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**TESTED[®]
DEVICE**

TRILUX GmbH & Co. KG

Fidesca-PM 50121564

Report No. TR 1512-797

DUPLICATE

Statement of
Qualification

Particle Emission

Statement of Qualification

Customer	TRILUX GmbH & Co. KG Heidestrasse 4 59759 Arnsberg Germany
Component tested	
Category:	Cleanroom Facilities
Subcategory:	Lighting Systems
Product name:	Surface-mounted cleanroom luminaire Fidesca-PM 412/1548 LED12400-940 ETDD, Fidesca-PM 50121564 (manufacturing date: 11/13/2015; color: white; serial number: 6298451)

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 $\geq 0.1\text{ }\mu\text{m}$, $\geq 0.2\text{ }\mu\text{m}$, $\geq 0.3\text{ }\mu\text{m}$, $\geq 0.5\text{ }\mu\text{m}$, $\geq 1.0\text{ }\mu\text{m}$ and $\geq 5.0\text{ }\mu\text{m}$
Test environment parameters:	<ul style="list-style-type: none">Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1Airflow velocity:.....0.45 m/sAirflow pattern:..... vertical laminar flowTemperature:22 °C \pm 0.5 °CRelative humidity: 45 % \pm 5 %
Test procedure parameters:	The luminaire was subjected to stress as follows: <ul style="list-style-type: none">Structure-borne noiseapprox. 5 to 50 HzOscillation velocity (\varnothing):..... v = 9 $\mu\text{m/s}$Oscillation acceleration (\varnothing):..... a = 3 mm/s²Deflection of the system (\varnothing):.....s = 0.03 μm

Test result / Classification

When operated under the specified test conditions, the surface-mounted cleanroom luminaire Fidesca-PM 412/1548 LED12400-940 ETDD 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 = 5 to 50 Hz	1
Overall result	1

It must be pointed out, that according to ISO 14644-1 cleanrooms classes 1 to 5 have a high filter occupancy, with the result that large-surface lighting systems cannot be used in some cases. Cleanrooms with a horizontal displacement flow form an exception to this.

The test result may be influenced by the surrounding ceiling system, in particular the material pairing between the light and ceiling frame, as well as other assembly accessories. Particle emission behavior should be re-assessed in the respective 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.

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Department of Ultraclean Technology and Micromanufacturing	-- <small>Place, current date</small>
Nobelstrasse 12 70569 Stuttgart Germany	on behalf of  <small>Frank Bürger, Project Manager Fraunhofer IPA</small>