

Optics | SPHERICAL LENSES - UV TO NIR

Surface Tolerances	Precision	Laser Grade	Manufacturing Limit
Surface quality (scratch-dig)	40-20	10-5	5-2
Polished surface roughness (Å, RMS)	10	5	< 1
Polished spherical irregularity (waves, P-V @ 633 nm)	$\lambda/4$	$\lambda/10$	$\lambda/100$
MRF [®] surface irregularity (waves, P-V @ 633 nm)	$\lambda/20$	$\lambda/40$	$\lambda/80$
Spherical radius (fringes)	5	3	0.5
Flat irregularity (waves, P-V @ 633 nm)	$\lambda/4$	$\lambda/20$	$\lambda/100$
Dimensional Tolerances	Commercial	Precision	Manufacturing Limit
Diameter (mm)	+0.000/-0.250	+0.000/-0.025	+0.000/-0.005
Thickness (mm)	±0.250	±0.050	±0.005
Centration (edge thickness difference, mm)	0.05	0.01	0.005
Wedge	<5 arc min	≤1 arc sec	≤0.5 arc sec
Clear aperture (%)	85	90	100

- High laser damage threshold
- Low scattering, low absorption
- Single V, Dual V, and broadband AR coatings available
- Conventional, diamond turned, and molded options available
- Ask us about FabExpress™ Rapid Prototyping in less than two weeks
- Diameters up to 600 mm
- For materials see pgs 6-7



The general tolerance specifications above provide a guideline regarding manufacturing capabilities for uncoated optics ranging in size from 3-100 mm. The manufacturing limits are not absolute and may vary depending on material; tighter tolerances may be possible. Part specific tolerances may vary. All specifications do not need to be from single column.

SPHERICAL LENSES - INFRARED

Optics

Surface Tolerances	Silicon		Zinc Selenide		Germanium	
	Typical	Mfg Limit	Typical	Mfg Limit	Typical	Mfg Limit
Surface quality (scratch-dig)	40-20	10-5	40-20	20-10	40-20	10-5
Polished Surface roughness (Å, RMS)	10	5	10	5	10	5
Surface power (waves, P-V @ 633 nm)	$\lambda/4$	$\lambda/20$	$\lambda/4$	$\lambda/20$	$\lambda/4$	$\lambda/20$
Surface irregularity (waves, P-V @ 633 nm)	$\lambda/4$	$\lambda/20$	$\lambda/4$	$\lambda/20$	$\lambda/4$	$\lambda/20$
Spherical radius accuracy (% radius)	0.10	0.02	0.10	0.02	0.10	0.02
Dimensional Tolerances						
Diameter (mm)	± 0.1	+0.00/-0.013	± 0.1	+0.00/-0.013	± 0.1	+0.00/-0.013
Center Thickness (mm)	± 0.1	± 0.01	± 0.1	± 0.01	± 0.1	± 0.01
Wedge (arc seconds)	30	1	30	1	30	1
Clear aperture (%)	90	98	90	98	90	98

- Conventional lenses
- Durable coatings
- For aspheric and diffractive lenses see page 11

Lens Types

Plano-Concave
 Plano-Convex
 Bi-Convex
 Bi-Concave
 Meniscus

Material Types

CaF₂
 Si
 ZnS
 AMTIR
 GaAs
 ZnSe
 Ge



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