

# Aspheric Glass Lenses

## Description

Aspheric lenses are used to correct spherical aberrations. Instead of having to use multiple lenses such aberrations can be reduced to a minimum by using a single aspheric lens.

## Applications

Typical applications of these lenses include the collimation of laser diodes and the focusing of a collimated beam into an optical fiber. Since output power levels continue to increase, common plastic lenses can sometimes no longer be used. LASER COMPONENTS can offer aspheric lenses made of glass.



## Specifications

Tolerances in general:

|  | Standard Quality           |
|--|----------------------------|
| Center thickness                               | $\pm 0.025$ mm             |
| Diameter                                       | $\pm 0.030$ mm (typically) |
| Surface deviation power-irregularity (fringes) | 5 – 2                      |
| ETD (wedge)                                    | 0.05 mm                    |
| Axis alignment                                 | 5 minutes                  |
| Scratch-dig                                    | 60 – 40                    |
| Index of refraction ( $N_d$ )                  | $\pm 0.001$                |
| Abbe number ( $V_d$ )                          | $\pm .8\%$                 |
| Sag  | $\pm 0.015$                |

## Standard EFL/diameter:

| EFL (mm) | Diameter | CT (mm) | CA (mm), side 1* | Numerical Aperture |
|----------|----------|---------|------------------|--------------------|
| 2.00     | 3.00     | 1.869   | 2.00             | 0.50               |
| 2.59     | 4.40     | 3.056   | 3.12             | 0.60               |
| 3.10     | 6.325    | 3.190   | 5.40             | 0.62               |
| 4.50     | 3.00     | 1.500   | 2.80             | 0.31               |
| 4.51     | 6.325    | 2.940   | 4.95             | 0.55               |
| 4.60     | 6.00     | 3.102   | 4.89             | 0.53               |
| 5.30     | 7.33     | 2.932   | 5.83             | 0.55               |
| 6.16     | 4.70     | 3.480   | 3.70             | 0.30               |
| 6.24     | 7.20     | 5.360   | 5.00             | 0.40               |
| 7.50     | 6.51     | 2.750   | 4.50             | 0.30               |
| 8.00     | 9.94     | 3.690   | 8.00             | 0.50               |
| 11.00    | 7.20     | 5.000   | 5.50             | 0.26               |
| 11.00    | 7.20     | 2.200   | 6.59             | 0.30               |
| 15.29    | 6.50     | 2.200   | 5.80             | 0.16               |
| 18.40    | 6.50     | 2.170   | 5.50             | 0.15               |

\*value for side 2 may be different (data available on request)

## Good to know

- All lenses can be delivered with following standard coatings:  
 A-Coating: 400 – 600 nm ( $R_{max} < 1\%$ ,  $R_{typ} < 0.4\%$  average)  
 B-Coating: 600 – 1050 nm ( $R_{max} < 1\%$ ,  $R_{typ} < 0.4\%$  average)  
 C-Coating: 1050 – 1600 nm ( $R_{max} < 1\%$ ,  $R_{typ} < 0.4\%$  average)
- Precision quality lenses with a better surface quality and tighter tolerances are available on request.
- For customers solution we must know
  - requirements of the application or
  - the required aspheric shape of the lens and material

## Product Code

|            |   |                       |                 |                |
|------------|---|-----------------------|-----------------|----------------|
| <b>APX</b> | — | <b>Diameter (mm)/</b> | <b>EFL (mm)</b> | <b>Coating</b> |
|------------|---|-----------------------|-----------------|----------------|

## For example:

APX-7.2/11.0GL-B, asph. lens, dia. 7.2 mm, EFL 11.0 mm, coating B  
 (aspherical lens, diameter = 7.2 mm, EFL = 11.0 mm, coating)