



Fraunhofer

TESTED[®]
DEVICE

IL SAN ELECTRIC WIRE Co., Ltd.
IMOTPEV-S 4C x 24 AWG (0.25SQ)

Report No. IL 2506-1639

DUPLICATE

Statement of
Qualification

Single product
Particle Emission
in Cleanroom
(atmospheric)

Customer	IL SAN ELECTRIC WIRE Co., Ltd. 225-58, Otae-ro 116 beon-gil 27683 Daeso Myeon Eumseong-gun, Chungcheongbuk-do Republic of Korea
Tested product	
Category:	Energy Supply
Subcategory:	Cable Systems
Product name:	IMOTPEV-S 4C x 24 AWG (0.25SQ) (manufacturing date: 4/1/2025; color: black; serial number: 202504-02)

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 $\geq 0.1\text{ }\mu\text{m}$, $\geq 0.2\text{ }\mu\text{m}$, $\geq 0.3\text{ }\mu\text{m}$, $\geq 0.5\text{ }\mu\text{m}$, $\geq 1.0\text{ }\mu\text{m}$ and $\geq 5.0\text{ }\mu\text{m}$
Test environment parameters:	- 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 °C ± 0.5 °C - Relative humidity: 45 % ± 5 %
Test procedure parameters:	- Energy chain: igus E61.29.02.150 - Bending radius:r = 150 mm - Stroke length: s = 820 mm - Parameter Set 1:.....v₁ = 0.5 m/s; a₁ = 1.0 m/s² - Parameter Set 2:.....v₂ = 1.0 m/s; a₂ = 2.0 m/s² - Parameter Set 3:.....v₃ = 2.0 m/s; a₃ = 4.0 m/s²

Test result / Classification	The cable IMOTPEV-S 4C x 24 AWG (0.25SQ) is suitable for use under the specified test parameters (room temperature: 22 °C ± 0.5 °C; relative humidity: 45 % ± 5 %) in cleanrooms 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 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	IL 2006-1160 Report No. first document	Stuttgart, July 3, 2020 Place, date of first document issued
Business unit Testing and Certification	IL 2506-1639 Report No. current document	Stuttgart, July 4, 2025 Place, current date
Nobelstrasse 12 70569 Stuttgart Germany	on behalf of Dr.-Ing. Frank Bürger, head of business unit Testing and Certification	