Прецизионная и контрольная оптика Tropel, Aspheres, Inspection

Описание

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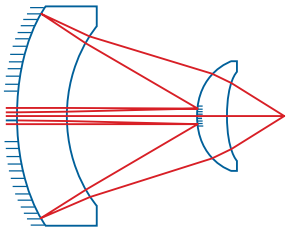
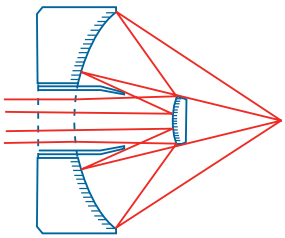
Tropel® µCAT™ UV Micro-Objectives

High Numerical Aperture and Long Working Distance

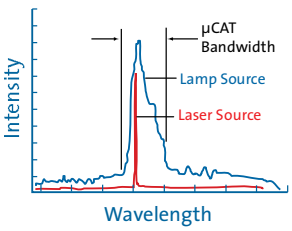
CORNING



Typical µCAT Design



Typical Schwarzschild Design



Corning's Tropel® µCAT™ family of catadioptric, long working distance micro-objectives are designed for use down to Deep Ultraviolet wavelengths. The µCAT's superior design attributes outperform Schwarzschild objectives. Before considering an all-mirror system, take a closer look at the Tropel µCAT.

Benefits of the µCAT Design

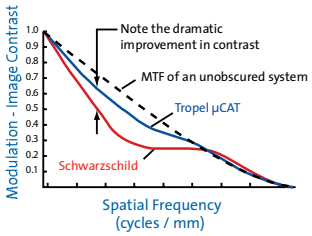
The µCAT design incorporates reflective and refractive elements, resulting in a micro-objective with high numerical aperture, long working distance and low obscuration. High resolution and advantaged light collection, with a working distance that can work with a pellicle, the µCAT's features combine performance and flexibility in a cost effective solution.

Broad-Bandwidth

The µCAT designs can provide sufficient bandwidth to accommodate lamp-based systems, eliminating the need for expensive laser sources; lowering the overall cost of your system.

Less Obscuration Equals Improved Performance

Central obscuration within the lens has a direct effect on the mid-frequency modulation transfer function (MTF) (i.e. image contrast). The µCAT's design reduces the amount of obscuration, and improves the mid-frequency MTF. The amount of central obscuration in the µCAT design can be as low as 15%, while typical Schwarzschild objectives have greater than 35% central obscuration.

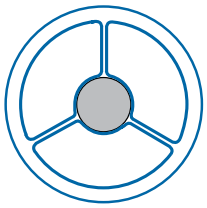


Another feature of the µCAT design is the use of a "floating" secondary mirror, thereby eliminating mechanical struts or "spiders", which when present in other micro-objectives, obstruct some light from passing through the system. By eliminating these struts, there is also a reduction in unwanted diffraction effects that are present in many reflective micro-objective systems.

Well Designed for a Long Life

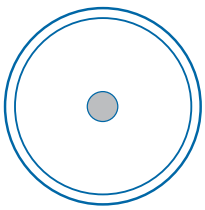
Cornings's expertise in contamination control, optical materials selection, high transmission coatings, and low outgassing materials combine to offer a robust design - which translates into lenses with longer lifetimes for our customers.

The µCAT is an enclosed system designed to be purged with high purity nitrogen. Controlling the internal atmosphere by purging with high purity nitrogen prevents harmful environmental contaminants from depositing on the internal components. Corning's purge design enhances internal cleanliness and maintains UV transmission while maximizing system life.



Schwarzschild Design

All materials selected for use in the µCAT objectives are ultra-low outgassing to minimize sources of contamination. µCAT designs are free of cemented surfaces which are known to degrade system performance and reduce lifetime by lowering transmission in UV applications.



Tropel® µCAT™ Design

Corning designs include materials specifically selected to optimize transmission at wavelength and specially developed coatings are applied to the optical surfaces to maximize transmission and lifetime.

Which do you think performs better?

UV Micro-objectives for High Performance Applications

Because of the low obscuration incorporated into the design, the µCAT can be used in inspection applications with partial coherent illumination conditions, or to inspect images on reticles and wafers. µCAT objectives are currently utilized in OEM applications including photomask and wafer inspection and writing.

UV Optics for High Performance Imagery, Interferometry, and Inspection Applications

All µCATs are corrected at specified wavelength ranges and are certified at those UV wavelengths to verify their performance. A Certificate of Conformance and wavefront map are included with every micro-objective manufactured. All µCATs are certified for diffraction limited performance. Standard wavelengths are 193 nm, 213 nm, and 248 nm, with additional wavelengths and configurations available with special orders.

Tropel® µCAT™ micro-objectives are available to special order at different wavelengths, numerical apertures and mechanical configurations. Please contact Corning for your specific requirements. Specifications are subject to change.

Tropel® µCAT® Panther Micro-Objectives

High Numerical Aperture and Long Working Distance

CORNING

Specifications

Trade name	Panther 193	Panther 213	Panther 248
NA	0.745	0.75	0.75
Field (µm)	120	140	120
Wavelength (nm)	193.3	213.0	248.4 *filtered lamp capable*
Bandwidth (nm)	1 - FWHM	1 - FWHM	6 - FWHM
Pupil Diameter (mm)	4	4	4
EFL (mm)	2.68	2.67	2.67
Residual BB RMS OPD (mλ)	75 - maximum	50 - maximum	50 - maximum
Working Distance (mm)	≥ 8	≥ 8	≥ 8
Telecentric (degrees)	< 0.1 - object side	< 0.1 - object side	< 0.1 - object side
Calibrated Distortion (nm)	30 - maximum	30 - maximum	30 - maximum
Optical Material	Excimer SiO_2	Excimer SiO_2	Excimer SiO_2
Obscuration (%)	15 - linear	15 - linear	15 - linear
Cemented Surfaces	None	None	None
Internal Foci	None	None	None
Diameter (mm)	86 - maximum	86 - maximum	86 - maximum
Length (mm)	63 - maximum	63 - maximum	63 - maximum
Flange-to-Focus (mm)	65 - nominal	65 - nominal	65 - nominal
Mount	M27 x 0.75 thread *specials to order*	M27 x 0.75 thread *specials to order*	M27 x 0.75 thread *specials to order*
Mass (g)	1600	1600	1600
Purge Requirement	N_2	N_2	N_2
Documentation	OPD Interferogram, Flange-to-focus Certificate of Compliance	OPD Interferogram, Flange-to-focus Certificate of Compliance	OPD Interferogram, Flange-to-focus Certificate of Compliance

NOTE: inquire about a custom tube lens to support your magnification requirements.

Patent # 6,560,039

Aspheres by Corning

Performance improving precision to meet your toughest specifications.

CORNING

Rely on Corning for Your Precision Aspheres

With over 40 years of experience in optical design, metrology and DUV and lithography inspection systems, Corning is uniquely suited to fabricate and qualify your most demanding precision Aspheres. Let our knowledgeable engineers and skilled manufacturing technicians assess your project. Corning is well positioned to provide a full range of optical products from materials and components to complex multi-element lenses and fully aligned opto-mechanical assemblies. Our customers value Corning's insights and solutions to their challenges.

Meeting Requirements for Demanding Applications

- Material Choices – fused silica, calcium fluoride, optical glasses and more
- Diameters to 200 mm and more
- State-of-the-Art manufacturing capability
- DUV to IR applications

Full Suite of Measurement Capabilities

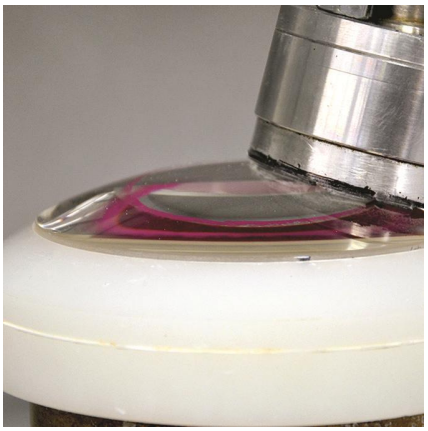
Corning's comprehensive measurement capabilities can provide the accuracy you require in a cost-effective manner. Leverage Corning's quality architecture and measurement tools to obtain the performance required:

- Contact Stylus Profiler ~ 1.0 µm
- Non-Contact Profiler ~ 0.1 µm
- 2-D Surface Interferometry ~ 0.03 µm
- Proprietary TASP tool ~ 0.03 µm

Specifications and Tolerance Limits

Capability by Attribute	Units	Manufacturing Limits
Dimensional Tolerances		
Diameter	mm	+0.000 / -0.002
Center Thickness	mm	+0.010 / -0.010
Radius	mm	< 1 fringe
Mechanical Departures		
Bevel Sags	mm	+0.000 / -0.002
Sag	mm	+0.000 / -0.002
Wedge	mm	+0.0005 / -0.0005
Aspheric Profile Tolerances		
Irregularity (PV)	fringes	0.05
Irregularity	nm	2
Slope	fr/mm	0.1
Profile	µm	< 0.025
Features		
Bevels	mm	0.3
Roughness	Å	2
Scratch-Dig		< 20-10

NOTE: Manufacturing specification limits are dependent on required diameters and departure from best fit spheres.



We are with you from design through production.

Glass Inspection at All Manufacturing Stages

Corning manufactures precision optical systems for inspecting the patterned glass used in flat-panel televisions, cellular telephones, personal digital assistants (PDAs), and other consumer electronics.

Inspection Optics often require advanced features to deliver speed, sensitivity, and performance-matching to enhance overall system value.

Corning's vertical integration, from design through production, allows for faster turn around and ultimately more cost effective solutions.

Our skilled engineering and operational teams have experience building and testing custom products for inspection at all stages of semiconductor and flat panel display manufacturing:

- Components
- Assemblies
- Objectives
- Modules
- Turnkey Systems

Inspection Optics: We Can Elevate the Value of Your System

Precision Testing: We Ensure Quality of Consumer Electronics

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