ARGOS®
Quality inspection of optics
For lenses and flats, detection of imperfections
ARGOS®

Inspection and automatic evaluation of optical surfaces

Quick inspection of the entire surface
Complete documentation according to ISO 10110-7
Increased yield and quality

Inspect and certify
- lenses
- flats
- mirrors

Types of imperfections
- digs
- scratches
- edge chips
- coating holes
- contamination
- bubbles and inclusions
- volume imperfections

Advantages
- easy control
- objective results
- user-independent
- statistical recording

Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>surface material</td>
<td>glass, metal, semiconductors, sapphire glass, etc.</td>
</tr>
<tr>
<td>smallest defect grade</td>
<td>5/1 x 0.004</td>
</tr>
<tr>
<td>maximum sample diameter</td>
<td>45mm</td>
</tr>
<tr>
<td>surface testing time</td>
<td>2s</td>
</tr>
<tr>
<td>volume scan testing time</td>
<td>&lt; 60s</td>
</tr>
<tr>
<td>image size</td>
<td>256 mio. pixel</td>
</tr>
<tr>
<td>image resolution</td>
<td>0.0028 mm/pixel</td>
</tr>
</tbody>
</table>
Fully automatic handling system for optical lens inspection

MA microautomation GmbH and DIOPTIC have jointly developed the first fully automated system for the inspection of optical surfaces. With the high-resolution ARGOS®, we offer the possibility to carry out the manual inspection of optical surfaces in a highly efficient and repeatable manner. Depending on the desired inspection characteristics, the system offers the possibility to test high throughput volumes of optical surfaces in up to 24/7 operation and classify them according to DIN ISO 10110-7. Optional accessories such as palletizers, flowboxes and feeding systems allow the system to adapt to your product while ensuring the necessary environmental conditions for the test.

The ma optronic business segment develops and builds assembly systems for optical components such as lenses, prisms, lasers and camera modules. Ma optronic also develops and produces test systems for fully automatic optical inspection using industrial image processing for quality assurance or process monitoring.

### Specification

- **dimensions** (l x w x h) 1300mm x 1500mm x 2200mm
- **cleanroom** < ISO8
- **handling time** 12s
- **cycle time**: 20 - 60s (depending on the inspection task)
- **scalability with regard to pallet size**
- **customizable gripper**
- **additional options**: flowbox, palletizer, packaging modules, extensions
Example evaluations of surface defects

<table>
<thead>
<tr>
<th>5/1x0.016</th>
<th>5/L1x0.006</th>
<th>5/1x0.4</th>
<th>E 0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>small dig</td>
<td>long scratch</td>
<td>concentration</td>
<td>edge chip</td>
</tr>
</tbody>
</table>

100 µm | 2000 µm | 400 µm | 200 µm |

**Specification**

- **Precision:** 1 µm
- **Visibility:** 1 µm
- **Reproducibility:** >99% for 5/1x0.16, >96% for 5/1x0.04

<table>
<thead>
<tr>
<th>Smallest</th>
<th>Resolved</th>
<th>Grade Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/1x0.004</td>
<td>5/C1x0.01</td>
<td>5/L1x0.004, 5/E0.04</td>
</tr>
</tbody>
</table>

- Smallest visible defects overreported to grade number 0.0025 due to optical resolution
- Allocation probability to grade number
- Long scratches, Edge chips

**ARGOS® Test Report (excerpt)**

- **Surface specification:** 5/2x0.160; L1x0.010
- Sample Drawing number: 3279
- Largest Defects
  - No. 1: R = 5.9 mm, ϕ = 128.6°, S, Grade 0.010 mm
  - No. 2: R = 6.8 mm, ϕ = 18.9°, D, Grade 0.063 mm

*D = Dig, S = Scratch, C = Coating Imperfection, E = Edge Chip

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