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DEVICE

LS Cable & System Ltd.
e-Flatek-160401
Report No. LS 1605-824

Statement of
Qualification

Particle Emission

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Statement of Qualification

Customer

LS Cable & System Ltd.
27, Gongdan-ro 140beon-gil
15845 Gunpo-si, Gyeonggi-do
Republic of Korea

Component tested

Category: Energy Supply

Subcategory: Cable Systems

Product name: e-Flatek-160401
(manufacturing date: 1/4/2016; color: white; batch number: 160401-05)

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 110 and LasAir III 110 with measuring ranges ≥ 0.1 µm, ≥ 0.2 µm, ≥ 0.3 µm, ≥ 0.5 µm, ≥ 1.0 µm and ≥ 5.0 µm

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
- Temperature: ..... 22 °C ± 0.5 °C
- Relative humidity: ..... 45 % ± 5 %

Test procedure parameters:

- Energy chain: ..... none
- Bending radius: ..... r = 70 mm
- Stroke length: ..... s = 820 mm
- Cable length: ..... l = 1050 mm
- Parameter set 1: ..... v_1 = 0.5 m/s; a_1 = 1.0 m/s²
- Parameter set 2: ..... v_2 = 1.0 m/s; a_2 = 2.0 m/s²
- Parameter set 3: ..... v_3 = 2.0 m/s; a_3 = 4.0 m/s²

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Test result / Classification

When operated under the specified test conditions, the cable system e-Flatek-160401 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
v_1 = 0.5 m/s; a_1 = 1.0 m/s²	1
v_2 = 1.0 m/s; a_2 = 2.0 m/s²	1
v_3 = 2.0 m/s; a_3 = 4.0 m/s²	1
Overall result	**1**

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.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

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Stuttgart, June 17, 2016
Place, date of first document issued

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Place, current date

on behalf of
Frank Bürger, Project Manager Fraunhofer IPA

This document only applies to the named product in an unchanged state and is valid from the date of issue for a period of 5 years. The document can be verified under **www.tested-device.com**.

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