



Fraunhofer

TESTED[®] DEVICE

KUKA Deutschland GmbH
LBR iisy 11 R1300 CR
Report No. KU 2303-1404

Statement of
Qualification

Single product
Outgassing Behavior
Inorganic Acids

Statement of Qualification · Single product

Customer	KUKA Deutschland GmbH Zugspitzstrasse 140 86165 Augsburg Germany
Component tested	
Category:	Automation Components
Subcategory:	Robotics
Product name:	LBR iisy 11 R1300 CR (manufacturing date: 1/10/2024; color: white and orange; weight: 46.3kg; serial number: 4561014)

Emission chamber measurements with gas impingement in combination with ion chromatography (IC)

Standards/Guidelines:	ISO 14644-8, -15; VDI 2452 Part 1 (impinger); ISO 10304-1 (anions); VDI 2083 Part 17 The norms stated generally refer to the version valid at the time of the tests.
Test devices:	<ul style="list-style-type: none">Measuring station:.....Metrohm Professional IC 850Sampling chamber:.....Markes International µCTE
Sample storage:	<ul style="list-style-type: none">Pre-conditioning<ul style="list-style-type: none">Cleanroom Air Cleanliness Class (according to ISO 14644-1):.....ISO 1Airflow velocity:.....0.45 m/sAirflow type:..... vertical laminar flowTemperature:22 °C ± 0.5 °CRelative humidity:..... 45 % ± 5 %Purified air: VOC-filtered
Test procedure parameters:	Outgassing test temperature:..... 23 °C

Test result / Classification

The outgassing behavior of the robot LBR iisy 11 R1300 CR at rest at the stated temperature was investigated according to VDI 2083 Part 17 and ISO 14644-15. Based on the outgassing rates determined for the specific units, the following material classification was made for the corresponding Contaminant Category:

Contaminant Category (x)	SER _u ¹⁾ 23 °C [g/unit · s]	ISO-ACC _e Class (x) based on 23 °C
Fluoride (HF)	< 7.0 x 10 ⁻⁹	< -8.2
Chloride (HCl)	< 7.0 x 10 ⁻⁹	< -8.2
Bromide (HBr)	< 7.0 x 10 ⁻⁹	< -8.2
Nitrate (HNO ₃)	< 7.0 x 10 ⁻⁹	< -8.2
Phosphate (H ₃ PO ₄)	< 7.0 x 10 ⁻⁹	< -8.2
Sulfate (H ₂ SO ₄)	< 7.0 x 10 ⁻⁹	< -8.2

¹⁾SER_u: Unit-specific emission rate

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	KU 2303-1404 Report No. first document	Stuttgart, May 22, 2024 Place, date of first document issued
Department of Ultraclean Technology and Micromanufacturing	-- Report No. current document	-- Place, current date
Nobelstrasse 12 70569 Stuttgart Germany	on behalf of Dr.-Ing. Frank Bürger, Project Manager Fraunhofer IPA	

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