



Fraunhofer

TESTED[®] DEVICE

Ammega Group B.V.
22EX06ESD vacuum

Report No. AM 2507-1651

DUPLICATE

Statement of
Qualification

Single product
Electrical Resistance
in Dry-Cleanroom

Statement of Qualification · Single product

Customer

Ammega Group B.V.
Marconistraat 15
Heerhugowaard 1704RH
P.O. Box 38
1700 AA Heerhugowaard
The Netherlands

Tested product

Category: Automation Components
Subcategory: Transfer Systems and Bearing
Product name: 22EX06ESD vacuum
(manufacturing date: 2025; material: aluminium; article number: 22EDXWW-LLLL20XPPPS6; serial number: 75232755)

Electrical resistance measurements at representative points (resistance to groundable point (R_{gp}) and point-to-point resistance (R_{p-p})) in Dry-Cleanroom

Standards/guidelines: IEC 61340-2-3, -5-1
The norms stated generally refer to the version valid at the time of the tests.

Test equipment:

- Data acquisition:
 - Type: MetrISO 3000
..... Wolfgang Warmbier GmbH & Co. KG
- Measuring probes:
 - Type: Model 850, ME 2.5 kg, \varnothing 63.5 mm, IEC 61340-2-3, -4-1
..... Wolfgang Warmbier GmbH & Co. KG

Test environment parameters:

- Cleanroom Air Cleanliness Class (according to ISO 14644-1): ISO 3
- Airflow velocity: 0.1 m/s \pm 0.05 m/s
- Airflow pattern: displacement flow
- Temperature: 22 °C \pm 1.0 °C
- Dew point: -40 °C \pm 5 °C

Test procedure parameters:

Insulating base 1:

- Type: flat PTFE-sheet with $R > 10^{14} \Omega$
- Size: 1210 mm x 1200 mm (\pm 5 mm)
- Thickness: 5 mm (\pm 1 mm)

Insulating base 2:

- Type: flat PTFE-Plate with $R > 10^{14} \Omega$
- Size: 300 mm x 300 mm (\pm 5 mm)
- Thickness: 5 mm (\pm 1 mm)

Test result / Classification

The transfer system 22EX06ESD vacuum was tested based on IEC 61340-2-3. The product measurement relevant for the product qualification is below the limit value $1 \times 10^9 \Omega$ specified in IEC 61340-5-1 for ESD protective elements. Some surfaces show insulating properties, it is recommended to measure the electrostatic field at the point where the ESDS are handled. If the measured field strength exceeds 5000 V/m, charge-reducing measures should be applied to prevent electrostatic phenomena.

Resistances to groundable point (R_{gp})		
Measuring points	Max. σ -values [Ω]	Limit value
Potential to contact ESDS	6.9×10^4	fulfilled
Without potential to contact ESDS	1.2×10^{12}	not fulfilled
Point-to-point resistances (R_{p-p})		
Measuring point pairings	Max. σ -values [Ω]	Limit value
Potential to contact ESDS – potential to contact ESDS	4.8×10^3	fulfilled
Potential to contact ESDS – no potential to contact ESDS	1.2×10^{12}	not fulfilled

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.

Fraunhofer Institute for Manufacturing Engineering and Automation IPA

AM 2507-1651
Report No. first document

Stuttgart, April 20, 2026
Place, date of first document issued

Business unit Testing and Certification

--
Report No. current document

--
Place, current date

Nobelstrasse 12
70569 Stuttgart
Germany

on behalf of 
Dr.-Ing. Frank Bürger, head of business unit Testing and Certification