



A.W.I. Industries  
(USA) Inc.

Welcome to AWI

## OPTICS-Aspheric Lenses

By definition, any curvature that is not spherical can be categorized as aspheric. The most common form of aspheric equation is as follows:

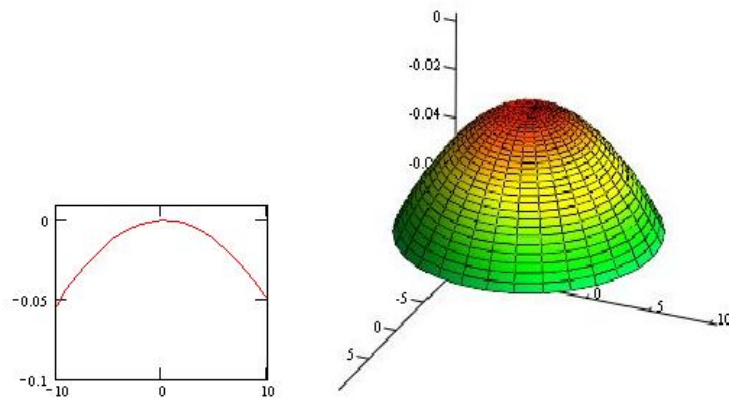
$$f(x) := \frac{C \cdot x^2}{1 + \sqrt{1 - (1 + k) \cdot C^2 \cdot x^2}} + A_1 \cdot x + A_2 \cdot x^2 + A_3 \cdot x^3 + A_4 \cdot x^4 + A_5 \cdot x^5 + \dots$$

where A1, A2, A3, A4... are constants.

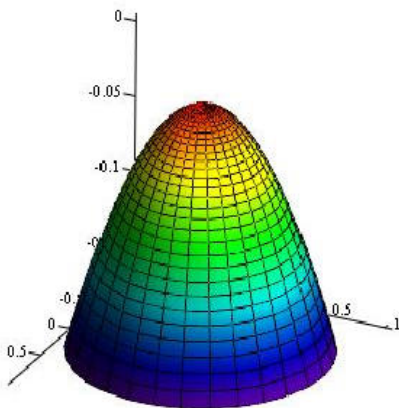
C is the reciprocal of radius of curvature (1/R).

K is the conic constant.

The shape of the lens is given by plotting  $f(x)$  and rotate the 2D curve along the X axis:



There are also other kinds of aspherics such as elliptical and parabolic



There are many different kinds of aspheric lens designs, they include aspheric-plano, aspheric-concave, aspheric-convex, bi-aspheric, or aspheric lens arrays.

A.W.I. Industries (USA) Inc. manufactures and supplies both molded plastic and molded glass aspheric lenses. Our aspheric lenses range from diameter 1.6mm to diameter 150mm. We also supply on-axis and off-axis metal and glass parabolic mirrors using single point diamond turning (SPDT) process and "ground & polished" process.

A.W.I. also supplies small glass-replica aspheric laser collimating lenses and lens arrays for use in telecommunication, metrology, imaging, data storage and medical industries.

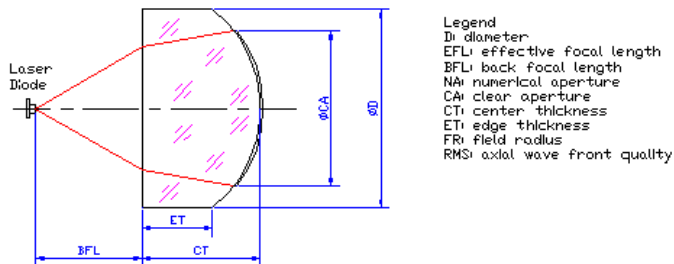
A.W.I. welcomes your inquiries and will be glad to assist in the design, material selection, function, and manufacturability of your aspheric lens application.



Below is a table containing standard aspheric lenses that AWI supplies:

Part Number	EFL (mm)	BFL (mm)	NA (mm)	CA (mm)	D (mm)	CT (mm)	ET (mm)	WEIGHT (g)	FR (mm)	RMS (waves)
E15456-01	40.00	38.20	0.11	9.0	10.00	3.00	2.40	0.65	0.80	0.020
E15456-02	27.00	25.50	0.11	6.0	8.00	2.50	2.10	0.34	0.70	0.020
E15456-03	23.00	22.00	0.13	6.0	8.00	2.50	1.87	0.30	0.50	0.030
E15456-04	22.00	20.80	0.11	4.8	6.00	2.00	1.63	0.20	0.50	0.020
E15456-05	19.00	18.00	0.16	6.0	8.00	2.50	1.74	0.30	0.40	0.030
E15456-06	19.00	17.00	0.11	4.2	5.20	3.00	2.68	0.20	0.40	0.025
E15456-07	16.90	15.10	0.18	6.0	6.50	3.00	2.46	0.36	0.40	0.030
E15456-08	15.00	13.50	0.20	6.0	8.00	2.50	1.60	0.40	0.25	0.030
E15456-09	14.80	13.40	0.18	5.4	6.50	2.50	1.92	0.30	0.25	0.030
E15456-10	11.00	9.60	0.20	4.4	6.00	2.35	1.64	0.21	0.20	0.030
E15456-11	10.00	8.60	0.19	3.8	4.50	2.35	1.92	0.12	0.20	0.030
E15456-12	9.00	7.60	0.25	4.6	6.50	2.33	1.39	0.26	0.18	0.030
E15456-13	9.00	7.60	0.30	5.4	6.50	2.33	1.39	0.26	0.15	0.030
E15456-14	7.90	6.50	0.30	4.8	6.50	2.50	1.43	0.27	0.20	0.020
E15456-15	7.50	6.10	0.30	4.5	6.50	2.50	1.35	0.27	0.18	0.030
E15456-16	7.50	6.10	0.19	2.8	4.00	2.50	2.10	0.12	0.30	0.030
E15456-17	6.25	4.80	0.35	4.4	6.50	2.50	1.04	0.26	0.15	0.030
E15456-18	6.00	4.50	0.15	1.8	2.30	2.20	2.00	0.02	0.40	0.030
E15456-19	4.40	2.30	0.50	4.4	5.50	3.70	2.41	0.25	0.09	0.030

E15456-20	4.40	2.20	0.50	4.4	5.50	3.87	2.58	0.26	0.10	0.030
E15456-21	3.30	2.30	0.45	3.0	5.20	2.00	-	0.09	0.07	0.030
E15456-22	3.30	2.30	0.45	3.0	4.00	2.00	1.10	0.07	0.07	0.030
E15456-23	3.00	1.60	0.47	2.8	4.00	2.51	1.48	0.12	0.08	0.040
E15456-24	3.00	1.60	0.55	3.3	4.00	2.51	1.48	0.12	0.06	0.055
E15456-25	0.78	0.15	0.80	1.3	1.63	1.26	-	0.70	0.20	0.065
E15456-26	10.90	9.70	0.30	6.60	7.20	2.20	1.40	0.30	0.10	0.050
E15456-27	4.60	2.90	0.53	4.90	6.00	3.10	1.50	0.30	0.06	0.060
E15456-28	10.00	7.60	0.44	8.70	10.00	4.10	2.00	0.90	0.10	0.040
E15456-29	14.80	13.30	0.22	6.40	8.00	2.50	1.60	0.40	0.30	0.040



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