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ebm-papst Mulfingen
Impeller Radical PPGF40
Report No. EB 1703-895

Statement of
Qualification

Outgassing Behavior
Inorganic Acids

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Statement of Qualification

Customer

ebm-papst Mulfingen GmbH & Co. KG
Bachmühle 2
74673 Mulfingen
Germany

Component tested

Category: Materials

Subcategory: Plastics

Product name: Impeller Radical PPGF40 Size 400*-1-3233
(manufacturing date: 4/2016; color: black; serial number: 40310-1-3233)

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

Standards/Guidelines: ISO 14644-8; VDI 2452 (Impinger); ISO 10304-1 (Anionen); 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: .....8 months

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

Test result / Classification

The outgassing behavior of the material sample from the Impeller Radical PPGF40 Size 400*-1-3233 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 substance group:

Substance Group (x)	**SER[1] 23 °C** [g/m²s]	**SER[1] 90 °C** [g/m²s]	**ISO-ACC$_m$ class** (x) based on 23 °C
Fluoric acid (HF)	6.1×10^{-10}	$< 5.8 \times 10^{-10}$	-9.2
Hydrochloric acid (HCl)	2.2×10^{-9}	2.5×10^{-9}	-8.7
Hydrobromic acid (HBr)	2.9×10^{-9}	1.1×10^{-9}	-8.5
Nirtric acid (HNO_3)	2.5×10^{-9}	2.1×10^{-9}	-8.6
Phosphoric acid (H_3PO_4)	$< 5.8 \times 10^{-10}$	2.3×10^{-9}	< -9.2
Sulfuric acid (H_2SO_4)	1.3×10^{-9}	9.0×10^{-10}	-8.9

[1] SER: Surface Specific Emission Rate

If the above-mentioned substance groups cannot be detected, the lower detection limit of the system is stated (< VALUE).

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.

For further information about the test environment and parameters, please refer to the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

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Place, current date

on behalf of
Frank Bürger, Project Manager Fraunhofer IPA

DUPLICATE