



Fraunhofer

**TESTED[®]
DEVICE**

Junkosha Inc.
CLEANFLEX T-type
Report No. JU 1309-668

DUPLICATE

Statement of
Qualification

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Customer: Junkosha Inc.
881-1 Ishibashi
Fuefuki-shi, Yamanashi-ken 406-0842
Japan

Component tested:

Category: Energy Supply
Subcategory: Cable Systems
Type: CLEANFLEX T-type (8 units cable, black)

Test results / Classification:
(according to ISO 14644-1)

CLEANFLEX T-type (8 units cable, black) is suitable for use in cleanrooms fulfilling the following Air Cleanliness Class:

Parameters	Air Cleanliness Class
Set 1	1
Set 2	1
Set 3	1
Overall result	1

Random check measurements of particle emission (airborne) at representative points

Test procedure: According to VDI 2083 – 9.1, ISO 14644-1
Each standard stated refers to the version valid at the time of testing.

Measuring instruments: Optical Particle Counter:
Model LasAir II 110 with measuring channels of $\geq 0.1 \mu\text{m}$, $\geq 0.2 \mu\text{m}$, $\geq 0.3 \mu\text{m}$, $\geq 0.5 \mu\text{m}$, $\geq 1.0 \mu\text{m}$ and $\geq 5.0 \mu\text{m}$

Test parameters of the test environment:

- Cleanroom Air Cleanliness Class (according to ISO 14644-1):..... ISO 1
- Air flow velocity:.....0.45 m/s
- Air flow guidance:vertical unidirectional air flow
- Temperature:22 °C \pm 0.5 °C (71.6 °F \pm 0.9 °F)
- Relative humidity: 45 % \pm 5 %

Test parameters of the test execution:

- Energy chain:..... none
- Effective length of the sample: l=800 mm
- Bending radius of the sample: r=90 mm
- Stroke length:.....s=820 mm
- Parameter set 1: $v_1=0.5 \text{ m/s}$; $a_1=1.0 \text{ m/s}^2$
- Parameter set 2: $v_2=1.0 \text{ m/s}$; $a_2=2.0 \text{ m/s}^2$
- Parameter set 3: $v_3=2.0 \text{ m/s}$; $a_3=5.0 \text{ m/s}^2$

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The measuring equipment used for the qualification is regularly calibrated and is based on national and international standards. In the case where no national standards exist, the measuring procedure used corresponds with technical regulations and norms valid at the time of the measurement. The documents drawn up for this procedure are available for viewing.

The validity of this certificate applies only to the mentioned product in this particular condition for a duration of 5 years.
Further information: www.tested-device.com.

Fraunhofer Institute for
Manufacturing Engineering and Automation IPA

Department Ultraclean Technology
and Micromanufacturing

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Germany

Stuttgart, October 22, 2013
Place, Date

[Signature]
i. A. Project manager