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6122 Menznau
Switzerland

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Braunschweig, 7 June 2019

Test report No. QA-2019-2572

Customer: SWISS KRONO AG
Willisauerstr. 37
6122 Menznau
Switzerland

Objective of the test: Classification of wood-based panels regarding formaldehyde release

Plant category: BE.YOND

WKI-ID-No.: 6509

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This test report comprises 4 pages and 1 figure.

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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

Classification of wood-based panels manufactured by Messrs. SWISS KRONO AG in 6122 Menznau (Switzerland) regarding formaldehyde release by consideration of the German "Regulation on the classification and external supervision of wood-based panels regarding formaldehyde emission (DIBt-Richtlinie 100)" version June 1994, respectively the German "Regulation on the Prohibition for Chemical Products [Chemikalien-Verbots-verordnung (ChemVerbotsV)]", using the chamber test method EN 717-1:2005-01: "Wood-based panels - Determination of formaldehyde release - Part 1: Formaldehyde emission by the chamber method".

The supervision contract no. 1290 is in preparation.

2. Material to be tested and data of receipt

Plant category:	BE.YOND
Type of wood-based panels:	particleboard, uncoated
Plant:	SWISS KRONO AG in 6122 Menznau (Switzerland)
Thickness [mm]:	18
Thickness range [mm]*:	more than 12 up to 25
WKI-Identity-No.:	6509
Production date:	20 March 2019

* According to the DIBt-Richtlinie 100 the manufacturer is allowed to differentiate between the following thickness ranges in order to enable him to restrict test and evaluation criteria: up to 12 mm, more than 12 mm up to 25 mm, more than 25 mm up to 40 mm, more than 40 mm up to 60 mm, more than 60 mm.

Referring to customer's information the boards were produced on 20 March 2019. The boards were sampled by the customer according to WKI guidelines and sent to WKI.

The samples arrived on 3 April 2019 and the test started on 7 May 2019.

The test material was used up.

3 . Execution of the test

According to the "Regulation on the Prohibition of Chemicals", annex to § 1, clause 3, faced and unfaced wood-based panels (particleboards, blockboards, veneer plywood, fibreboards) must not put in circulation if the emission of formaldehyde in the climate chamber test exceeds 0.1 ml/m³ (ppm).

Following test methods were used:

- Chamber method according to EN 717-1 to fulfil the requirements of ChemVerbotsV; DIBt guideline 100
Classification test

Determination of formaldehyde release according to EN 717-1 (1 m³ chamber method)

For the determination of formaldehyde release two samples each with the dimensions of 500 mm x 500 mm x thickness and a total surface of 1 m² were put into a 1 m³ chamber. Prior to testing the edges were partly sealed gas-tight with aluminium foil to get a ratio U (unsealed edges) / A (surface area) of 1.5 m/m².

During the test the temperature was kept at 23°C ± 0.5 K, the relative humidity of the air was kept at 45 ± 3 % and the air exchange rate was adjusted to 1 h⁻¹. Therefore, the relationship between air exchange level and room load was 1.

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.

The analytical and climatic test parameter above-mentioned correspond to EN 717-1:2005-01. The standard test parameters published in the German "Bundesgesundheitsblatt" No. 34, 10 (1991), page 488 - 489, to fulfil the requirements of the German Chemikalien-Verbotsverordnung - ChemVerbotsV-, annex § 1, para 3, are observed as well.

4. Test result

For the uncoated particleboard sample with thickness of 18 mm as tested as described in Ch. 3 a formaldehyde concentration of < 0.006 mg/m³ (≅ 0.005 ppm) was determined in the 1 m³ chamber (blank value of the chamber: ≤ 0.006 mg/m³ resp. 0.005 ppm; testing period: 291 hours – see figure 1 enclosed – 1 ppm ≅ 1.24 mg HCHO/m³ air at 23°C and 1013 hPa).

5. Assessment of the test result

According to the German Regulation on the Prohibition of Chemicals an admissible maximum value of 0.1 ppm of formaldehyde measured in a test chamber applies to wood-based materials, determined as an equilibrium concentration.

Based on the test results, the tested uncoated particleboard named "BE.YOND" manufactured by Messrs. SWISS KRONO AG in 6122 Menznau (Switzerland) complies with the requirements of the German "Regulation on the Prohibition for Chemical Products [Chemikalien-Verbotsverordnung (ChemVerbotsV)]", annex § 1, para 3, respectively the German "Regulation on the classification and external supervision of wood-based panels regarding formaldehyde emission (DIBt-Richtlinie 100)".

Requirement of limit value fulfilled?	Evaluation acc.	German ChemVerbotsV [BGA Blatt 34, 10/91] 0.1 ppm	DIBt Guideline 100 Formaldehyde class E1 0.1 ppm
Chamber method DIN EN 717-1		<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no

Messrs. SWISS KRONO AG in 6122 Menznau (Switzerland) are entitled to mark their uncoated particleboard named "BE.YOND" with thickness range more than 12 mm up to 25 mm correspondingly.

A supervision contract is in preparation.



Bettina Meyer
Official in charge




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

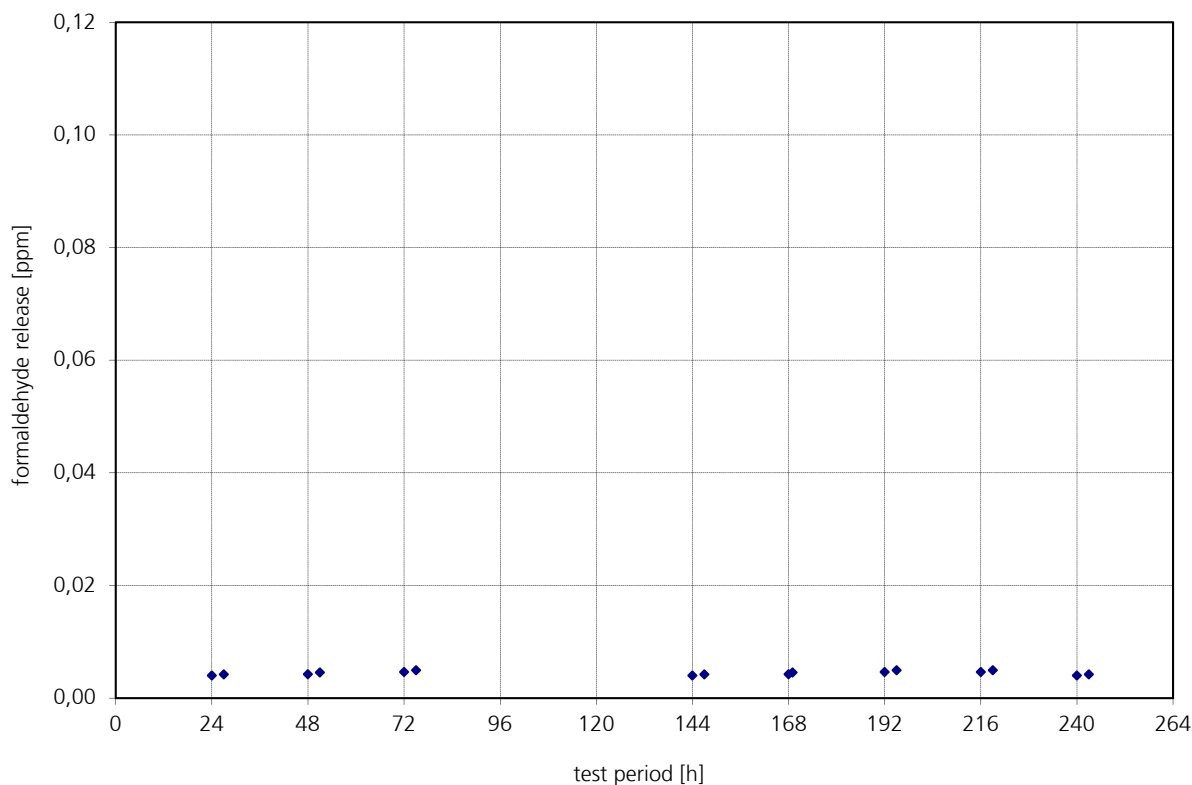


Figure: Determination of formaldehyde release using a 1 m³ chamber of uncoated particleboards marked with "BE.YOND" manufactured by Messrs. SWISS KRONO AG in 6122 Menznau (Switzerland)

Test conditions:

chamber volume	1	[m ³]
temperature	23°C ± 0.5	[°C]
rel. humidity	45 % ± 3	[%]
air exchange rate	1	[h ⁻¹]
sample dimensions	width	500 [mm]
	length	500 [mm]
	thickness	18 [mm]
number of samples	2	
emission surface area (without edges)	1	[m ²]
loading rate	1	[m ² / m ³]
ratio loading rate / air exchange rate	1	
edges	partly sealed gastight*	

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