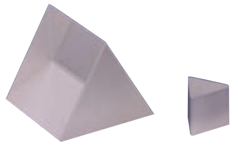
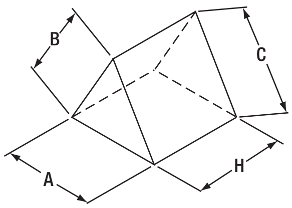
For current pricing, please see our website.

Updated 2/17/12 LF

Equilateral Dispersive Prism



Please refer to our website for complete models and drawings.



Dispersive Equilateral Prisms create less stray light, thus eliminating the higher order problems associated with diffraction gratings. Two high refractive index, low Abbe V_d number glasses have been chosen to provide the maximum dispersive power. The Abbe V_d number is given by

$$V_d = (n_d - 1) / (n_F - n_C)$$

where n_d, n_F, and n_C are the indices of refraction for the helium d-line (587.6 nm), the hydrogen F-line (486.1 nm), and the hydrogen C-line (656.3 nm), respectively. These prisms are typically used at the minimum angle of deviation. This is the angle at which the wavelength of interest travels parallel to the base of the prism, and the angle of incidence is equal to the angle of refraction. For more details on using these prisms at the minimum angle of deviation, please visit **www.thorlabs.com**

Specifications

- **Materials:** F2 or N-SF11 (See Price Table)
- **Dimensional Tolerances:** ±0.15 mm
- **Angular Tolerances:** ±5 arcmin
- **Clear Aperture:** 70% of Entrance Faces
- **Surface Flatness:** λ/10 at 633 nm
- **Surface Quality:** 40-20 Scratch-Dig
- **Number of Polished Faces:** 2

Please Note: N-SF11 stains easily. To maintain the optical quality of N-SF11 optics, clean off fingerprints quickly.

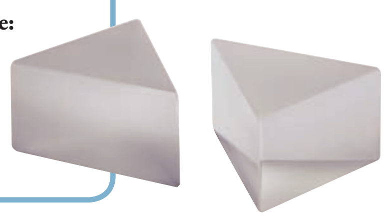
ITEM #	$	£	€	RMB	A=B=C=H	GLASS	Minimum Angle of Deviation*	Vd	INDEX n at 633 nm
PS850	$ 82.22	£ 59.19	€ 71,53	¥ 655.25	10 mm	F2	47.9° @ 633 nm	36.37	1.617
PS851	$ 93.03	£ 66.98	€ 80,94	¥ 741.45	10 mm	N-SF11	65.6° @ 633 nm	25.76	1.779
PS856	$ 88.73	£ 63.88	€ 77,19	¥ 707.14	15 mm	F2	47.9° @ 633 nm	36.37	1.617
PS857	$ 97.34	£ 70.08	€ 84,68	¥ 775.76	15 mm	N-SF11	65.6° @ 633 nm	25.76	1.779
PS858	$ 95.13	£ 68.49	€ 82,76	¥ 758.19	20 mm	F2	47.9° @ 633 nm	36.37	1.617
PS859	$ 97.34	£ 70.08	€ 84,68	¥ 775.76	20 mm	N-SF11	65.6° @ 633 nm	25.76	1.779
PS852	$ 105.95	£ 76.28	€ 92,17	¥ 844.38	25 mm	F2	47.9° @ 633 nm	36.37	1.617
PS853	$ 105.95	£ 76.28	€ 92,17	¥ 844.38	25 mm	N-SF11	65.6° @ 633 nm	25.76	1.779
PS855	$ 233.63	£ 168.21	€ 203,25	¥ 1,861.99	40 mm	N-SF11	65.6° @ 633 nm	25.76	1.779
PS854	$ 214.10	£ 154.15	€ 186,26	¥ 1,706.34	50 mm	F2	47.9° @ 633 nm	36.37	1.617

* The minimum deviation angle is the angle of deviation at which light rays pass through the prism parallel to its base. To calculate γ (minimum deviation angle) use $n = \sin[(\gamma + 60°)/2]/\sin 30°$. The incident angle that results in the minimum deviation angle is $\alpha = (\gamma + 60°)/2$.

Dispersion-Compensating Prism Pairs for Ultrafast Lasers

Specifications

- **Spectral Range:** 700 – 900 nm
- **Apex Angles Tolerance:** ±15 arcmin
- **Unpolished Sides:** Flat and Ground
- **Surface Flatness:** λ/4 at 633 nm



Dispersing prism pairs are used to compensate for spectral dispersion that occurs in ultrafast laser systems. This dispersion increases inversely with the pulse width, so it can become a significant factor when using ultrafast lasers. The apex angle (α) in these prisms is chosen such that the input and output angles are both at Brewster's Angle (θ_B).

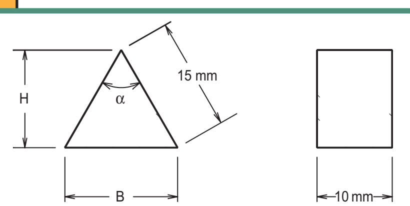
The accumulated phase ϕ(ω) in a prism pair is equal to

$$\phi(\omega) = \frac{2\omega d}{c} \cos\left(\theta_f^{short} - \theta_f\right)$$

where the variables ω, d, θ_f, and θ_f^{short} correspond to frequency, prism separation, frequency-dependent exit angle, and exit angle of the shortest transmitted wavelength, respectively. Solving for the frequency-dependent exit angle gives

$$\theta_f(\omega) = \arcsin\left[n\sin\left(\alpha - \arcsin\left(n^{-1}\sin\theta_B\right)\right)\right]$$

where n, θ_B, and α correspond to the frequency-dependent refractive index of the prism material, angle of incidence with the surface of the first prism, and apex angle of the prism, respectively. The second and third derivatives of the accumulated phase with respect to frequency are defined to be the Group Velocity Dispersion (GVD) and the Third-Order Dispersion (TOD), respectively.



ITEM #	MATERIAL	$	£	€	RMB	GVD at 800 nm	TOD at 800 nm	α*	H (mm)	B (mm)	θB**	REFRACTIVE INDEX at 800 nm	SCRATCH-DIG
AFS-CAF	CaF_2	$ 393.75	£ 283.50	€ 342,56	¥ 3,138.19	-5 fs²/cm	-12 fs³/cm	69.9°	12.3	17.2	-55.0°	1.430	40-20
AFS-FS	Fused Silica	$ 288.75	£ 207.90	€ 251,21	¥ 2,301.34	-16.5 fs²/cm	-20 fs³/cm	69.1°	12.4	17.0	-55.6°	1.453	20-10
AFS-SF10	SF10	$ 262.50	£ 189.00	€ 228,38	¥ 2,092.13	-97.5 fs²/cm	-388 fs³/cm	60.6°	13.0	15.1	-59.7°	1.711	20-10
AFS-SF14	N-SF14	$ 262.50	£ 189.00	€ 228,38	¥ 2,092.13	-113.5 fs²/cm	-473 fs³/cm	59.6°	13.0	14.9	-60.2°	1.745	20-10

*Apex Angle **Brewster's Angle