



valid until: March 25, 2031

# Fraunhofer

## TESTED<sup>®</sup> DEVICE

Norgren GmbH  
Excelon Plus 82 FRL Unit  
**Report No. NO 2511-1684**

DUPLICATE

Statement of  
Qualification

Single product  
Particle Emission  
in Dry-Cleanroom

# Statement of Qualification · Single product

**Customer**  
 Norgren GmbH  
 Bruckstrasse 93  
 46519 Alpen  
 Germany

**Tested product**

Category: Automation Components

Subcategory: Transfer Systems and Bearing

Product name: T82T-2GA-B1N, B 820014-51KIT B82G-2GK-QP3-RMG, F82C-2GD-QP0, 820014-52KIT, E02250828 (manufacturing date: 7/2025; article number: FRL82-3-00001361) in combination with:

- ISO compact double acting cylinder RA/192032/M/75 (manufacturing date: 7/2025)

**Random sampling of particle emissions (airborne) at representative sites in dry-cleanroom**

Standards/guidelines: ISO 14644-1, -14; VDI-EE 2083 Part 4.3  
 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:

- Dry-Cleanroom Air Cleanliness Class (according to ISO 14644-1): ..... ISO 1
- Airflow velocity: ..... 0.45 m/s
- Airflow pattern: ..... laminar airflow
- Room temperature: .....  $22^\circ\text{C} \pm 1^\circ\text{C}$
- Dew point: .....  $-40^\circ\text{C} \pm 5^\circ\text{C}$

Test procedure parameters:

- Operating pressure: ..... 6 bar
- Cycle time: ..... 1 s per single stroke (0.5 Hz)

**Test result / Classification**

The T82T-2GA-B1N, B 820014-51KIT B82G-2GK-QP3-RMG, F82C-2GD-QP0, 820014-52KIT, E02250828 in combination with ISO compact double acting cylinder RA/192032/M/75 is suitable for use under the specified test parameters (room temperature:  $22^\circ\text{C} \pm 1^\circ\text{C}$ ; dew point:  $-40^\circ\text{C} \pm 5^\circ\text{C}$ ) in dry-cleanrooms of the following Air Cleanliness Class according to ISO 14644-1:

Test parameter(s)	Air Cleanlines Class
1 s per single stroke (0.5 Hz)	<b>4</b>
<b>Overall result</b>	

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.