



valid until: June 20, 2029

# Fraunhofer

## TESTED<sup>®</sup> DEVICE

Rockwell Automation Inc.  
MML (Variant 2)  
**Report No. RO 2404-1512**

DUPLICATE

Statement of  
Qualification

Single product  
Particle Emission

# Statement of Qualification · Single product

**Customer**  
 Rockwell Automation Inc.  
 1201 S 2nd St  
 Milwaukee, WI 53204  
 USA

**Component tested**

Category: Automation Components  
 Subcategory: Transfer Systems and Bearing  
 Product name: MagneMoverLITE System (Variant 2)  
 (manufacturing date: 11/2023; weight: 59.9kg; batch numbers system components: 700-1708-8x, 700-1708-6x, 700-1708-4x, 700-1708-2x, 700-1708-0x, 700-1738-0x; serial numbers system components: 700-1708-20, 700-1708-80, 703-1708-03\_R1, 703-1708-23, 703-1708-60\_R1, 703-1708-81\_R1; dimensions: 3000 mm x 900 mm x 700 mm)

## 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:

- System length: ..... l = ~ 3000 mm
- System width:..... w = ~ 900 mm
- System height:..... h = ~ 700 mm
- Drive type:..... Magnetism
- Vehicle type:..... Tandem wheeled puck
- Parameter Set 1:..... 1 vehicle;  $m_1 = 5 \text{ kg}$ ;  $v_1 = 0.5 \text{ m/s}$ ;  $a_1 = 1.5 \text{ m/s}^2$
- Parameter Set 2:..... 1 vehicle;  $m_1 = 5 \text{ kg}$ ;  $v_2 = 1.5 \text{ m/s}$ ;  $a_1 = 1.5 \text{ m/s}^2$
- Parameter Set 3:..... 1 vehicle;  $m_2 = 10 \text{ kg}$ ;  $v_1 = 0.5 \text{ m/s}$ ;  $a_2 = 0.7 \text{ m/s}^2$
- Parameter Set 4:..... 1 vehicle;  $m_2 = 10 \text{ kg}$ ;  $v_2 = 1.5 \text{ m/s}$ ;  $a_1 = 1.5 \text{ m/s}^2$
- Parameter Set 5:..... 3 vehicles;  $m_2 = 10 \text{ kg}$ ;  $v_2 = 1.5 \text{ m/s}$ ;  $a_1 = 1.5 \text{ m/s}^2$

## Test result / Classification

When operated under the specified test conditions, the MagneMoverLITE System (Variant 2) 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
1 Wheeled puck - 5kg payload - 0.5 m/s	5
1 Wheeled puck - 5kg payload - 1.5 m/s	6
1 Wheeled puck - 10kg payload - 0.5 m/s	5
1 Wheeled puck - 10kg payload - 1.5 m/s	6
3 Wheeled pucks - 10kg payload - 1.5 m/s	5
<b>Overall result</b>	<b>5</b>

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

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Department of Ultraclean Technology and Micromanufacturing

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on behalf of   
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