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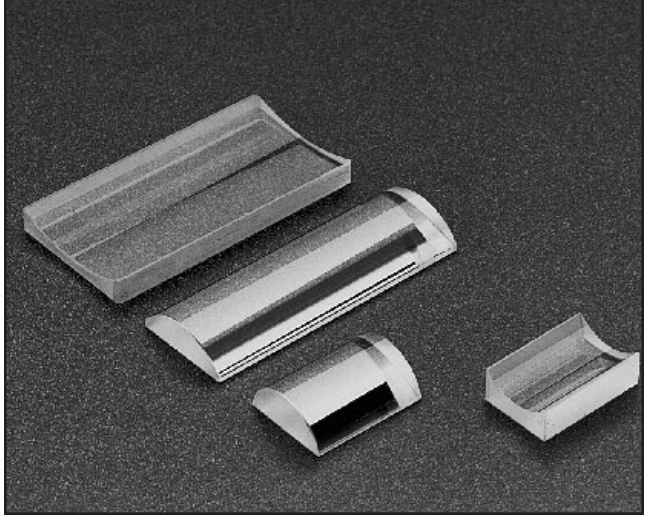
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Precision Plano-Cylindrical Glass Lenses

Precision cylindrical lenses are manufactured to meet the most demanding cylindrical lens specifications.

- These lenses can be used for applications such as bar-code scanning, holography, optical information processing and computing, laser projection, and illuminating slits or linear detector arrays.
- Wedge, centration, and surface accuracy are held to tight tolerances during manufacturing.
- For optimum performance, precision cylindrical lenses may be antireflection coated by appending a coating suffix from the options available in Chapter 5, *Optical Coatings*.

SPECIFICATIONS: PRECISION PLANO-CYLINDRICAL GLASS LENSES

Paraxial Focal Length: f ± 2%

Design Wavelength (λ_0): 587.6 nm

Surface Accuracy:
λ/2 in the y direction and λ/4 per centimeter in the x-direction, at 632.8 nm

Wedge = $\Delta t_c/x$: <1.0 mrad within lens

Centration: ≤3 arc minutes (400 series ≤6 arc minutes)

Length: x ± 0.1mm

Width: y ± 0.14 mm

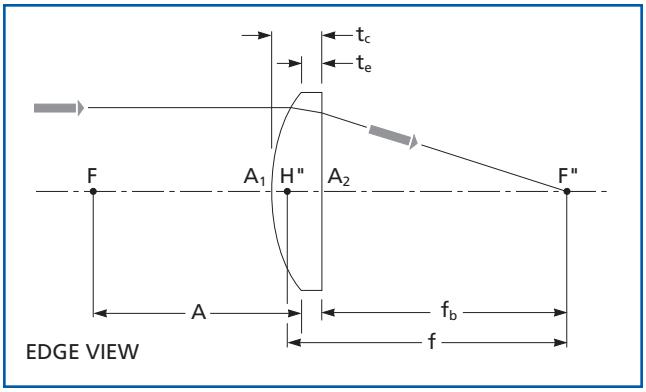
Flat Island Width (Δ): 0.75 mm ± 0.25 mm

Clear Aperture Width (x_1, y_1): see tables on page 8.5 and 8.6

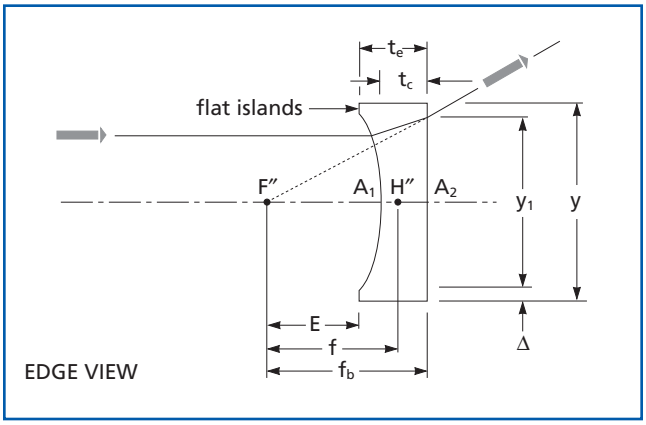
Center Thickness: t_c ± 0.5 mm

Material: BK7

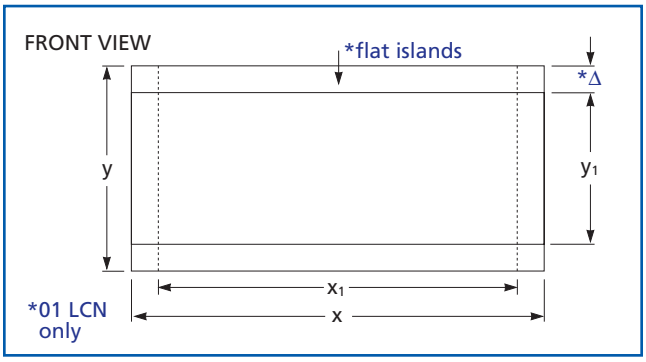
Surface Quality: Pitch polished, 60–40 scratch and dig



01 LCP precision plano-cylindrical glass lenses



01 LCN precision plano-cylindrical glass lenses

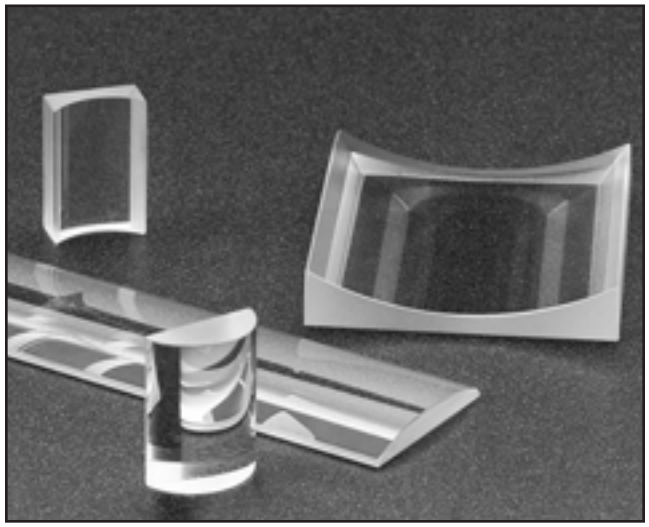


01 LCN/01 LCP precision plano-cylindrical glass lenses

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Precision Plano-Cylindrical Glass Lenses, Positive

f (mm)	x (mm)	y (mm)	t_c (mm)	t_e (mm)	A_2H'' (mm)	f_b (mm)	A (mm)	f/#	x_1	y_1	PRODUCT NUMBER
8.00	12.5	7.0	3.80	1.9	−2.5	5.5	9.9	1.14	11.0	5.5	01 LCP 425
10.00	12.5	9.0	3.80	1.2	−2.5	7.5	12.6	1.11	11.0	7.5	01 LCP 427
6.35	25.0	6.0	2.95	1.0	−2.0	4.4	8.3	1.06	23.0	5.0	01 LCP 124
12.70	25.0	11.0	4.00	1.0	−2.6	10.1	15.7	1.15	23.0	9.0	01 LCP 125
19.00	25.0	16.0	5.10	1.0	−3.4	15.6	23.1	1.19	23.0	13.0	01 LCP 126
22.20	20.0	12.5	5.75	3.9	−3.8	18.4	24.1	1.78	11.0	19.0	01 LCP 123
25.40	60.0	22.0	7.00	1.0	−4.6	20.8	31.4	2.15	57.0	19.0	01 LCP 127
38.10	60.0	26.0	6.90	2.0	−4.6	33.5	43.0	2.47	57.0	23.0	01 LCP 129
40.00	60.0	15.0	5.75	4.3	−3.8	36.2	41.4	2.67	57.0	12.0	01 LCP 128
50.00	60.0	26.0	5.50	2.0	−3.6	46.4	53.5	1.92	57.0	23.0	01 LCP 133
60.00	60.0	20.0	5.75	4.1	−3.8	56.2	61.7	3.00	57.0	17.0	01 LCP 136
76.20	60.0	26.0	4.20	2.0	−2.8	73.4	78.4	2.93	57.0	23.0	01 LCP 134
80.00	60.0	30.0	5.75	2.9	−3.8	76.2	82.8	2.67	57.0	27.0	01 LCP 145
100.00	60.0	50.0	8.89	2.4	−5.9	94.1	106.4	2.00	57.0	46.0	01 LCP 155
150.00	60.0	50.0	5.75	1.6	−3.8	146.2	154.1	3.00	57.0	46.0	01 LCP 166
200.00	60.0	50.0	6.35	3.3	−4.2	195.8	203.1	4.00	57.0	46.0	01 LCP 178
250.00	60.0	50.0	5.40	3.0	−3.6	252.4	252.4	5.00	57.0	46.0	01 LCP 135
300.00	60.0	50.0	6.00	4.0	−4.0	296.0	302.0	6.00	57.0	46.0	01 LCP 137



ADJUSTABLE CYLINDRICAL LENS HOLDERS

Cylindrical lenses can be mounted using the adjustable cylindrical lens holders in Chapter 24, *Lens, Filter, and Polarizer Mounts*.



Precision Plano-Cylindrical Glass Lenses, Negative

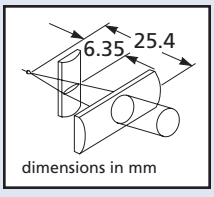
f (mm)	x (mm)	y (mm)	t_c (mm)	t_e (mm)	A_2H'' (mm)	f_b (mm)	E (mm)	f/#	x_1	y_1	PRODUCT NUMBER
−6.35	25.0	6.0	5.0	6.2	−3.3	−9.7	3.49	−1.27	23.0	4.0	01 LCN 123
−12.70	25.0	11.0	5.0	7.3	−3.3	−16.0	8.68	−1.27	23.0	9.0	01 LCN 124
−19.00	25.0	16.0	5.0	8.5	−3.3	−22.3	13.81	−1.27	23.0	13.5	01 LCN 125
−25.40	60.0	16.0	5.0	7.4	−3.3	−28.7	21.34	−1.69	57.0	13.0	01 LCN 126
−38.10	60.0	26.0	5.0	9.5	−3.3	−41.4	31.92	−1.52	57.0	23.0	01 LCN 127
−40.00	60.0	26.0	5.0	9.2	−3.3	−43.3	34.09	−1.60	57.0	23.0	01 LCN 128
−50.00	60.0	26.0	5.0	8.2	−3.3	−53.3	45.07	−2.0	57.0	23.0	01 LCN 129
−60.00	60.0	26.0	5.0	7.6	−3.3	−63.3	55.67	−2.40	57.0	23.0	01 LCN 133
−76.20	60.0	26.0	5.0	7.0	−3.3	−79.5	72.46	−3.05	57.0	23.0	01 LCN 134
−80.00	60.0	26.0	5.0	6.9	−3.3	−83.3	76.36	−3.20	57.0	23.0	01 LCN 135
−100.00	60.0	26.0	5.0	6.5	−3.3	−103.3	96.76	−4.00	57.0	23.0	01 LCN 136
−150.00	60.0	26.0	5.0	6.0	−3.3	−153.3	147.28	−6.00	57.0	23.0	01 LCN 137
−200.00	60.0	26.0	5.0	5.8	−3.3	−203.3	197.54	−8.00	57.0	23.0	01 LCN 138
−250.00	60.0	26.0	5.0	5.6	−3.3	−253.3	247.69	−10.00	57.0	23.0	01 LCN 139
−300.00	60.0	26.0	5.0	5.5	−3.3	−303.3	297.79	−12.00	57.0	23.0	01 LCN 144

APPLICATION NOTE

Using Cylindrical Lenses to Collimate Nonsymmetrical Beams

Cylindrical lenses follow the same theories and formulas as spherical lenses, although they image in one dimension, not two. For example, to collimate a diode laser's output with a beam divergence of 7.5° × 30° into a symmetrical beam, we collimate the beam first in one dimension with the first cylindrical lens and then collimate the orthogonal dimension with a second cylindrical lens. The ratio of the two focal lengths should be approximately equal to the ratio of the two beam divergences:

$$\frac{\theta_2}{\theta_1} = \frac{7.5°}{30°} = \frac{f_1}{f_2}.$$



The lenses should be positioned at their respective focal lengths from the diode laser to create a collimated beam.

The principal planes of the two lenses should be separated at a distance equal to the difference of their focal lengths, $f_2 - f_1$. The actual spacing between the plano surfaces is $f_{b2} - f_{b1}$. The convex surfaces should face the collimated rays to minimize aberrations.

Care must be taken to ensure that the beamwidth at each lens does not exceed the lens clear aperture. Since each lens is placed one focal length from the diode laser, maximum beam diameter at each lens can be determined from

$w_1 = 2 f_1 \tan\theta_1 = 7.34$ mm and $w_2 = 2 f_2 \tan\theta_2 = 6.68$ mm.

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