



**Fraunhofer**

**TESTED<sup>®</sup>  
DEVICE**

igus GmbH  
Igumid TE

**Report No. IG 2110-1268**

DUPLICATE

Statement of  
Qualification

Single product  
Outgassing Behavior  
Ammonia

Customer	igus GmbH Spicher Strasse 1a 51147 Cologne Germany
Component tested	
Category:	Materials
Subcategory:	Plastics
Product name:	Tile made from igumid TE material (manufacturing date: 7/13/2021; color: black; article number: MAT0060008)

Emission chamber measurements with impingement in combination with ion chromatography (IC)

Standards/Guidelines:	ISO 14644-8, -15; VDI 2083 Part 17; VDI 2452 Part 1 (impinger); ISO 14911 (cations) The norms stated generally refer to the version valid at the time of the tests.
Testing equipment:	<ul style="list-style-type: none"><li>Measuring station:.....Metrohm Professional IC 850</li><li>Sampling chamber:.....Markes International µCTE</li></ul>
Sample storage:	<ul style="list-style-type: none"><li>Pre-conditioning:<ul style="list-style-type: none"><li>Cleanroom Air Cleanliness Class (according to ISO 14644-1):.....ISO 1</li><li>Airflow velocity:.....0.45 m/s</li><li>Airflow type:..... vertical laminar flow</li><li>Temperature: .....22 °C ± 0.5 °C</li><li>Relative humidity: ..... 45 % ± 5 %</li><li>Purified air: ..... VOC-filtered</li></ul></li></ul>
Test procedure parameters:	Outgassing test temperatures: ..... 23 °C and 90 °C

Test result / Classification	The outgassing behavior of the tile made from igumid TE material the stated temperatures was investigated according to VDI 2083 Part 17 and ISO 14644-15. Based on the outgassing rates determined for the specific surfaces, the following material classification was made for the corresponding Contaminant Category:
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Contaminat Category (x)	SER <sub>a</sub> <sup>1)</sup> 23 °C [g/m²s]	SER <sub>a</sub> <sup>1)</sup> 90 °C [g/m²s]	ISO-ACC <sub>m</sub> Class (x) based on 23 °C
Ammonia (NH <sub>3</sub> )	< 2.9 x 10 <sup>-9</sup>	1.2 x 10 <sup>-8</sup>	< -8.5

<sup>1)</sup>SER<sub>a</sub>: Area-specific emission rate

The measuring devices used for the qualification tests are calibrated at regular intervals; their results can be traced back to national and international standards. In cases where no national standards exist, the test procedure implemented complies with the technical regulations and norms applicable at the time of the test. The relevant documentation can be viewed on request at any time.

Detailed information and parameters of the test environment can be found in the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA	IG 2110-1268 Report No. first document	Stuttgart, January 21, 2022 Place, date of first document issued
Department of Ultraclean Technology and Micromanufacturing	-- Report No. current document	-- Place, current date
Nobelstrasse 12 70569 Stuttgart Germany	on behalf of Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA	