

DAP-PL-1524.64

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LGA QualiTest GmbH Postfach 3022 90014 Nürnberg

**Test Report**

AKEMI Erich Höntsch GmbH  
Herrn Zimmermann  
Postfach 610163  
90221 Nürnberg

No.: 5641061-4  
- Original -

Customer: addressee

Assignment from: 12.02.2004

Scope of assignment: analysis of a surface treatment substance

Samples received on: 12.02.2004

Test period: 23.03.2004 – 08.03.2004

No. of enclosures: -

The test results apply to the analysed samples only.  
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a company of the LGA® Group  
(LGA – corporation under public law)

On 12<sup>th</sup> March 2004 LGA QualiTest GmbH received stone slabs from the customer which had been treated with the following surface treatment substance:

#### AKEMI Colour Intensifier

Stone slabs which had not been treated served as reference material.

In addition, 100 ml of the surface treatment substance was placed at our disposal.

To determine the range of testing, the formula of the employed substances together with the information about their proportional composition and the respective safety data sheets were submitted.

As requested, tests were also carried out to establish whether the treated stones could be used in contact with food.

#### Method of testing

##### Testing the stone for migration using isooctane:

The treated and untreated slabs were exposed to isooctane acting as an oil simulant over a period of 5 hours at a temperature of 20° C.

Subsequently the migrate was used for the following analyses:

Determination of the global migration:

The migrate was bled at a temperature of 105° C and then dried. The residue was gravimetrically analysed.

Determination of the polycyclical aromatic hydrocarbons:

The analysis was carried out by means of gas chromatography (GC-MSD)

Determination of organically-bonded fluorine compounds:

The migrate was burned using the Wickbold combustion apparatus and analysed in the obtained solution by means of ion-sensitive electrodes.

##### Testing the stone for migration using acetic acid:

The treated and untreated slabs were exposed to a 3% acetic acid solution over a period of 24 hours at a temperature of 40° C.

Afterwards the migrate was used for the following analyses:

Determination of organically-bonded fluorine compounds:

The migrate was burned using the Wickbold combustion apparatus and analysed in the obtained solution by means of ion-sensitive electrodes.

##### **Testing the surface treatment substance:**

Testing for tin-organic compounds:

The sample was extracted using a methanolic potash lye. The extract was then adjusted to pH 4.5 and converted with sodium tetraethylborate. After extraction with n-hexane, the organic phase was analysed by means of gas chromatography (GC-MSD).

Testing for benzene-toluene-xylenes:

The analysis was carried out by means of gas chromatography (GC-FID) after the sample had been diluted with n-pentane.

Results of the examination:

Analysis of the stone slabs:

parameters	ratio	result
global migration	mg/dm <sup>2</sup>	1.2
organic fluorine compounds in acetic acid	mg/dm <sup>2</sup>	< 0.03
in isooctane migrate	mg/dm <sup>2</sup>	< 0.03

Analysis in overview:

The migration of substances was lower than the analytic determination threshold.

Release of polycyclical aromatic hydrocarbons:

compound	ratio	result
naphthalene	mg/dm <sup>2</sup>	< 0.02
2-methylnaphthalene	mg/dm <sup>2</sup>	< 0.02
1-methylnaphthalene	mg/dm <sup>2</sup>	< 0.02
acenaphthylene	mg/dm <sup>2</sup>	< 0.02
acenaphthene	mg/dm <sup>2</sup>	< 0.02
fluorene	mg/dm <sup>2</sup>	< 0.02
phenanthrene	mg/dm <sup>2</sup>	< 0.02
anthracene	mg/dm <sup>2</sup>	< 0.02
fluoranthene	mg/dm <sup>2</sup>	< 0.02
pyrene	mg/dm <sup>2</sup>	< 0.02
chrysene	mg/dm <sup>2</sup>	< 0.02
benzo(a)anthracene	mg/dm <sup>2</sup>	< 0.02
benzo(bk)fluoranthene	mg/dm <sup>2</sup>	< 0.02
benzo(a)pyrene	mg/dm <sup>2</sup>	< 0.02
dibenzo(ah)anthracene	mg/dm <sup>2</sup>	< 0.02
indeno(cd)pyrene	mg/dm <sup>2</sup>	< 0.02
benzo(ghi)perylene	mg/dm <sup>2</sup>	< 0.02

Analysis of the surface treatment substance:

Determination of the tin-organic compounds:

substance	ratio	result
monobutyltin (MBT)	mg/kg	< 0.005
dibutyltin (DBT)	mg/kg	0.069
tributyltin (TBT)	mg/kg	< 0.005
tetrabutyltin (TTBT)	mg/kg	< 0.005
mono-octyltin (MOT)	mg/kg	< 0.005
dioctyltin (DOT)	mg/kg	< 0.005
tricyclohexyltin	mg/kg	< 0.005

Determination of the BTX aromatics:

substance	ratio	
benzene	mg/kg	<0.5
toluene	mg/kg	8.0
ethylbenzene	mg/kg	<0.5
m- and p-xylene	mg/kg	<0.5
o-xylene	mg/kg	<0.5
isopropylbenzene	mg/kg	<0.5
n-propylbenzene	mg/kg	<0.5

Evaluation:

One of the reasons for the analysis of the sample was to establish whether the substance was suitable for treating stone slabs which may come into contact with foodstuffs.

As the analysis showed, the value for global migration was far below the threshold value set down for coated food contact commodities.

A migration of organic fluorine compounds or polycyclic aromatic compounds could not be detected. In the specific analysis a migration of substances could also not be detected.

In the product itself traces of tin-organic compounds could be detected, but these can be considered as irrelevant from a toxicological point of view.

Although small traces of BTX aromatics could be measured in the surface treatment substance, it concerns a compound which is extremely volatile. If sufficient time is allowed for volatilization, a migration of amounts of toxicological relevance is not to be expected.

If sufficient time is allowed for volatilization, there are thus no objections against using the surface treatment substance for stone slabs which come into contact with foodstuffs.

Nuremberg, 8<sup>th</sup> April 2004

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