DISCOVER WHAT THE EYE CAN'T SEE

LumiSolarProfessional (LSP) Inline System
Advanced Electroluminescence Inspection for Pre-laminates and Solar Modules
DISCOVER WHAT THE EYE CAN`T SEE
LSA automation and greateyes offer an advanced LumiSolarProfessional (LSP) inline inspection system for pre-laminates and solar modules. The tool is not only capable to detect micro cracks, low intensity cells and contaminations, it also determines misaligned bus bars, rotated solar cells and other quality issues fastly.

The LSP Inline system exhibits a fast cycle time below 30sec including feed-in, inspection, automatic defect recognition, pass/fail decision and unloading. The unique design of the tool provide significant higher throughput and analysis power compared to conventional in-line EL inspection tools. Precise quality control, higher yield and cost savings are the main reason for implementing the machine in the production line.

In contrast to other vendors the new inspection system uses two scientific greateyes cameras in combination with high-throughput objectives allowing for fast detection of the weak electroluminescence. Furthermore an innovative automatic image analysis software provides superior performance in the detection of failures within pre-laminates or solar modules.

### General specifications

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<tr>
<th>Specification</th>
<th>Details</th>
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<tbody>
<tr>
<td>System</td>
<td>Turn-key electroluminescence inline inspection system</td>
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<tr>
<td>Substrates</td>
<td>Pre-laminates or modules</td>
</tr>
<tr>
<td>Cell type</td>
<td>mono- and polycrystalline silicon, thin-film, HIT, IBC</td>
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<tr>
<td>Max. size</td>
<td>2.0m x 1.0m</td>
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<tr>
<td>Complete cycle time</td>
<td>26sec (including feed-in, feed-out)</td>
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<td>Nominal throughput</td>
<td>138 modules/hour</td>
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<tr>
<td>Inspection</td>
<td>Sunny side down</td>
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<tr>
<td>Defect detection</td>
<td>Cracks, inactive cell areas, micro-cracks, contaminations, low intensity cells, inactive (dead) cells, edge defects, misaligned bus bars, misaligned/rotated cells</td>
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<tr>
<td>Imaging Subsystem</td>
<td>Two scientific 16bit large format greateyes cameras, resolution 500µm</td>
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<tr>
<td>Dimensions (W x D x H)</td>
<td>2200mm x 2200mm x 1400mm - for prelamine inspection with long side forward</td>
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<td>Certification</td>
<td>CE</td>
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### Software System

Operator & engineer HMI
- Fully automated image analysis
- Defect identification and classification
- MES, ERP, QA interfaces
- Multiple data export capabilities
- Receive definitions
- Statistical/ history functions
- Simplified touch panel control
### Features of the LumiSolarProfessional (LSP) Inline System

**Characterization method**
- Forward bias electroluminescence inspection
- No risk measurement - drive current below short-circuit current
- Scientific 16bit high dynamic range imaging subsystem

**Detection capabilities**
- Micro-cracks | Contaminations | Inactive areas | Low intensity/dead cells | Misaligned Cells | Rotated cells | Edge defects

**System advantages:**
- High nominal throughput, low total cycle time
- Superior defect identification and classification compared to conventional EL systems
- Fixed imaging subsystem, no moving cameras, reduced maintenance & higher lifetime
- Counting of branched cracks, total defect area, precise receive control

**Design flexibilities**
- Pre-laminate or module inspection
- Inspection of mono- or poly-crystalline silicon, thin-film, HIT, IBC
- Long-side or short-side forward feed-in / feed-out
- Connectivity to supervisory systems (MES, ERP, QA)