

Product Catalogue 2026-2027



Clarvis
Industrial

High Precision Optical Components & Machine Vision Calibration Solutions



ZnSe focus lens



High Precision Optical Components

Key Features

- Optimized for 10.6 μ m CO₂ Laser Cutting & Engraving Systems
- Premium CVD Zinc Selenide for Ultra-Low Absorption
- High Laser Damage Threshold (LDT) for High-Power Operations
- Custom Broadband Anti-Reflection (BBAR) Coatings Available



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Technical Specifications



Technical Parameter	Specification
Substrate	CVD ZnSe
Focal Length tolerance	$\pm 1\%$
Diameter tolerance	$+0.0/-0.1\text{mm}$
Center Thickness tolerance	$\pm 0.2\text{mm}$
Surface figure	$< \lambda/2$ per 1" Dia @ 632.8nm
Surface quality	40-20 scratch and dig
Centering	$< 3'$ arc minutes
Clear aperture	$> 90\%$
Chamfer	$< 0.3 \pm 0.2 \times 45^\circ$
AR Coating	$R < 0.5\%$ per surface @ $10.6 \mu\text{m}$
LIDT	3KW/CM ²

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Silicon Reflection Mirrors



High Precision Optical Components

Key Features

- Gold/Dielectric Enhanced Coating: Reflectivity > 99.2% (Gold) or > 99.7% (Dielectric) @ 10.6 μ m to minimize energy loss.
- Superior Thermal Conductivity: Fast heat dissipation prevents thermal deformation, ensuring a stable beam during long-term operation.
- Lightweight Substrate: Significantly lighter than Molybdenum (Mo) mirrors, reducing axis load for high-acceleration laser heads.
- High Durability: Wipe-resistant optical coating designed for demanding industrial environments.



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Technical Specifications



Technical Parameter	Specification
Substrate	Optical Grade Silicon
Diameter tolerance	+0.0/-0.1mm
Thickness tolerance	±0.1mm
Surface accuracy	$< \lambda / 4 @ 632.8\text{nm}$
Surface quality	S1. 40-20scratch and dig
Parallelism	$< 1'$ arc minutes
Clear aperture	$> 90\%$
Chamfer	$< 0.3 \pm 0.2 \times 45^\circ$
HR Coating	MMR、EG、ES、PG

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CO2 laser combiners



High Precision Optical Components

Key Features

- Premium ZnSe Substrate:
Optimized for 10.6 μ m transmission to ensure zero power loss for the CO2 laser beam.
- High Visible Reflectivity:
Specialized coating reflects >98% of 635nm-670nm red light, providing a clear and sharp pointer.
- Minimum Beam Displacement:
Precision surface flatness and parallelism to ensure the combined beams stay perfectly aligned over long distances.
- Industrial Grade Durability:
Multi-layer hard coating designed to withstand high-power laser environments without degradation.



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Technical Specifications



Technical Parameter	Specification
Substrate	CVD ZnSe
Wavelength	10.6 μm (CO ₂) & 635nm–670nm (Red Laser)
Diameter tolerance	+0.0/-0.1mm
Thickness tolerance	$\pm 0.1\text{mm}$
Surface Flatness	$\lambda/4$ @ 633nm per 25mm
Surface quality	40–20 Scratch and Dig (MIL–PRF–13830B)
Parallelism	< 1 arc minute
Clear aperture	>90%
Chamfer	$< 0.3 \pm 0.2 \times 45^\circ$
AR Coating	T > 99% @ 10.6 μm
HR coating	R > 90% @ 650–670nm
Coating Type	AR+HR
LIDT	> 500W / cm^2

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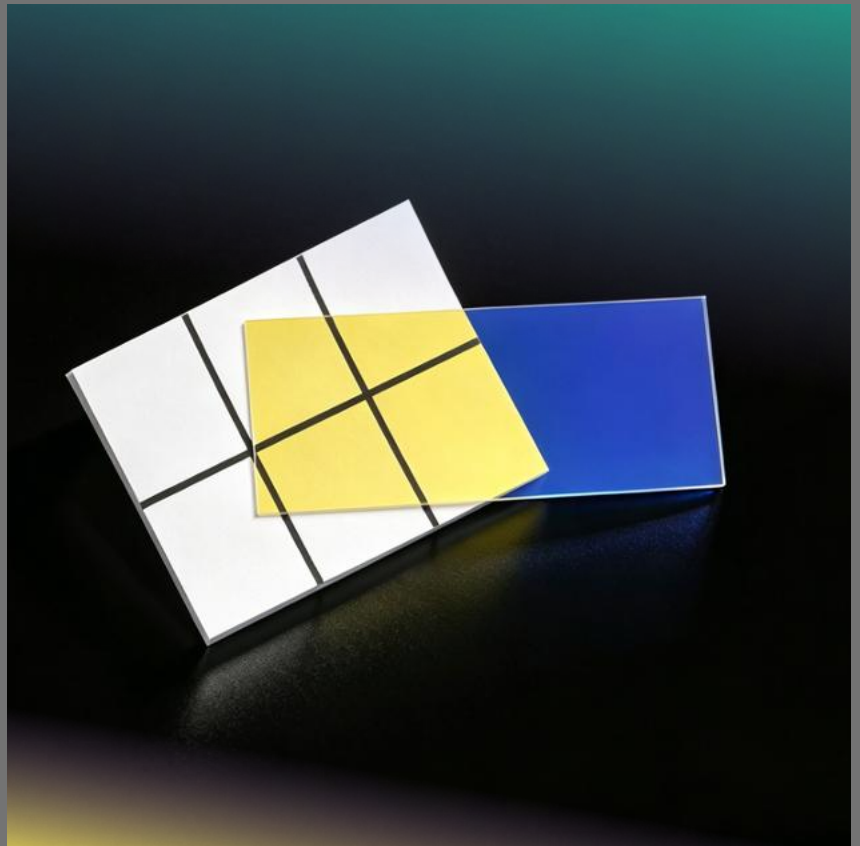
530nm IPL Longpass Filter



High Precision Optical Components

Key Features

- **Precision Cut-off:** Sharp 530nm transition edge safely blocks harmful UV and short-wave blue light while maximizing therapeutic yellow-red spectrum delivery.
- **Ultimate Durability:** Advanced hard dielectric coating withstands intense pulsed light (IPL) energy and thermal stress without degrading.
- **Zero Color Shifting:** High-density Ion-Assisted Deposition (IAD) guarantees environmentally stable optical performance and a prolonged lifespan for instrument handpieces.
- **Clear Visual Verification:** Distinct dual-color optical property (deep blue reflection for blocked wavelengths, bright yellow/green transmission for passed wavelengths).



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Technical Specifications



Technical Parameter	Specification
Substrate	Optical Glass (BK7) / Fused Silica
Wavelength	530nm - 1200nm (Transmitting)
Average Transmittance	> 90% @ 540nm - 1200nm
Cut-off Blocking	OD4 (T < 0.01%) @ 200nm - 520nm
Dimension Tolerance	+/- 0.1mm
Thickness Tolerance	+/- 0.1mm
Surface Quality	40-20 Scratch and Dig
Clear aperture	>90%
Damage Threshold	> 10 J/cm ² (Optimized for IPL)

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940nm Narrow Bandpass Filter



High Precision Optical Components

Key Features

- Ultimate Noise Immunity: Deep OD4+ broadband blocking completely eliminates factory overhead lighting, sunlight, and unpredictable ambient glare, ensuring reliable automated optical inspection (AOI).
- Perfect LED Matching: Precision 940nm Center Wavelength (CWL) with a narrow Full Width at Half Maximum (FWHM) optimizes the signal-to-noise ratio for 940nm IR LED illuminators.
- "No-Glow" Covert Sensing: Operating deep in the near-infrared spectrum, 940nm is completely invisible to the human eye, eliminating the "red burst" (red glow) effect found in 850nm systems—ideal for driver monitoring and discreet inspection.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Optical Glass
Center Wavelength (CWL)	940nm $\pm$ 2nm
FWHM (Bandwidth)	20nm (Customizable)
Peak Transmittance	> 90% @ 940nm
Out-of-Band Blocking	$\geq$ OD4 (T < 0.01%) @ 300nm - 1100nm
Angle of Incidence (AOI)	0° (Standard)
Surface Quality	40-20 Scratch and Dig
Clear aperture	> 90% of central dimension
Coating Technology	Hard Ion-Assisted Deposition (IAD)

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532nm Ultra-Narrow Bandpass Filter



High Precision Optical Components

Key Features

- **Extreme Contrast for Fluorescence:** Precision-engineered to transmit the 532nm excitation wavelength while aggressively blocking out-of-band noise up to OD6, guaranteeing crisp, high-contrast imaging for FITC/GFP fluorophores.
- **Ultra-Narrow Bandwidth:** With a Full Width at Half Maximum (FWHM) as narrow as 2nm - 3nm, it perfectly isolates your target signal and prevents spectral crosstalk in multiplexing instruments.
- **Dense Dielectric Durability:** Manufactured with high-density Ion-Assisted Deposition (IAD), ensuring zero wavelength shift under temperature fluctuations and a prolonged lifespan in rigorous laboratory environments.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Fused Silica / UV Grade Glass
Center Wavelength (CWL)	532nm $\pm$ 0.5nm
FWHM (Bandwidth)	2nm - 3nm (Customizable)
Peak Transmittance	> 85% @ 532nm
Out-of-Band Blocking	$\geq$ OD6 (T < 0.0001%) @ 200nm - 1200nm
Angle of Incidence (AOI)	0° $\pm$ 2°
Surface Quality	20-10 Scratch and Dig (High Precision)
Clear aperture	> 90% of central dimension
Coating Technology	Hard Ion-Assisted Deposition (IAD)

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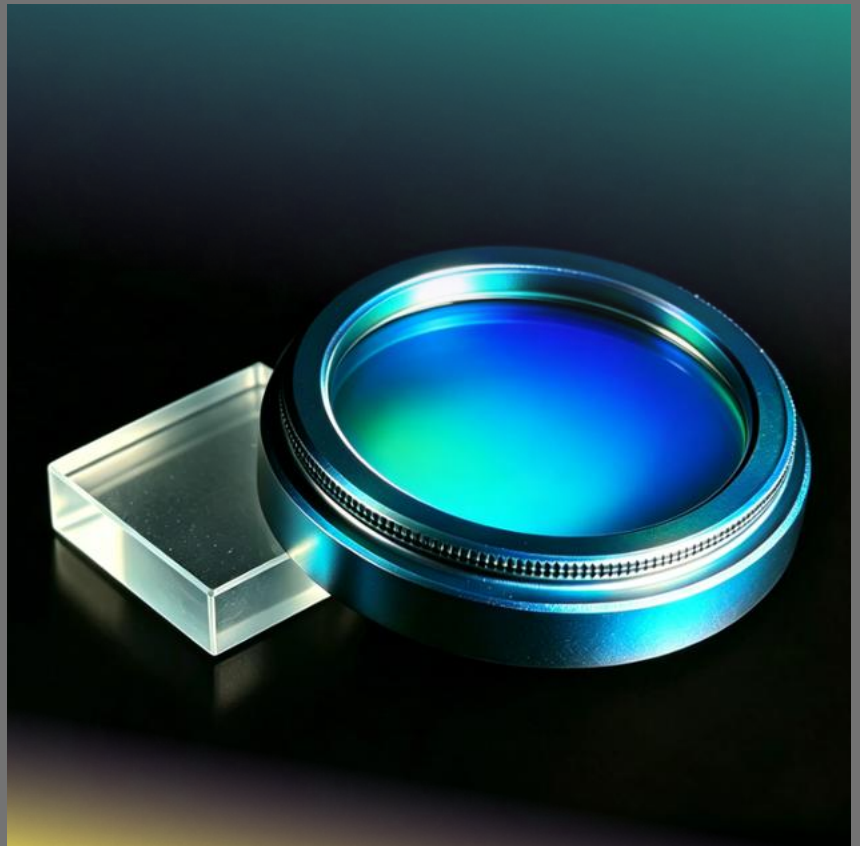
850nm Narrow Bandpass Filter



High Precision Optical Components

Key Features

- **Industrial-Grade Mount:** Housed in a black anodized aluminum ring with precision knurled edges and standard screw threads, ready for direct drop-in integration onto industrial camera lenses.
- **Asymmetric Optical Architecture:** Features a highly reflective cyan-blue dielectric front face to aggressively block visible light, and a deep-purple Anti-Reflection (AR) back face to eliminate sensor ghosting.
- **Optimized for LED Thermal Drift:** Features a practical 50nm Full Width at Half Maximum (FWHM). This specific bandwidth is engineered to capture the full output of 850nm IR LEDs even when their center wavelength shifts due to thermal variations in harsh factory environments, ensuring consistent image brightness.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Optical Glass
Mounting Frame	Black Anodized Aluminum (with knurled grip)
Center Wavelength (CWL)	850nm $\pm$ 2nm
FWHM (Bandwidth)	50nm (Optimized for standard IR LED arrays)
Peak Transmittance	> 90% @ 850nm
Out-of-Band Blocking	OD4 (T < 0.01%) @ Vis to Near-IR
Front Face (External)	High-Density Dielectric Coating (Cyan-Blue Reflection)
Back Face (Internal)	Anti-Reflection (AR) / Absorptive Layer (Deep Purple)
Clear Aperture	> 90% of internal ring diameter

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High-Precision Glass Optical Encoder Disk



High Precision Optical Components

Key Features

- Absolute "Dead-Black" Contrast for High Signal-to-Noise Ratio
- Razor-Sharp Micron-Level Grating Edges without Burrs
- Exceptional Thermal Stability via Optical-Grade Glass Substrates
- Custom Resolutions, Dimensions, and Sub-Assembly Support Available



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Technical Specifications



Technical Parameter	Specification
Substrate	Optical Glass (e.g., K9, B270, Quartz)
Coating	Vacuum Deposited Chrome
Optical Density	> 3.0 OD
Dimensional Tolerance	± 0.05 mm
Thickness Tolerance	± 0.05 mm
Grating Accuracy	± 1 arc second
Surface Quality	40-20 scratch and dig
Clear Aperture	>90%
Chamfer	<0.5mm x 45°

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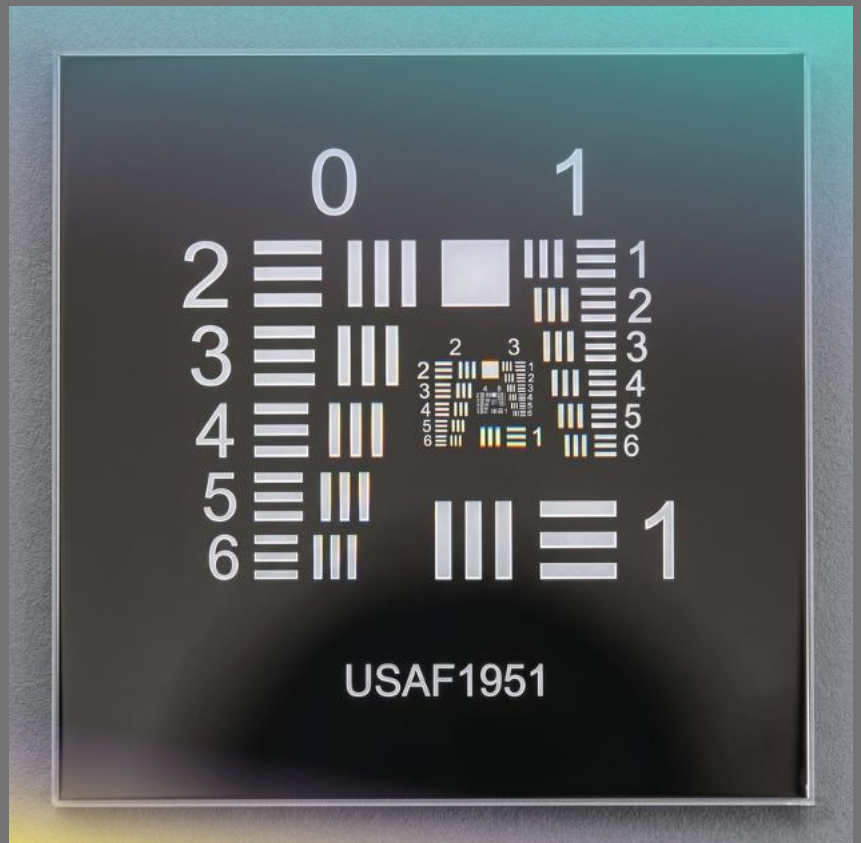
USAF 1951 Resolution Target (Negative)



High Precision Optical Components

Key Features

- Vacuum-Deposited Chrome with >3.0 OD for Absolute "Dead-Black" Contrast
- Razor-Sharp Clear Line Pairs (Up to Group 7) with Zero Edge Burrs
- Engineered for Industrial Automation, Microscopy, and Optical Metrology
- Custom Dimensions, Substrates, and Fixture Sub-Assembly Available



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Technical Specifications



Technical Parameter	Specification
Pattern Type	USAF 1951 (Negative / Clear pattern on dark background)
Substrate Material	Soda Lime Glass / B270 / Quartz (Customizable)
Coating	Vacuum Deposited Chrome
Optical Density (OD)	> 3.0 OD (Opaque Area)
Resolution Range	Group 0 to Group 7 (Up to 228 lp/mm)
Dimensional Tolerance	± 0.1 mm
Thickness Tolerance	± 0.1 mm
Surface Quality	40-20 Scratch and Dig
Export Status	Unrestricted for Civilian & Industrial Use

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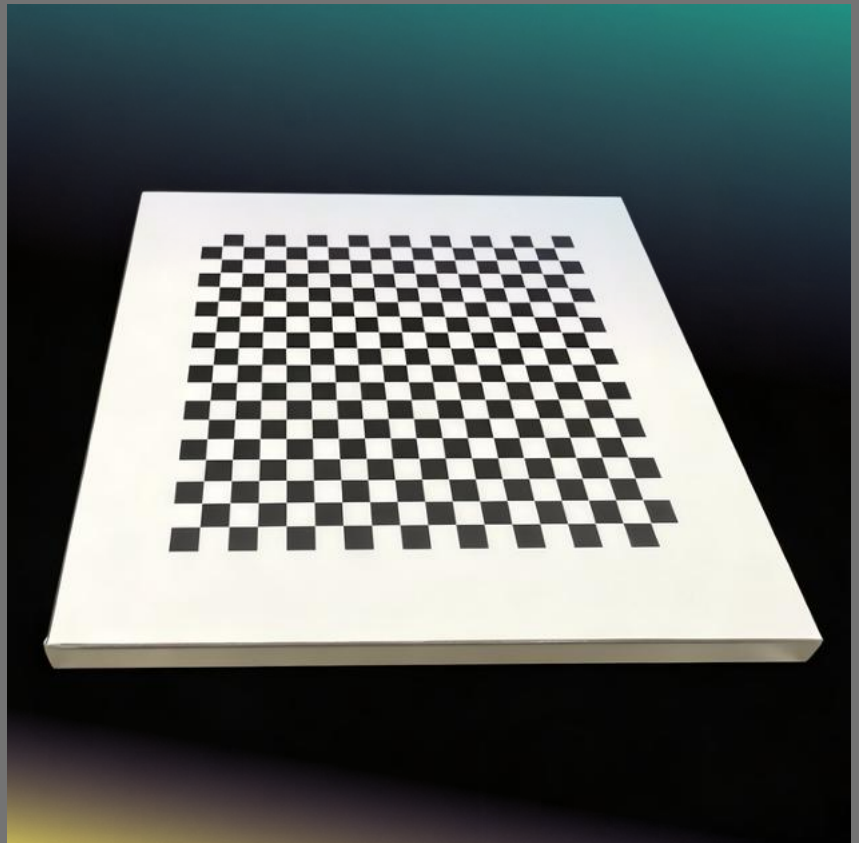
Checkerboard Calibration Target



High Precision Optical Components

Key Features

- $\pm 5\mu\text{m}$ Micron-Level Accuracy for Reliable Camera Calibration
- Premium Transparent Glass Substrate with Zero Distortion
- Vacuum-Deposited Chrome (>3.0 OD) for "Dead-Black" Contrast
- Custom Dimensions and Opto-Mechanical Assembly Available



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Technical Specifications



Technical Parameter	Specification
Pattern Type	Checkerboard (Clear glass background with chrome squares)
Substrate Material	Transparent Optical Glass (Soda Lime / B270 / Quartz)
Coating	Vacuum Deposited Chrome
Manufacturing Accuracy	$\pm 5 \mu\text{m}$ (Customizable)
Overall Dimensions	50 mm x 50 mm (Customizable)
Optical Density (OD)	> 3.0 OD (Chrome Area)
Surface Quality	40-20 Scratch and Dig
Export Status	Unrestricted for Civilian & Industrial Use

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Microscope Glass Reticle



High Precision Optical Components

Key Features

- Vacuum-Deposited Chrome Pattern for Anti-Glare & High Contrast
- Micron-Level Linewidth Accuracy ($\pm 5\mu\text{m}$ Standard, Higher Upon Request)
- Engineered for Industrial Automation, Medical Devices, & QC Metrology
- Custom Dimensions, Antireflective (AR) Coatings, & Mounting Assembly Available



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Technical Specifications



Technical Parameter	Specification
Pattern Type	Crosshair, Reticle, Micro-Scale (Custom Designs Welcome)
Substrate Material	Premium Optical Glass (B270 / Quartz / Soda Lime)
Coating	Vacuum Deposited Dark Chrome (Optimized Blue Contrast)
Accuracy Tolerance	± 5 μm Standard (Down to ± 2 μm with Quartz substrate)
Surface Quality	40-20 Scratch and Dig
Pattern Color	Dark Blue / Deep Black (Dependent on lighting and coating type)
Antireflection Coating	Optional AR coating (BBAR) upon Request
Thickness Tolerance	± 0.1 mm
Diameter Tolerance	± 0.05 mm
Export Status	Unrestricted for Civilian Metrology Use

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Glass Stage Micrometer & Calibration Slide



High Precision Optical Components

Key Features

- 4-in-1 Target Design (0.01mm Grid, 0.1mm Scale, 0.15mm & 0.07mm Dots)
- Vacuum-Deposited Chrome for Razor-Sharp Edge Contrast
- Unrestricted Civilian-Grade Component for Global B2B Export
- Available for Custom Opto-Mechanical Sub-Assembly Integration



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Technical Specifications



Technical Parameter	Specification
Substrate Material	Premium Optical Glass (B270 / Soda Lime)Calibration Slide
Standard Dimensions	75 mm x 25 mm (Slide Format)
Pattern Material	High-Contrast Vacuum Deposited Chrome
Target 1 (Micro-Grid)	1 DIV = 0.01 mm (10 μm spacing)
Target 2 (Linear Scale)	1 DIV = 0.1 mm (100 μm spacing)
Target 3 & 4 (Reference Dots)	Ø 0.15 mm & Ø 0.07 mm
Manufacturing Accuracy	±2 μm to ±5 μm
Surface Quality	40-20 Scratch and Dig
Export Status	Unrestricted for Civilian Industrial Use

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AR-Coated Machine Vision Window



High Precision Optical Components

Key Features

- **Industrial-Grade Protection:** Acts as a robust first line of defense for expensive camera sensors and internal optics, shielding them from factory dust, oil mist, and physical debris without compromising image quality
- **High-Efficiency BBAR Coating:** Features a premium Broadband Anti-Reflection (BBAR) coating applied to both faces. This aggressive reduction in surface reflectivity prevents stray light and ghosting, ensuring sharp contrast for machine vision algorithms.
- **Precision Optical Flatness:** Manufactured with strict parallelism and surface flatness to guarantee zero optical distortion or beam deviation, which is critical for sub-pixel measurement accuracy in automated inspection.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Optical Glass (K9/N-BK7, B270, or other optical glass)
Dimensions	Custom (Round, Square, Rectangular, or Stepped Geometries)
Dimensional Tolerance	$\pm 0.1\text{mm}$ (Standard) / $\pm 0.02\text{mm}$ (High Precision)
Surface Quality	40-20 to 60-40 Scratch-Dig
Surface Flatness	$< \lambda/4$ @ 632.8nm
Parallelism	< 3 arc minutes (Standard)
Coating (Both Faces)	Broadband Anti-Reflection (BBAR) VIS (400-700nm) or NIR (700-1050nm)
Peak Transmittance	$> 98\%$ Absolute Transmission across design wavelength
Clear Aperture	$> 90\%$ of central dimension

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Sapphire Protective Windows



High Precision Optical Components

Key Features

- **Unmatched Durability (Mohs 9):** Manufactured from monocrystalline sapphire. Delivers exceptional resistance to scratches, chemicals, and extreme temperatures. The ideal protective barrier for critical laser optics and sensors in harsh industrial environments.
- **Broadband Transmission (UV to MWIR):** Outstanding optical clarity spanning from Deep Ultraviolet (170nm) to Mid-Wave Infrared (5μm). The premier choice for multi-spectral machine vision and thermal imaging systems.
- **Thermal & Pressure Stability:** Features immense structural strength and superior thermal conductivity. Withstands high-pressure differentials and severe thermal shock, ensuring long-term reliability for sealed vacuum viewports.



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Technical Specifications



Technical Parameter	Specification
Substrate	Synthetic Sapphire (Al_2O_3) – C-plane, A-plane, or R-plane
Dimensions	Custom (Round, Square, Stepped, or Custom CNC Geometries)
Thickness	0.3mm to 30mm
Surface Quality	60-40 (Standard) to 40-20 Scratch-Dig (Precision)
Surface Flatness	$< \lambda/4$ @ 632.8nm
Parallelism	< 1 arc minute (Standard) / < 10 arc seconds (Precision)
Hardness	Mohs 9 (Knoop 2000)
Transmission Range	$\sim 150\text{nm}$ to $5\mu\text{m}$ (Uncoated)
Coating	Uncoated, Single-layer MgF_2 , or Custom BBAR
Clear Aperture	$> 90\%$ of central dimension

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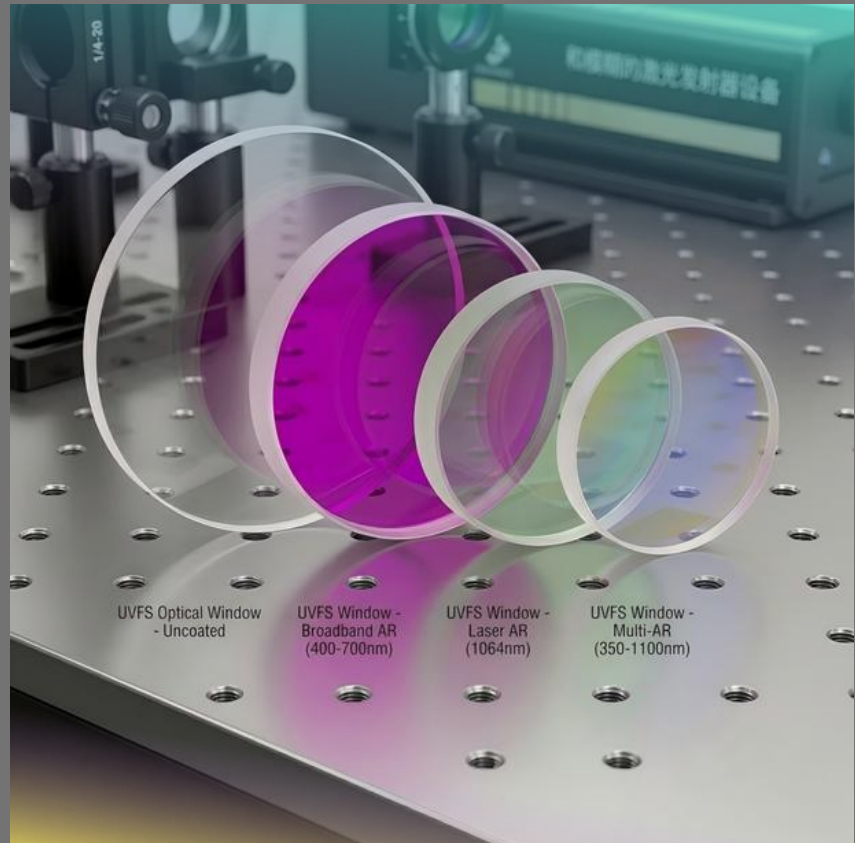
UV Fused Silica Windows



High Precision Optical Components

Key Features

- **Exceptional UV Transmission:** Manufactured from high-purity UV Grade Fused Silica (equivalent to JGS1 or Corning 7980), these windows deliver outstanding optical transmission deep into the ultraviolet spectrum, functioning effectively down to 185nm without solarization or darkening.
- **Extreme Thermal Stability:** Features an incredibly low Coefficient of Thermal Expansion (CTE), allowing the window to withstand severe thermal shocks and high-energy laser irradiation without distorting the optical wavefront or fracturing.
- **Laser-Grade Surface Quality:** Polished to precision tolerances with minimal bubbles and inclusions. Available with surface qualities up to 10-5 Scratch-Dig, ensuring minimal scattering and absorption in high-power UV laser systems.



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Technical Specifications



Technical Parameter	Specification
Substrate	UV Grade Fused Silica (JGS1 / Corning 7980 equivalent)
Dimensions	Custom (Round, Square, Rectangular, or Stepped Geometries)
Dimensional Tolerance	$\pm 0.1\text{mm}$ (Standard) / $\pm 0.02\text{mm}$ (High Precision)
Surface Quality	40-20 (Standard) to 20-10 Scratch-Dig (Laser Grade) (Precision)
Surface Flatness	$< \lambda/4$ to $\lambda/10$ @ 632.8nm
Parallelism	< 3 arc minutes (Standard) / < 10 arc seconds (Precision)
Transmission Range	185nm to 2.1um (Uncoated)
Coating	Uncoated, Narrowband UV-AR (e.g., 266nm, 355nm), or Broadband UV-VIS
Clear Aperture	$> 90\%$ of central dimension

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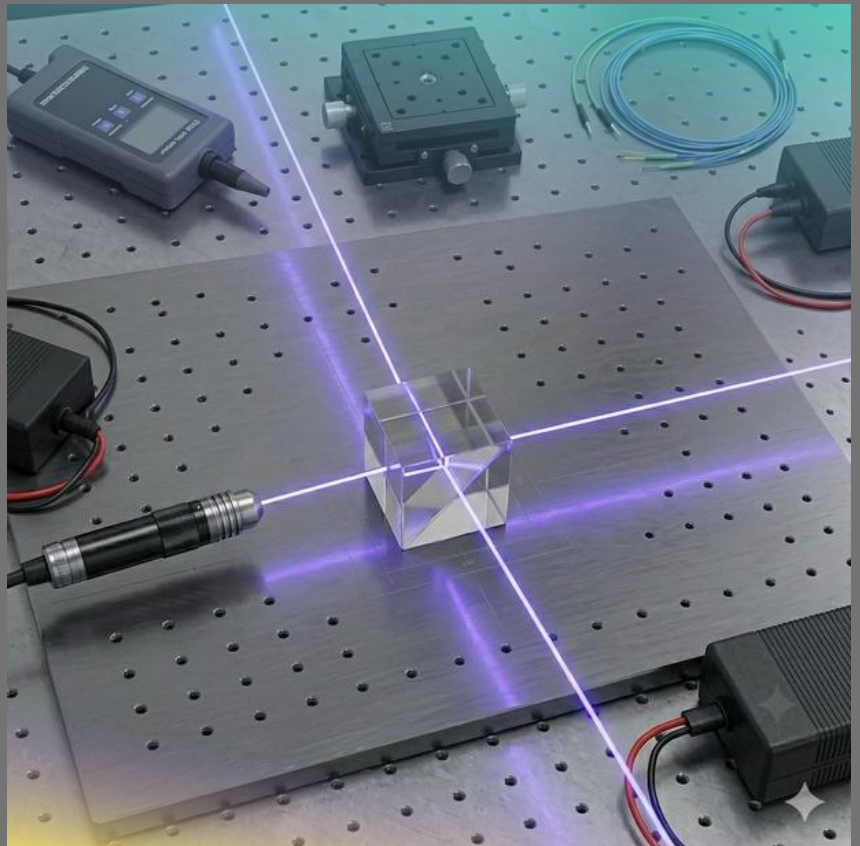
Custom Beamsplitter Cubes



High Precision Optical Components

Key Features

- **Complex Optical Routing:** Engineered to precisely divide a single beam of light into two separate paths, or combine two beams into one. Essential for building compact, folded optical systems where space and alignment are critical.
- **Custom Split Ratios:** Available in both Non-Polarizing (NPBS) and Polarizing (PBS) configurations. We manufacture custom transmission-to-reflection (T:R) ratios including 50:50, 70:30, 90:10, or exactly tailored to your system's energy requirements.
- **High-Stability Cementing:** Manufactured using precision cementing or optical contacting techniques, ensuring the internal hypotenuse coating remains stable and free from stress-induced wavefront distortion, even under demanding industrial conditions.



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Technical Specifications



Technical Parameter	Specification
Type	Non-Polarizing (NPBS) or Polarizing (PBS)
Substrate	Premium Optical Glass (K9/N-BK7) or UV Fused Silica
Dimensions	Custom (Typical range: 3mm x 3mm to 100mm x 100mm)
Dimensional Tolerance	$\pm 0.1\text{mm}$ (Standard) $\pm 0.05\text{mm}$ (Precision) (Precision)
Split Ratio (T:R)	50:50, 70:30, 90:10, or Fully Customized
Split Ratio Tolerance	$\pm 5\%$ (Standard) / $\pm 2\%$ (Precision)
Surface Quality	40-20 to 20-10 Scratch-Dig
Surface Flatness	$< \lambda/4$ @ 632.8nm
Beam Deviation	< 3 arc minutes
Coating	Broadband AR on all Entrance/Exit faces; Custom Dielectric Beamsplitter Coating on Hypotenuse

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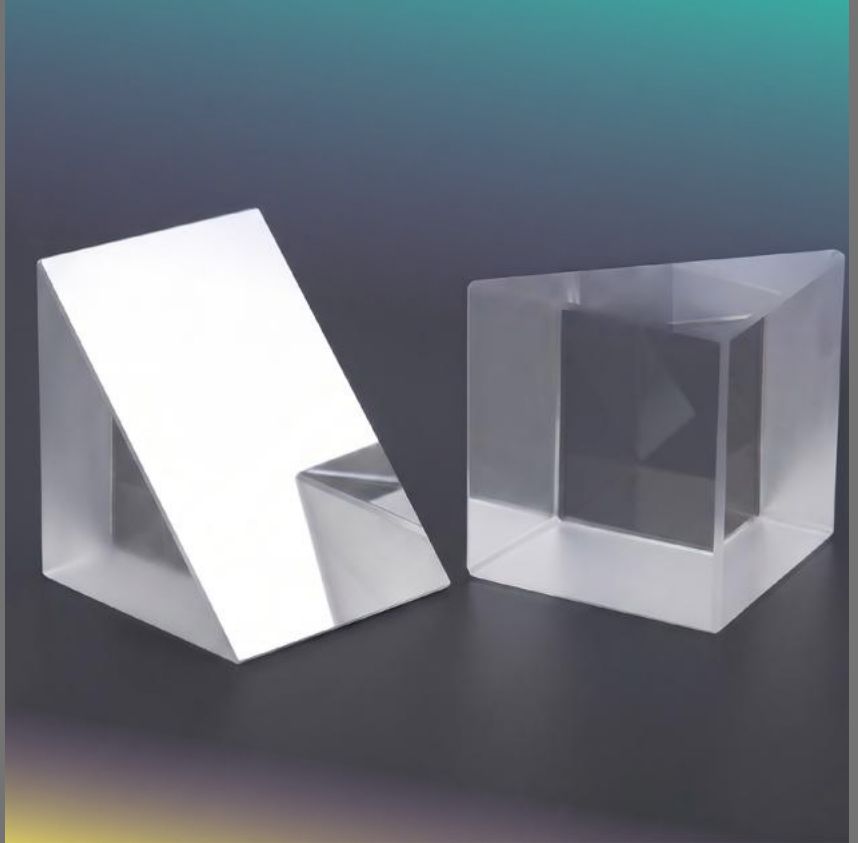
Right Angle Prisms



High Precision Optical Components

Key Features

- **Precise 90° or 180° Beam Deviation:** Utilizes Total Internal Reflection (TIR) to bend image paths or redirect laser beams at perfect 90-degree angles. Can also be used as retroreflectors for 180-degree beam deflection when light enters the hypotenuse face.
- **Minimal Alignment Stress:** Unlike standard first-surface mirrors, right angle prisms are mechanically rigid and easier to mount. Their precise 90° geometry provides a highly stable reference point, drastically reducing assembly and alignment time in automated production environments.
- **High-Fidelity Surface Accuracy:** Polished to strict tolerances with surface flatness guaranteed down to $< \lambda/4$ PV. This ensures the reflected wavefront remains completely free from distortion, maintaining razor-sharp contrast for high-resolution machine vision and metrology sensors.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Optical Glass (K9/N-BK7). UV Fused Silica
Dimensions (A=B=C)	Custom (Typical range: 2mm to 100mm)
Dimensional Tolerance	$\pm 0.1\text{mm}$ (Standard) / $\pm 0.05\text{mm}$ (Precision)
Angle Tolerance (90°)	± 3 arc minutes (Standard) / ± 10 arc seconds (Precision)
Angle Tolerance (45°)	± 3 arc minutes (Standard) / ± 15 arc seconds (Precision)
Surface Quality	40-20 (Standard) to 20-10 Scratch-Dig (Laser Grade)
Surface Flatness	$< \lambda/4$ PV @ 632.8nm
Clear Aperture	$> 90\%$ of central dimension
Coating Options	Uncoated (TIR), BBAR on input/output legs, or HR metallic on hypotenuse

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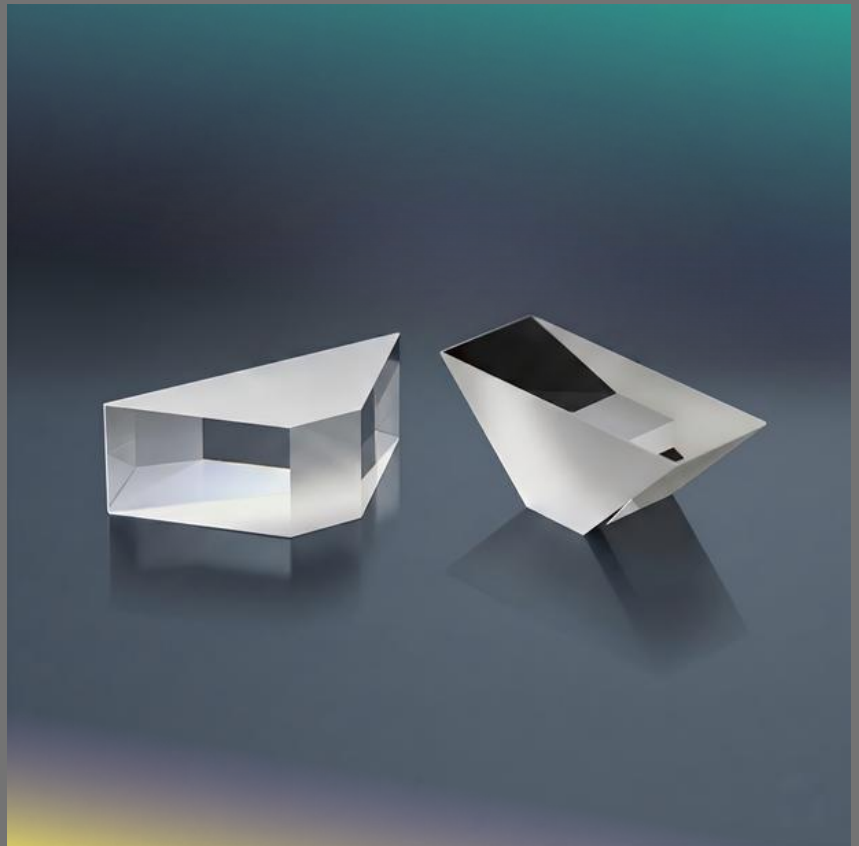
Custom Dove Prisms



High Precision Optical Components

Key Features

- **Precision Image Rotation:** Uniquely designed so that when the prism is rotated along its longitudinal axis, the transmitted image rotates at exactly twice the rate of the prism. Essential for dynamic optical alignment and complex imaging systems.
- **High-Fidelity Optical Path:** Manufactured from highly homogeneous glass with tight surface flatness tolerances ($< \lambda/4$ PV), ensuring that the inverted wavefront remains completely free from distortion for high-resolution sensors.
- **Optimized Throughput:** Available uncoated utilizing Total Internal Reflection (TIR) for broadband use, or with custom Broadband Anti-Reflective (BBAR) coatings on the entrance and exit faces to eliminate stray light and maximize signal strength.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Optical Glass (K9/N-BK7), UV Fused Silica
Dimensions (Length/Aperture)	Custom (Typical length: 10mm to 100mm)
Dimensional Tolerance	$\pm 0.1\text{mm}$ (Standard) / $\pm 0.05\text{mm}$ (Precision)
Angle Tolerance	± 3 arc minutes (Standard) / ± 30 arc sec (Precision)
Surface Quality	40-20 (Standard) to 20-10 Scratch-Dig (Laser Grade)
Surface Flatness	$< \lambda/4$ PV @ 632.8nm
Clear Aperture	$> 90\%$ of central dimension
Coating Options	Uncoated (Standard TIR) or custom BBAR on end faces

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High Precision Optical Components

Key Features

- **Advanced Beam Shaping:** Uniquely designed to focus or expand light in a single dimension. Perfectly transforms a collimated laser beam into a uniform, highly visible laser line, or corrects astigmatism in complex laser diode systems.
- **Optimized for Machine Vision:** The ultimate solution for 3D laser profiling, automated optical inspection (AOI), and industrial alignment. Generates crisp, straight lines essential for accurate dimensional measurement and surface topography mapping.
- **High-Fidelity Surface Accuracy:** Polished to strict tolerances with minimal surface irregularity, ensuring the focused laser line maintains a consistent width and high contrast without localized hot spots or optical distortion.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Optical Glass (K9/N-BK7), UV Fused Silica, ZnSe
Lens Types	Plano-Convex (PCX), Plano-Concave (PCV)
Dimensions (L x W)	Custom (Typical range: 5mm to 100mm)
Dimensional Tolerance	$\pm 0.1\text{mm}$ (Standard) / $\pm 0.05\text{mm}$ (Precision)
Focal Length Tolerance	$\pm 2\%$ (Standard) / $\pm 1\%$ (Precision)
Surface Quality	40-20 (Standard) to 20-10 Scratch-Dig (Laser Grade)
Surface Irregularity	$< \lambda/4$ PV @ 632.8nm
Centration	< 3 arc minutes
Coating Options	Uncoated, V-Coat for specific laser lines, or custom BBAR

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Achromatic Doublet Lenses



High Precision Optical Components

Key Features

- **Superior Color Correction:** Expertly cemented using two carefully matched optical glasses (typically a low-dispersion Crown glass and a high-dispersion Flint glass) to bring two distinct wavelengths into the exact same focal plane, completely eliminating color fringing.
- **Maximized Image Sharpness:** Significantly reduces spherical aberration compared to standard singlet lenses. This results in ultra-crisp, high-contrast images, making them the superior choice for critical imaging relays and precision laser focusing.
- **Optimized for Machine Vision:** The ultimate imaging solution for Automated Optical Inspection (AOI), color-sensitive barcode scanning, and multi-spectral industrial metrology where spatial accuracy and true-color reproduction are non-negotiable.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Crown & Flint Glass (e.g., K9 / N-BK7 + ZF Series)
Dimensions (Diameter)	Custom (Typical range: 5mm to 100mm)
Dimensional Tolerance	$\pm 0.1\text{mm}$ (Standard) / $\pm 0.03\text{mm}$ (Precision)
Focal Length Tolerance	$\pm 2\%$ (Standard) / $\pm 1\%$ (Precision)
Surface Quality	40-20 (Standard) to 20-10 Scratch-Dig (Precision)
Surface Irregularity	$< \lambda/4$ PV @ 632.8nm
Centration	< 3 arc minutes
Coating Options	Uncoated, or Custom BBAR (Visible to Near-IR)

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Plano-Convex (PCX) Lenses



High Precision Optical Components

Key Features

- **Versatile Light Manipulation:** Featuring one flat surface and one convex surface, PCX lenses have a positive focal length, making them the industry standard for collecting and collimating light, or focusing a collimated beam into a tight spot.
- **Minimized Spherical Aberration:** When oriented correctly—with the convex surface facing the collimated beam or infinite light source—plano-convex lenses significantly minimize spherical aberration, ensuring a sharper, tighter focal point for precision laser and imaging systems.
- **High-Fidelity Surface Accuracy:** Manufactured utilizing premium optical substrates and polished to strict surface irregularity tolerances ($< \lambda/4$ PV). This guarantees that the focused wavefront remains free from distortion, providing consistent energy distribution for demanding machine vision applications.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Optical Glass (K9/N-BK7), UV Fused Silica, ZnSe
Dimensions (Diameter)	Custom (Typical range: 2mm to 100mm)
Dimensional Tolerance	$\pm 0.1\text{mm}$ (Standard) / $\pm 0.03\text{mm}$ (Precision)
Focal Length Tolerance	$\pm 2\%$ (Standard) / $\pm 1\%$ (Precision)
Surface Quality	40-20 (Standard) to 20-10 Scratch-Dig (Laser Grade)
Surface Irregularity	$< \lambda/4$ PV @ 632.8nm
Centration	< 3 arc minutes
Coating Options	Uncoated, or Custom BBAR / V-Coat (UV, VIS, NIR, or IR)

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Aspheric Lenses



High Precision Optical Components

Key Features

- **Ultimate Aberration Control:** Designed with a complex surface profile that deviates from a traditional sphere. This unique geometry allows an aspheric lens to focus light to a single, perfect point, completely eliminating spherical aberration and drastically reducing optical distortion.
- **Compact & Lightweight Systems:** A single highly optimized aspheric lens can often replace complex, multi-lens assemblies (such as doublets or triplets). This significantly reduces the overall weight, size, and assembly cost of your optomechanical modules while improving light transmission.
- **Optimized for Machine Vision & Lasers:** Exceptional for high Numerical Aperture (NA) applications. They are the premier choice for collimating highly divergent light from laser diodes or capturing wide-angle, high-resolution imagery in automated optical inspection (AOI) systems without edge blurring.



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Technical Specifications



Technical Parameter	Specification
Substrate	Premium Optical Glass (e.g., D-ZK3, N-BK7), UV Fused Silica
Manufacturing Process	CNC Precision Polishing / Precision Glass Molding (PGM)
Dimensions (Diameter)	Custom (Typical range: 2mm to 100mm)
Dimensional Tolerance	$\pm 0.03\text{mm}$ (Precision)
Surface Quality	40-20 (Standard) to 20-10 Scratch-Dig (Laser Grade)
Surface Irregularity	$< 0.5\mu\text{m}$ (Standard) to $< 0.1\mu\text{m}$ (Precision CNC)
Clear Aperture	$> 90\%$ of central dimension
Coating Options	Uncoated, or Custom BBAR / V-Coat (UV, VIS, NIR)

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ZnSe Windows



High Precision Optical Components

Key Features

- Ultra-Low Absorption: Premium CVD ZnSe prevents thermal lensing in high-power CO₂ lasers.
- >99% Transmittance @ 10.6μm: BBAR-coated for efficient industrial laser cutting and engraving.
- Robust OEM Seal: Protects internal resonator optics from dust, debris, and harsh gases.
- 100% Export Compliant: Civilian-grade optics ensuring restriction-free global B2B sourcing.



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Technical Specifications



Technical Parameter	Specification
Substrate	CVD ZnSe
Design Wavelength	10.6 um (CO2 Laser)
Dimensions (Diameter)	Custom (Standard sizes: 12.7mm, 19.05mm, 20mm, 25.4mm, 38.1mm)
Dimensional Tolerance	+0.0 / -0.1 mm
Thickness Tolerance	±0.1 mm
Surface quality	40-20 Scratch-Dig (Standard) to 20-10 (Precision)
Surface Flatness	< $\lambda/40$ @ 10.6um
Parallelism	< 3 arc minutes (Customizable)
Standard Coating	BBAR @ 10.6um (R < 0.2% per surface)
Clear Aperture	> 90% of central diameter

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CVD ZnSe Output Couplers



High Precision Optical Components

Key Features

- **Precise Partial Reflectance:** Custom transmission-to-reflection ratios (e.g., 50%, 60%, 80%) engineered to maintain optimal laser oscillation and beam extraction.
- **High Damage Threshold (LIDT):** Premium CVD ZnSe substrate combined with advanced dielectric coatings withstands continuous high-power intra-cavity energy without degradation.
- **Exceptional Surface Flatness:** Polished to severe tolerances ($< \lambda/40$ @ $10.6\mu\text{m}$) to guarantee a stable fundamental beam mode (TEM00) and prevent wavefront distortion.



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Technical Specifications



Technical Parameter	Specification
Substrate	CVD Zinc Selenide (ZnSe)
Design Wavelength	10.6 um (CO2 Laser)
Reflectance (R)	Custom tailored (e.g., 20% to 90%, Tolerance: $\pm 1\%$)
Dimensions (Diameter)	Standard (19.05mm, 25.4mm, 38.1mm) or Custom
Thickness Tolerance	± 0.1 mm
Surface quality	40-20 Scratch-Dig Standard
Surface Flatness	$< \lambda/40$ @ 10.6um
Wedge Angle	3 to 5 arc minutes (Standard, prevents etalon effects)
Coating (Surface 1)	Partial Reflective (PR) Dielectric Coating @ 10.6um
Coating (Surface 2)	Broadband Anti-Reflective (BBAR) Coating @ 10.6um

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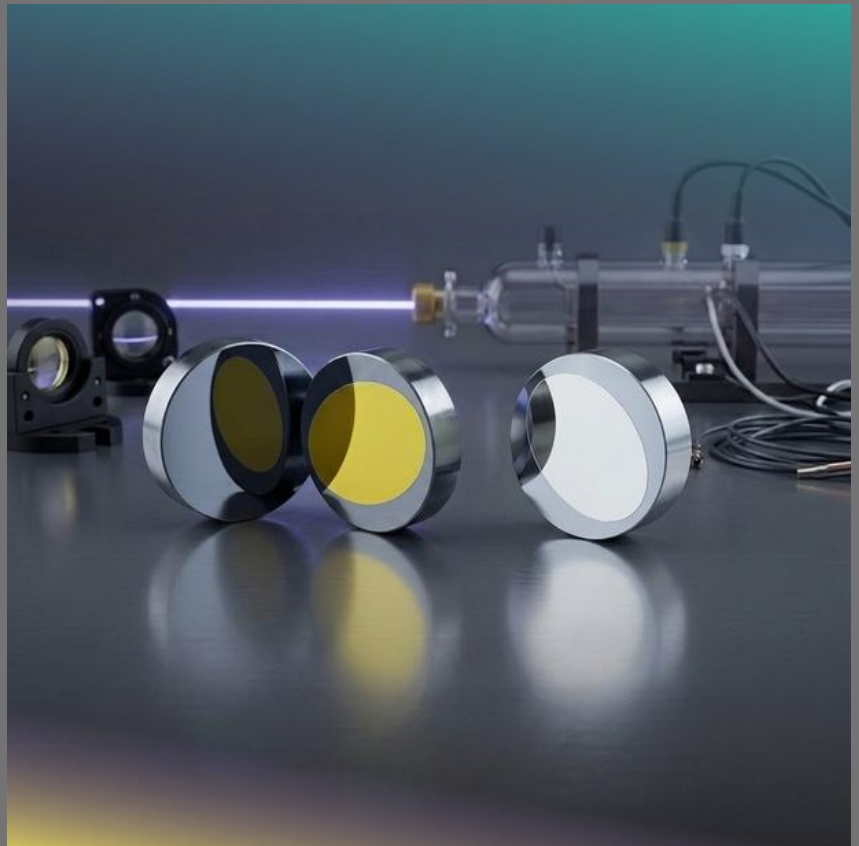
Silicon Rear Mirrors



High Precision Optical Components

Key Features

- Maximum Reflectance: Advanced Enhanced Gold (Au) or HR dielectric coatings deliver >99.5% reflection at 10.6 μ m.
- Superior Thermal Management: Premium Optical-Grade Silicon (Si) substrate provides outstanding thermal conductivity for rapid heat dissipation.
- Zero Wavefront Distortion: Polished to extreme flatness ($< \lambda/40$) to guarantee a stable fundamental beam mode (TEM₀₀).



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Technical Specifications



Technical Parameter	Specification
Substrate	Optical Grade Silicon (Si)
Design Wavelength	10.6 μm (CO ₂ Laser)
Reflectance (R)	99.5% @ 10.6 μm
Diameter Tolerance	+0.0 / -0.1 mm
Thickness Tolerance	± 0.1 mm
Thickness Tolerance	± 0.1 mm
Surface Figure	$< \lambda/40$ @ 10.6 μm
Surface Quality	40-20 scratch and dig (Standard)
Clear Aperture	90%
Chamfer	$< 0.3 \pm 0.2 \times 45^\circ$
Coating (Reflective Side)	Enhanced Gold (Au) or High-Reflection (HR) Dielectric Coating
Coating (Back Side)	Uncoated or Commercial Polish

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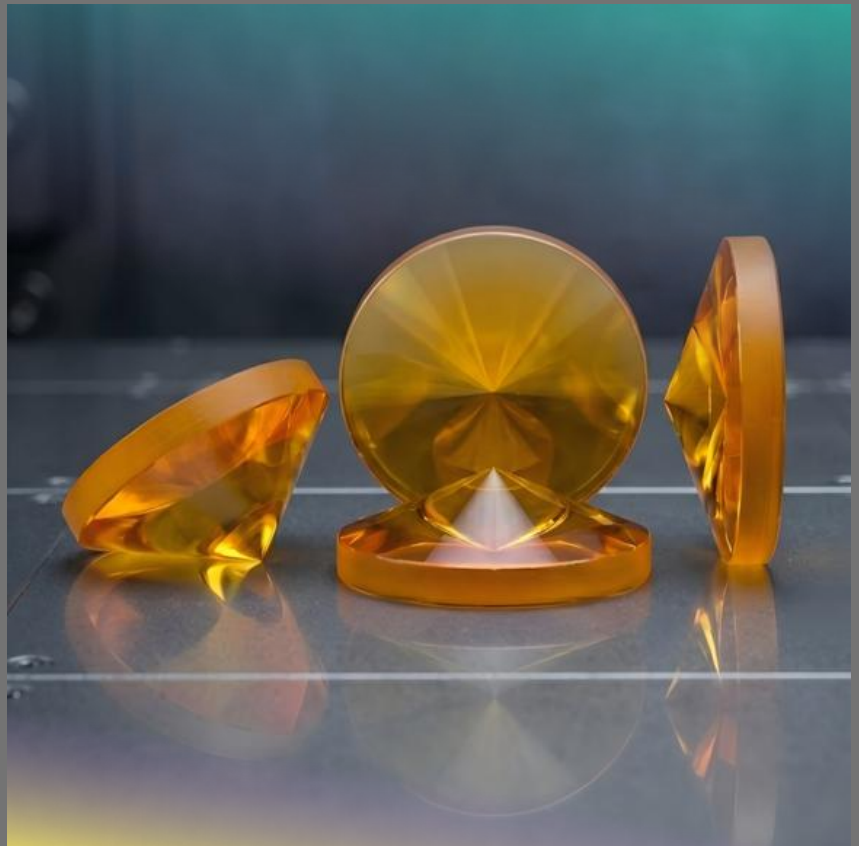
CVD ZnSe Axicons (Conical Lenses)



High Precision Optical Components

Key Features

- Transforms standard Gaussian laser beams into non-diffracting Bessel beams or ring profiles
- Advanced CNC polishing ensures ultra-precise apex transitions with minimal tip rounding
- Premium CVD Zinc Selenide (ZnSe) prevents thermal lensing in high-power CO2 lasers



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Technical Specifications



Technical Parameter	Specification
Substrate	CVD Zinc Selenide (ZnSe)
Design Wavelength	10.6 um (CO2 Laser)
Apex Angle / Base Angle	Custom fabricated to your exact optical design
Angle Tolerance	$\pm 0.05^\circ$ (3 arc minutes)
Diameter Tolerance	+0.0 / -0.1 mm
Center Thickness Tolerance	± 0.1 mm
Apex Rounding (Tip Zone)	< 0.2 mm (Strictly controlled via advanced polishing)
Surface Figure (Plano Side)	< $\lambda/20$ @ 10.6um
Surface Quality	40-20 Scratch-Dig (Precision Standard)
Clear Aperture	> 90% of central diameter
AR Coating	BBAR @ 10.6um (R < 0.5% per surface)

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195 Series Infinity Plan Achromatic Objective Lenses



High Precision Optical Components

Key Features

- Complete Magnification (4X to 100X): Includes a specialized L40X (Long Working Distance) lens. Ideal for scalable machine vision systems and industrial microscopes.
- Plan Achromatic Precision: Premium optical coated glass eliminates field curvature, delivering edge-to-edge, distortion-free flat-field imaging.
- Universal Integration: Standard 195mm mechanical tube length and 20.2mm RMS thread guarantee seamless drop-in replacement for global optical frames.



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Technical Specifications



Technical Parameter	Specification
Product Series	195 Series Infinity Plan Achromatic Objectives
Available Magnifications	4X, 10X, 20X, 40X, L40X, 60X, 100X (In-Stock)
Optical System	Infinity-Corrected (∞)
Mounting Thread	Standard 20.2mm RMS
Parfocal Distance	45 mm
Cover Glass Compatibility	0.17 mm standard (Specific models support 0 / no cover glass)
Housing Material	Industrial-Grade Metal
Lens Material	Precision Optical Glass with Anti-Reflective Coating
Packaging	Dedicated protective container for secure international transit

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Object-Space Telecentric Lenses



High Precision Optical Components

Key Features

- **Absolute Measurement Accuracy:** Ultra-low object-space telecentricity ($<0.02^\circ$) eliminates perspective distortion for constant magnification. Essential for precision dimensional gauging.
- **High-Fidelity Optical Path:** Premium optical glass delivers sub-micron defect detection, achieving exceptional optical resolution (e.g., $5.59\mu\text{m}$ on 1.5X models).
- **Optimized Integration:** Standard C-Mount interfaces and typical 110mm working distances ensure safe mechanical clearance for automated equipment and robotic arms.



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Technical Specifications



Technical Parameter	Specification
Product Series	Object-Space Telecentric Lenses
Magnification Range	0.061X to 2.0X (Multiple in-stock configurations)
Object-Space Telecentricity	< 0.02° (Precision Grade)
Working Distance (W.D.)	39mm to 238mm (110mm standard on core models)
Maximum Sensor Format	Up to 2/3" (Broadly compatible with 1/3" 1/2" 1/1.8")
Camera Interface	Standard C-Mount
Optical Resolution	Down to 2.2 μm (Model dependent, e.g., 5.59 μm at 1.5X)
Illumination Options	Standard ambient / Integrated coaxial illumination available

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Bi-Telecentric Lenses (C-Mount)



High Precision Optical Components

Key Features

- Absolute Metrology Grade: True bi-telecentric design ($<0.01^\circ$ telecentricity) eliminates perspective parallax and sensor-tilt errors for strict dimensional gauging.
- Exceptional Image Fidelity: 0.02% optical distortion and high MTF (>0.4 @ 100lp/mm) ensure sharp edge detection for sub-micron algorithms.
- Industrial Robustness: Anodized aluminum housing (-20°C to $+80^\circ\text{C}$) featuring a standard 110mm working distance and internal M62 $\times$ 0.75 filter threads.



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Technical Specifications



Technical Parameter	Specification
Optical Design	True Bi-Telecentric (Object & Image Space Correction)
Telecentricity	$< 0.01^\circ$ (Precision Metrology Grade)
Optical Distortion	0.02%
Image MTF	$> 0.4 @ 100 \text{ lp/mm}$
Working Distance (W.D.)	110 mm $\pm$ 3% (Standardized across core models)
Camera Interface	Standard C-Mount
Front Filter Thread	M62.00 $\times$ 0.75 mm (Internal UV/Polarizer Thread)
Construction Material	Industrial Anodized Aluminum Alloy + Coated Optical Glass
Operating Temperature	-20° C to +80° C
Operation Focus / Zoom	Manual Focus Lock / Fixed Zoom

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