IPA

Cleanroom (atmospheric)

valid until: January 21, 2031

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TESTED® DEVICE

Bosch Rexroth AG
BSHP 25-SNS NRTVG unlubricated
Report No. BO 2511-1694

Statement of Qualification

Single product
Particle Emission in Cleanroom (atmospheric)

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Statement of Qualification · Single product

Customer

Bosch Rexroth AG
Ernst-Sachs-Strasse 100
97424 Schweinfurt
Germany

Tested product

Category: Automation Components

Subcategory: Linear Units

Product name: Standard Ball Rail System BSHP 25-SNS NRTVG (unlubricated, without seal) (manufacturing date: 9/2025; max. stroke: 631 mm; drive used: Linear module with ball screw assembly MKK-080-NN-3; serial numbers: R207C 294 04, R2045 233 31)

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 ≥0.1 µm, ≥0.2 µm, ≥0.3 µm, ≥0.5 µm, ≥1.0 µm and ≥5.0 µm

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 °C ± 0.5 °C
- Relative humidity: 45 % ± 5 %

Test procedure parameters:

- Installation position: horizontal, slide at the top
- Travel length: s = 630 mm
- Test load: none
- Acceleration: a = 10000 mm/s²
- Parameter set 1: ED_1 = 20 %; v_1 = 0.1 m/s; t_1 = 25280 ms
- Parameter set 2: ED_2 = 60 %; v_2 = 0.1 m/s; t_2 = 4213 ms
- Parameter set 3: ED_3 = 60 %; v_3 = 0.4 m/s; t_3 = 1078 ms
- Parameter set 4: ED_4 = 60 %; v_4 = 1.2 m/s; t_4 = 431 ms

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Test result / Classification

The Standard Ball Rail System BSHP 25-SNS NRTVG (unlubricated, without seal) is suitable for use under the specified test parameters (room temperature: 22 °C ± 0.5 °C; relative humidity: 45 % ± 5 %) in cleanrooms of the following Air Cleanliness Classes according to ISO 14644-1:

Test parameter(s)	Air Cleanliness Class
ED_1 = 20 %; v_1 = 0.1 m/s; t_1 = 25280 ms	1
ED_2 = 60 %; v_2 = 0.1 m/s; t_2 = 4213 ms	1
ED_3 = 60 %; v_3 = 0.4 m/s; t_3 = 1078 ms	2
ED_4 = 60 %; v_4 = 1.2 m/s; t_4 = 431 ms	3
Overall result	**3**

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

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.

DUPLICATE

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

Business unit
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-- — Report No. current document
-- — Place, current date

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

This document only applies to the named product in its original state and is valid for a period of 5 years from the date the first document was issued. The document can be verified under **www.tested-device.com**.