



valid until: January 21, 2031

Fraunhofer

TESTED[®]
DEVICE

Bosch Rexroth AG
BSHP 25-SNS NRTVG FKM seal
Report No. **BO 2511-1694**

Statement of
Qualification

Single product
Particle Emission
in Cleanroom
(atmospheric)

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 (lubricated, FKM 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)

Test result / Classification

The Standard Ball Rail System BSHP 25-SNS NRTVG (lubricated, FKM 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	4
ED ₂ = 60 %; v ₁ = 0.1 m/s; t ₂ = 4213 ms	2
ED ₂ = 60 %; v ₂ = 0.4 m/s; t ₃ = 1078 ms	4
ED ₂ = 60 %; v ₃ = 1.2 m/s; t ₄ = 431 ms	5
Overall result	5

Please note: Transport damages, incorrect installation, oil leakage, aging
behavior, corrosion 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 ≥ 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:ED₁ = 20 %; v₁ = 0.1 m/s; t₁ = 25280 ms
- Parameter set 2:ED₂ = 60 %; v₁ = 0.1 m/s; t₂ = 4213 ms
- Parameter set 3:ED₂ = 60 %; v₂ = 0.4 m/s; t₃ = 1078 ms
- Parameter set 4:ED₂ = 60 %; v₃ = 1.2 m/s; t₄ = 431 ms

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.