Total Process Ownership for AR Optical Metrology

- 18 years of expertise in test automation, optical metrology
- Off-the-shelf products and tailored test solutions
- 14000+ delivered systems
- 450+ true tech geeks worldwide
- 18 support and service teams on 3 continents
- Working with all major brands including Google, Xreal, Intel, AMD, Qualcomm, Samsung, Lenovo, Asus, Dispelix, Pico, Sunny Optical
- HQ and own manufacturing in Finland, EU
- Engineering offices in Cupertino, CA and Redmond, WA
- Engineering and manufacturing facilities in APAC
- Global market leader in AR and Touch display optical metrology and robot-assisted test & measurement systems
Total Process Ownership for AR Optical Metrology

- Master Creation & Analysis
- Stacking
- Image Quality
- Replication & Visual Inspection
- Active Alignment
Total Process Ownership for AR Optical Metrology
What is the problem?

Expectation

Worst Case Reality
Human-eye mimicking optical setup
• **OptoEYE**, mimics the human eye’s radiometric properties
• **OptoColor**, mimics the human eye’s colorimetric properties
• **OptoProjector**, mimics a uniform, powerful light engine
Robotics
• pantoscopic tilts (up to 12°)
• face wraps (±7.5°)
• Rx up to ± 8 dpt
• both world-side and eye-side
• wafers and diced waveguides

Image Quality Measurements for AR Waveguides
# Image Quality Measurements for AR Waveguides

<table>
<thead>
<tr>
<th>Measurements</th>
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<tbody>
<tr>
<td>Checkerboard contrast</td>
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<tr>
<td>Colour</td>
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<tr>
<td>Colour uniformity</td>
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<tr>
<td>CRA (Chief Ray Angle)</td>
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<tr>
<td>Efficiency</td>
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<td>Eye box</td>
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<td>Geometric distortion</td>
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<td>MTF</td>
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<td>Pointing vector</td>
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<td>Transverse chromatic aberration</td>
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WG-IQ: Waveguide Image Quality Measurement System

https://youtu.be/LyQj0UnVDYE
Thank you!

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