



EPIC New Product Release
Superpolished Optics

Angelica Compatangelo

The Enemy of Optical Systems: Scatter

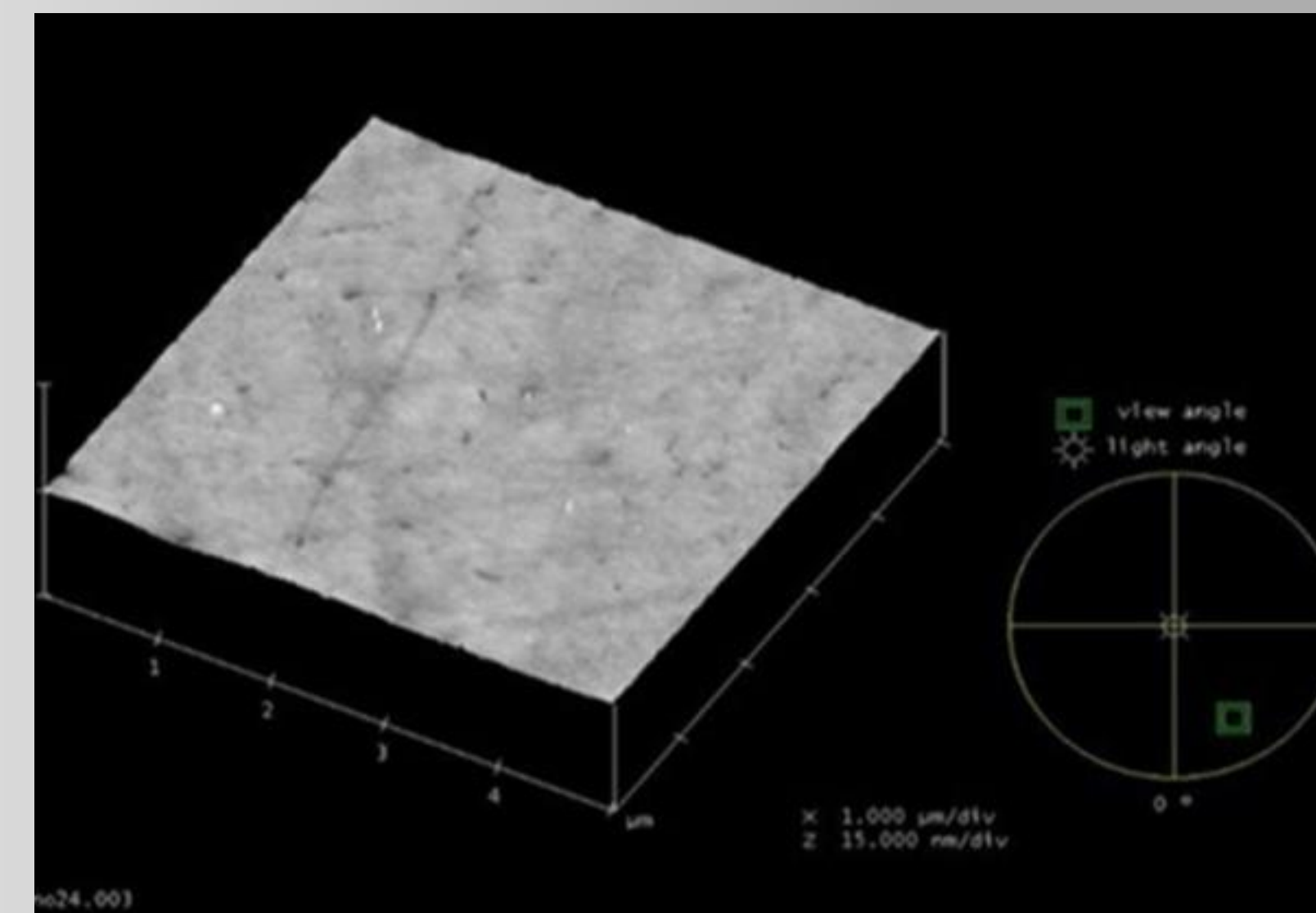
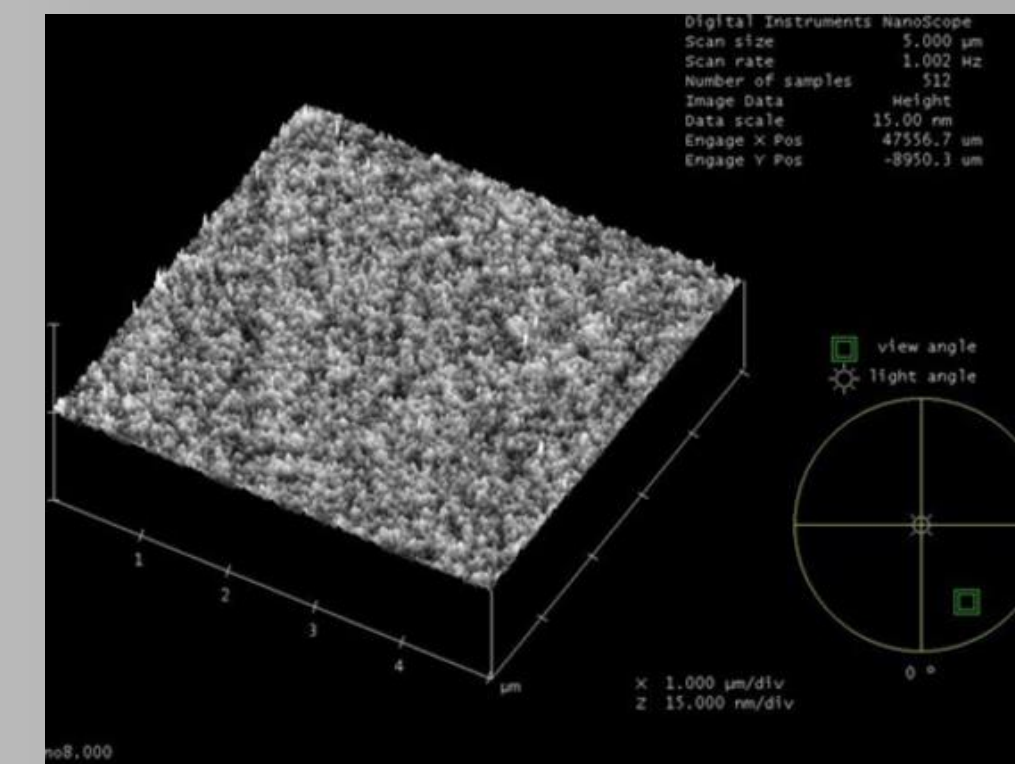
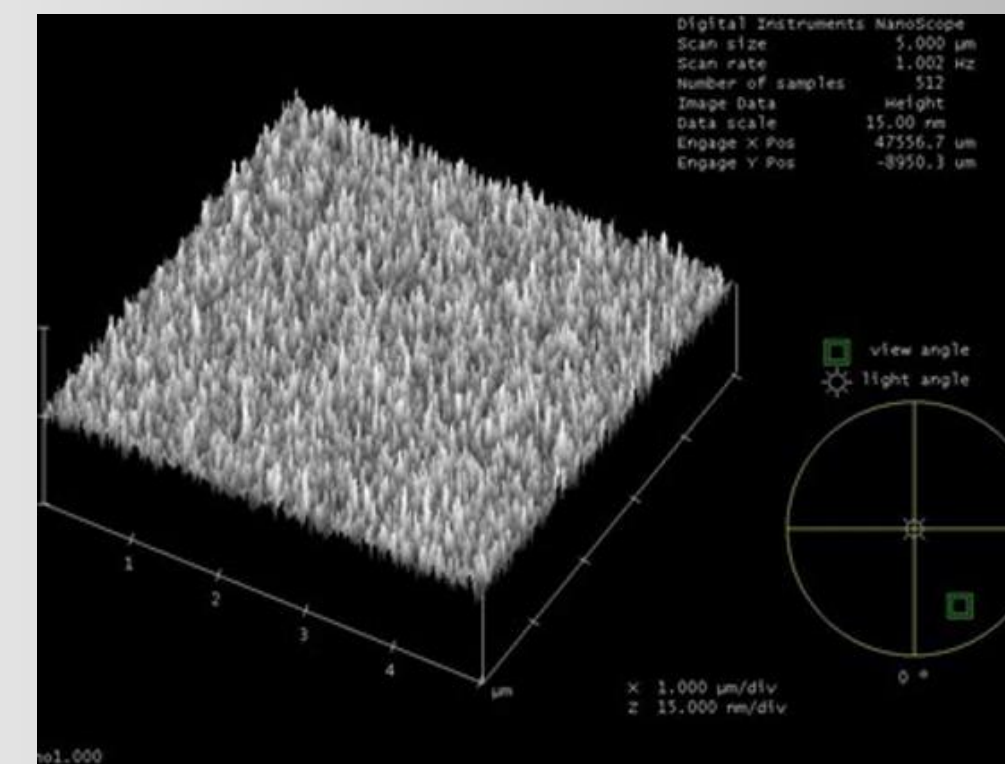
- Scatter = reflected light = loss of power
- An issue for precision, high power or UV laser applications

The Solution: Superpolished Optics

- $\leq 1\text{\AA}$ RMS surface roughness
- Range of in-stock substrates available
- Custom sizes, shapes and coatings available

What Does 'Superpolished' Mean?

- No true industry standard for a 'Superpolished' optic
- Edmund Optics has developed a process to polish surfaces to $\leq 1\text{\AA}$ RMS surface roughness



Learn more: J. Nelson and S. Jiles "Creating sub angstrom surfaces on planar and spherical substrates", Proc. SPIE 111175, Optifab 2019, 1117505 (15 November 2019); <https://doi.org/10.1117/12.2536689>

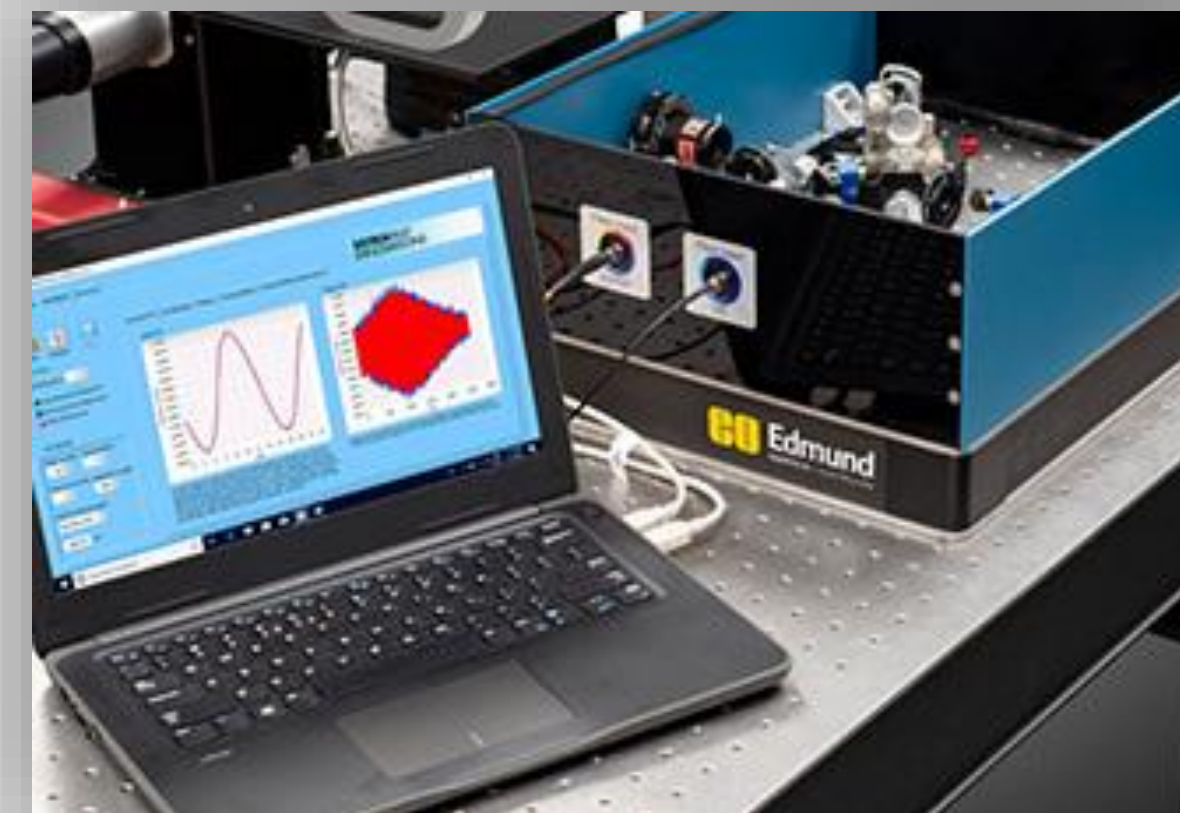
If You Can't Measure it, You Can't Make it

Superpolished Optics Metrology

- Zygo® NewView White Light Interferometers
- Zygo® VeriFire™ High Resolution Interferometers
- Park Systems XE-100 Atomic Force Microscope (AFM)

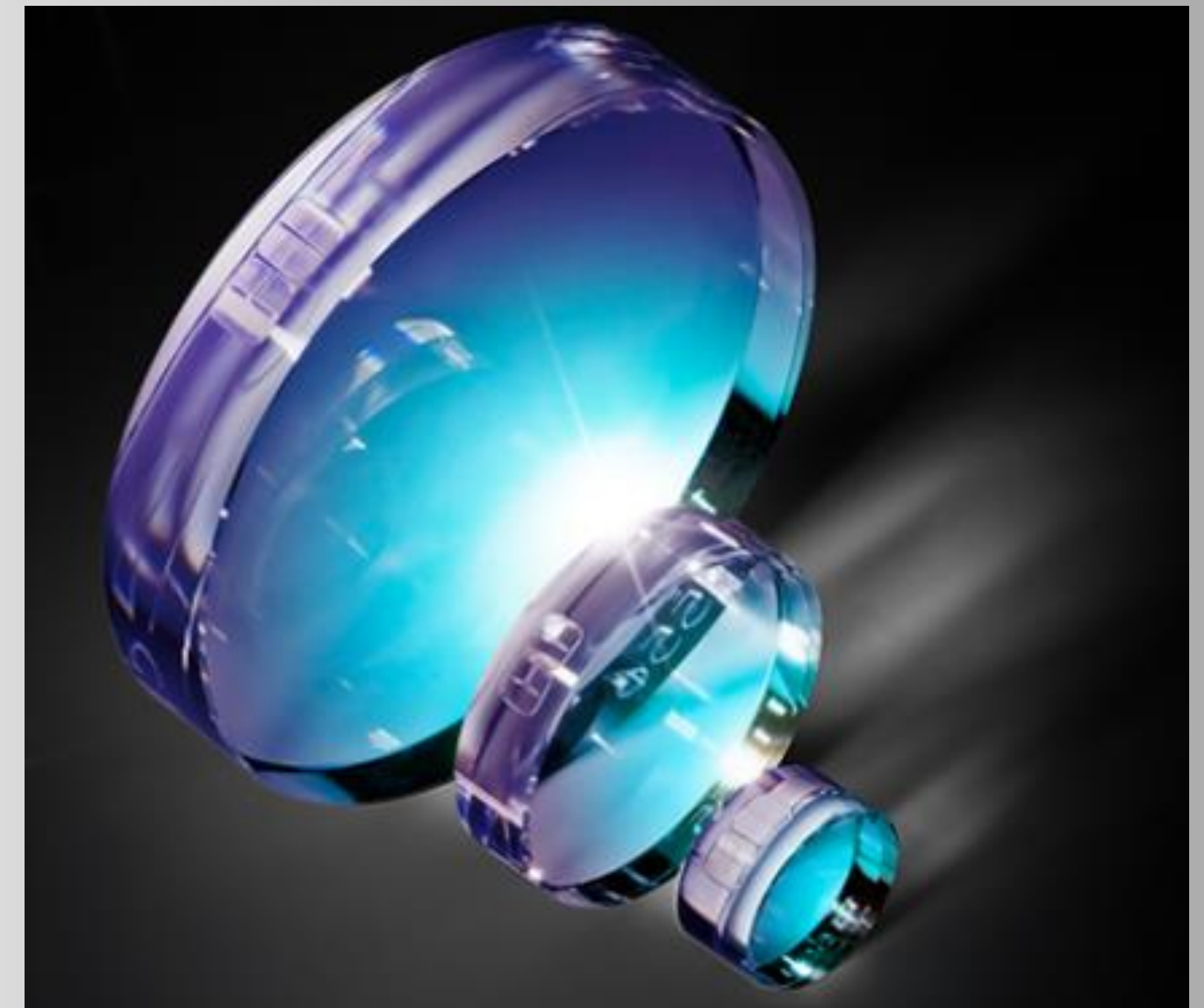
Learn more:

Shawn Iles and Jayson Nelson "Sub-angstrom surface roughness metrology with the white light interferometer", Proc. SPIE 11175, Optifab 2019, 1117519 (15 November 2019); <https://doi.org/10.1117/12.2536683>



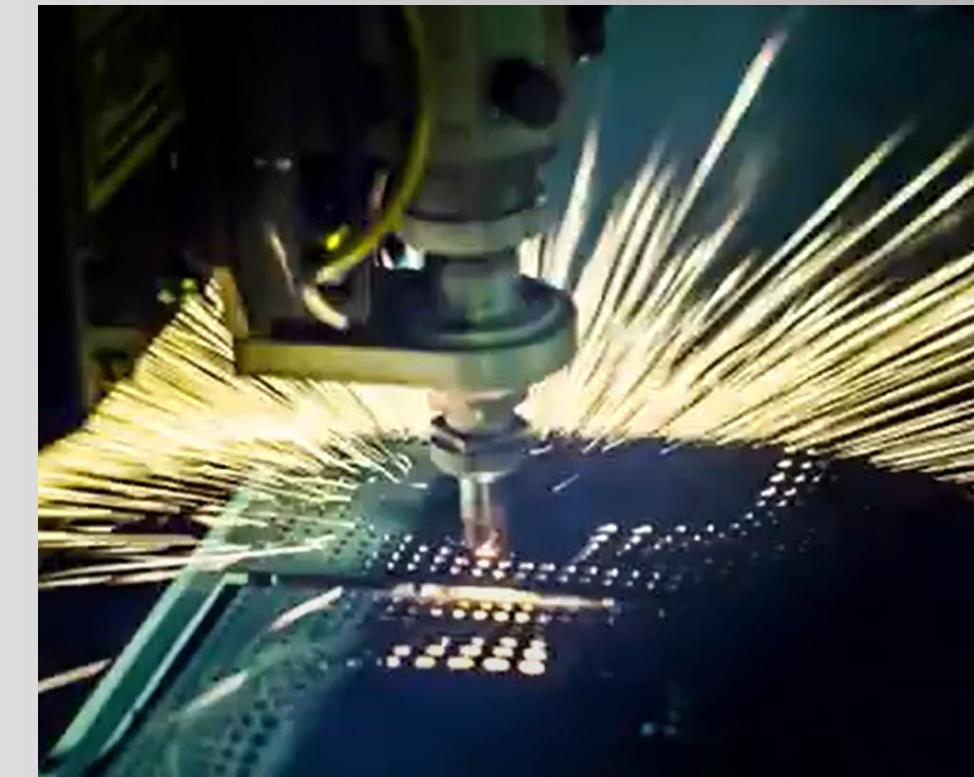
Products: Superpolished Substrates

- Superpolished on both surfaces with $\leq 1\text{\AA}$ RMS surface roughness
- Current standard Fused Silica sizes 12.7, 25.4, 50.8mm
- Custom sizes and shapes from 6 - 100mm
- High power, complex laser coatings available
- Next steps: spherical optics, additional substrates



Who Benefits From Superpolished Optics?

- High power laser systems
- UV systems
 - Medical systems
 - Photolithography
- Ultra-low scatter requirement systems
 - Metrology



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- From prototype to volume production
- 2 Million optical components manufactured per year



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