



Fraunhofer

**TESTED[®]
DEVICE**

Ritterwand GmbH & Co. KG
luminaire FK 498.62.5090
Report No. RI 1606-832

DUPLICATE

Statement of
Qualification

Particle Emission

Statement of Qualification

Customer Ritterwand GmbH & Co. KG
Metall-Systembau
Rösseweg 5-7
71154 Nufringen
Germany

Component tested

Category: Cleanroom Facilities

Subcategory: Lighting Systems

Product name: luminaire Ritterwand FK 498.62.5090
(manufacturing date: 19/1/2016; color: white (RAL 9010);
article number: 498625090)

Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines: VDI 2083-9.1; ISO 14644-1
The norms stated generally refer to the version valid at the time of the tests.

Test devices: Optical particle counter:
LasAir II 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: $22^\circ\text{C} \pm 0.5^\circ\text{C}$
- Relative humidity: $45\% \pm 5\%$

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

- Structure-borne noise: approx. 5 to 50 Hz
- Oscillation velocity (\emptyset):..... $v = 14 \mu\text{m/s}$
- Oscillation acceleration (\emptyset):..... $a = 7 \text{ mm/s}^2$
- Deflection of the system (\emptyset):..... $s = 0.04 \mu\text{m}$

Test result / Classification

When operated under the specified test conditions, the system recessed luminaire Ritterwand FK 498.62.5090 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. 5 to 50 Hz	1
Overall result	1

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 panel lighting 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 lights and ceiling frames, as well as other mounting accessories. Particle emission behavior should be reassessed in each assembly situation.

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, date of first document issued

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Place, current date

on behalf of 
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