

## Random Patterned Diffusers

Diffusers are used for a variety of purposes: to hide a light source or to eliminate the image of its filament; to broaden the angular range over which a signal transmitted through the air is detectable; to make the appearance of a viewing screen more uniform; or to spread the light from a source into a defined angle.

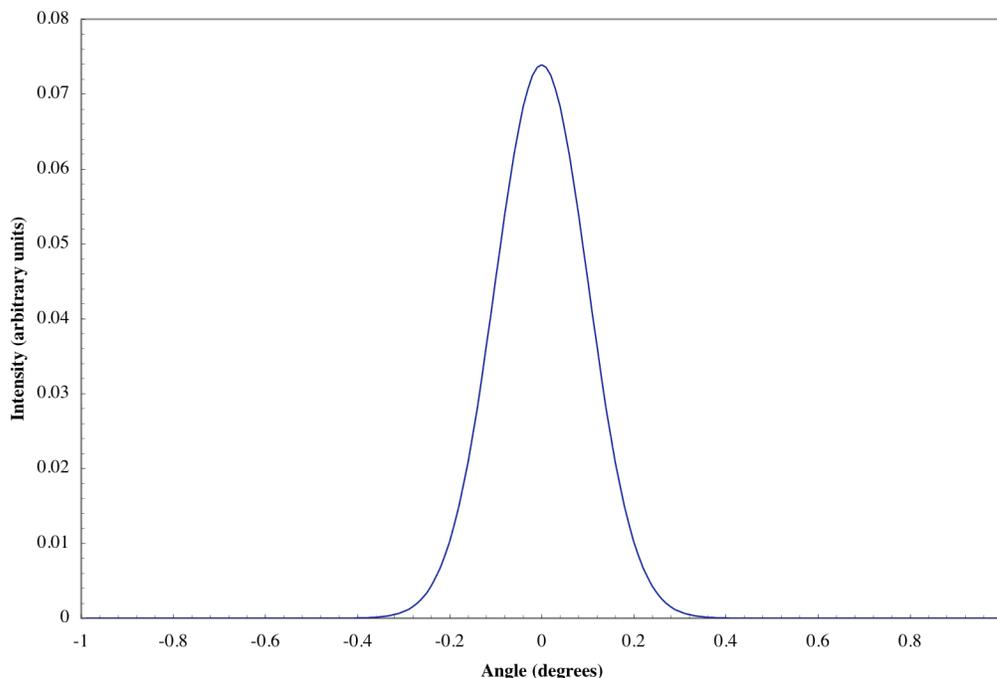


Figure 1 Averaged angular dispersion of the DIFF\_RND\_0.2\_R diffuser.

Many of the diffusers on the market are produced by either etching a surface or creating a regularly spaced array of small lenslets. While suitable for many applications, the structure of these diffusers can -- in certain applications -- cause a number of unwanted effects. Fresnel Technologies' Random Patterned Diffusers are designed to avoid these objectionable artifacts.

In our Random Patterned Diffusers, diffusion occurs because of a randomly spaced array of small lenslets on the surface of a refractive medium. The randomness of

the spacing produces a randomness in the lenslet mean diameter (and shape) and therefore in maximum angle of rays exiting the individual lenslet. This results in a more or less Gaussian distribution of rays (Figure 1). Because of this structure, these diffusers exhibit lower losses than etched surfaces and avoid undesirable interactions with other periodic structures in an optical system that can occur with regularly-spaced lens arrays.

Diffuser Number	Dimensions	Average Diffusion Angle (FWHM)
DIFF RND 0.1 M	3.0" x 3.0"	< 0.1°
DIFF RND 0.1 L	3.0" x 3.0"	0.1°
DIFF RND 0.2 M	3.0" x 3.0"	0.2°
DIFF RND 0.2 R	5.5" x 5.5"	0.2°
DIFF RND 0.5 M	5.5" x 5.5"	0.5°
DIFF RND 0.5 R	5.5" x 5.5"	0.5°
DIFF RND 0.6 R	5.5" x 5.5"	0.6°
DIFF RND 2.5 R	4" dia	2.5°
DIFF RND 4.8 R	5.5" x 5.5"	4.8°
DIFF RND 6.0 R	4.0" x 4.0"	6.0°
DIFF RND 6.9 R	5.5" x 5.5"	6.9°

Table 1 Diffusers currently available. Please note, these angles are for acrylic.

Our Random Patterned Diffusers can be fabricated in most of our optical materials, covering a range of wavelengths from visible to mid-IR. Other sizes and diffusion angles are also available. Please, contact Fresnel Technologies to discuss your specific requirements.

The information presented in this data sheet is correct and reliable to the best of our knowledge. The data sheet is not meant to be all-inclusive and shall be used only as a guide. The data sheet is furnished without warranty, expressed or implied. **fresnel technologies** inc. shall not be held responsible for the use of, or reliance upon, these data for hazards which might be associated with the handling and/or the use of this component or for any results obtained. It is responsibility of the customer to evaluate the suitability and safety of our materials or components for their application.