

Functional Testing of Micro-Optics and Lighting Units for Automotive

Sébastien Reithinger
Tech Leader

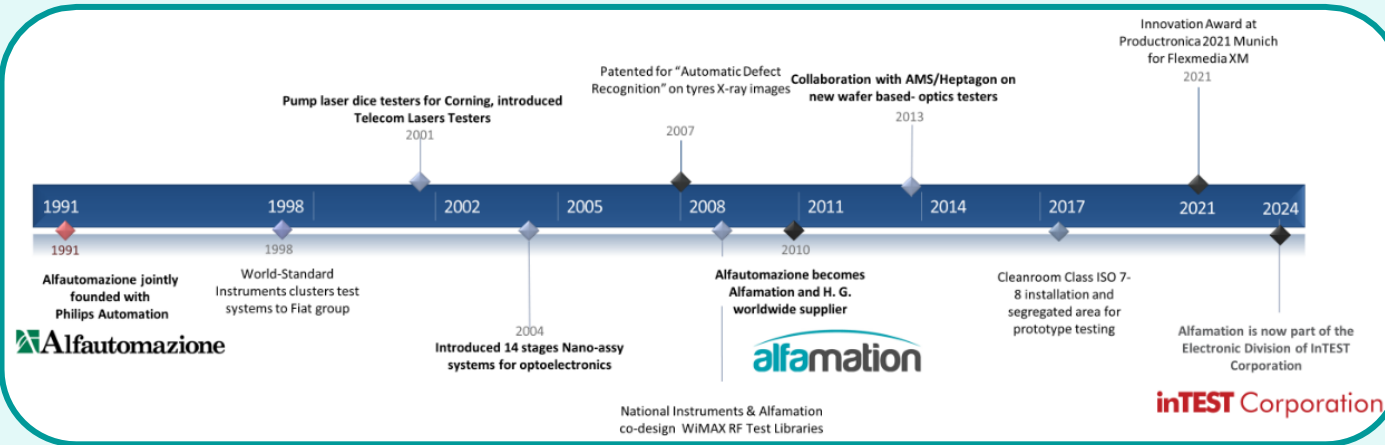
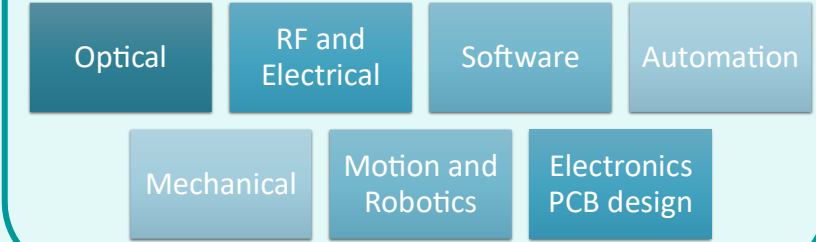


34 years of passion and expertise

Headquarters in Lissone (MB)
Italy
Part of inTEST Corp. (NJ USA)
NYSE: INTT



Broad In-house Engineering Competencies



InTEST Overview



**Headquarters in
Mt. Laurel, New Jersey USA**
NYSE: **INTT**



**Diversified Global Manufacturer of
Innovative Test and Process
Solutions**

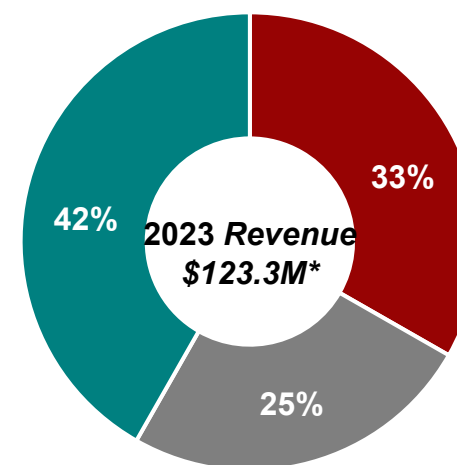
Market Capitalization	\$162.0 million
Recent Closing Price	\$13.32
52 Week Low-High	\$10.66 - \$27.17
Shares Outstanding	~12.2 million
Institutional Ownership	~63%
Insider Ownership	~5%

**Division revenue split is unaudited*

Market data as of April 1, 2024, Source: S&P Capital IQ; Shares Outstanding as of March 1, 2024; Ownership as of most recent filing.



~450 Employees

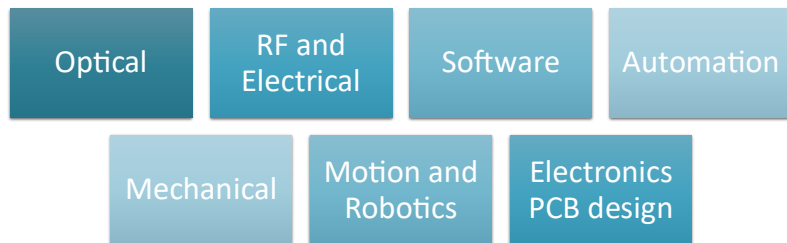


- **Process Technologies**
- **Environmental Technologies**
- **Electronic Test**

From Instruments to Automated Test Systems

Alfamation strong engineering capabilities help covering wide test needs, from instrumentation to turn-key automated test systems

Broad In-house Engineering Competencies



Instrumentation (Flexmedia XM)

- Communication Protocols
- Signal generation
- Signal analysis, measurements



Sub-assemblies Test Systems

- PCB testing
- Flashing station
- Burn-in station



End-of-line Test Systems

- Electrical tests
- Optical tests
- Calibrations



Instrumentation

flexmedia XM[®]



Automotive Lighting Applications:

- generate/control **lighting patterns**
- **measure electrical parameters**
- manage **data communication**



FPD LINK III - IV



APIX® 2 - 3



NOW PART OF
ANALOG DEVICES

GMSL 1 - 2 - 3

HDMI™ DisplayPort

LVDS - OpenLDI
Analog Video



flexmedia XM

Flexmedia XM is a modular, robust and **cost-effective** solution to build flexible, scalable functional testers that **keep pace** with **technology evolutions**

Flexmedia XM is a family of **ethernet-powered, OS-agnostic professional test tools** in a very **compact** and **rugged** form factor, conceived for **24/7 Manufacturing Test** as well as **R&D, V&V and Service**

Full catalog: <https://flexmediaxm.com/>

Test Systems for:

Lighting Units Sub-Assemblies

MLA Decorative Lighting

Welcome Carpet and “Driving Intensions”

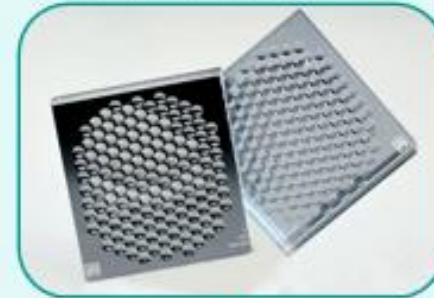


Welcome Carpet

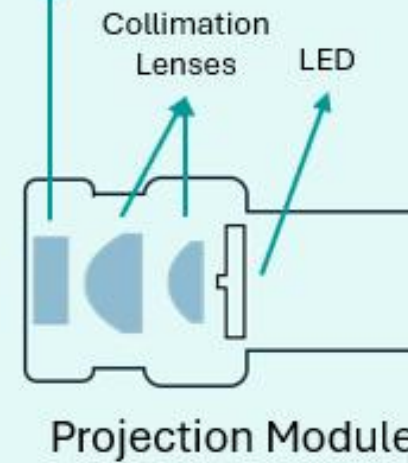


“Driving Intensions”

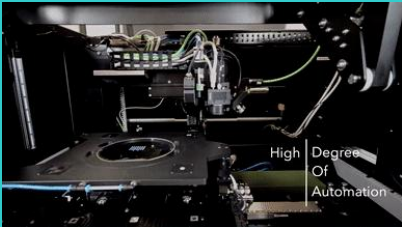
MLA (Micro Lens Array)



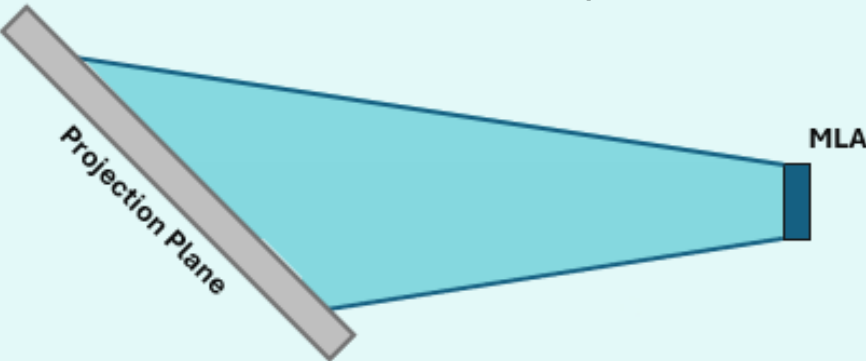
Tested at Wafer-Level!



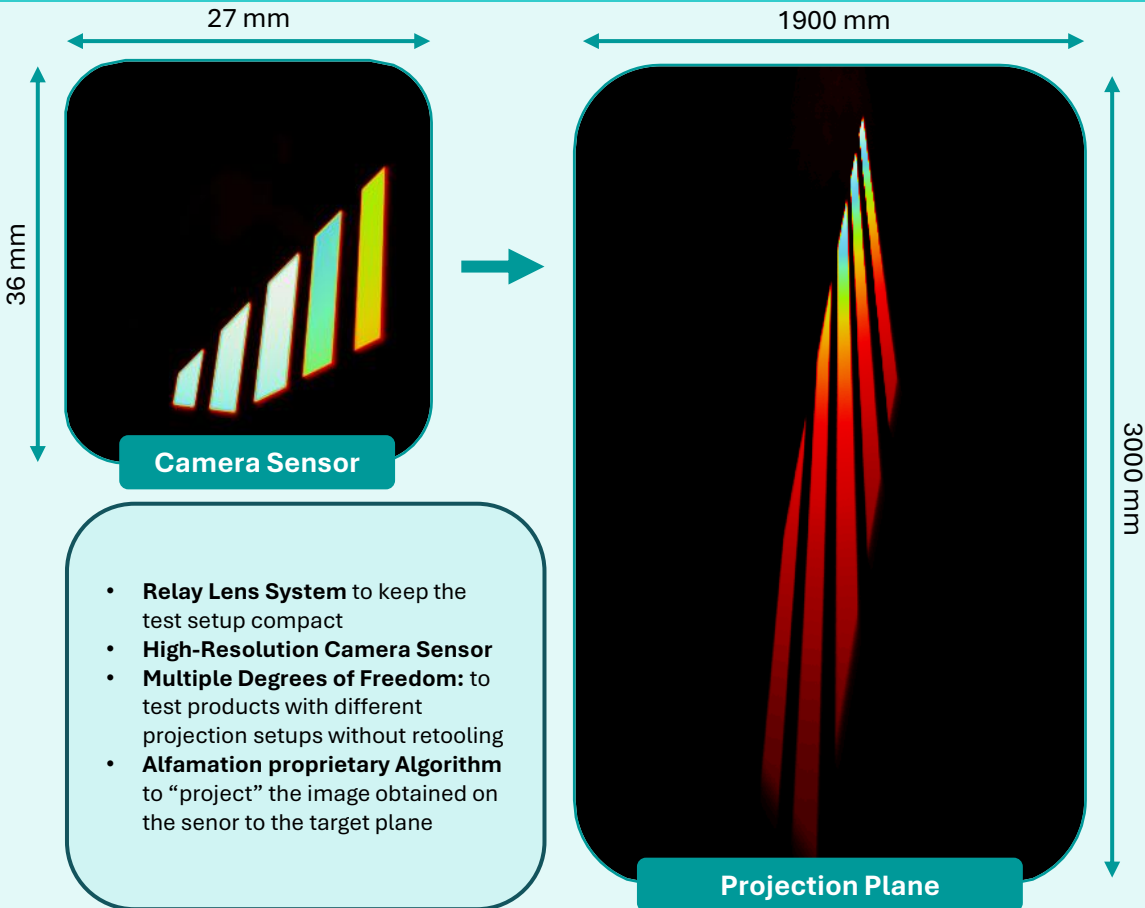
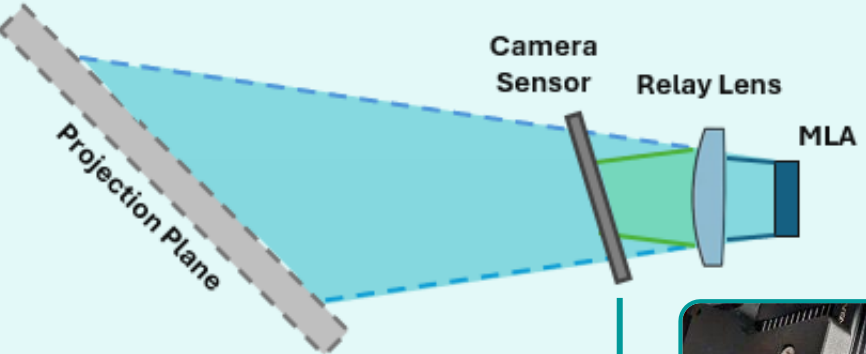
MLA Decorative Lighting Setup



Use-case Setup



Testing Setup



Test Metrics: Relative Brightness, Contrast\Gradient, Cross Talk\Ghost, Chromatic Aberration

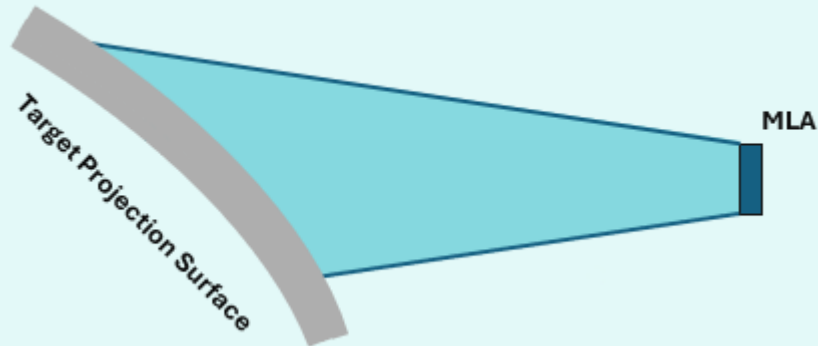
Speed: Up to **2800 UPH** (Units per hour)

Stability: Gage R&R < 10%

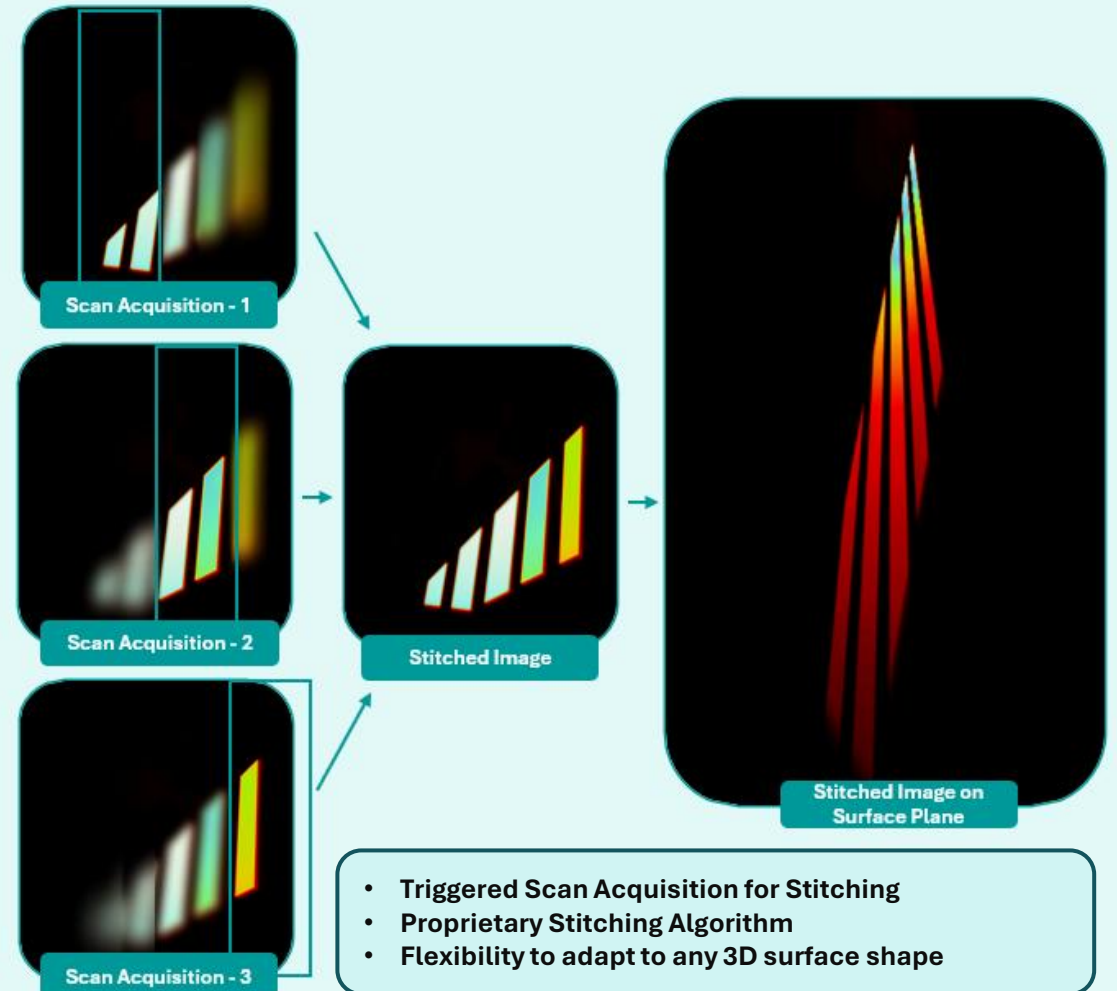
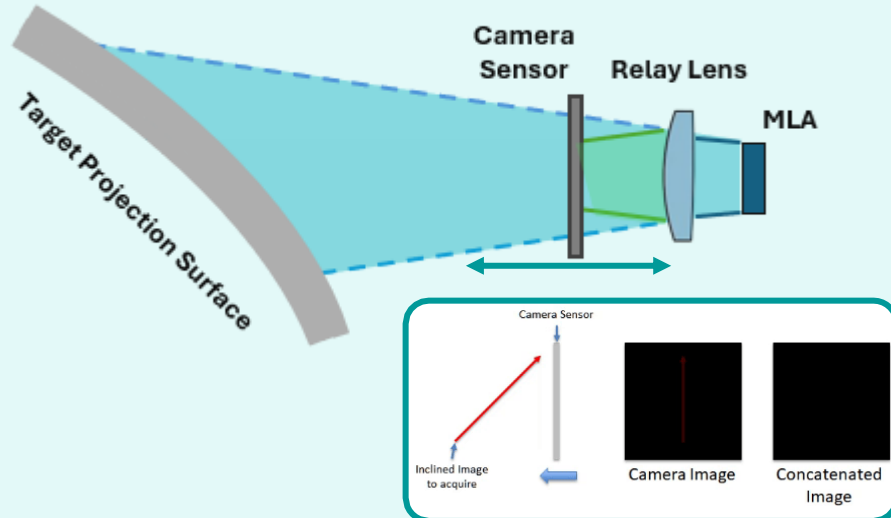
Performance

MLA Decorative Lighting Setup – Curved surface

Use-case Setup



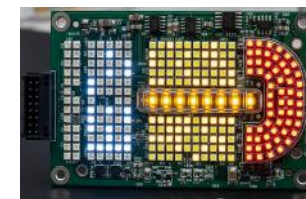
Testing Setup





Lighting Sub-assemblies:

- Functional testers for:
 - Lighting control units
 - Displays control units
 - LED boards
 - Light Shaping Optics – (Monolithic and also wafer-level)



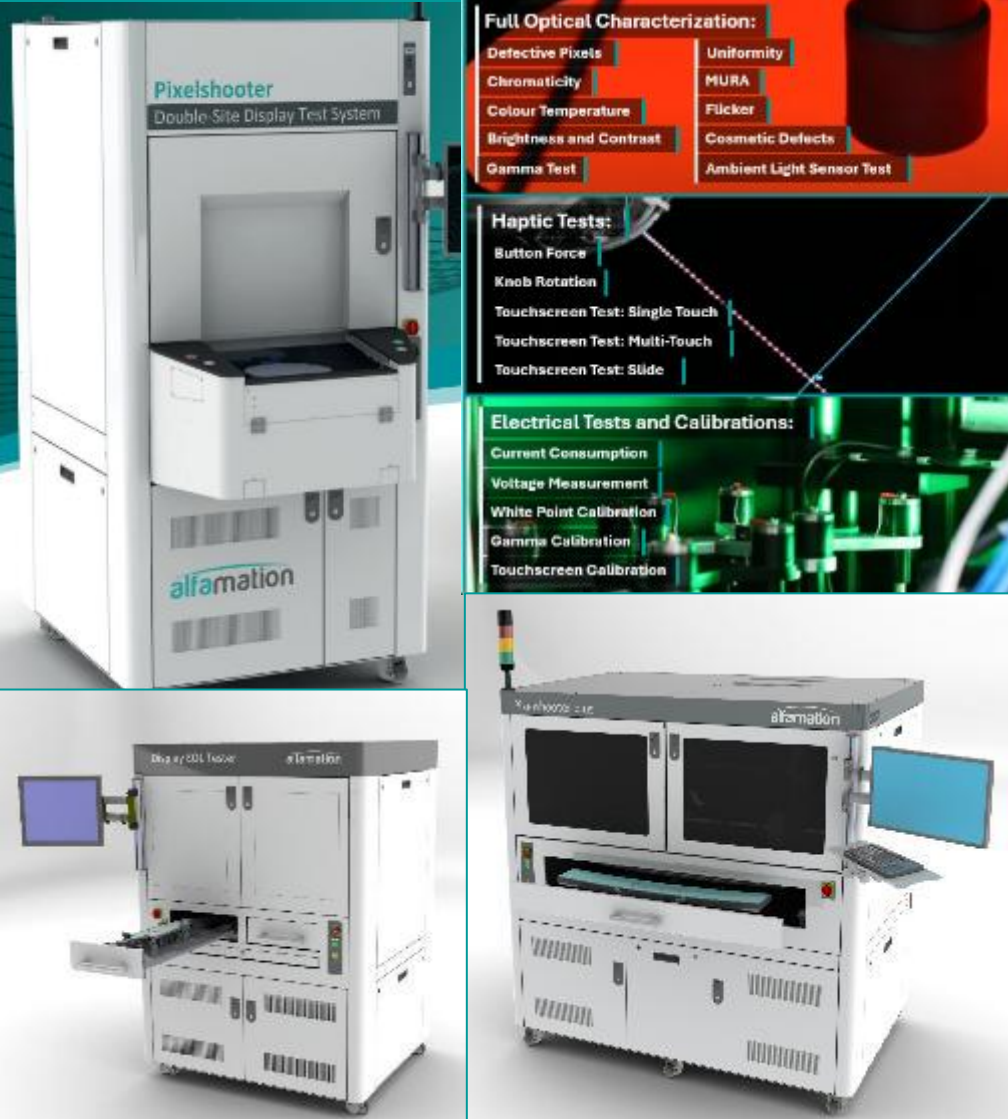
Test solution for production and R&D:

- Automated internal device handling and electrical contacting
- Easy device fixture swap to test variants
- Cost effective and scalable
- High throughput

Flexible and Scalable Platforms

Test Systems for:

Lighting Units End-Of-Line (EoL)



Lighting Units and Displays:

- Functional testers for:
 - LED Interactive Displays
 - Headlamps
 - Light projection units

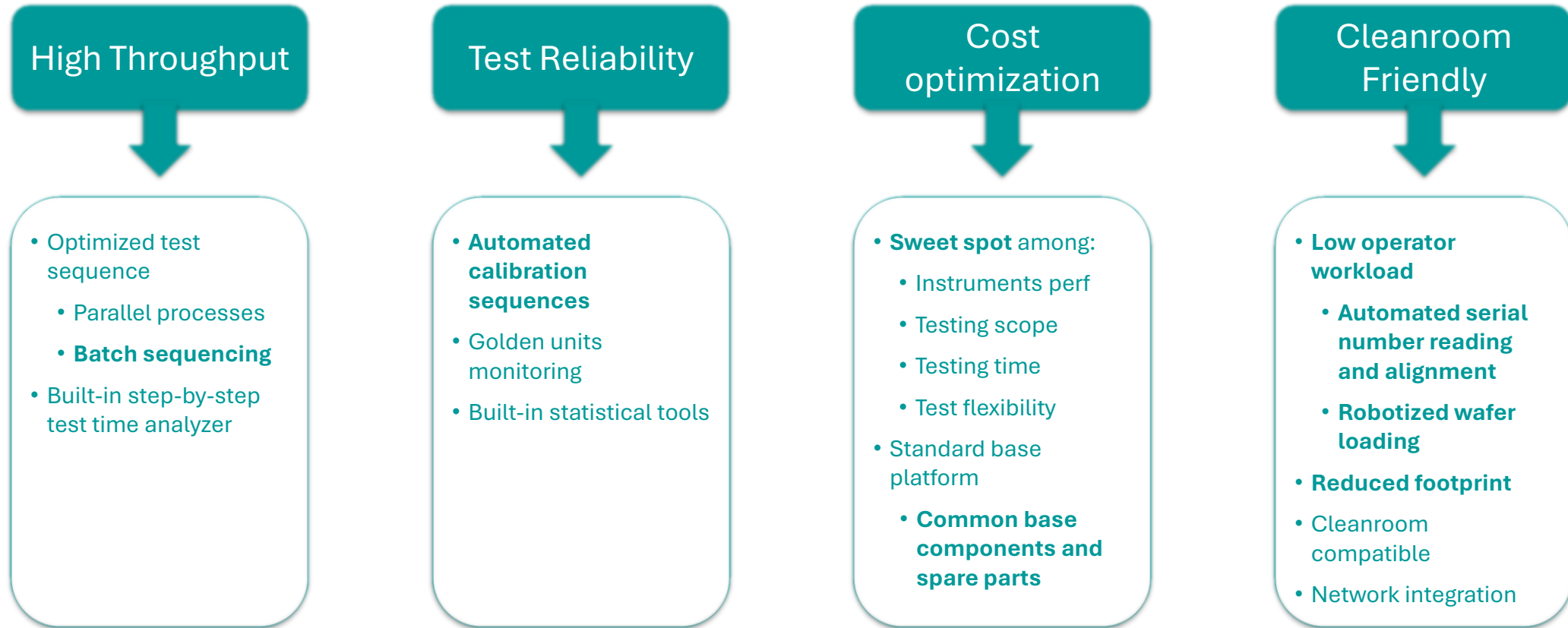


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**Flexible and Scalable
Platforms**

Scaling-up Production Challenges



18-21 November 2025 - Messe München

Hall A1 - Stand 465 & 565 - VISIT US!



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**SEMICON
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