



Fraunhofer

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DEVICE

Teamtronic
In-line_9575_ISO_1800
Report No. TE 2502-1593

DUPLICATE

Statement of
Qualification

Single product
Particle Emission
in Cleanroom
(atmospheric)

Customer	Teamtronic A/S Kratholmvej 27B 5260 Odense S Denmark
Tested product	
Category:	Cleanroom Facilities
Subcategory:	Lighting Systems
Product name:	In-line_95-75_ISO_1800mm_PRM_RAL9016 (manufacturing date: 1/8/2025; color: RAL9016; size: 1800 x 93 x 78 mm; article number: 5704059312262)

Random sampling of particle emissions (airborne) at representative sites in cleanroom under atmospheric conditions

Standards/guidelines:	ISO 14644-1, -14 The norms stated generally refer to the version valid at the time of the tests.
Test equipment:	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 - Room temperature: $22^\circ\text{C} \pm 0.5^\circ\text{C}$ - Relative humidity: $45\% \pm 5\%$
Test procedure parameters:	The luminaire was subjected to stress as follows: - Structure-borne noise: approx. 50 Hz - Oscillation velocity ($\varnothing$):..... $v = 1.4194 \text{ mm/s}$ - Oscillation acceleration ($\varnothing$):..... $a = 0.4836 \text{ m/s}^2$ - Deflection of the system ($\varnothing$):..... $s = 0.0391 \text{ mm}$

Test result / Classification

When operated under the specified test conditions (room temperature: $22^\circ\text{C} \pm 0.5^\circ\text{C}$; relative humidity: $45\% \pm 5\%$), the luminaire In-line_95-75_ISO_1800mm_PRM_RAL9016 is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Class according to ISO 14644-1:

Test parameter(s)	Air Cleanlines Class
Structure-borne noise = approx. 50 Hz	1
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 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.

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	TE 2502-1593 Report No. first document	Stuttgart, May 28, 2025 Place, date of first document issued
Department of Ultraclean Technology and Micromanufacturing	-- Report No. current document	-- Place, current date
Nobelstrasse 12 70569 Stuttgart Germany	on behalf of Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA	