



**Fraunhofer**

**TESTED<sup>®</sup>  
DEVICE**

DYDEN CORPORATION  
FH-RMFEV (with Block)  
**Report No. DY 1108-572**

DUPLICATE

Statement of  
Qualification

# Statement of Qualification

**Customer:** DYDEN CORPORATION  
2-15-1 Minami  
830-8511 Kurume-shi, Fukuoka  
Japan

**Component tested:**

Category: Energy Supply  
Subcategory: Cable Systems  
Type: FH-RMFEV (with Block)

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

Test procedure: According to VDI 2083 Part 9.1

Measuring instruments being used: Optical Particle Counter:  
Model LasAir II 110 manufactured by PMS 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: .....  $22^\circ\text{C} \pm 0.5^\circ\text{C}$  ( $71.6^\circ\text{F} \pm 0.9^\circ\text{F}$ )
- Relative humidity: .....  $45\% \pm 5\%$

Test parameters of the test execution:

- Cable length: .....  $l = 1000 \text{ mm}$
- Bending diameter of the chain: .....  $d = 100 \text{ mm}$
- Stroke length: .....  $s = 820 \text{ mm}$
- 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: .....  $v_3 = 2.0 \text{ m/s}$ ;  $a_3 = 5.0 \text{ m/s}^2$

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

The cable FH-RMFEV (with Block) is suitable for use in cleanrooms fulfilling the Air Cleanliness Class 2 when operated at parameter set 1.

The cable FH-RMFEV (with Block) is suitable for use in cleanrooms fulfilling the Air Cleanliness Class 4 when operated at parameter set 2.

The cable FH-RMFEV (with Block) is suitable for use in cleanrooms fulfilling the Air Cleanliness Class 5 when operated at parameter set 3.

Parameters	Classification		
	Velocity $v$ [m/s]	Acceleration $a$ [ $\text{m/s}^2$ ]	Air Cleanliness Class (according to ISO 14644-1)
Set 1	0.5	1.0	ISO 2
Set 2	1.0	2.0	ISO 4
Set 3	2.0	5.0	ISO 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.

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](http://www.tested-device.com).

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Stuttgart, September 19, 2011

Place, Date

*[Signature]*  
i. A.   
Project manager