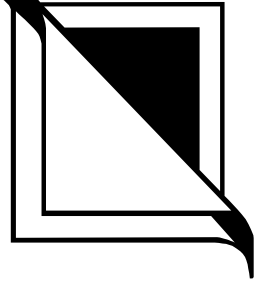


# OptiGrafix™ Light Diffuser Films

Winter 2006



## Description:

OptiGrafix Light Diffuser Films are 1 or 2 side diffuser film products designed to break up and distribute light evenly. OptiGrafix Light Diffusers are available in the following grades:

Grade	Stock Thickness	Custom Thickness	1/Side Mt	2/Side Mt	Color	Polarized Light	Light Transparency	Haze	Base Film Type
<b>Grades</b>									
DFPM	.003"-.007" (70-170um)	.010" (200um)	X		Clear/White	No	87%	88%	PET
DFMM	.003"-.007" (70-170um)	.010" (200um)		X	Clear/White	No	66%	89%	PET
DFPMHT	.003", .004" (70, 100um)	.005"-.010" (125-200um)	X		Clear/White	No	98%	83%	PET
DFPMET		.003"-.010" (70-200um)	X		Clear/White	No	99%	79%	PET
LBMT	.003", .004" (70um, 100um)	.001-.002" (25-50um)	X		Clear	Yes	99%	45%	LB Grade

OptiGrafix Light Diffuser Films are specially designed to be used for different back lighting applications: Transmissive Electronic Displays, LED Lighting Systems, and Back-lit Signage.

DFxx Grade Diffuser Film, is a translucent, matte finish film which can be used under a variety of lighting conditions except polarized light. These grades of film are offered in 1 or 2 side matte configurations, and a variety of thicknesses. These grades are available in a variety of thicknesses and widths.

LBxx Grade Diffuser Film is a 1 side matte clear film. Its low uniform birefringent properties make it ideal for diffusing polarized light.

Grades	Product Benefits	Anti-Static	Rugged PET Base	Low Birefringence	Commercially Available	Max Width (Stock)	Max Width Custom	Polarized Light	Roll Stock	Sheet Stock
DFPM	Y	Y		Y		42"/1067mm	60"/1525mm		Y	Y
DFMM	Y	Y		Y		42"/1067mm	60"/1525mm		Y	Y
DFPMHT	Y	Y		Y		42"/1067mm	60"/1525mm		Y	Y
DFPMET	Y	Y		Y		42"/1067mm	60"/1525mm		Y	Y
LBMT			Y	Y		50"/1270mm		Y	Y	Y

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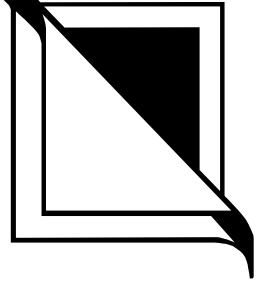
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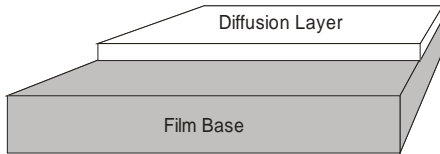


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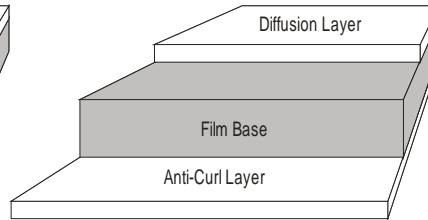
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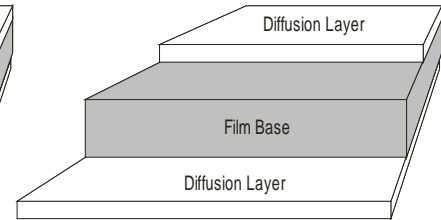
## Diffuser Film Constructions



**LBMT**

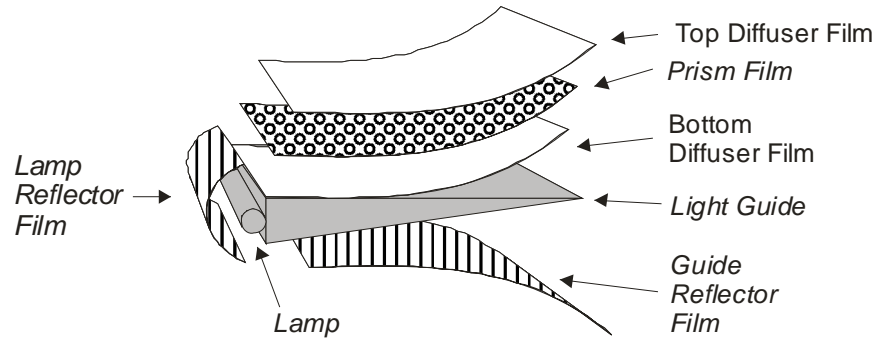


**DFPM  
DFPMT  
DFPMET**



**DFMM**

## Typical Back-Light Panel Application



Top Diffuser Grades	Bottom Diffuser Grades
DFPMHT	DFMM
DFPMET	DFPM
LBMT	DFPMHT

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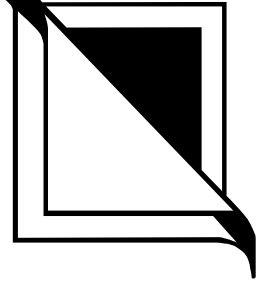
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## Technical Specifications and Properties

Optical Properties	DFMM	DFPM	DFPMHT	DFPMET	LBMT	Unit	Test Method
Transparency	66	87	99	98	99	%	
Gloss 60 Degrees, Black Back	3-6	8	10	12	12	gu	ASTM D523
Opacity	< 20	<15	<10	< 7	<10	%	ASTM D1003
Haze	87	88	83	79	45	%	ASTM D1003
Brightness Average	>1700	>1730	>1800	>1830	>1830	cd/m2	
Uniformity	90	90	80	90	90	%	
Refractive Index	1.5	1.5	1.5	1.5	1.485		
Physical Properties	DFMM	DFPM	DFPMHT	DFPMET	LBMT	Unit	Test Method
Specific Gravity	1.3	1.3	1.3	1.3	1.32		
Softening Temp	180	180	180	180	120	Deg. C	
Linear Heat Shrinkage 75 C for 15 min.	> 1	> 1	> 1	> 1	> 2	%	
Yield Strength	21000	21000	21000	21000	1387	PSI	ASTM D882
Tensile Strength at Break	28000	28000	28000	28000	1904	PSI	ASTM D882
Elongation at Break	92	92	92	92	30-45	%	ASTM D882
Elastic Modulus In Tension	710000	710000	710000	710000	67357	PSI	ASTM D882
Electrical Properties	DFMM	DFPM	DFPM	DFPM	LBMT	Unit	Test Method
Surface Resistivity	$1 \times 10^{19}$	$1 \times 10^{19}$	$1 \times 10^{19}$	$1 \times 10^{19}$	$1.6 \times 10^{13}$	Ohms/sq	ASTM D257
Dielectric Breakdown	7	7	7	7	150	k-Vmm <sup>-1</sup>	ASTM D149

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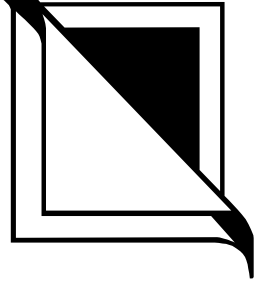
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## Testing Data

Test Type	DFMM	DFPM	DFPMT	DFPMT	LBM1	Description
60 C/90% RH, 500H	Y	Y	Y	Y	Y	High Temp. & Humidity Durability
80 C, 500H	Y	Y	Y	Y		High Temp. Durability
-20 C, 500H	Y	Y	Y	Y	Y	Low Temp. Durability
-20 C -> 25 C -> 70 C -> -25 C 30min x 100 cycles	Y	Y	Y	Y	Y	Heat Fluctuation Durability
UV Exposure, 200H	Y	Y	Y	Y	Y	UV Exposure

**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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