ADVANCED **MANUFACTURING**

CAPABILITIES GUIDE

Your Partner for

Custom Optics

Design, Fabrication, Metrology, Coating, and Assembly Solutions for the entire beam path.

PRECISION OPTICS
by EDMUND

OPTICAL **FILTERS**
by EDMUND

LASER OPTICS
by EDMUND

IMAGING OPTICS
by EDMUND

800.363.1992
www.edmundoptics.com/**manufacturing**

Edmund optics | worldwide

Welcome!

The **Future Depends on Optics®** and world-changing innovations enable applications that tackle the challenges of tomorrow. For **over 80 years**, Edmund Optics® (EO) has been at the forefront of these advancements, supplying industries worldwide with precision optical components and assemblies.

Whether you need custom coated components made to your specification, optical design services to optimize a lens to meet your needs or a partner for large-scale production, our extensive manufacturing capabilities and engineering expertise are dedicated to supporting you at every stage of your project and along your entire beam path.

Reach out to us today—we're here to help you succeed.

Marisa Edmund
Chairman of the Board,
Chief Marketing & Sales Officer

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Why Edmund Optics®

Customer First!
Our top priority is to serve our customers and truly understand their needs, guiding everything we do.

A Trusted Partner
Since 1942, we've built our reputation on reliable partnerships with customers, institutions, and companies, fostering trust every step of the way.

Global Reach, Local Touch
With 17 locations worldwide and a multilingual team, we ensure that support is always within easy reach, no matter where you are.

Optics for Your Entire Beam Path
We provide the full spectrum of optical solutions to shape your beam path.

For more detailed **MANUFACTURING CAPABILITIES**, visit **www.edmundoptics.com/manufacturing**

What We Do

Engineering Services
Global optical experts support your project from concept to completion.

Metrology
Precision metrology ensures top-tier quality in every manufactured product.

Manufacturing
Specialized global teams deliver exceptional quality through advanced facilities.

Coating
Custom optical thin film coatings designed to your specifications.

Assembly
Complete optical assembly with precision alignment and testing.

Where We Are

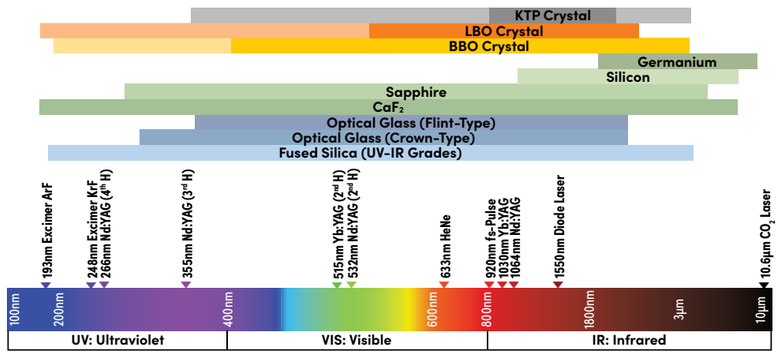
We are **present in 13 countries** and **manufacture in 8 factories**. Close to the customer and easy to reach!

Materials We Use

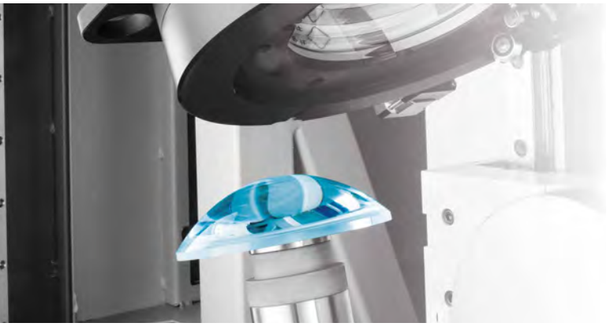
We have direct access with various providers and manufacturers of optical materials. Our experts can assist in selecting the right materials, ensuring both optimal performance and cost-efficiency.

Materials We Provide:

- Optical Glasses
- Crystals
- Polymers
- Color Filter Glass
- Metals
- And More....



Scan for our full glass types chart



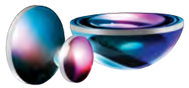
Precision Components

Edmund Optics® specializes in guiding customers from prototype to volume production, providing tailored, cost-effective optical solutions that meet specific requirements, timelines, and budgets.

Over 250,000 sq. ft. (23,000 m²) of combined manufacturing space globally. In-Region Design-for-Manufacturing Support for **US, Europe, and Asia**.

Tolerancing an optical system helps balance yield and cost. The tables below show examples of precision levels to use as starting points for your optical design. **If your system requires tighter tolerances, we can accommodate.**

Scan to learn more



Curved Surfaces – **Spheres**

Spheres	←	Sphere Precision Tolerancing Spectrum to Help Balance Yield and Cost			→
Yield:		♦♦♦	♦♦	♦	Tighter Specifications Possible, Please Contact Us
Cost:		$	$$	$$$	
Diameter (mm):		+0.000/-0.100	+0.000/-0.025	+0.000/-0.010	
Center Thickness (mm):		+/-0.10	+/-0.05	+/-0.01	
Irregularity - Interferometer (waves, PV):		2	1	0.05	
Radius or Power :	←	+/-0.3% or 3λ	+/-0.2% or 2λ	+/-0.05% or 1λ	
Clear Aperture:		80%	90%	95%	
Surface Quality (ISO 10110-7: 2017):		80-50 or N* x 0.40	60-40 or N* x 0.16	10-5 or N* x 0.10	
Roughness (nm, RMS):		4	2	1†	
Wedge (arcmin):		5'	2'	1'	
Glass Material (n_d, v_d):		+/-0.001, +/-0.8%	+/-0.0005, +/-0.5%	Melt Rebalanced	
Non-Glass Material:		Crystalline Materials	Silicon and Germanium	–	

Diameter Range: 5 - 200mm *Defect number will depend on the size of the clear aperture
†<2A available for superpolished surfaces

Curved Surfaces – **Aspheres**

Aspheres	←	Asphere Precision Tolerancing Spectrum to Help Balance Yield and Cost			→
Yield:		♦♦♦	♦♦	♦	Tighter Specifications Possible, Please Contact Us
Cost:		$	$$	$$$	
Diameter (mm):		+0.000/-0.100	+0.000/-0.025	+0.000/-0.010	
Center Thickness (mm):		+/-0.10	+/-0.05	+/-0.01	
Irregularity - Interferometer (waves, PV):		2	1	0.15	
Irregularity - Profilometer (microns, PV):		+/- 2.0	+/- 0.5	N/A	
Radius or Power :	←	+/-0.3% or 3λ	+/-0.2% or 2λ	+/-0.1% or 1λ	
Clear Aperture:		80%	90%	90%	
Surface Quality (ISO 10110-7: 2017):		80-50 or N* x 0.40	60-40 or N* x 0.16	10-5 or N* x 0.10	
Roughness (nm, RMS):		4	2	1	
Aspheric Wedge (tilt: arc min; decenter: µm):		5'; 50	2'; 25	1'; 10	
Mid-Spatial Frequency Errors (mrad with 1mm sampling length):		N/A	0.3	0.1	
Glass Material (n_d, v_d):		+/-0.001, +/-0.8%	+/-0.0005, +/-0.5%	Melt Rebalanced	

Diameter Range: 10 - 200mm *Defect number will depend on the size of the clear aperture

Flat Surfaces – **Prisms & Beamsplitters**

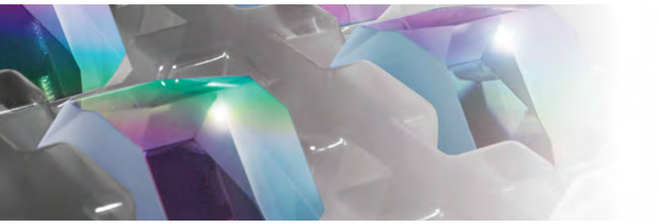
Prisms & Beamsplitters	←	Flatwork Precision Tolerancing Spectrum to Help Balance Yield and Cost			→
Yield:		♦♦♦	♦♦	♦	Tighter Specifications Possible, Please Contact Us
Cost:		$	$$	$$$	
Dimensions (mm):		+/-0.20	+/-0.08	+/-0.01	
Irregularity (waves, PV):		1	0.25	0.1	
Power (waves):		5λ	3λ	1λ	
Clear Aperture:	←	80%	90%	90%	
Surface Quality (ISO 10110-7: 2017):		80-50 or N* x 0.40	60-40 or N* x 0.16	10-5 or N* x 0.10	
Roughness (nm, RMS):		4	2	1†	
Beam Deviation:		5'	1'	30"	
Angle Tolerance:		2'	30"	10"	
Glass Material (n_d, v_d):		+/-0.001, +/-0.8%	+/-0.0005, +/-0.5%	Melt Rebalanced	

Size Range: 5 - 100mm
†<2A available for superpolished surfaces
Sharp edges, protective chamfers and measured bevel sizes available
*Defect number will depend on the size of the clear aperture

Flat Surfaces – **Windows, Mirrors, & Filter Substrates**

Windows, Mirrors, & Filter Substrates	←	Flatwork Precision Tolerancing Spectrum to Help Balance Yield and Cost			→
Yield:		♦♦♦	♦♦	♦	Tighter Specifications Possible, Please Contact Us
Cost:		$	$$	$$$	
Dimensions (mm):		+/-0.2	+/-0.08	+/-0.01	
Irregularity (waves, PV):		1	0.25	0.10	
Power (waves):		5λ	3λ	1λ	
Clear Aperture:	←	80%	90%	90%	
Surface Quality (ISO 10110-7: 2017):		80-50 or N* x 0.40	60-40 or N* x 0.16	10-5 or N* x 0.10	
Roughness (nm, RMS):		4	2	1†	
Parallelism:		5'	1'	5"	
Angle Tolerance:		2'	30"	10"	
Glass Material (n_d, v_d):		+/-0.001, +/- 0.8%	+/-0.0005, +/- 0.5%	Melt Rebalanced	
Non-Glass Materials:			Silicon and Germanium	Laser Crystals and Laser Glass	

Size Range: 5 - 300mm
†<2A available for superpolished surfaces
Sharp edges, protective chamfers and measured bevel sizes available
*Defect number will depend on the size of the clear aperture



Thin Film Coatings

Optical coatings are a critical portion of the finished optical component. Quality optical coating design and production can mean the difference between the component failing in the field or lasting for the intended lifetime of the project.

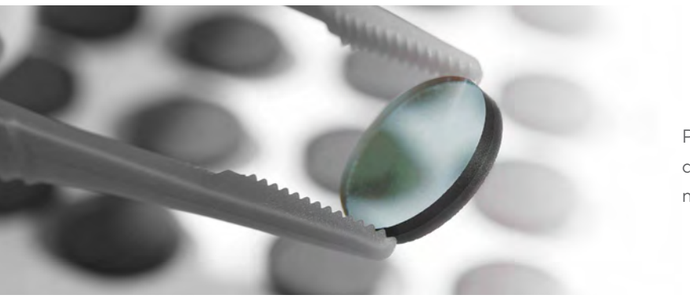
- Internal High Volume Coating Capabilities from 248nm to >40µm
- Custom Coating Design from UV to LWIR Spectral Ranges
- Well-Established Partners Covering Selective Deep, Vacuum and Extreme UV Ranges from 4.1nm - 248nm
- Competitive Volume Pricing
- Anti-Reflective, Highly-Reflective, Filter, Polarizing, Beamsplitter, and Metallic Designs
- High Laser Induced Damage Threshold (LIDT) and Ultrafast Laser Coatings

Scan to learn more

Thin Film Coatings (AR, HR, Beamsplitter, Filter, Laser)

		Thermal Electron Beam (E-Beam)	E-Beam with Ion Assist	Advanced Plasma Source (APS)	Radical Assisted Sputtering with Bias Voltage (RAS-Bias)	Ion Beam Sputtering (IBS)	Metallic Mirrors	Diamond Like Carbon (DLC)
Custom thin film coating designs can be created to achieve the reflection, transmission or specified blocking that your system needs.	**Wavelength Range:**	157nm - 12µm	190nm - >20µm	250nm - >20µm	320nm - 3500nm	266nm - 3500nm	250nm - 20µm	2µm - 15µm
	Vacuum Ultraviolet:	■	▒					
	Ultraviolet:	■	■	▒		▒	▒	
	Visible:	■	■	■	■	■	■	
	Near Infrared:	■	■	■	■	■	■	
	Infrared:	■	■	■			■	■
	Substrate Materials:	All Glass and Laser Crystals	All Glass and Laser Crystals	All Glass	Glass wafers	All Glass	All Glass and Metal	IR Materials
	Maximum Dimension:	400mm	400mm	150mm	150mm	75mm	150mm	400mm
	Coating Materials:	Fluorides	Fluorides, Oxides	Fluorides, Oxides	Oxides	Oxides	Al, Ag, Au	Nanocomposite Carbon
	Batch Cost:	$	$$	$$$	$$$$	$$$$	$	$$$
	Chamber Size:	▬	▬	▬	▬	▮	▬	▬
	Unit Cost (Batch Optimized):	$	$	$$	$$	$$$$	$	$$
	Possible Coating Complexity:	♦	♦♦	♦♦♦	♦♦♦♦	♦♦♦♦♦	♦	♦
	Density:	Low	Med-High	High	Very High	Very High	Med-High	Very High
	Scattering:	✸	★	★	✦	•	★	✸
	Durability:	Good	Very Good	Very High	Very High	Very High	Good – Very Good	Very High
Anti-Reflective (AR)	**Reflectivity Specification (R<%) for Narrow Bandwidth:**	0.25%	0.25%	0.20%	0.20%	<0.05%		
	Reflectivity Specification (R<%) for Broad Bandwidth:	0.50%	0.50%	0.40%	0.40%	0.25%		
Mirrors / High Reflective (HR)	**Reflectivity Specification (R>%) for Narrow Bandwidth:**	>99.8%	>99.8%	>99.8%	>99.8%	>99.999%		
	Reflectivity Specification (R>%) for Broad Bandwidth:	>99%	>99%	>99%	>99%	>99.9%	>95%	
Beamsplitters	**Ts - Tp (Broadband Non-Polarizing):**	<8%	<6%	<6%				
	Ts - Tp (Laser Line Non-Polarizing):	<3%	<2%	<2%				
	R/T Splitting Ratio Tolerance (Non-Polarizing):	+/-10%	+/-5%	+/-5%				
	Extinction Ratio (Polarizing):	500:1	>1000:1	>1000:1				
Optical Filters	**Optical Filters OD Blocking Value:**			OD3	OD4+	OD6+		
	Minimum Bandwidth:			25nm	10nm	<5nm		
	Transition Width (Max. OD to 50%T):			5% of CWL	3% of CWL	1% of CWL		
Laser Coatings* Example Data for 1064nm. Values for other materials and wavelengths available upon request.	**LIDT (J/cm²) - Nanosecond at 1064nm:**	20 - 100	20 - 100			20 - 100	2 - 5	
	LIDT (J/cm²) - Ultrafast at 1064nm:	0.5 - 5	0.5 - 5			0.5 - 10	0.2 - 2	
	Absorption (ppm):	10	<10			<5		

*All LIDT values provided are typical ranges and do not represent the highest performance achievable; actual results vary depending on material, design, and testing specifications. LIDT also scales with wavelength and pulse duration. Typical values for specific materials, wavelengths and pulse durations can be requested. All our laser coatings are all verified through in-house and/or third-party vendors.



Polarizers & Optical Retarders

Polymer polarizer and retarder films can be laminated onto a range of substrates to create a custom polarization optic to meet your unique needs.

Lamination of Film Products

- **Various grades of polarizer film available for lamination onto glass or polymer (ex: PMMA)**
- **Lamination of SCHOTT color filter glass or neutral density (ND) filters possible for custom filtering solutions**
- **Roll-to-roll lamination (circular polarizers, adhesives, etc.)**

Cutting of Film Products

- **Laser for High Throughput**
- **Mechanical for Best Edge Quality**
- **Custom Sizes and Shapes**

Linear Polarizer Manufacturing Capabilities*

*For specifications for circular polarizers and retarders, visit **www.edmundoptics.com/capabilities/polarizers**

Specifications:	Linear Polarizing Film	PMMA Laminated	Glass Laminated	Wire-Grid Polarizing Film
Dimensions:	3 x 3mm - 600 x 1000mm	3 x 3mm - 600 x 900mm	6 x 6mm - 250 x 250mm	3 x 3mm - 75 x 75mm
Diameter:	3 - 600mm	3 - 600mm	6 - 250mm	3 - 80mm
Dimensional Tolerance:	According to DIN ISO 2768-1m/c			
Thickness:	0.18 - 1.00mm	1.00 - 3.00mm	2.00 - 3.50mm	0.19mm
Transmission:	Up to 42%			85%
Extinction Ratio:	Up to 1:30,000			1:2,000

Online Tool for Quick Quotes of Custom Polarizers and Retarders

Single Point Diamond Turning

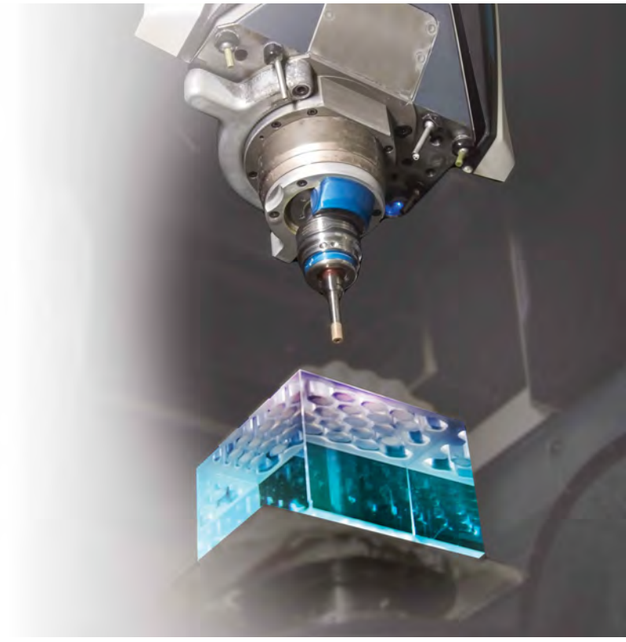
Single point diamond turning (SPDT) is a precision machining process to produce high-quality on and off-axis optical components with nanometer-scale surface finishes and sub-micron form accuracies. This technique, enables the production of complex shapes such as aspheric lenses and mirrors.

- **Aluminium**
- **Ni-Plated Surfaces**
- **Crystals (ex. Ge, CaF_2, ZnS, etc.)**
- **Polymers**
- **In-House Machine Shop for Substrate Preparation**

Complex Shaping and Post Processing

Optics are rarely complete without back-end or post processing—whether it's a serial number engraved on the side or edge blackening for stray light reduction. EO even offers CNC machining of glass parts to create complex, high-precision outer shapes or structures.

- **Laser Engraving (glass & metal)**
- **Blackening & Silk Screen Printing**
- **Cementing**
- **DMG-Mori 5-Axis-Ultrasonic CNC**
- **Complex Shapes**
- **Lightweight Structures**
- **In-House Tool Production for Shorter Lead Time**



Over 250,000 sq. ft. (23,000 m²) of combined manufacturing space globally.

In-Region Design Support for **US, Europe, and Asia**.

Design Areas of Expertise

No problem is the same and neither are any of our designs. Our **advanced applications engineers** can help define your design requirements to ensure our team of design experts solve your unique need.

- **Imaging Assemblies**
  - Fixed Focal Length
  - Telecentric
  - Eyepieces
  - Zoom Lenses
  - Adjustable Aperture
  - Scheimpflug Systems
  - Microscope Objectives
  - Liquid Lens Integration
- **Laser Optics Assemblies**
  - Beam Expanders
  - F-Theta Lenses
- **Illumination Design**
- **Reflective Systems**
  - Beam Expanders
  - Objectives
- **Analysis**
  - As-Built Tolerancing
  - Finite Element (FEA)
  - Stray Light
  - Thermal Analysis
- **Special Environments**
  - Athermalization
  - Ruggedization
  - Motorization

Zemax CODE V FRED Optimum SolidWorks



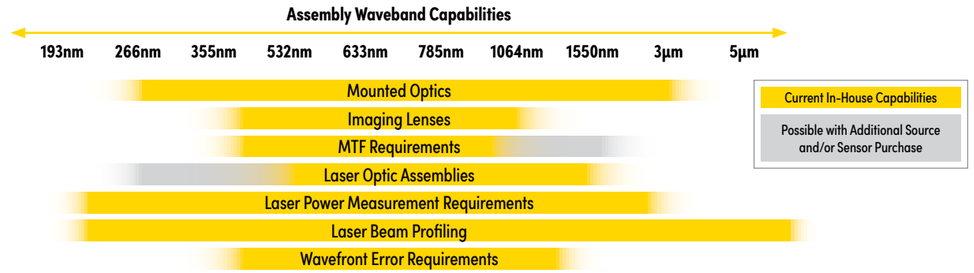

For more **DESIGN ASSISTANCE**, visit **www.edmundoptics.com/design**

Assembly Capabilities

Optical assemblies demand dedication to cleanliness, precision, and quality, along with a deep understanding of processes and best practices. At Edmund Optics®, we build **over 175,000 assemblies each year**—why not yours?

- **Mounted Optical Components & Subassemblies**
  - Retained
  - Bonded
  - Fiber Coupled
  - Actively Aligned
  - Adjustable
- **Bonded Components and Subassemblies**
  - Glass-to-Glass
  - Optical Contacting
  - Glass-to-Metal
- **Multielement Optical Assemblies**
  - Drop Together
  - Actively Aligned and/or Compensated
  - Adjustable (Focus, Iris)
  - Zoom
- **Advanced Assemblies and Systems**
  - Precision Positioning
  - ESD Sensitive
  - Challenging Environments
  - Clean Room Requirements
  - Sensor Alignment
  - Electronics Integration
  - Software Integration
  - Motorization

Assembly Waveband Capabilities



Did You **Know**?

Nominal performance or specifications in optical systems refer to the ideal system achieved in simulation during the design phase. In contrast, **as-built** refers to actual dimensions and deviations (tolerances) observed in manufactured components and allows for modeling of the real-world variation in performance that occurs in production. **Appropriate modeling of as-built tolerancing is crucial for evaluating the true performance of an optical system**, and allows for prediction of adjustments or compensations that may be needed during final assembly.

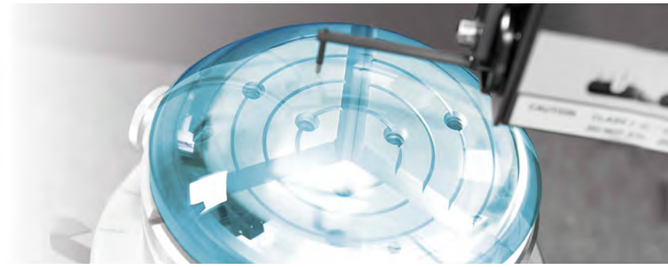
Preferred Assembly Parameters	
System Diameter:	Ø3 – 300mm
Laser Assembly Wavelengths:	532nm, 633nm, 1050nm, 1064nm, 1550nm
Element Centration:	Down to ±1µm
Glass Materials:	High melt frequency visible glasses. To see our preferred glass types, visit **www.edmundoptics.com/glass-types**.
Mechanics Materials:	Aluminum, Steel, Brass, Plastic
Finishes:	Black Anodization, Black Paint, Chem Film / Alodine
Electronics Integration:	Liquid Lenses, Camera Modules, Sensor Alignment

Your Partner for Custom Optical Solutions

With more than 80 years in optics, decades of in-house manufacturing experience, and paired precision metrology technology, Edmund Optics® is **your partner for custom component needs**.

Metrology Equipment

All our manufacturing technology is supported by state-of-the-art metrology systems to verify that we achieve our quality targets at each step of the process.



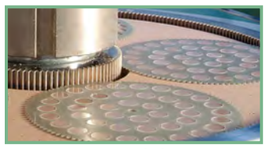
Our Expertise – **Manufacturing Equipment**

Satisloh SPM CNC Grinding

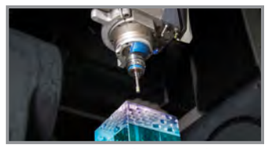
QED Magnetorheological Finishing

Satisloh C-300 7-Axis CNC Centering

Computer Controlled Polishing



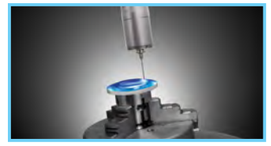
Super Polishing



Coring, Slicing and Dicing Platforms

Manufacturing Equipment		Verification
Satisloh SPM CNC Grinding Multi-Axis Ultra Precision Lathe (UPL) Diamond Turning	→	Taylor Hobson Talysurf Zeiss Contura Coordinate Measuring Machine (CMM)
Satisloh SPS CNC Polishing Computer Controlled Polishing (in-house developed) QED Magnetorheological Finishing	→	Taylor Hobson Luphoscan 260HD QED Aspheric Stitching Interferometer Fizeau Interferometry with Computer Generated Holograms (CGH)
Satisloh C-300 7-Axis CNC Centering	→	Trioptics OptiCentric AspheroCheck Taylor Hobson Luphoscan 260HD
Double- & Single-Sided Plano Polishing Optical Contacting	→	Zygo VeriFire Short Coherence Length Interferometry Trioptics PrismMaster
Super Polishing	→	Zygo NewView White Light Interferometer Atomic Force Microscope (AFM)
Coring, Slicing and Dicing Platforms	→	Keyence IM-7000 3D Optical Profiler Zeiss Contura CMM

Our Expertise – **Metrology Equipment**

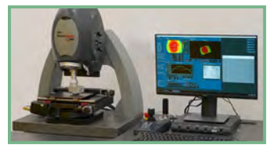


Zeiss Contura CMM

QED Aspheric Stitching Interferometer

Trioptics OptiCentric AspheroCheck

Short Coherence Length Interferometry



Zygo NewView White Light Interferometer

Keyence IM-7000 3D Optical Profiler

If You Can't Measure It – **You Can't Make It.**

Edmund Optics' philosophy is and has always been that
metrology is as important, if not more so, than manufacturing equipment.

- We invest in pairing our manufacturing processes with the metrology needed to fully verify specifications
- State-of-the-art commercial systems are complemented by custom solutions developed in-house made to our requirements

Did You **Know**?

While the large selection of **asphere surface metrology** may seem redundant, there are very good reasons for it – for example: While the measurement on a well-calibrated interferometer with a CGH as a reference may give the most precise result, it has limitations regarding lens geometries. For that reason, we complement that option with other market-leading systems, like the Luphoscan, to complete our capabilities and always have the right solutions available to meet your requirements!

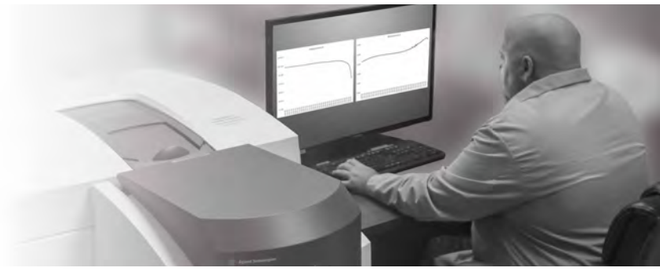
Asphere Surface Metrology			
System	Precision	Cost	Flexibility
Talysurf	+	$	++++
Luphoscan	++	$$	++++
QED ASI	+++	$$$	++
Fizeau w/ CGH	++++	$$$$	+

Coating Technologies

Edmund Optics® utilizes various coating technologies, to offer the **best solution for all requests** – from precisely monitored and high accuracy IBS-chambers allowing for hundreds of layers, to fast deposition evaporative systems that allow for cost effective AR coatings with high throughput.

Coating Metrology

All our coating technology is supported by state-of-the-art metrology systems, to verify that we achieve our quality targets at each step of the process!



Our Expertise – **Coating**

Electron Beam Evaporative Coating Platform

Ion Beam Sputtering Chamber

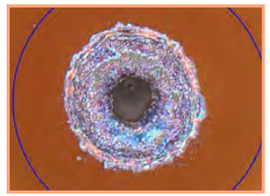
Automated Ultrasonic Cleaning

Coating Equipment	Verification
Electron Beam Evaporative Coating Platform Electron Beam with Ion Assisted Deposition APS Advanced Plasma Source Radical Assisted Sputtering with Bias Voltage	Commercial Spectrophotometry: Agilent Cary Perkin Elmer Lambda Series
Ion Beam Sputtering Chambers	Custom-Built OD8 Spectrophotometer Cavity Ring Down Spectrophotometer Photothermal Common-Path Interferometry Ultrafast Group Delay Dispersion (GDD) Characterization
Automated Ultrasonic Cleaning Environmentally Controlled Storage Locations	In-House LIDT Test Facility UV-Degradation Testing Visual Inspection Setups (MIL-Conforming) Durability Test Setups (ISO 9211) Climate Chambers (ISO 9022)

Our Expertise – **Coating Metrology**

Agilent Cary

Cavity Ring Down Spectrophotometer



LIDT Testing

We offer a **global presence with in-region engineers and coating designers** ready to support you through every phase of your project from initial design to final production.

To facilitate precise and efficient design processes, we utilize a range of advanced design tools, including:

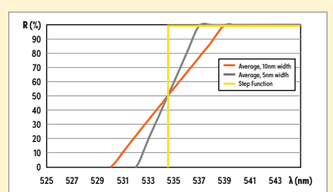
- **OptiLayer:** For sophisticated optical coating design and analysis.
- **Essential Macleod:** To simulate and optimize thin-film optical coatings.
- **Filmstar:** For comprehensive thin-film design and analysis.

With these tools, we provide cutting-edge solutions to **bring your designs from concept to reality**.

Did You **Know**?

Characterizing high performance optical filters comes with many metrology challenges that can require trade-offs. High spectral resolution helps to characterize steep transitions, but limits signal strength that may be required to verify highest blocking. We use a mix of state-of-the-art commercially available platforms and an OD8-capable spectrophotometer custom-made to our specifications to verify all the requirements you may have.

Unsure how to specify your filter to ensure best performance?
Consult with our coating engineers and designers to find your solution.



A spectrophotometer's monochromator passes a finite spectral width of light. The resulting curve is an average of the true performance in that spectral range and high spectral resolution is desirable to verify transition widths. However, that may also lead to low light throughput, limiting the maximum measurable optical density. Rigorous engineering is required to find the right balance to measure modern, high-end optical filters.

Assembly Technologies

From components to complex systems, Edmund Optics® can help define, design, and produce a solution for your needs. **Let our experts help bring your concept to reality**!

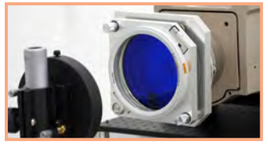
Assembly Metrology

Leverage our extensive facilities and highly experienced teams to ensure your product meets every requirement, every time.

Our Expertise – **Assembly**

Zeiss Contura


TriOptics ImageMaster HR


Fizeau Interferometer


Thermotron Thermal & Humidity Chamber


TriOptics Opticentric


In-House Machine Shop

Our Expertise – **Assembly Metrology**

Advanced Assemblies	Verification
 Mounted Optical Components Bonded Components and Subassemblies	**Surface and Angle Measurements:** Zeiss Duramax & Contura CMM OptiPro OptiTrace 5000 NewView White Light Interferometer Autocollimators, Radius Slides, Theodolites
 Imaging Lens Assemblies	**Image Performance Testing:** Optikos Lens Check VIS Slanted-Edge MTF (EO-Designed) Veiling Glare Testing per ISO 9358 (EO-Designed) TriOptics ImageMaster HR Reverse Projection (EO-Designed) Telecentricity Testing (EO-Designed)
 Laser Optics Assemblies	**Wavefront Testing and Laser Beam Characterization:** Fizeau Interferometers Gentec Beamage-M2 Ophir 3A-P Quad and PD300R-UV Power Meters Phasics SID4-UHR Wavefront Sensor DataRay Beam'R2 and Coherent Lasercam Beam Profilers
 Athermalized & Ruggedized Assemblies	**Environmental Testing:** Vibration Research Shaker Thermotron Thermal & Humidity Chamber Ingress Protection (IPX7 & IPX9K) Testing
 Advanced Assemblies and Solutions	**Precision Assembly, Integration, & Test Support:** TriOptics Opticentric Physik Instrumente (PI) 6-Axis Hexapod Custom Test Bed Development Motorization and Automation Optical Perspectives Point Source Microscope (PSM) Custom Tooling and Fixturing Electronics and Software Integration & Testing
 Assembly Customization	Laser Engravers Custom Packaging 3D Printers In-House Machine Shops

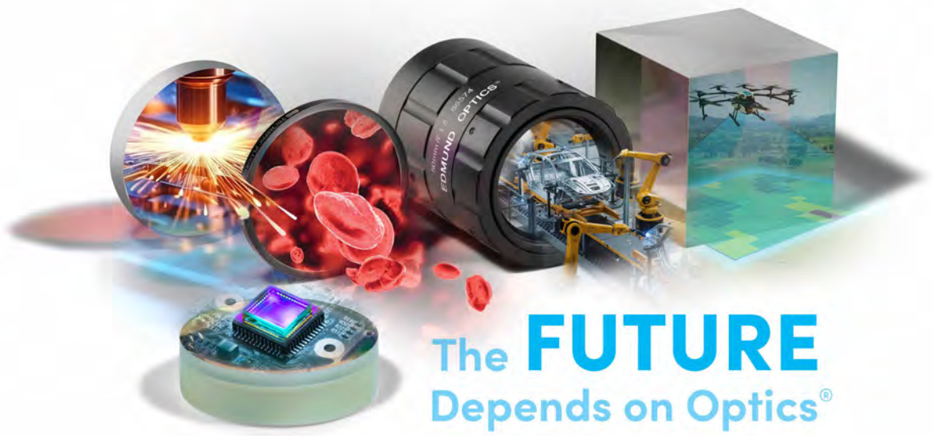
Edmund Optics® cares about quality! We have facilities that are:

- ISO 9001 Certified for our quality management systems (QMS)
- ISO 13485 Certified for our medical device QMS
- ISO 14001 Certified for our environmental QMS
- AS9100 Certified for our aerospace QMS
- AS9164 Certified for our foreign object damage (FOD) prevention

Did You **Know**?

Active alignment is a methodology that aligns optical elements across multiple degrees of freedom during the assembly process. It is critical for high precision optical assemblies sensitive to misalignments. Edmund Optics® can accomplish precision alignment of optics down to 1µm centration to meet the needs of your most demanding applications.

Active Alignment			
Lens Assembly Method	**Precision**	**Cost**	**Flexibility**
Drop Together	+	$	+
Shim to Center	++	$$	+
Active Alignment	+++	$$$	+++
Alignment Turning	++++	$$$$	++++



We are proud to create products that play a role in addressing **global challenges** such as climate change, demographic shifts, and health and well-being. Some examples of markets and applications supported by Edmund Optics®:

Automation

Optics are crucial in the **automation** industry, enhancing both precision and efficiency. Imaging lenses are employed for real-time monitoring and quality control, with machine vision filters improving image clarity and accuracy in defect detection on production lines. Rigorous testing during assembly ensures that custom optical components maintain precise alignment and optimal performance in critical tasks like measurement and inspection.

Life Sciences

In **life sciences**, optics enable applications including microscopy, spectroscopy, and molecular diagnostics. High optical density filters play a vital role in selectively isolating specific wavelengths of light, which enhances signal clarity and sensitivity in techniques like fluorescence microscopy. Lenses and prisms further contribute to precise imaging of samples, while high-performance objectives provide the necessary resolution and contrast to observe cellular structures in detail. Together, these optics drive advancements in medical research, diagnostics, and imaging techniques, ultimately improving health outcomes.

Materials Processing

Optics are crucial in **materials processing**, particularly through the use of high laser induced damage threshold (LIDT) mirrors, beam expanders, and other components. They enable precision in cutting, shaping, and analyzing materials by withstanding intense laser energies without degradation, ensuring consistent performance in demanding applications. Additionally, optical sensors and imaging systems provide real-time monitoring and quality control, while techniques like spectroscopy allow for material characterization and assessment.

Defense

In the **defense** industry, optics are essential for enhancing situational awareness and operational effectiveness. Optical systems are optimized to reduce size and weight by incorporating components like aspheric lenses, combining mobility with reliable performance in demanding conditions. Advanced optical systems, such as night vision goggles and thermal imaging devices, enable soldiers to operate safely and effectively in low-light environments. Furthermore, precision optics in robust targeting systems and surveillance drones enhance threat identification and engagement, contributing to overall mission success.

Visit our knowledge center for more case studies

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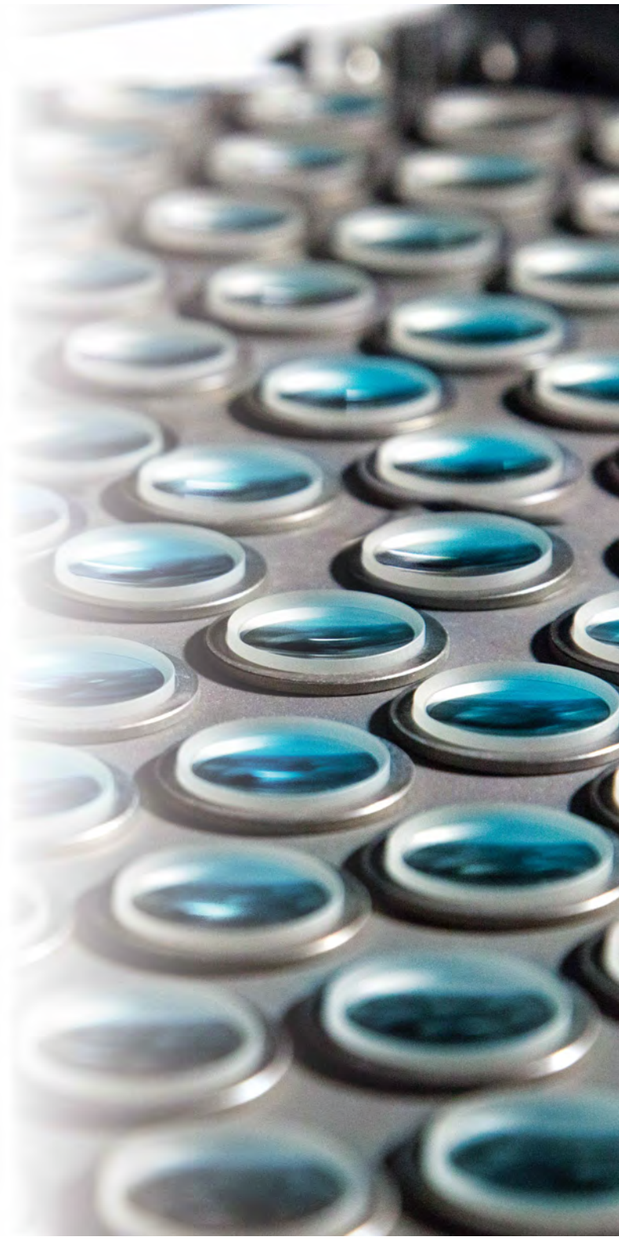
Edmund Optics® is Compliant with:

- ISO 9001:2015
- ISO 14001:2015
- ISO 13485:2016
- ANSI / ASME Y14.5
- ISO 10110
- MIL-C-48497A
- MIL-STD-810
- MIL-PRF-13830B
- MIL-C-675C



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