Test Report F 151366.1
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Applicant: L´Isolante K-Flex S.p.A.
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Application re: Testing of the insulating material with the designation
"K-Flex IN CLAD"
for water extractable chloride-, fluoride-, silicate- and sodium-ions as well as the pH-value
of the aqueous extract according to DIN EN 13468

Material tested: One section of a grey plate with a thickness of approximately 1 mm

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to textual, grammatical, semantical, hermeneutical of linguisticual provisions to this English
research report – in particular within legal procedures – MPA Darmstadt reserves the right
of explanation in German language.

Sampling: The test material was transferred by the applicant.

Samples received: 2015/09/03
Date of the testing: 2015/09/07 till 2015/09/21
Sample whereabouts: The test material will be disposed after three month.

Staatliche Materialprüfungsanstalt Darmstadt
Werkstoffanalytik
Grafenstraße 2, 64283 Darmstadt

Date of issue: 2015/09/22  Sign: F/F5/Pu/Hl

Managing Director
by proxy Dr.-Ing. Casper Pusch

Official in charge
Dr.-Ing. Rainer Hill

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Staatliche Materialprüfungsanstalt Darmstadt.
1 Object of the Testing

The task was to determine the content of water extractable chloride-, fluoride-, silicate- and sodium-ions of a foamed insulation material labelled „K-Flex IN CLAD”, as well as the pH-value of the aqueous extract according to DIN EN 13468 „Thermal insulating products for building equipment and industrial installations – Determination of trace quantities of water soluble chloride, fluoride, silicate and sodium ions and pH”, issued December 2001.

The following sample material was forwarded by the applicant for the purpose of testing:

➢ one section of a grey plate with a thickness of approximately 1 mm without any further specifications

2 Performance of the Testing

Determination of water-extractable chloride-, fluoride-, silicate- and sodium-ions as well as of the pH value of the aqueous extracts

The extraction was done with 400 ml of deionised water on a section of the insulation material with a weight of 7.5 g according to DIN EN 13468, Table 1, at a testing temperature of 100 °C on terms of 30 minutes.

The determination of chloride was done by means of titration according to section 7.2.2.3 and fluoride was done with spectrophotometry due to section 7.2.3.4 of the European standard.

The determination of the silicate- and sodium-content of the extract was done by means of atom-emission-spectrometry with inductively coupled plasma (ICP-AES) according to sections 7.2.4.3 respectively 7.2.5.3 of the mentioned European standard.

The pH-value was measured with a pH-meter due to section 7.2.6 of the European standard.

3 Results

The testings according to section 2 of this report of the sample “K-Flex IN CLAD” yielded the following levels, expressed in table 1 (referring to the amount of the tested material).

<table>
<thead>
<tr>
<th>Table 1: Measured values of the aqueous extracts</th>
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<tbody>
<tr>
<td>Parameter</td>
</tr>
<tr>
<td>Sodium expressed as Na⁺</td>
</tr>
<tr>
<td>Silicate expressed as SiO₃²⁻</td>
</tr>
<tr>
<td>Chloride expressed as Cl⁻</td>
</tr>
<tr>
<td>Fluoride expressed as F</td>
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<tr>
<td>pH-value</td>
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</tbody>
</table>
4 Assessment

Concerning the assessment of the testing results there are no general specifications available neither in the above-mentioned European standard nor in DIN EN 14304 “Thermal insulation products for building equipment and industrial installations – Factory made flexible elastomeric foam (FEF) products – Specification”, issue March 2010.

In fact in section 4.3.6 „small amounts of water soluble ions and pH-value“ of DIN EN 14304 is mentioned that the producer has to specify the amounts of the named parameters. Thereby the fluoride- and chloride-content must not exceed the specified value, whereas the sodium- and silicate-content must not fall below the specified value. The pH-value must not differ more than 1.0 units from the specified value.

The specified value of the tested product is not known to the official in charge. Therefore it is not possible to determine whether the product fulfills the requirements.