

Scan Lenses (f- θ Lenses) for Lasers

Lenses used in combination with XY galvanometer scanner are called f -theta lenses, plane field objectives or simple scan lenses. f -theta lenses are used in various applications from industrial material processing, drilling, welding of synthetic material and cutting in addition to medical and biotechnology (confocal microscopy, ophthalmology) to science and research. The design and the quality of the optical components are playing a decisive role.

A standard lenses focus the laser beam on a spherical plain in contrast to an ideal flat or plane field. The use of f -theta lenses provides a plane focusing surface and almost constant spot size over the entire XY image plane or scan field. The position of the spot on the image plane is directly proportional to the scan angle.

The scan length specifications in this catalogue are based on mirror spacings of typical scan heads. For other scan systems the parameter “aperture stop” defines the distance of the geometrical center between the mirrors to the mechanical edge of the lens housing.

Telecentric f -theta lenses focus the laser beam so it is almost perpendicular (within 1 degree) to the work surface over the entire scan field. This ensures the spot is round even in the corners of the scan field and if holes or channels are machined, they are perpendicular to the work surface.

Color corrected f -Theta lenses are designed to accommodate multiple wavelengths. Normally each wavelength would focus to a different point on the work surface. In a color corrected lens the focal point for each wavelength coincide. This is achieved by schlechting an ideal combination of different glass types for the various lens elements in the lens. Color corrected f -theta lens are primarily used for simultaneously viewing the work surface through the scan lens with a camera while laser processing. Another common application for color corrected scan lenses are for use in confocal scan microscopes which require a broad range of visible wavelengths.

STS series of f-theta lens

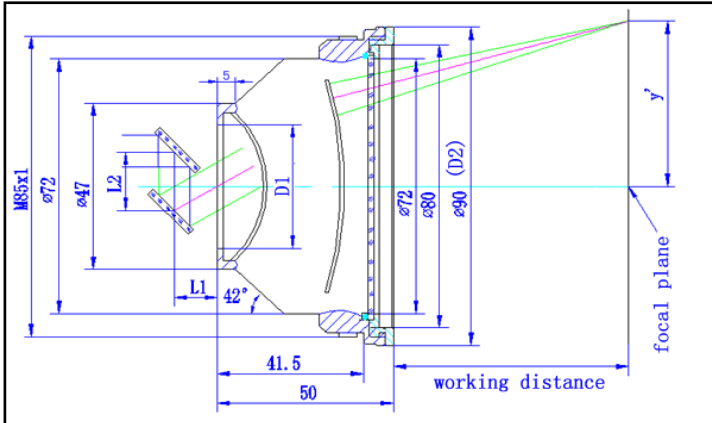


Fig. 1 (Design: L1=14.4mm, L2=22.2mm. Suitable range: L1=9.5-19.5mm, L2=16-28mm)

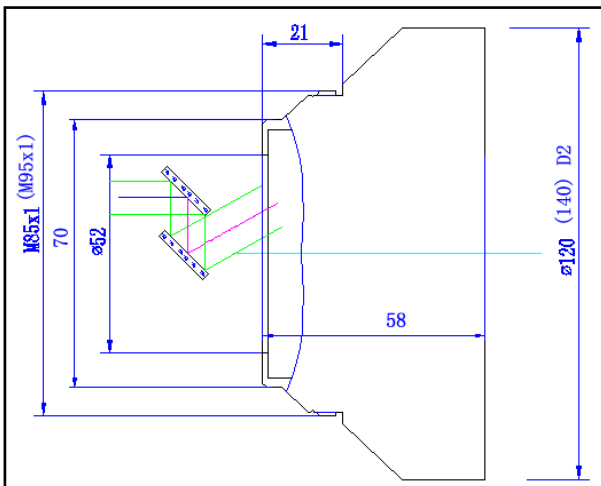


Fig. 2

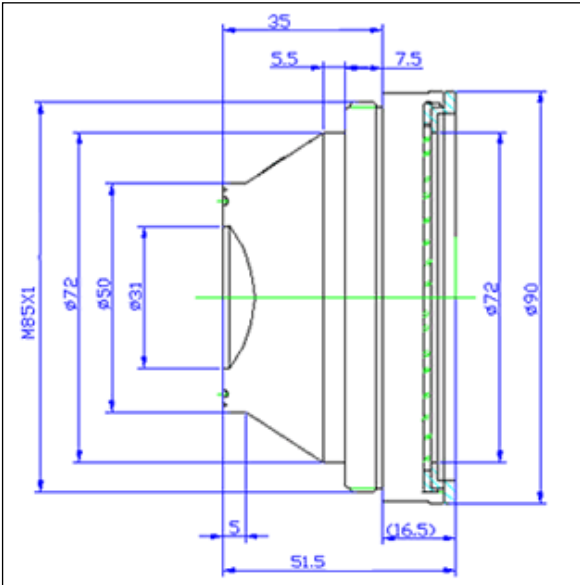


Fig. 3

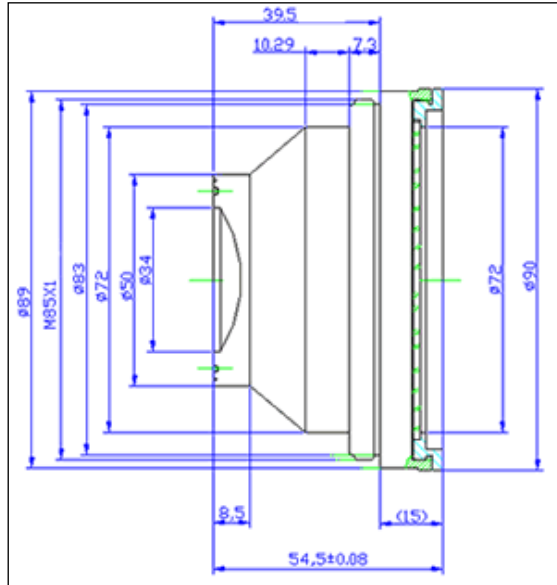


Fig. 4

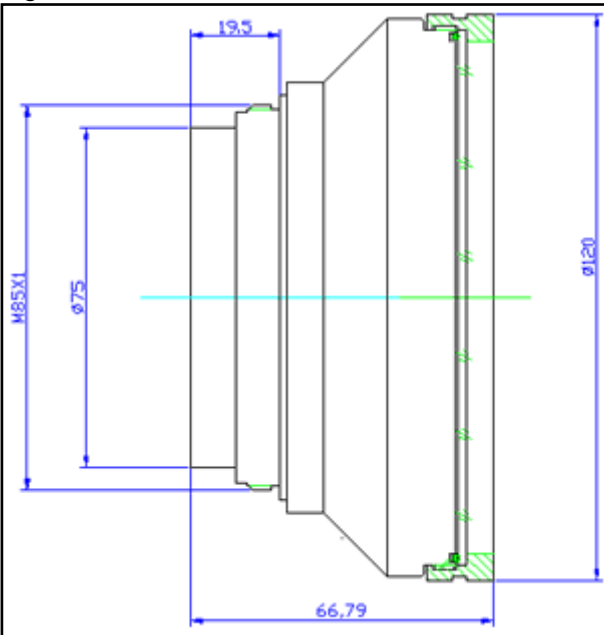


Fig. 5

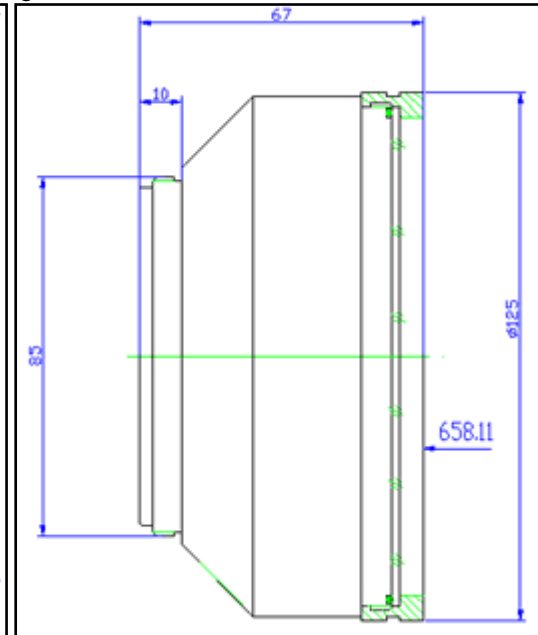


Fig. 6

STJ series of f-theta lens



Fig. 7

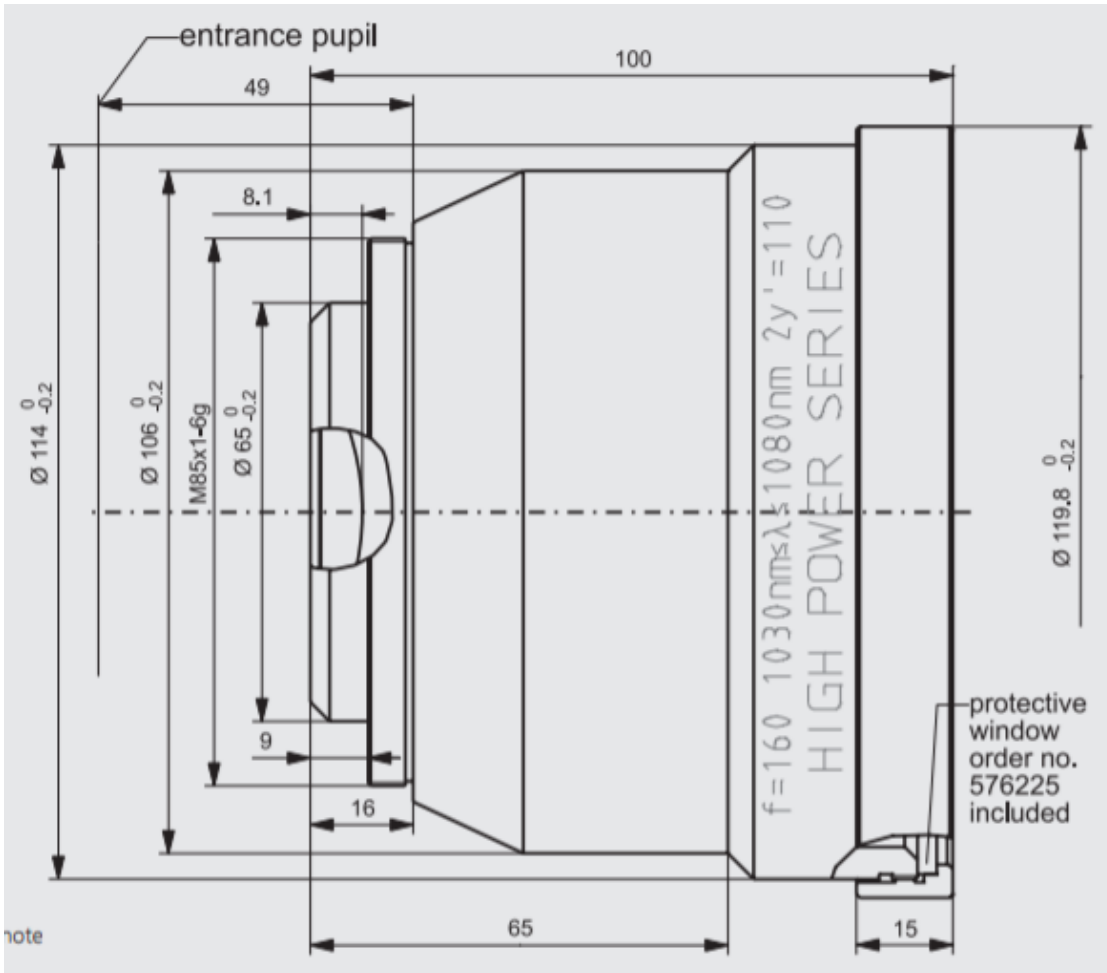


Fig. 8

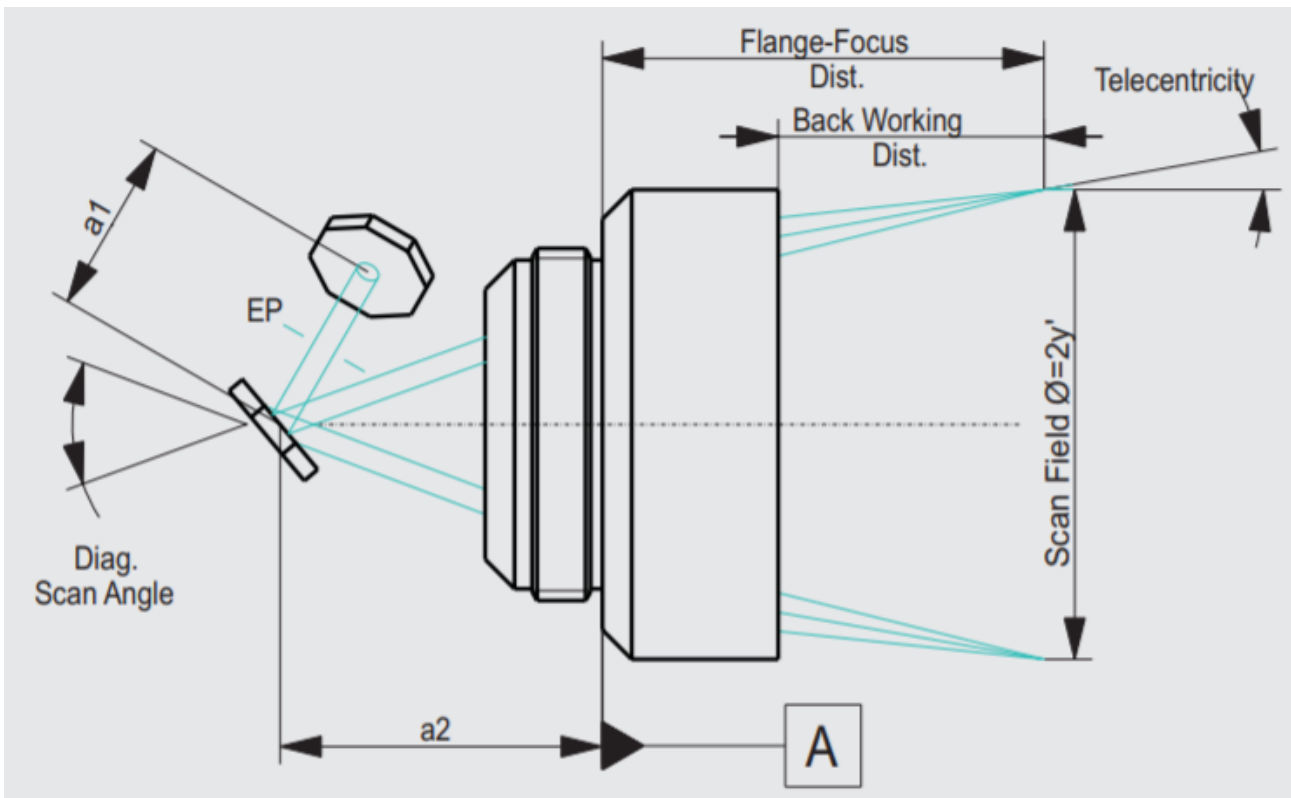


Fig. 9

Description of part Number: STS-xxxx-yyy-zzz-A

STS--- STS series

xxxx-- laser wavelength, 1064 means 1064nm, 10.6 means 10.6um.

yyy---- mark field, yyy x yyy mm

zzz---- effective focal length in mm

A----- others

Remark: The f-theta lens consists of 3 lenses and one protective glass. The coating is a di-electric layer. The transmission is >99% at 1064nm. Two sides of the protective glass are AR-coated at 1064nm.

Wavelength 1850nm

Model	WL (nm)	FL (mm)	TC	M	MI (mm)	SA (mm)	AS(mm)	WD (mm)	MO (mm)	L (mm)	MT	Remark
STS-1850-215-344	1850 - 1980	344.8	standard	fs	20	215 x 215	38.5	203	163	179	M85x1	
STS-1850-60-103	1850 - 1980	103.6	telecentric	fs	10	60 x 60	22.5	138.8	104	72	M85x1	
STS-1850-60-103	1850 - 1980	103.6	telecentric	fs	10	60 x 60	22.5	130.1	106	82	M85x1	
STS-1850-20-57	1850 - 1980	57.1	telecentric	fs	10	20 x 20	17.5	78.6	89	45.3	M85x1	
STS-1850-20-57	1850 - 1980	57.1	telecentric	fs	10	20 x 20	17.5	72.5	89	51.9	M85x1	
STS-1850-90-170	1850 - 1980	170.2	telecentric	fs	15	90 x 90	27.7	209.8	130	102	M85x1	

Wavelength 1550nm

Model	WL (nm)	FL (mm)	TC	M	MI (mm)	SA (mm)	AS(mm)	WD (mm)	MO (mm)	L (mm)	MT	Remark
STS-1550-160-264	1550	264.1	standard	fs	15	160 x 160	33.1	124	155	183	M85x1	
STS-1550-215-342	1550	342.2	standard	fs	20	215 x 215	38.5	202.6	163	177	M85x1	
STS-1550-60-101	1550	101.8	telecentric	fs	10	60 x 60	22.5	136.5	104	72	M85x1	
STS-1550-60-101	1550	101.8	telecentric	fs	10	60 x 60	22.5	127.7	106	82	M85x1	
STS-1550-20-56	1550	56.1	telecentric	fs	10	20 x 20	17.5	77.3	89	45.4	M85x1	
STS-1550-20-56	1550	56.1	telecentric	fs	10	20 x 20	17.5	71.3	89	51.9	M85x1	
STS-1550-170-264	1550	264.7	standard	fs	10	170 x 170	26.9	327.9	105	61	M85x1	
STS-1550-82-118	1550	118.4	standard	fs	6	82 x 82	17.1	160.1	89	49	M85x1	
STS-1550-90-167	1550	167	telecentric	fs	15	90 x 90	27.7	205.8	130	102	M85x1	
STS-1550-35-100	1544 - 1560	100	telecentric	glass	10	35 x 35	32	113.6	94	98.8	M85x1	Color-corrected

Wavelength 1064nm

Model	WL (nm)	FL (mm)	TC	M	MI (mm)	SA (mm)	AS(mm)	WD (mm)	MO (mm)	L (mm)	MT	Remark
STS-1064-19-59	1064	59.7	telecentric	glass	14	19 x 19	20.1	66.6	89	58	M85x1	
STS-1064-16-56	1064	56.5	telecentric	glass	10	16 x 16	26.4	58.4	90	40.7	M85x1	
STS-1064-36-63	1064	63	standard	glass	8	36 x 36	15	74.5	59.2	35.8	M39x1 /M55x1	
STS-1064-39-79	1064	79.9	telecentric	glass	25	39 x 39	27.2	79.4	107	84.1	M85x1	
STS-1064-20-82	1030 - 1090	82	telecentric	fs	15	20 x 20	33	84.5	93.8	103	M85x1	
STS-1064-20-81	900 - 1070	81.7	telecentric	fs	15	20 x 20	33	84.1	93.8	103	M85x1	
STS-1064-60-105	1064	105.1	standard	glass	12	60 x 60	27.2	125.3	90	50.2	M85x1	
STS-1064-55-99	1064	99.7	standard	glass	10	55 x 55	16.5	110.8	90	40	M85x1	
STS-1064-65-99	1064	99.7	standard	glass	7	65 x 65	14.3	111.5	47	28.5	M39x1	
STS-1064-50-183	1064	183.1	telecentric	glass	15	50 x 50	108.7	216.4	108	70.6	M85x1	

STS-1064-100-160	1064	160.1	standard	glass	8	100 x 100	15	180.1	59.2	25.2	M39x1 / M55x1	
STS-1064-107-162	1064	162.4	standard	glass	12	107 x 107	22	181.2	89	43.1	M85x1	
STS-1064-100-160	1064	160.1	standard	glass	8	100 x 100	15	178.9	47	25	M39x1	
STS-1064-125-191	1064	191.4	standard	glass	20	125 x 125	40	220.5	128	57.9	M85x1	
STS-1064-90-201	1064	201.6	standard	glass	30	90 x 90	43	242.2	132	85	M85x1	
STS-1064-139-207	1064	207.3	telecentric	glass	14	139 x 139	46	288.4	281	162	TK 267.0	
STS-1064-139-207	1064	207.3	telecentric	glass	14	139 x 139	46	273.4	281	179	TK 267.0	
STS-1064-160-254	1064	254.4	standard	glass	14	160 x 160	27	284.9	89	43.1	M85x1	
STS-1064-155-250	1064	250	standard	glass	8.5	155 x 155	13	273.3	47	25	M39x1	
STS-1064-142-300	1064	300.8	standard	glass	20	142 x 142	35	346.4	128	72.2	M85x1	
STS-1064-175-298	1064	298	standard	glass	20	175 x 175	35	350.8	128	78	M85x1	
STS-1064-180-299	1064	299.9	standard	glass	8.5	180 x 180	14.7	327.7	47	23	M39x1	
STS-1064-210-335	1064	335.1	standard	glass	8.5	210 x 210	15.2	366.3	47	23	M39x1	
STS-1064-212-346	1064	346.3	standard	glass	12	212 x 212	22.5	412.2	95	52.3	M85x1	
STS-1064-160-354	1064	354.5	standard	glass	30	160 x 160	53.5	396.9	128	48.5	M85x1	
STS-1064-210-409	1064	409.6	standard	glass	20	210 x 210	44	472.5	105	56.8	M85x1	
STS-1064-242-420	1064	420	standard	glass	30	242 x 242	59.5	480	136	52	M132x1	
STS-1064-200-401	900 - 1070	401.7	standard	fs	20	200 x 200	34	471.5	106	63	M85x1	
STS-1064-325-569	1064	569.7	standard	glass	20	325 x 325	45	651.4	127	56.9	M85x1	
STS-1064-350-638	1030 - 1090	638.6	standard	fs	10	350 x 350	39	734.7	89	38	M85x1	
STS-1064-370-657	1064	657.3	standard	glass	25	370 x 370	75	732.8	133	48.5	M110x1	
STS-1064-410-649	1030 - 1090	649.7	standard	fs	20	410 x 410	34.1	561.8	134	115	M85x1	
STS-1064-410-646	900 - 1070	646.9	standard	fs	20	410 x 410	34.1	559.1	134	115	M85x1	
STS-1064-60-101	1030 - 1090	101.4	standard	fs	5	60 x 60	15	120.7	59.2	31	M39x1	
STS-1064-140-254	1030 - 1090	254.2	standard	fs	8	140 x 140	15.5	282.8	59.2	33.3	M39x1	
STS-1064-100-163	1030 - 1090	163	standard	fs	7	100 x 100	15.8	194.1	59.2	33.3	M39x1	
STS-1064-425-874	1030 - 1090	874.2	standard	fs	20	425 x 425	35	975.2	96	42.5	M85x1	
STS-1064-560-819	1064	819.7	standard	glass	24	560 x 560	43.3	893.8	130	58	M102x1	
STS-1064-500-910	1030 - 1090	910	standard	fs	30	500 x 500	47	1048.8	154	80.8	M110x1	
STS-1064-102-163	1064	163.2	standard	glass	12	102 x 102	29	159.7	106	82.5	M85x1	
STS-1064-160-254	1064	254.7	standard	glass	12	160 x 160	23.5	306.5	109	55.3	M85x1	
STS-1064-215-340	1030 - 1090	340	standard	fs	20	215 x 215	38.5	203.4	163	175	M85x1	
STS-1064-215-338	900 - 1070	338.5	standard	fs	20	215 x 215	38.5	202	163	175	M85x1	
STS-1064-280-420	1030 - 1090	420	standard	fs	14	280 x 280	28.3	499.2	122	67.7	M85x1	
STS-1064-280-418	900 - 1070	418.5	standard	fs	14	280 x 280	28.3	497.5	122	67.7	M85x1	
STS-1064-340-500	1030 - 1090	500	standard	fs	20	340 x 340	30.5	569.8	148	68	M85x1	
STS-1064-340-498	900 - 1070	498.4	standard	fs	20	340 x 340	30.5	568.7	148	68	M85x1	
STS-1064-106-163	1064	163	standard	glass	20	106 x 106	29	192.3	128	66	M85x1	

STS-1064-94-163	1030 - 1090	163.3	standard	fs	20	94 x 94	30.5	205.4	159	110	M85x1	
STS-1064-94-162	900 - 1070	162.8	standard	fs	20	94 x 94	30.5	204.7	159	110	M85x1	
STS-1064-61-339	1030 - 1090	339.9	standard	fs	20	61 x 61	30.5	441.7	89	91.7	M85x1	
STS-1064-180-420	1030 - 1090	420.1	standard	fs	30	180 x 180	52.8	293	139	187	M85x1	
STS-1064-280-500	1030 - 1090	500	standard	fs	30	280 x 280	48.5	620.2	198	127	M120x1	
STS-1064-7-50	1030 - 1090	50	telecentric	fs	15	7 x 7	26	60.5	90	69.9	M85x1	
STS-1064-20-60	1030 - 1090	60.5	telecentric	fs	6	20 x 20	22.3	81.9	87	39.8	M85x1	
STS-1064-90-163	1030 - 1090	163.5	telecentric	fs	15	90 x 90	27.7	201.5	130	102	M85x1	
STS-1064-90-163	900 - 1070	163	telecentric	fs	15	90 x 90	27.7	200.9	130	102	M85x1	
STS-1064-120-163	1064	163	standard	glass	15	120 x 120	22.9	186.7	103	52	M85x1	
STS-1064-160-255	1030 - 1090	255	standard	fs	15	160 x 160	32.5	321.3	159	91.3	M85x1	
STS-1064-115-253	1064	253.8	standard	glass	30	115 x 115	48.9	297	130	75.5	M85x1	
STS-1064-142-277	1030 - 1090	277.1	standard	fs	15	142 x 142	31	346.2	105	61	M85x1	
STS-1064-142-276	900 - 1070	276.1	standard	fs	15	142 x 142	31	345	105	61	M85x1	
STS-1064-137-317	1030 - 1090	317.6	telecentric	fs	15	137 x 137	30	506.2	218	248	M85x1	
STS-1064-320-479	1064	479.8	standard	glass	30	320 x 320	63.7	443.7	260	183	M150x1	
STS-1064-35-100	1030 - 1090	100.3	telecentric	fs	10	35 x 35	32	129.8	106	78.7	M85x1	
STS-1064-35-99	900 - 1070	99.8	telecentric	fs	10	35 x 35	32	129.3	106	78.7	M85x1	
STS-1064-6-32	1030 - 1090	32.8	telecentric	fs	10	6 x 6	16.5	28.7	90	39.9	M85x1	
STS-1064-15-65	1030 - 1090	65.1	telecentric	fs	15	15 x 15	24	83.1	94	76.5	M85x1	
STS-1064-50-125	1030 - 1090	125.4	telecentric	fs	15	50 x 50	33.5	157.6	106	108	M85x1	
STS-1064-168-254	1064	254	standard	glass	20	168 x 168	38	292.8	130	70.1	M85x1	
STS-1064-69-107	1064	107.7	telecentric	glass	12	69 x 69	34.9	137.8	128	85.5	M85x1	
STS-1064-75-163	1064	163.6	telecentric	glass	10	75 x 75	58.3	193.9	136	128	M85x1	
STS-1064-73-162	1064	162.9	telecentric	glass	20	73 x 73	61.5	197.8	154	115	M85x1	
STS-1064-40-99	1064	99.2	telecentric	glass	25	40 x 40	37.4	115	116	80.4	M85x1	
STS-1064-35-100	1000 - 1100	100.2	telecentric	glass	10	35 x 35	32	115	94	98.8	M85x1	Color-corrected
STS-1064-95-163	1064	163	standard	glass	10	95 x 95	27	197.2	89	44	M85x1	
STS-1064-70-398	1064	398.3	telecentric	glass	25	70 x 70	45	160.7	132	292	M85x1	
STS-1064-180-253	1064	253.9	standard	glass	15	180 x 180	25	211.4	128	122	M85x1	
STJ-1064-110-160	1030 - 1080	160	5.2 5.4	fs	14	110		184			M85x1	
STJ-1064-160-255	1030 - 1080	255	7.2 7.4	fs	20	160		303			M85x1	
STJ-1064-360-423	1030 - 1080	423	16.4 16.4	fs	14	360		500			M85x1	
STJ-1064-93-100	1030 - 1080	100	8.7 9.1	fs	10	93		87			M85x1	
STJ-1064-80-125	1030 - 1080	125	4.9 5.1	fs	15	80		155			M85x1	
STJ-1064-93-125	1030 - 1080	125	7.2 7.4	fs	15	93		155				
STJ-1064-80-125	1030 - 1080	125	4.9 5.1	fs	15	80		155			M85x1	
STJ-1064-93-125	1030 - 1080	125	7.2 7.4	fs	15	93		155				
STJ-1064-170-160	1030 - 1080	160	17.1 17.2	fs	10	170		178			M85x1	

STJ-1064-170-160	1030 - 1080	160	17.1 17.2	fs	10	170		178			M85x1	
STJ-1064-170-170	1030 - 1080	170	11.6 11.7	fs	14	170		194			M85x1	
STJ-1064-239-255	1030 - 1080	255	14.3 15.0	fs	20	239		291			M85x1	
STJ-1064-239-255	1030 - 1080	255	14.3 15.0	fs	20	239		291			M85x1	
STJ-1064-354-347	1030 - 1080	347	18.7 18.7	fs	16	354		404			M85x1	
STJ-1064-452-350	1030 - 1080	350	23.7 24.0	fs	15	452		395			M85x1	
STJ-1064-420-420	1030 - 1080	420	18.7 18.8	fs	15	420		501			M85x1	
STJ-1064-66-100	1030 - 1080	100	8.7° 9.1°	fs	10	66 x 66		87				
STJ-1064-57-125	1030 - 1080	125	4.9° 5.1°	fs	15	57 x 57		154.6				
STJ-1064-57-125	1030 - 1080	125	4.9° 5.1°	fs	15	57 x 57		154.6				
STJ-1064-120-160	1030 - 1080	160	17.1° 17.2°	fs	10	120 x 120		178.4				
STJ-1064-120-160	1030 - 1080	160	17.1° 17.2°	fs	10	120 x 120		178.4				
STJ-1064-120-170	1030 - 1080	170	11.6° 11.7°	fs	14	120 x 120		194				
STJ-1064-169-255	1030 - 1080	255	14.3° 15°	fs	20	169 x 169		291				
STJ-1064-169-255	1030 - 1080	255		fs	20	169 x 169		291				
STJ-1064-250-347	1030 - 1080	347	23.7° 24°	fs	16	250 x 250		403.8				
STJ-1064-320-350	1030 - 1080	350		fs	15	320 x 320		395.4				
STJ-1064-297-420	1030 - 1080	420	18.7° 18.8°	fs	15	297 x 297		500.6				

Wavelength 808nm

Model	WL (nm)	FL (mm)	TC	M	MI (mm)	SA (mm)	AS(mm)	WD (mm)	MO (mm)	L (mm)	MT	Remark
STS-808-14-56	808	56.3	telecentric	glass	10	14 x 14	17.5	69.3	90	55.2	M85x1	
STS-808-14-60	600 - 1000	60.5	telecentric	glass	5	14 x 14	35	52.8	40	53.5	M36x0.75	
STS-808-19-76	808	76.8	telecentric	glass	10	19 x 19	33	103.6	69	45	M85x1	
STS-808-39-79	808	79.5	telecentric	glass	25	39 x 39	27.7	78.5	107	83.4	M85x1	
STS-808-30-88	808	88.6	telecentric	glass	10	30 x 30	36.6	119	98	55	M85x1	
STS-808-53-97	808	97.5	standard	glass	10	53 x 53	16.5	108	90	40	M85x1	
	808		standard	glass	12	108 x 108	20.8	176.4	89	43.1	M85x1	
STS-808-90-196	808	196.9	standard	glass	30	90 x 90	43	236.2	132	85	M85x1	
STS-808-160-267	808 - 980	267.4	standard	fs	20	160 x 160	33.1	128.2	155	183	M85x1	
	808		standard	fs	20	160 x 160	33.1	128.2	155	183	M85x1	
STS-808-175-292	808 - 980	292.8	standard	glass	20	175 x 175	35	337	128	72.2	M85x1	
	808		standard	glass	20	175 x 175	35	337				
STS-808-175-292	808	292.2	standard	glass	20	175 x 175	35	344				
STS-808-209-397	808	397.9	standard	glass	20	209 x 209	33	487.1	118	53	M85x1	
STS-808-250-410	808	410.9	standard	glass	30	250 x 250	54.6	468.6	136	52	M132x1	
STS-808-200-398	808 - 980	398.4	standard	fs	20	200 x 200	34	467.9	106	63	M85x1	
STS-808-415-639	808	639.8	standard	glass	30	415 x 415	58.3	713.5	133	48.5	M110x1	
STS-808-410-640	808 - 980	640.2	standard	fs	20	410 x 410	34.1	552.5	134	115	M85x1	

	808		standard	fs	20	410 x 410	34.1	552.5	134	115	M85x1	
STS-808-450-803	808	803.5	standard	glass	30	450 x 450	54	876.2	90	69.9	M85x1	
STS-808-215-334	808 - 980	334.8	standard	fs	20	215 x 215	38.5	198.7	163	175	M85x1	
STS-808-215-334	808	334.8	standard	fs	20	215 x 215	38.5	198.7	163	175	M85x1	
STS-808-103-158	808	158.8	standard	glass	20	103 x 103	29	187.1	128	66	M85x1	
STS-808-103-158	808	158.8	standard	glass	20	103 x 103	29	187.1	128	66	M85x1	
STS-808-90-161	808 - 980	161.5	telecentric	fs	15	90 x 90	27.7	199.1	130	102	M85x1	
STS-808-115-248	808	248.7	standard	glass	30	115 x 115	47.9	290.1	130	75.5	M85x1	
STS-808-35-98	808 - 980	98.9	telecentric	fs	10	35 x 35	32	128.1	106	78.7	M85x1	
STS-808-15-64	808 - 980	64.2	telecentric	fs	15	15 x 15	24	82	94	76.5	M85x1	
STS-808-68-105	808	105.6	telecentric	glass	12	68 x 68	35	135.2	128	85.5	M85x1	
STS-808-102-163	808 - 980	163	standard	glass	20	102 x 102	22	151.2	106	90.5	M85x1	

Wavelength 532nm

Model	WL (nm)	FL (mm)	TC	M	MI (mm)	SA (mm)	AS(mm)	WD (mm)	MO (mm)	L (mm)	MT	Remark
STS-532-20-59	532	59.3	telecentric	glass	10	20 x 20	16.9	72.1	89	58	M85x1	
STS-532-15-53	532	53.1	telecentric	glass	6	15 x 15	25.5	52.6	90	40.7	M85x1	
STS-532-30-62	532	62.9	standard	glass	7	30 x 30	15	75.7	59.2	35.7	M39x1 / M55x1	
STS-532-49-77	532	77	telecentric	glass	14	49 x 49	22.8	74.1	107	83.8	M85x1	
STS-532-58-89	532	89.7	standard	glass	6	58 x 58	16.5	96.3	90	40	M85x1	
STS-532-50-171	532	171	telecentric	glass	15	50 x 50	102.1	196.6	108	70.6	M85x1	
STS-532-100-162	532	162.1	standard	glass	7	100 x 100	16.1	183.5	59.2	25.2	M39x1 / M55x1	
STS-532-77-147	532	147.1	standard	glass	7	77 x 77	20	161.8	89	43.1	M85x1	
STS-532-75-198	532	198.4	telecentric	glass	20	75 x 75	111.6	232	142	94	TK 133.0	
STS-532-139-201	532	201.5	telecentric	glass	10	139 x 139	46	279	281	162	TK 267.0	
STS-532-139-201	532	201.5	telecentric	glass	10	139 x 139	46	264	281	179	TK 267.0	
STS-532-200-276	532	276.9	standard	glass	14	200 x 200	29	324.1	128	78	M85x1	
STS-532-330-528	532	528.3	standard	glass	16	330 x 330	43	603.8	127	56.9	M85x1	
STS-532-367-613	515 - 545	613.2	standard	fs	10	367 x 367	33.5	706.9	89	38	M85x1	
STS-532-585-768	532	768.6	standard	glass	16	585 x 585	43	842.9	130	9	M102x1	
STS-532-36-88	532	88	telecentric	glass	16	36 x 36	33.8	107.5	85	66.3	70	
STS-532-32-88	532	88	telecentric	glass	16	32 x 32	39.8	107.3	85	66.3	M55x1 / M85x1	
STS-532-102-163	532	163.2	standard	glass	12	102 x 102	29	159.7	106	82.5	M85x1	
STS-532-148-233	532	233.5	standard	glass	10	148 x 148	24.7	282.1	109	55.3	M85x1	
STS-532-212-347	515 - 545	347.9	standard	fs	14	212 x 212	36	279	122	108	M85x1	
STS-532-114-148	532	148.3	standard	glass	10	114 x 114	29	173.4	128	66	M85x1	
STS-532-7-48	515 - 545	48.1	telecentric	fs	15	7 x 7	26	60.2	90	64.9	M85x1	
STS-532-	515 -	58.6	telecentric	fs	6	20 x	21	79.3	87	39.7	M85x1	

20-58	545					20						
STS-532-74-113	515 - 545	113.2	standard	fs	5	74 x 74	19.2	152	89	48.5	M85x1	
STS-532-90-163	515 - 545	163.9	telecentric	fs	10	90 x 90	26.3	219	122	98	M85x1	
STS-532-120-162	532	162.8	standard	glass	10	120 x 120	28	186.5	106	47	M85x1	
STS-532-162-259	515 - 545	259.4	standard	fs	10	162 x 162	26	325.5	105	61	M85x1	
STS-532-141-305	515 - 545	305.5	telecentric	fs	15	141 x 141	30	487.9	218	248	M85x1	
STS-532-310-430	532	430	standard	glass	20	310 x 310	56.3	409.1	240	149	M130x1	
STS-532-35-100	515 - 545	100	telecentric	fs	10	35 x 35	30	130.2	106	78.7	M85x1	
STS-532-6-32	515 - 545	32.2	telecentric	fs	10	6 x 6	16.5	28.4	90	39.9	M85x1	
STS-532-15-67	515 - 545	67.2	telecentric	fs	15	15 x 15	24	85.8	94	73.3	M85x1	
STS-532-53-125	515 - 545	125.3	telecentric	fs	10	53 x 53	34.6	167	106	92.2	M85x1	
STS-532-65-163	515 - 545	163.6	telecentric	fs	12	65 x 65	35.2	195.4	121	148	M85x1	
STS-532-69-100	532	100.1	telecentric	glass	10	69 x 69	30	126.7	128	85.5	M85x1	
STS-532-75-162	532	162.7	telecentric	glass	10	75 x 75	53.9	195.1	136	128	M85x1	
STS-532-75-162	515 - 545	162.7	telecentric	glass	10	75 x 75	53.9	195.1	136	128	M85x1	
STS-532-180-254	532	254	standard	glass	15	180 x 180	25	211.4	128	122	M85x1	
STJ-532-90-100	515 - 540	100	7.7 7.8	fs	10	90		95			M85x1	
STJ-532-75-102	515 - 540	102	4.1 4.9	fs	15	75		133			M85x1	
STJ-532-75-108	515 - 540	108	4.9 5.1	fs	15	75		130			M85x1	
STJ-532-86-108	515 - 540	108	7.1 7.3	fs	15	86		130				
STJ-532-160-170	515 - 540	170	10.9 11.0	fs	14	160		195			M85x1	
STJ-532-233-255	515 - 540	255	14.2 14.3	fs	20	233		294			M85x1	
STJ-532-347-330	515 - 540	330	18.4 18.4	fs	16	347		384			M85x1	
STJ-532-420-420	515 - 540	420	19.3 19.3	fs	15	420		485			M85x1	
STJ-532-64-100	515 - 540	100	7.7° 7.8°	fs	10	64 x 64		95				
STJ-532-53-102	515 - 540	102	4.1° 4.9°	fs	15	53 x 53		132.9				
STJ-532-53-108	515 - 540	108	4.9° 5.1°	fs	15	53 x 53		130.2				
STJ-532-113-170	515 - 540	170	10.9° 11°	fs	14	113 x 113		195				
STJ-532-165-255	515 - 540	255	14.2° 14.3°	fs	20	165 x 165		294				
STJ-532-245-330	515 - 540	330	18.4° 18.4°	fs	16	245 x 245		384.1				
STJ-532-297-420	515 - 540	420	19.3° 19.3°	fs	15	297 x 297		485.2				

Wavelength 405nm

Model	WL (nm)	FL (mm)	TC	M	MI (mm)	SA (mm)	AS(mm)	WD (mm)	MO (mm)	L (mm)	MT	Remark
STS-405-200-315	405	315.1	standard	glass	10	200 x 200	36.2	372	116	49	M92x1	
STS-405-300-375	405	375.3	standard	glass	10	300 x 300	35.5	447.9	116	47.9	M92x1	
STS-405-326-593	405	593.8	standard	fs	10	326 x 326	39	686.1	89	38	M85x1	
STS-405-748-1202	405	1202.7	standard	glass	20	748 x 748	48.5	1353.7	152	96.9	M85x1	
STS-405-110-176	405	176	standard	fs	6	110 x 110	21.1	220.9	89	36.8	M85x1	
STS-405-164-263	405	263.9	standard	fs	10	164 x 164	26	331.3	105	61	M85x1	

STS-405-63-111	405	111.4	telecentric	fs	6	63 x 63	33.1	157.6	121	86	M85x1	
STS-405-60-170	405	170.1	telecentric	glass	10	60 x 60	60.7	191.6	119	143	M85x1	
STS-405-14-80	405	80.2	telecentric	glass	6	14 x 14	95.2	24.2	59	87.9	TK52	
STS-405-30-55	405	55.1	telecentric	glass	6	30 x 30	16.2	67.3	90	52	M85x1	

Wavelength 355nm

Model	WL (nm)	FL (mm)	TC	M	MI (mm)	SA (mm)	AS(mm)	WD (mm)	MO (mm)	L (mm)	MT	Remark
STS-355-320-580	355	580.8	standard	fs	10	320 x 320	39	671.5	89	38	M85x1	
STS-355-440-829	355	829.4	standard	fs	14	440 x 440	25	981.1	90	62.5	M85x1	
STS-355-470-919	355	919.9	standard	fs	14	470 x 470	41	1035.1	89	40	M85x1	
STS-355-210-329	355	329.3	standard	fs	14	210 x 210	36	260.5	122	108	M85x1	
STS-355-7-45	355	45	telecentric	fs	15	7 x 7	26	55.7	90	64.9	M85x1	
STS-355-20-56	355	56	telecentric	fs	6	20 x 20	19.5	75.9	87	39.5	M85x1	
STS-355-76-108	355	108.3	standard	fs	6	76 x 76	17.1	145.7	89	49	M85x1	
STS-355-109-174	355	174.7	standard	fs	6	109 x 109	21.1	219	89	36.8	M85x1	
STS-355-90-163	355	163.4	telecentric	fs	10	90 x 90	26	221.7	127	104	M85x1	
STS-355-155-250	355	250.3	standard	fs	10	155 x 155	28.1	309.8	105	61	M85x1	
STS-355-137-290	355	290	telecentric	fs	10	137 x 137	30	465.9	218	248	M85x1	
STS-355-35-100	355	100.2	telecentric	fs	10	35 x 35	34.6	132	106	78.7	M85x1	
STS-355-6-32	355	32.1	telecentric	fs	10	6 x 6	16.5	29.1	90	39.8	M85x1	
STS-355-15-65	355	65.5	telecentric	fs	15	15 x 15	24	81.7	94	79	M85x1	
STS-355-63-109	355	109.4	telecentric	fs	6	63 x 63	33.1	154.6	121	86	M85x1	
STS-355-53-125	355	125	telecentric	fs	10	53 x 53	36.8	156.9	106	106	M85x1	
STS-355-65-163	355	163	telecentric	fs	10	65 x 65	35.2	193.7	121	146	M85x1	
STS-355-86-256	355	256.8	telecentric	fs	6	86 x 86	24	145.4	138	174	M85x1	
STS-355-70-398	355	398.9	telecentric	glass	15	70 x 70	45	160.7	132	292	M85x1	
STJ-355-71-103	355	103	2.4 2.8	fs	9	71		135			M85x1	
STJ-355-240-255	355	255	12.7 12.7	fs	10	240		314			M85x1	
STJ-355-431-510	355	510	18.2 18.2	fs	14	431		609			M85x1	
STJ-355-140-170	355	170	4.8 4.8	fs	10	140		236			M85x1	
STJ-355-170-255	355	255	18.2° 18.2°	fs	10	170 x 170		313.6				
STJ-355-328-510	355	510		fs	14	328 x 328		609				
STJ-355-100-170	355	170	2.6° 2.9°	fs	10	100 x 100		235.8				
STJ-355-24-53	355	53	0.4 1.5	fs	10	24		65			M85x1	
STJ-355-17-53	355	53	0.4° 1.5°	fs	10	17 x 17		64.9				

Wavelength 266nm

Model	WL (nm)	FL (mm)	TC	M	MI (mm)	SA (mm)	AS(mm)	WD (mm)	MO (mm)	L (mm)	MT	Remark
STS-266-148-245	266	245.4	standard	fs	4	148 x 148	13.5	249.3	90	47	M85x1	
STS-266-20-53	266	53.5	telecentric	fs	6	20 x 20	17.8	72	87	39	M85x1	
STS-266-73-101	266	101.5	standard	fs	5	73 x 73	17.1	136.3	89	49	M85x1	

STS-266-105-161	266	161.4	standard	fs	5	105 x 105	21.1	202.8	89	36.8	M85x1	
STS-266-50-96	266	96.1	telecentric	fs	5	50 x 50	26.9	134.5	121	86.2	M85x1	
STS-266-64-159	266	159.8	telecentric	fs	10	64 x 64	32.6	213.6	121	173	M85x1	
STS-266-70-162	266	162.9	telecentric	fs	10	70 x 70	35.2	218.4	121	110	M85x1	
STJ-266-71-103	266	103	2.6 2.9	fs	9	71		133			M85x1	
STJ-266-50-103	266	103		fs	9	50 x 50		133 mm				

Notes: WL=wavelength; FL=focal length; TC: telecentric; M=material; SA=scan area; L= length; MI=max. input beam diameter; AS=aperture stop; MO=max. outside diameter; MT=mounting thread; WD=working distance;.

Multi-spectral f-theta lens

For online inspection systems we successfully developed the colored corrected f-theta lens 1064nm and 532nm. Color correction offers usage of one lens for several manufacturing steps at the same time. In addition, we offer color corrected f-theta lenses designed for microscopy applications optimized for a wavelength range from 450nm to 650nm and a lens optimized for 355nm and 1064nm. The focal lengths and working distance are same for several wavelengths, resulting in identical image fields for the laser and inspection wavelength respectively for a whole wavelength range. Please feel free to contact us for more information to your particular applications.

When you select f-theta lens, you need to consider the following factors:

1. When the marking field increases, the focal length will be longer and the focused beam diameter will be larger.
2. When the diameter is larger, the power density on the workpiece will be lower. Thus you may need higher laser power.
3. When the laser power is higher, the laser beam quality may be worse and then the focused beam diameter will be larger.

Thus you should choose a proper f-theta lens according to a reasonable marking field. In order to meet various application requirements such as large field and small field, you may buy a few lenses with different marking fields to achieve good marking quality.