IPA

Fraunhofer

TESTED®
DEVICE

Hitachi Cable (HCM)
EcoFlex
Report No. HI 1002-508

DUPLICATE

Statement of
Qualification

Fraunhofer
IPA

Statement of Qualification

Customer:

Hitachi Cable Manchester Inc.
900 Holt Avenue
Manchester, NH 03109
USA

Component tested:

Cable

Type:

EcoFlex

Tests performed:

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

Test parameters:

- Energy chain: igus E6.26.02.250.0.
- Stroke length: 820 mm
- Set of parameters 1: v_1: 0.5 m/s; a_1: 1.0 m/s²
- Set of parameters 2: v_2: 1.0 m/s; a_2: 2.0 m/s²
- Set of parameters 3: v_3: 2.0 m/s; a_3: 5.0 m/s²

Test results / classification:

When the cable is being operated at the above mentioned test parameters 1 and 2, it is suitable for use in cleanrooms fulfilling the Air Cleanliness Class 1 according to ISO 14644-1.
When the cable is being operated at the above mentioned test parameter 3, it is suitable for use in cleanrooms fulfilling the Air Cleanliness Class 2 according to ISO 14644-1.

Test parameters	**Air Cleanliness Class** (in accordance to ISO 14644-1)
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: 5.0 m/s²	3

Standards / guidelines used for the qualification:

VDI 2083 Part 1, 4 and 9.1; ISO 14644-1

Test parameters of the cleanroom environment:

Cleanroom of Air Cleanliness Class ISO Class 1
(according to ISO 14644-1)

Air flow velocity: 0.45 m/s

Air flow guidance: vertical unidirectional air flow from ceiling to floor. (raised floor)

Temperature: 22 °C ± 0.5 °C (71.6 °F ± 0.9 °F)

Relative humidity: 45 % ± 5 %

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.

Fraunhofer
IPA

Fraunhofer Institute
for Manufacturing Engineering
and Automation IPA

Department Ultraclean Technology
and Micromanufacturing

Nobelstrasse 12
70569 Stuttgart
Germany

Stuttgart, February 25, 2010
Place, date

i. A.
Project manager