Luminit™
SHAPING LIGHT AS NEEDED

Machine Vision Applications

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. Integral to this process are illumination systems that provide highly homogenized and precisely controlled illumination angles. 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.

LED Lightline with 40° x 0.2° diffuser on left

HB White LED Lightline from Advanced Illumination

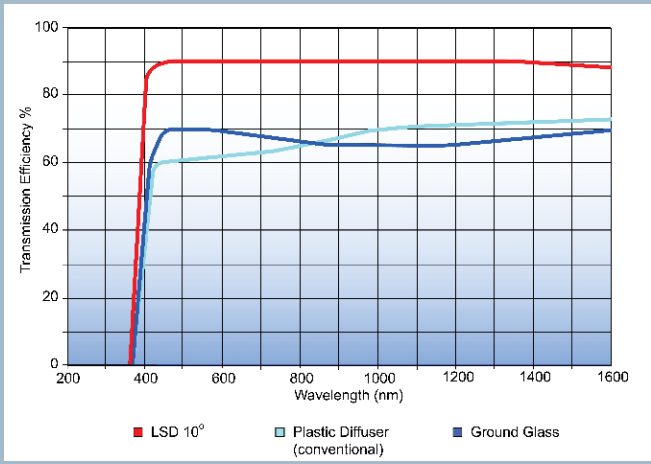
HB Red LED Backlight from Advanced Illumination

Highly uniform backlights are required for inspection of transparent objects (e.g. bottles, LCD glass, etc) to detect imperfections or cracks. Luminit's symmetrical diffusers are currently in use in such applications to homogenize the backlight (either edge-lit or direct back-lit), resulting in more repeatable and accurate dimensional measurement of the part under inspection. Circular diffusers are available in any size up to 60" diagonal.

Machine Vision Diffuser Applications:

- Lightline
- Backlighting
- Co-axial Lighting
- Ring Lighting

Luminit Light Shaping Diffusers® (LSD) shape, control and distribute light. The patented holographic master recording process allows a wide variety of circular or elliptical light patterns. 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°. Custom angles may also be available on request.



Transmission Efficiency Chart

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 10"x10" area)	≤ 1° ± 0.5° 1° < Angle ≤ 10° ± 1° > 10° ± 10%
Transmission Spectral Range	400nm to 1600nm
Brightness Uniformity	≥ 85%
Cosmetic Defects	Not to exceed 1000 microns

Temperature Range	-30°C to 100°C @ 240 hrs.
Humidity	> 95% ± 5% RH @ 24hrs.
Refractive Index	PC=1.586; PE=1.640; AC=1.494; Epoxy=1.586
Pencil Hardness	> 3H
Yellow Index	0.3% glass exposure (600 hrs) 2.6% direct exposure (600 hrs)
Adhesion	100%-Crosshatched adhesion test ASTM-D3359
Laser Damage	GL=8.1 J/cm^2; PC=0.22 J/cm^2; PE=0.2 J/cm2; AC=0.17 J/cm^2 @ 1064 nm, 10 ns pulse

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

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