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ULO Optics

ZNSE SCANNING LENSES, 75TSL SERIES

Introduction

The 75TSL lenses are intended as an alternative to the 48TSL lenses for the focal lengths 100 to 300mm. By moving the pair of scanning mirrors back from the lens, some improvement in performance is possible at the expense of using a larger lens (restricted to 75mm diameter here). They can be seen as an intermediate jump in performance from the 48TSL to the ZSD-15- doublets.
At focal lengths shorter than 100mm, a 75TSL does not offer significant improvement over the 48TSL and at focal lengths longer than 300mm, the scanning mirrors have to be moved even further back to achieve better performance – thus requiring even larger lenses and the performance improvement over the 48TSL lenses is less significant. The spot size variation over the field is also reduced with the 75TSL lenses.

Note that the 75TSL are not intended for use with laser beams larger than 15mm full diameter (a large scanning lens does not necessarily indicate use with a large beam).
Note also that the spacing between the scanning mirrors is the same as for the 48TSL.

Specifications

Material:	Laser Grade ZnSe
Diameter:	75.0 +0/-0.1mm
Edge thickness, ET:	3.0mm
Mirror locations:	See Figure 10.63
and Table 10.62.	
Beam diameter:	Up to 15mm (12mm
$1/e^2$)	
Optical scan field:	+/-20deg in X and Y
Performance:	See Table 10.61
Focal length:	Within 1%
Absorption:	< □0.25%.
Coating:	AR/AR for 10.6μm
Damage threshold:	CW 3000W/mm at 10.6μm.

See Table 10.61 and fig 10.62 for part numbers, focal lengths, working distances and performance.

Table 10.61					
Part no.	**Focal length (mm)**	**Field size (mm)**	**Back focal length (mm)**	**Flange focal length (mm)**	**Average spot size (μm)**
75TSL100	99.8	70 x 70	100.4	104.2	154
75TSL150	150.0	105 x 105	153.7	158.4	193
75TSL200	200.3	140 x140	204.6	209.3	247
75TSL250	247.6	175 x 175	253.0	257.7	300
75TSL300	303.1	210 x 210	310.1	314.8	363

1) Focused spot diameters assume a 15mm diameter full beam (approximately 12mm $1/e^2$) and TEM_{00} mode ($M^2 = 1$). The 'average' is the mean of 25 field positions in a quadrant.
2) Each scanning mirror deflects the beam by up to 20deg from the central position.
3) See Fig 10.63 for the definition of the back focal length and flange focal length. Note that the distances from the edge of the lens are more useful because this is where the mount ledges are located.

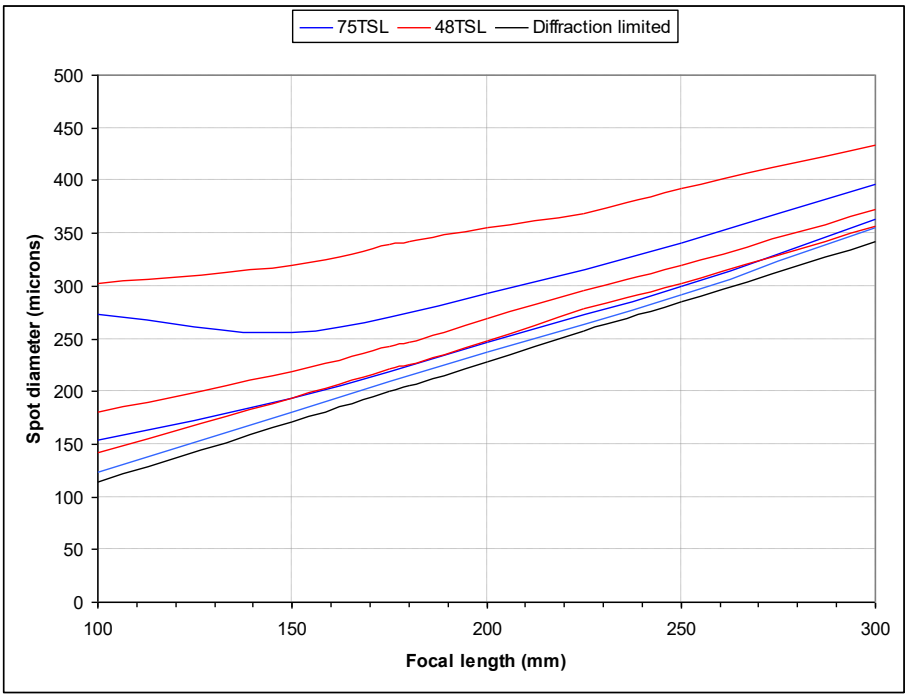

Fig. 10.62: Comparison of the maximum, average and minimum spot sizes between the 75TSL and 48TSL lenses.

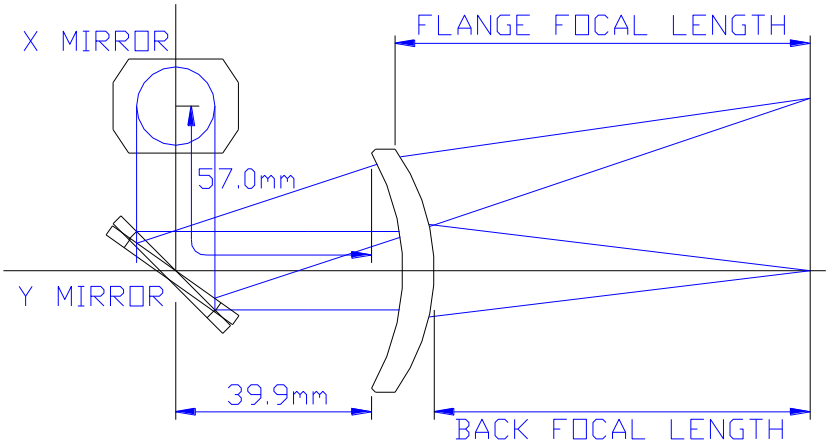

Fig 10.63