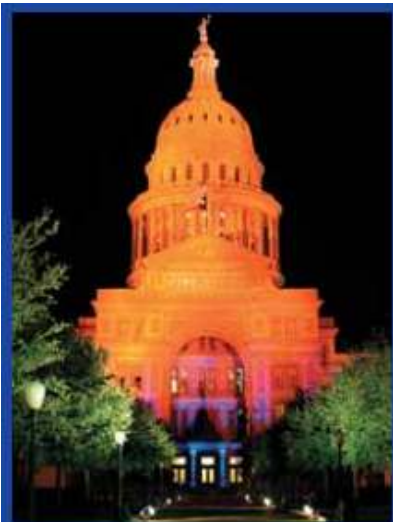


GHOLOGRAPHIC COMPANY

DIFFUSER : Light Shaping

Beam Shaping Diffuser / Direction Turning Film



Texas State Capitol



Celine Dion Concert



Eiffel Tower

Location Lighting using Luminet Light Shaping Diffusers®

Benefits

- **High Quality Product**
- **High Transmission**
- **Beam Shaping**
- **Luminance Uniformity**
- **Color Mixing**



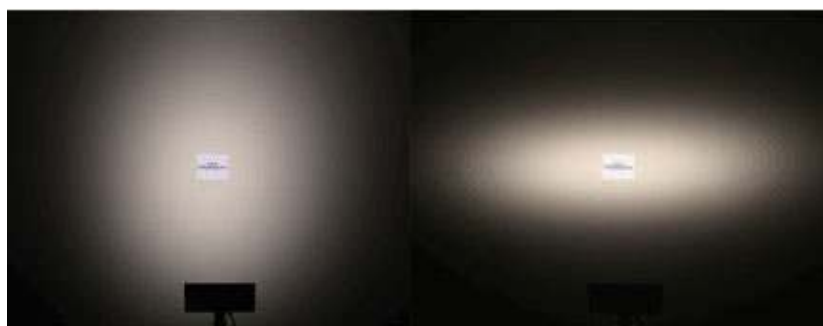
Light Shaping Diffuser

Applications :

LED Lighting, LCD displays, projection systems, computer monitors, mobile displays, barcode scanning, flashlight, lamp, microscope illumination, fiber-optics, and LED illumination, laser, LD and CCFL homogeneity and beam shapers, optical sensing, bio-medical instrumentation, architectural, office and in-house lighting, automotive lighting, signs, posters, wall washers, PAR lamps, recessed down lights, MR lamps, Machine Vision Illuminators.

Benefits:

Homogenization, removing striations, reducing hot spots, reducing multiple shadows, controlling beam angle, RGB LED color mixing, controlling glare, laser eye safety, LED hiding power



40° Circular

60°x10° Elliptical

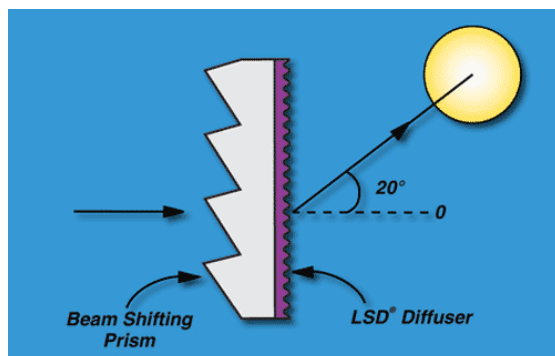
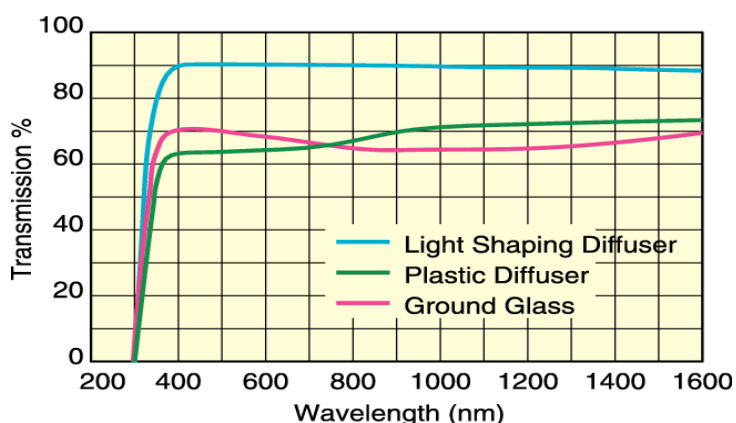




Table of Contents

Light Shaping Diffuser (LSD)

LSD Rolls
LSD Films & Sheets
Direction Turning Films
Electronically Variable Diffuser
UV & High Temperature Diffuser
Rigid LSDs
Front Projection Screen
Biomedical Diffuser
Machine Vision Diffuser
LED Lighting Diffuser

Light Shaping Diffusers (LSD)

High Transmission Efficiency – up to 92%

Beam Shaping LSDs precisely shape, control and distribute light. Standard circular angles range from 0.5° to 80° FWHM. A wide variety of standard elliptical angles are available from 0.2° x 10° to 95° x 35°. Beam shaping puts more of the light where it is needed.

Homogenized Light “Hotspots” and uneven light distribution are common problems with filament, arc, LED, CCFL, fiberoptic and laser light sources. LSDs greatly smooth and homogenize sources while providing uniform light in critical applications such as LCD backlights, LED displays, machine vision, automotive lighting and viewing screens. Large angle LSDs produce the greatest degree of homogenized light. Homogenization provides a uniform pattern of light in the target area.



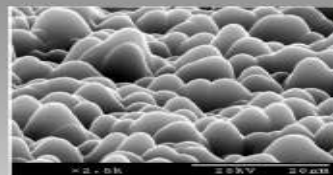
Light Shaping Diffuser

Awards

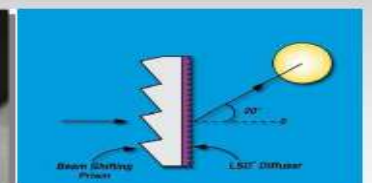
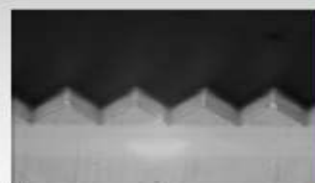


Luminit Products

- Light Shaping Diffusers®



- Directional Turning Film®



LSD Rolls

LSDs are non-wavelength dependent and will work with white, monochromatic, coherent or incoherent light.

LSDs can be combined with other optical components such as lenses, Fresnels, and prismatic structures.

Application:

- LED Lighting
- LCD Backlighting
- LED Display
- Projection Systems
- Signs and Displays
- Machine Vision Inspection
- Front Projection Screens
- Mobile Phones & PDA's
- Projection Systems
- Barcode Scanners
- Inspection Systems
- Set/Event Lighting
- Microscopic Illumination
- Fiber-Optic Illumination
- Medical Instrumentation
- Architectural Lighting

LSD ROLLS	ANGLE FWHM	SUBSTRATE & THICKNESS	SIZE	OPTION		
	75°x45°	POLYESTER E5 - 0.005"	ROLL WIDTH 20"	Protective Film		
	55°x45°					
	60°x10°	POLYCARBONATE P1 - 0.010" (2 sided diffuser) S1 - 0.010"				
	1x60°					
	0.2x40°					
	15°x30					
	30°x3					
	15°x1°					
	60°					
	50°					
	30°					
	20°					
	10°					
	5°					
	1°					

LSD Technology Specifications:

LSD Angle Range FWHM

Circular: 0.2° to 80°
Elliptical:
minor: 0.2° to 60°
major: 10° to 95°

Transmission Efficiency

Circular
0.2° to 20° ≥ 90%
20° to 80° ≥ 85%
Elliptical ≥ 85%

Angle Tolerance
(Based on a 10"x10" area)

≤1° ± 0.5°
1° < Angle ≤10° ± 1°
> 10° ± 10%

Transmission Spectral Range

400nm to 1500nm

Temperature Range

-30°C to 80°C @ 240 hours

Humidity

>95% ± 5% RH @ 24 hrs.

Refractive Index

PC=1.586; PE=1.51
AC=1.494; Epoxy=1.50

Pencil Hardness

> 2H

Yellow Index

0.3% glass exposure (600 hrs)
2.6% direct exposure (600 hrs)

Adhesion

ASTM D3359

Note that the specifications contained herein are subject to change without notice.

LSD Films & Sheet

Light Shaping Diffuser **ADVANTAGES**

- High Transmission Efficiency – up to 92%
- Controlled Diffusion Cone Angle
- Available Diffuser Angles: 0.2° to 95° FWHM
- Circular and Elliptical Angles
- Homogenization of Light Sources
- Multiple Substrate Selections:
PC, PET, AC, UL rated, UV stable, Glass & others
- Works in UV, Visible and NIR Spectrums
- No Moiré Fringes or Chromatic Aberration
- Many Sizes Available
- Can be Integrated into any Plano Surface Geometric Optic

LSD SHEETS AND PANELS



ANGLE FWHM	SUBSTRATE & THICKNESS	SIZE
90°x60°	POLYCARBONATE	12"x12"
95°x25°	P1 - 0.010"	16"x16"
75°x45°	P3 - 0.030"	
60°x10°	P6 - 0.060"	
60°x1°	P8 - 0.118"	
40°x0.2°	(2 sided diffuser)	Note: Custom Angles and Larger Sizes Available
30°x5°	S1- PCS 0.010"	
80°	POLYESTER	
60°	E5 - 0.005"	
40°	ACRYLIC	
30°	A3 - 0.030"	
20°	A6 - 0.060"	
10°		
5°	ACRYLIC-UVT	
1°	V3 - 0.030"	
0.5°		

APPLICATIONS OF LSDs

LED LIGHTING

- Architectural Lighting
- Can Lights
- Decorative Lighting
- Pool Lighting
- Set/Event Lighting
- Wall Wash

ILLUMINATION SYSTEMS

- Aircraft Inspection Lights
- Aircraft Reading Lights
- Automotive Instrument Clusters
- High Intensity Discharge Lamps
- Signs & Displays

BACKLIGHT SYSTEMS

- Cell Phone & PDA Displays
- Cockpit Instrumentation Displays
- LCD Screens
- Light Box

MACHINE VISION

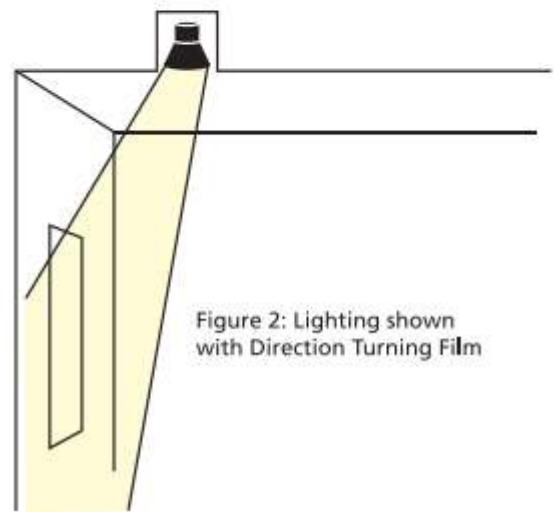
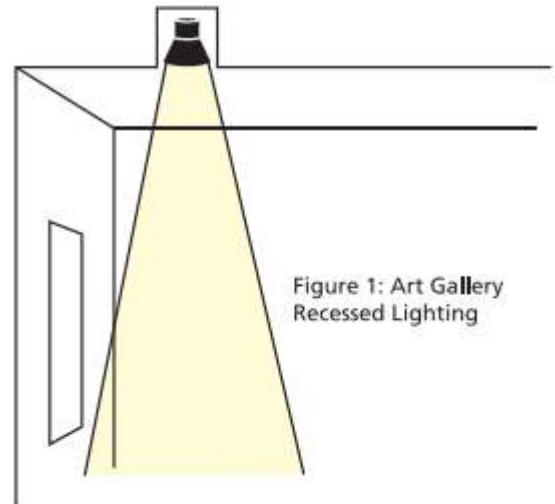
- Barcode Scanners
- Metrology Systems
- Microscope Ring Light
- Backlight, Light Lines



LED Array 60°x10°

Direction Turning Films

Direction Turning Films are used to change the light beam direction to light a wall, walkway or other lighting target. Applications include LED lighting, aviation displays, traffic signs, displays and LCD backlights.



Possible (DTF) Direction Turning Film Usages

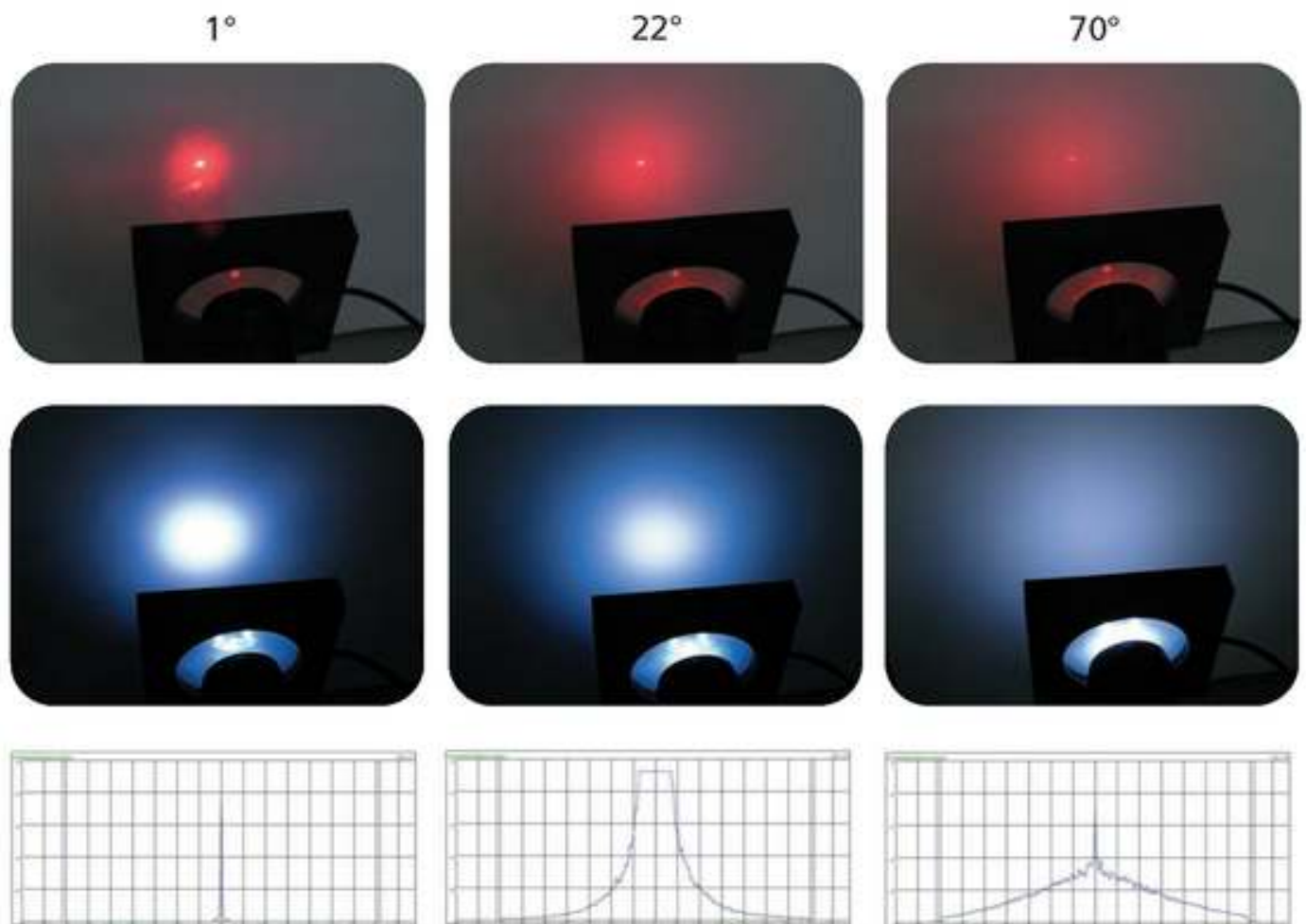


Electronically Variable Diffuser

Electronically Variable Diffuser is world's first continuously variable diffuser instrument. By this we can change smoothly the light shape and provide uniform illumination.

Applications :

- Light Beam Divergence
- Bio-Photonics Research
- Beam Intensity Adjustment
- Bio-Physical Research
- Optical Material Characterization
- Holography
- Detector Characterization
- Detector Saturation Prevention



Physical Specifications:

Clear Aperture (CA)	25mm	Inner Optical Threads (I)	1"-32 and C-Mount
Dimensions (W x H)	113 x 87mm	Optical Thread Depth (D)	6mm
Thickness (T)	19mm	Weight (without power supply)	330 grams

UV & High Temperature Diffuser

Light Shaping Diffusers are particularly applicable to laser, biomedical instrumentation and other high temperature/high power applications as well as UV applications requiring high transmission efficiency of UV radiation. Custom sizes are available to fit most applications.

A holographically recorded, randomized surface relief structure is replicated in a glass surface on a float glass or UV silica substrate. The precise surface relief structures provide High Transmission Efficiency (up to 92%) and Controlled Angular Distribution while providing high-quality

Homogenized Light.

High Temperature Glass-On-Glass diffusers can withstand temperatures up to 500 °C and have a laser damage threshold of 8 J/cm².

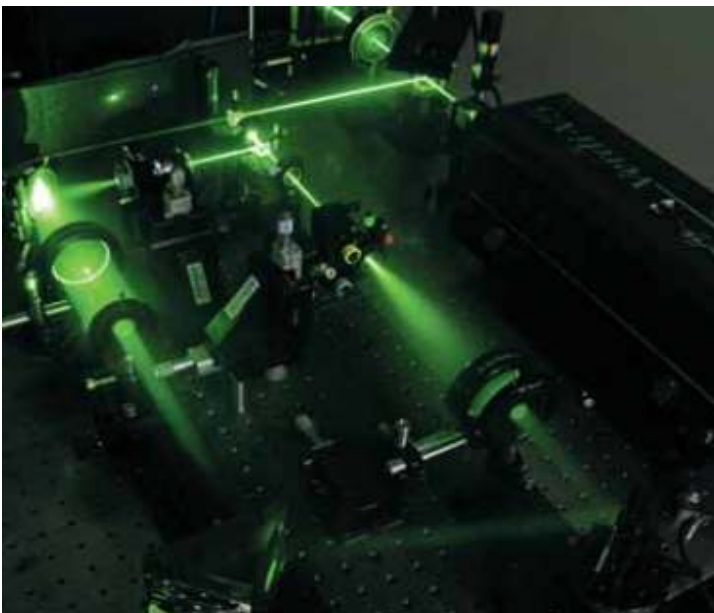
Light Shaping Diffusers® that are designed for high temperature and high power laser applications and offer superior UV transmission.

High temperature Up to 725°C stable

- High laser damage threshold 8J/cm²
- Excellent UV Transmission 240nm and higher

LSD® Ultra-High Temperature Power Glass Diffuser 725°C Stable		
Angle FWHM	Substrate & Thickness	Size
0.5° to 12°	Silica, Glass B270 3mm	25mm Dia. 50mm Dia. 2" x 2"

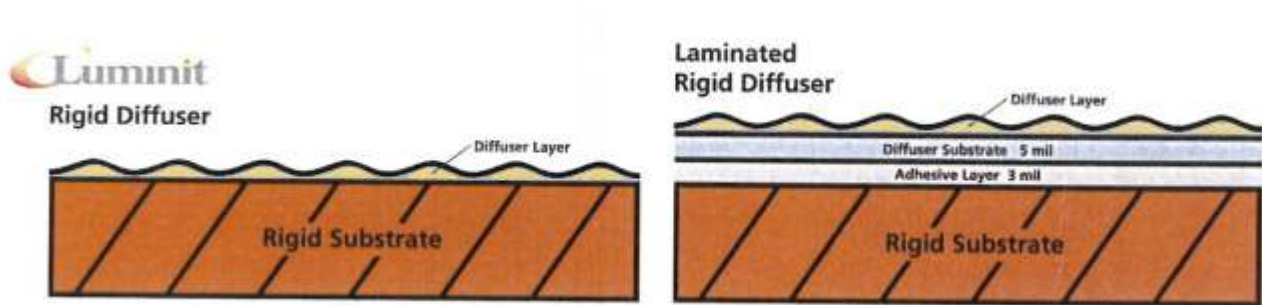
LSD® UV Transmitting Fused Silica Diffuser 70% at 190nm		
Angle FWHM	Substrate & Thickness	Size
0.5° to 12°	Fused Silica 3mm	25mm Dia. 50mm Dia. 2" x 2"



Luminit is a world-wide leader in technical innovation in the management of light. Our broad product line of Light Shaping Diffusers® and custom designed solutions can be tailored to your most exacting needs.

Rigid LSDs

Luminit applies its LSD structures directly on a rigid polycarbonate surface to make a very high transmission rigid diffuser.



Front Projection Screen

LORS (Lights OnReflective Screen) **Advantages:**

- High-gain/high-resolution screens
- Excellent viewing, even under high ambient light conditions
- Precise dispersion angles allow maximum utilization of available light
- Custom viewing angles available
- With a metalized front surface, polarization is not impacted and reflection screens can be used in PMLCD reflector applications



Biomedical Diffuser

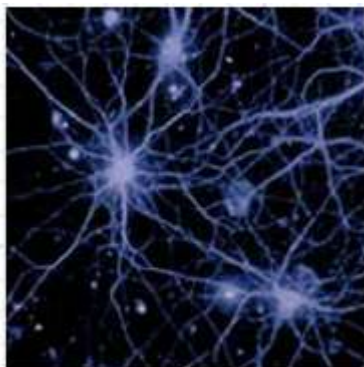
Today's medical instrumentation includes a wide selection of light sources from fluorescent fixtures to UV sources to lasers for applications from general lighting to laser surgery and everything in between.

Applications:

- Laser eye surgery
- Laser cosmetic surgery
- Bacteria identification systems
- Biological imaging systems
- Teeth whitening systems
- Blood analyzer systems



Cosmetic Laser Surgery



Biological Microscopy



Biological
Analysis System

Machine Vision Diffuser

Today's advanced Automatic Optical Inspection (AOI) platforms incorporate the latest high resolution cameras to detect and measure defects on surfaces ranging from silicon wafers to champagne bottles.

Luminit diffusers enable both of these attributes with minimal transmission loss for both line scan and backlight applications.

Line scan applications typically require LED or fiber optic lightlines with a high level of uniformity across the long axis. The use of Luminit's asymmetrical diffusers (e.g. 30°x5°) in this application has been proven to improve uniformity beyond 95% when the long axis is oriented in parallel with the wider-angle axis of the diffuser. These diffusers are available in custom shapes with any lengths up to 1,500 feet.

Highly uniform backlights are required for inspection of transparent objects (e.g. bottles, LCD glass, etc) to detect imperfections or cracks.



LED Lightline with 40°x 0.2° Diffuser on left



HB White LED Lightline from
Advanced Illumination



HB Red LED Backlight from
Advanced Illumination

LED Lighting Diffuser

Many LED LIGHTING APPLICATIONS require diffusers capable of improving the uniformity and controlling the beam angle of the fixture without sacrificing light output. In some applications the diffuser is required to mix the color emissions of multiple sources or to illuminate a larger symmetrical or asymmetrical area.

“Hotspots” and uneven light distribution are common problems with LED sources. Luminitt offers Light Shaping Diffusers® (LSD) that homogenize and shape the light with high transmission efficiency – 85% to 92%.

Benefit: Reduced Total Cost

Required: 7 Different Fixture Angles

- 7 Optical Designs
- 7 Molds
- 7 SKUs
- Larger Inventory

- 1 Optical Design
- 1 Molds
- 1 SKU
- 7 Accessory Lenses



Applications - Up Lighting

- Architectural Lighting
- Wall/Cove Lighting



Applications - Lamps/Modules

- PAR38
- A19
- Replaceable modules





GHOLOGRAPHIC COMPANY

**Jhawar Kunj, Kotri Goverdhanpura,
Kota, Rajasthan, INDIA - 324007**

Ph: +91-9314235320

Email: sales@genuineholographics.com, gholographics@gmail.com
www.genuineholographics.com