



valid until: April 17, 2031

# Fraunhofer

## TESTED<sup>®</sup> DEVICE

KUKA Deutschland GmbH  
KR 6 R1840-2 arc HW  
**Report No. KU 2602-1729**

DUPLICATE

Statement of  
Qualification

Single product  
Particle Emission  
in Cleanroom  
(atmospheric)

# Statement of Qualification · Single product

**Customer**  
 KUKA Deutschland GmbH  
 Zugspitzstrasse 140  
 86165 Augsburg  
 Germany

**Tested product**

Category: Automation Components

Subcategory: Robotics

Product name: KR 6 R1840-2 arc HW  
 (manufacturing date: 12/2025; color: orange; weight: 191 kg; article number: 0010033436; serial number: 4327629)

## 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  $\geq 0.1 \mu\text{m}$ ,  $\geq 0.2 \mu\text{m}$ ,  $\geq 0.3 \mu\text{m}$ ,  $\geq 0.5 \mu\text{m}$ ,  $\geq 1.0 \mu\text{m}$  and  $\geq 5.0 \mu\text{m}$

Test environment parameters:

- 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:

- Capacity: .....40 % and 80 % of maximum velocity
- Attached payload: ..... 6 kg
- Pause between cycles: .....1 s
- Operation of each axis:..... separately
- Movement of each axis:
  - Axis 1: ..... 150° to -150°
  - Axis 2: ..... -40° to -160°
  - Axis 3: ..... 90° to -90°
  - Axis 4: ..... 150° to -150°
  - Axis 5: ..... 60° to -110°
  - Axis 6: ..... 180° to -180°

## Test result / Classification

The robot KR 6 R1840-2 arc HW 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
40 % of maximum velocity	6
80 % of maximum velocity	6
<b>Overall result</b>	<b>6</b>

Coating was found to be flaking off the test object. This should be avoided, since large particles pose a contamination risk in cleanrooms and the production areas located inside them. Therefore, the coating should be prepared so that it does not chip off when the robot is installed in a cleanroom.

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.