



**Fraunhofer**

**TESTED<sup>®</sup>  
DEVICE**

Ziehl-Abegg SE  
PA6-GF30 blue

**Report No. ZI 1709-953**

DUPLICATE

Statement of  
Qualification

Outgassing Behavior  
Inorganic Acids

# Statement of Qualification

**Customer**  
 Ziehl-Abegg SE  
 Heinz-Ziehl-Strasse 1  
 74653 Künzelsau  
 Germany

**Component tested**

Category: Materials  
 Subcategory: Plastics  
 Product name: PA6-GF30 blue  
 (manufacturing date: 7/20/2017; color: blue; serial number: 00412286)

## Emission chamber measurements with gas impaction in combination with ion chromatography (IC)

Standards/Guidelines: ISO 14644-8; ISO/DIS 14644-15; VDI 2452 Part 1 (impinger); ISO 10304-1 (anions); VDI 2083 Part 17  
 The norms stated generally refer to the version valid at the time of the tests.

Test devices:
 

- Measuring station:.....Metrohm Professional IC 850
- Sampling chamber:.....Markes International µCTE

Sample storage:
 

- Age of sample: .....63 days
- Pre-conditioning
  - Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1
  - Airflow velocity: .....0.45 m/s
  - Airflow type:..... vertical laminar flow
  - Temperature: .....22 °C ± 0.5 °C
  - Relative humidity: ..... 45 % ± 5 %
  - Purified air: ..... VOC-filtered

Test procedure parameters: Outgassing test temperatures: ..... 23 °C and 90 °C

## Test result / Classification

The outgassing behavior of PA6-GF30 blue at the stated temperatures was investigated according to VDI 2083 Part 17. Based on the outgassing rates determined for the specific surfaces, the following material classification was made for the corresponding Contaminant Category:

Contaminant Category (x)	SER <sub>a</sub> <sup>1)</sup> 23 °C [g/m <sup>2</sup> s]	SER <sub>a</sub> <sup>1)</sup> 90 °C [g/m <sup>2</sup> s]	ISO-ACC <sub>m</sub> Class (x) based on 23 °C
Fluoric acid (HF)	< 2.9 x 10 <sup>-9</sup>	4.8 x 10 <sup>-9</sup>	< -8.5
Hydrochloric acid (HCl)	< 2.9 x 10 <sup>-9</sup>	< 2.9 x 10 <sup>-9</sup>	< -8.5
Hydrobromic acid (HBr)	< 2.9 x 10 <sup>-9</sup>	< 2.9 x 10 <sup>-9</sup>	< -8.5
Nitric acid (HNO <sub>3</sub> )	< 2.9 x 10 <sup>-9</sup>	3.0 x 10 <sup>-9</sup>	< -8.5
Phosphoric acid (H <sub>3</sub> PO <sub>4</sub> )	< 2.9 x 10 <sup>-9</sup>	< 2.9 x 10 <sup>-9</sup>	< -8.5
Sulfuric acid (H <sub>2</sub> SO <sub>4</sub> )	< 2.9 x 10 <sup>-9</sup>	< 2.9 x 10 <sup>-9</sup>	< -8.5

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

The detection limit at the time of the test was ISO-ACC<sub>m</sub> Class = -8.5 (NH<sub>3</sub>). The ISO-ACC<sub>m</sub> Class (x) was assigned for the named contaminat categories at the test temperature of 23 °C (room temperature).

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

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Department of Ultraclean Technology and Micromanufacturing

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on behalf of   
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