



valid until: September 15, 2028

Fraunhofer

TESTED[®] DEVICE

Knauf Ceiling Solutions
THERMATEX Alpha
Report No. KN 2308-1449

DUPLICATE

Statement of
Qualification

Single product
Particle Emission

Statement of Qualification · Single product

Customer
 Knauf Ceiling Solutions GmbH & Co. KG
 Elsenthal 15
 94481 Grafenau
 Germany

Component tested

Category: Cleanroom Facilities
 Subcategory: Wall/Ceiling/Floor/Door
 Product name: Mineral ceiling tile THERMATEX Alpha
 (manufacturing date: 6/6/2023; dimensions: 600 x 600 x 19mm; article number: 713559)

Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines: ISO 14644-1, -14
 The norms stated generally refer to the version valid at the time of the tests.

Test devices: Optical particle counter:
 LasAir II 110 and LasAir III 110 with measuring ranges $\geq 0.1 \mu\text{m}$, $\geq 0.2 \mu\text{m}$, $\geq 0.3 \mu\text{m}$, $\geq 0.5 \mu\text{m}$, $\geq 1.0 \mu\text{m}$ and $\geq 5.0 \mu\text{m}$

Test environment parameters:

- Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1
- Airflow velocity:.....0.45 m/s
- Airflow pattern:..... vertical laminar flow
- Temperature:22 °C \pm 0.5 °C
- Relative humidity: 45 % \pm 5 %

Test procedure parameters: The ceiling system was subjected to stress as follows:

- Structure-borne noise: approx. 50 Hz
- Oscillation velocity (\emptyset):.....v = 4.6060 mm/s
- Oscillation acceleration (\emptyset):.....a = 1.5177 m/s²
- Deflection of the system (\emptyset):..... s = 0.0559 mm

Test result / Classification

When operated under the specified test conditions, the mineral ceiling tile THERMATEX Alpha is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Class according to ISO 14644-1:

Test parameter(s)	Air Cleanliness Class
Structure-borne noise = approx. 50 Hz	4
Overall result	

It should be noted that cleanrooms of class 1 to 5 according to ISO 14644-1 have a higher filter occupancy, which may restrict the use of flat ceiling systems. Cleanrooms with a horizontal displacement flow form an exception to this.
 The test result may be affected by the surrounding ceiling system, in particular the material pairing between luminaire frame and ceiling system, as well as other mounting accessories. Particle emission behavior should be reassessed in each assembly situation.

The cut edges/backside of the PO05 consist of very porous material. This is to be considered critical in clean/hygienic areas.

Please note: Transport damages, incorrect installation, aging behavior, corrosion etc. can influence the test result.

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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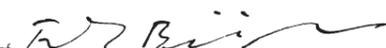
Stuttgart, June 28, 2018
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Department of Ultraclean Technology and Micromanufacturing

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on behalf of 
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