IPA

Cleanroom (atmospheric)

valid until: November 10, 2030

Fraunhofer

TESTED®
DEVICE

KUKA Deutschland GmbH
KR 20 R1810 CR
Report No. KU 2507-1650

DUPLICATE

Statement of
Qualification

Single product
Particle Emission
in Cleanroom
(atmospheric)

Fraunhofer
IPA

Fraunhofer
IPA

Statement of Qualification · Single product

Customer

KUKA Deutschland GmbH
Zugspitzstrasse 140
86165 Augsburg
Germany

Tested product

Category: Automation Components

Subcategory: Robotics

Product name: KR 20 R1810 CR
(manufacturing date: 8/2025; color: white; article number: 0010027484;
serial number: 457893; weight: 274 kg; max. payload: 20 kg; range: 1831 mm)

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:

- Velocity: 40 % and 80 % of maximum velocity
- Attached payload: 20 kg
- Range: 1813 mm
- Pause between cycles: 1 s
- Operation of each axis: separately
- Movement of each axis:
  - Axis 1: 150° to -150°
  - Axis 2: -30° to -160°
  - Axis 3: -60° to 90°
  - Axis 4: 170° to -170°
  - Axis 5: 35° to -115°
  - Axis 6: 250° to -250°

Test result / Classification

The robot KR 20 R1810 CR 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 Cleanlines Class
40 % of maximum velocity	5
80 % of maximum velocity	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

Business unit
Testing and Certification

Nobelstrasse 12
70569 Stuttgart
Germany

KU 1805-1035 — Report No. first document
Stuttgart, December 13, 2018 — Place, date of first document issued

KU 2507-1650 — Report No. current document
Stuttgart, November 10, 2025 — Place, current date

on behalf of
Dr.-Ing. Frank Bürger, 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 current date the document was issued. The document can be verified under **www.tested-device.com**.