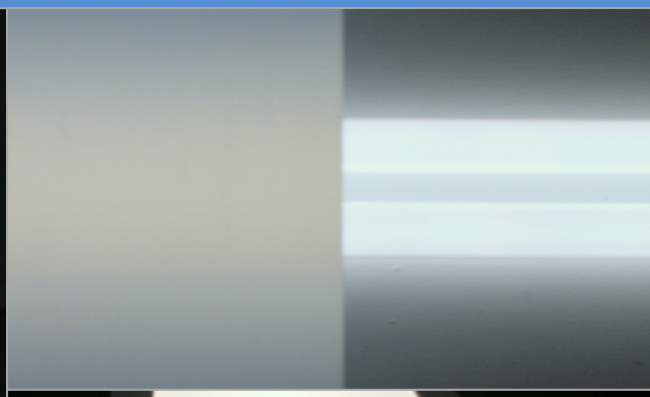
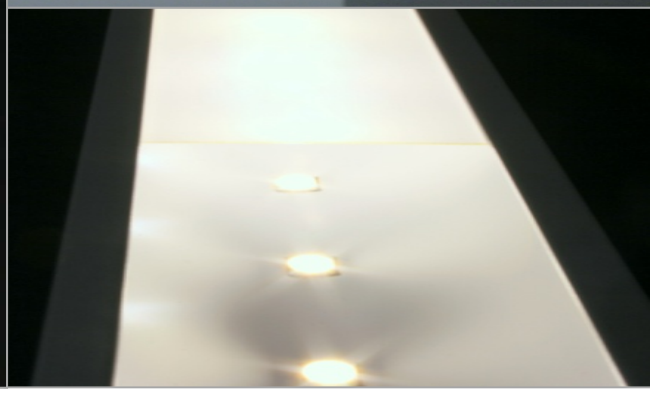
Advanced Diffusion Lenses PMMA





DESCRIPTION

Fusion Optix Advanced Diffusion Lenses are based upon patented core technology, with deep roots in optical physics and material sciences.

Advanced Diffusion Lenses are available in a broad range of diffusion properties and lighting distributions. Along with the optical properties, key mechanical properties are also controlled, including thickness, surface finish, and material systems.

All products are available cut to fit, typically in circular, square or rectangular format, based upon customer supplied drawings typically with no up-front tooling costs.

Typical Benefits:

- High Transmission/Low Insertion Losses
- LED/Lamp Obscuration
- Luminance Uniformity
- Color Mixing
- Beam Spread
- Durability

APPLICATIONS

- **LED Downlights**
- **LED Pendants**
- **LED Lamps (MR, PAR)**
- **LED Light Boxes**
- **Machine Vision Lights**

Fusion optix green Optical Innovation™

ROHS

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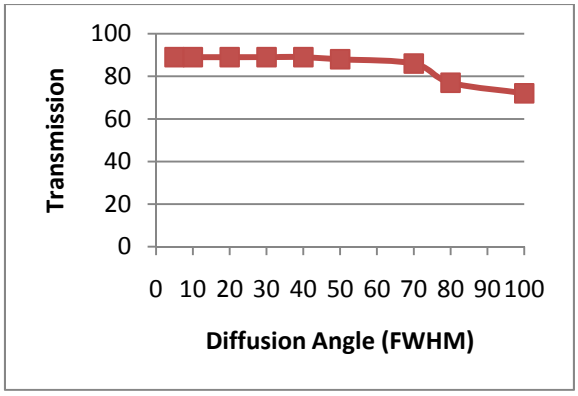
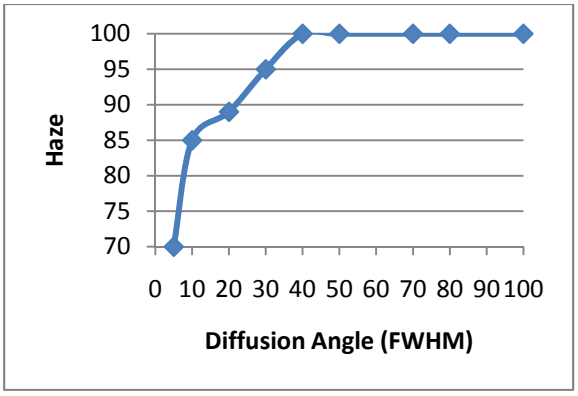
OPTICAL PROPERTIES





Low Angle

Characteristic	Unit	Performance Options			
		1010	2020	3030	4040
FWHM Angle (589nm)	X°	10	20	30	40
FWHM Angle (589nm)	Y°	10	20	30	40
Transmission	%	91	91	91	91
Haze	%	15	95	99	100
Clarity	%	15	4.0	3.0	2.9
Relative Intensity/Gain	%	4.6	4.5	4.4	3.9
ΔCCT (3100K)		-80	-90	-100	-110
u' Color Point w/3100K LS		0.268	0.279	0.279	0.274
v' Color Point w/3100K LS		0.528	0.532	0.533	0.531
Film Thickness	in	0.004"	0.005"	0.006"	0.008"
Film Thickness	um	100	125	150	200
Substrate Thickness		1mm, 2mm, 3mm, 4mm, 5mm, 6mm			
Max Dimensions		10" x 10" *(Larger with NRE)*			

High Angle

Characteristic	Unit	Performance Options			
		5050	6060	7070	8080
FWHM Angle (589nm)	X°	50	60	70	80
FWHM Angle (589nm)	Y°	50	60	70	80
Transmission	%	89	88	84	79
Haze	%	100	100	100	100
Clarity	%	2.8	2.7	2.5	2.2
Relative Intensity/Gain	%	3.9	3.9	3.5	3.1
ΔCCT (3100K)		-110	-110	-110	-110
u' Color Point w/3100K LS		0.274	0.274	0.274	0.274
v' Color Point w/3100K LS		0.531	0.531	0.531	0.531
Film Thickness	in	0.012"	0.014"	0.016"	0.020"
Film Thickness	um	300	350	400	500
Substrate Thickness		1mm, 2mm, 3mm, 4mm, 5mm, 6mm			
Max Dimensions		10" x 10" *(Larger with NRE)*			

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MATERIALS SELECTOR

Characteristic	Unit	Material System		
		PMMA	PC	PETG
Density	g/cm^3	1.17	1.20	1.32
Refractive Index		1.491	1.584	1.568
Pencil Hardness		HB	HB	HB
Flammability (0.2mm)		94HB	94HB	94HB
Operating Temp	°C	-30 to 90	-30 to 120	-30 to 65
UV Resistance		Good	Poor	Poor
Water Absorption		0.3	0.3	0.3
Key Benefits		Transmission, color, UV	Thermal range, durability	Thermoforming, low birfrigence

VISUAL INSPECTION CRITERIA

Properties	Criteria	Specification
Dark Point Defects- Inclusions	D<0.3 mm	Unlimited
	0.3mm < D < 0.5mm	2 max / pc
	0.5mm < D	none
Clear Point Defects - Gels, Pits	D < 0.7mm	Unlimited
	0.7mm < D < 1.5	2 max / pc
	1.5mm < D	none
Linear Defects – Fiber/Scratch/Die Line/Flow Line	Width<0.03 and Length<3mm	Pass
	0.03mm < Width < 0.10 mm and Length < 2mm	Pass
	Width>0.1mm	Justify as point defect
Large Area Effects - Ripples/Blotches	Grade in comparison to selected defect samples	Equal to or better than approved sample.

PRODUCT RELIABILITY

Fusion Optix Advanced Diffusion Lenses have been designed to be used in a wide variety of LED lighting applications. The products are tested using the following accelerated tests.

	Outdoor	Indoor
Equipment	QUV chamber	QUV chamber
Test Method	ASTM G154 Cycle 1	Custom
On Cycle	8hr @ 60°C, ~ 95% humidity	Continuous 50°C, ~ 95% humidity
Off Cycle	4hr @ 50°, 100% humidity (condensation)	-
UV Lamp	UVA-340nm	UVA-351nm
Irradiance	0.89 W/m^2	0.50W/m^2

Notes:

1. Outdoor cycle simulates Florida outdoor sunlight exposure.
2. Indoor cycle simulates UV from sunlight filtered through window/skylight glass.
3. Standard Sample size is 2"x3"

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QUALITY ASSURANCE

Fusion Optix products are manufactured using tightly controlled, high volume production processes. We adhere to the strictest quality and process control standards which allows us to provide customers with a dependable supply of parts. The company is fundamentally organized to carefully validate, control, and continuously improve both internal and supplier processes to meet or exceed customer expectations. Every Fusion Optix employee is encouraged, expected, and supported to make quality leadership the highest priority.

QUALITY STATEMENT

Fusion Optix delivers innovative, reliable products and services by working closely with customers to anticipate and verify requirements for component and system performance, delivery time, and cost.

Quality assurance capabilities include state-of-the art test equipment and processes to specify measure the complete range of optical, physical, and environmental film characteristics. Fusion Optix also develops custom quality assurance procedures for custom products. We also help our customers achieve ratings UL and EnergyStar, by understanding requirements and developing products accordingly.

HANDLING & STORAGE

Advanced Diffusion Lenses do not contain any delicate surface features or embossed coatings that present restrictive handling concerns. In handling Advanced Diffusion Lenses, the same level of care should be exercised as in handling clear PMMA, PC or PETG film of similar gauge. Gloves should be used to prevent fingerprints and other surface contaminants. The product should not be bent, flexed, or twisted as white stress marks may appear in the plastic. Product should be stored lying flat on shelves, covered or sealed to prevent contamination.

ENVIRONMENTAL CONSIDERATIONS, REQUIREMENTS & DISPOSAL

Lead free, mercury free, cadmium free, haxavalent chromium free, polybrominated biphenyls free, and polybrominated diphenyl ether free manufacturing processes are used. Advanced Diffusion Lenses can be recycled in large quantities and through most standard municipal recycling programs.

ORDERING INFORMATION

For ordering information on products from Fusion Optix, please call: **1-781-995-0805**

For technical information please send an e-mail to: **sales@fusionoptix.com**

Optical Innovation™

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