



Fraunhofer

TESTED[®] DEVICE

ABB Engineering (Shanghai) Ltd.

IRB1200-7/0.7

Report No. AB 1411-733

DUPLICATE

Statement of
Qualification

Particle Emission

Statement of Qualification

Customer: ABB Engineering (Shanghai) Ltd.
No. 5, Lane 369, Chuangye Road
201319 Pudon District, Shanghai
China

Component tested

Category: Automation Component

Subcategory: Robot

Product name: IRB1200-7/0.7 (Serial number: 1200-900002; member of the IRB1200 M2004 family, manufacturing date: 19/9/2014; color: white)

Test result / Classification:

The robot IRB1200-7/0.7 (SN: 1200-900002) is suitable for use in clean-rooms fulfilling the specifications of the following air cleanliness classes according to ISO 14644-1:

Parameter	Air Cleanliness Class	
	with covering on axis 6	without covering on axis 6
50%	5	5
100%	5	5
Overall result	5	5

Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines: VDI 2083-9.1; ISO 14644-1
The norms stated refer to the relevant editions applicable at the time of the tests.

Test devices: Optical particle counter:
LasAir II 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
- Temperature:..... $22^\circ\text{C} \pm 0.5^\circ\text{C}$
- Relative humidity: $45\% \pm 5\%$

Test procedure parameters:

- Attached payload: 7.0 kg
- Operation of each axis: separately
- Speed:..... 50 % and 100 %
- Pause between cycles: 1 s to 3 s
- Modification on axis 6: with and without covering

Axis	50 % Speed		100 % Speed	
	Average cycle time [s]	Average cycle velocity [$^\circ/\text{s}$]	Average cycle time [s]	Average cycle velocity [$^\circ/\text{s}$]
1	3.51	51.267	1.71	105.079
2	4.33	20.766	1.31	68.702
3	3.42	46.185	1.73	91.382
4	2.63	60.767	1.20	133.667
5	2.73	58.544	1.18	135.939
6	3.39	47.087	0.95	168.776

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, January 16, 2015

Place, date of first document issued

--
Place, current date

Frank Bürger
i. A. Frank Bürger, Project Manager Fraunhofer IPA

This document only applies to the named product in an unchanged state and is valid from the date of issue for a period of 5 years. The document can be verified under www.tested-device.com