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Sw-50
Dresden, 19 October, 2018

Test Report Order no. 2518463

Client: Bona AB
Murmansgatan 130 Box 210 74
200 21 Malmö
Schweden

Date of order: 24 September, 2018

Order: Determination of the migration behavior of heavy metals according to DIN EN 71-3: 2018-08 (category III, table 1) in 4 samples

Contractor: EPH – Laboratory chemical testing

Engineer in charge: Dr. Christiane Swaboda



Prof. Dr. habil. M. Beyer
Head of Laboratory Chemical Testing

The test report contains 4 pages. Any duplication, even in part, requires written permission of EPH. These test results are exclusively related to the tested materials

1 Assignment

Determination of the migration behaviour of heavy metals according to DIN EN 71-3 (category III, table 1) in 4 variants of lacquers.

2 Sample material

The client handed over the following samples:

P1	WT 3006	Mega ONE
P2	341-86N	Bona Pure
P3	341-86P	Bona LinoPrime
P4	341-86R	Bona Pure Colour

Sample receipt in the EPH: 25 September 2018

The test material is stored for 3 months.

3 Investigations carried out

3.1 Migration behavior of heavy metals acc. to DIN EN 71-3

The following elements were to be determined:

Aluminum (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Boron (B), Cadmium (Cd), Cobalt (Co), Chrome (Cr), Copper (Cu), Mercury (Hg), Manganese (Mn), Nickel (Ni), Lead (Pb), Selenium (Se), Tin (Sn), Strontium (Sr), Zinc (Zn)

About 1 g of the lacquer were scraped from the surface of the glass plates added with 50 ml of 0.07 mol HCl, stirred for 15 minutes at 37°C and then left for 2 hours. Afterwards, the liquid was separated by centrifugation. The resulting pH - value of the solutions was 1.5.

The quantitative determination of the heavy metals was carried out with the methods and detection limits indicated in table 1. The results are average values from a double determination.

The evaluation of the results followed the limit values for category III according to pt. 4.2 for scratched materials.

Table 1 Methods, determination limits and limit values for estimation of the heavy metal contents

Element	Al	As	Ba	B	Cd	Co	Cr	Cu
Method	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES	ICP-OES
Wavelength [nm]	237.312	193.696	455.403	182.577	214.439	230.786	205.560	213.598
DL [mg/kg]	3.0	1.5	0.1	3.0	0.05	0.1	0.05	0.1
LV category III [mg/kg]	70000	47	18750	15000	17	130	460 0.2*	7700

Continuation of table 1

Element	Hg	Mn	Ni	Pb	Sb	Se	Sn	Sr	Zn
Method Wavelength [nm]	ICP-OES with Hydrid systeme 184.887	ICP-OES 257.610	ICP-OES 231.604	ICP-OES 220.353	ICP-OES 206.834	ICP-OES 196.026	ICP-OES 189.925	ICP-OES 407.771	ICP-OES 213.857
DL [mg/kg]	0.05	0.05	0.3	1.5	1.5	1.5	0.05	0.05	1.5
LV category III [mg/kg]	94	15000	930	23	560	460	180000 12**	56000	46000

ICP-OES = Inductively Coupled Plasma Optical Emission Spectrometry,

DL= Determination Limit

LV = Limit value acc.to DIN EN 71-3. pt. 4.2 table 2 in connection with table 1 pt. 4.1

* value for Cr VI ** = Value for Organotin

4 Results

Table 2 Contents of heavy metals after extraction acc. to DIN EN 71-3 in mg/kg

Sample	Al	As	B	Ba	Cd	Co	Cr	Cu
P1	1.9	< DL	69.0	0.2	< DL	0.1	0.1	0.4
P2	2.3	< DL	5.8	0.5	< DL	< DL	0.1	1.1
P3	9.7	< DL	8.3	0.9	< DL	< DL	0.1	1.4
P4	32.7	< DL	3.9	0.4	< DL	< DL	0.1	0.4

Continuation of table 2

Sample	Hg	Mn	Ni	Pb	Sb	Se	Sn	Sr	Zn
P1	< DL	< DL	0.7	0.3	< DL	< DL	0.4	0.2	< DL
P2	< DL	< DL	0.2	0.4	< DL	< DL	0.4	0.7	< DL
P3	< DL	< DL	0.8	13.3	< DL	< DL	1.5	1.4	< DL
P4	< DL	< DL	0.4	1.6	< DL	< DL	< DL	0.4	< DL

DL = Determination limit

5 Evaluation

The 4 products completely meet the requirements of DIN EN 71-3 (2018:08).

6 Miscellaneous

The product samples will be stored in the EPH for 3 months as retained samples.

A handwritten signature in black ink, appearing to read "Ch. Swaboda". The signature is written in a cursive style with a large initial "C" and a long horizontal stroke.

Dr. rer. nat. Ch. Swaboda
Chemist in Charge