

NIRSPEC

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NIRSPEC Optics Application Note 1.00 Calibration Unit Lens Design

After NIRSPEC Optics Design Note 4.03 was written, the calibration unit optics were redesigned in order to improve performance and manufacturability. Below is the final optical prescription, matched to International Scientific Product's "Part 2" test plates and manufactured by ISP (Tarrytown, NY; phone: 914-366-4207; contact: Mark Lifshotz). The ZEMAX design files can be found at betelgeuse/c/calunit/zemax. File *cufnrntp.zmx* is the prescription for the front end optics; *cubacktp.zmx* is for the back end.

lens/material	radius, plate	thickness	clear aperture	total diameter
Front End				
#1 LiF	28.38 mm, concave	4.0 mm	20.2 mm	26.0 mm
	13.87 mm, convex			
#2 BaF ₂	18.323 mm, concave	10.0 mm	21.9 mm	26.0 mm
	32.66 mm, concave			
#3 BaF ₂	83.95 mm, concave	9.1 mm	20.8 mm	26.0 mm
	17.00 mm, concave			
#4 LiF	14.06 mm, convex	4.6 mm	21.0 mm	26.0 mm
	23.12 mm, concave			
Back End				
#1 CaF ₂	13.92 mm, convex	7.8 mm	17.3 mm	22.0 mm
	17.96 mm, concave			
#2 LiF	131.83 mm, concave	2.5 mm	18.5 mm	24.0 mm
	21.58 mm, convex			
#3 CaF ₂	26.3 mm, concave	9.8 mm	19.5 mm	24.0 mm
	32.28 mm, concave			
#4 CaF ₂	51.25 mm, concave	7.9 mm	35.1 mm	40.0 mm
	110.77 mm, concave			
#5 LiF	46.89 mm, concave	5.0 mm	33.5 mm	40.0 mm
	22.18 mm, convex			
#6 CaF ₂	38.04 mm, convex	6.6 mm	38.8 mm	44.0 mm
	29.99 mm, concave			
Fold Mirrors				
Ag mirror	flat (84)	---	30.0 mm	38.0 mm
Ag mirror	flat (84)	---	32.0 mm	38.0 mm
Ag mirror	flat (84)	5 mm	50.0 mm	50.0 mm