

フェムト秒用オプティクス

Laser Optics for femto second lasers



A bandwidth-limited pulse has a spectral width given by the Fourier transform of its time-domain profile. Consequently, a 10-fs FWHM Gaussian pulse centred at 800 nm has a bandwidth of 94 nm (1466 cm⁻¹). When a short pulse travels through a dispersive medium, the component frequencies are separated in time. Firstly, the centre of the pulse is delayed with respect to a pulse travelling in air. This is usually called the group delay, which is not a broadening effect. Secondly, normally-dispersive media like glass impose a positive frequency sweep or “chirp” on the pulse meaning that the blue components are delayed with respect to the red.

Consequently, if optics is used for very short pulses, especially for femto second pulses, the optics has to be chosen very carefully. Sill Optics designed some beam achromatic expanders and f-theta objectives taken these issues into account in order to minimized the chirp on the pulse.

Beam Expanders

Article Number	S6ASS4030	S6ASS4034	S6ASS4035
Design input beam diameter [mm]	12	8	7.5
Clear aperture input side [mm]	12	12	8
Clear aperture output side [mm]	39.5	39.5	39.5
Magnification factor	3.0	4.0	5.0
Design wavelength range [nm]	760–820	760 –820	760 –820
Glasses	Low dispersion glasses		

F-Theta Objective

Article Number	S4LFT0089/094
Design wavelength [nm]	780
Effective focal length [mm]	88.4
Design input beam diameter [mm]	8
Glasses	Low dispersion glasses



405nm用オブティクス

Laser optics for 405 nm printing applications

Sill Optics new product line of f-theta objectives for 405 nm targets especially at the use in CTP platesetters. Computer-to-plate (CTP) is the process of transferring digital data from computers directly onto printing plates resulting in faster turnaround times due to a reduced prepress production time. Laser based UV exposure of printing plates with laser systems emitting at 355 nm are well established. Sill Optics offers standard as well as telecentric scan objectives for 355 nm for beam diameters of up to 10 mm and scan lengths of maximum 650 mm. Incorporating the newly developed objectives for 405 nm, popular-priced light sources as for example violet laser diodes can be utilized. The scan objectives produce diffraction limited spots over the whole scan area for highest resolution. Laser beam diameters of up to 14 mm and exposure lengths of 600 mm or more can be easily realized with our scan objectives, currently 4 different standard f-theta objectives are available. The anti reflection coating of the objectives is well suited for a wavelength range from 400 nm to 410 nm, other wavelengths are available on demand. The glasses used in our laser optics for 405 nm is highly transmittive, the total transmission, including the coating losses, is at least 95%. The optical as well as the mechanical design can be customized and fit to various beam deflection systems such as galvo or polygon scanners to reach best performance.

Besides the CTP application the objectives can be used in medical diagnostic, fluorescence spectroscopie, optical storage mediums (DVD/CD-mastering, -inspection), and laboratory applications.

F-theta objectives optimized for XY galvo systems

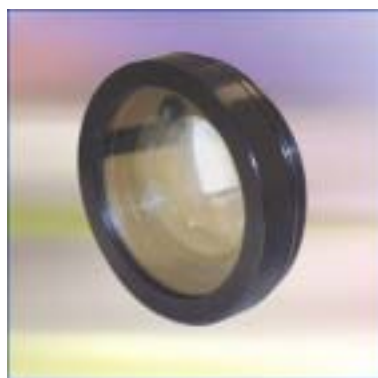
article number	EFL [mm]	max. beam diameter [mm]	scan length [mm]
S4LFT3160/173	178	6	140
S4LFT0580/173	594	10	465
S4LFT0375/173	375	11	430
S4LFT8050/173 ¹	55	7,5	35

Scan lenses for polygon scanners

article number	EFL [mm]	max. beam diameter [mm]	scan length [mm]
S4LFT0560/173	560	14	600 mm

Beam expander

article number	magnification	max. beam diameter [mm] ²	scan length [mm]
S6ASS3103/173	3	4	600 mm



¹ Telecentric lens

² diffraction limited input beam diameter

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