

WAVELENGTH OPTO-ELECTRONIC'S

INFRARED OPTICS

MANUFACTURING CAPABILITIES

► CONTENT MATERIALS

- Package & Laser Windows
- Anti-Reflection Coatings
- Lenses & Lens Systems
- Optics for QCL's & Spectroscopy
- Infrared Imaging

Longwave Infrared
Page 5



Midwave Infrared
Page 5



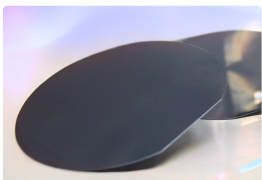
Ronar-Smith®
Beam Expanders
Page 3



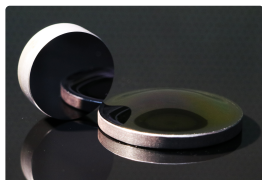
Shortwave Infrared
Page 5



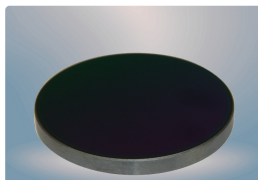
IR Bandpass Filters



Molded Chalcogenide



Infrared Windows

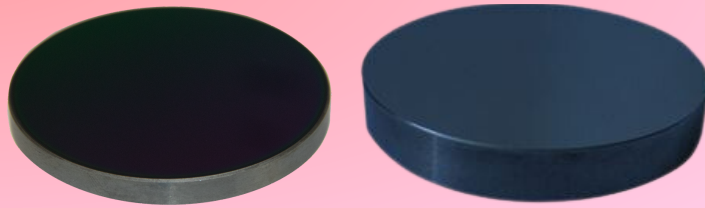


WAVELENGTH
OPTO-ELECTRONIC

Your Photonics Strategic Partner
Infrared Optics 2023 Brochure

PACKAGE & LASER WINDOWS

Suitable optical windows that transmits the needed wavelength for it's application.



INFRARED WINDOWS

- ICL/QCL Windows
- Instrument Windows
- Infrared Emitters
- TO-Can & HHL Packages
- Laser Windows
- Parallel & Wedged

Available in Various Materials

- Barium Fluoride
- Gallium Arsenide
- Potassium Bromide
- Silicon
- Sapphire
- Zinc Sulfide
- Germanium
- Zinc Selenide
- Chalcogenide
- Calcium Fluoride
- Magnesium Fluoride

◆ Thorium-Free Coatings (No Radioactive Materials) ◆ Wide Range of AOI's ◆

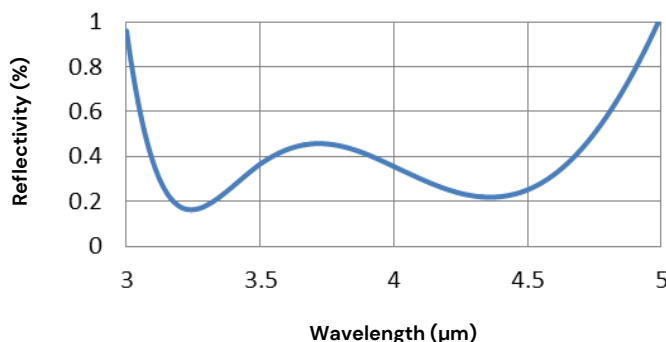
◆ Avg Transmission $\geq 98\%$ at 3-5 μm or 8-12 μm ◆ High Damage Threshold Options For Laser Optics ◆

ANTI-REFLECTION COATINGS

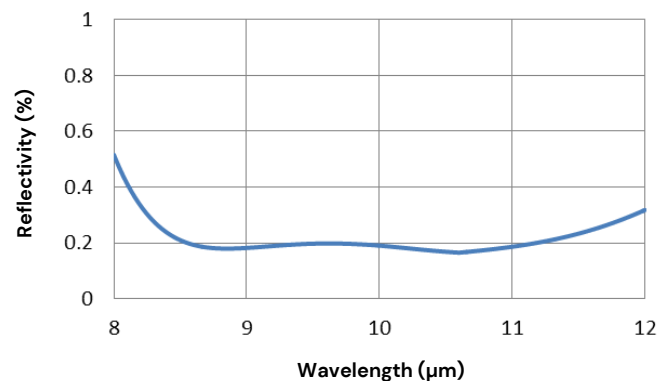


◆ Over 20 coating chambers in operation, including IBS ◆

AR Coating, 3-5 μm

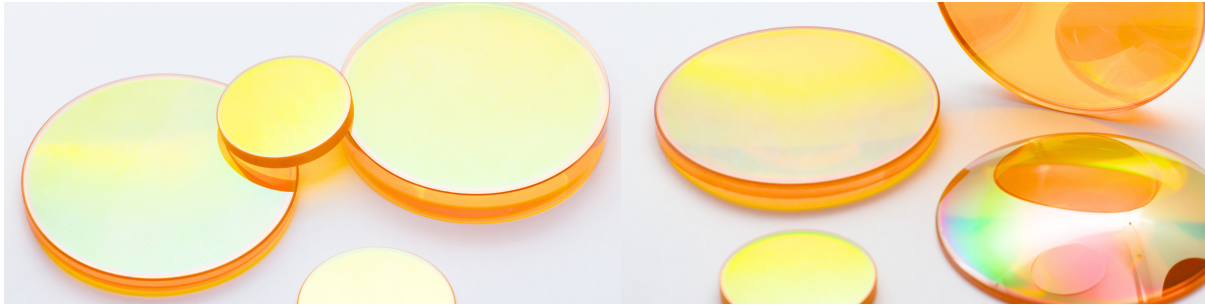


AR Coating, 8-12 μm



LENSES & LENS SYSTEMS

See the world clearer & brighter with our high-quality lenses.



Spherical Singlets • Multi-Element Focusing Lenses • Diamond-Turned Aspheres

RONAR-SMITH[®] BEAM EXPANDERS



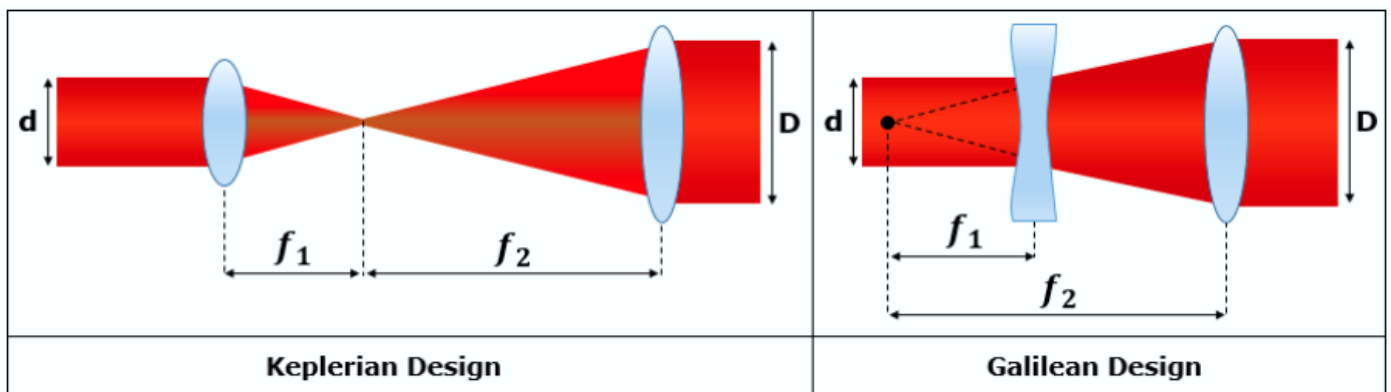
Ronar Smith[®] brand Lens systems are specially made by Wavelength Opto-Electronic only. The patented designs are developed by our talented engineers and are manufactured in-house.

Often available from stock

Water-cooled option for power levels above 500W

Fixed and adjustable magnification options

AVAILABLE IN GALILEAN & KEPLERIAN DESIGNS

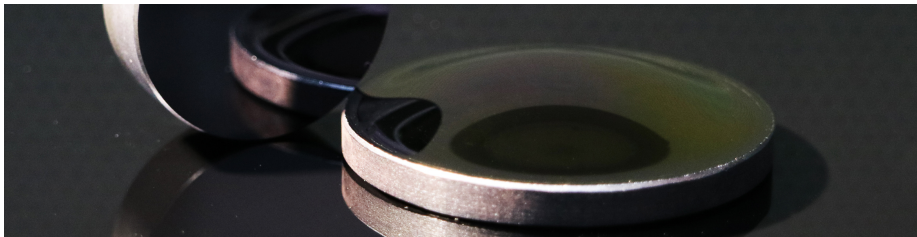


Your Photonics Strategic Partner

Scan to find the Beam Expander for you!



OPTICS FOR QCL'S & SPECTROSCOPY



MOLDED CHALCOGENIDE PRECISION ASPHERES

Greatly reduced cost over diamond turning for 100's of pcs or higher

APPLICATIONS

ICL & QCL Collimation • Coupling Light Into Chalcogenide & Fluoride (ZBLAN) Fiber • Light Collection For Flame Detection

MULTIPLE MATERIAL OPTIONS

Low Dispersion & Thermo-Optic Coefficient

IN-HOUSE DESIGN AND MANUFACTURING

Chalcogenide Materials Manufacturing

Optical Lens Design

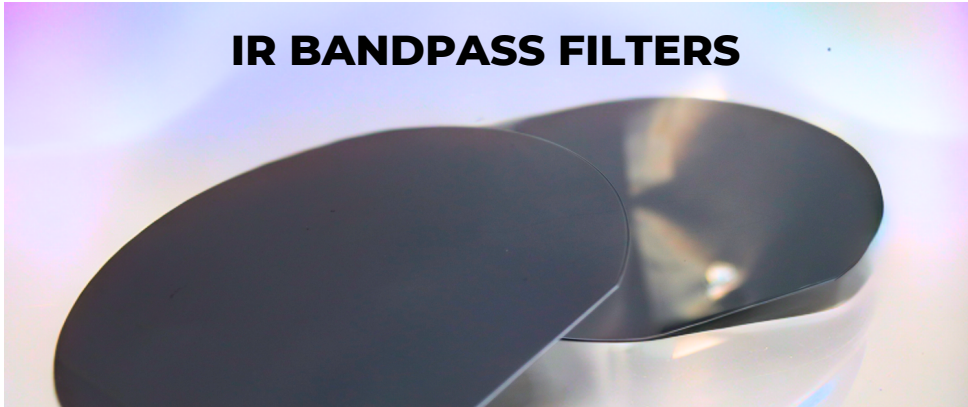
Lens Molding in Volume

AR Coatings

Comprehensive QC Analysis

MATERIAL	COMPOSITION
WIRGO1	Ge ₃₃ As ₁₂ Se ₅₅
WIRGO2	Ge ₂₂ As ₂₀ Se ₅₈
WIRGO3	Ge ₂₀ Sb ₁₅ Se ₆₅
WIRGO4	As ₃₀ Sb ₄ Se ₆₃ Sn ₃
WIRGO5	Ge ₂₈ Sb ₁₂ Se ₆₀
WIRGO6	As ₄₀ Se ₆₀
WIRGO7	Ge ₁₀ As ₄₀ Se ₅₀
WIRGO8	As ₄₀ Se ₆₀
WIRGO9	Ge ₃₀ As ₁₃ Se ₃₂ Te ₂₅

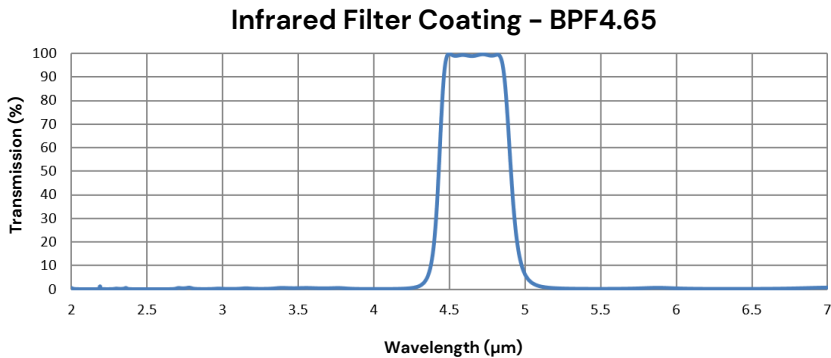
GENERAL SPECIFICATIONS		
Specifications	Standard	Precision
Diameter	1-25mm	
Diameter Tolerance	±0.015mm	±0.005mm
Thickness Tolerance	0.03mm	0.005mm
Irregularity (P-V)	<1µm	<0.6µm
Irregularity (RMS)	0.3µm	0.08 - 0.15µm
Centering Error	1'	
Surface Quality	60-40	20-10



IR BANDPASS FILTERS

APPLICATIONS

- Detection of CO₂, CH₄, and other molecular gas and hydrocarbons
- Wavelength narrowing of IR sources
- Thermal noise shielding



SPECIFICATIONS	
Blocking	<1% 200nm-11µm*
FWHM	100 to 500nm
Thickness	1mm (Typ.)
Clear Aperture	>90%
CWL Tolerance	<1% of CWL
Peak Transmission	≥92%
Avg Transmission	≥90%
Diameter Tolerance	+0/-0.2mm
Substrate	All common materials
Mounted in Housing	Optional

*Blocking may be increased on customer request.

INFRARED IMAGING

High-performance IR cameras & objectives



Life Sciences • Security • Machine Vision • Thermal Imaging
PCB/Semiconductor Packaging Diagnostic • Process Control • Thermal Gradient Measurement

COMPREHENSIVE PRODUCT LINE OF CATALOG IR CAMERA LENSES



SWIR LENS



MWIR LENS



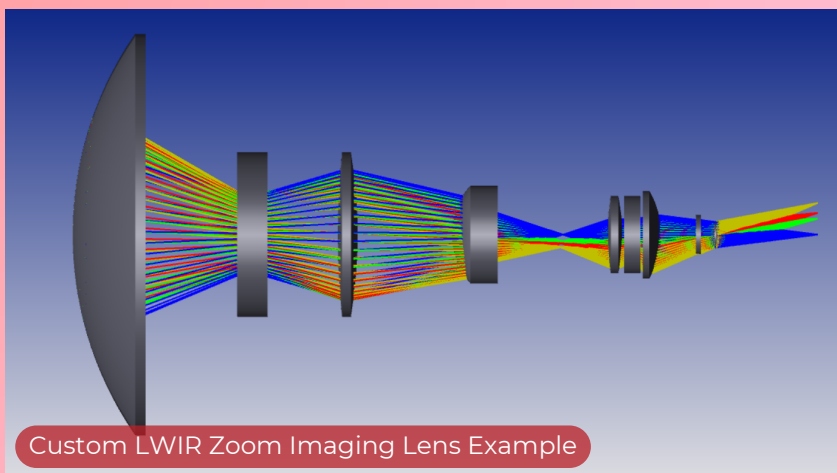
LWIR LENS



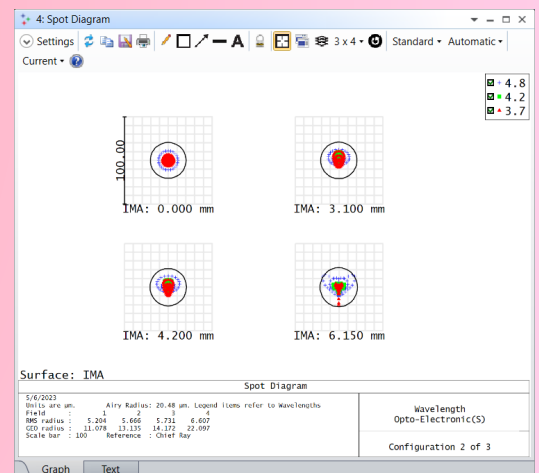
IR ZOOM LENS

Fixed magnification, continuous zoom and switchable focal lengths possible

CUSTOM IN-HOUSE DESIGN & MANUFACTURING CAPABILITIES



Custom LWIR Zoom Imaging Lens Example



Wavelength: 8 – 12 μm • Focal Length: 25 – 225 mm • Constant Total Length & Image Plane Over Focal Length Range

Discuss your custom IR camera application needs with us today.

Your Photonics Strategic Partner

Laser Optics • Imaging Optics • Consumer Optics • Lasers & Detectors • Systems & Software



- ◆ Established in August 2002
- ◆ ISO9001 certified since 2004

We specialize in the following capabilities:

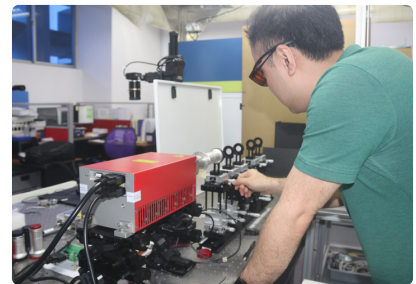
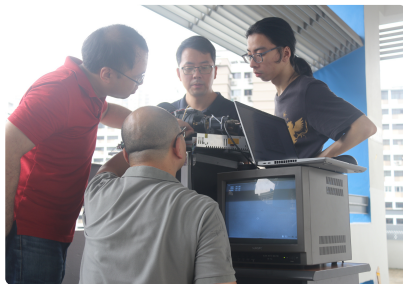
Optical Design

Manufacturing Optics

Optical Assemblies

Complex Customization

Rapid Optics Prototyping



>60

Lens Polishing
Machines

55

Lens Molding
Machines

14

Diamond Turning
& CNC Machines

6

Edging
Machines

21

Coating
Chambers

>50

Testing & QC
Instruments

10,000

m² Production
Footprint

1,500

m² Class 100K
Cleanroom

1,000

m² Class 10K
Cleanroom

>587

Total Staff

