valid until: April 28, 2028

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TESTED®
DEVICE

KUKA Deutschland GmbH
KR 10 R1100-2
Report No. KU 2210-1359

Statement of
Qualification

Single product
Particle Emission
Dry-Cleanroom

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Statement of Qualification · Single product

Customer

KUKA Deutschland GmbH
Zugspitzstrasse 140
86165 Augsburg
Germany

Component tested

Category: Automation Components

Subcategory: Robotics

Product name: KUKA KR 10 R1100-2
(manufacturing date: 1/2022; color: white; article number: 0010028076;
serial number: 4555405; weight: 59 kg)

Random sampling of particle emissions (airborne) at representative sites in the Dry-Cleanroom

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

Test devices: 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:

- Dry and clean environment with Class (according to ISO 14644-1): .... ISO 3
- Airflow velocity: ..... 0.1 m/s ± 0.05 m/s
- Airflow pattern: ..... displacement flow
- Temperature: ..... 21 °C ± 1.5 °C
- Humidity/Dew point: ..... -40 °C ± 2 °C

Test procedure parameters:

- Capacity: ..... 50 % and 100 % of maximum velocity
- Attached payload: ..... 10 kg
- Pause between cycles: ..... 0 to 2 s
- Operation of each axis: ..... separately
- Movement of each axis:
  - Axis 1: ..... -165° to 165°
  - Axis 2: ..... -185° to 40°
  - Axis 3: ..... -115° to 150°
  - Axis 4: ..... -180° to 180°
  - Axis 5: ..... -109° to 109°
  - Axis 6: ..... 180° to -180°

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Test result / Classification

When operated under the specified test conditions, the robot KUKA KR 10 R1100-2 is suitable for use in cleanrooms (divergent with a dew point of -40 °C ± 2 °C; room temperature of 21 °C ± 1.5 °C) fulfilling the specifications of the following Air Cleanliness Classes according to ISO 14644-1:

Test parameter(s)	Air Cleanlines Class
50 % of maximum velocity Attached payload: 10 kg	5
100 % of maximum velocity Attached payload: 10 kg	6
Overall result	**6**

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.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

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on behalf of
Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA

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**.