

Appendix 6 Declaration on emissions of formaldehyde

Applies to all wood-based panels/boards used in the production of Nordic Swan Ecolabelled buildings either as (building) panels/boards, boards in floors or boards in fittings. Panels that are not solely marketed as façade panels are exempted.

Product name, Denmark MDF 800++	
Product name, Finland MDF 800++	
Product name, Iceland MDF 800++	
Product name, Norway MDF 800++	
Product name, Sweden MDF 800++	
Manufacturer Sonae Arauco Deutschland ,Radinkendorfer Straße 71 , 15848 Beeskow , Germany	
Product description MDF DEEP ROUTERI / MDF 800++ 12/16/18 mm x 2620 x 2070 mm PEFC certified AB79S* MDF Novolac	<input checked="" type="checkbox"/> Wood based panels/boards <input type="checkbox"/> Boards in floorings <input type="checkbox"/> Boards in doors and fittings <input type="checkbox"/> Mouldings, baseboards and frames

1. Does the wood board/panel contain more than 3% by weight of formaldehyde-based additives?

Yes No

If yes, fill in bullet 2 and then either bullet 3 or 4 below.

2. For laminated panels/boards:

Does the level of free formaldehyde in glue with any hardener (i.e. the final glue compound) exceed 2,000 ppm (0.2% by weight)?

Yes No

If yes, fill in bullet 3 or 4 below.

3. Is the product certified with any of the following certifications?

E1 or M1 for MDF-boards

Yes No

Class M1 for doors resistant to fire according to EN16034 (applies only to tambour doors in Finnish apartment buildings)

Yes No

CARB PHASE II or Indoor Air Comfort GOLD/Indoor Air Comfort for all types of boards?

Yes No

If yes, what certification is held? If no, please, fill in point 4.

CARB 2 Phase 2; E1 (Fraunhofer certification program E[D2020])

4. Does the emission of free formaldehyde exceed the below stated limit, in accordance with the current version of the standard at the time of sampling? Please tick below and attach test results.

EN 717-1:

0.124 mg/m³ air for MDF panels/boards Yes No
 0.07 mg/m³ air for all other types of panels/boards Yes No

ISO 16000-9, M1, Eurofins or equivalent:

0,05 mg/m²/h for MDF-boards Yes No
 0,03 mg/m²/h for all other boards Yes No

ASTM E1333:

0,09 ppm for MDF-boards Yes No
 0,08 ppm for all other boards Yes No

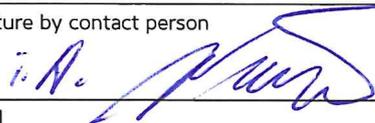
JIS A1460:

0,90 mg/l for MDF-boards Yes No
 0,53 mg/l for all other boards Yes No

ISO 12460-5 alternatively EN 120:

8 mg/100 g dry substance for MDF-boards Yes No
 4 mg/100 g dry substance for all other boards Yes No

Signature of panel/board manufacturer

City and Date Beeskow, 24.06.2020	Company Sonae Arauco Beeskow GmbH
Name of contact person Roland Weidig	Signature by contact person 
Phone +49 (0) 3366 500 225	E-mail roland.weidig@sonaearauco.com

A correct signed declaration can result in the acceptance of use of the construction product in Nordic Swan Ecolabelled buildings. This shall not be mixed up with the Nordic Swan Ecolabelling of the construction product.

Sonae Arauco Beeskow GmbH
Radinkendorfer Straße 71
15848 Beeskow
Germany

Fraunhofer Institute for Wood Research
Wilhelm-Klauditz-Institut WKI

Director
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Your reference

Your message dated

Our reference

Braunschweig,
May 5, 2020

Test Report No. QA - 2020 - 1604

Client:	Sonae Arauco Beeskow GmbH Radinkendorfer Straße 71 15848 Beeskow Germany								
Objective of the test:	Supervision of uncoated wood-based materials according to the Final Regulation Order of Airborne Toxic Control Measure to Reduce Formaldehyde Emission from Composite Wood Products, 93120-93120.12, title 17, California Code of Regulations, § 93120 - Quarterly Chamber Test - Quarter 1 / 2020.								
Product name:	MDF BASIC (AB79T)/MDF ST (AB79B, AB7B9, AB7FB)/MDF SUPERLACK (AB74B)/MDF NOVOLACK (AB79S, AB7PC, AB7FS)/HDF FLOORING (AB75D, AB79D, AB74D)								
WKI-Identity-Number:	4007								
Content of the test report:	<table><tr><td>1. Task</td><td>Page 2</td></tr><tr><td>2. Test material and data of receipt</td><td>Page 3</td></tr><tr><td>3. Execution of the test</td><td>Page 3</td></tr><tr><td>4. Test results</td><td>Page 4</td></tr></table>	1. Task	Page 2	2. Test material and data of receipt	Page 3	3. Execution of the test	Page 3	4. Test results	Page 4
1. Task	Page 2								
2. Test material and data of receipt	Page 3								
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The test report comprises 4 pages and 4 tables. This test report is not permitted to be published incompletely. A publication in extracts is in any case subject to the previous consent of Fraunhofer-Institut für Holzforschung, Wilhelm-Klauditz-Institut WKI, Bienroder Weg 54E in 38108 Braunschweig (Germany). The test results exclusively refer to the objects of the test. The test material was used up.



1. Task

By order of the State of California Air Resource Board (CARB) with reference to the executive order W-18-004 the Fraunhofer-Institut für Holzforschung, Wilhelm-Klauditz-Institut (WKI), was approved as ARB third party certifier to certify uncoated wood based products according to the Final Regulation Order of "Airborne Toxic Control Measure to Reduce Formaldehyde Emission from Composite Wood Products", 93120-93120.12, title 17, California Code of Regulations, § 93120.

Messrs. Sonae Arauco Beeskow GmbH in 15848 Beeskow (Germany) assigned WKI to determine by measurements the formaldehyde emission potential of wood-based panels according to the requirements published by CARB referring to the Final Regulation Order of Airborne Toxic Control Measure to Reduce Formaldehyde Emission from Composite Wood Products, 93120-93120.12, title 17, California Code of Regulations, § 93120.

A supervision contract with No. 641 dated November 5, 2008 was signed by the customer.

The determination of formaldehyde release should be carried out according to § 93120.9 "Test methods". According to § 93120, Appendix 2 (f)(3)(A) the quarterly chamber test has to be carried out for uncoated wood-based panels by using the primary or secondary test method for each production line of each plant.

1.1. Secondary test method

Referring to § 93120.9 (a)(2) a secondary method, defined as specified in ASTM D 6007 "Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber" can be used to determine formaldehyde release.

Equivalence has been shown and established between the American standard ASTM E 1333 "Determining Formaldehyde Concentration in Air and Emission Rates from Wood Products Using a Large Chamber" and ASTM D 6007 "Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber" according to § 93120.9 (a)(B)) with volume of 1 m³ and 0.225 m³. Therefore, the small chamber test method as specified in ASTM D 6007 can be used for quality control testing.

According to § 93120.9 (a)(2)(A) for the secondary method as ASTM D 6007 nine specimens have to be tested in groups of three specimens. Three test results of small scale chamber test were received and averaged, representing one data point of the panel.

2. Test material and data of receipt

Product:	MDF, unfaced
Product name:	MDF BASIC (AB79T)/MDF ST (AB79B, AB7B9, AB7FB)/MDF SUPERLACK (AB74B)/MDF NOVOLACK (AB79S, AB7PC, AB7FS)/HDF FLOORING (AB75D, AB79D, AB74D)
Plant:	Sonae Arauco Beeskow GmbH in 15848 Beeskow, Germany
Thickness (mm):	10
Thickness range (mm):	$> 8 \leq 50$
WKI-Identity-Number:	4007
Production date:	March 18, 2020

The sample material was selected by the customer corresponding to WKI's guidelines, marked and sent to the WKI for examination.

The samples arrived at WKI packed separately in polyethylene plastic foil and stored under room conditions. Table 1 shows the data of receipt and test. The test material was used up.

3. Execution of the test

Referring to chamber test according to ASTM D 6007 three samples were positioned vertically standing with a minimum distance of 0.15 m between each specimen in a closed chamber. The chamber parameter and samples sizes are mentioned in table 2.

The conditioning of the samples was done for seven days \pm 3 h at a temperature of (24 ± 3) °C and a relative humidity of (50 ± 5) %. The air exchange rate was adjusted to 2 AC/h.

Subsequent to seven-day-conditioning period the test chamber was operated at 25 ± 1 °C, a relative humidity of (50 ± 4) % and an air exchange rate of (0.5 ± 0.05) AC/h.

The formaldehyde concentration in the chamber was measured by taking air samples at a test period of 19 and 20 hours. To this end a gas quantity of at least 0.12 m³ at a rate of approximately 2 L/min was taken from the ambient air using gas sampling equipment and led through gas washing bottles filled with absorption liquid.

The absorbed formaldehyde was determined photometrically and/or fluorimetrically according to the acetyl/acetone method described in EN 717-1:2005-01.

4. Test results

In table 1 and 2 enclosed to the test report the data of receipt and test parameter are mentioned. The formaldehyde release values for chamber tests according to ASTM D 6007 of the tested samples of Messrs. Sonae Arauco Beeskow GmbH in 15848 Beeskow (Germany) are specified in table 3.

Referring to the test results an average formaldehyde concentration of 0.05 ppm was determined for three chamber tests according to ASTM D 6007 "Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber" (1 ppm \triangleq 1.23 mg HCHO/m³ air at 25°C and 1013 hPa).

The limit values according to the requirements of the Final Regulation Order of "Airborne Toxic Control Measure to Reduce Formaldehyde Emission from Composite Wood Products", 93120-93120.12, title 17, California Code of Regulations, § 93120.2 (a) "Formaldehyde Emission Standards for Hardwood Plywood (HWPW), Particleboard (PB), and Medium Density Fiberboard (MDF)" are listed in Table 4.

A supervision contract is in force.

K. Huslage

Dipl.-Ing. (FH) Kathrin Huslage
Official in charge



H. Schwab

Dipl.-Ing. Harald Schwab
Head of Testing, Supervision and
Certifying Body

Table 1: Test material, data of receipt and test

Product: MDF, unfaced
 Product name: MDF BASIC (AB79T)/MDF ST (AB79B, AB7B9, AB7FB)/MDF SUPERLACK (AB74B)/MDF NOVOLACK (AB79S, AB7PC, AB7FS)/HDF FLOORING (AB75D, AB79D, AB74D)
 Plant: Sonae Arauco Beeskow GmbH
 in 15848 Beeskow, Germany
 Thickness (mm): 10
 WKI-Identity-Number: 4007
 Production date: March 18, 2020
 Audit date: March 24, 2020
 Sampling date: March 24, 2020

Test material, data of receipt and test					
Sample-ID	Thickness [mm]	Samples cut out of number of large sized boards	Size of boards app. [m]	Data of receipt	Test date
					Chamber method ASTM D 6007
4007	10	3	1.2 x 2.0	March 30, 2020	April 15, 2020

Table 2: Test parameter of ASTM D 6007: "Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber"

Conditioning data					
Temperature of conditioning:	(24 ± 3)	[°C]	Rel. humidity of conditioning:	(50 ± 5)	[%]
Minimum distance between samples:	0.15	[m]	Formaldehyde background concentration:	0.01	[ppm]

Chamber data - climatic parameter and air exchange					
Temperature:	(25 ± 1)				[°C]
Rel. humidity:	(50 ± 4)				[%]
Air exchange rate:	0.5				[1/h]

Chamber data - loading rate and sample sizes					
Chamber volume:	1		0.225		[m³]
Type of wood based material:	particleboard or plywood	MDF	particleboard or plywood	MDF	
Loading ratio*:	0.43	0.26	0.43	0.26	[m²/m³]
Sample size (length x width)*:	0.5 x 0.143	0.5 x 0.085	0.2 x 0.08	0.2 x 0.049	[m]
Number of panels per chamber**:	3	3	3	3	
Number of exposed surfaces:	6	6	6	6	
Edges***	sealed gastight with aluminium tape				

* depending on the type of wood based material tested

** samples cut evenly distributed out of one large board (size see table 1)

*** edges sealed gastight with aluminium tape if the ratio of the edge exposure is greater than 5 % of the surface area

Table 3: Test results of ASTM D 6007 "Determining Formaldehyde Concentration in Air from Wood Products Using a Small Scale Chamber" using a chamber with volume of 0.225 m³

Product:	MDF, unfaced
Product name:	MDF BASIC (AB79T)/MDF ST (AB79B, AB7B9, AB7FB)/MDF SUPERLACK (AB74B)/MDF NOVOLACK (AB79S, AB7PC, AB7FS)/HDF FLOORING (AB75D, AB79D, AB74D)
Plant:	Sonae Arauco Beeskow GmbH in 15848 Beeskow, Germany
Thickness (mm):	10
Production date:	March 18, 2020
Sampling date:	March 24, 2020

Sample set 1				4007-1
Test period	19	20	[h]	Average sample set 1
Temperature test conditions	23.9	24.1	[°C]	
Rel. humidity test conditions	49.3	48.8	[%]	
Determined chamber value	0.04	0.04	[ppm]	
Reported Chamber value corrected to 25°C/50%RH	0.05	0.05	[ppm]	0.05 ppm

Sample set 2				4007-2
Test period	19	20	[h]	Average sample set 2
Temperature test conditions	24.4	24.6	[°C]	
Rel. humidity test conditions	50.1	49.4	[%]	
Determined chamber value	0.05	0.05	[ppm]	
Reported Chamber value corrected to 25°C/50%RH	0.05	0.05	[ppm]	0.05 ppm

Sample set 3				4007-3
Test period	19	20	[h]	Average sample set 3
Temperature test conditions	24.1	24.3	[°C]	
Rel. humidity test conditions	48.2	47.5	[%]	
Determined chamber value	0.04	0.04	[ppm]	
Reported Chamber value corrected to 25°C/50%RH	0.05	0.05	[ppm]	0.05 ppm

Sample set 1 4007-1	Sample set 2 4007-2	Sample set 3 4007-3	Average value WKI-ID-No.: 4007
0.05 ppm	0.05 ppm	0.05 ppm	0.05 ppm

Table 4: Final Regulation Order of "Airborne Toxic Control Measure to Reduce Formaldehyde Emission from Composite Wood Products", 93120-93120.12, title 17, California Code of Regulations, §93120.2 (a), emission standards, according to table 1: "Phase 1 and Phase 2 formaldehyde emission standards for hardwood plywood (HWPW), particleboard (PB) and medium density fibreboard (MDF)¹"

- Phase 1 (P1) and Phase 2 (P2) Emission Standards (ppm) –						
Effective Date	HWPW-VC	HWPW-CC	PB	MDF	Thin MDF	
1 January 2009	P1: 0.08	-	P1: 0.18	P1: 0.21	P1: 0.21	
1 July 2009	-	P1: 0.08	-	-	-	
1 January 2010	P2: 0.05	-	-	-	-	
1 January 2011	-	-	P2: 0.09	P2: 0.11	-	
1 January 2012	-	-	-	-	P2: 0.13	
1 July 2012	-	P2: 0.05	-	-	-	

¹ Based on the primary test method [ASTM E 1333-96 (2002)] in parts per million (ppm) HWPW-VC: veneer core; HWPW-CC: composite core

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Sonae Arauco Beeskow GmbH
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Your reference

Your message dated

Our reference
 Mey/Fra

Braunschweig, June 3, 2020

Test report No. QA-2020-1896

Customer: Sonae Arauco Beeskow GmbH
 Radinkendorfer Straße 71
 15848 Beeskow (Germany)

Product name: MDF BASIC (AB79T)/MDF ST (AB79B, AB7B9, AB7FB)/MDF SUPERLACK (AB74B)/MDF NOVOLACK (AB79S, AB7PC, AB7FS)/HDF FLOORING (AB75D, AB79D, AB74D)

WKI-ID-No.: 5172

Receipt of sample: 19 February 2020

Start of test: 3 March 2020

Objective of the test: Determination of the formaldehyde release according to EN 717

Content of the test report:

1. Task	2
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3. Execution of the test	2
4. Test result.....	3
5. Assessment of test result	3

This test report comprises 3 pages, 2 tables and 1 figure.

This test report is not permitted to be published incompletely. A publication in extracts is in any case subject to the previous consent of Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut WKI, Bienroder Weg 54E in 38108 Braunschweig (Germany).

The test results exclusively refer to the objects of the test. The test material was used up.



Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e. V., München
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1. Task

The Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut WKI, was entrusted by Messrs. Sonae Arauco Beeskow GmbH in 15848 Beeskow (Germany) with the determination of formaldehyde emission of a wood-based panel according to chamber method EN 717-1:2005 "Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method".

The determination of formaldehyde release should be carried out according to the test methods required by the German Ordinance on bans and restrictive measures for the marketing of hazardous substances, preparations and products according to the Chemicals Act (Chemicals Prohibition Ordinance; Chemikalien-Verbotsverordnung, ChemVerbotsV).

The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) announced the new analytical procedures for the sampling and investigation in the German "Bundesanzeiger" (German Federal Gazette) with date of 26 November 2018. The required test methods are mentioned in table 1 of this test report.

2. Test material

Product:	MDF, UF/MUF, unfaced
Product name:	MDF BASIC (AB79T)/MDF ST (AB79B, AB7B9, AB7FB)/MDF SUPERLACK (AB74B)/MDF NOVOLACK (AB79S, AB7PC, AB7FS)/HDF FLOORING (AB75D, AB79D, AB74D)
Thickness [mm]:	10
Production date ref. customer:	2 February 2020
WKI-ID-No.:	5172

The sample material was selected by the customer corresponding to WKI's guidelines, marked and sent to the WKI for examination. The test material arrived at WKI packed in polyethylene foil on 19 February 2020, was marked with WKI-ID-No. "5172" and stored under room conditions until the test start on 3 March 2020.

3 . Execution of the test

For the determination of formaldehyde release the samples were placed vertical and approximately in the centre of the closed chamber, with their surfaces parallel to the direction of the air flow, and separated by not less than 200 mm. The summary of chamber parameter, number of samples and sizes are mentioned in table 2.

Prior to testing the edges were sealed gas-tight with aluminium foil to get a ratio U (unsealed edges) / A (surface area) of 1.5 m/m² and correspond to the large chamber ratio. The edges were sealed air-tight by using self-adhesive aluminium tape.

The concentration of formaldehyde in the chamber was measured twice a day by drawing app. 0.12 m³ air from the chamber through gas washing bottles filled with absorption solution. The formaldehyde content of the aqueous solution was determined photometrically or fluorimetrically by the acetyl acetone method. Sampling has been periodically continued until the formaldehyde concentration in the chamber has reached a steady-state.

4. Test result

For the tested sample named "MDF BASIC (AB79T)/MDF ST (AB79B, AB7B9, AB7FB)/MDF SUPERLACK (AB74B)/MDF NOVOLACK (AB79S, AB7PC, AB7FS)/HDF FLOORING (AB75D, AB79D, AB74D) – Thickness: 10 mm" of Messrs. Sonae Arauco Beeskow GmbH in 15848 Beeskow (Germany) tested according to EN 717-1 following formaldehyde release was determined in the test chamber:

test period [h]	formaldehyde release in the chamber EN 717-1	
	[mg/m ³]	[ppm]
243	0.060	0.05

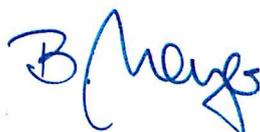
The course of formaldehyde release is shown in figure 1 enclosed to the test report. The blank value of the chamber before starting the test was determined with ≤ 0.006 mg/m³ resp. 0.005 ppm (1 ppm $\hat{=}$ 1.24 mg HCHO/m³ air at 23°C and 1013 hPa).

5. Assessment of test result

According to the German Ordinance on bans and restrictive measures for the marketing of hazardous substances, preparations and products according to the Chemicals Act (Chemicals Prohibition Ordinance; German: Chemikalien-Verbotsverordnung, ChemVerbotsV), Appendix 1 to Section 3, Prohibition on entry into force, "Entry 1: Formaldehyde" Clause 2 (1), coated and uncoated wood-based materials (particleboards, blockboard, veneer boards and fibreboards) shall not be placed on the market if the level of formaldehyde in the air determined as steady-state concentration in chamber caused by the wood-based material exceeds 0.1 ml/cbm (ppm).

Based on the results the tested material complies with the formaldehyde limit value of the German Chemicals Prohibition Ordinance (ChemVerbotsV) with start on January 1, 2020 mentioned below:

Requirement of limit value fulfilled?	Test method [test result]	Evaluation acc. limit value	ChemVerbotsV [BMU Veröffentlichung Prüfverfahren 2018-11-26] valid from 2020-01-01
Chamber method	EN 717-1 [x factor 2.0]	0.1 ppm formaldehyde	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no



Bettina Meyer
Official in charge




Dipl.-Ing. Harald Schwab
Head of Testing, Supervision and
Certifying Body

Table 1: Analytical procedures for sampling and testing announced by the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) with regard to formaldehyde for fulfillment of the German Chemicals Prohibition Ordinance (ChemVerbotsV), published on 26 November 2018

Here: »Bekanntmachung analytischer Verfahren für Probenahmen und Untersuchungen für die in Anlage 1 der ChemVerbotsV genannten Stoffe und Stoffgruppen«

Annex 1 (to § 3) ChemVerbotsV	Matrix	Sample preparation	Test method/ procedure
Formaldehyde	coated and uncoated wood-based panels	<p>Reference method: Emission testing in a test chamber; average of a double determination of the 28th day as steady-state concentration; air exchange rate 0.5/h, room loading 1.8 m²/m³; partly edge sealing: perimeter/area = 1.5 m⁻¹</p> <p>Additional method: emission testing in a test chamber; steady-state concentration has to be multiplied by factor 2.0</p> <p>Derived test methods: derived test methods are only suitable for production control. Therefore, a product specific manufacturer correlation has to be established.</p>	<p>DIN EN 16516</p> <p>DIN EN 717-1</p> <p>e. g. EN ISO 12460-3</p>
		<p>Valid up to 31 December 2019:</p> <p>»Prüfverfahren für Holzwerkstoffe und Produkte aus Holzwerkstoffen«</p> <p>Reference method: emission testing in the test chamber (all plain wood-based panels)</p> <p>Derived method: extraction method ref. to perforator method (only raw particleboards, raw MDF)</p> <p>Derived method: emission testing acc. to gas analysis method (only raw plywood and coated wood-based panels)</p>	<p>Bundesgesundheitsblatt 34, 10 (1991), S.488-489</p> <p>DIN EN 717-1</p> <p>EN ISO 12460-5</p> <p>EN ISO 12460-3</p>

Table 2: Test parameter referring to chamber method EN 717-1

Chamber volume		0.225	[m ³]
temperature		23 ± 0.5	[°C]
rel. humidity		45 ± 3	[%]
air exchange	(volume of air flow)	0.225	[h ⁻¹]
emission surface area	(without edges)	0.225	[m ²]
loading rate	(surface area per chamber volume)	1	[m ² / m ³]
air exchange rate	(air volume per chamber volume)	1	[m ³ / h / m ³]
Test pieces	number	dimensions	
	1	length x width/height	280 x 200 [mm]
	1	length x width/height	280 x 200 [mm]
		edges	partly sealed gastight*

* ref. to EN 717-1: ratio U (unsealed edges) / A (surface area) of 1.5 m/m²

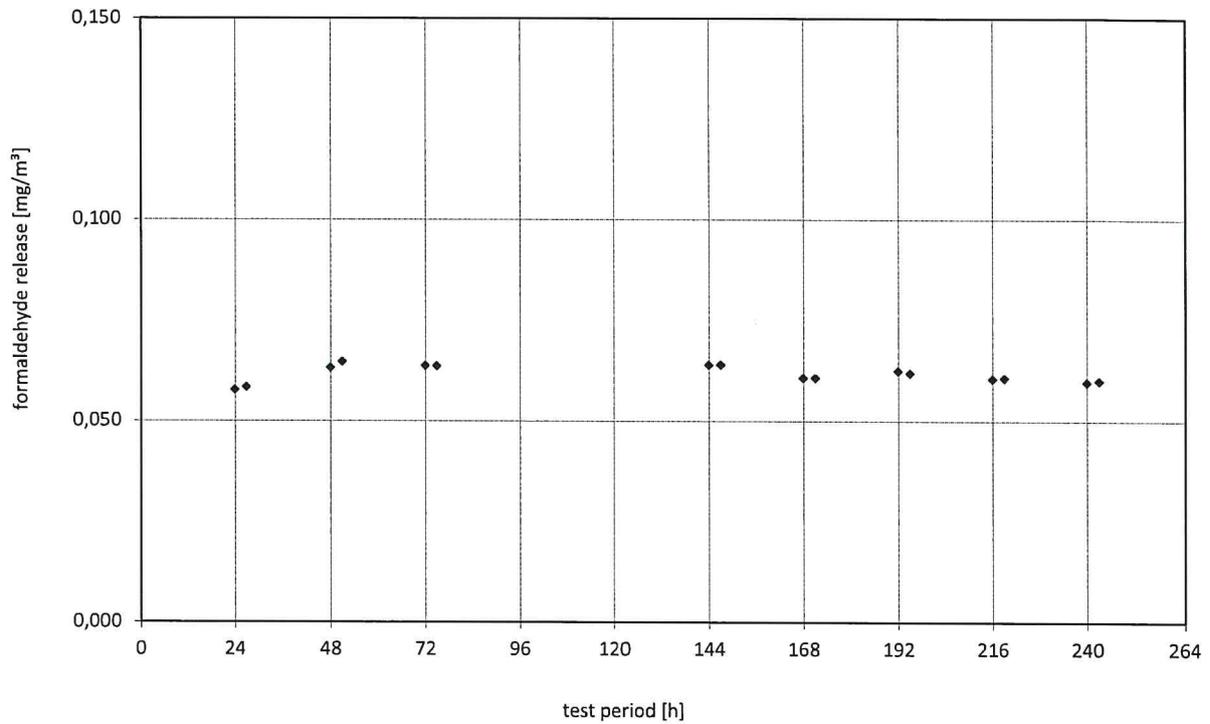


Figure 1: Course of formaldehyde release [mg/m³] in the test chamber during the test of a sample named "MDF BASIC (AB79T)/MDF ST (AB79B, AB7B9, AB7FB)/MDF SUPERLACK (AB74B)/MDF NOVOLACK (AB79S, AB7PC, AB7FS)/HDF FLOORING (AB75D, AB79D, AB74D) – Thickness: 10 mm" sent by Messrs. Sonae Arauco Beeskow GmbH in 15848 Beeskow (Germany)