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AGROP NOVA a.s.
Ptenský Dvorek 99
79843 Ptení
Czech Republic

Fraunhofer Institute for Wood Research
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Your reference	Your message dated	Our reference	
		Hus	Braunschweig, April 22, 2024

Test report No. QA-2024-0759

Customer:	AGROP NOVA a.s. Ptenský Dvorek 99 79843 Ptení (Czech Republic)
Product name:	**SWP 27 (9-9-9) mm Spruce**
WKI-ID-No.:	0040_2024
Receipt of item:	March 14, 2024
Start of measurement:	March 19, 2024
Objective of the measurement:	Determination of the formaldehyde release according to EN 717-1

Content of the test report:

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3. Execution of the measurement 3
4. Measured quantity value 4

This test report comprises 4 pages and 4 enclosures (1 table, 1 figure and 2 annexes concerning assessment).

1. Task

The Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut WKI, was entrusted by AGROP NOVA a.s. in 79843 Ptení (Czech Republic) to determine the 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".

1.2 Task | Evaluation of measured value

As ordered the measured value shall be evaluated as follows:

No evaluation of the measured value formaldehyde

1.2.1 [ ] Determination of material characteristics,
statements on conformity with a requirement are not part of the test report.

Evaluation of the measured value formaldehyde under consideration of the limit value

1.2.2 [X] Chemicals Prohibition Ordinance - ChemVerbotsV - Annex §1, Section 3

1.2.3 [ ] DIN EN 13986 „Wood-based panels for use in building - Properties, evaluation of conformity and marking of conformity and marking"; German version DIN EN 13986:2015-06

1.2.4 [ ] other:

1.3 Task | Evaluation of measured value – Consideration of measurement uncertainty

According to the order, the measurement results are to be evaluated taking into account the decision rule applicable to the measurement procedure.Fraunhofer WKI decision rule are to be evaluated as follows:

1.3.1 [X] Evaluation of the results shall be carried out according to the above requirement / standard.
No measurement uncertainties shall be considered. The requirements shall be considered fulfilled if the measured value complies with the requirements for the limit value.

1.3.2 [ ] Evaluation shall be made considering the measurement uncertainty
The requirements are considered fulfilled if the measurement result (measured value incl. measurement uncertainty) complies with the limit value minus the measurement uncertainty at the most.

2. Test item and data of receipt

Product:	multi layer board, uncoated
Product name:	SWP 27 (9-9-9) mm Spruce
Product code:	30M33SM270590059034
Manufacturer:	AGROP NOVA a.s.
Thickness [mm]:	27
Production date ref. customer:	February 27, 2024
WKI-ID-No.:	0040_2024

The test item was sent to the Fraunhofer WKI for measurement.
Selection and marking was done

X	selection and marking by the customer
	selection corresponding to Fraunhofer WKI guidelines and marking by the customer
	other:

The test item arrived at Fraunhofer WKI packed in polyethylene foil on March 14, 2024, was marked with WKI-ID-No. "0040_2024" and stored under room conditions until the measurement starts on March 19, 2024.

3. Execution of the measurement

For the determination of formaldehyde release the test pieces 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 test pieces and size of the test pieces are mentioned in table 1.

Prior to the measurement the edges of the test pieces were sealed gas-tight with self-adhesive aluminium foil to get a ratio U (unsealed edges) to A (surface area) of 1.5 m/m² and correspond to the large chamber ratio.

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 fluorometrically by the acetyl acetone method. Sampling has been periodically continued until the formaldehyde concentration in the chamber has reached a steady-state.

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4. Measured quantity value

For the item sample named "SWP 27 (9-9-9) mm Spruce – Thickness: 27 mm" of AGROP NOVA a.s. in 79843 Ptení (Czech Republic) tested according to EN 717-1 following formaldehyde release was determined in the test chamber:

Measurement period	Measured quantity value formaldehyde release in the chamber EN 717-1	
[h]	[mg/m³]	[ppm]
531	**0.014**	**0.01**

The relative uncertainty of measurement calculated by Fraunhofer WKI for the applied test method is ± 3.6%.

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

Accredited Testing Laboratory Wilhelm-Klauditz-Institut WKI Braunschweig in accordance with ISO/IEC 17025

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Dipl.-Ing. Harald Schwab
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Quality Assessment

Table 1: Chamber parameter referring to chamber method EN 717-1

Chamber volume			1		[m³]
temperature			23 ± 0.5		[°C]
rel. humidity			45 ± 3		[%]
air exchange	(volume of air flow)		1		[h^{-1}]
emission surface area	(without edges)		1		[m²]
loading rate	(surface area per chamber volume)		1		[m² / m³]
air exchange rate	(air volume per chamber volume)		1		[m³ / h / m³]
Test pieces	number	dimensions			
	1	length x width/height	500 x	500	[mm]
	1	length x width/height	500 x	500	[mm]
		edges	partly sealed gastight*		

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

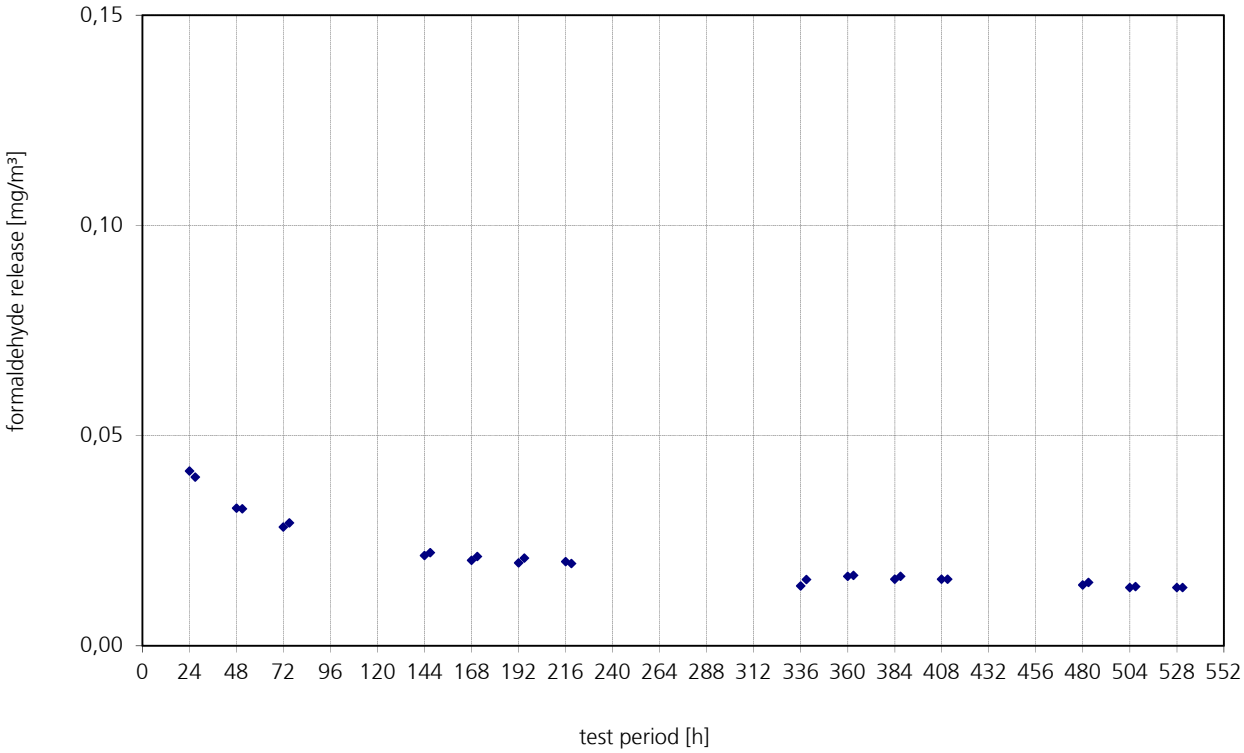

Figure 1: Course of formaldehyde release [mg/m³] in the test chamber during the measurement of an item named "SWP 27 (9-9-9) mm Spruce – Thickness: 27 mm" sent by AGROP NOVA a.s. in 79843 Ptení (Czech Republic)

Annex 3 to test report No. QA-2024-0759
dated April 22, 2024

Fraunhofer WKI

Assessment of measurement result | ChemVerbotsV

1. Basis of assessment

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).
The test specifications published by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) in the Federal Gazette on 26 November 2018 were used to evaluate the test result (see annex 4).

2. Item | Measurement procedure | Measurement result

Test report No.	**QA-2024-0759** dated April 22, 2024			
Customer:	AGROP NOVA a.s., 79843 Ptení (Czech Republic)			
Product name	SWP 27 (9-9-9) mm Spruce			
Type of wood-based panel	multi layer board, uncoated			
Thickness [mm]	27			
Measurement procedure (applied)	EN 717-1		Measurement period [h]	531
Measured quantity value	0.01	ppm	0.014	mg/m³
Measurement result*	0.01	ppm	0.014	mg/m³

* Based on the low level of measurement uncertainty and experiences from interlaboratory comparison tests, it is regarded as insignificant and not considered for calculation of the measurement result. In this case, the measured quantity value is equivalent to the measurement result.

3. Assessment

The tested item complies with the requirement of German ChemVerbotV as follows:

Requirement of limit value fulfilled?**	Test method [*test result*]	Limit value	Evaluation acc.	German ChemVerbotsV [BMU publication Test methods 2018-11-26] valid from 2020-01-01
Chamber method	EN 16516	0.1 ppm		☐ yes ☐ no
Chamber method	EN 717-1 *[x factor 2.0]*	0.1 ppm		☒ yes ☐ no

** Note concerning the decision rule: Statements on conformity assessment were made on the basis of the measured quantity value obtained. Measurement uncertainties were not considered for the assessment. The measured quantity value meets the requirement, if it complies with the limit values of ≤ 0.10 ppm without mathematical rounding.

Table: - Informative -
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	**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 m^2/m^3; partly edge sealing: perimeter/area = 1.5 m^{-1}	**DIN EN 16516**
		Additional method: emission testing in a test chamber; steady-state concentration has to be multiplied by factor 2.0	**DIN EN 717-1**
		Derived test methods: derived test methods are only suitable for production control. Therefore, a product specific manufacturer correlation has to be established.	e. g. EN ISO 12460-3
		Valid up to 31 December 2019: »Prüfverfahren für Holzwerkstoffe und Produkte aus Holzwerkstoffen« Reference method: emission testing in the test chamber (all plain wood-based panels) Derived method: extraction method ref. to perforator method (only raw particleboards, raw MDF) Derived method: emission testing acc. to gas analysis method (only raw plywood and coated wood-based panels)	 Bundesgesundheitsblatt 34, 10 (1991), S.488-489 DIN EN 717-1 EN ISO 12460-5 EN ISO 12460-3