



valid until: April 24, 2029

Fraunhofer

TESTED[®] DEVICE

ebm-papst
Fan impeller Scolefin 34 G14-9
Report No. EB 2403-1502

DUPLICATE

Statement of
Qualification

Single product
Outgassing Behavior
Inorganic Acids

Statement of Qualification · Single product

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

Component tested

Category: Materials
 Subcategory: Plastics
 Product name: Fan impeller Scolefin 34 G14-9
 (manufacturing date: 8/2022; color: black; serial number: 8217101676)

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

Standards/Guidelines: ISO 14644-8, -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:

- 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 the material of the Fan impeller Scolefin 34 G14-9 at 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:

Contaminant Category (x)	SER _a ¹⁾ 23 °C [g/m ² s]	SER _a ¹⁾ 90 °C [g/m ² s]	ISO-ACC _m Class (x) based on 23 °C
Fluoride (HF)	< 2.9 x 10 ⁻⁹	< 2.9 x 10 ⁻⁹	< -8.5
Chloride (HCl)	< 2.9 x 10 ⁻⁹	< 2.9 x 10 ⁻⁹	< -8.5
Bromide (HBr)	< 2.9 x 10 ⁻⁹	< 2.9 x 10 ⁻⁹	< -8.5
Nitrate (HNO ₃)	< 2.9 x 10 ⁻⁹	< 2.9 x 10 ⁻⁹	< -8.5
Phosphate (H ₃ PO ₄)	< 2.9 x 10 ⁻⁹	< 2.9 x 10 ⁻⁹	< -8.5
Sulfate (H ₂ SO ₄)	< 2.9 x 10 ⁻⁹	< 2.9 x 10 ⁻⁹	< -8.5

¹⁾SER_a: 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

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Stuttgart, April 24, 2024

Place, date of first document issued

Department of Ultraclean Technology and Micromanufacturing


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Nobelstrasse 12
 70569 Stuttgart
 Germany

on behalf of 
 Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA