

Light Shaping Diffusers (LSD)

LIGHT SHAPING DIFFUSERS (LSD)



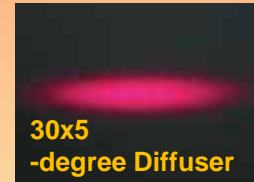
No Diffuser



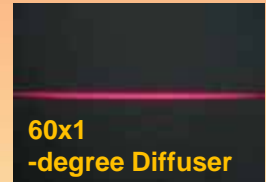
5-degree Diffuser



30-degree Diffuser



30x5
-degree Diffuser



60x1
-degree Diffuser

Sources:

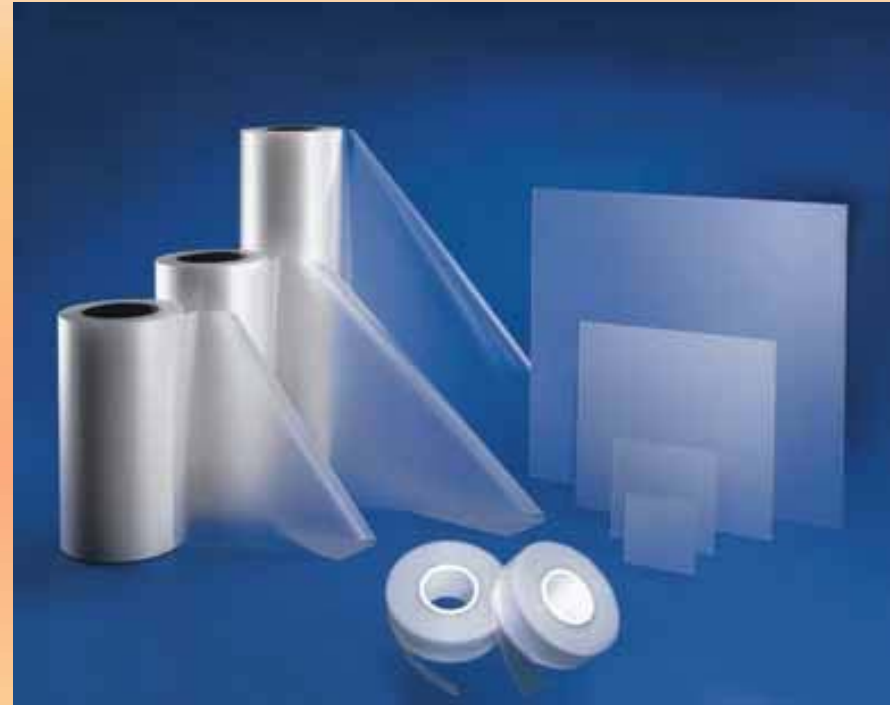
- “Mike Wood; Protocol Magazine, Fall2012, P22-25
- Power Tuning Suppliers Technical Information

www.PowerTuningEgypt.com

Light Shaping Diffusers (LSD)

Importance

- 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.



Light Shaping Diffusers (LSD)

Example



LED panel, no diffuser



LED panel with $40^\circ \times 0.2^\circ$ diffuser



LED panel with 80° diffuser

Elliptical LSD diffusers shape the light in separate horizontal and vertical angles.



LED panel with $60^\circ \times 1^\circ$ diffuser

- Here is an example of a $60^\circ \times 1^\circ$ elliptical LSD utilizing a strip LED light source with incorporated primary optics. The light is shaped by spreading it 60° in the horizontal direction, but only 1° in the vertical direction eliminating hotspots.

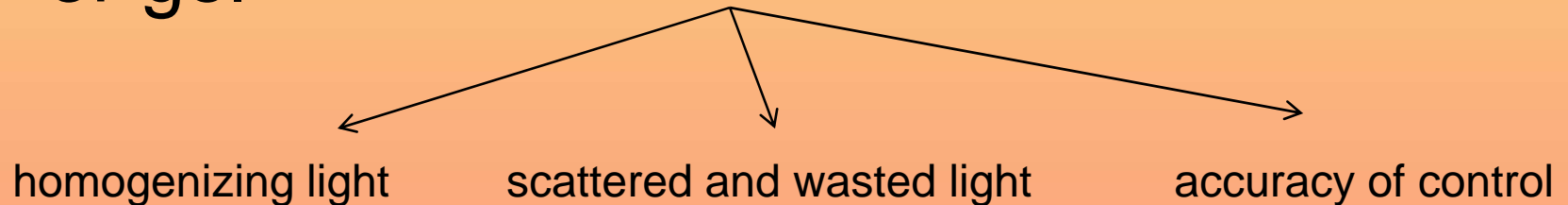
Problems of Gaussian Diffusers

- The Gaussian distribution (the same one we are familiar with from statistics) implies true randomness and lack of control, and that's precisely what a normal frost filter does to light.
- We have very little control over this softening and, in fact, all Gaussian diffusers scatter light everywhere, inevitably producing spill light. They are also inherently inefficient, as the random scattering means a lot of the light is wasted.

Light Shaping Diffusers (LSD)

Non-Gaussian Light Shaping diffusers

- Now we want more out of our diffuser than we can get out of a piece of frosted glass or gel



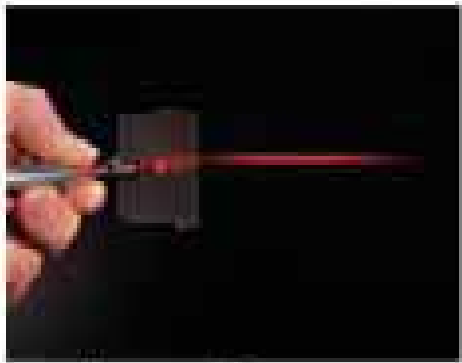
What would be better would be a diffuser that had reduced scatter, a more defined light distribution, and a range of values that allowed us to pick the beam angle we want. That's where our *non-Gaussian diffusers* step in.

Light Shaping Diffusers (LSD)

Non-
Gaussian
diffusers

Beam Shaping

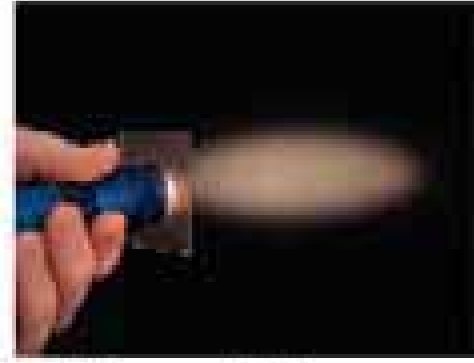
LSDs precisely shape, control and distribute light. The patented holographic master recording process, allows a variety of circular or elliptical light patterns. Standard circular angles range from 0.5° to 80° FWHM.



Laser Source
40" x 0.2" FWHM Linear



LED Source
20" FWHM Circular



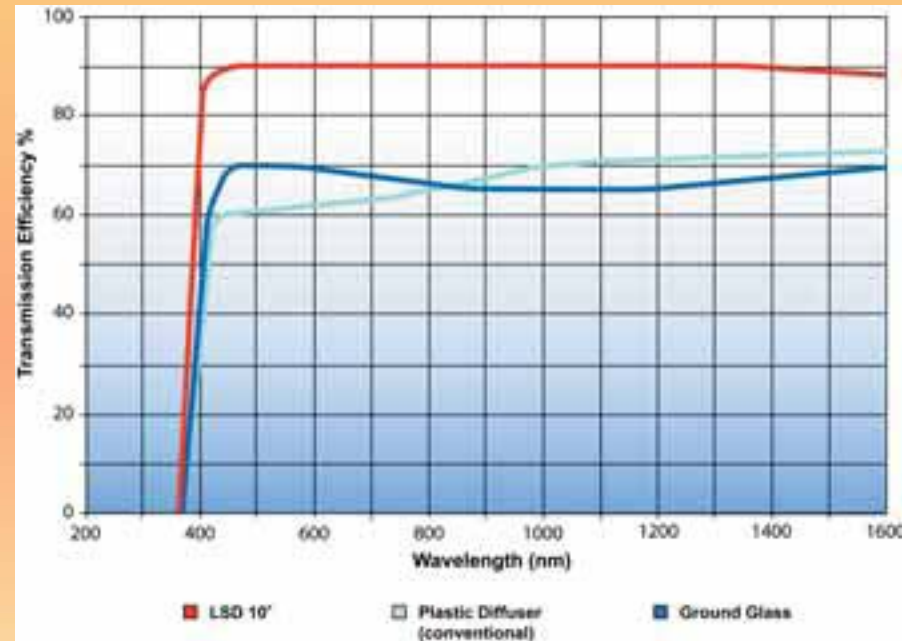
Filament Source
60" x 10" FWHM Elliptical

Light Shaping Diffusers (LSD)

Non-Gaussian diffusers

High Transmission Efficiency - 92%

A holographic diffuser can actually be more efficient than a clear piece of the same plastic. For example, clear polycarbonate is around 89% transparent, whereas the same material with a holographic diffuser layer can be 92 or 93% transparent. This seemingly paradoxical result is achieved by the diffuser layer reducing surface reflections that are the main cause of loss in flat, uncoated materials.

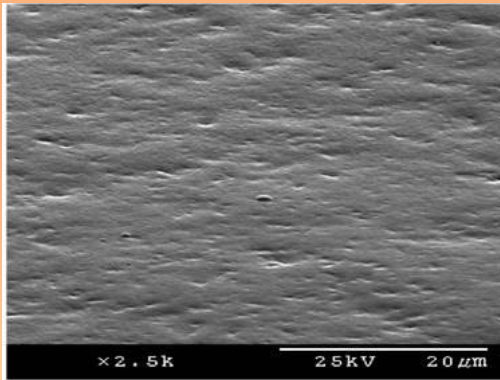


Light Shaping Diffusers (LSD)

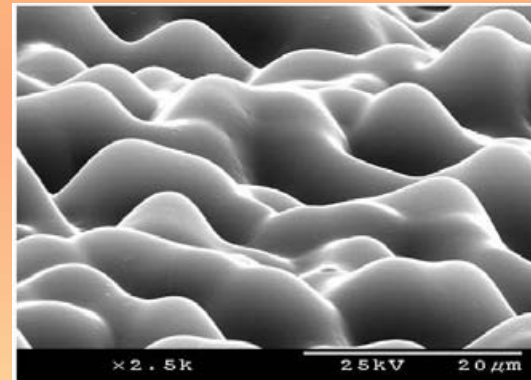
Non-Gaussian diffusers

Technology:
Holographic Light Shaping Diffusers

- The surface is stamped or printed with an epoxy layer with a very fine pseudorandom pattern that has been generated holographically on a master plate or drum



5° diffuser



50° diffuser

Light Shaping Diffusers (LSD)

**THANK
YOU**

Address: 75 Sakr Qurish –
Sheraton Heliopolis – Cairo – Egypt
Tel.: (+202) 22 672 075
Fax: (+202) 22 681 807
Email: pte@powertuningegypt.com
Mobile: (+0100) 621 9325

Eng. Ramy El Zabet

**For more information
please contact us**