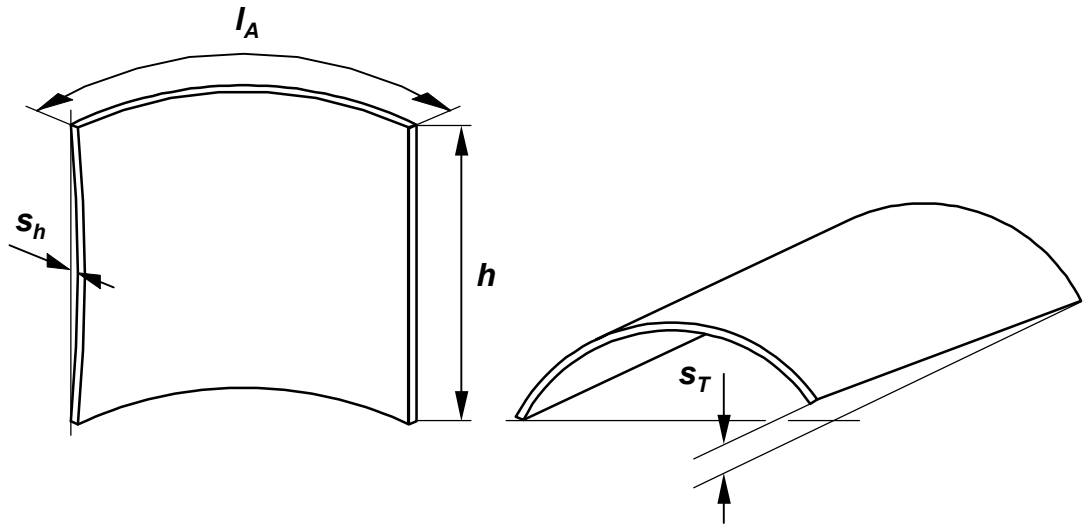

Fig. 6.1: Round bent ROBAX® panels

All geometric tolerances are specified by means of a two-dimensional enveloping contour. For testing the geometric tolerances a flat plastic gauge with a defined contour slot is used. The geometry of the contour slot is determined by the radius of curvature of the panel R_{soll}, by the arc length l_A and by the tolerance of the contour slot widths s_i, s_a (see fig. 6.2). If required the drawing of the contour slot gauge can be provided for the customer.

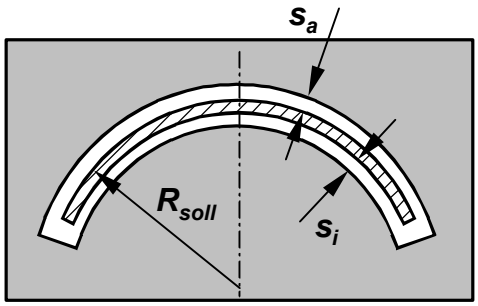

Fig. 6.2: Contour slot gauge geometry for round bent ROBAX® panels

The tolerances of the contour slot widths for round bent panels are given in table 6.3.

Aperture angle α_B	Arc length l_A					
	185 mm < l_A ≤ 400 mm		400 mm < l_A ≤ 600 mm		600 mm < l_A ≤ 1100 mm	
	s_i	s_a	s_i	s_a	s_i	s_a
α_B ≤ 130°	1.0 mm	1.0 mm	1.25 mm	1.25 mm	1.25 mm	1.25 mm
130° < α_B ≤ 180°	1.25 mm	1.25 mm	1.5 mm	1.5 mm	1.5 mm	1.5 mm

Table 6.3: Tolerances of the contour slot widths s_i , s_a for round bent panels

The glass ceramic panel must easily fit into the contour slot gauge.

6.2 Material Characteristics

The material characteristics comply with the specifications of item 3.2, incl. subitems.

7. Angular Bent Panels

7.1 Dimension and Form Tolerances

Characteristics / Areas / Location	Tolerance
Leg length l_1, l_3	± 2.0 mm
Middle section length l_2	± 1.0 mm
Panel height *h*	
$h \leq 500$ mm	± 1.0 mm
$500 \text{ mm} < h \leq 600$ mm	± 1.5 mm
$600 \text{ mm} < h$	Determination according to initial sample
Corner radius *r*	
$r \leq 20$ mm	± 1.5 mm
$r > 20$ mm	± 2.0 mm
Sagging at leg edge s_{l1}, s_{l3}	s_{l1}, s_{l3} ≤ 2.0 mm
Sagging at middle section edge s_{l2}	s_{l2} ≤ 2.0 mm
Sagging at panel edge s_h	
$h \leq 500$ mm	s_h ≤ 1.5 mm
$500 \text{ mm} < h \leq 600$ mm	s_h ≤ 2.0 mm
$600 \text{ mm} < h$	Determination according to initial sample
Drilled hole diameter d_H	
$4 \text{ mm} \leq d_H \leq 20$ mm	± 0.2 mm
$20 \text{ mm} < d_H \leq 60$ mm	± 0.5 mm
Position of drilled hole	
• Deviation between drilled hole centre axis and panel centre axis	± 1.5 mm
• Deviation between drilled hole centre axis of adjacent drilled holes (max. distance 500 mm)	± 1.0 mm

Table 7.1: Dimension and form tolerances for angular bent panels (see also fig. 7.1)

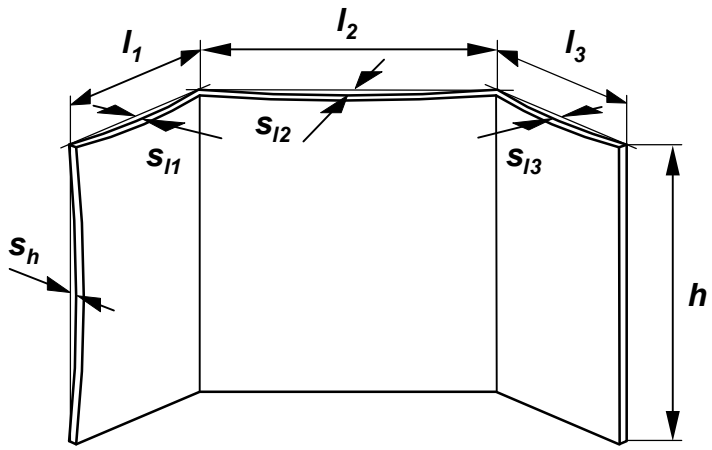

Fig. 7.1: Angular bent ROBAX® panels

Table 7.2 contains the permissible overall torsion values of angular bent panels.

	Panel Size A		
	$A \leq 20$ dm²	20 dm² < $A \leq 40$ dm²	40 dm² < A
Permissible overall torsion s_T [mm]	2.5	4	5

Table 7.2: Permissible overall torsion of angular bent panels (see also fig. 7.2)

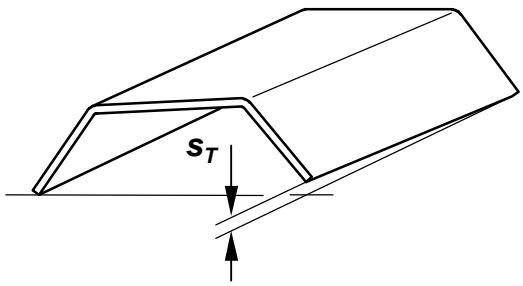

Fig. 7.2: Overall torsion of an angular bent ROBAX® panel

All geometric tolerances are specified by means of a two-dimensional enveloping contour. For testing the geometric tolerances a flat plastic gauge with a defined contour slot is used. The geometry of the slot is determined by the edge lengths l_1, l_2, and l_3, by the bending angle α_W and by the tolerances of the contour slot widths s_i, s_a (see fig. 7.1, 7.2, 7.3 and 7.4). If required the drawing of the contour slot gauge can be provided for the customer.

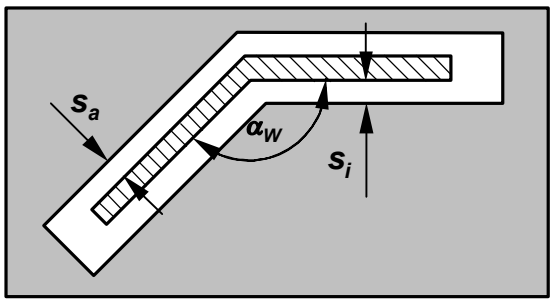

Fig. 7.3: Contour slot gauge geometry for single angular bent ROBAX® panels

The tolerances of the contour slot widths for single angular bent panels are given in table 7.3.

Bending angle α_W	Sum of leg lengths L					
	180 mm < L ≤ 440 mm		440 mm < L ≤ 900 mm		900 mm < L ≤ 1300 mm	
	s_i	s_a	s_i	s_a	s_i	s_a
90° < α_W ≤ 160°	1.0 mm	1.0 mm	1.5 mm	1.5 mm	2.0 mm	2.0 mm

Table 7.3: Tolerances of the contour slot widths s_i , s_a for single angular bent panels

The glass ceramic panel must easily fit into the slot gauge.

The contour slot gauge geometry as shown in fig. 7.4 is valid for double angular bent panels.

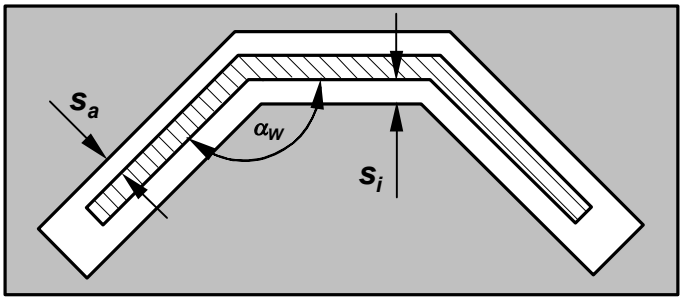

Abb. 7.4: Slot gauge geometry for double angular bent ROBAX® panels

The tolerances of the contour slot widths for double angular bent panels are given in table 7.4:

Bending angle α_W	Longest leg length $l_{,max}$					
	30 mm < l ≤ 100 mm		100 mm < l ≤ 200 mm		200 mm < l ≤ 340 mm	
	s_i	s_a	s_i	s_a	s_i	s_a
110° < α_W	1.0 mm	1.0 mm	1.25 mm	1.25 mm	1.5 mm	1.5 mm

Table 7.4: Tolerances of the contour slot widths s_i , s_a for double angular bent panels

The glass ceramic panel must easily fit into the slot gauge.

7.2 Material Characteristics

The material characteristics comply with the specifications of item 3.2, incl. subitems.

8. Transport, Storage and Handling

To avoid damage, it is necessary for the panels to be handled properly as well as transported and stored only vertically secured, and protected against touching each other by suitable intermediate layers (paper, cardboard, cork or PE foamfoils).

9. Installation Guidelines

The same conditions apply to the installation and the handling of ROBAX® panels as are generally valid for handling glass and glass ceramic parts.

- The **different thermal expansion** between the various frame materials and the ROBAX® panel has to be taken into account for the complete construction. Furthermore the possible production tolerances of frame and panel have to be considered.
- For installation it is necessary to use a sufficiently **low distortion frame construction**. As a minimal distortion of the frame construction cannot be excluded a **temperature stable, permanently resilient gasket** (e.g. fibre glass cloth or mineral fibre cloth) is required in order to prevent any transfer of distortions from the frame construction onto the ROBAX® panel. Any direct contact between glass ceramics and metal has to be avoided.
- If for constructive reasons a pressing of the panel in the frame is required the **contact pressure must be applied uniformly (never at points only)** over the entire edge area of the panel.

10. Procedures if Deviations Occur

10.1 Basic Action

Deviations should be handled in the most cost-effective manner for both partners. Deviations are estimated according to the state of the products at time of delivery. Changes in the material which occur during further processing of ROBAX® glass ceramic panels exclude warranty claims of the recipient against SCHOTT.

10.2 Obligation of Recipient to Provide Information

SCHOTT requires the following data for reporting, testing and evaluating deviations:

- SCHOTT order number
- Pallet voucher with production order number
- Warehouse unit number
- Delivery quantity affected
- Complaint quantity with article number
- Reasons for complaint
- Results of random sample tests

10.3 Recipient's Storage Obligation

All parts with characteristic values deviating from the specifications and complained about by the recipient must be stored by the recipient until final clarification of the facts and made available to SCHOTT upon request. If such parts are scrapped by the recipient without written authorization from SCHOTT or if they are no longer available for other reasons, all warranty rights regarding such parts shall be null and void.

STEFFCA®
– sealing and service under pressure

Round packing with or without core

Basic/material

E-glass.

Description

The basic material consists of 6-9 micron E-glass fiber yarns which are texturized.
The product is inorganic, sterile, refractory, and contains no toxins or heavy metals. It is a knitted glass fiber packing – with or without core – made of E-glass.
It is a heavy packing, so you get a more stable packing, e.g. for wood-burning stove doors. The packing is suitable as a door seal in stoves and sealing flues.

Dimensions and technical data

Dimensions:	Ø 3-50 mm
Length:	50/100 mm
Temperature:	550 °C
Colour:	White / Antracit
Application:	Packing/seal
Flammability:	Inflammable

STEFFCA®
– sealing and service under pressure

Glass tape/ladder tape

Basic/material

E-glass.

Description

The basic material consists of 6-9 micron E-glass fiber yarns which are texturized.
The product is inorganic, sterile, refractory, and contains no toxins or heavy metals.
A knitted fiberglass tape has a great packing surface – with less packing thickness. This makes the tape suitable for packing glass in stoves, where usually there is no room for a round seal.
A ladder tape is a knitted fiberglass tape with a ladder in the middle. That is, on the middle, there are only transverse strands.
This makes it particularly suitable for packing of the glass in the stove, as the tape packs on both sides simultaneously.
The packing is available with self-adhesive tape for easy installation.

Dimensions and technical data

Dimension:	8x2 mm - 25x3 mm
Length:	50 / 100 mm
Temperature:	550 °C
Colour:	Antracit
Tape:	Yes
Application:	Packing / sealing
Flammability:	Inflammable

INSULFRAX LTX BLANKET

Description

Insulfrax® LTX™ Blankets are the latest addition to the Insulfrax product family. Insulfrax LTX offers the same benefits as previous Insulfrax blankets, now with physical properties enhanced to improve both thermal performance and handling. These lightweight needled blankets combine innovative proprietary technology with Insulfrax proven performance to create the best low-biopersistent Insulfrax blanket available from Insulcon today. Insulfrax LTX blankets are manufactured from alkaline earth silicate (AES) wool, and provide effective solutions to a variety of thermal management challenges.
The new Insulfrax LTX products can help customers reduce costs. The enhanced LTX fibre performance helps companies reduce their energy costs and meet increasingly strict carbon emission targets, without increasing the amount of insulation required. Alternatively, customers can save on material costs by using less insulation to achieve the same performance as standard AES blankets. Customers can save money by reducing their lining thickness up to 25%, freeing up valuable space in furnaces and ovens.
Insulfrax LTX Blankets are completely inorganic and binder free with an improved, smoother surface finish. Insulfrax LTX Blankets retain their strength, flexibility and thermal properties in many working environments without the generation of smoke or fumes. These new blankets are less dusty, which makes handling and cutting the material easier, resulting in faster installation of the product onsite and, in some cases, reduced waste of material. Insulfrax LTX Blankets are also printed on the surface of the blanket, which makes installation tracking and inspection on the job site or in the fabrication shop easier.
Available in a range of density and thickness combinations, Insulfrax LTX Blankets can be used in a wide variety of applications and are especially suited for use as high-temperature gaskets, wraps and heat shields.

General Characteristics

Insulfrax LTX Blanket products have the following outstanding characteristics:

- Exceptional insulating properties
- High temperature stability (up to 1200°C)
- Resistance to thermal shock
- High tensile strength & resiliency
- Lightweight
- Excellent flexibility
- Good acoustic properties

Typical Applications

Insulfrax LTX Blankets are the next generation of low biopersistent Insulfrax fiber and the product of choice for a wide range of applications in a number of industries including:

Appliances

- Residential self-cleaning ovens
- High-temperature commercial cooking appliances

Hearth Products

- Chimney Insulation

LEADER IN HIGH TEMPERATURE SOLUTIONS

TECHNICAL DATASHEET

Insulcon B.V.- The Netherlands - Tel: +31 (0) 167 565 750
Insulcon GmbH - Germany - Tel: +49 (0) 2131 408548-0
Keramab N.V. - Belgium - Tel: +32 (0) 3 711 02 78
Insulcon Projects S.A. - Switzerland - Tel: +41 (0) 919117390

INSULCON LEADER IN HIGH TEMPERATURE SOLUTIONS | KERAMAB LEADER IN HIGH TEMPERATURE SOLUTIONS

www.insulcon.com / www.keramab.com

Form: A1-049
Effective: 22012018/AJ/an
supersedes: ss None

INSULFRAX LTX BLANKET

Primary Metals
- Expansion joint seals
- Aluminium transfer ladle covers
- Backup insulation for dense refractory linings
- Backup insulation for Fiberfrax® or Isofrax® linings
- Maintenance blanket
- Heat shields

Metals Processing
- Stress relieving blankets
- Seals and gaskets

Petrochemical/Power
- Reusable insulating pads
- External boiler and duct insulation

Ceramic and Glass
- Glass tank crown insulation
- Expansion joints
- Carbon baking furnace covers

Passive fire protection

Exhaust Insulation and Heat Shields

Typical Product Parameters

	Insulfrax LTX Blanket			
Typical Chemical Analysis (wt. %)				
SiO_2	61.0 – 67.0			
CaO	27.0 – 33.0			
MgO	2.5 – 6.5			
Al_2O_3	<1.0			
Fe_2O_3	<0.6			
Physical Properties				
Colour	White			
Classification Temperature (C°)*	1200			
Use Limit (C°)*	1100			
Melting Point (C°)	>1330			
Mean Fibre Diameter (microns)	4.0			
Permanent Linear Shrinkage (%) 24 hour soak EN 1094-1				
1200°C	1.0			
Density (kg/m³)	**64**	**96**	**128**	**160**
Thermal Conductivity (W/mK) – ASTM C201				
Mean Temp.				
200°C	0.06	0.06	0.05	0.05
400°C	0.11	0.09	0.08	0.08
600°C	0.17	0.14	0.12	0.11
800°C	0.26	0.20	0.18	0.15
1000°C	0.38	0.29	0.25	0.21
Tensile Strength (kPa)				
	45	65	85	100

LEADER IN HIGH TEMPERATURE SOLUTIONS

TECHNICAL DATASHEET

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Keramab N.V. - Belgium - Tel: +32 (0) 3 711 02 78
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www.insulcon.com / www.keramab.com

Form: A1-049
Effective: 22012018/AJ/an
supersedes: ss None

* The maximum continuous use limit temperature for these products depends upon operating and application conditions, and also the engineered design of the insulation lining. For additional information and support regarding product performance or to identify the recommended product for your application, please contact your nearest Insulfrax Application Engineering office.
Data shown is based on average results of tests conducted under standard procedures and are subject to variation. Results should not be used for specification purposes.

Availability

Thickness (mm)	Density (kg/m³)				Roll Length (m)
	64	96	128	160	
6		*	✓		22.00
10		*	*		18.30
13		✓	✓	*	14.64
19	*	✓	✓	*	10.00
25	✓	✓	✓	✓	7.32
38	*	✓	✓	*	5.00
50	✓	✓	✓	✓	3.66

Standard roll width is 610mm.
Products in the table above listed with a checkmark are standard items.
Products marked with an asterisk (*) are not standard items but are available on request and may be subject to minimum order requirements. Other thicknesses, sizes and densities (e.g. 80 kg/m3) are available on request subject to minimum order requirements. Versions with aluminium foil and other coverings are also available.

Insulcon B.V.- The Netherlands - Tel: +31 (0) 167 565 750
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Insulcon Projects S.A. - Switzerland - Tel: +41 (0) 919117390

Form: A1-049
Effective: 22012018/AJ/an
supersedes: ss None

V-1100 (600) Vermiculite insulating slabs

for hot-face and back-up insulation - up to 1100°C (2012°F)

Maximum service temperature		
	°C	1100
	°F	2012
Bulk density, dry		
	kg/m^3	600
	lbs/cu.ft.	37.5
Compressive strength (EN 1094-5: 1995)		
@ room temperature	MPa	4.2
	lbs/sq.in.	609
Modulus of rupture (EN 993-6: 1995)		
	MPa	1.6
	lbs/sq.in.	232
Total porosity (EN 1094-4: 1995)		
	%	76
Specific heat		
	kJ/(kg×K)	0.94
	BTU/(lb×°F)	0.224
Coefficent of reversible thermal expansion (BS 1902: section 5.3: 1990)		
@ 20°C-750°C (68°F-1382°F)	K^{-1}	11×10^{-6}
	$°F^{-1}$	6.1×10^{-6}
Resistance to thermal shock (EN 993-11: 1998)		
heating to 950°C (1742°F)	cycles	>10
Linear reheat shrinkage (EN 1094-6: 1999)		
@ 1000°C	%	1.0
@ 1100°C	%	
Pyrometric cone equivalent (ASTM C24-89 ORTON cones)		
	°C	1300
	°F	2372
Thermal conductivity (ASTM C-182)		
mean temp. @ 200°C	W/(m×K)	0.15
mean temp. @ 400°C	W/(m×K)	0.16
mean temp. @ 600°C	W/(m×K)	0.19
mean temp. @ 800°C	W/(m×K)	-
mean temp. @ 392°F	BTU/(sq.ft.×h×°F/in.)	1.04
mean temp. @ 752°F	BTU/(sq.ft.×h×°F/in.)	1.11
mean temp. @ 1112°F	BTU/(sq.ft.×h×°F/in.)	1.32
mean temp. @ 1472°F	BTU/(sq.ft.×h×°F/in.)	-
Chemical analysis, typical	%	
Silica	SiO_2	47
Titanium dioxide	TiO_2	0.5
Ferric oxide	Fe_2O_3	4
Alumina	Al_2O_3	7
Magnesium oxide	MgO	21
Calcium oxide	CaO	2
Sodium oxide	Na_2O	0.5
Potassium oxide	K_2O	11
Loss on ignition 1025°C (1877°F)	LOI	7
Colour		sand

Data are average results of tests conducted under standard procedures and are subject to variation. Data contained in this data sheet are supplied in good faith as a technical service and are subject to change without notice. Misprint and errors excepted.

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www.skamol.com

Skamol A/S is DS/EN ISO 9001 certified.

March 2004

Annex 29

Title: Labels

Pages total: 2, excl this cover page

Manufactured by: Morsø
Model: 2B Classic 2020

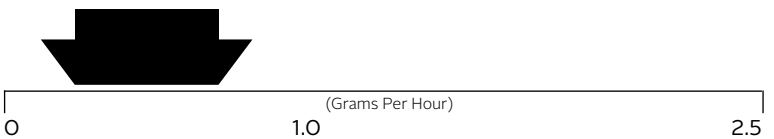
Annex 29 (2 pages)

U.S. ENVIRONMENTAL PROTECTION AGENCY

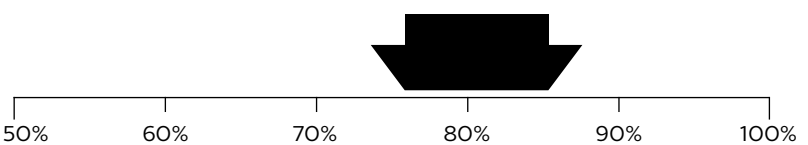
Certified to comply with 2020 particulate emission standards using cord wood.

SMOKE

THIS MODEL



EFFICIENCY



Particulate emission using ASTM E3053-17 cordwood test method:

Emission
0.47 g/h

Wood heaters with higher efficiencies cost less to operate.

HEAT OUTPUT
9,037 to 31,988 Btu/Hr

Use this to choose the right size appliance for your needs.
ASK DEALER FOR HELP

This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual.

PFS TECO
Clackamas, Oregon
USA

Solid Fuel Room Heater
Fournaise de Pièce Au Gas Solide
Tested to/Testé à:
UL 1482-2011 (R2015) , ULC-S628-93 (R2016)

Model/Modèle:
2B Classic 2020

Serial No./
Nu.de Série

morsø
DK-7900
Nykøbing Mors
Denmark

Report No./Rapport Nu: F20-XXX

PREVENT HOUSE FIRES:

Install and use only in accordance with manufacturer's installation and operating instructions and local codes. Contact local building or fire officials about restrictions and installation inspection in your area. In absence of any local codes, installation must meet minimum requirements of NFPA 211 in USA, and B365 in Canada. Refer to manufacturer's instructions and local codes for precautions required for passing chimney through a combustible wall or ceilling. Inspect and clean chimney system frequently in accordance with manufacturer's instructions.
For use with solid wood fuel only. Do not connect this unit to a chimney flue serving another appliance.
Do not use grate or elevate fire. Build wood fire directly on hearth.
Use a residential type masonry or listed type HT factory-built chimney.
High Temperature (H.T.) Chimney Standard UL-103-1985 (2100º F.) for the USA, and High Temperature (650ºC) Standard ULC S-629 for Canada.
NOTE: Replace glass only with factory supplied ceramic. Operate only with door closed. Do not operate with start device open or ajar.
Do not obstruct beneath the heater

PREVENT CREOSOTE FIRES: Inspect and clean chimney frequently. Under certain conditions of use creosote buildup may occur rapidly.

CAUTION: Fully open combustion air control before opening the fuel feed door.

PRÉVENTION DES FEUX DE MAISON:

Installez et utilisez seulement en accord avec les instructions d'installation et d'opération du manufacturier et des codes locaux. Contactez les autorités locales en charge des constructions et de la prévention contre le feu au sujet des restrictions et l'inspection des installations dans votre région. Dans l'absence des codes locaux, l'Installation doit être conforme aux exigences de NFPA 211 aux États-Unis, et B365 au Canada. Référez-vous aux instructions du manufacturier et des codes locaux pour les précautions exigées pour passer une cheminée à travers un mur ou un plafond combustibles. Inspectez et nettoyez le système de la cheminée frequemment en accord avec les instructions du manufacturier.
Pour une utilisation avec des combustibles solides uniquement. Ne pas brancher cette unité à une cheminée utilisée pour une autre installation.
N'utilisez pas un âtre et n'élevez pas la feu. Édifiez le bois de feu directement sur le foyer.
Utilisez une cheminée maçonnée de type résidentiel ou une cheminée préfabriquée répertoriée de type HT. Cheminée Haute Température (HT), norme UL-103-1985 (2100 °F) pour les États-Unis et Haute Température (650 °C), norme ULC S-629 pour le Canada.
NOTE: Remplacez la vitre seulement avec de la céramique fournie par l'usine.
Opérer seulement avec la porte fermée. Ne pas opérer si le démarreur d'opération est ouvert ou entrouvert.
Ne pas obstruer sous le poêle.

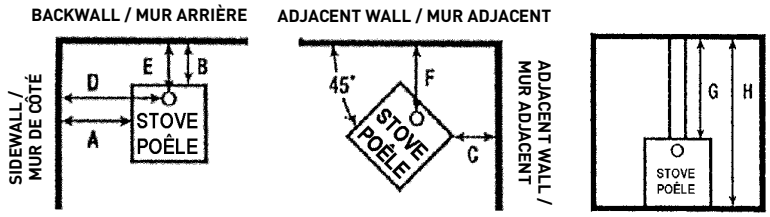
PRÉVENEZ LES FEUX DE CRÉOSOTE: Inspectez et nettoyez la cheminée fréquemment. Sous certaines conditions d'usage, le résidu de créosote peut se faire rapidement.

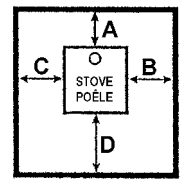
AVIS: Ouvrez complétement le contrôle d'air de combustion avant d'ouvrir la porte du foyer.

FREESTANDING INSTALLATION

STANDARD RESIDENTIAL FREESTANDING INSTALLATIONS REQUIRE: 6" diameter, minimum 24 MSG black or 26 MSG blued steel connector, with listed (type UL103 HT or ULC S629) factory-built chimney, suitable for use with solid fuel or masonry chimney. / **POUR LES INSTALLATIONS RÉSIDENTIELLES:** Utiliser un connecteur de cheminée de 6" de diamètre, en acier noir de minimum 24 MSG ou en acier bleu de minimum 26 MSG vers une cheminée préfabriquée homologuée (type UL103 HT ou ULC S629) ou vers une cheminée maconnée.

MINIMUM CLEARANCE TO COMBUSTIBLE
DEGAGEMENTS MINIMAUX AUX MATERIAUX COMBUSTIBLES





CLEARANCE REQUIREMENTS DÉGAGEMENT MINIMAUX DES MATÉRIAUX COMBUSTIBLES:	STANDARD RESIDENTIAL FREESTANDING INSTALLATIONS (SINGLEWALL CONNECTOR): INSTALLATION RÉSIDETIELLE STANDARD (TUYAU DE RACCORDEMENT À SIMPLE PAROI):
A. SIDEWALL TO UNIT / DU MUR DE CÔTÉ AU POÊLE	26" (660 mm.)
B. BACKWALL TO UNIT / DU MUR ARRIÈRE AU POÊLE	7" (178 mm.)
C. CORNERWALL TO UNIT / DU MUR DU COIN AU POÊLE	22" (558 mm.)
D. SIDEWALL TO CONNECTOR / DU MUR DE CÔTÉ AU RACCORD DE CHEMINÉE	29" (736mm.)
E. BACKWALL TO CONNECTOR / DU MUR ARRIÈRE AU RACCORD DE CHEMINÉE	15" (381 mm.)
F. CORNERWALL TO CONNECTOR / DU MUR DE COIN AU RACCORD DE CHEMINÉE	29" (736 mm.)
G. UNIT TO CEILING / DU POÊLE AU PLAFOND	-
H. FLOOR TO CEILING / DU SOL AU PLAFOND	-

For additional types of installations and clearances consult your owners manual.
Pour d'autres modes d'installation et degagements supplementalres consultez votres manual du proprietaire.

FLOOR PROTECTION REQUIREMENTS/ EXIGENCES PROTECTION DU SOL	NON -COMBUSTIBLE MATERIAL BENEATH STOVE/ MATÉRIEUX NON COMBUSTIBLES AU-DESSOUS DU POÊLE	
	USA	CANADA
A EXTENDING DISTANCE, BACK DISTANCE, ARRIÈRE	-	8" (200 mm.)
B EXTENDING DISTANCE, RIGHT SIDE DISTANCE, CÔTÉ DROIT	6"	8" (200 mm.)
C EXTENDING DISTANCE, LEFT SIDE DISTANCE, CÔTÉ GAUCHE	6"	8" (200 mm.)
D EXTENDING DISTANCE, FRONT DISTANCE, AVANT	16"	18" (450 mm.)

FLOOR PROTECTOR MUST BE NON-COMBUSTIBLE MATERIAL. IT MUST EXTEND BENEATH HEATER, AND TO THE FRONT / SIDES / REAR AS INDICATED
LE PROTECTEUR DE PLANCHER DOIT ÊTRE D'UN MATÉRIAL INCOMBUSTIBLE. IL DOIT S'ÉTENDRE EN DESSEUS DE L'APPAREIL ET AU DEVANT, AUX CÔTÉS ET À L'ARRIÈRE DE L'APPAREIL COMME INDIQUÉ

CAUTION

HOT WHILE IN OPERATION - DO NOT TOUCH, KEEP CHILDREN, CLOTHING AND FURNITURE AWAY.
CONTACT MAY CAUSE SKIN BURNS - SEE NAMEPLATE AND INSTRUCTIONS.
KEEP FURNISHINGS AND COMBUSTIBLE MATERIAL A CONSIDERABLE DISTANCE AWAY FROM THE APPLIANCE.
DO NOT OVERFIRE. IF HEATER OR CHIMNEY CONNECTOR GLOWS, YOU ARE OVERFIRING.

ATTENTION

TRÈS CHAUD LORSQU'IL FONCTIONNE - NE PAS TOUCHER, ÉLOIGNEZ LES ENFANTS, LES VÊTEMENTS ET LES MEUBLES. TOUT CONTACT PEUT CAUSER DES BRÛLURES - VOIR PLAQUE SIGNLÉTIQUE ET INSTRUCTIONS. LES MEUBLES ET LES MATÉRIAUX COMBUSTIBLES DOIVENT ÊTRE DISPOSÉS À UNE DISTANCE SUFFISANTE DE L'INSTALLATION. NE PAS SURCHAUFFER. SI LE POÊLE OU LE TUYAU DE CHEMINÉE ROUGISSENT, IL Y A SURCHAUFFE

U.S. ENVIRONMENTAL PROTECTION AGENCY

Certified to comply with 2020 particulate emission standards using cord wood.
This wood heater needs periodic inspection and repair for proper operation. Consult the owner's manual for further information. It is against federal regulations to operate this wood heater in a manner inconsistent with the operating instructions in the owner's manual. Test results using ASTM E3053-17 cordwood test method:

Certifié conforme aux normes EPA de 2020 les émissions de particules solides utilisant le bois de crèche.
Ce poêle doit être revisé et reparé périodiquement pour une utilisation correcte.
Il est contre la loi fédérale d'utiliser ce poêle contredit les instructions de ce manuel.
Résultats des tests utilisant la méthode d'essai ASTM E3053-17 cordwood:

PARTICULATE EMISSION / EMISSION DE PARTICULATE : 0.47 g/h

HEAT OUTPUT / PUISSANCE CALORIFIQUE: 9,037 - 31,988 BTU/Hr

DO NOT REMOVE THIS LABEL / NE PAS ENLEVER CETTE ÉTIQUETTE

MADE IN DENMARK / FABRIQUÉ AU DANEMARK

DATE OF MAUFACTURE / DATE DU MANUFACTURE

2020	2021	2022	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Annex 30

Title: Pictures of Morsø 2B Classic 2020

Pages total: 2, excl this cover page

Annex 30 (2 pages)

Annex 31a

Title: User' manual US

(Revised June 2021 release)

Pages: 13, excl this cover page

By appointment to The Royal Danish Court

morsø

Installation and Operating Instructions

Morsø 2B Classic 2020

For use in North America

MORSØ JERNSTØBERI A/S . DK-7900 NYKØBING MORS
E-Mail: stoves@morsoe.com · Website: www.morsoe.com

Enjoy your new Morsø stove!

We congratulate you on your choice of a Morsø stove. Morsø has been producing some of the world's best stoves since 1853. If you follow this installation- and operating instruction carefully, we can assure you many years of warmth and pleasure.

Contents

Optional Accessories
A wide range of accessories (such as handling gloves, fireside tools, glass cleaner and heat-proof paint) are available for use with your Morsø stove. They help with day-to-day running and maintenance. Contact your Morsø dealer for more information.

The Morsø 2B Classic 2020 has been certified by PFS TECO.
The test standards are UL-1482-2011 (R2015)for the United States and ULC-S628-93 (R2016) for Canada.

Certified & Listed By — PFS C US — Clackamas, Oregon USA

PFS TECO
Report Number: F21-679

The stove is listed for burning wood only. Do not burn other fuels.

U.S. ENVIRONMENTAL PROTECTION AGENCY. Certified to comply with 2020 particulate emission standards using cord wood.

Average particulate emission using ASTM E3053-17 cord wood test method is 0.47 g/h
Under specific test conditions this heater has been shown to deliver heat at rates ranging from 9,037 to 31,988 Btu/hr.
This appliance was determined to have an average higher heating efficiency value of 80.1% when tested in accordance with CSA B415.1

This wood heater needs periodic inspection and repair for proper operation. It is against federal regulations to operate this wood heater in a manner inconsistent with operating instructions in this manual.

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We suggest that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training www.wettinc.ca

Cast iron
Cast iron is a live material. There are no two ovens that are identical. This is partly due to the tolerances of the casting process, partly because the ovens are a work of craftsmanship. Minor unevennesses may also occur in the cast iron surface.

1.0 Installation of your Morsø stove

Installation of woodburning stoves must be safe and legal.

If your Morsø stove is not installed correctly, it may cause a house fire. To reduce the risk of fire, the installation instructions must be followed carefully. Contact the local building officials about restrictions and installation inspection in your area.

Before you start installing your stove, make sure that:
- The stove and chimney connection are placed far enough from combustible materials to meet all clearance requirements.
- The floor protection must be adequate and must be made correctly according to the requirements.

All neccessary approvals are needed from the local building officials.

The data plate, which is located on the back of the stove, provides information regarding safety testing information, name of certified testing laboratory, and installation requirements.

Installation requirements vary in different districts, and the local building officials have the final authorization to approve your installation. You should discuss the installation with them before beginning. Please ask your dealer for further information.

Do not connect to any air distribution duct or system.

Important: If the installation instructions are not followed carefully, it may cause dangerous situations like chimney - and house fires. Follow the instructions carefully and do not deviate from them as it may cause injuries to people or property.

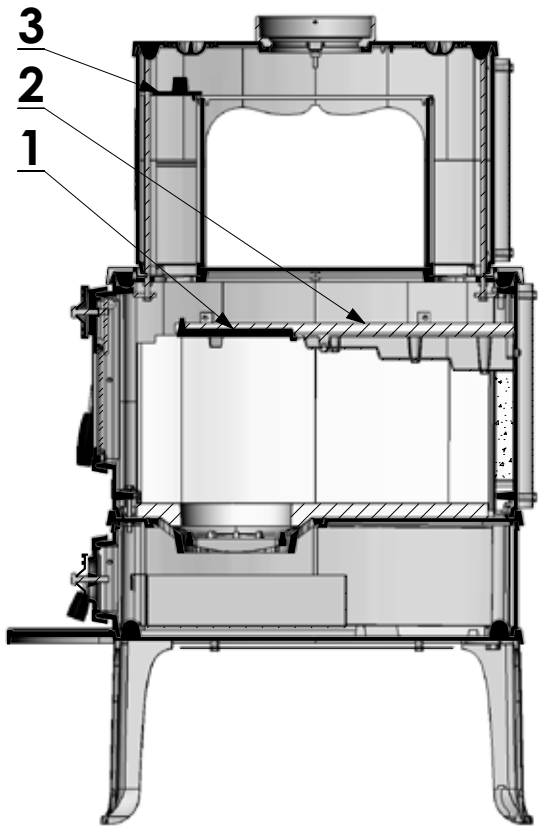
1.1 Unpacking the stove

2B Classic: After removing the outer packaging, flatten it and lay onto the floor close to the stove; this can then act as protective work surface during the assembly process.

Next, remove the legs and bolts from inside the stove. Gently lay the stove onto its back and unscrew it from the wooden pallet. Using the bolts supplied, now screw the legs into position on the underside of the base. The stove should now be lifted and moved into the upright position, avoiding excess load on the back legs.

1.2 Checking loose parts in the stove

After unpacking, check that the fire bricks are firmly in position and have not shifted in transit. Check also that the air control works freely.
Before starting the initial fire, make sure that the baffle (1) and insulation (2) over the baffle are placed correctly, as shown on the images below. Also check that the cover (3) identification number 2118 are placed correctly.



How to fit the Smoke Cover
Place the smoke cover by the smoke vent in front of the stove. This is easily done by leading the smoke cover down through the flue collar before fitting the pipe. It is also possible to fit the smoke cover through the access door opening. See pictures below.





How to fit the Vertical Baffle
Lead the vertical baffle through the door as shown below (picture 1 & 2). Place the baffle into the right position (picture 3 & 4). The baffle insulation is placed on the baffle.




Standard Accessories
A Morsø glove and ceramic flue connection gasket are standard accessories that usually can be found in the ashpan or firebox area.

1.3 The chimney / flue system

Note that the flue system must be independently secured and must not rely on the stove for support.

The stove must not be connected to a chimney flue serving any other appliance. (Several flues may run up a single chimney stack; use one flueway per appliance).

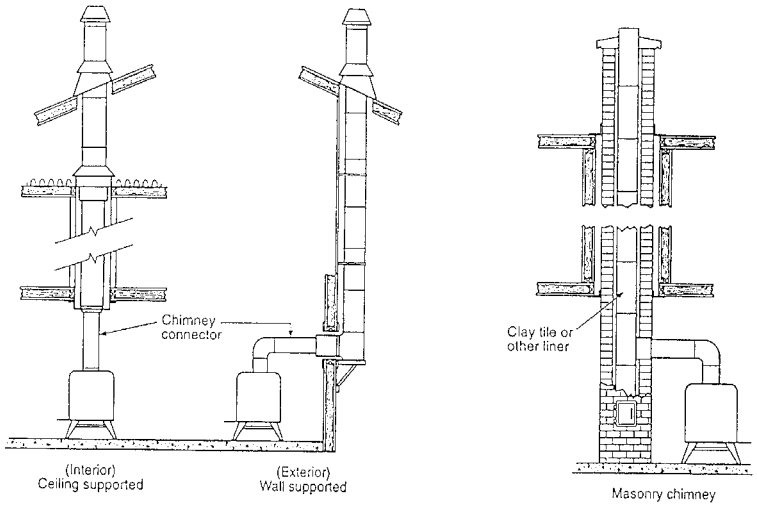
Use a residential type masonry or listed type HT factory-built chimney.

High Temperature (H.T.) Chimney Standard UL-103-1985 (2100° F.) or a code-approved masonry chimney with flue liner for the USA, and High Temperature (650°C) Standard ULC S-629 for Canada.

The internal dimensions of the chimney connector and chimney must not be less than 6 inches diameter (or equivalent cross section), and should not be significantly larger than this. Too large a section will tend to allow the flue gases to cool excessively, causing sluggishness or unpredictability in the stove's performance.

We recommend the length of the chimney system should be at least 16 feet (not required) above the stove in normal domestic situations, measured from the flue collar to the top of the chimney.
Local conditions like for example - roof constructions, large trees nearby and high altitude, may influence the chimney draft and height. Therefore, contact the local professional chimney sweep or your Morsø dealer.

Typical Factory-Built or Masonry Chimney Installations



1.4 Flue Connection

A flue collar is placed in the firebox area.

Use a 24 MSG black or blue chimney connector or listed double wall chimney connector. Refer to local codes and the chimney manufacturer's instructions for precautions required for passing a chimney through a combustible wall or ceiling. Remember to secure the chimney connector with a minimum of three screws to the product and to each adjoining section. Position the stove and connect to the flue system.

Wear gloves and protective eyewear when drilling, cutting or joining sections of chimney connector.

1.5 Connection to the existing chimney

A chimney connector is the double-wall or single-wall pipe that connects the stove to the chimney. The chimney itself is the masonry or prefabricated structure that encloses the flue. Chimney connectors are used only to connect the stove to the chimney.
Double-wall connectors must be tested and listed for use with solid-fuel burning appliances. Single-wall connectors should be made of 24 gauge or heavier gauge steel. Do not use galvanized connector; it cannot withstand the high-temperatures that smoke and exhaust gases can reach, and may release toxic fumes under high heat. The connector must be 6 inches (150mm) in diameter.

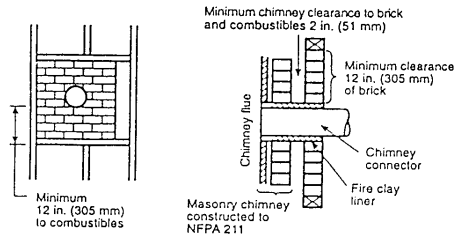
If possible, do not pass the chimney connector through a combustible wall or ceiling. If passage through a combustible wall is unavoidable, refer to the sections on Wall Pass- Throughs. Do not pass the connector through an attic, a closet or similar concealed space when installing the chimney connectors.

It is important to keep the flue gases moving smoothly in the right direction. Do not vent into a large void at this location; rather form one continuous section all the way up. Use mild bends (e.g. 45° vs. 90°) rather than sharp angles where a change of direction is required. All parts of the venting must be accessible for cleaning purposes.
In horizontal runs of chimney, maintain a distance of 18 inches from the ceiling. Keep it as short and direct as possible, with no more than two 90 degree turns. Slope horizontal runs of connector upward 1/4 inch per foot (20 mm per metre) going from the stove toward the chimney. The recommended maximum length of a horizontal run is 3 feet (1 metre), and the total length should be no longer than 8 feet (2.5 metres).
Information on assembling and installing connectors is provided by the manufacturer's instructions exactly as you assemble the connector and attach it to the stove and chimney.

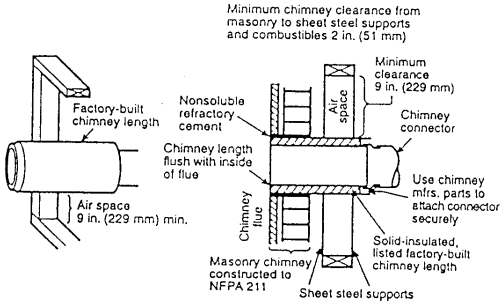
Be sure the installed stove and chimney connector are correct distances from near by combustible materials. See the clearance paragraph page 11.

Where passage through a wall or partition of combustible construction is desired, the installation shall conform to CAN/CSA-B365.

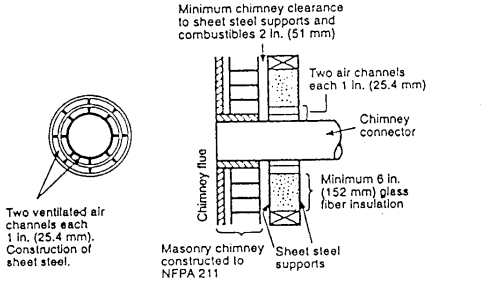
Chimney Connector Systems and Clearances from Combustible Walls for Residential Heating Appliances



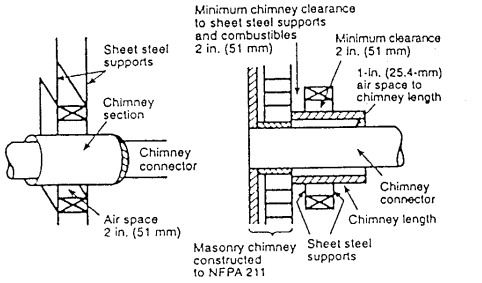
A Minimum 3.5-in thick brick masonry all framed into combustible wall with a minimum of 12-in brick separation from clay liner to combustibles. The fireclay liner shall run from outer surface of brick wall to, but not beyond, the inner surface of chimney flue liner and shall be firmly cemented in place.



B Solid-insulated, listed factory-built chimney length of the same inside diameter as the chimney connector and having 1-in. or more of insulation with a minimum 9-in. air space between the outer wall of the chimney length and combustibles.



C Sheet steel chimney connector, minimum 24 gauge in thickness, with a ventilated thimble, minimum 24 gauge in thickness, having two 1-in. air channels, separated from combustibles by a minimum of 6-in. of glass fiber insulation. Opening shall be covered, and thimble supported with a sheet steel support, minimum 24 gauge in thickness.



D Solid insulated, listed factory-built chimney length with an inside diameter 2-in. larger than the chimney connector and having 1-in. or more of insulation, serving as a pass-through for a single wall sheet steel chimney connector of minimum 24 gauge thickness, with a minimum 2-in. air space between the outer wall of chimney section and combustibles. Minimum length of chimney section shall be 12-in. chimney section spaced 1-in. away from connector using sheet steel support plates on both ends of chimney section. Opening shall be covered, and chimney section supported on both sides with sheet steel supports securely fastened to wall surfaces of minimum 24 gauge thickness. Fasteners used to secure chimney section shall not penetrate chimney flue liner.

1.6 Positioning the stove

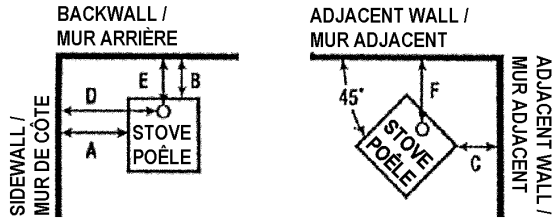
Distance to walls and lintel

When the stove is positioned near combustible materials, observe all current local and national building regulations with regards to clearances. Whatever regulations apply to your area, do not in any case install the stove within 8 inches of combustible materials around the sides or 16 inches above the top of the stove (fireplace installations require greater clearances above the stove - see below in the clearance chart). These distances may need to be increased if the materials are sensitive to heat. Note also that wall paper and other decorative materials may become detached with the effects of heat and care should be taken to ensure that they do not fall towards the stove in such an event.
When the stove is positioned near non-combustible materials, a gap of 4 inches or more is recommended for cleaning purposes and to ensure that heat circulates around the stove and out into the room.

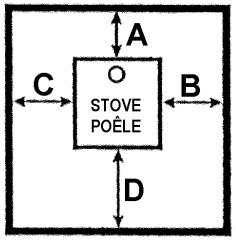
Clearance requirements for 2B Classic (Singlewall connector)

CLEARANCE REQUIREMENTS	STANDARD RESIDENTIAL INSTALLATION (SINGLEWALL CONNECTOR)	
	USA	CANADA
A. Sidewall to unit	26"	26" (660 mm)
B. Backwall to unit	7"	7" (178 mm)
C. Cornerwall to unit	22"	22" (559 mm)
D. Sidewall to connector	29"	29" (737 mm)
E. Backwall to connector	15"	15" (381 mm)
F. Cornerwall to connector	29"	29" (737 mm)
G. Unit to ceiling	-	-
H. Floor to ceiling	-	-

MINIMUM CLEARANCES TO COMBUSTIBLES:
DEGAGEMENTS MINIMAUX AUX MATERIAUX COMBUSTIBLES:



NON-COMBUSTIBLE FLOOR PROTECTOR:
PROTECTUR DE PLANCHER INCOMBUSTIBLE



FLOOR PROTECTOR MUST BE NON-COMBUSTIBLE MATERIAL. IT MUST EXTEND BENEATH HEATER, AND TO THE FRONT/SIDEES/REAR AS INDICATED.

LE PROTECTEUR DE PLANCHER DOIT ÈNTRE D´UN MATÉRIAL INCOMBUSTIBLE. IL DOIT S'ÉTENDRE EN DESSOUS DE L'APPAREIL ET AU DEVANT, AUX CÔTÉS ET À L'ARRIÈRE DEL L'APPAREIL COMME INDIQUÉ.

Floor protection requirements	Non-combustible materials beneath stove	
	USA	Canada
A. Extending distance, back	-	200 mm
B. Extending distance, right side	6"	200 mm
C. Extending distance, left side	6"	200 mm
D. Extending distance, front	16"	450 mm

In the US, floor protection must be constructed of a non-combustible material and installed to extend beneath the heater and 16" to the front and 8" to the sides of the fuel loading door and ash removal openings. In Canada, floor protection must be constructed of a non-combustible material and installed to extend beneath the heater and 450 mm.(16") to any side with a door and 200 mm.(8") beyond the appliance on the other sides.

Distance to furniture
The recommended minimum distance from stove to furniture is 30 inches. Note that some furniture is more easily affected by heat and may need to be moved to a greater distance. This is your responsibility.
In addition other combustible materials, away from the stove. In general, a distance of 30 inches must be maintained between the stove and moveable combustible item such as drying clothes, newspapers, firewood etc.

DO NOT INSTALL IN A MOBILE HOME

Note:
Acid Protection
If acid-washing the masonry around the stove, protect the stove surface with an acid-proof cover.
Fresh Air Inlet
Unless there is deemed to be sufficient ambient leakage of air into the room via doorways, windows and the like, a dedicated fresh air inlet will be needed. This inlet should have 2 square inches (1250 square mm) of free air space. This is particularly important where the room is well sealed, or where an extractor hood or ventilation system disturbs the natural air pressure. Such an inlet should not be on a wall that is usually subject to negative pressure from normal wind pattern. Avoid placing the inlet directly across the room from the stove, thus causing a cold air draft.

2.0 Operation

2.1 Before you start firing

For use with solid wood fuel only.
Do not overfire; if heater or chimney connector glows, you are overfiring.
Inspect and clean chimney frequently. Under certain conditions of use, creosote buildup may occur rapidly. Because of risk of smoke and flame spillage, operate only with door fully closed.

Caution:
Hot while in operation.
Keep children, clothing and furniture away.
Contact may cause skin burns.
Do not use chemicals or fluids to start the fire.
Do not burn garbage or flammable fluids.
Do not use gasoline, gasoline-type lantern fuel, kerosene, charcoal lighter or fluid or similar liquids to start or freshen up a fire in this heater. Keep all such liquids away from the heater while it is in use.

Choosing your fuel
All types of natural wood can be burned on your stove, but they must be well-seasoned and dry. Once the wood is cut to length, it should be split down middle - to suit the dimensions given below - to allow moisture to evaporate.Cut the wood to a length of max 12 inches (30cm) and approx. 3 to 3.5 inches (7-8 cm) in section. If you can weigh your wood, aim for around 2 lbs. For correct combustion and heat output, wood fuel should contain no more than 20% moisture; this can easily be checked by using the Morsø Moisture Meter (part no. 62929900)

To naturally season wood fuel, stack and store it under cover in an airy location where fresh air can move through each piece. Some soft woods may take as little as one good summer to season whereas harder woods such as oak, maple, and elm may require seasoning up to 18 months. Avoid overly dry wood that is gray in color as under certain conditions it can cause performance problems, such as back-puffing and sluggishness. Well seasoned wood will be light to hold and will show signs of cracking from the center-out in the ends. If your wood spits or sizzles when burnt, and your stove's door glass persistently mists up, your wood is not properly seasoned. Never use drift wood (from the sea), whose salt content may cause corrosion, nor construction wood that may have been impregnated with chemicals.

To optimize efficiency:
Burning wet wood has a negative impact on efficiency

Caution: Do not place fuel within the installation clearances for the stove or within the space required for loading fuel and ash removal.

Starting the First Fire
The initial fire should be small, so that the stove paint can cure and the main plates of the stove can settle into position. Some fumes will be given off by the paint. Ventilate the room during this phase. The setting of the air control, lighting techniques and loading intervals will depend on chimney draft, the fuel used, the heat required and so on. Some basic techniques are outlined below.

In principle
Your stove is fitted with Primary and Secondary air inlets.
Primary Air is controlled using the spinner on the door. Open the spinner will allow a supply of preheated air to enter the firebox via the 'airwash' system situated inside the stove and above the glass.

The secondary air is injected into the flue gases above the fire resulting in a cleaner, more efficient combustion process. The supply of secondary air is fixed open and is not adjustable.
For extra safety, your stove has been fitted with a removable handle on the frontdoor.

2.2 Lighting and loading intervals

When first lighting the stove, a large volume of air is needed. When the stove is cold, you should leave the door open an inch or two for the first few minutes and open the primary air supply completely. While the door is open, do not leave the stove unattended.
To form a reasonable bed of ash on the floor of the stove, you should use 2-4 pounds of dry kindling at the initial lighting. If possible, maintain a 1-1.5 inch (2-3 cm) layer of ash on the floor of the combustion chamber for added insulation.

1. We recommend using the "top-down" method to light your wood-burning stove. It is the most environmentally-friendly method of lighting. Use two firelighters and approx. 2-4 lbs of dry kindling sticks to quickly create a glowing layer of wood. Place the firelighters directly under the top layer of kindling sticks.This minimizes soot formation on the glass. Soot formation on the glass is often caused by too vigorous burning in contact with cold surfaces. If you avoid the formation of soot when lighting the fire and build up a layer of hot embers, you will have minimal soot formation when getting the fire burning again later.

2. The air supply must be fully open.
Turn the spinner control 2 1/2 turns counterclockwise from closed position to fully open the primary air supply
(See box on page 15 regarding closed position)

3. Light the fire.

4. After lighting, partially close the door, leaving it open an inch or two to allow in plenty of combustion air.

5. When the chimney is warm after about 5-10 minutes, the frontdoor should be closed. We recommend setting the spinner control at a minimum of 1-1 1/2 turns counterclockwise from closed position, when burning the kindling/start-up fuel.
A suitable layer of embers will be formed after about 15-20 minutes.

6. When ready to reload, use a poker to spread the embers across the firebox floor, bringing plenty towards the front of the stove.

7. Refuelling of your stove should be done while there are still glowing embers in the bed. Spread the embers across the bottom, but concentrated mostly towards the front of the stove.
We recommend using fuel load with a weight of 4 lbs (2 pieces) and up to 7 lbs (5 pieces).

Always keep the fuel load beneath the lowest secondary air nozzles. The space in front of and above the lowest air nozzles is reserved for volatile gas combustion only.

When refuelling your stove, it is recommended that you open the stove door gently for the first 1-2", then wait for a few seconds for the pressure in the flue to equalise; you are now safe to proceed and open it all the way. By using this technique smoke spillage can be eliminated particularly in poor chimney draft conditions. The stove door should not be opened when the stove is being fired vigorously.

8. Close the frontdoor. Turn the spinner control 2 1/2 turns counterclockwise from closed position to fully open the primary air supply
The new fuel will ignite in a minute or two

9. After a few minutes, adjust the primary air supply to suit your heating requirements.
If using the minimum low burn rate (spinner control closed) allow the fire to establish properly, by burning at medium burn rate for about 15 minutes beforehand. Turn the spinner control 1-11/2 turns counterclockwise from closed position to achive a medium burn rate.

10. For refueling, add a layer of wood while there are still plenty of live embers, Repeat steps 6-9.

This wood heater has a manufacturer-set minimum low burn rate that must not be altered. It is against federal regulations to alter this setting or otherwise operate this wood heater in a manner inconsistent with operating instructions in this manual.

When the spinner air controller is turned all the way down, closed position, there is still a small gap between the spinner and the door frame allowing for the minimum low burn rate. The manufacturer-set gap is 1 mm equal to 3/4 turn

Warning: Fireplace stoves must never be left unattended with the door open. If the door is left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke. We recommend that you fit a smoke detector in the room where the stove is installed.

DO NOT OVERFIRE THIS HEATER. Overfiring may cause a house fire, or can result in permanent damage to the stove. If any part of the stove glows, you are overfiring.

The maximum recommended weight of wood fuel per load is 3.5 kg/7 lbs (approx 5 split logs).

Under normal firing, the average flue temperature in the stove pipe, measured 20 cm above the stove, is approx. 300° C (550°F). The maximum flue temperature in the stove pipe must not exceed 450° C (750°F). If the flue temperature exceeds 450°C (750°F), it is considered as over firing and may cause premature wear and tear of the stove.

To help gauge the correct running temperature of your stove, we recommend you use the Morsø Flue Gas Thermometer (part no. 62901200). The Flue Gas Thermometer magnetically attaches onto the stove pipe approx 20 cm (8") above the stove's top plate and measures the surface temperature of the stove pipe. Please see your authorized Morsø Dealer for availability.

Draft conditions
If smoke or fumes come out of your stove when lightning up and reloading, or if the fire simply will not respond, a poor draft is almost certainly to blame. (In a very few cases, there may be insufficient fresh air getting into the room - see installation advice above). Take advice from your stove supplier on how best to upgrade your flue system to improve draft.

Rules of woodburning
If you want less heat, put fewer logs on the stove and reduce the amount of air. It is still important to maintain a good layer of embers.
Less heat - less wood - less air
Greater heat - more wood - more air
Soot deposits will settle on the glass if the stove is run too slowly or if your wood is not well seasoned.

Carbon monoxide detectors
It is required in some jurisdictions to install smoke and carbon monoxide detectors where heaters are installed. Install at least one smoke detector on each floor of your home to ensure your safety. It should be located away from the wood appliance and close to the sleeping areas. Locating a smoke detector too close to a wood appliance can cause the smoke detector alarm to sound if a puff of smoke is emitted while the wood appliance door is open during reloading. Follow the smoke detector manufacturers placement, installation, and maintenance instructions

3.0 Maintenance

When perfoming maintenance on your stove, always protect yourself, using safety goggles and gloves

3.1 Exterior Maintenance
The stove surface is painted with heat-resistant Senotherm paint. It is best kept clean by vacuuming with a soft brush attachment or by wiping with a lint-free cloth.
Over a period of time, the painted surface may become slightly grey. A can of Morsø touch-up spray paint should be available from your stove supplier. This can be applied - in accordance with the instructions - in just a few minutes. When first firing after touching up, the stove will give off a slight smell as the paint cures. Make sure to ventilate the room well during this phase.

3.2 Internal maintenance
Glass
If the stove is generally run at the correct temperatures, there should be little or no dirt on the glass. If dirt does settle during lighting, most will burn off as temperatures increase.For heavier deposits that will not burn off, use Morsø glass cleaner, applied when the glass is cold, in accordance with the instructions. Never use abrasive cleaners on the glass surface.

Reasons for dirty glass
- Fuel too wet
- Logs too large or not split
- Combustion temperatures too low

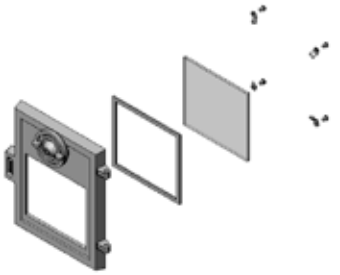
Replace broken glass immediately.
Do not operate your stove if the glass in the door is damaged.

If you need to replace the glass, it should be replaced with the high temperature ceramic class supplied by Morsø, contact your Morsø dealer.

ALWAYS USE ORIGINAL MORSØ SPAREPARTS

Installing the glass
Never install the glass when the stove is in function.

Ceramic glass replacement
Ceramic glass cannot be recycled because it has a higher melting point that ordinary glass. If ceramic glass is mixed with ordinary glass, the raw material is spoiled, and the reclaiming process may be halted. Take care that the ovenproof glass does not end up among ordinary recycled waste. That will be a great benefit to the environment.
Note: Should be handed in to a recycling station as ceramic glass.



1. Lift the door off the hinges and place it face down on a sheet of cardboard or other non-abrasive fabric.

2. Unscrew the 4 bolts that secure the glass. (In the event that a bolt sheers off when being unscrewed, remove the remaining body of the bolt by drilling down its centre with 1/8 inch high speed steel drill bit. Smaller drill bits may be successful, but do not use a lager bit. Make sure the bit stays away from the edges of the bolt - this may damage the thread in the cast iron).

3. Remove the old ceramic gaskets and clean up the surface underneath with wire wool or emery paper to remove loose particles.

4. Place the new gasket material in position around the perimeter of the window area, making sure to pinch them to the length in such a way that they make a continuous seal. Leave no gaps.

5. Place the new glass in position on the strips and screw home the fresh bolts and fitting by hand.

6. Finally, give each of the bolts an extra half turn or so. The glass should held tight enough by that cleaning will not dislodge it. Do not over-tighten the bolts as this may put excessive pressure on the glass, resulting in cracking - important!

To reduce the risk of breaking the glass, avoid striking the glass or slamming the door.

Internal service parts
The flame-path equipment - consisting of the ashpan, grate, firebricks, Cast iron fire plates, glass, baffle and flue collar - are subject to the extremes of heat produced by the fire. From time to time, one or other of these parts may need replacing as a matter of routine maintenance.

Stone replacement
When replacing the stones, unscrew at the rear of the stove the heat reflector, which is mounted with 4 screws. This provides access to the 2 bolts that hold the smoke baffle in place. Remove these bolts so that the smoke baffle inside the stove can be raised. Raise the smoke baffle so that the old stones can be removed from the stove and the new ones can be installed. The side stones are placed in the grooves in the vermiculite bottom plate. Once the stones have been properly put into place, lower the smoke baffle down onto the stones and re-bolt it securely to the cast rear of the stove.
Finally, reinstall the rear heat reflector with its 4 screws.

NOTE: The flame-path equipment, the ceramic rope and the paint finish are not covered by guarantee.

All of these service parts can be bought from your Morsø dealer, and we recommend that damaged parts are replaced as soon as possible to avoid collateral damage.
Should the baffle be distorted by an overfire, the stove will still function, although its efficiency may be compromised. Replace it as soon as possible.

Reasons for fast internal wear and tear
- Persistent heavy firing
- Soot and ashes left to accumulate

Gasket
The gasket around the perimeter of the door may harden over a period of time. It should be replaced if it becomes difficult to close the doors or if air starts to leak in around the perimeter of the doors, causing the fire to become a little less controllable. A Morsø rope gasket kit is available from your stove supplier.

3.3 Cleaning the Stove and the Flue
Check for soot above the baffle plate and around the flue outlet every month or so to start with. If the stove suddenly becomes sluggish, check for a soot fall around the flue collar or in the flue/chimney.

The chimney and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire.

Clean the flue/chimney - all the way from the stove to the flue terminal point above the house. A good routine is to clean the flue after each heating season in any case, and inspect prior to the season to ensure that bird's nests or other blockages have not occurred during the off season.

Ash disposal
Empty the ashpan on a daily basis or as needed. Ash allowed to build up towards the underside of the grate will trap heat and could cause premature failure of the grate.

Empty the ashpan according to this procedure:
Open the front door, and use a shovel or poker to stir excess ash through the ash slots in the grate down into the ash pan. Take out the ash pan, making sure to keep it level to avoid spilling ash.

Dispose the ash in a metal container with a tight fitting lid.
The closed container of ashes should be placed on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ashes are disposed of by burial in soil or otherwise locally disperded, they should be retained in the closed container until all cinders have thoroughly cooled.
Return the ash pan to its original position in the stove, and close the door.

Caution:
Never empty a stove in operation.
Never use your household or shop vacuum cleaner to remove ash from the stove; always remove and dispose of the ash properly.

Creosote - formation and need for removal
When wood is burned slowly, it produces tar and other organic vapors, which combine with expelled moisture to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited this creosote makes an extremely hot fire. When burning wood, the chimney and chimney connector should be inspected at least once every two months during the heating season to determine if a creosote buildup has occurred. If creosote has accumulated, it should be removed to reduce the risk of a chimney fire.

Chimney sweeping
Inspect the system regularly during the heating season as part of a regular maintenance schedule. To inspect the chimney, let the stove cool completely. Then, using a mirror, sight up through the flue collar into the chimney flue. If you cannot inspect the flue system in this fashion, the stove must be disconnected to provide better viewing access.
Clean the chimney using a brush the same size and shape as the flue liner. Run the brush up and down the liner, causing any deposits to fall to the bottom of the chimney where they can be removed through the clean-out door.
Clean the chimney connector disconnecting the sections, taking them outside, and removing any deposits with a stiff wire brush. Reinstall the connector sections after cleaning, being sure to secure the joints between individual sections with sheet metal screws.
If you cannot inspect or clean the chimney yourself, contact your local Morsø Dealer or a professional chimney sweep.

If you do experience a chimney fire, act promptly and:
1. Close the air control.
2. Get everyone out of the house.
3. Call the Fire Department.

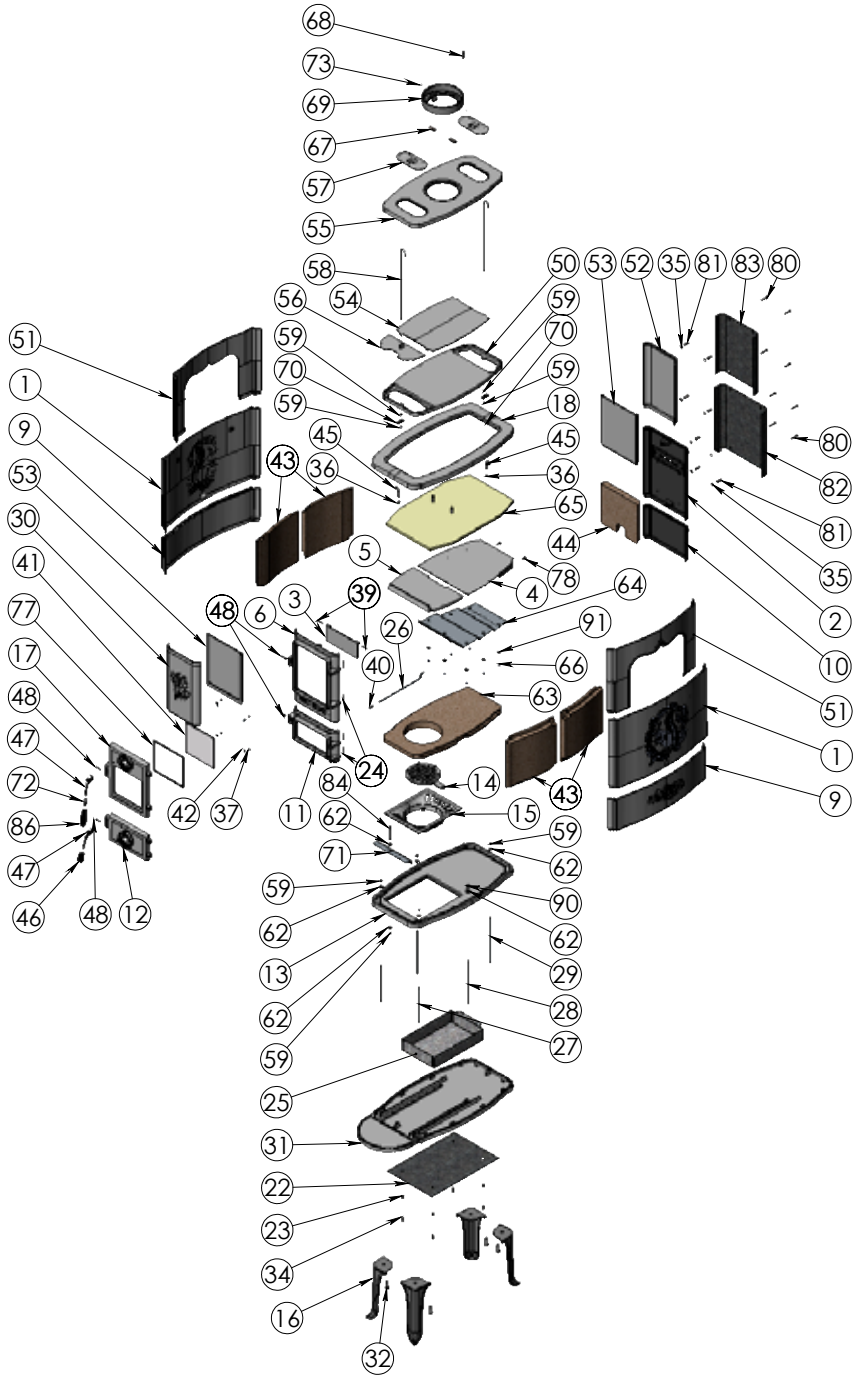
Annual maintenance
Before the heating season, perform a thorough cleaning, inspection and repair:
Thoroughly clean the chimney and chimney connector.
Inspect the chimney for damage and deterioration. Replace weak sections of prefabricated chimney. Have a mason make repairs to a masonry chimney.
Inspect the chimney connector and replace any damaged sections.
Check gasketing for wear or compression, and replace if necessary.
Check the glass for cracking; replace if needed.
Check door and handle for tightness. Adjust if needed.

3.4 Leaving the stove for extended periods
Important:
If the stove is to be left unused for any period of time, clean it out thoroughly and leave the air control slightly open to allow airflow. Make sure that the flue does not allow rainwater to come anywhere near the stove; install a chimney cap, but do not block off the flue completely.
These measures should ensure there is a slight movement of air through the stove, and that the body of the stove remains dry, right into the corners.
Any ash left within an unfired stove can attract moisture like blotting paper. If moisture is allowed to settle within the stove, rust will form. Rust expands as it takes a grip. This can lead to undue pressure on the stove joints, and this in turn may result in damage to the stove.

NOTE: It is best to thoroughly clean the stove after the heating season has concluded. Adding a dessicant, such as kitter litter, into the ash pan helps absorb moisture during the summer months. Be sure to remove this prior to the heating season.

Thank you for buying a Morsø stove.
We hope you have many years of carefree warmth in its company. Some initial experimentation with loading and running techniques will decide your normal routine. If you have any problems after this short learning phase, please refer to your stove dealer. Should they be unable to help for any reason, please contact us in writing at the address on the front of this publication.

3.5 Parts diagram for model Morsø 2B Classic 2020



3.6 Parts list for model Morsø 2B Classic 2020

Pos. No.	Parts	SKU no.
1	Squirrel Side Panel	54200321
2	Rear Plate	44203821
3	Smoke Valve	44200800
4	Horizontal Baffle	44203600
5	Front Baffle	34203800
6	Front	44201521
9	Side Panel for Upper Part	44202521
10	Rear Plate for Lower Part	44202621
11	Front for Lower Part	44202721
12	Ash Door	44204821
13	Intermediate Grate Frame	44204921
14	Riddling Grate	44203000
15	Inner Grate Frame	44203100
16	Leg	44200121
17	Door assembly	44204421
18	Frame	44211121
20	Poker	541075
22	Radiation Shield - Base	54137000
23	Distance Tube Ø10x1 L=10mm	541439
24	Hinge Pin Ø6x45	541808
25	Ash pan	541405
26	Riddling Handle	542052
27	Bolt M6x170	542053
28	Bolt M6x205	542054
29	Bolt M6x215	542055
30	Rear Panel for Upper Part	44211421
31	Base	54209400
32	M10x16 DIN 933 screw (black)	73111600
34	M6x25 DIN 933 Screw (black)	731616
35	Vistop lock washer 6 mm	746206
36	M8 DIN 934 bolt	735008
37	M85x08 ISO 7380 button head screw	73850800
39	M5x25 DIN 965A fzb screw	743525
40	Knob for riddling handle	752619
41	Door Glass	790715
42	Glass Clips	790743
43	Side Brick	79209000
44	Rear Brick	79209100
45	M8x50 DIN 931 angled screw	791172
46	Bakelite Handle 36 mm	79118200
47	Clasp	79127000
48	Ø6x32mm Pin	791868
50	Intermediate Frame	44211200
51	Side Panel for Upper Part	44211321
52	Rear Panel for Upper Part	44203921
53	Inside rear panel upper part	44211521
54	Inside top - upper part	44211621
55	Top - upper part	44200721

3.6 Parts list for model Morsø 2B Classic 2020

Pos. No.	Parts	SKU no.
56	Cover - upper part	44211800
57	Access Door Upper Part	44211921
58	Bolt - Ø5 360 mm	542146
59	M6 DIN 934 black steel nut	735006
62	06 mm DIN 9021 fzb washer	791891
63	Brick - Base	79209200
64	Baffle - stainless steel	71209061
65	Insulation	79077100
66	M6x08 DIN 933 A2 screw	74160804
67	Fitting for Cover w. thread	44256700
68	M6x30 DIN 7991 screw (black)	74241900
69	Flue Collar	44145921
70	Fitting w/o thread	44256800
71	Radiation Shield - Front	71209161
72	Fitting for handle	75140161
73	3,5x13 DIN 7981 fzb screw	79183600
77	Gasket for glass	79074200
78	M6x16 buttonhead A2 Screw	73861300
80	M6x30 DIN 933 Screw (black)	731630
81	Distance Tube Ø10x1 L=20mm	542635
82	Conv. back rear plate	54201221
83	Radiation Shield - Back	54202921
84	M6x60 DIN 933 Screw (black)	731645
86	Bakelite Handle 72 mm 7	9118300
90	M6 nut Verbus Ribb - BN2798-HFC851	735306
91	06 mm 6.5x16x1 fzb DIN 522-A washer	766106

Guarantee
Product Registration

MORSØ 10 YEAR GUARANTEE CERTIFICATE

Behind every Morsø stove is more than 160 years of dedicated stove design and manufacturing experience. Quality control has always been at the heart of the production process and detailed measures have been put into place at all key stages of the build. Accordingly, provided that the stove has been supplied by an authorised Morsø dealer, Morsø will offer a 10-Year Manufacturers Guarantee against manufacturing defect to any of the main exterior body parts of its stoves.

Read more about "Morsø 10 years guarantee/product registration card" and REGISTER your new Morsø stove online:
http://international.morsoe.com/warranty-registration

Morsø Jernstøberi A/S - 24-06-.2021 - 72207100

IMPORTANT!

How to heat safely for the environment and yourself!

- **Use only dry wood**
  Use only dry (max. 20% moisture content) and untreated wood. The fuel must be split and 8 - 12 cm thick.

- **Light**
  Light with dry kindling (use 1 - 2 kg). Leave the door ajar and stay close to the stove during the lighting phase.

- **Good layer of embers**
  Be certain to have a good layer of embers before refilling. The wood should light within 2 minutes. If the logs do not ignite it may, in an extreme case, cause the flue gases to ignite which may pose a risk to material damage or personal injury.

- **Refuelling**
  When refuelling use 2 - 3 pieces of wood - no more than 2 - 2.5 kg.

- **Ensure adequate air**
  I.e. clear and yellow flames.

- **Never burn overnight**

By appointment to The Royal Danish Court

morsø

Morsø Jernstøberi A/S - 24-06-2021 - 72207100

MORSØ JERNSTØBERI A/S . DK-7900 NYKØBING MORS
E-Mail: stoves@morsoe.com · Website: www.morsoe.com

Annex 31b

Title: User' manual CAN (Fr)

(Revised June 2021 release)

Pages total: 13, excl this cover page

By appointment to The Royal Danish Court

morsø

Manuel d'installation et d'utilisation

Morsø 2B Classic 2020

Pour utilisation en Amérique du Nord

MORSØ JERNSTØBERI A/S . DK-7900 NYKØBING MORS
E-Mail: stoves@morsoe.com · Website: www.morsoe.com

Félicitations pour l'acquisition de votre nouveau poêle Morsø !

Morsø, le plus important fournisseur sur le marché danois, fabrique des poêles-cheminées de haute qualité depuis 1853. En suivant les présentes instructions, nous sommes persuadés que votre nouveau poêle vous apportera plaisir et satisfaction durant de nombreuses années.

Sommaire

Avant d'installer et d'utiliser votre nouvel appareil de chauffage, veuillez lire ce manuel en entier. Une mauvaise installation de cet appareil de chauffage peut entraîner un incendie.
Suivez les instructions d'installation pour limiter ce risque d'incendie. Le non-respect des instructions peut entraîner des dommages matériels, corporels ou même mortels.

Contactez l'administration locale de construction concernant les restrictions et équipements d'inspection dans votre région.

Conservez ces instructions

Accessoires en option
Une gamme étendue d'accessoires (tels que gants de manipulation, ustensiles de cheminée, nettoyant pour vitre et peinture résistant à la chaleur) est disponible pour une utilisation adaptée à votre poêle Morsø. Ils facilitent l'entretien et l'utilisation de chaque jour. Contactez votre revendeur Morsø pour plus d'informations.

Le 2B Classic 2020 de Morsø a été certifié par les services d'inspection PFS TECO.
Les standards du test sont UL-1482-2011 (R2015) pour les États Unis et ULC- S627-00 pour le Canada.

Certified & Listed By PFS C US **Clackamas, Oregon USA**

PFS TECO
Report Number: F21-679

Le poêle est répertorié uniquement pour brûler du bois. Ne brûler aucun autre combustible.

U.S. ENVIRONMENTAL PROTECTION AGENCY. Certifié conforme aux normes d'émission de particules 2020 en utilisant du bois de corde.

L'émission moyenne de particules selon la méthode d'essai ASTM E3053-17 sur le bois de corde est de 0,47 g / h

Sous conditions spécifiques de test, on a pu constater que le rendement calorifique varie entre 9,037 et 31,988 Btu/hr
Un essai effectué conformément à la norme CSA B415.1 a montré que ce poêle avait un rendement moyen de chauffage supérieur à 80,1 %.

Ce poêle doit être revisé et reparé périodiquement pour une utilisation correcte.
Il est contre la loi fédérale d'utiliser ce poêle contredit les instructions de ce manuel.

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We suggest that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training www.wettinc.ca

La fonte
La fonte n'est pas un matériau inerte. Raison pour laquelle il n'y a pas deux poêles identiques. Ceci en raison des marges de tolérance de la fonte et de la fabrication artisanale des poêles. De fines irrégularités sont normales sur la surface de la fonte.

1.0 Installation de votre poêle Morsø

L'installation des poêles à bois doit être sûre et légale.

Si votre poêle Morsø n'est pas installé correctement, un incendie peut en résulter. Afin de réduire ce risque, suivez attentivement les instructions d'installation. Contactez l'administration locale de construction concernant les restrictions et l'inspection de l'installation dans votre région.

Avant de commencer l'installation de votre poêle, assurez-vous que :

- Le poêle et le raccord de cheminée sont placés suffisamment loin des matériaux de combustion afin de remplir toutes les conditions d'espacement.
- La protection du sol est adéquate et correctement effectuée conformément aux conditions.

Contactez l'administration locale de construction pour toutes les approbations nécessaires.

La plaque d'informations située à l'arrière du poêle fournit les informations nécessaires concernant les données de test de sécurité, le nom du laboratoire de test agréé et les conditions d'installations.

Les conditions d'installation diffèrent selon les districts et l'administration locale de construction a le pouvoir d'autorisation définitive pour approuver votre installation. Discutez de l'installation avec eux avant de commencer. Pour plus d'informations, contactez votre vendeur.

Ne connectez aucun conduit ou système de distribution d'air.

Important : Si vous ne suivez pas attentivement les instructions d'installation, il peut en résulter des situations dangereuses comme des incendies de cheminée ou demaison. Suivez attentivement les instructions et ne vous en écartez pas car cela peut entraîner des dégâts corporels ou matériels.

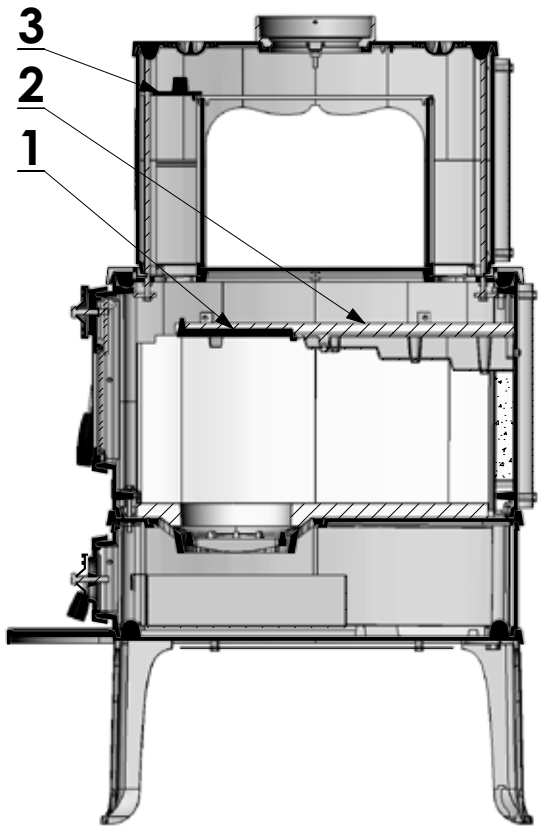
1.1 Déballage du poêle

2B Classic : après le déballage, dévissez la chambre de combustion de la palette avant de la poser tranquillement sur le côté. Pour éviter tout dommage du poêle et du sol, vous pouvez utiliser l'emballage en carton comme protection. Déballez les pieds fournis avec le poêle et vissez-les sur le socle en fonte à l'aide des boulons joints.

1.2 Vérifier les pièces mobiles dans le poêle

Après le déballage, vérifiez que les briques réfractaires sont fermement en place et n'ont pas bougé pendant le transport. Vérifiez également que le contrôle d'air fonctionne librement.

Avant le premier allumage, assurez-vous que le déflecteur (1) et l'isolation (2) au-dessus du déflecteur sont placés correctement, selon les illustrations ci-dessous. Vérifiez aussi que le couvercle (3) marquée 2118 est bien placé.



Pose du couvercle de fumée
Placez le couvercle de fumée à côté de l'échappement de fumée, sur le devant du poêle. Pour le faire plus facilement, faites passer le tuyau de fumée par le collier de serrage, avant de fixer le conduit. Vous pouvez aussi placer le couvercle de fumée par l'ouverture de la porte d'accès. Voir illustrations ci-dessous.





Pose du déflecteur vertical
Faites passer le déflecteur vertical par la porte, comme indiqué ci-dessous (illustrations 1 et 2). Placez le déflecteur dans la position correcte (illustrations 3 et 4). Placez l'isolation sur le déflecteur.




Accessoires standard
Le gant Morsø et le joint étanche de raccord de tuyau céramique sont des accessoires standard et se trouvent habituellement dans le cendrier ou le foyer.

1.3 Le système de cheminée/conduit

Remarque : le système de conduit doit être sécurisé de façon indépendante et ne doit pas reposer sur le poêle.

Le poêle ne doit pas être raccordé à un conduit de cheminée servant à un autre appareil. (Plusieurs tuyaux peuvent parcourir une seule souche de cheminée ; utilisez un seul tuyau par appareil).

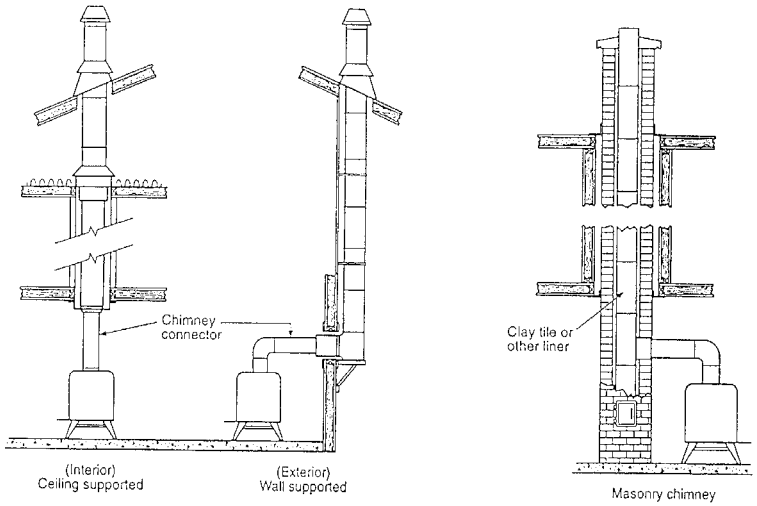
Utilisez une cheminée maçonnée de type résidentiel ou une cheminée d'usine de type HT répertoriée.

Cheminée Haute Température (H.T.) Standard UL-103-1985 (2100° F) pour les États-Unis et Standard Haute Température (650° C) ULC S-629 pour le Canada.

Les dimensions internes du raccord de cheminée et de la cheminée ne doivent pas être inférieures à 6 pouces (150 mm) de diamètre (ou coupe transversale équivalente) et ne doivent être beaucoup plus grandes. Une coupe trop grande a tendance à laisser les gaz du conduit refroidir excessivement, causant ainsi lenteur ou imprévisibilité de fonctionnement du poêle.

Nous conseillons que la longueur de la cheminée est au moins de 16 pieds (4,90 m) (pas indispensable) au-dessus du poêle dans des situations ménagères normales, mesurée du collier de serrage du tuyau à l'extrémité supérieure de la cheminée.
Les conditions locales comme, par exemple, la construction du toit, de gros arbres à proximité et une altitude élevée, peuvent avoir une influence sur le tirage et la hauteur de la cheminée. Veuillez donc contacter les ramoneurs professionnels locaux ou votre concessionnaire Morsø.

Installations typiques de cheminée usine ou maçonnée



1.4 Connexion du conduit

Un collier de serrage de tuyau est placé dans la zone du foyer.
Utilisez un raccord de cheminée bleu ou noir de 24 MSG ou un raccord de cheminée à doubl paroi répertorié. Reportez-vous aux règlements locaux et aux instructions du fabricant de la cheminée concernant les précautions à respecter pour faire passer une cheminée à travers un mur ou un plafond combustible. Pensez à sécuriser le raccord de cheminée avec au moins trois vis au produit et à chaque section contiguë.
Positionnez le poêle et connectez le système de conduit.

Portez des gants et des lunettes de protection lors du perçage, coupage ou assemblage des sections du raccord de cheminée.

1.5 Connexion à une cheminée déjà en place

Un raccord de cheminée est le tuyau à double ou simple paroi qui relie le poêle à la cheminée. La cheminée elle-même est la structure maçonnée ou préfabriquée qui contient le tuyau. Les raccords de cheminée permettent de relier le poêle à la cheminée.

Les raccords à double paroi doivent être testés et répertoriés pour une utilisation avec des appareils à combustibles solides. Les raccords à paroi simple doivent être faits en acier de calibre 24 ou plus. N'utilisez pas de raccords galvanisés : ils ne résistent pas aux hautes températures atteintes par la fumée et les gaz d'échappement et qui peuvent dégager des vapeurs toxiques sous grande chaleur. Le raccord doit avoir un diamètre de 6 pouces (150 mm).

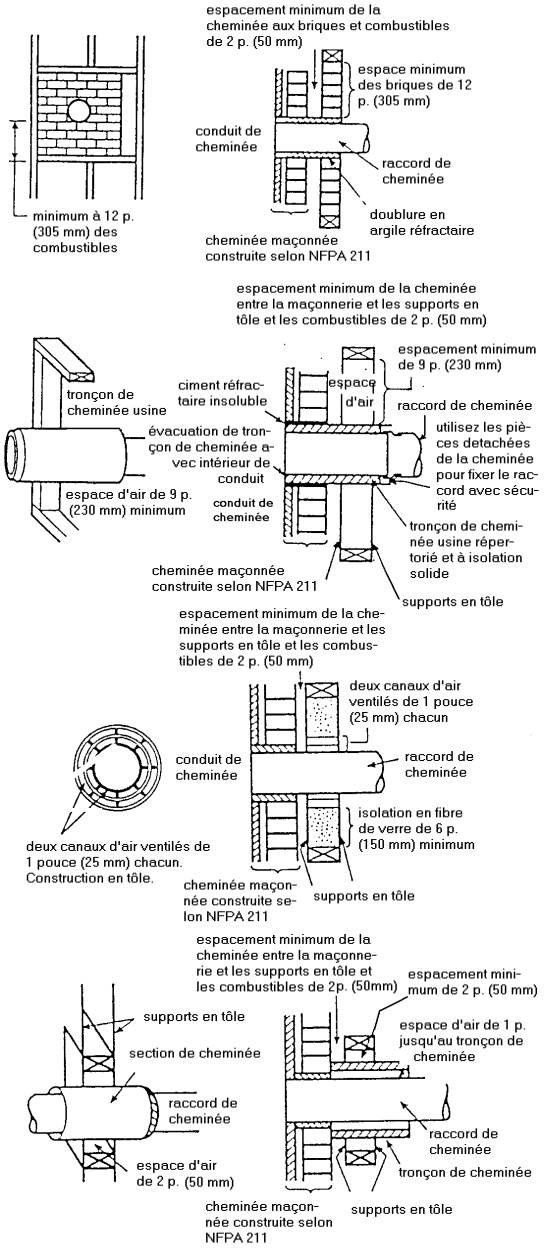
Si possible, évitez de faire passer le raccord de cheminée à travers un mur ou un plafond combustible. Si cela est inévitable, référez-vous aux sections sur Traverser les murs. Ne faîtes pas passer le raccord à travers un grenier, un placard ou tout espace confiné semblable lors de l'installation des raccords de cheminée.

Il est primordial de garder les gaz du tuyau en déplacement doux dans la bonne direction. Ne déviez pas dans un grand vide à cet endroit ; formez plutôt une section continue jusqu'en haut. Utilisez des courbures moyennes (par ex. 45° au lieu de 90°) plutôt que des angles aigus lorsqu'un changement de direction est nécessaire. Toutes les parties du conduit doivent être accessibles pour des raisons de nettoyage.
Dans les tronçons de cheminée horizontaux, maintenez un espacement de 18 pouces (455 mm) du plafond. Gardez-les aussi courts et directs que possible avec des coudes n'excédant pas 90 degrés. Inclinez les tronçons horizontaux de raccords de ¼ par pied (20mm par mètre) en partant du poêle vers la cheminée. La longueur maximum recommandée d'un tronçon horizontal est de 3 pieds (1 mètre) et la longueur totale ne doit pas dépasser 8 pieds (2,5 mètres).
Les informations sur l'assemblage et l'installation des raccords sont fournies par les instructions du fabricant, comme vous assemblez et fixez le raccord au poêle et à la cheminée.

Assurez-vous que le poêle et le raccord de cheminée installés se trouvent à une distance correcte des matériaux de combustion proches. Voir le paragraphe sur les espacements page 9.

Si le conduit passe par une paroi ou une cloison de construction inflammable, l'installation doit être conforme à la norme CAN/CSA-B365.

Systèmes de raccord de cheminée et autorisations des appareil de chauffage ménagers à travers les murs inflammables



A. Maçonnerie en briques charpentée d'au moins 3,5 pouces (90 mm) d'épaisseur dans un mur inflammable avec une séparation en brique de 12 pouces (305 mm) minimum de la doublure en argile aux combustibles. La doublure en argile réfractaire doit aller de la surface de la sortie du mur en brique jusqu'à la surface interne de la doublure du tuyau de cheminée mais pas au delà et doit être solidement cimentée en place.

B. Tronçon de cheminée usine répertoriée, à isolation solide, de même diamètre intérieur que le raccord de cheminée et ayant une isolation de 1 pouce (25 mm) ou plus avec un espace d'air minimum de 9 pouces (230 mm) entre le mur extérieur de la longueur de la cheminée et les combustibles.

C. Raccord de cheminée en tôle, minimum calibre 24 en épaisseur, avec un cylindre ventilé minimum calibre 24 en épaisseur ayant deux canaux d'air de 1 pouce (25 mm), séparés des combustibles par au moins 6 pouces (150 mm) d'isolation de fibre de verre.
L'ouverture doit être couverte et le cylindre sou tenu soutenu par un support en tôle, minimum calibre 24 en épaisseur.

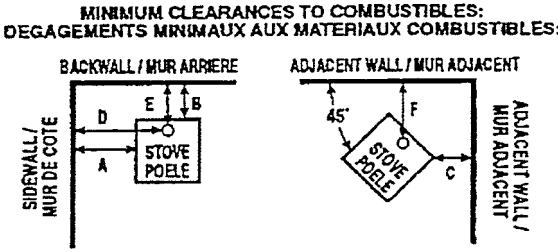
D. Tronçon de cheminée usine répertoriée, à isolation solide d'un diamètre intérieur plus grand de 2 pouces (50 mm) que le raccord et ayant une isolation de 1 pouce (25 mm) ou plus, servant de traverse pour un raccord de cheminée à simple paroi en tôle d'épaisseur minimum de calibre 24, avec un espace d'air d'au moins 2 pouces (50 mm) entre le mur extérieur de la section de cheminée et les combustibles. La longueur minimum de la section de cheminée doit être de 12 pouces (305 mm) et espacée de 1 pouce (25 mm) du raccord utilisant des plaques de soutien en tôle à chaque extrémité de la section de cheminée. L'ouverture doit être couverte et la section de cheminée soutenue des deux côtés avec des supports en tôle fixés à des murs de calibre 24 épaisseur minimum.
Les fixations utilisées pour sécuriser la section de cheminée ne doivent pas pénétrer la doublure du conduit de cheminée.

1.6 Positionnement du poêle

Distance avec murs et linteaux

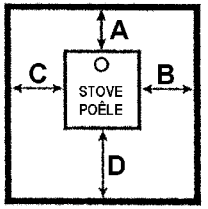
Si le poêle se trouve à proximité de matériaux combustibles, consultez tous les règlements de constructions locaux et nationaux en vigueur en ce qui concernent les espacements. Quels que soient les règlements qui s'appliquent à votre région, n'installez en aucun cas le poêle à moins de 8 pouces (205 mm) des matériaux combustibles sur les côtés et à moins de 16 pouces (405 mm) au-dessus du poêle (des installations des poêles demandent plus d'espacement au-dessus du poêle - voir le graphique des distances en dessous). Il peut s'avérer nécessaire d'augmenter ces distances si les matériaux sont sensibles à la chaleur. Notez également que les papiers peints et autres matériaux de décoration peuvent se détacher sous l'effet de la chaleur. Prenez garde à ce qu'ils ne tombent pas sur le poêle, le cas échéant.

Si le poêle se trouve à proximité de matériaux non combustibles, un espace de 4 pouces (100 mm) ou plus est recommandé pour des raisons de nettoyage et afin d'assurer la circulation de la chaleur autour du poêle et dans toute la pièce.



Conditions d'espacement requises:	Installation résidentielle standard (raccord à simple paroi)	
	États-Unis	Canada
A. De la paroi latérale à l'unité	26" (660 mm)	26" (660 mm)
B. De la paroi arrière à l'unité	7" (178 mm)	7" (178 mm)
C. De la paroi d'angle à l'unité	22" (559 mm)	22" (559 mm)
D. De la paroi latérale au raccord	29" (737 mm)	29" (737 mm)
E. De la paroi arrière au raccord	15" (381 mm)	15" (381 mm)
F. De la paroi d'angle au raccord	29" (737 mm)	29" (737 mm)
G. De l'unité au plafond	-	-
H. Du sol au plafond	-	-

NON-COMBUSTIBLE FLOOR PROTECTOR:
PROTECTUR DE PLANCHER INCOMBUSTIBLE



FLOOR PROTECTOR MUST BE NON-COMBUSTIBLE MATERIAL. IT MUST EXTEND BENEATH HEATER, AND TO THE FRONT/SIDEES/REAR AS INDICATED.

LE PROTECTEUR DE PLANCHER DOIT ÊNTRE D´UN MATÉRIAL INCOMBUSTIBLE. IL DOIT S'ÉTENDRE EN DESSOUS DE L'APPAREIL ET AU DEVANT, AUX CÔTÉS ET À L'ARRIÈRE DEL L'APPAREIL COMME INDIQUÉ.

Exigences de protection du sol	Matériaux incombustibles sous le poêle	
	USA	Canada
A. Distance de prolongement, arrière	-	200 mm
B. Distance de prolongement, côté droit	6"	200 mm
C. Distance de prolongement, côté gauche	6"	200 mm
D. Distance de prolongement, avant	16"	450 mm

Sur le sol
Si le poêle est placé sur un sol combustible, une protection solide non combustible doit couvrir le sol sous le poêle. Cette protection doit couvrir une zone d'au moins 16 pouces (450 mm Canada) devant la porte du poêle et au moins 8 pouces (200 mm Canada) de chaque côté de l'ouverture amovible pour le mazout ou les cendres. Pour les tuyaux de cheminée horizontaux, une protection non combustible doit être placée au-dessous du tuyau, dépassant de 2 pouces de chaque côté.
Vous devez vous assurer que le sol dans cette zone peut aisément supporter le poids du poêle.

Distance des meubles
La distance minimum recommandée entre le poêle et les meubles est de 30 pouces (760 mm). Veuillez noter que certains meubles sont plus facilement affectés par la chaleur et peuvent par conséquent nécessiter d'être plus éloignés. Ceci est votre responsabilité.

De plus, maintenez tout autre matériau combustible éloignés du poêle. En général, une distance de 30 pouces (760 mm) doit être conservée entre le poêle et les objets inflammables mobiles tels que chiffons, journaux, bois de chauffage, etc.

NE PAS INSTALLER DANS UN MOBILE HOME

Remarque :
Protection de l'acide
En cas de lavage à l'acide de la maçonnerie autour du poêle, protégez la surface du poêle avecune couverture résistante à l'acide.

Entrée d'air frais
A moins que la circulation d'air dans la pièce par les portes, fenêtres et autre soit jugée suffisante, une entrée d'air frais est nécessaire. Cette entrée d'air doit avoir un espace d'air libre de 2 pouces carrés (1250 mm carrés). Ceci est particulièrement important lorsque la pièce est bien scellée ou lorsqu'une hotte aspirante ou un système de ventilation perturbe la pression naturelle de l'air. Une telle entrée d'air ne doit pas se trouver sur un mur habituellement sujet à une pression négative du déplacement habituel du vent. Evitez de placer l'entrée d'air directement à l'opposé du poêle dans la pièce créant ainsi un courant d'air froid.

2.0 Fonctionnement

2.1 Avant d'allumer le feu

Pour une utilisation avec des combustibles solides uniquement. Ne poussez pas trop le feu, si l'appareil ou le raccord de cheminée devient incandescent, le feu est trop fort. Inspectez et nettoyez fréquemment la cheminée. Dans certaines conditions d'utilisation, la formation de créosote peut arriver rapidement. A cause des risques de débordement de fumée et de flammes, opérez uniquement avec la porte fermée.

Attention :
Chaud pendant le fonctionnement.
Tenir les enfants, vêtements et meubles éloignés.
Risque de brûlures cutanées en cas de contact.
Ne pas utiliser de produits chimiques ni de liquides pour l'allumage.
Ne pas brûler de déchets ni de liquides inflammables.
Ne pas utiliser d'essence, de pétrole à lampe, de kérosène, d'allumeur ou de liquide à charbon de bois ou tout autre liquide pour démarrer ou relancer un feu dans ce poêle. Tenir tous ces liquides éloignés du poêle pendant son fonctionnement.

Choisir votre combustible
Vous pouvez brûler tous les types de bois naturel dans ce poêle mais ils doivent être bien secs. Une fois coupé en longueur, couper le bois en deux – conformément aux dimensions mentionnées ci-dessous- pour permettre à l'humidité de s'évaporer. Couper le bois à une longueur maximale de 18 pouces (45 cm) et d'un diamètre d'environ 3 à 3,5 pouces (7 à 8 cm). Si vous pouvez peser votre bois, comptez environ 1,0 kg. Pour une combustion optimale et un bon dégagement de chaleur, le bois doit pas contenir plus de 20% d'humidité; ceci peut facilement être contrôlé à l'aide de l'hygromètre Morsø (article # 62929900).

Stockez les bûches couvertes dans un endroit bien aéré, où l'air peut circuler entre les bûches. Certains bois tendres peuvent n'avoir besoin que d'un bel été pour sécher, alors que certains bois plus durs, comme p.ex. le chêne, l'érable et l'orme peuvent prendre jusqu'à 18 mois. Eviter du bois trop sec, souvent d'une couleur tirant sur le gris, car dans certaines conditions, cela peut poser des problèmes de rendement tels que lenteur et projection d'étincelles. Un bois bien sec est léger à manipuler et présente des fentes du centre vers les extrémités. Si votre bois crépite ou grésille en brûlant et que de la suie persiste à se former sur la porte vitrée du poêle, votre bois n'est pas suffisamment sec. N'utilisez jamais de dérive (de la mer) dont le contenu salé peut entraîner de la corrosion, ni du bois de construction pouvant être imprégné de produits chimiques.

Attention! Ne pas entreposer de combustible dans l'espacement libre requis à proximité du poêle ni dans l'espace destiné au chargement du combustible ou au vidage des cendres.

Allumage
Au début, faîtes un petit feu pour que la peinture s'accoutume et que les plaques principales du poêle se mettent en place. La peinture peut dégager des vapeurs. Aérez la pièce pendant cette phase. Le réglage de l'aération, les techniques d'allumage et les intervalles d'alimentation dépendent du tirage de la cheminée, du combustible utilisé, de la chaleur voulue, etc. Quelques techniques de base sont soulignées ci-dessous.

En principe:
Votre poêle est équipé d'entrées d'air primaire et secondaire.
L'air primaire est contrôlé grâce au levier situé sous le rebord à cendres du poêle. Pour ouvrir l'admission d'air, déplacer le levier de contrôle vers le bas. De l'air préchauffé pénètre alors dans la chambre de combustion via le système de " nettoyage d'air " situé à l'intérieur du poêle et au dessus de la vitre.
L'air secondaire est injecté dans les gaz du conduit à la fois au dessus et en face du feu, rendant ainsi le processus de combustion plus propre et plus efficace.
L'admission d'air secondaire est constamment ouverte et n'est pas réglable.
Pour plus de sécurité, votre poêle est équipé d'une poignée amovible. Lorsqu'elle n'est pas utilisée, on peut la ranger grâce au goujon au pied droit du poêle.

2.2 Allumage et intervalles d'alimentation

Le premier allumage du poêle nécessite un volume d'air important. Lorsque le poêle est froid, laissez la porte entrouverte de 2 ou 3 cm pendant les premières minutes et ouvrez complètement l'entrée d'air primaire. Ne laissez pas le poêle sans surveillance tant que la porte est ouverte.
Afin de constituer un lit de cendres raisonnable au fond du poêle, utilisez 2 à 4 livres de petit bois sec lors du premier allumage. Maintenez en permanence une couche de 1 à 1,5 pouces (2 à 3 cm) de cendres au fond de la chambre de combustion à chaque fois.

1. Lorsqu'on allume un poêle à bois, il est recommandé d'utiliser la méthode d'allumage Top Down. C'est la méthode d'allumage la plus respectueuse de l'environnement. Pour obtenir rapidement la formation d'une couche de braises, utiliser pour l'allumage 2 sachets allume-feu, ainsi que 2 kg environ de bois d'allumage. Poser les allume-feu juste en-dessous de la couche supérieure de petit bois.
Il est important de commencer avec précaution, de telle sorte que la combustion se développe lentement. De cette manière, la formation de suie sur la vitre est faible. En effet, l'encrassement de la vitre est souvent dû à une combustion trop violente et au fait que les flammes entrent en contact avec des surfaces froides. En évitant la formation de suie lors de l'allumage et en faisant en sorte d'obtenir une couche de braises chaudes, la formation de suie sera minime lors des étapes suivantes d'alimentation.

2. Ouvrez complètement le régulateur d'air primaire.
Tournez la commande rotative de 2 1/2 tours dans le sens antihoraire de la position fermée pour ouvrir complètement l'alimentation en air primaire
(Voir encadré page 15 concernant la position fermée)

3. Allumez le feu.

4. Après l'allumage, fermez partiellement les portes en les laissant entrouverte de 2 ou 3 cm pour laisser entrer suffisamment d'air de combustion.

5. Lorsque la cheminée est chaude après 5 à 10 minutes, fermez la porte.
Nous recommandons de régler la commande de la centrifugeuse à un minimum de 1 à 1 1/2 tour dans le sens antihoraire à partir de la position fermée, lors de la combustion du bois d'allumage / de démarrage.
Un lit de braises convenable se forme au bout de 15 à 20 minutes.

6. Au moment de recharger, repartez les braises dans le foyer en les rapprochant surtout vers l'avant du poêle.

7. Poser trois morceaux de bois sur les braises. Laissez ½ pouce (1 cm) ou plus entre chaque morceau.

Toujours garder la charge de carburant sous le tube d'air secondaire le plus bas. L'espace devant et au-dessus du tube à air le plus bas est réservé à la combustion de gaz volatil.

8. Fermez la porte. Tournez la commande rotative de 2 1/2 tours dans le sens antihoraire à partir de la position fermée pour ouvrir complètement l'alimentation en air primaire
Le nouveau carburant s'enflammera dans une minute ou deux

9. Après quelques minutes, réglez l'entrée d'air primaire en fonction de la chaleur voulue.
Si vous utilisez le taux de combustion bas minimum (commande de rotation fermée)
permettre au feu de s'établir correctement, en brûlant à une vitesse de combustion moyenne pendant environ 15 minutes à l'avance. Tournez la commande rotative 1-11 / 2 tours dans le sens antihoraire à partir de la position fermée pour atteindre un taux de combustion moyen.

10. Anticipez chaque alimentation et souvenez-vous de n'ajouter qu'une modeste couche de bois tant qu'il y a beaucoup de braises. Reprenez les points 6 à 9.

N'essayez en aucun cas d'accroître le feu de votre poêle en modifiant le réglage du contrôle d'air décrit dans ces instructions.

Attention : Les poêles à feu de bois ne doivent jamais être laissés sans surveillance la porte ouverte.

Cet appareil de chauffage à bois a un taux de combustion minimal inférieur fixé par le fabricant et qu'il convient de ne pas modifier. Les règles fédérales interdisent de modifier ce réglage ou d'effectuer sur ce poêle toute autre intervention contrevenant aux instructions de service figurant dans le présent manuel
Lorsque le contrôleur d'air du cône est tourné à fond vers le bas, position fermée, il est toujours un petit écart entre le cône et le cadre de la porte permettant un faible taux de combustion minimum. L'écart défini par le fabricant est de 1 mm égal à 3/4 de tour

Si vous laissez les portes entrouvertes, gaz et flammes peuvent sortir du foyer par l'ouverture, créant ainsi des risques d'incendie et de fumée. Nous vous conseillons d'installer un détecteur de fumée dans la pièce où vous installez le poêle.

NE PROVOQUER JAMAIS DE SURCHAUFFE. Toute surchauffe peut entraîner un incendie ou des dégâts permanents pour le poêle. Si n'importe quelle pièce du poêle devient incandescente, vous êtes en surchauffe.

Le poids maximal de bois recommandé par charge est de 3.5 kg/7 lbs (environ 5 bûches).

Dans des conditions de chauffage normales, la température moyenne à l'intérieur du tuyau du poêle, mesurée à 20 cm au-dessus du poêle est d'env. 300° C (550°F). La température maximale dans le tuyau du poêle ne doit pas excéder 450° C (750°F). Une température du poêle dépassant 450°C (750°F) est considérée comme surchauffe et peut être la cause d'une usure prématurée du poêle.

Pour permettre de mesurer correctement la température de fonctionnement de votre poêle, nous recommandons l'utilisation du Thermomètre à gaz pour poêle Morsø (article # 62901200). Le Thermomètre à gaz pour poêle est magnétique; il se fixe sur le tuyau du poêle, à environ 20 cm (8") au-dessus de la plaque supérieur du poêle, et mesure la température de surface du tuyau du poêle. Disponible auprès de votre distributeur Morsø agréé.

Conditions de tirage
Si de la fumée ou des émanations se dégagent du poêle lors de l'allumage et de l'alimentation ou si tout simplement le feu ne prend pas, ceci est sûrement dû à un faible tirage. (Dans très peu de cas, pas assez d'air frais entre dans la pièce – voir les conseils d'installation plus haut). Demandez conseil à votre vendeur pour savoir comment améliorer votre système de tuyauterie pour accroître le tirage.

Règles de feu de bois
Pour avoir moins de chaleur, mettez moins de bûches dans le poêle et réduisez la quantité d'air. Il est toujours important de maintenir une bonne couche de braises.
Moins de chaleur – moins de bois – moins d'air
Plus de chaleur – plus de bois – plus d'air
Des dépôts de suie se font sur la vitre si le poêle fonctionne trop lentement ou si votre bois n'est pas assez sec.
Il est fortement conseillé de ne pas laisser le poêle allumé pendant la nuit. En plus des effets nocifs sur l'environnement, le rendement du bois serait mauvais puisque les gaz qu'il contient ne s'enflamment pas à basse température mais se fixent sous forme de suie (gaz non consumés) dans la cheminée et le poêle.

Détecteurs de monoxyde de carbone
Dans certaines juridictions, l'installation de détecteurs de fumée et d'oxyde de carbone dans les lieux où sont placés des appareils de chauffage est obligatoire. Pour assurer votre sécurité, installez au moins un détecteur de fumée à chaque étage de votre maison. Il devra être placé à distance de l'appareil à bois et à proximité des espaces de repos. En effet, en plaçant un détecteur de fumée trop près du poêle, l'alarme risque de se déclencher si un rejet de fumée intervient lorsqu'on ouvre la porte pour remettre du bois. Suivez les instructions du fabricant de détecteurs de fumée concernant l'emplacement, l'installation et l'entretien.

3.0 Entretien

Lors de l'entretien de votre poêle, portez toujours des lunettes et des gants de protection.

3.1 Entretien extérieur
La surface du poêle est peinte avec la peinture résistant à la chaleur Senotherm. Nettoyez de préférence avec un aspirateur équipé d'un embout à brosse souple ou en essuyant avec un chiffon anti-peluche.
Au bout d'un certain temps, la surface peinte peut devenir légèrement grise. Vous pouvez trouver une boîte de peinture en spray pour retouche Morsø chez votre revendeur. Il suffit de quelques minutes – en suivant les instructions- pour l'appliquer. Lors du premier allumage après une retouche, une légère odeur peut se dégager du poêle le temps de l'accoutumance de la peinture. Assurez-vous de bien aérer la pièce pendant cette période.

3.2 Entretien intérieur
Vitre
Si le poêle est généralement utilisé aux températures correctes, la vitre ne devrait être que peu ou pas sale. Si de la saleté se dépose lors de l'allumage, la majeure partie brûlera au fur et à mesure que la température augmente. En cas de dépôts plus importants qui ne brûlent pas, utilisez le nettoyant pour vitres Morsø. Appliquez sur la vitre froide en suivant les instructions. N'utilisez jamais de nettoyants abrasifs sur la surface vitrée.

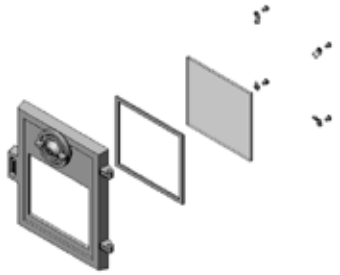
Causes possibles de vitre sale
- Combustible trop humide
- Bûches trop grandes ou non fendues
- Température de combustion trop basse

Remplacez immédiatement toute vitre cassée.
N'utilisez pas votre poêle si la vitre de la porte est endommagée.

Si vous devez changer la vitre, utilisez du verre céramique à haute température fourni par Morsø. Contactez votre concessionnaire Morsø.

UTILLISEZ TOUJOURS DES PIÈCES DE RECHANAGE D'ORIGINE MORSØ

Installer la vitre
N'installez jamais la vitre lors du fonctionnement du poêle.



Remplacement du vitre céramique
Le vitre céramique ne peut pas être recyclé, car sa température de fusion est trop élevée. Si le vitre céramique est mélangé au verre normal, la matière première est dénaturée et le processus de recyclage du vitre peut être interrompu. Veillez à ce que le vitre réfractaire ne soit pas traité comme matériau à recycler normal. Vous contribuerez beaucoup à la protection de l'environnement.
ATTENTION ! Doit être déposé comme vitre céramique dans une station de collecte des déchets.

1. Soulevez la porte pour la sortir de ses gonds et posez-la face avant vers le bas sur des cartons ou tout autre tissu non abrasif.

2. Dévissez les quatre boulons qui maintiennent la vitre. (Au cas où un boulon se casserait lors du dévissage, retirer le reste du boulon en perçant au centre avec une mèche de perceuse acier grande vitesse de 1/8 de pouce (3 mm). Des mèches plus petites peuvent également convenir mais n'utilisez en aucun cas de mèche plus grande. Assurez-vous que la mèche ne touche pas les bords du boulon – ceci pouvant endommager le filetage dans la fonte).

3. Retirez le joint d'étanchéité en céramique usagé et nettoyez la surface en dessous avec de la paille de fer ou du papier de verre pour éliminer les particules.

4. Mettez en place le nouveau joint d'étanchéité tout autour de l'emplacement de la vitre en vous assurant de bien le pincer tout le long de façon à faire un joint continu. Ne laissez aucun espace.

5. Placez la nouvelle vitre sur les bandes et revissez les boulons et équipements à la main.

6. Enfin, donnez environ un demi-tour supplémentaire aux boulons. La vitre doit être tenue assez fermement de manière à ne pas bouger pendant le nettoyage. Ne vissez pas les boulons trop fort car cela entraîne une pression excessive sur la vitre risquant de la casser - important !

Afin de réduire le risque de casser la vitre, évitez de frapper sur la vitre ou de claquer la porte.

Pièces de rechange intérieures
L'équipement feu – comprena nt le cendrier, la grille, les briques réfractaires, plaques de fonte pour protection feu, la vitre, le déflecteur et le collier de serrage du tuyau – est soumis à une chaleur extrême produite par le feu. De temps en temps, il peut s'avérer nécessaire de remplacer une de ces pièces pour des raisons d'entretien routinier.

Remplacement des pierres
Lors du remplacement des pierres, dévisser à l'arrière du poêle la plaque de rayonnement, fixée avec 4 vis. Cela permet d'accéder aux 2 boulons, maintenant en place la chicane pour la fumée. Retirer ces boulons de manière à pouvoir lever la chicane pour la fumée à l'intérieur du poêle. Lever la chicane pour la fumée afin de pouvoir sortir la pierre du poêle et installer la nouvelle. Placer les pierres latérales dans les rainures de la plaque de fond en vermiculite. Lorsque les pierres sont placées correctement, abaisser la chicane pour la fumée sur les pierres et la revisser sur le côté arrière en fonte du poêle.
Pour terminer, monter la plaque de rayonnement arrière avec les 4 vis.

REMARQUE : L'équipement feu, la corde céramique et la finition de peinture ne sont pas couverts par la garantie.

Toutes ces pièces de rechange sont en vente chez votre concessionnaire Morsø et nous vous recommandons de remplacer toute pièce endommagée aussi tôt que possible afin d'éviter des dégâts supplémentaires.
Si le déflecteur est déformé par une surchauffe, le poêle continue à fonctionner même si sa performance peut être compromise. Remplacez-le dès que possible.

Causes possibles d'usure interne rapide
- Feu fort et persistant
- Accumulation de suie et de cendres

Joint d'étanchéité
Le joint entourant le périmètre des portes peut durcir avec le temps. Remplacez-les s'il devient difficile de fermer les portes ou si l'air commence à s'infiltrer autour des portes, causant ainsi un feu un peu moins contrôlable. Un jeu de joint Morsø est en disponible chez votre revendeur.

3.3 Nettoyage du poêle et du conduit

Vérifiez la présence de suie au-dessus de la plaque du déflecteur et autour de la sortie du tuyau environ tous les mois pour commencer. Si le poêle devient soudain lent, regardez si de la suie est tombée autour du collier de serrage du tuyau ou dans le tuyau/ la cheminée.

Effectuez une inspection de la cheminée et du raccord de cheminée au moins tous les deux mois pendant la saison de chauffage pour détecter la formation éventuelle de créosote. S'il y a de créosote il faut l'éliminer pour réduire le risque d'un feu de cheminée.

Nettoyez le tuyau/ la cheminée – sur toute la longueur du poêle jusqu'à l'extrémité du tuyau sur le toit de la maison.
Une bonne habitude est de nettoyer le tuyau après chaque saison de chauffage dans tous les cas et d'inspecter avant chaque saison pour vous assurer qu'aucun nid d'oiseau ou autre bouchon ne s'est constitué pendant la saison de non-utilisation.

Elimination des cendres
Videz les cendriers quotidiennement ou selon les besoins. Si vous laissez des cendres s'accumuler en dessous de la grille, la chaleur est piégée et cela peut entraîner un mauvais fonctionnement prématuré de la grille.

Videz le cendrier selon cette procédure :
Ouvrez les portes avant et utilisez une pelle ou un tisonnier pour remuer l'excès de cendres et la faire tomber dans les cendriers à travers les fentes de la grille. Retirez le cendrier en prenant soin de bien le tenir horizontal.
Jetez les cendres dans un récipient en métal avec un couvercle hermétique.
Placez le récipient fermé contenant les cendres sur un sol non inflammable ou sur la terre, bien éloigné de tout matériau combustible en attendant l'enlèvement définitif. Si vous vous débarrassez des cendres en les enterrant ou en les dispersant, gardez-les dans le récipient fermé jusqu'à leur refroidissement complet. Remettez le cendrier en place et fermez le poêle.

Attention :
Ne jamais vider un poêle en train de fonctionner.
Ne jamais utiliser votre aspirateur ménager ou professionnel pour enlever les cendres du poêle ; toujours éliminer les cendres correctement.

Créosote – Formation et élimination.
Lorsque le bois brûle lentement, il produit du goudron et d'autres vapeurs organiques qui s'associent avec l'humidité émise pour former du créosote. Les vapeurs de créosote se condensent dans le conduit de cheminée relativement froid lors d'un feu brûlant faiblement. Il en résulte que les résidus de créosote s'accumulent sur la paroi du tuyau. Une fois enflammé, le créosote crée un feu extrêmement chaud. Vérifiez la cheminée et le conduit de cheminée au moins deux fois par mois pendant la saison de chauffage pour contrôler l'absence de formation de créosote. En cas de dépôt de créosote, éliminez-le pour diminuer le risque de feu de cheminée.

Ramonage de la cheminée
Inspectez le système régulièrement au cours de la saison de chauffage comme partie intégrante d'un programme d'entretien régulier. Pour inspecter la cheminée, laisser le poêle refroidir complètement. Puis, à l'aide d'un miroir, regardez par le collier du tuyau dans le conduit de cheminée. Si vous ne pouvez pas inspecter le système de conduit de cette façon, déconnectez le poêle pour faciliter l'accès.
Nettoyez la cheminée à l'aide d'une brosse de la même forme et taille que le tuyau. Faites coulisser la brosse de haut en bas et inversement dans le conduit afin de faire tomber tous les dépôts en bas de la cheminée où vous pouvez les évacuer grâce à la porte de nettoyage. Nettoyez le raccord de cheminée en déconnectant les sections, mettez-les à l'extérieur et éliminez tous les dépôts avec une brosse dure. Remettez les sections du raccord en place après le nettoyage en vous assurant de sécuriser les joints entre chaque section avec des vis en tôle. Si vous ne pouvez pas inspecter ou nettoyer la cheminée vous-même, contactez votre concessionnaire Morsø ou un ramoneur professionnel.

En cas de feu de cheminée, agissez rapidement et :
1. Fermez le contrôle d'air.
2. Faites sortir tout le monde de la maison.
3. Appelez les pompiers.

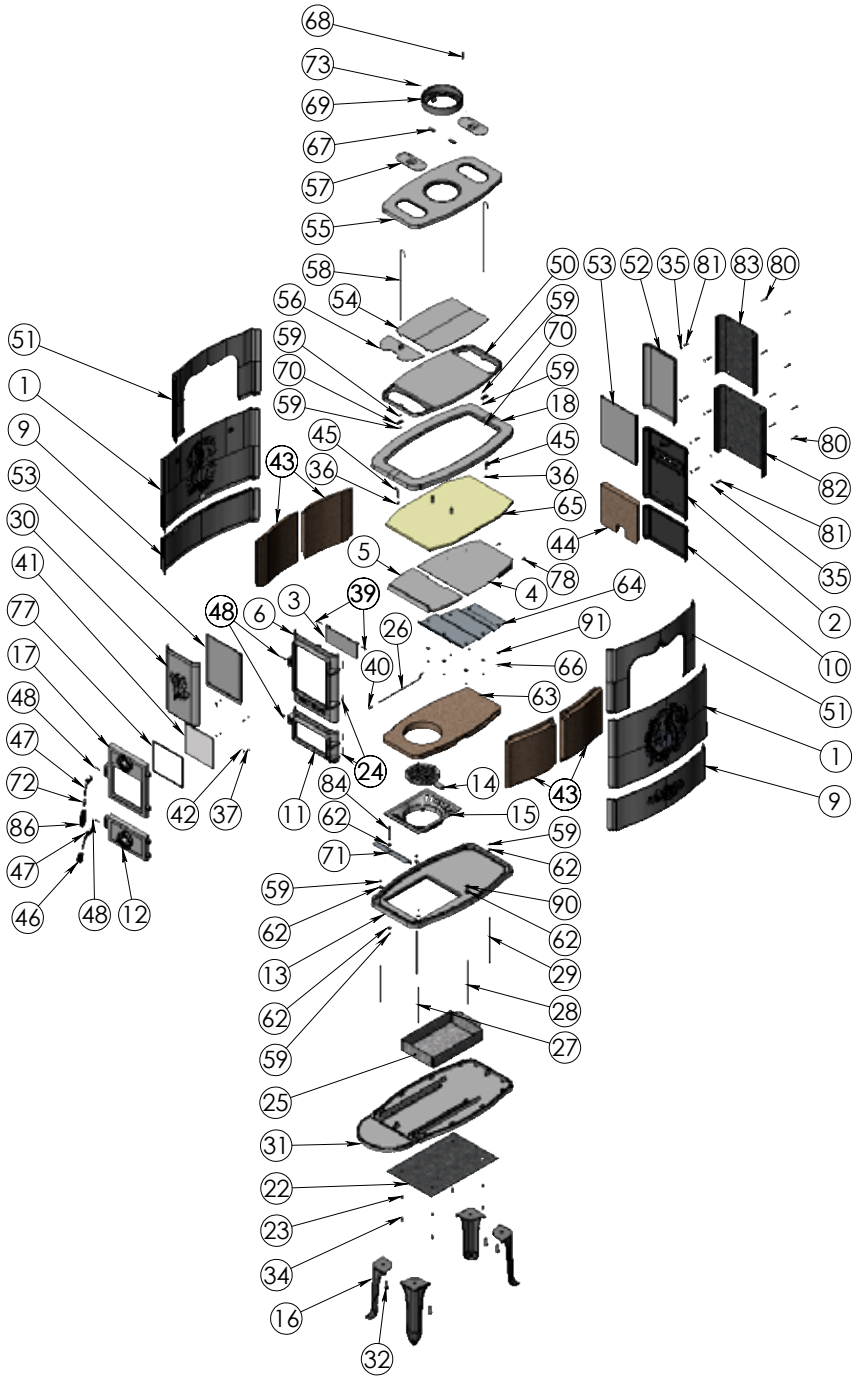
Entretien annuel
Avant la saison de chauffage, effectuez un nettoyage en profondeur, inspectez et réparez :
Nettoyez la cheminée et le raccord de cheminée à fond.
Vérifiez si la cheminée est abîmée ou usée. Remplacez les sections faibles de la cheminée préfabriquée. Faites faire les réparations par un maçon pour la cheminée maçonnée.
Inspectez le raccord de cheminée et remplacez les sections endommagées.
Vérifiez l'usure ou la compression de l'étanchéité et remplacez si nécessaire.
Vérifiez si la vitre est craquelée; remplacez si nécessaire.
Vérifiez si la porte et les poignées ferment bien. Ajustez si nécessaire.

3.4 Périodes prolongées de non-utilisation du poêle
Important:
Si vous n'utilisez pas le poêle pendant une période quelconque, nettoyez-le en profondeur et laisser l'aération légèrement ouvert pour laisser l'air circuler. Assurez-vous que le tuyau ne laisse pas entrer d'eau de pluie près du poêle ; installez un chapeau sur la cheminée mais ne bouchez pas complètement le tuyau.
Ces mesures permettent d'assurer un léger courant d'air dans le poêle et au corps du poêle de rester sec, dans les moindres recoins.
Les cendres laissées dans un poêle qui ne brûle pas attirent l'humidité comme du papier buvard. Si vous laissez l'humidité s'installer dans le poêle, de la rouille se forme. La rouille s'étend dès qu'elle prend prise. Ceci peut entraîner une pression excessive sur les joints du poêle, endommageant ainsi ultérieurement le poêle.

REMARQUE : Il est préférable de nettoyer à fond le poêle à la fin de la saison de chauffage. Ajouter un dessicatif, comme de la litière pour chat, dans le cendrier aide à absorber l'humidité pendant les mois d'été. Assurez-vous de l'enlever avant la saison de chauffage.

Nous vous remercions d'avoir acheté un poêle Morsø.
Nous vous souhaitons des années de chaleur sans souci en sa compagnie. Après quelques expérimentations initiales avec les techniques d'alimentation et de fonctionnement, vous trouverez vos habitudes. En cas de problèmes après cette courte phase d'apprentissage, adressez-vous au vendeur de votre poêle. Si celui-ci est dans l'impossibilité de vous aider, veuillez nous contacter par écrit à l'adresse figurant sur la première page de cette publication.

3.5 Schéma des pièces détachées pour le modèle 2B Classic 2020



3.6 Liste des pièces détachées pour le modèle 2B Classic 2020

No.	Pièces	SKU no.
1	Panneau latéral Ecureuil	54200321
2	Plaque arrière	44203821
3	Valve à fumée	44200800
4	Déflecteur horizontal	44203600
5	Déflecteur vertical	34203800
6	Face frontale	44201521
9	Panneau latéral, partie supérieure	44202521
10	Plaque arrière, partie inférieure	44202621
11	Porte, partie inférieure	44202721
12	Porte du cendrier	44204821
13	Cadre intermédiaire de poêle	44204921
14	Grille à fentes	44203000
15	Cadre de poêle intérieur	44203100
16	Pied	44203221
17	Porte Assemblé	44204421
18	Cadre	44211121
20	Tisonnier	541075
22	Écran de protection radiant - base	54137000
23	Tube d'éloignement Ø10x1 L=10mm	541439
24	Axe de charnière Ø6x45	541808
25	Boîte de cendrier	542051
26	Poignée à fentes	542052
27	Boulon M6x170	542053
28	Boulon M6x205	542054
29	Boulon M6x215	542055
30	Panneau arrière, partie supérieure	44211421
31	Base	54209400
32	Vis M10x16 DIN 933 screw (black)	73111600
34	Vis M6x25 DIN 933 Screw (black)	731616
35	Rondelle, Vistop 6 mm	746206
36	Vis M8 DIN 934	735008
37	Vis M85x08 ISO 7380	73850800
39	Vis M5x25 DIN 965A fzb	743525
40	Bouton pour poignée à fentes	752619
41	Porte vitrée	790715
42	Clip vitre	790743
43	Brique, latérale	79209000
44	Brique, arrière	79209100
45	Vis M8x50 DIN 931	791172
46	Poignée bakélite 36 mm	79118200
47	Fixation	79127000
48	Pivot Ø6x32mm	791868
50	intermédiaire de grille	44211200
51	Panneau latéral, partie supérieure	44211300
52	Panneau arrière, partie supérieure	44203921
53	Panneau arrière intérieur, partie supérieure	44211521
54	Haut, à l'intérieur - partie supérieure	44211621
55	Haut - partie supérieure	44200721

Pos. No.	Parts	SKU no.
56	Couverture, - partie supérieure	44211800
57	Porte d'acces, partie supérieure	44211921
58	boulon - Ø5 360 mm	542146
59	Écrou, M6 DIN 934	735006
62	Rondelle, 06 mm DIN 9021 fzb	791891
63	Brique, base	79209200
64	Déflecteur - acier inoxydable	71209061
65	isolation	79077100
66	Vis M6x08 DIN 933 A2	74160804
67	Raccord pour couvercle avec filetage	44256700
68	Vis M6x30 DIN 7991	74241900
69	Collier de cheminée	44145921
70	Raccord sans filetage	44256800
71	Écran anti-rayonnement - Avant	71209161
72	Raccord pour poignée	75140161
73	Vis 3,5x13 DIN 7981 fzb	79183600
77	Joint pour verre	79074200
78	Vis M6x16 buttonhead A2	73861300
80	Vis M6x30 DIN 933	731630
81	Tube d'éloignement Ø10x1 L=20mm	542635
82	Plaque arrière pour convection	54201221
83	Écran de protection radiant- arrière	54202921
84	Vis M6x60 DIN 933	731645
86	Poignée bakélite 72 mm	9118300
90	Écrou M6 Verbus Ribb - BN2798-HFC851	735306
91	Rondelle, 06 mm 6.5x16x1 fzb DIN 522-A	766106

Enregistrement de la garantie du produit

CERTIFICAT DE GARANTIE 10 ANS MORSØ

Chaque produit Morsø est le résultat de plus de 160 années d'expérience de la conception et de la fabrication des poêles à bois. Le contrôle de la qualité a toujours été la clé de voûte de notre processus de production. Des mesures rigoureuses ont été mises en place à chaque étape clé. Par conséquent, lorsqu'un poêle est fourni par un revendeur Morsø agréé, Morsø offre une garantie de dix ans contre tous les défauts de fabrication sur tous les principaux composants extérieurs de ses poêles.

Pour en savoir plus sur la «garantie de 10 ans Morsø / carte d'enregistrement de produit» et enregistrer votre nouveau poêle Morsø en ligne, allez sur le site: http://international.morsoe.com/warranty-registration

IMPORTANT!

Comment chauffer en toute sécurité pour l'environnement et pour vous-même!

- **Utiliser uniquement du bois sec**
  Utiliser uniquement du bois sec (teneur en humidité max. de 20%) et non traité. Le combustible doit être coupé en deux et faire de 8 à 12 cm d'épaisseur.

- **Allumer**
  Allumer avec du bois d'allumage sec (utiliser 1 - 2 kg). Laisser la porte entrouverte et rester à proximité du poêle pendant la phase d'allumage.

- **Obtenir une bonne couche de braises**
  S'assurer d'avoir une bonne couche de braises avant d'alimenter le feu. Le bois doit s'allumer en 2 minutes. Si les bûches ne s'allument pas, dans des circonstances extrêmes, cela peut provoquer l'allumage des gaz de combustion, ce qui présente un risque de dommages matériels et de préjudices corporels.

- **Alimenter le feu**
  Pour alimenter le feu, utiliser 2 ou 3 morceaux de bois (pas plus de 2 - 2,5 kg).

- **Garantir une ventilation adéquate**
  C'est-à-dire des flammes claires et jaunes.

- **Ne jamais laisser brûler toute la nuit**

By appointment to The Royal Danish Court

morsø

Morsø Jernstøberi A/S 24-06-2021- 72208500

MORSØ JERNSTØBERI A/S . DK-7900 NYKØBING MORS
E-Mail: stoves@morsoe.com · Website: www.morsoe.com

Annex 32

Title: Sample analysis data

Pages total: 5, excl this cover page

Sample analysis, HF1 (#1), 2. September 2020

Sample analysis, test run #1				
Filter series:	(1-4)	1		
Gasket series:	(1-4)	1		
Probe series:	(A-B-C)	C		
	PRIOR (mg)		**FINAL (mg)**	
Main train probe	121224,4		121224,9	Main train
Filters 1+2	341,1		343,2	
Gaskets 1+2	4897,7		4899,4	
Split train probe 1H	120717,1		120717,1	Split train, 1. hour
Filters 3+4	176,8		179,1	
Gaskets 3+4	4910,3		4911,3	
Split train probe remaining	121051,9		121051,9	Split train, remaining time
Filters 5+6	175,8		176,7	
Gaskets 5+6	4954,1		4954,7	
Room probe	-		-	Room blanc
Filter 7	167,5		167,2	
Gasket 7	2483,5		2483,8	

Gasmeter	Main train (nl)	Split train (nl)
Start of test	8508,94	8429,27
At the first hour		8856,90
End of test	9229,65	9155,42

Sample analysis, LF (#2), 2. September 2020

Sample analysis, test run #2				
Filter series:	(1-4)	2		
Gasket series:	(1-4)	2		
Probe series:	(A-B-C)	A		
	PRIOR (mg)		**FINAL (mg)**	
Main probe	119806,5		119806,5	Main train
Filter 1+2	174,8		173,6	
Gasket 1+2	4907,4		4909,4	
Split probe 1H	120122,8		120122,8	Split train, 1. hour
Filter 3+4	184,5		184,3	
Gasket 3+4	4886,6		4887,4	
Split probe remaining	120595,1		120595,1	Split train, remaining time
Filter 5+6	178,3		176,6	
Gasket 5+6	4917,6		4919,5	
Room probe	-		-	Room blanc
Filter 7	167,1		166,6	
Gasket 7	2473,0		2473,6	

Gasmeter	Main train (nl)	Split train (nl)
Start of test	9229,65	9155,42
At the first hour		9577,91
End of test	11475,63	11401,02

Sample analysis, HF2 (#3), 3. September 2020

Sample analysis, test run #3				
Filter series:	(1-4)	3		
Gasket series:	(1-4)	3		
Probe series:	(A-B-C)	B		
	PRIOR (mg)		**FINAL (mg)**	
Main probe	120160,9		120161,2	Main train
Filter 1+2	168,8		170,5	
Gasket 1+2	4899,0		4899,9	
Split probe 1H	120027,1		120027,6	Split train, 1. hour
Filter 3+4	167,9		168,9	
Gasket 3+4	4896,8		4897,6	
Split probe remaining	120684,6		120685,0	Split train, remaining time
Filter 5+6	168,0		168,3	
Gasket 5+6	4969,3		4969,6	
Room probe	-		-	Room blanc
Filter 7	162,8		162,2	
Gasket 7	2457,6		2458,2	

Gasmeter	Main train (nl)	Split train (nl)
Start of test	11475,63	11401,02
At the first hour		11828,32
End of test	12123,53	12048,91

Sample analysis, MF (#4), 3. September 2020

Sample analysis, test run #4				
Filter series:	(1-4)	4		
Gasket series:	(1-4)	1		
Probe series:	(A-B-C)	A		
	PRIOR (mg)		**FINAL (mg)**	
Main probe	119806,3		119806,3	Main train
Filter 1+2	169,3		170,0	
Gasket 1+2	4897,7		4898,2	
Split probe 1H	120122,7		120123,0	Split train, 1. hour
Filter 3+4	168,1		168,9	
Gasket 3+4	4910,2		4910,4	
Split probe remaining	120595,1		120595,1	Split train, remaining time
Filter 5+6	168,1		168,0	
Gasket 5+6	4954,0		4954,2	
Room probe	-		-	Room blanc
Filter 7	167,3		166,9	
Gasket 7	2483,5		2483,9	

Gasmeter	Main train (nl)	Split train (nl)
Start of test	12123,53	12048,91
At the first hour		12471,65
End of test	13547,26	13472,71

Sample analysis, HF3 (#5), 4. September 2020

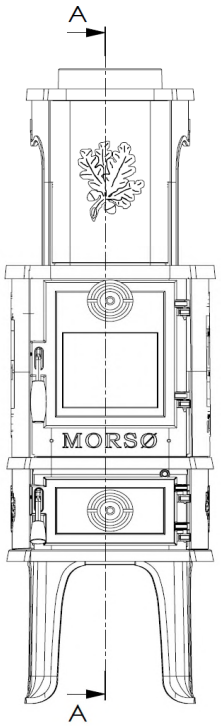
Sample analysis, test run #5				
Filter series:	(1-4)	1		
Gasket series:	(1-4)	1		
Probe series:	(A-B-C)	C		
	PRIOR (mg)		**FINAL (mg)**	
Main probe	121224,9		121224,9	Main train
Filter 1+2	166,9		167,9	
Gasket 1+2	4898,0		4898,8	
Split probe 1H	120717,3		120717,3	Split train, 1. hour
Filter 3+4	158,0		159,4	
Gasket 3+4	4910,5		4910,4	
Split probe remaining	121052,3		121052,3	Split train, remaining time
Filter 5+6	159,2		159,7	
Gasket 5+6	4954,2		4954,2	
Room probe	-		-	Room blanc
Filter 7	163,0		162,8	
Gasket 7	2483,5		2483,6	

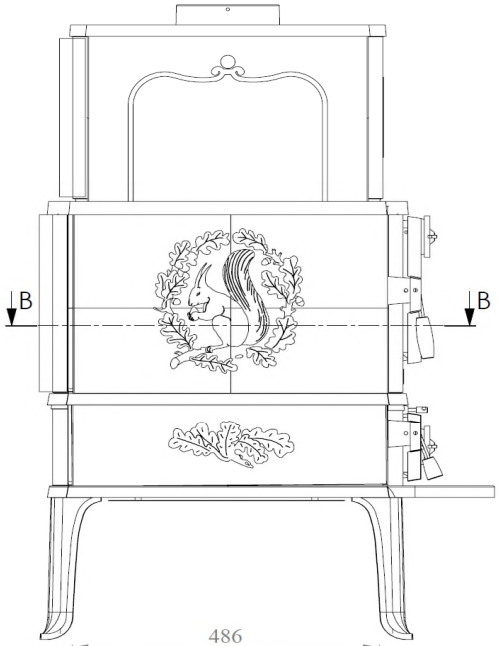
Gasmeter	Main train (nl)	Split train (nl)
Start of test	13571,7	13496,95
At the first hour		13924,52
End of test	14181,64	14107,45

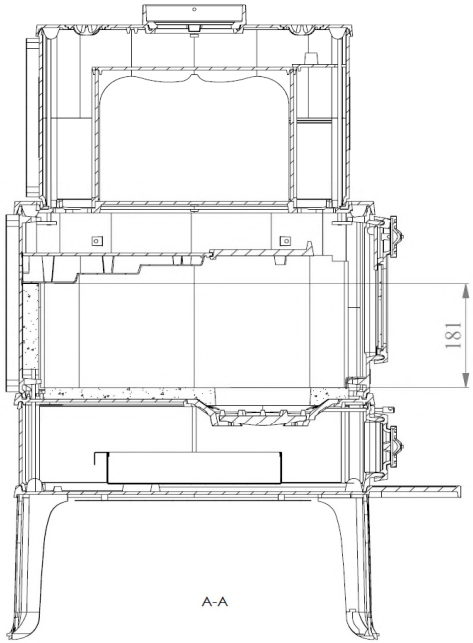
Annex 33

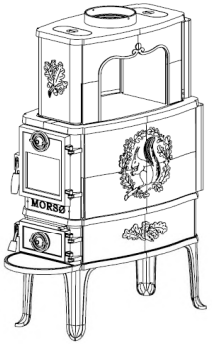
Title: Firebox drawing with volume indication

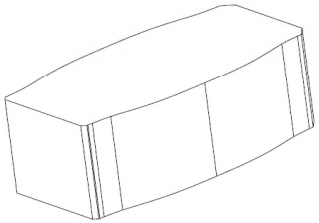
Pages total: 1, excl this cover page

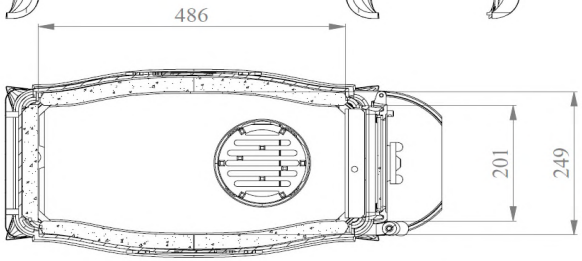












Firebox Volume

0.019431 m³
0.686199 ft³

(Solidworks CAD Calculation)

Firebox width : side insulation stone to side insulation stone
Firebox height : Hearth to top end of back insulation stone
Firebox depth : back insulation stone to front door frame

Annex 34

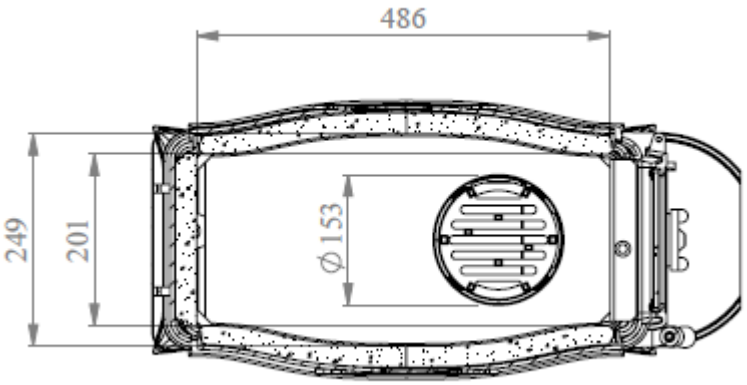
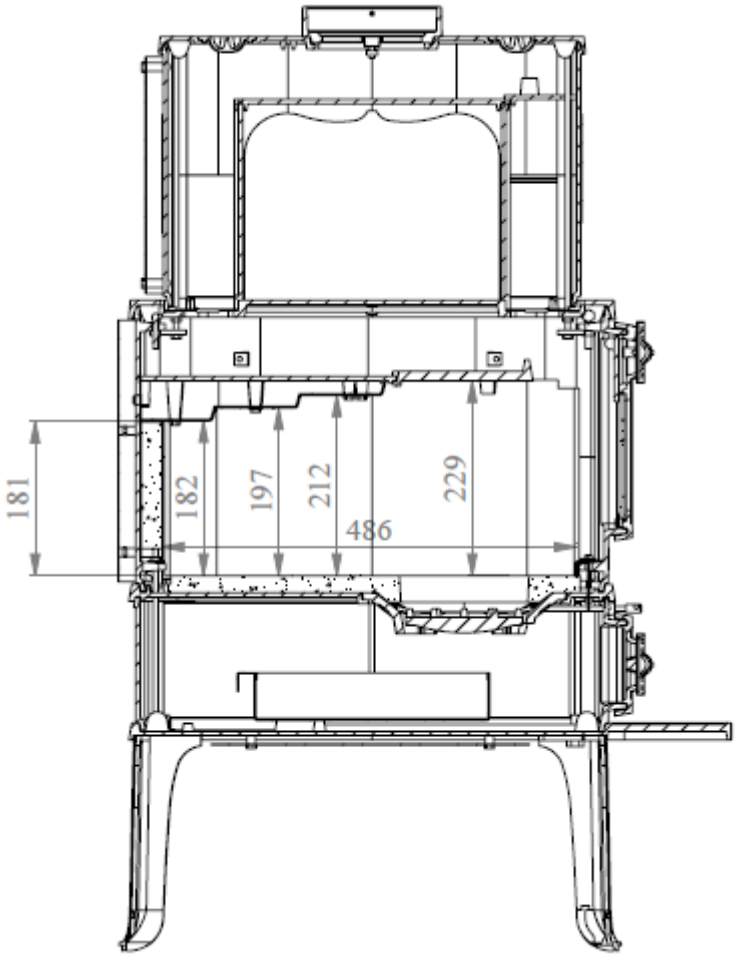
Title: Quality Assurance Plan, Morsø 2B Classic 2020
(revised June 2021 release)

Pages total: 10, excl this cover page

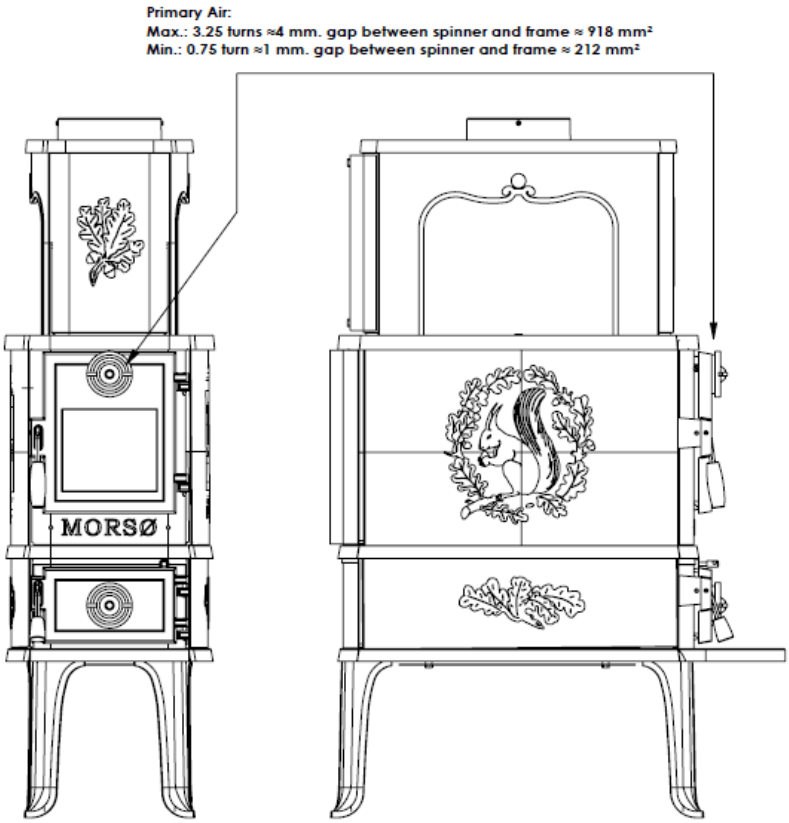
Quality Assurance Plan 2B Classic 2020

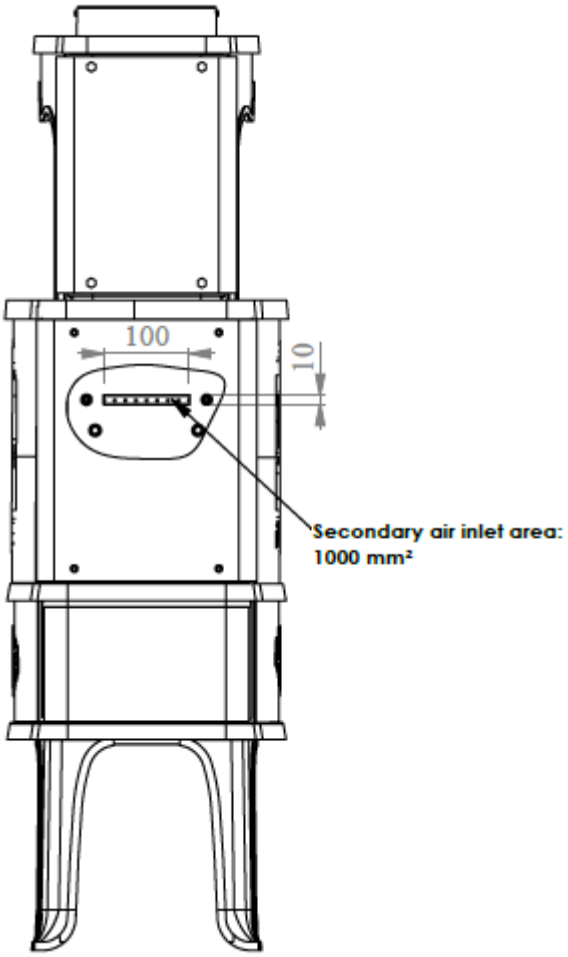
Product:	Morsø 2B Classic 2020 woodstove
Description and information:	Quality Assurance Plan is a plan for assuring the quality for products, tested according to NSPS by taking measurements and checks of some key components, referred to as K-list components. For the Morsø 2B Classic 2020 woodstove the K-list components include: (i) Firebox: Dimensions. (ii) Air introduction systems: Cross-sectional area of restrictive air inlets and outlets, location, and method of control. (iii) Baffles: Dimensions and locations. (iv) Refractory/insulation: Dimensions and location. ~~(v) Catalyst: Dimensions and location;~~ N/A ~~(vi) Catalyst bypass mechanism and catalyst bypass gap tolerances (when bypass mechanism is in closed position): Dimensions, cross-sectional area, and location;~~ N/A (vii) Flue gas exit: Dimensions and location. (viii) Door and catalyst bypass gaskets: Dimensions and fit. (ix) Outer thermal shielding and thermal coverings: Dimensions and location. ~~(x) Fuel feed system: For wood heaters that are designed primarily to burn pellet fuel or wood chips and other wood heaters equipped with a fuel feed system, the fuel feed rate, auger motor design and power rating, and the angle of the auger to the firebox; and~~ N/A ~~(xi) Forced-air combustion system: For wood heaters so equipped, the location and horsepower of blower motors and the fan blade size.~~ N/A
Procedure:	For each K-list component measurements will be taken according to an attached drawing, where dimensions are outlined. For (viii) the gaskets will controlled that they are from the right supplier and have the correct size according to inventory list.
Tools needed:	Rulers/measuring tapes and caliper rule. All measurements in millimeters.
Quality check frequency	Minimum once per production run or once every 100 stoves, whichever is less.

(i) Firebox: Dimensions

Register measurement of • Maximum and minimum width of firebox • Maximum depth of firebox hearth • Dimension of ash grate	**Section view through top** 
Register measurement of • Height of side brick lining • Height of back brick lining • Height measured from hearth to lowest point of the three-step, tiered hollow baffle • Maximum depth of firebox, rear brick to front frame shield	**Section view through side** 

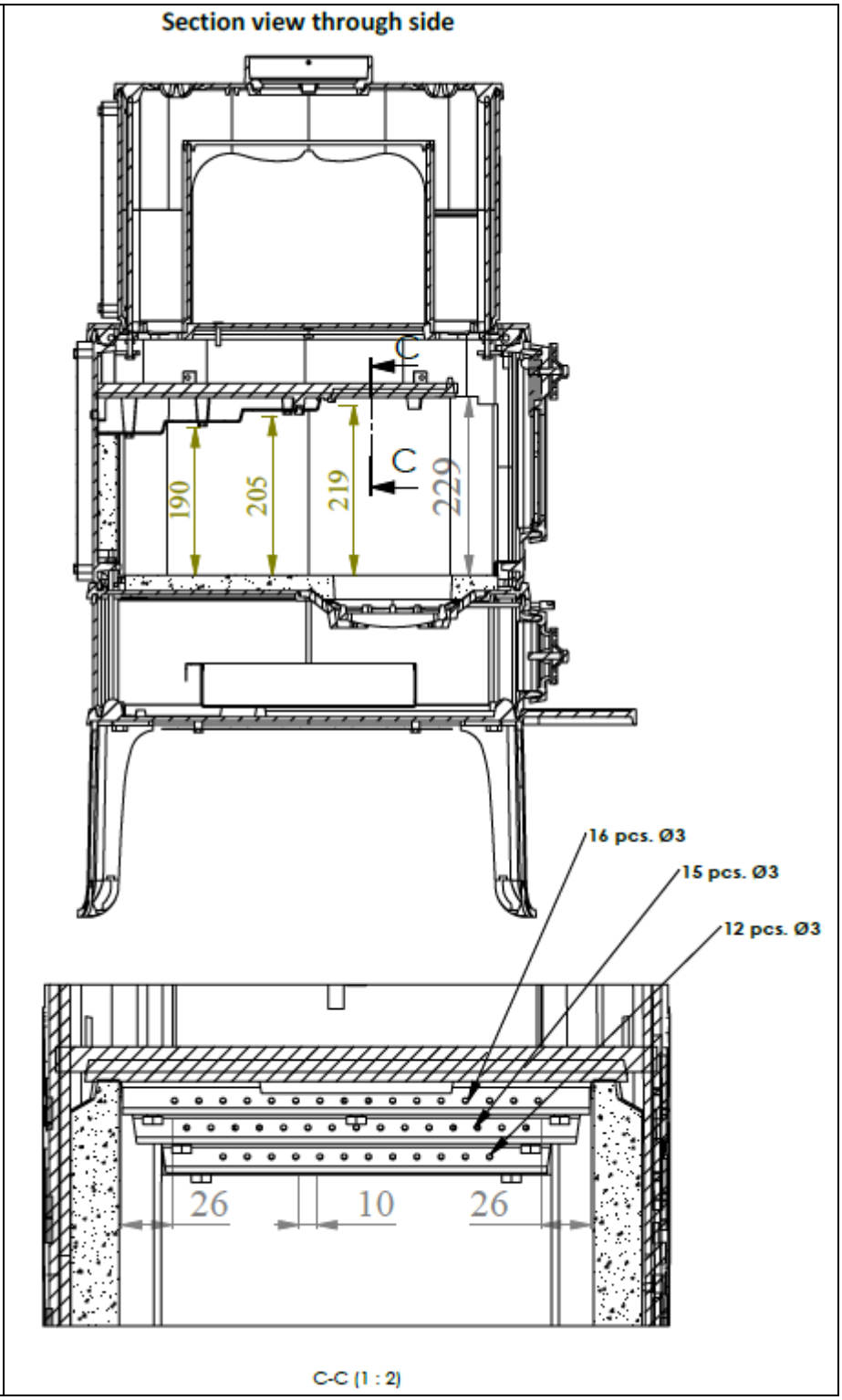
(ii) Air introduction systems: Cross-sectional area of restrictive air inlets and outlets, location and method of control

Register measurement of • Maximum primary air inlet 3.25 turns ≈ 4 mm. gap between spinner and frame (≈ 918 mm²) • Minimum primary air inlet 0.75 turn ≈ 1mm. gap between spinner and frame (≈ 212 mm²)	

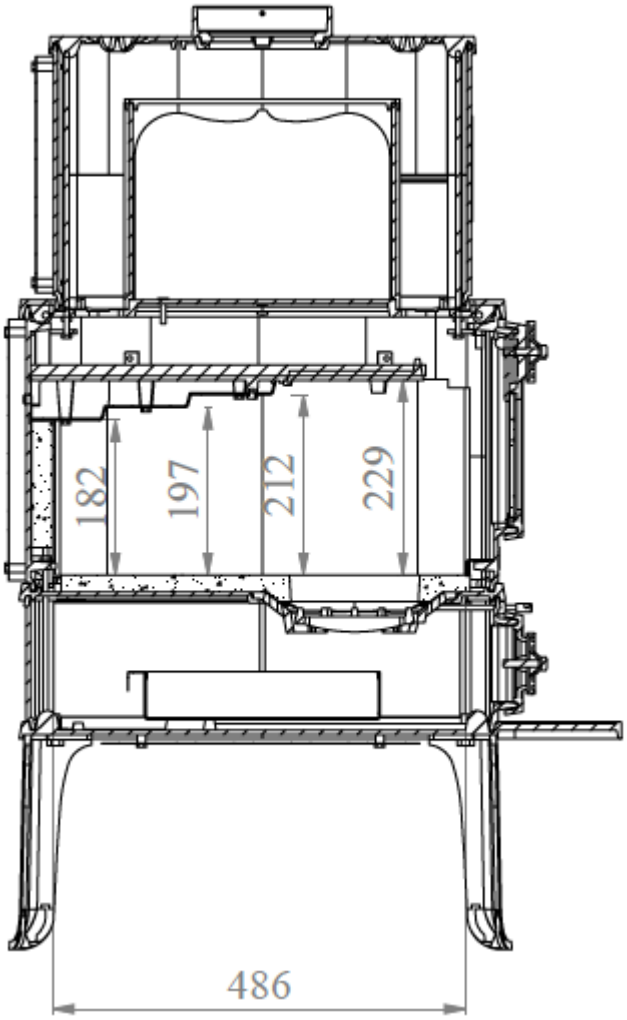
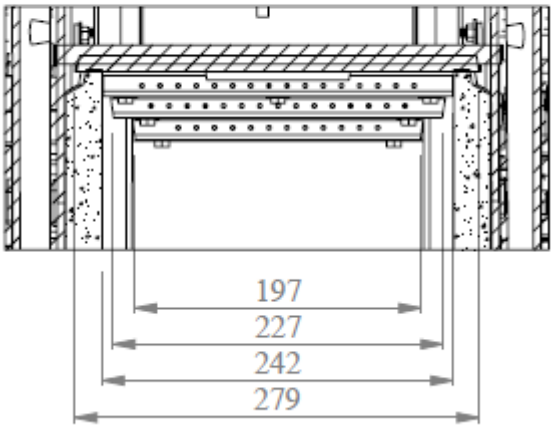
Register measurement of • Secondary air inlet area. Fixed. Rectangular 10 x 100 mm hole	**Broken-out section view** 

Register measurement of

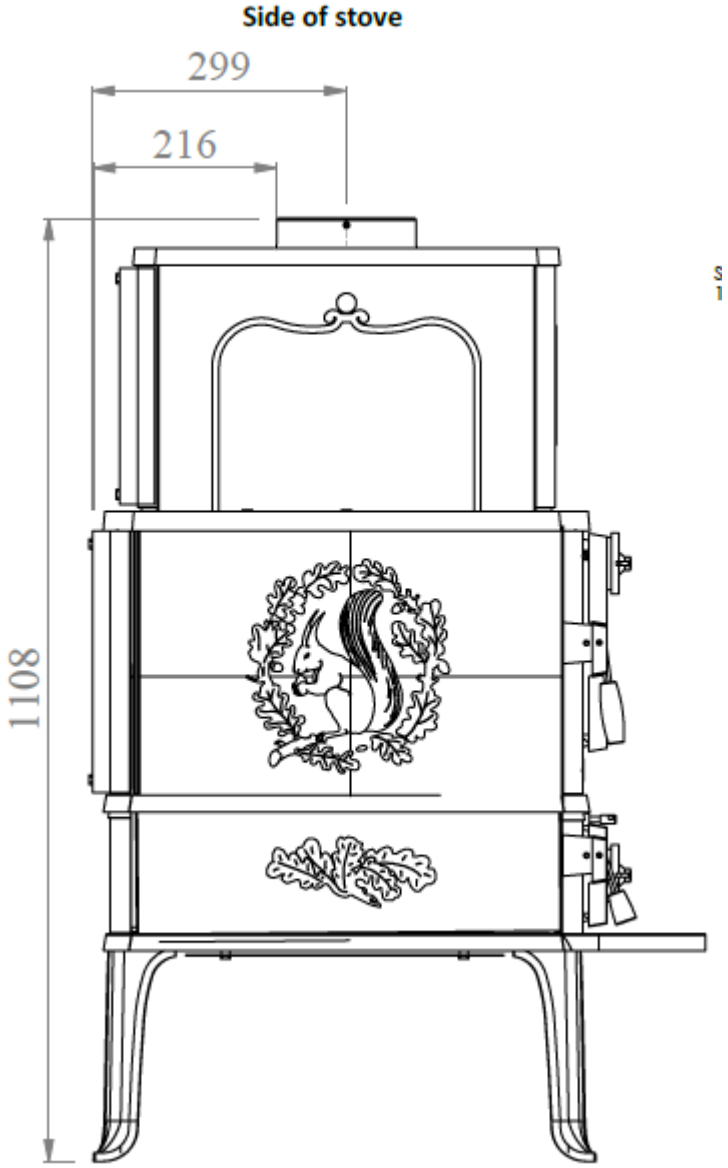
- Secondary air supplying baffle Location and number of nozzles holes

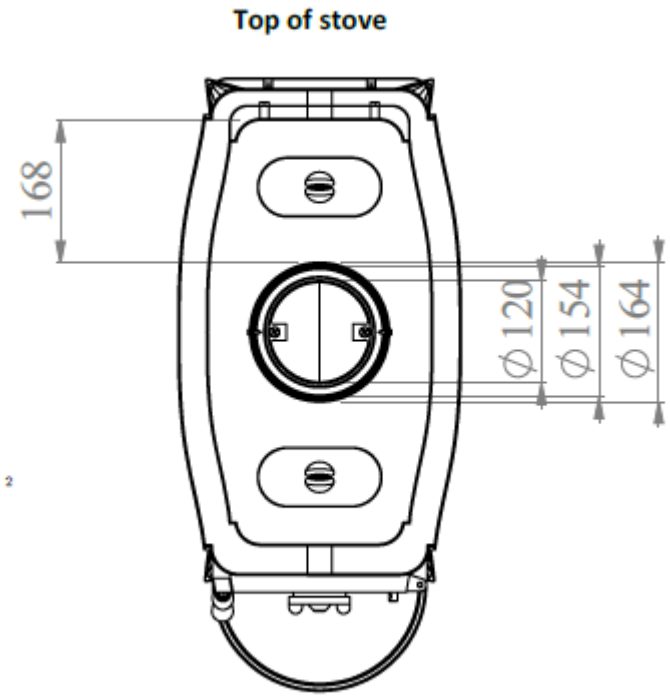


(iii) Baffles: Dimensions and locations

Register measurement of • Horizontal length of baffle • Vertical location height(s) of baffle measured from hearth	**Section view through side** 
Register measurement of • Width(s) of baffle	**SECTION VIEW THROUGH FRONT OF STOVE** 

(vii) Flue gas exit: Dimensions and location

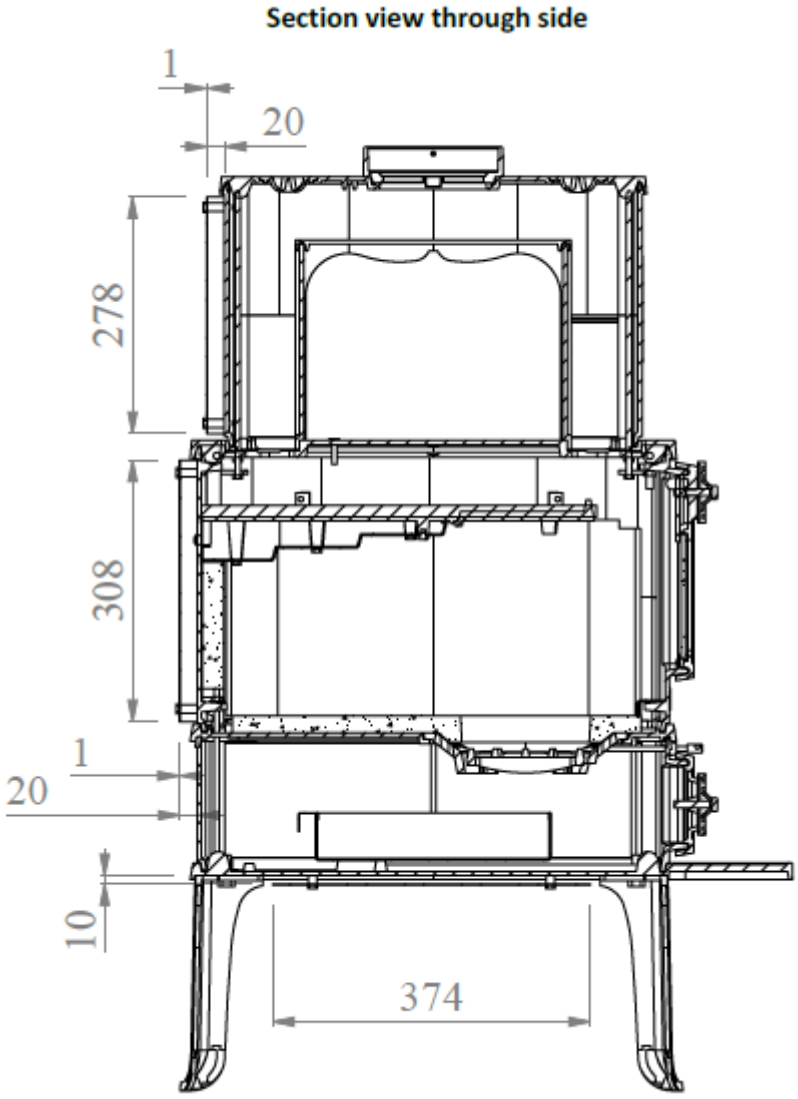
Register measurement of • Location of spigot	

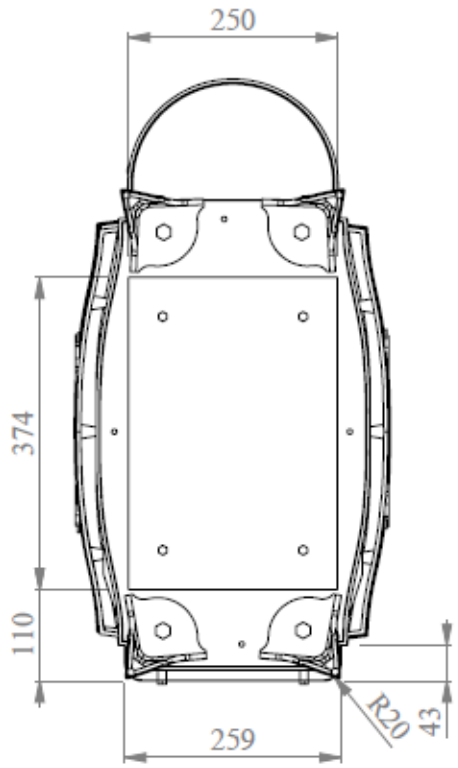
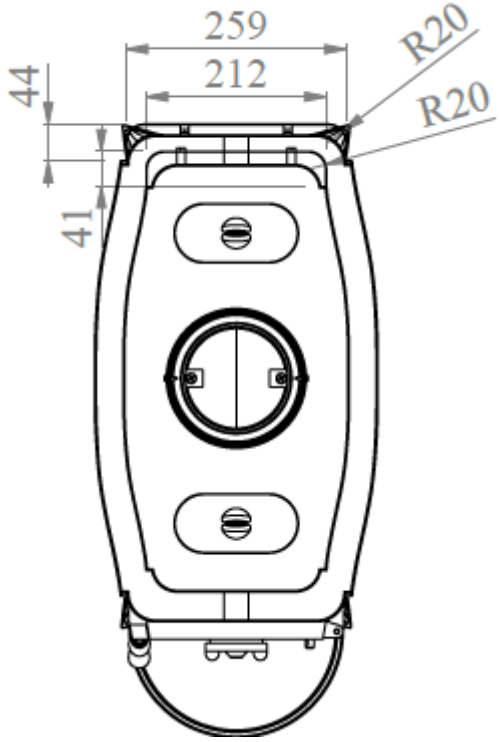
Register measurement of • Horizontal location of spigot • Measurement of flue outlet diameter, Ø164 (outer), Ø154 (inner), Ø120 (passage)	

(viii) Door and catalyst bypass gaskets: Dimensions and fit

Register that the used gaskets robes are correct sized and of same fabric according to the inventory list. No measurements. The Gasket robe are bought from external supplier with own quality control.

(ix) Outer thermal shielding and thermal coverings: Dimensions and location

Register measurement of • Lengths of radiation shields • Distances from radiation shield to stove • Thickness of shields	

Register measurement of • Width of radiation shields	**BOTTOM VIEW**  **Top View** 

Annex 35

Title: Lab hand notes 2. Sept, 3. Sept, and 4. September

Pages total: 8, excl this cover page

HF + LF 2/9

Test run summary, Cordwood test ..... Test_____, Date 2/9

Time	Event
* 12:19:15	Ignition of the Cold Start part test using the gas touch for ___ minute. The air valve is set in position _____ (ignition). 100 % DS 0,604 kg kindling and 0,913 kg start-up fuel is added 19,7 %DS 16,5 % wb
12 20 00 / 12 24 40	Ignition is over, the door is closed. at scale 1,52 kg of 45 sec | of 12:24:40
12:47:05 ~~12:47:50~~	End of Kindling+Start-up at 550 g, ~~taring~~ of the platform scale to ~~1,520~~ g, evening out of the embers
* 12:47:10	Loading of HF fuel load using in total 3,155 kg firewood at moisture content 16,0 % wb or 19,1 % Dry Basis
12:47:50	End of loading time at 40 seconds
	Door action Closed right away
	Valve action Manifold fully open 3/4 under.
	The air valve adjusted to position _____ being the maximum combustion air supply
12 59 41 13 10	Any observations Skuffen skubbet tilbage i lod. Knæk-ovnen er ved at gå ud. Tyk vægt 3 vejninger + CO_2 + EPA kanal
13:19:15	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 8941885 nl ~~(Bergen)~~
14 00 40 30	End of the High Fire test at 850 g, taring of the platform scale to _____ g and evening out of the embers. #The air valve is reset to position _____ (ignition)
* 14:06:00 ~~14:47:05~~	The LF/MF fuel load of in total 3,840 kg is entered at 0,1675 kg Moisture content 16,3 %wb or 19,5 % Dry Basis
1406:50 ~~14:47:50~~	End of loading time after ~~95~~ 50 seconds Fik travlt lidt sent ved pumpen maintained Track 905
	The air valve is ~~adjusted~~ to the 100 % op position Gradually down
14 15 35	At _____ kg corresponding to 15 % of the test load mass has been combusted, the air valve is set to its final position, 3/4 ab ..... -OR- The air valve is set right away to its final position_____ (dash out the option not chosen)
	Any observations
15 06 ~~30~~ 20	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 9577,91 nl
* 19:19:48	The Low/Medium Fire test is done at platform scale reading 0 kg Track v. ovnen 0,675
15 30 15:45	Any remarks or anomalies Ildemærke ved ved ca 1,4 kg på vægten De sidste flammer er væk ved 1,25 kg på vægten 575

Logger file 02-09-2020_084310 + LF på 2020-09-02_1401-25

13 50 45 Filter Clog - Change out with new pair

13 53 50 Up running again . Extra filter + 167,0 mg

Notater til EPA Test:

RUM FUGT BAROMFST

HF prøve 2/9 START 40 % RH 1018 HPa

SLUT 38 % 1015

Dato: 2/9

Prøve nr.: HF

Teak 0,08 m/s 0,05 c begyndelse midtvejs

DOP Filnavn: 2020-09-02_08-43-07

Kanal hastighed [pd]:	Start sys tid: 01.00.00	Stop Sys tid: 01.04.00

Traversering, aflæs Pd på håndholdt differenstrykmåler

Navn	12,7mm	37,5 mm	75 mm	112,5 mm	137,3 mm
Diameter-1	21,3	23,3	31,9	25,9	18,2
Diameter-2	25,6	32,6	32,3	28,9	20,9

Fra DOP: Pd= 30,8 Ps= 48,8 Temp= 24,3 (TEMP. KANAL)

Gasmålere:			
Navn	Start [Nl]	Skift [Nl]	Slut [Nl]
Gasmåler Hel	8508,94	-	9229,65
Gasmåler Delt	8429,27	8856,90	9155,42

Filter serie:	1-4	1
Gasket serie:	1-2-3	1
Sonde serie:	A-B-C	C

Tryk (hel) aflæst	4,4	mBar
Tryk (delt) aflæst	4,3	mBar
Flow Room Blanc	7,2	l/min

Navn:	Før	Lige efter	Efter	
Sonde Hel	1212244	1212247	1212249	Main train
Filter 1+2 (4,3)	167+174,1 ~~175,1~~	176,7+166,7	176,4+166,8	
Gasket 1+2	4897,7	4899,4	4899,4	
Sonde Delt-1	120717,1	120718,1	~~120716,9~~	120717,1 Sec train 1. hour
Filter 3+4	176,8	179,2	179,1 ~~178,1~~	
Gasket 3+4	4910,3	4911,5	4911,3	
Sonde Delt-2	1210519	1210526	1210519	Sec train remaining time
Filter 5+6	175,8	176,8	176,7	
Gasket 5+6	4954,1	4955,0	4954,7	
Filter 7	167,5	167,2	167,2	Room blanc
Gasket 7	2483,5	2484,0	2483,8	

Action:	Kl.	Bem.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Notater til EPA Test:

Dato:

Prøve nr.:

LF 2/9

	START	SLUT
Amb	24,4	24,5
RH	38	37
Bunch	101,5	101,3
Trach	0,05	0,07
FG temp	208	33

DOP Filnavn:

Kanal hastighed [pd]: Start sys tid: _____ Stop Sys tid: _____					
Traversering, aflæs Pd på håndholdt differenstrykmåler					
Navn	12,7mm	37,5 mm	75 mm	112,5 mm	137,3 mm
Diameter-1					
Diameter-2					

Fra DOP: Pd= _____ Ps= _____ Temp= _____

Gasmålere:			
Navn	Start [Nl]	Skift [Nl]	Slut [Nl]
Gasmåler Hel	9229,65	-	11475,63
Gasmåler Delt	9155,42	9577,91	11401,02

Filter serie:	1-4	2
Gasket serie:	1-2-3	2
Sonde serie:	A-B-C	A

Tryk (hel) aflæst	4,4	mBar
Tryk (delt) aflæst	4,3	mBar
Flow Room Blanc	7,2	l/min

Navn:	Før	Lige efter	Efter	
Sonde Hel	119806,5	119806,6	119806,4	119806,5 NEGATIVE → RESET
Filter 1+2	174,8	173,3	173,6	Main train
Gasket 1+2	4907,4	4909,5	4909,4	
Sonde Delt-1	120122,8	120123,1	120123,2	22,8
Filter 3+4	184,5	184,2	184,3	Sec train 1. hour
Gasket 3+4	4886,6	4887,5	4887,4	
Sonde Delt-2	120595,1	120595,3	120595,2	94,8 NEGATIVE → RESET
Filter 5+6	178,3	176,5	176,6	Sec train
Gasket 5+6	4917,6	4919,7	4919,5	remaining time
Filter 7	167,1	166,6	166,6	Room blanc
Gasket 7	2473,0	2473,7	2473,6	

Action:	Kl.	Bem.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

HF og MF 3/9

Test run summary, Cordwood test ..... Test_____, Date_____

Time	Event
113400	Ignition of the Cold Start part test using the gas touch for 1 minute. The air valve is set in position 100% (ignition). 3¼ omdr. 0,603 kg kindling and 0,817 kg start-up fuel is added 19,7 % DB
113945	Ignition is over, the door is closed. åben 5 ¾ min
115526	End of Kindling+Start-up at 550 g, ~~taring of the platform scale to _____ g~~, evening out of the embers
~~11:55:30~~ 11:55:30	Loading of HF fuel load using in total 3,190 kg firewood at moisture content 16,2 % wb 19,3% total mass (wg
115625	End of loading time at 55 seconds
120125	Door action åben før 5 minuts
	Valve action Fixed at 100% op = 3 ¼ omdr
	The air valve adjusted to position _____ being the maximum combustion air supply
	Any observations Ovnen brænder meget bedre end igår Røgtemp stabiliseret sig på 180°C
123400	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 11828,32 nl
130451	End of the High Fire test at 350 g, ~~taring of the platform scale to _____ g~~ and evening out of the embers. #The air valve is ~~reset to position~~ 100% (ignition) open
13:14:40	The LF/MF fuel load of in total 3,736 kg is entered at 0,675 kg Moisture content 16,3 %wb → 19,4 % ~~DB~~ DB
131525	End of loading time after 45 seconds
	The air valve is adjusted to the_____ position _____
13:19:30	At 4,25 kg corresponding to 15 % of the test load mass has been combusted, the air valve is set to its final position, 1,25 omdr. åben The air valve is set right away to its final position (dash out the option not chosen)
	Any observations . Røgtemp MF stabiliseret sig på 140°C
14:14:40	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 12471,65nl
16:38:18	The Low/Medium Fire test is done at platform scale reading kg 0,675 kg
1430	Any remarks or anomalies Ilden begynder at gå ud ved hver dør på 600 g tilbage til start Ned på 5 g/min efter at ilden er gået ud.

Logger file 2020-09-03_08-30-28

Notater til EPA Test:

Dato:

Prøve nr.:

HF 3/9

Rum 23,8 → 24,6

	Træk	Barom.	RH %
11:30	9,04	1013	40
16:30		1011	41 %
MIDDAG	9,02		
slut LF	0,03		

DOP Filnavn:

Kanal hastighed [pd]: Start sys tid: 0250:00 Stop Sys tid: 0253:00

Traversering, aflæs Pd på håndholdt differenstrykmåler

Navn	12,7mm	37,5 mm	75 mm	112,5 mm	137,3 mm
Diameter-1	24.9	30.8	33.2	29.6	23.3
Diameter-2	20.5	22.5	32,7	27.3	22.5

Fra DOP: Pd= 31,5 Ps= 48,4 Temp= 26,5

Gasmålere:

Navn	Start [Nl]	Skift [Nl]	Slut [Nl]
Gasmåler Hel	11475,63	-	12123,53
Gasmåler Delt	11401,02	11828,32	12048,91

Filter serie:	1-4	3
Gasket serie:	1-2-3	3
Sonde serie:	A-B-C	B

Tryk (hel) aflæst	4,4	mBar
Tryk (delt) aflæst	4,3	mBar
Flow Room Blanc	17,2	l/min

Navn:	Før	Lige efter	Efter	
Sonde Hel	120160,9	120161,3	120161,82	Main train
Filter 1+2	168,8	169,9	170,5 169,9	
Gasket 1+2	4899,0	4899,6	4899,9	
Sonde Delt-1	120027,1	120026,7	120027,6	Sec train 1. hour
Filter 3+4	167,9	17 168,8	168,9	
Gasket 3+4	4896,8	4897,6	4897,6	
Sonde Delt-2	120684,6	120684,8	120685,0	Sec train remaining time
Filter 5+6	168,0	168,3	168,3	
Gasket 5+6	4969,3	4969,6	4969,6	
Filter 7	162,8	162,2	162,2	Room blanc
Gasket 7	2457,6	2458,3	2458,2	

Action:	Kl.	Bem.
1		
2		
3		
4	RR	2,053 kg/h
5	EMi	1,875 g/h
6	EMi 1H	1,97 g/h
7		
8		
9		
10		

HF Net Fuel Calculation

Notater til EPA Test:

MF 3/9

Dato:

Prøve nr.:

DOP Filnavn:

Kanal hastighed [pd]:	Start sys tid: _____	Stop Sys tid: _____		
Traversering, aflæs Pd på håndholdt differenstrykmåler				
Navn	12,7mm	37,5 mm	75 mm 112,5 mm	137,3 mm
Diameter-1				
Diameter-2				

Fra DOP: Pd= _____ Ps= _____ Temp= _____

Gasmålere:			
Navn	Start [Nl]	Skift [Nl]	Slut [Nl]
Gasmåler Hel	12123,53	-	13547,726
Gasmåler Delt	12048,91	1247,165	13432,971

* ovf fra HF d. 4/9

Filter serie:	1-4	4
Gasket serie:	1-2-3	1
Sonde serie:	A-B-C	A

Tryk (hel) aflæst	4,3	mBar
Tryk (delt) aflæst	4,2	mBar
Flow Room Blanc	7,2	l/min

Navn:	Før	Lige efter	Efter	
Sonde Hel	119806,3	119806,9	119806,93	Main train
Filter 1+2	169,3	170,0	170,0 169,1	
Gasket 1+2	4897,7	4898,2	4898,2	
Sonde Delt-1	120122,7	120122,9	120123,0	Sec train 1. hour
Filter 3+4	168,1	168,9	168,9	
Gasket 3+4	4910,2	4910,3	4910,4	
				NEGATIVE → RESET
Sonde Delt-2	120595,1	120595,4	120595,0	120595,1
Filter 5+6	168,1	168,1	168,0	Sec train
Gasket 5+6	4954,0	4954,3	4954,2	remaining time
Filter 7	167,3	166,9	166,9	Room blanc
Gasket 7	2483,5	2484,0	2483,9	

Action:	Kl.	Bem.
1		
2		
3		
4	EA	0,892 kg/h
5	EMI	0,332 g/h
6	EMI 1H	1,3112 g/h
7		
8		
9		
10		

HF 4/9

Test run summary, Cordwood test ..... Test_____, Date_____

Time	Event
* 10:05:58	Ignition of the Cold Start part test using the gas touch for 55 sec minute. The air valve is set in position 100 % cP (ignition). 0,605 kg kindling and 0,909 kg start-up fuel is added 19,5 %DB 16,2 %WB
10:11:54	Ignition is over, the door is closed.
10:30:40	End of Kindling+Start-up at 550 g, taring of the platform scale to 550 g, evening out of the embers
* 10:31:00	Loading of HF fuel load using in total 3,183 kg firewood at moisture content 16,1 % wb (19,2 % wef)
10:31:55	End of loading time at 55 seconds
10:36:50	Door action Door open for 5:50 in total
	Valve action kept 100 % open
	The air valve adjusted to position _____ being the maximum combustion air supply
	Any observations HF Fuel Load Total dry mass combusted 3,142 Burn Rate 1,993 kg/h weighted mean 15,22 %
11:05:58	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading 13924,52 l
* 11:32:25	End of the High Fire test at 840 g, ~~taring of the platform scale to _____ g and evening out of the embers.~~ Game #~~The air valve is reset to position _____ (ignition)~~ Over
	The LF/MF fuel load of in total _____ kg is entered Moisture content _____%wb
	End of loading time after _____seconds
	The air valve is adjusted to the_____ position _____
	At _____ kg corresponding to 15 % of the test load mass has been combusted, the air valve is set to its final position, _____ ..... -OR- The air valve is set right away to its final position_____ (dash out the option not chosen)
	Any observations
	Change of the filter holder arrangement in the split extraction train at the hour at gas meter reading _____ nl
	The Low/Medium Fire test is done at platform scale reading 0 kg
	Any remarks or anomalies

Logger file 2020-09-04_09-16-26

Rockmon sidste kørsel om: 0,46 Pa

Notater til EPA Test:

HF 4/9

	TRÆK	BAROMET	FUGT RH
9:45	0,09	1002	44
11:55	0,03	1013	44

Dato:

Prøve nr.:

DOP Filnavn:

Kanal hastighed [pd]: Start sys tid: 002800 Stop Sys tid: 003200

Traversering, aflæs Pd på håndholdt differenstrykmåler

Navn	12,7mm	37,5 mm	75 mm	112,5 mm	137,3 mm
Diameter-1	22.3	25.1	29.8	29.3	19.9
Diameter-2	18.7	20.8	30.0	29.4	18.9

Fra DOP: Pd= ~~28,8~~ Ps= 44,9 Temp= 27,4 Kanal flow: 7,1 m/s

Gasmålere:

Navn	Start [Nl]	Skift [Nl]	Slut [Nl]
Gasmåler Hel	13571,70	-	14181,64
Gasmåler Delt	13496,95	13924,52	14107,45
		13924.52	

Filter serie:	1-4	1
Gasket serie:	1-2-3	1
Sonde serie:	A-B-C	C

Tryk (hel) aflæst	4,4	mBar
Tryk (delt) aflæst	4,5	mBar
Flow Room Blanc	7,2	l/min

Navn:	Før	Lige efter	Efter	
Sonde Hel	121224,9	121224,7	~~121224,5~~	NEGATIVE → RESET 121224,9 Main train
Filter 1+2	166,9	167,9	167,9	
Gasket 1+2	4898,0	4899,1	4898,8	
Sonde Delt-1	120717,3	120717,2	~~120716,8~~	NEGATIVE → RESET 120717,3 Sec train 1. hour
Filter 3+4	158,8	159,4	159,4	
Gasket 3+4	4910,5	4910,7	4910,4	
Sonde Delt-2	121052,3	121052,2	~~121052,0~~	NEGATIVE → RESET 121052,3 Sec train remaining time
Filter 5+6	159,2	159,6	159,7	
Gasket 5+6	4954,2	4954,5	4954,2	
Filter 7	163,0	162,8	162,8	Room blanc
Gasket 7	2483,5	2483,7	2483,6	

Action:	Kl.	Bem.
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

HF Net Fuel Cal.