

Futonics F-Theta lenses

Design wavelengths
1940 nm – 2050 nm



The new Futonics product line of F-Theta lenses is based on crystal lenses made of zinc selenide and calcium fluoride. Effective focal lengths of 170 mm and 345 mm are available.

High power applications at 2 μm wavelength need absorption free lens materials. Most quartz materials absorb at 2 μm wavelength due to intrinsic OH-Molecules. At several hundred Watts of laser power this residual absorption will heat up the lens and cause at least thermal wave front distortion. In extreme cases the material even cracks.

For plastic welding it is important to heat up the plastic materials just within a limited range of temperature. This can be done best by temperature control of the welding area with a pyrometer. Pyrometers below 2 μm wavelength are not very sensitive at low temperatures and interfere with the laser wavelength. Therefore measurement should be done above 3 μm wavelength. The Futonics lenses are transparent up to 10 μm wavelength and AR-coated accordingly.

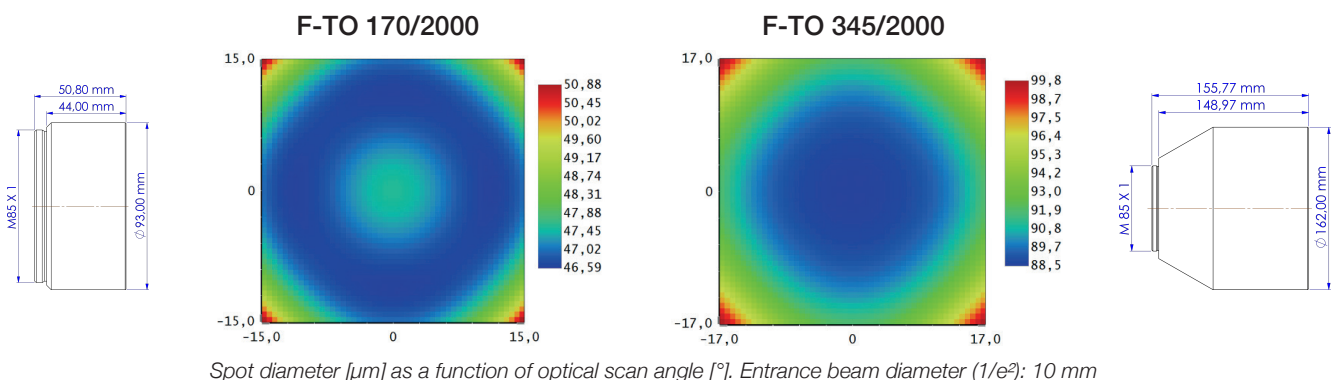
Due to design and size, these lenses offer best processing results in the whole working area. Such these new F-Theta lenses can be used for various applications, in industrial manufacturing, medical and biotechnology, and in science and research.

Features:

- Wavelength: 1940 nm - 2050 nm
- Focal length: 170 mm or 345 mm
- Lenses material: zinc selenide and calcium fluoride

Applications:

- Welding
- Cutting
- Labeling



Futronics F-Theta lenses



F-TO 170/2000

Design wavelength	1940 nm – 2050 nm
Effective focal length	170,2 mm
Entrance beam diameter (1/e ²)	10 mm
Scan area	90 mm x 90 mm
Working distance	189,7 mm
Flange focus distance	242,7 mm
Optical scan angle	±22°
Mirror distances from flange	12,7 mm / 29,7 mm
Spot diameter focus (1/e ²)*	47,6 μm
Max. telecentricity error	11,5°
Lens material	ZnSe, CaF ₂
Cover glass	CaF ₂
AR-Coating	Vis (600 nm – 700 nm) T>80%, Laser (1940 nm -2050 nm) T>99%, Pyro (3,5μm – 5μm) T>60%
LIDT (coating)	Not available yet
Weight	0,8 kg
Mounting thread	M85 mm x 1 mm

F-TO 345/2000

Design wavelength	1940 nm – 2050 nm
Effective focal length	344,8 mm
Entrance beam diameter (1/e ²)	10 mm
Scan area	205 mm x 205 mm
Working distance	316,7 mm
Flange focus distance	466,2 mm
Optical scan angle	±24°
Mirror distances from flange	25,0 mm / 52,0 mm
Spot diameter focus (1/e ²)*	88,6 μm
Max. telecentricity error	14,6°
Lens material	ZnSe, CaF ₂
Cover glass	CaF ₂
AR-Coating	Vis (600nm – 700nm) T>80%, Laser (1940nm -2050nm) T>99%, Pyro (3,5μm – 5μm) T>60%
LIDT (coating)	Not available yet
Weight	4,5 kg
Mounting thread	M85 mm x 1mm

**Smaller spot diameters can be achieved in the central region when larger entrance beam diameters (up to 15 mm / 20 mm) are used*

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