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Dresden, 04.11.2015

## Test Report Order no. 2515453

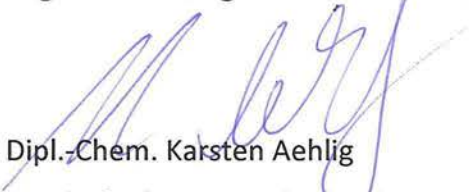
**Client:** LOBA GmbH & Co.KG  
Herr Ehmman  
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71241 Ditzingen

**Date of order:** 31.08.2015

**Order:** Determination of the migration behavior of heavy metals according to  
DIN EN ISO 71-3 in the product Hardwax Oil Lobasol Markant

**Contractor:** EPH – Laboratory chemical testing

**Engineer in charge:** Dr. Christiane Swaboda



Dipl.-Chem. Karsten Aehlig  
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 material.

## 1 Task

Determination of the migration behavior of heavy metals according to DIN EN ISO 71-3: 2014-12 in an hardwax oil.

## 2 Sample material

The client handed over the following sample:

**2515453 - 1**                      **Hardwax Oil, LOBASOL Markant**

Sample receipt in the EPH: August 28<sup>th</sup>, 2015

## 3 Investigations carried out

### 3.1 Migration behavior of heavy metals

The following elements were to determine according to DIN EN 71-3:

Aluminium (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 oil was given on a filter paper and air dried overnight. About 1 g of the impregnated, dried and cut paper 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 ore leather.

Table 1                      Methods, detection limits and limit values for estimation of the heavy metal content

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]	1.5	1.5	0.1	1.5	1.5	0.05	0.05	0.05
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 Wave- length [nm]	ICP-OES (Hydrid- system) 184.88	ICP-OES 257.61	ICP-OES 231.60	ICP-OES 220.35	ICP-OES 206.83	ICP-OES 196.02	ICP-OES 189.92	ICP-OES 407.77	ICP-OES 213.85
DL [mg/kg]	0.05	1.5	0.05	0.05	0.1	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= Detection 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 Tin organic substances

The results are average values of a double determination.

#### 4 Results

Table 2 Content of heavy metals in mg/kg

Sample	Al	As	Ba	B	Cd	Co	Cr	Cu
2515453 - 1	< DL	< DL	8.3	< DL	< DL	0.9	< DL	0.08

Continuation of table 2

Sample	Hg	Mn	Ni	Pb	Sb	Se	Sn	Sr	Zn
2515453 - 1	0.11	< DL	0.1	< DL	< DL	< DL	< DL	0.12	3.1

<DL = below detection limit

## 5 Evaluation

The product Hardwax Oil LOBASOL Markant completely meets the limit values for the migration of heavy metals according to DIN EN ISO 71-3 (2014:12).

The values for Chromium and Tin organic substances are below the detection limits and limit values.



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