



Fraunhofer

**TESTED[®]
DEVICE**

igus GmbH
SKS20+TR.CSCS
Report No. IG 2303-1401

DUPLICATE

Statement of
Qualification

Single product
Particle Emission

Customer

igus GmbH
Spicher Strasse 1a
51147 Cologne
Germany

Component tested

Category:

Energy Supply

Subcategory:

Cable Guiding Systems

Product name:

Clean SCARA Cable Solution with e-skin soft SKS20
(manufacturing date: 1/26/2023; color: white; article number:
SKS20.033.02.1 + TR.CSCS.20.01.16.48.01.1 + TR.CSCS.20.02.40.01.1;
serial number: SKS20 + TR.CSCS)

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:

- Production hall from igus GmbH in a cleanroom box
- Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1
- Airflow velocity:.....0.45 m/s
- Airflow pattern:.....vertical low-turbulence displacement airflow
- Temperature:22 °C \pm 0.5 °C
- Relative humidity:45 % \pm 5 %

Test procedure parameters:

- Minimal bending radius:..... r_{min} = 100 mm
- Maximal bending radius: r_{max} = 180 mm
- Stroke length:.....s = 750 mm
- Parameter Set 1:..... v_1 = 0.5 m/s; a_1 = 1.0 m/s²
- Parameter Set 2:..... v_3 = 2.0 m/s; a_3 = 4.0 m/s²

Test result / Classification

When operated under the specified test conditions, the Clean SCARA Cable Solution with e-skin soft SKS20 is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Classes according to ISO 14644-1:

Test parameter(s)	Air Cleanliness Class
v_1 = 0.5 m/s; a_1 = 1.0 m/s ²	2
v_3 = 2.0 m/s; a_3 = 4.0 m/s ²	1
Overall result	2

Please note: Transport damages, incorrect installation, aging behavior, 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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on behalf of


Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA

Stuttgart, March 7, 2023

Place, date of first document issued

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Place, current date



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