



Fraunhofer
TESTED[®]
DEVICE
KODUCT Co., Ltd.
KE30/N-W57-R70
Report No. KO 2512-1698

DUPPLICATE

Statement of
Qualification

Single product
Particle Emission
in Cleanroom
(atmospheric)

Statement of Qualification • Single product

Customer

KODUCT Co., Ltd.
58, Nakdongnam-ro 991 beon-gil
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Republic of Korea

Tested product

Category: Energy Supply
Subcategory: Cable Guiding Systems
Product name: KE30/N-W57-R70
(manufacturing date: 10/31/2025; color: black; article number: KE30/N-W57-R70)

Test result / Classification

The cable guiding system KE30/N-W57-R70 is suitable for use under the specified test parameters (room temperature: $22^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$; relative humidity: $45\% \pm 5\%$) in cleanrooms of the following Air Cleanliness Classes according to ISO 14644-1:

Test parameter(s)	Air Cleanliness Class
$v_1 = 0.5 \text{ m/s}; a_1 = 1.0 \text{ m/s}^2$	4
$v_2 = 1.0 \text{ m/s}; a_2 = 2.0 \text{ m/s}^2$	4
$v_3 = 2.0 \text{ m/s}; a_3 = 4.0 \text{ m/s}^2$	4
Overall result	4

Please note: Transport damages, incorrect installation, aging behavior, etc. can influence the test result.

Random sampling of particle emissions (airborne) at representative sites in cleanroom under atmospheric conditions

Standards/guidelines: ISO 14644-1, -14
The norms stated generally refer to the version valid at the time of the tests.

Test equipment: Optical particle counter:
LasAir II 110 and LasAir III 110 with measuring ranges $\geq 0.1 \mu\text{m}$, $\geq 0.2 \mu\text{m}$, $\geq 0.3 \mu\text{m}$, $\geq 0.5 \mu\text{m}$, $\geq 1.0 \mu\text{m}$ and $\geq 5.0 \mu\text{m}$

Test environment parameters:

- Cleanroom Air Cleanliness Class (according to ISO 14644-1): ISO 1
- Airflow velocity: 0.45 m/s
- Airflow pattern: vertical laminar flow
- Room temperature: $22^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$
- Relative humidity: $45\% \pm 5\%$

Test procedure parameters:

- Bending radius: $r = 70 \text{ mm}$
- 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: $v_3 = 2.0 \text{ m/s}; a_3 = 4.0 \text{ m/s}^2$

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.

Detailed information and parameters of the test environment can be found in the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing
Engineering and Automation IPA

KO 2512-1698
Report No. first document

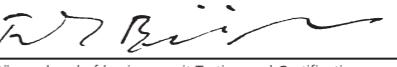
Stuttgart, December 12, 2025
Place, date of first document issued

Business unit
Testing and Certification

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Report No. current document

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Place, current date

Nobelstrasse 12
70569 Stuttgart
Germany

on behalf of 
Dr.-Ing. Frank Bürger, head of business unit Testing and Certification

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