



Fraunhofer

**TESTED[®]
DEVICE**

isel Germany AG
robot IWH-BA13D14HDF-3
Report No. IS 1512-799

DUPLICATE

Statement of
Qualification

Particle Emission

Statement of Qualification

Customer isel Germany AG
 Bürgermeister-Ebert-Strasse 40
 36124 Eichenzell
 Germany

Component tested

Category: Automation Component

Subcategory: Robotics

Product name: IWH-BA13D14HDF-3
 (manufacturing date: 18/6/2014; color: silver-gray; serial number: 537907)

Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines: VDI 2083-9.1; ISO 14644-1
 The norms stated generally refer to the version valid at the time of the tests.

Test devices: Optical particle counter:
 LasAir II 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 $> 5.0 \mu\text{m}$

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
- Temperature:22 °C \pm 0.5 °C
- Relative humidity: 45 % \pm 5 %

Test procedure parameters:

- Capacity:30 % of the maximum capacity
- Installed position: standing
- Substrate:none
- Operation of each axis:..... separately
- Movement area of the axis:
 - T-axis:-100° until 100°
 - R1-axis:-50 mm until 200 mm
 - R2-axis: -50 mm until 200 mm
 - Z-axis: 100 mm until 200 mm

Test result / Classification

When operated under the specified test conditions, the robot IWH-BA13D-14HDF-3 is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Class according to ISO 14644-1:

| Test parameter(s) | Air Cleanliness Class |
|---|-----------------------|
| Area around dual arms; installed position = standing workload = 30 % | 1 |
| Area beneath the cover panel; installed position = standing workload = 30 % | 5 |
| Overall result | 5 |

Provided it is installed in a standing position and encapsulated beneath the cover panel, the robot IWH-BA13D14HDF-3 is suitable for use in cleanrooms fulfilling the specifications of the Air Cleanliness Class 1 according to ISO 14644-1 in the area around the dual arms when operated with the given test parameters.

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.

For further information about the test environment and parameters, please refer to the Fraunhofer IPA test report.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

Department of Ultraclean Technology and Micromanufacturing

Nobelstrasse 12
 70569 Stuttgart
 Germany

Stuttgart, February 20, 2016

Place, date of first document issued

--

Place, current date

on behalf of 
 Frank Bürger, Project Manager Fraunhofer IPA