HOMMEL-ETAMIC IPS and HOMMEL-ETAMIC CCS
Optical surface inspection and profile measurement
Your advantages

• Integration into production processes
• 100 percent quality control
• Optical inspection and therefore wear-free
• Automatic inspection of bores and plane surfaces
• Testing speed in line with required cycle times
• Secure and clear detection of typical surface defects thanks to 2.5D analysis
• Optical measurement of structural elements in bores
• Useable in multi-sensor systems, compact inspection machines
• Latest camera and sensor technology
• EVOVIS vision software for machine control with standardized evaluation algorithms

TECHNICAL DATA

IPS - Image Processing Systems for optical surface inspection

<table>
<thead>
<tr>
<th>HOMMEL-ETAMIC</th>
<th>IPS B10</th>
<th>IPS B100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test diameter</td>
<td>14-50 mm</td>
<td>68-110 mm</td>
</tr>
<tr>
<td>Image sensor</td>
<td>CMOS technology</td>
<td></td>
</tr>
<tr>
<td>Object illumination</td>
<td>integrated, LED</td>
<td></td>
</tr>
<tr>
<td>Front collision protection</td>
<td>integrated</td>
<td></td>
</tr>
<tr>
<td>Line cycle time</td>
<td>22 s (4-cylinder block), 6 s (master cylinder)</td>
<td></td>
</tr>
<tr>
<td>Flaw detection limit</td>
<td>100 µm</td>
<td></td>
</tr>
<tr>
<td>Surfaces</td>
<td>matt to high-gloss finishes and textured surfaces</td>
<td></td>
</tr>
</tbody>
</table>

IPS - Image Processing Systems for optical surface inspection

<table>
<thead>
<tr>
<th>HOMMEL-ETAMIC</th>
<th>IPS F400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scan width</td>
<td>up to 400 mm, working distance 100 mm</td>
</tr>
<tr>
<td>Image sensor</td>
<td>CMOS technology</td>
</tr>
<tr>
<td>Object illumination</td>
<td>integrated, multi LED</td>
</tr>
<tr>
<td>Line cycle time</td>
<td>22 s (4-cylinder block, slide valve housing)</td>
</tr>
<tr>
<td>Flaw detection limit</td>
<td>100 µm</td>
</tr>
<tr>
<td>Surfaces</td>
<td>matt to high-gloss finishes and textured surfaces</td>
</tr>
<tr>
<td>- differentiation of valleys and markings</td>
<td></td>
</tr>
<tr>
<td>- dynamic masking for detection of edge defects</td>
<td></td>
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</tbody>
</table>

CCS - Confocal Chromatic Sensors for optical profile measurement

<table>
<thead>
<tr>
<th>HOMMEL-ETAMIC</th>
<th>CCS C100</th>
<th>CCS R50</th>
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</thead>
<tbody>
<tr>
<td>Measurement technology</td>
<td>confocal chromatic</td>
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<tr>
<td>Measurement range</td>
<td>1.2 mm</td>
<td>600 µm</td>
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<tr>
<td>Resolution</td>
<td>0.1 µm</td>
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<tr>
<td>Measurement rate</td>
<td>4 kHz</td>
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<tr>
<td>Profile evaluation</td>
<td>structural elements</td>
<td>micro structures</td>
</tr>
</tbody>
</table>
OPTICAL SURFACE INSPECTION

HOMMEL-ETAMIC IPS B10 and IPS B100: Optical bore inspection

Typical applications
- Master cylinder
- Cylinder liner
- Transmission housing
- Con rod
- Piston

System features
- Automatic inspection of inner bore surfaces with 360 degree lens
- Detection of common surface defects such as blowholes, porosities, scratches, etc.
- Image acquisition occurs while in motion
- Integrated collision protection

System integration
- Offline with manual loading
- In-line with automated workpiece handling
- Flexible robot system
- Innovative multi-sensor machine capabilities

HOMMEL-ETAMIC IPS F400: Optical inspection of plane surfaces

Typical applications
- Crank case
- Cylinder head
- Valve spool housing

System features
- Automatic inspection of plane surfaces
- Detection of common surface defects such as blowholes, porosities, scratches, etc.
- Image pick-up in line with cycle times
- Innovative illumination technology for error free differentiation of valleys and raised areas
- Dynamic masking for reliable inspection of edges

System integration
- Offline with manual loading
- In-line with automated workpiece handling
- Innovative multi-sensor machine capabilities
HOMMEL-ETAMIC CCS C100: Optical measuring system for determination of structural elements in cylinder bores

Typical application
- Mechanically roughened surfaces in cylinder bores
- Measurement of groove width, groovebase and included angles

System features
- Automatic measurement of dovetail micro profiles in cylinder bores
- Bi-directional measurement
- Automatic assembly and evaluation of the measured profile
- Profile measurement in any circumferential positions

System integration
- Offline with manual loading
- In-line with automated workpiece handling
- Innovative multi-sensor machine capabilities

HOMMEL-ETAMIC CCS R50: Optical measuring system for determination of micro structures in cylinder bores

Typical application
- Roughened surfaces in cylinder bores
- Measurement of micro structures

System features
- Automatic measurement of micro structures in cylinder bores
- Capable of integration into fully automatic machines
- 3D topography measurement possible

System integration
- Offline with manual loading
- In-line with automated workpiece handling
- Innovative multi-sensor machine capabilities