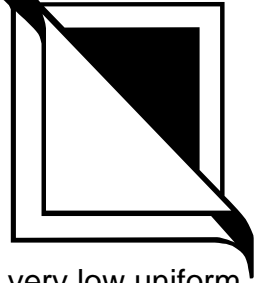


OptiGrafix™

OC Grade Polymer Film

Ultra Clear Optical Base Film



OC Grade Optical Polymer Films are solvent cast, high clarity, polymer films with very low uniform birefringence and haze. The optical properties of OC Grade Films make them an excellent choice for use in polarizer, LCDs, Video Projection, Scientific Test Equipment and other demanding optical applications.

OC Grade Standard Products:

⇒ **OC-VLB Grade Films** are high performance products with heat resistance up to 95° C. This grade of polymer film contains no silica or other additives so transparency is maximized while haze and light scattering is minimized. In addition this film will not yellow over time, and can withstand high lux and temperature exposure without shifts in its optical properties.

Thickness: .0032" to .007" (80um to 175um), OPD < 10nm

Width: up to 48" wide

⇒ **OC-LB Grade Film** is an excellent general purpose high clarity film. It is ideal for room temperature optical applications.

Thickness: .001 to .002" (24um to 50um), OPD < 10nm

Thickness: .003" (75um), OPD < 25nm

Thickness: .005" (120um), OPD < 35nm

Width: up to 50" wide

Our OC Grade Film can be custom manufactured to meet specific customer requirements:

⇒ Produced with additives such as color filter dyes, pigments, fluorescent dyes, optical brighteners, UV inhibitors and other additives. Minimums orders may apply.

Product Features:

- ⇒ Very Low Birefringence
- ⇒ Ultra Clear, High Optical Transmission
- ⇒ Very Low Haze
- ⇒ High Gloss Surface
- ⇒ Very Low Defect Count
- ⇒ Good Dimensional Stability
- ⇒ Commercially Available
- ⇒ Cost Effective Alternative to Tri-Acetate, CAB and Polycarbonate

GRAFIX® Plastics

A Division of GRAFIX, Inc.

19499 Miles Rd. Cleveland, OH. 44128

(800) 447-2349 (216) 581-9050 FAX (216) 581-9041

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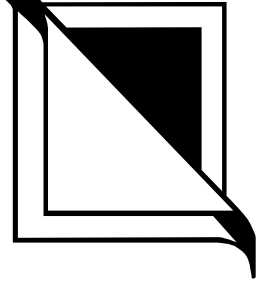


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Summer 2005

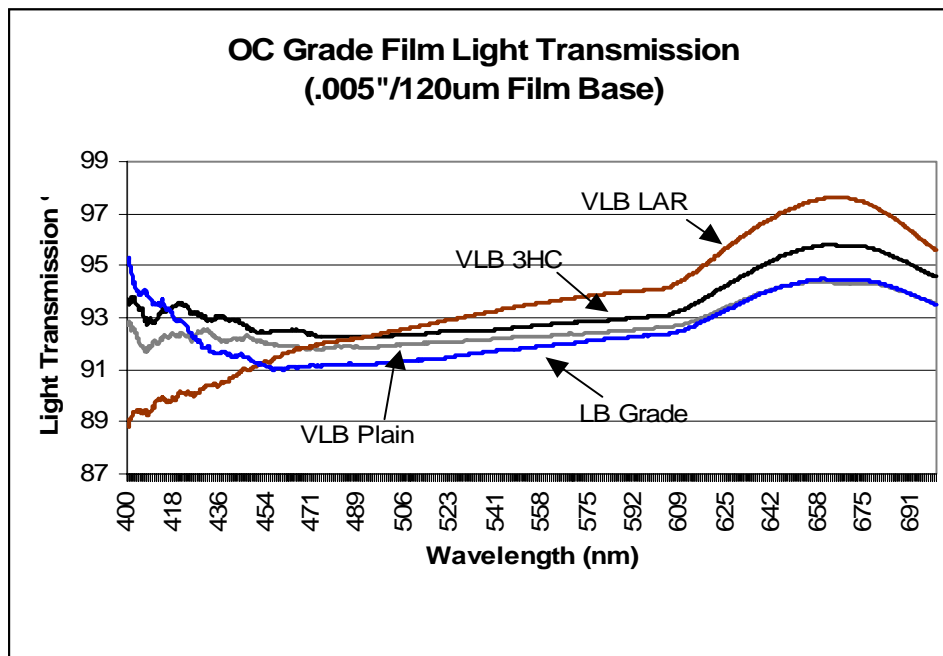


OptiGrafix OC Grade Base films can be enhanced by a variety of secondary processes. This allows our optical films to meet the needs of a wide variety of optical applications such as out door viewable LCD's with touch panel overlays.

Post Processing Options

Product Type	Thickness (.00n"/um)	High Clarity 3H Hard Coat	< 1% AR Liquid Coating	< .5% AR Sputter Coating	ITO Sputter Coating	Anti Glare Hard Coating	Optical PSA
VLB	3.2/80	1 or 2 side	1 or 2 side	1 or 2 side	1 Side	1 side	1 side
	5/125	1 or 2 side	1 or 2 side	1 or 2 side	1 Side	1 side	1 side
	7/125	1 or 2 side	1 or 2 side	1 or 2 side	1 Side	1 side	1 side
LB	1/24	N/A	N/A	N/A	NA	N/A	1 side
	2/50	N/A	N/A	N/A	NA	1 side	1 side
	3/75	1 or 2 side	N/A	N/A	NA	1 side	1 side
	5/125	1 or 2 side	N/A	N/A	NA	1 side	1 side

OptiGrafix OC Grade base films have excellent clarity and light transmission!



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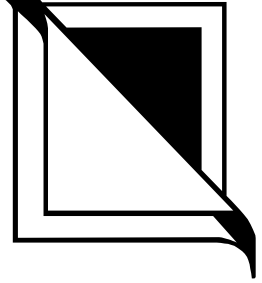


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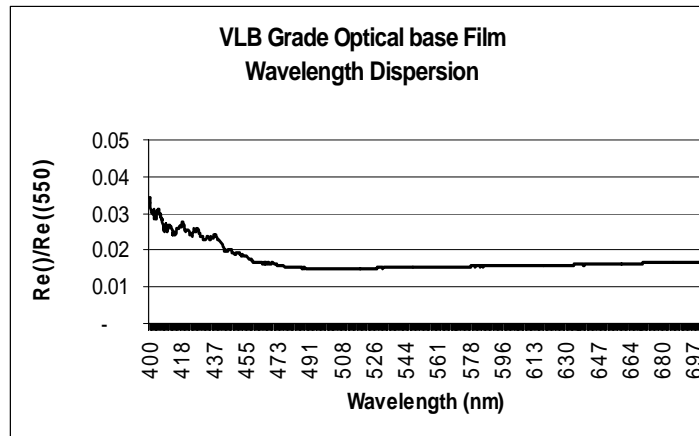
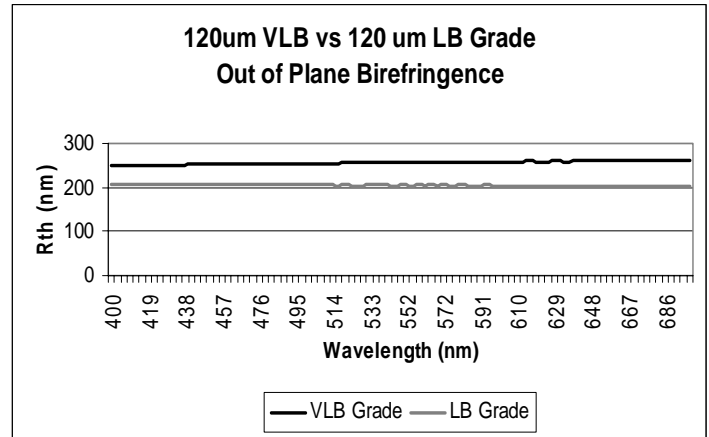
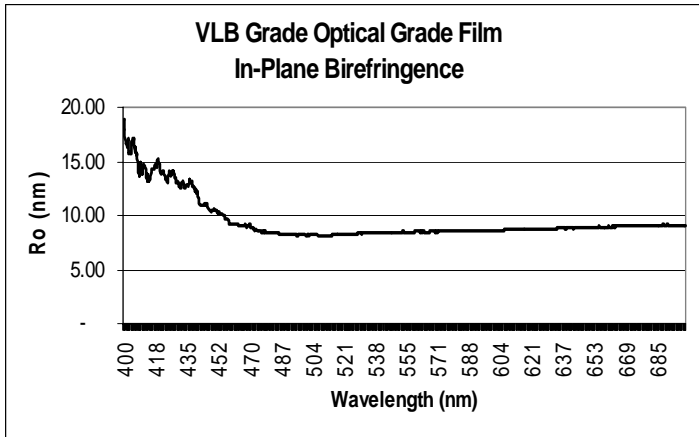
OC Grade Polymer Film

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Retardation Data (.005"/120um Film)



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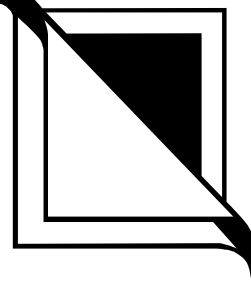


OptiGrafix™ OC Grade Polymer Film

Ultra Clear Optical Base Film

Properties based on .003" Gloss/Gloss Base Film properties of other gauges and finishes of may vary.

The following technical information and data should be considered representative or typical only, and not used for specification purposes.



TYPICAL OPTICAL PROPERTIES

Property	OC-LB Value	OC-VLB Values	Units	Test Method
Phase Uniformity:	< 5	<5	%	
Transparency:	>90	>92	%	ASTM D1476
Hazy	1.1	<1	%	ASTM D1003
Gloss	137	140	%	20° ASTM D523
	145	145	%	60° ASTM D523
	122	115	%	85° ASTM D523
Refractive Index	1.485	1.485		ASTM D542

TYPICAL PHYSICAL PROPERTIES

Property	OC-LB Value	OC-VLB Values	Units	Test Method
Specific Gravity	1.31	1.31		
Max Service Temp.	75°	95°	°C	
Linear Heat Shrinkage 80°C @ 85% RH for 20 Hrs..	1.17	0	%	ASTM D1204-4
Water Vapor Permeability	685	685	g/m ² /day	
Gas Permeability - O ₂	1800	1800	g/m ² /day	
Yield Strength MD	65.4	65.4	Yield/Nmm ²	ASTM D882-91
	TD	61.5	61.5	Yield/Nmm ²
Tensile Strength	58.6	58.6	Yield/Nmm ²	ASTM D882-91
Elongation at Break	47.2	47.2	%	ASTM D882-91
Modulus of Elasticity MD	975	975	Nmm ²	ASTM D882-91
Mullen Bursting Strength	72.5	72.5	PSI	BS 4768

Important Notice: Grafix makes no warranties, express or implied, including but not limited to any implied warranty of merchantability of fitness for a particular purpose. The user is responsible for determining whether the Grafix product is fit for a particular purpose and suitable for the user's method of application. Please remember that many factors can affect the use and performance of an OptiGrafix optical film product in a particular application. Given the variety of factors that can affect the use and performance of a Grafix product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the Grafix product to determine whether it is fit for a particular purpose and suitable for the user's method of application.

Limitation of Remedies and Liability: If the Grafix product is proven to be defective, THE EXCLUSIVE REMEDY, AT GRAFIX'S OPTION, SHALL BE TO REFUND THE PURCHASE PRICE OF OR TO REPAIR OR REPLACE THE DEFECTIVE GRAFIX PRODUCT. Grafix shall not otherwise be liable for loss or damages, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including, but not limited to, contract, negligence, warranty or strict liability.

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