



Fraunhofer

TESTED[®] DEVICE

SEW-EURODRIVE
MAXO-MS/LA006

Report No. SE 2312-1478

DUPLICATE

Statement of
Qualification

Single product
Particle Emission

Statement of Qualification · Single product

Customer
 SEW-EURODRIVE GmbH & Co KG
 Ernst-Blickle-Strasse 42
 76646 Bruchsal
 Germany

Component tested

Category: Automation Components
 Subcategory: Robotics
 Product name: MAXO-MS/LA006-X-H/EL0423-M/L/U-00
 (manufacturing date: 11/15/2023; color: RAL7015; weight: 450 kg; part number: 26094312; serial number: 01.8319193101.0001.23)

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: $22^\circ\text{C} \pm 0.5^\circ\text{C}$
- Relative humidity: $45\% \pm 5\%$

Test procedure parameters:

- Length of transport route: $l = 5\text{ m}$
- Width of transport route: $w = \text{ca. } 1,5\text{ m}$
- Attached Payload: $m = 600\text{ kg}$
- Stroke:
 - Velocity:..... $v_H = 0.1\text{ m/s}$
 - Acceleration:..... $a_H = 0.02\text{ m/s}^2$
 - Deceleration:..... $a_{HB} = 0.05\text{ m/s}^2$
 - Min. Stroke:..... $h_{\min} = 0$
 - Max. Stroke:..... $h_{\max} = 150$
- Drive:
 - Max. Velocity:..... $v_{\max} = 1.6\text{ m/s} = 0.5\text{ rad/s}$
 - Acceleration:..... $a = 0.5\text{ m/s}^2 = 1\text{ rad/s}^2$
 - Deceleration:..... $a_b = 2\text{ m/s}^2 = 1.1\text{ rad/s}^2$
 - Nominal Velocity straight line:..... $v_G = 0.7\text{ m/s}$
 - Nominal Velocity Curve:..... $v_k = 0.3\text{ m/s} = 0.5\text{ rad/s}$

Test result / Classification

When operated under the specified test conditions, the automated guided vehicle MAXO-MS/LA006-X-H/EL0423-M/L/U-00 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
Ground level	5
Stroke	4
Driving route	5
Overall result	5

Please note: Transport damages, incorrect installation, oil leakage, aging behavior, corrosion etc. can influence the test result.

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

SE 2312-1478
 Report No. first document

Stuttgart, January 17, 2024
 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