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Dresden, 28 February, 2018

Test Report Order no. 2518094/2

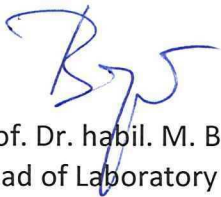
Client: Hemel Emprenye San. ve Tic.A.Ş.
IDOSB
Vakum Cad: 25 B-1 Özel, Parsel, Aydinli-Orhanli Mevkii, Tuzla
34957, Istanbul

Date of order: 07 February, 2018

Order: Determination of the migration behavior of heavy metals according to
DIN EN 71-3 in 1 sample

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 3 pages. Any duplication, even in part, requires written permission of EPH.

1 Assignment

Determination of the migration behaviour of heavy metals according to DIN EN 71-3 (category III, table 1) in one variant of wood oil.

2 Sample material

The client handed over the following sample:

2518094 – P2 HEMEL Yacht Varnish

Sample receipt in the EPH: February 12th, 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)

First the liquid paint was given on a glass plate and air dried overnight. About 1 g of the scraped lacquer was 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. 7.4.3.1 for uncolored or imbued materials like wood, wood based materials, bones or leather.

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	160	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
P2	0.6	< DL	< DL	< DL	< DL	0.34	< DL	0.2

Continuation of table 2

Sample	Hg	Mn	Ni	Pb	Sb	Se	Sn	Sr	Zn
P2	0.09	0.10	< DL	< DL	< DL	< DL	< DL	< DL	< DL

DL = Determination limit

5 Evaluation

The two products completely meet the requirements of DIN EN 71-3.

6 Miscellaneous

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



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