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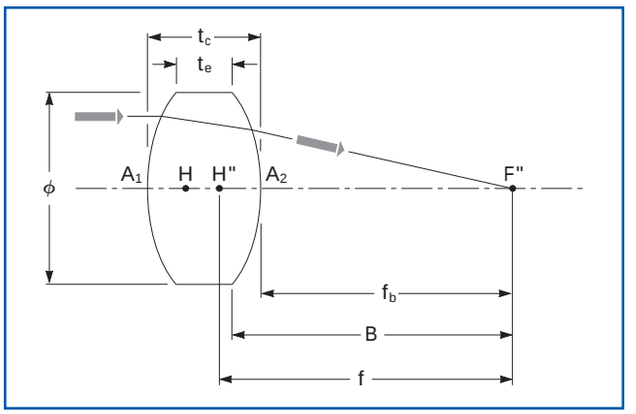
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Symmetric-Convex Glass Lenses

Symmetric-convex lenses are manufactured with an identical convex surface on both sides of the lens.

- Symmetric-convex lenses have positive focal lengths and form both real and virtual images.
- Aberrations such as coma, distortion, and chromatic aberration almost exactly cancel out at unit conjugate ratios due to the symmetry. Aberrations will increase as conjugate ratios depart from unity.
- Recommended for virtual imaging of real objects, and for positive conjugate ratios from approximately 0.2 to 5. Values are wavelength sensitive.
- Antireflection coatings are available by appending the appropriate coating suffix as described in Chapter 1, *Introduction to Optical Coatings*.



01 LDX symmetric-convex glass lenses

SPECIFICATIONS: SYMMETRIC-CONVEX GLASS LENSES

Paraxial Focal Length (f): ±2%, except 400 series ±5%

Design Index (n_0): ±0.001

Centration: 3 arc minutes

Diameter (ϕ): +0, −0.10 mm (+0, −0.15 mm for $\phi \geq 75$ mm)

Clear Aperture Diameter: 90%

Center Thickness (t_c): ±0.2 mm

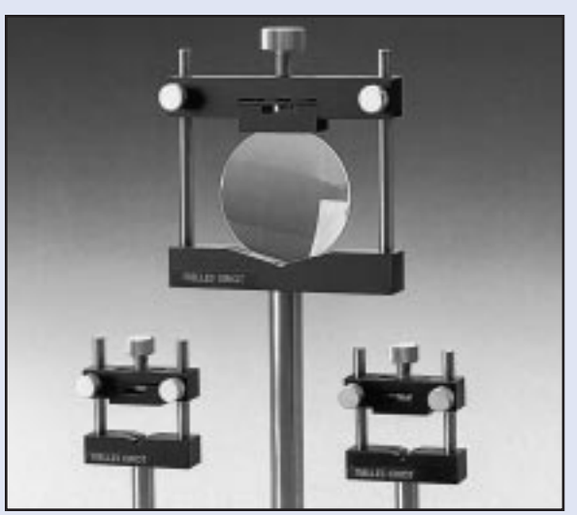
Material: BK 7, grade A fine annealed

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

Circumference is ground and both edges have a slight protective bevel (except for diameters ≤5.0 mm).

ADJUSTABLE LENS HOLDERS

Melles Griot adjustable lens holders, page 381, offer mounting flexibility for various diameter lenses.



Symmetric-Convex Glass Lenses

f (mm)	ϕ (mm)	Design Wavelength λ0 (nm)	Design Index n_0	t_c (mm)	t_e (mm)	A_1H (mm)	f_b (mm)	B (mm)	f/#	PRODUCT NUMBER
4.5	5.0	587.6	1.5168	2.0	0.4	0.7	3.8	4.6	0.90	01 LDX 401
7.0	5.0	546.1	1.5187	3.0	2.0	1.1	5.9	6.4	1.40	01 LDX 001
8.0	6.0	546.1	1.5187	3.2	2.0	1.1	6.9	7.5	1.33	01 LDX 003
10.0	5.0	546.1	1.5187	2.6	2.0	0.9	9.1	9.4	2.00	01 LDX 005
10.0	7.5	546.1	1.5187	3.5	2.0	1.2	8.8	9.5	1.33	01 LDX 007
10.0	10.0	546.1	1.5187	4.8	1.9	1.7	8.3	9.7	1.00	01 LDX 009
12.7	6.3	546.1	1.5187	2.8	2.0	1.0	11.7	12.1	2.02	01 LDX 013
14.2	12.5	546.1	1.5187	5.0	2.0	1.8	12.4	13.9	1.14	01 LDX 015
15.0	6.0	587.6	1.5168	1.7	1.1	0.6	14.4	14.7	2.50	01 LDX 403
15.0	7.5	546.1	1.5187	2.9	2.0	1.0	14.0	14.5	2.00	01 LDX 017
15.0	14.5	546.1	1.5187	5.9	2.0	2.1	12.9	14.9	1.03	01 LDX 019
18.0	13.0	546.1	1.5187	4.4	2.0	1.5	16.5	17.7	1.38	01 LDX 023
20.0	15.0	546.1	1.5187	4.9	2.0	1.7	18.3	19.8	1.33	01 LDX 025
20.0	21.0	546.1	1.5187	8.2	2.0	2.9	17.1	20.2	0.95	01 LDX 027
22.0	20.0	546.1	1.5187	6.9	2.0	2.4	19.6	22.1	1.10	01 LDX 029
25.0	22.4	546.1	1.5187	7.3	1.9	2.5	22.5	25.2	1.12	01 LDX 035
25.4	12.7	546.1	1.5187	3.6	2.0	1.2	24.2	25.0	2.00	01 LDX 039
25.4	20.0	546.1	1.5187	6.1	2.0	2.1	23.3	25.4	1.27	01 LDX 041
25.4	25.4	546.1	1.5187	9.0	2.0	3.2	22.2	25.8	1.00	01 LDX 043
28.6	12.7	546.1	1.5187	3.4	2.0	1.1	27.5	28.2	2.25	01 LDX 049
30.0	22.4	546.1	1.5187	6.3	2.0	2.2	27.8	30.0	1.34	01 LDX 055
30.0	30.0	546.1	1.5187	10.3	2.0	3.6	26.4	30.5	1.00	01 LDX 057
31.0	20.0	546.1	1.5187	5.3	2.0	1.8	29.2	30.8	1.55	01 LDX 059
31.7	25.4	546.1	1.5187	7.3	2.0	2.5	29.2	31.9	1.25	01 LDX 061
31.7	35.0	546.1	1.5187	12.9	1.9	4.6	27.1	32.6	0.91	01 LDX 063
33.0	10.0	546.1	1.5187	2.7	2.0	0.9	32.1	32.5	3.30	01 LDX 065
35.0	19.5	546.1	1.5187	4.7	2.0	1.6	33.4	34.8	1.79	01 LDX 067
38.1	25.4	546.1	1.5187	6.3	2.0	2.1	36.0	38.1	1.50	01 LDX 069
38.1	38.1	546.1	1.5187	12.4	1.9	4.3	33.8	39.0	1.00	01 LDX 079
40.0	25.0	546.1	1.5187	5.9	1.9	2.0	38.0	40.0	1.60	01 LDX 085
50.0	22.4	546.1	1.5187	4.5	2.0	1.5	48.5	49.7	2.23	01 LDX 101
50.0	25.0	546.1	1.5187	5.1	2.0	1.7	48.3	49.8	2.00	01 LDX 103
50.0	30.0	546.1	1.5187	6.5	2.0	2.2	47.8	50.1	1.67	01 LDX 104
50.0	42.0	546.1	1.5187	11.2	1.9	3.8	46.2	50.8	1.19	01 LDX 107

Melles Griot can reduce (edge) diameters of all lenses to meet your requirements.

Symmetric-Convex Glass Lenses *(continued)*

f (mm)	ϕ (mm)	Design Wavelength $\lambda 0$ (nm)	Design Index n_0	t_c (mm)	t_e (mm)	A_1H (mm)	f_b (mm)	B (mm)	f/#	PRODUCT NUMBER
50.8	50.8	546.1	1.5187	16.8	2.8	5.9	44.9	51.9	1.00	01 LDX 115
50.8	60.0	546.1	1.5187	23.7	2.8	8.5	42.3	52.7	0.85	01 LDX 117
60.0	22.4	546.1	1.5187	4.0	1.9	1.3	58.7	59.7	2.68	01 LDX 121
60.0	50.0	546.1	1.5187	12.9	2.0	4.4	55.6	61.1	1.20	01 LDX 123
63.5	50.0	546.1	1.5187	13.2	3.0	4.5	59.0	64.1	1.27	01 LDX 127
65.0	35.0	546.1	1.5187	6.7	2.0	2.2	62.8	65.1	1.86	01 LDX 129
70.0	30.0	546.1	1.5187	5.2	2.0	1.7	68.3	69.9	2.33	01 LDX 135
70.0	60.0	546.1	1.5187	16.4	2.8	5.6	64.4	71.2	1.17	01 LDX 139
75.0	25.0	546.1	1.5187	4.0	2.0	1.3	73.7	74.7	3.00	01 LDX 141
76.2	38.1	546.1	1.5187	6.7	2.0	2.2	74.0	76.3	2.00	01 LDX 143
76.2	50.8	546.1	1.5187	11.5	2.9	3.9	72.3	76.6	1.50	01 LDX 145
80.0	22.4	546.1	1.5187	3.5	2.0	1.2	78.8	79.6	3.57	01 LDX 149
80.0	47.0	546.1	1.5187	8.9	2.0	3.0	77.0	80.5	1.70	01 LDX 157
88.9	25.4	546.1	1.5187	3.8	2.0	1.3	87.6	88.5	3.50	01 LDX 161
100.0	22.4	546.1	1.5187	3.2	2.0	1.1	98.9	99.6	4.46	01 LDX 167
100.0	30.0	546.1	1.5187	4.2	2.0	1.4	98.6	99.7	3.33	01 LDX 168
100.0	42.0	546.1	1.5187	6.3	2.0	2.1	97.9	100.1	2.38	01 LDX 169
100.0	50.0	546.1	1.5187	8.2	2.0	2.7	97.3	100.4	2.00	01 LDX 171
101.6	50.8	546.1	1.5187	9.3	3.0	3.1	98.5	101.6	2.00	01 LDX 179
125.0	25.0	546.1	1.5187	3.2	2.0	1.1	123.9	124.5	5.00	01 LDX 185
125.0	40.0	546.1	1.5187	5.1	2.0	1.7	123.3	124.9	3.13	01 LDX 187
127.0	50.8	546.1	1.5187	8.0	3.0	2.7	124.3	126.8	2.50	01 LDX 189
150.0	22.4	546.1	1.5187	2.8	2.0	0.9	149.1	149.5	6.70	01 LDX 201
150.0	30.0	546.1	1.5187	3.5	2.0	1.2	148.8	149.5	5.00	01 LDX 202
150.0	42.0	546.1	1.5187	4.8	1.9	1.6	148.4	149.8	3.57	01 LDX 203
150.0	50.0	546.1	1.5187	6.1	2.0	2.0	148.0	150.0	3.00	01 LDX 205
150.0	75.0	546.1	1.5187	12.2	2.9	4.1	145.9	150.6	2.00	01 LDX 209
150.0	100.0	546.1	1.5187	20.8	3.9	7.0	143.0	151.4	1.50	01 LDX 213
175.0	100.0	546.1	1.5187	18.2	3.9	6.1	168.9	176.1	1.75	01 LDX 215
200.0	22.4	546.1	1.5187	2.6	2.0	0.9	199.1	199.4	8.93	01 LDX 217
200.0	30.0	546.1	1.5187	3.1	2.0	1.0	199.0	199.5	6.67	01 LDX 218
200.0	42.0	546.1	1.5187	4.1	2.0	1.4	198.6	199.7	4.67	01 LDX 219
200.0	50.0	546.1	1.5187	5.0	2.0	1.7	198.3	199.8	4.00	01 LDX 222
200.0	100.0	546.1	1.5187	16.3	3.9	5.4	194.6	200.8	2.00	01 LDX 223

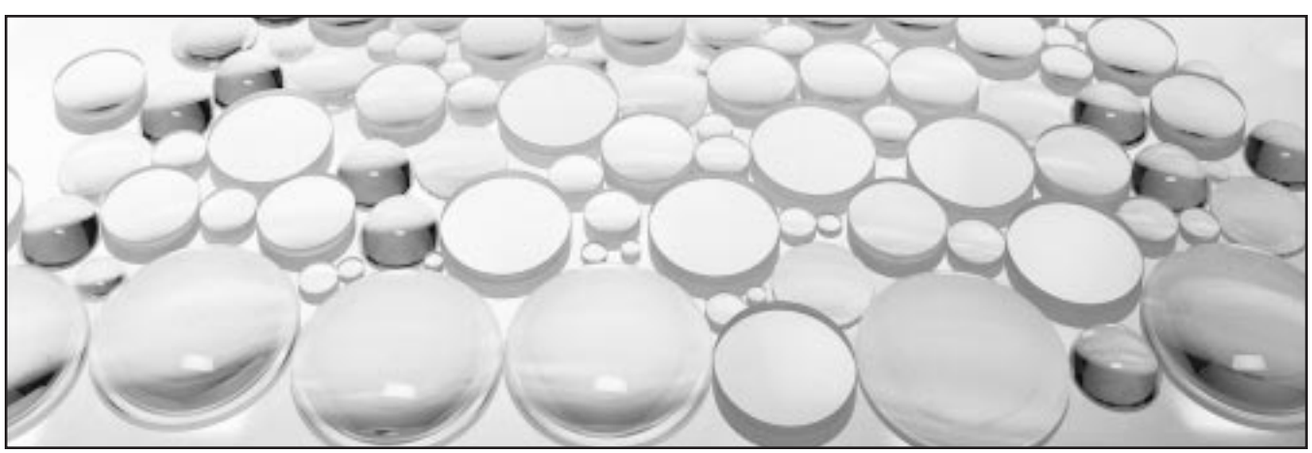
Melles Griot can reduce (edge) diameters of all lenses to meet your requirements.

(continued)

Symmetric-Convex Glass Lenses *(continued)*

f (mm)	ϕ (mm)	Design Wavelength λ0 (nm)	Design Index n_0	t_c (mm)	t_e (mm)	A_1H (mm)	f_b (mm)	B (mm)	f/#	PRODUCT NUMBER
250.0	42.0	546.1	1.5187	3.7	2.0	1.2	248.8	249.6	5.95	01 LDX 225
250.0	100.0	546.1	1.5187	13.7	3.9	4.6	245.4	250.4	2,50	01 LDX 235
300.0	42.0	546.1	1.5187	3.4	2.0	1.1	298.9	299.6	7.14	01 LDX 237
400.0	42.0	546.1	1.5187	3.1	2.0	1.0	399.0	399.5	9.52	01 LDX 243
500.0	30.0	546.1	1.5187	2.4	2.0	0.8	499.2	499.4	16.67	01 LDX 245
500.0	42.0	546.1	1.5187	2.8	1.9	0.9	499.1	499.5	11.90	01 LDX 247
500.0	50.0	546.1	1.5187	3.2	2.0	1.1	498.9	499.5	10.00	01 LDX 248
500.0	80.0	546.1	1.5187	6.1	3.0	2.0	498.0	499.5	6.25	01 LDX 249
600.0	47.0	546.1	1.5187	2.9	2.0	1.0	599.0	599.5	12.77	01 LDX 257
1000.0	30.0	546.1	1.5187	2.2	2.0	0.7	999.3	999.4	33.33	01 LDX 258
1000.0	42.0	546.1	1.5187	2.4	2.0	0.8	999.2	999.4	23.81	01 LDX 259
1000.0	50.0	546.1	1.5187	2.6	2.0	0.9	999.1	999.4	20.00	01 LDX 262
2000.0	42.0	546.1	1.5187	2.2	2.0	0.7	1999.3	1999.4	47.62	01 LDX 263

Melles Griot can reduce (edge) diameters of all lenses to meet your requirements.



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