



Fraunhofer

TESTED[®] DEVICE

ABB Engineering (Shanghai) Ltd.

IRB120T CR

Report No. AB 1403-698

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

Sub-category: Automation Components/Robotics

Product name: IRB120T CR (Serial number: 120-501227; member of the IRB120 M2004 family, manufacturing date: 11/1/2014; color: RAL 9003, white)

Test result / Classification:
(in acc. with ISO 14644-1)

The robot IRB120T CR (SN: 120-501227) is suitable for use in cleanrooms fulfilling the specifications of the following air cleanliness classes:

Parameter	Air Cleanliness Class
50 %	4
100 %	5
Overall result	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 $\geq 0.1 \mu\text{m}$, $\geq 0.2 \mu\text{m}$, $\geq 0.3 \mu\text{m}$, $\geq 0.5 \mu\text{m}$, $\geq 1.0 \mu\text{m}$ und $\geq 5.0 \mu\text{m}$

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:..... 3.0 kg
- Operation of each axis:..... separately
- Speed:..... 50 % and 100 %
- Pause between cycles:..... 1 s to 3 s

Axis	50 % workload		100 % workload	
	Average cycle time [s]	Average cycle velocity [$^\circ/\text{s}$]	Average cycle time [s]	Average cycle velocity [$^\circ/\text{s}$]
1	4.0	44.8	1.8	100.0
2	3.2	28.1	1.4	66.0
3	4.6	34.1	2.0	77.3
4	2.6	61.2	1.0	149.2
5	2.7	58.4	1.1	136.7
6	3.4	47.1	0.9	169.7

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, April 8, 2014

Place, date of first document issued

--
Place, current date

i. A. 
Frank Bürger, Project Manager Fraunhofer IPA