



Fraunhofer

**TESTED[®]
DEVICE**

ETS GEORGES RENAULT
Screwdriver ERXS20
Report No. DE 1802-1007

DUPLICATE

Statement of
Qualification

Particle Emission

Statement of Qualification

Customer
 ETS GEORGES RENAULT
 ZAC de la lorie
 38, Rue bobby Sands
 44800 Saint Herblain
 France

Component tested

Category: Working Place and Operator

Subcategory: Work Equipment

Product name: Screwdriver ERXS20
 (manufacturing date: 12/7/2017; serial number: 17C34296)

Test result / Classification

When operated under the specified test conditions, the Screwdriver ERXS20 is suitable for use in cleanrooms fulfilling the specifications of the following Air Cleanliness Classes according to ISO 14644-1:

Test parameter(s)	Air Cleanliness Class
Installation position = horizontal Tightenings/min = 15 Run down angle = 3600° Run down velocity = 500 rpm	6
Controller & power supply = CVIXS	1
Overall result	6

Random sampling of particle emissions (airborne) at representative sites

Standards/Guidelines: ISO 14644-1, -14
 The norms stated generally refer to the version valid at the time of the tests.

Test devices: 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
- Temperature:22°C \pm 0.5°C
- Relative humidity: 45 % \pm 5 %

Test procedure parameters:

- Installation position: horizontal
- Tightenings/min:..... 15
- Run down angle:..... 3600°
- Final angle:..... 720°
- Run down velocity: 500 rpm (50 % tool max. velocity)
- Final velocity: 100 rpm (10 % tool max. velocity)
- Controller & power supply: CVIXS

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

DE 1802-1007
 Report No. first document

Stuttgart, March 28, 2018
 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