



Fraunhofer

TESTED[®] DEVICE

F & K DELVOTEC Bondtechnik GmbH

Wire Bonder M17 D

Report No. DE 1808-1060

Statement of
Qualification

Particle Emission

Statement of Qualification

Customer
 F & K DELVOTEC Bondtechnik GmbH
 Daimlerstrasse 5-7
 85521 Ottobrunn
 Germany

Component tested

Category: Process Equipment

Subcategory: Circuit Board Assembly

Product name: Ultrasonic Wire Bonder M17 D Indexer
 (manufacturing date: 2018; article number: 60-D-600 064V; serial number: 60-D-600 064; weight: 1600 kg; Filter Fan Units (FFU): 2 x HEPA – H14 Filter)

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:

- Bond head, quantity: 2 pieces
- Payload:without printed circuit board, without wire
- Airflow velocity filter fan units: v = 1.23 m/s
- Printed circuit boards, conveyor:
 - Travel: s = 1200mm
 - Velocity: v = 0.1 m/s

Test result / Classification

When operated under the specified test conditions, the Ultrasonic Wire Bonder M17 D Indexer 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
Exterior	6
Product area	4
Machine interior	6
Overall result	6

Visible abrasion has occurred on the exterior of the system. The impact of the release of airborne particles could be demonstrated.

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.