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Your ref.	Our ref./document	telephone
AvdL/sh/August 7, 2015	LUVJ02-115 (1048700)	0531-23899-0

*Short version of our test report STWC15-025 of February 13, 2015*

### Examination of PPG6650-401/A Beige Basecoat with PPG6250-402/A Beige Adhesive Lacquer

You asked us to examine **PPG6650-401/A Beige Basecoat with PPG6250-402/A Beige Adhesive Lacquer** with respect to current food legislation.

According to your information the material is intended to be used as internal coating for caps and lids made of tin plate (ETP) for glass jars in contact with all kind of foodstuff, alcoholic products (max. 15 % alcohol) as well as milk and dairy products which will be filled cold or hot.

This product is a slightly modified version of a tested lacquer system (our test report STGM26-063 of June 28, 2013). Therefore a selected overall migration test and specific migration tests were carried out. The other testing results have been adopted from this test report.

In order to carry out the examinations we received coated tin plate panels, size DIN A4, which were coated under the following conditions:

- |                                 |                     |                         |
|---------------------------------|---------------------|-------------------------|
| 1. PPG6650-401/A:               | curing condition:   | 12 minutes 195 °C (PMT) |
|                                 | dry coating weight: | 12 g/m <sup>2</sup>     |
| 2. PPG6250-402/A:               | curing condition:   | 12 minutes 195 °C (PMT) |
|                                 | dry coating weight: | 8 g/m <sup>2</sup>      |
| 3. Simulation external lacquer: | curing condition:   | 20 minutes 190 °C (PMT) |

Die Prüfergebnisse beziehen sich ausschließlich auf die Prüfgegenstände. Prüfberichte und Gutachten dürfen ohne Genehmigung des Prüfinstitutes weder vollständig noch auszugsweise vervielfältigt werden.



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Deutsche Akkreditierungsstelle (DAkkS)  
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The coated substrates were brought into contact with aqueous and non aqueous solvents under test conditions which are suitable to simulate the influence of foodstuff.

The conditions for testing were applied in accordance with Regulation (EU) No 10/2011, which is valid for plastic food contact materials and articles since May 1, 2011.

In applying 21 CFR 175.300 of the US FDA Regulations, the extraction into n-heptane was determined.

## PROCEDURE OF THE EXAMINATIONS

### 1. Evaluation of the lacquer compositions

The composition of system **PPG6650-401/A Beige Basecoat with PPG6250-402/A Beige Adhesive Lacquer** was disclosed to the testing laboratory. The composition has been checked with regard to possible restrictions for the use of the applied starting substances for food contact applications. The evaluation of the compositional data covered all starting substances for which the chemical identity was disclosed to the testing laboratory. For each substance it was checked whether the substance is evaluated for food contact applications according to the requirements of the European Food Safety Authority (EFSA). The evaluations are mentioned for instance in the Food Contact Materials Database of the EU Commission, DG Sanco, Regulation (EU) No 10/2011, Council of Europe Resolution AP (2004) 1, CEPE Code of Practice and 21 CFR 175.300 of the US FDA Regulations. Based on the results of the composition evaluation the required tests for specific migration and residual monomer contents in the lacquer have been selected.

### 2. Overall migration

The overall migration was determined as dry residue of the migrates. The organic components of the dry residue were determined as their chloroform soluble parts according to the requirements of 21 CFR 175.300.

### 3. Analysis of the migrates

The lacquer film has been examined for phenols, formaldehyde and five further starting substances.

The examination for phenols and formaldehyde was carried out using a photometric method.

### 4. Extraction test of the lacquer film

The lacquer film has been examined for residues of 12 starting substances and one group of chemical components for which maximum migration limits or limits of residual content in the food contact material exist.

### 5. Sensory evaluation

The enamelled substrates were brought into contact with the flavour sensitive test solution tap water. The contact was carried out at 2 h 130 °C and subsequent storage for 10 d at 40 °C and a surface/volume ratio of 1 cm<sup>2</sup> : 2 ml. The sensory evaluation was carried out as triangle tests by a taste panel with particular experience. As blank we used tap water which had not been in contact with the coating material. The evaluation was carried out in accordance to DIN 10 955 (German Institute for Standardisation).

## RESULTS OF THE EXAMINATIONS

### 1. Evaluation of the lacquer compositions

According to the results of our evaluation all starting substances, with the exception of two catalysts, used for the manufacture of system **PPG6650-401/A Beige Basecoat with PPG6250-402/A Beige Adhesive Lacquer** are evaluated according to EFSA requirements. All starting substances are permitted according to CEPE Code of Practice, Resolution AP (2004) 1 resp. AP 92 (2).

All of the starting substances of the dry film are permitted according to 21 CFR 175.300 of the US FDA Regulations. Due to the use of one starting substance the coating must not be used in contact with alcoholic food within the scope of US FDA Regulations.

According to the results of our composition check titanium dioxide and eight further Additives\* which are permitted as food additives according to EU legislation have been identified as starting substances (dual use additives). These additives do not migrate, or because of their low concentration in the material they do not migrate according to our opinion in amounts, which could have technological effects in the food.

2. Overall migration

Simulants	t/T conditions	Dry residue of migrates mg/dm <sup>2</sup>	Chloroform soluble parts of dry residue mg/dm <sup>2</sup>
3 % acetic acid	2 h 130 °C + 10 d 40 °C	1.7	-
10 % ethanol	2 h 130 °C + 10 d 40 °C	1.1	0.9
50 % ethanol	2 h 130 °C + 10 d 40 °C	3.9	-
Olive oil	2 h 130 °C + 10 d 40 °C	< 2	-
n-heptane	2 h 65 °C	0.8	0.6

3. Analysis of the migrates

	Simulants	t/T-conditions	Results
Phenols	3 % acetic acid	2 h 130 °C + 10 d 60 °C	n.d. (< 0.02 mg/dm <sup>2</sup> )
	50 % ethanol	2 h 130 °C + 10 d 60 °C	0.01 mg/dm <sup>2</sup>
Formaldehyde	3 % acetic acid	2 h 130 °C + 10 d 60 °C	n.d.p.*
	50 % ethanol	2 h 130 °C + 10 d 60 °C	n.d. (< 0.03 mg/dm <sup>2</sup> )

n.d. = not detectable

\*n.d.p. = no determination possible; interference by corrosion

The results of further specific migration tests are mentioned in our test report STWC15-025 of February 13, 2015.

4. Extraction test of the lacquer film

The results of the test on residual substances in the lacquer film are mentioned in our test report STWC15-025 of February 13, 2015.

5. Sensory evaluation

Simulant t/T conditions	Surface/volume ratio	Appearance	Odour	Flavour
Tap water 2 h 130 °C + 10 d 40 °C	1 cm <sup>2</sup> : 2 ml	-*	0.8	1.8

\* interference by corrosion occurred

0 = no deviation detectable

1 = deviation slightly detectable

2 = slight deviation

3 = considerable deviation

4 = strong deviation

## EVALUATION

Based on a surface to volume ratio of 6 dm<sup>2</sup>/1 kg the following statement can be made:

### 1. Overall migration

The dry residues of the migrates are low and well below the limit mentioned in Resolution AP (2004) 1 of the Council of Europe. This applies to the overall migrates as well as to their chloroform soluble parts. They are also lower than the limits mentioned in 21 CFR 175.300 of the US FDA Regulations concerning resinous coatings.

### 2. Analysis of the migrates

The analysis of the migrates showed no specific migration of phenols, formaldehyde and the tested starting substances which may give reason for concerns.

### 3. Extraction test of the lacquer film

According to the examination of the lacquer film residues of the starting substances were not detectable or detectable in small amounts which give no reason for concerns.

### 4. Sensory evaluation

The sensory evaluation showed no deviation which could give reason for doubts concerning creation of off-odours or off-flavours in food. Also there was no diffusion of colours and/or turbidity detectable.

According to the results of our evaluation the system **PPG6650-401/A Beige Basecoat with PPG6250-402/A Beige Adhesive Lacquer** complies with regard to its composition and the migration properties with requirements of §§ 30 and 31 (1) of the Lebensmittel- und Futtermittelgesetzbuch (LFGB) (German Law Book on Foodstuff and Feeds) and Art 3 of Regulation (EC) No 1935/2004.

The lacquer system complies with requirements of 21 CFR 175.300 of the US FDA Regulations taking the above mentioned restriction into account that the coating must not be used in contact with alcoholic food, provided that the polycyclic aromatic hydrocarbon content from the solvents is limited to a technologically unavoidable amount.

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Under conditions of appropriate application and under circumstances of destined and expected use it does not add any particles and/or components to food which are harmful to human health, which alter odour or flavour of food.

  
INSTITUT NEHRING GmbH

Dr. Ulrich Nehring  
Gener | Manager



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