



Fraunhofer

**TESTED[®]
DEVICE**

HITACHI CABLE, LTD. cable series
RBT V/UL2464(FA)/UL2570(FA)
Report No. HI 0901-470

DUPLICATE

Statement of
Qualification

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Manufacturer of object tested: HITACHI CABLE, LTD.
HITAKA WORKS
5-1-1, Hitaka-cho, Hitachi-shi
IBARAKI-Ken
319-1414-Japan

Component tested: Cable systems

Type: RBT V series:
RBT2-V 2x0.2 mm² (Overall diameter = 4.1 mm)
RBT2-V(SB) 12Px0.2 mm² (Overall diameter = 9.4 mm)
RBT2-V(SB) 20Px0.5 mm² (Overall diameter = 21.0 mm)
UL2464 (FA) series:
UL2464 (FA) 2x28AWG (Overall diameter = 3.7 mm)
UL2464 (FA) 5Px25AWG (Overall diameter = 7.0 mm)
UL2464-SX (FA) 20Px23AWG (Overall diameter = 15.0 mm)
UL2570 (FA) series:
UL2570 (FA) 5x16AWG (Overall diameter = 8.3 mm)
UL2570 (FA) 12x14AWG (Overall diameter = 16.9 mm)

Tests performed: Random sample measurements of particle emission (airborne) at representative points

Test parameters: Stroke length: 820.0 mm
Set of parameters 1 : $v_1 = 0.5 \text{ m/s}$; $a_1 = 1.0 \text{ m/s}^2$
Set of parameters 2 : $v_2 = 1.0 \text{ m/s}$; $a_2 = 2.0 \text{ m/s}^2$
Set of parameters 3 : $v_3 = 2.0 \text{ m/s}$; $a_3 = 5.0 \text{ m/s}^2$

Test results / classification: When the below mentioned test pieces are being operated at the conditions of the following table, they are suitable for use in cleanrooms fulfilling the air cleanliness specifications according to ISO 14644-1.

Type	Air Cleanliness Class (in accordance with ISO 14644-1)		
	$v_1 = 0.5 \text{ m/s}$	$v_2 = 1.0 \text{ m/s}$	$v_3 = 2.0 \text{ m/s}$
RBT2-V 2x0.2 mm ²	ISO Class 1	ISO Class 1	ISO Class 1
RBT2-V(SB) 12Px0.2 mm ²	ISO Class 1	ISO Class 1	ISO Class 1
RBT2-V(SB) 20Px0.5 mm ²	ISO Class 1	ISO Class 1	ISO Class 1
UL2464 (FA) 2x28AWG	ISO Class 1	ISO Class 1	ISO Class 2
UL2464 (FA) 5Px25AWG	ISO Class 1	ISO Class 1	ISO Class 1
UL2464-SX (FA) 20Px23AWG	ISO Class 1	ISO Class 4	ISO Class 4
UL2570 (FA) 5x16AWG	ISO Class 5	ISO Class 5	ISO Class 6
UL2570 (FA) 12x14AWG	ISO Class 5	ISO Class 1	ISO Class 3



Fraunhofer Institut
Produktionstechnik und
Automatisierung

The RBT V series is suitable for its use in cleanrooms fulfilling the specifications of Cleanliness Class ISO Class 1 (according to ISO 14644-1) at a velocity range of 0.5 m/s to 2.0 m/s.

The UL2464 (FA) series and UL2570 (FA) series is suitable for its use in cleanrooms fulfilling the specifications of Cleanliness Class ISO Class 6 (according to ISO 14644-1) at a velocity range of 0.5 m/s to 2.0 m/s.

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.

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Stuttgart, Germany, June 3rd 2009

Place, date

i. A. 
Signature of project manager