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UNMOUNTED N-BK7 GROUND GLASS DIFFUSERS

- Offered in 120, 220, 600, and 1500 Grit Polishes
- Polished for Greater Uniformity than Sand Blasting
- Round and Square Diffusers

Application Idea



DG06-220
(1/2")



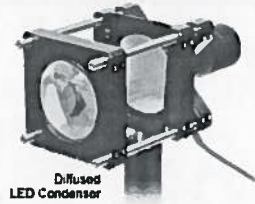
DG10-120
(1")



DG20-600
(12")



DG100X100-120
(100 mm x 100 mm)



Diffused
LED Condenser

OVERVIEW

Features

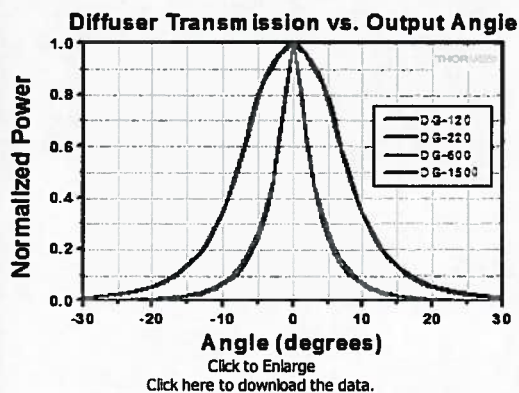
- Available in Four Sizes:
 - Round: 1/2", 1", and 2"
 - Square: 100 mm x 100 mm
- Substrate Material: N-BK7 (Uncoated)

Thorlabs' Unmounted N-BK7 Ground Glass Diffusers provide a solution for a variety of applications requiring a diffuse Gaussian-like distribution. They are offered in 120, 220, 600, and 1500 grit polishes. Each grit polish is available in 1/2", 1", and 2" round sizes as well as 100 mm x 100 mm square version.

For improved transmission, our Ø1" diffusers are also available with either an AR coating for 350 - 700 nm or 650 - 1050 nm. When positioning the diffusers, the grit-polished side should face away from the source.

Polished diffusers are advantageous over sand blasted diffusers, as the surface has greater uniformity. The various grits provide a range from fine to coarse scattering. A finer grit (e.g., 1500) allows higher transmission, while a coarser grit (e.g., 120) creates a wider diffusion pattern at the expense of transmission. Please see the graph to the right to compare the performance of our ground glass diffusers.

Please see the *Application Idea* tab for a Diffused LED Condenser that uses a ground glass diffuser. For applications requiring specific divergence angles, spatial distribution of the illumination, and intensity profiles, our engineered diffusers are more suitable. Thorlabs also offers UV Fused Silica Diffusers for applications that extend into the ultraviolet portion of the spectrum.



Diffuser Selection Guide			
Ground Glass Diffusers			
Standard Diffusers	N-BK7 Substrate	Unmounted, Uncoated	35%
		Unmounted, AR Coated	35% 65%
	UVFS Substrate	Mounted, Uncoated	35%
		Unmounted, Uncoated	18%
Diffuse Reflectors	N-BK7 Substrate	Unmounted, UV-Enhanced Aluminum Coated	25%
		Unmounted, Protected Silver Coated	45%
		Unmounted, Protected Gold Coated	80%
Alignment Disks			
Engineered Diffusers			
Diffuser Kits			

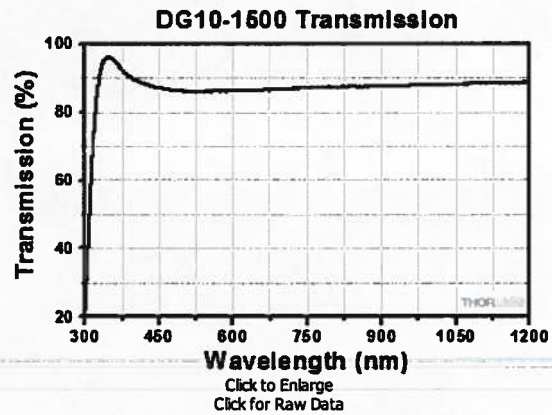
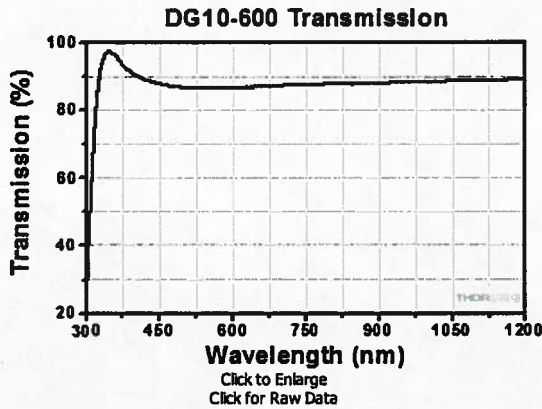
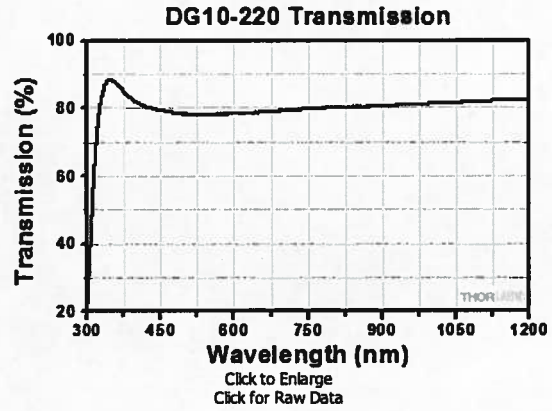
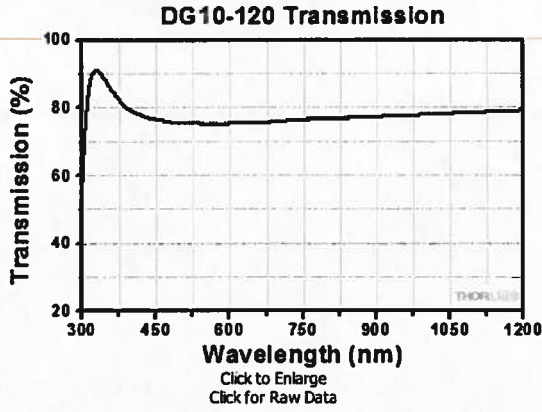
S P E C S

Common Specifications	
Diameter Tolerance ^a	+0.00/-0.25 mm
Thickness	2.0 mm
Thickness Tolerance	±0.2 mm
Clear Aperture	>90%
Surface Flatness of Smooth Side (@ 633 nm)	<4λ
Surface Quality of Smooth Side	80-50 Scratch-Dig
Parallelism	<3 arcmin

- The Diameter Tolerance pertains to round optics and does not pertain to square diffusers.

Item #	Size	Grit
DG05-120	Ø1/2"	120
DG05-220	Ø1/2"	220
DG05-600	Ø1/2"	600
DG05-1500	Ø1/2"	1500
DG10-120	Ø1"	120
DG10-220	Ø1"	220
DG10-600	Ø1"	600
DG10-1500	Ø1"	1500
DG20-120	Ø2"	120
DG20-220	Ø2"	220
DG20-600	Ø2"	600
DG20-1500	Ø2"	1500
DG100X100-120	100 mm x 100 mm	120
DG100X100-220	100 mm x 100 mm	220
DG100X100-600	100 mm x 100 mm	600
DG100X100-1500	100 mm x 100 mm	1500

GRAPHS



APPLICATION IDEA

Build Your Own Collimated LED Source

The setup shown to the right uses a custom 2" x 2", square, 600 grit ground glass diffuser as part of a homemade Diffused LED Condenser, which collimates the light exiting the LED source. Although Thorlabs also manufactures out-of-the-box collimated LED light sources, which essentially provide the same result, the one shown here is perfect for those inclined to build their own, perhaps as part of an educational setup. In this particular case, the setup was built using a 60 mm cage system. If you are not familiar with Thorlabs' 60 mm cage assemblies, they consist of cage-compatible components that are interconnected with cage rods. Each cage component features four tapped holes with center-to-center spacings of 60 mm, and they are joined together into a cage system using $\varnothing 6$ mm rigid steel cage rods; in this case 4" long cage assembly rods were chosen. The reason for building a cage system is to ensure that the optical components housed inside the cage system have a common optical axis.

To integrate the MWWHL3 mounted warm white light LED, which has internal SM1 (1.035"-40) threading, into the 60 mm cage system, the mounted LED was threaded into an LCP02 30 mm-to-60 mm cage plate adapter using an SM1T2 Lens Tube Coupler. Next, the light source is directed through a custom ground glass diffuser, which is held in place using an LCP05 Cage-Compatible Mount for 2" Square Filters. After exiting the diffuser, the divergent light is collimated using an LA1401 $\varnothing 2$ " Uncoated Plano-Convex Lens with a focal length of 60.0 mm. The lens is housed in an LCP01 60 mm Cage Plate.



The entire 60 mm cage assembly is mounted onto a TR3 post using the 8-32 thread on the bottom of the LCP05, placed in a PH3 post holder, and attached to the breadboard using a BA2 mounting base.

Component Items Needed to Build a Diffused LED Condenser		
Item #	Description	Qty.
MWWHL3 ^a	Mounted Warm White Light LED	1
LCP02	30 mm to 60 mm Cage Plate Adapter	1
SM1T2	SM1 (1.035"-40) Coupler, External Threads	1
LCP05	60 mm Cage-Compatible Mount for 2" Square Filters Up to 2 mm Thick	1
N/A	Custom Ground Glass Diffuser, 2" x 2", 600 Grit	1
ER4	Cage Assembly Rod, 4" Long, $\varnothing 6$ mm	4
LCP01	60 mm Threaded Cage Plate (Two SM2RR Retaining Rings Included)	1
LA1401	BK7 Uncoated Plano-Convex Lens, DIA = 50.8 mm, f = 60.0 mm	1
TR3	$\varnothing 1/2$ " x 3" Post	1
PH3	Post Holder with Spring-Loaded Thumbscrew, L=3"	1
BA2	Mounting Base, 2" x 3" x 3/8" (51 x 76 x 10 mm)	1

 $\varnothing 1/2$ " N-BK7 Ground Glass Diffusers

- If you do not currently own an LEDD1B T-Cube LED Driver (or any other industry standard driver with a circular 4-pin M8 connector), you will need to also purchase one of these as well as a TPS001 15 V Power Supply (TPS008 or TCH002 are also options).

Part Number	Description	Price	Availability
DG05-120	$\varnothing 1/2$ " Unmounted N-BK7 Ground Glass Diffuser, 120 Grit	\$11.73	Today
DG05-220	$\varnothing 1/2$ " Unmounted N-BK7 Ground Glass Diffuser, 220 Grit	\$11.73	Today
DG05-600	$\varnothing 1/2$ " Unmounted N-BK7 Ground Glass Diffuser, 600 Grit	\$11.73	Today
DG05-1500	$\varnothing 1/2$ " Unmounted N-BK7 Ground Glass Diffuser, 1500 Grit	\$11.73	Today

Ø1" N-BK7 Ground Glass Diffusers

Part Number	Description	Price	Availability
DG10-120	Ø1" Unmounted N-BK7 Ground Glass Diffuser, 120 Grit	\$13.16	Today
DG10-220	Ø1" Unmounted N-BK7 Ground Glass Diffuser, 220 Grit	\$14.18	Today
DG10-600	Ø1" Unmounted N-BK7 Ground Glass Diffuser, 600 Grit	\$14.18	Today
DG10-1500	Ø1" Unmounted N-BK7 Ground Glass Diffuser, 1500 Grit	\$14.18	Today

Ø2" N-BK7 Ground Glass Diffusers

Part Number	Description	Price	Availability
DG20-120	Ø2" Unmounted N-BK7 Ground Glass Diffuser, 120 Grit	\$16.32	Today
DG20-220	Ø2" Unmounted N-BK7 Ground Glass Diffuser, 220 Grit	\$16.32	Today
DG20-600	Ø2" Unmounted N-BK7 Ground Glass Diffuser, 600 Grit	\$16.32	Today
DG20-1500	Ø2" Unmounted N-BK7 Ground Glass Diffuser, 1500 Grit	\$16.32	Today

100 mm x 100 mm Square N-BK7 Ground Glass Diffusers

Part Number	Description	Price	Availability
DG100X100-120	100 mm x 100 mm N-BK7 Ground Glass Diffuser, 120 Grit	\$42.80	Today
DG100X100-220	100 mm x 100 mm N-BK7 Ground Glass Diffuser, 220 Grit	\$42.80	Today
DG100X100-600	100 mm x 100 mm N-BK7 Ground Glass Diffuser, 600 Grit	\$42.80	Today
DG100X100-1500	100 mm x 100 mm N-BK7 Ground Glass Diffuser, 1500 Grit	\$42.80	Today

Visit the *Unmounted N-BK7 Ground Glass Diffusers* page for pricing and availability information:
http://www.thorlabs.com/newgroupage9.cfm?objectgroup_id=1132