



Fraunhofer

**TESTED[®]
DEVICE**

igus GmbH
SKS28.068.02.1 e-skin soft + cable
Report No. IG 1907-1125

DUPLICATE

Statement of
Qualification

Single product
Particle Emission

Customer	igus GmbH Spicher Strasse 1a 51147 Köln Germany
Component tested	
Category:	Energy Supply
Subcategory:	Cable Systems
Product name:	SKS28.068.02.1 e-skin soft + CF SOFT (manufacturing date: 5/20/2019; color: white; serial number: SKS28.068.02.1)

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 $\geq 0.1\text{ }\mu\text{m}$, $\geq 0.2\text{ }\mu\text{m}$, $\geq 0.3\text{ }\mu\text{m}$, $\geq 0.5\text{ }\mu\text{m}$, $\geq 1.0\text{ }\mu\text{m}$ 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:	<ul style="list-style-type: none">Bending radius:r = 100 mmStroke length:..... s = 820 mmParameter Set 1:.....v₁ = 0.5 m/s; a₁ = 1.0 m/s²Parameter Set 2:.....v₂ = 1.0 m/s; a₂ = 2.0 m/s²Parameter Set 3:.....v₃ = 2.0 m/s; a₃ = 4.0 m/s²

Test result / Classification	When operated under the specified test conditions, the energy supply system SKS28.068.02.1 e-skin soft + CF SOFT is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Classes according to ISO 14644-1:
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Test parameter(s)	Air Cleanlines Class
v ₁ = 0.5 m/s; a ₁ = 1.0 m/s ²	1
v ₂ = 1.0 m/s; a ₂ = 2.0 m/s ²	1
v ₃ = 2.0 m/s; a ₃ = 4.0 m/s ²	1
Overall result	1

Please note: Transport damage, incorrect installation, oil leakage, aging behavior and 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	IG 1907-1125 Report No. first document	Stuttgart, August 23, 2019 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	