

## 3M Optical Systems



*Dual Brightness Enhancement Film—Diffuse (DBEF-D400)*



For  
Energy Efficient  
Displays



Vikuiti™ Dual Brightness Enhancement Film—Diffuse 400 (DBEF-D400) is a thin, multi-layer reflective polarizer with two diffuse surfaces that provides brightness enhancement for wide viewing angle applications. Vikuiti DBEF-D400 delivers display uniformity, masks minor cosmetic imperfections in the panel, and eliminates wet-out thereby reducing the need for a cover sheet. Vikuiti DBEF-D400 also reduces reflective moiré, is supplied with a premask, and provides improved workability for assembly.

Vikuiti DBEF-D400 is ideal for use with LCD panels in applications where thermal reliability is required.

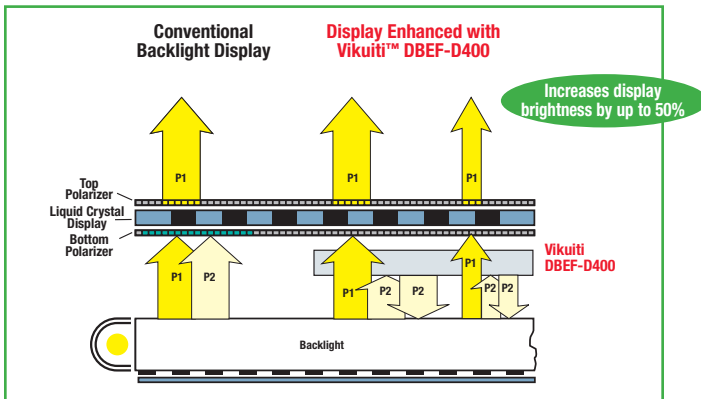




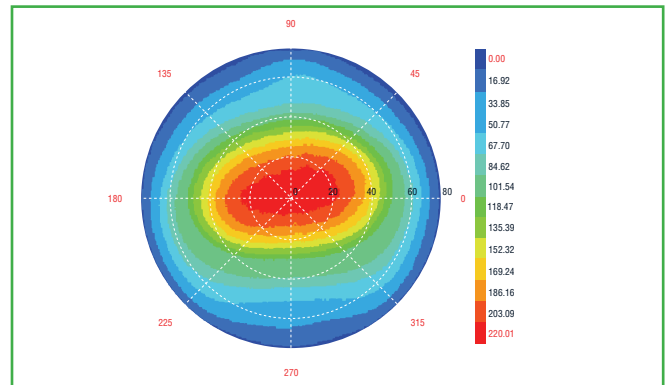
## Vikuiti™ Dual Brightness Enhancement Film–Diffuse 400 (DBEF-D400)

### How it works

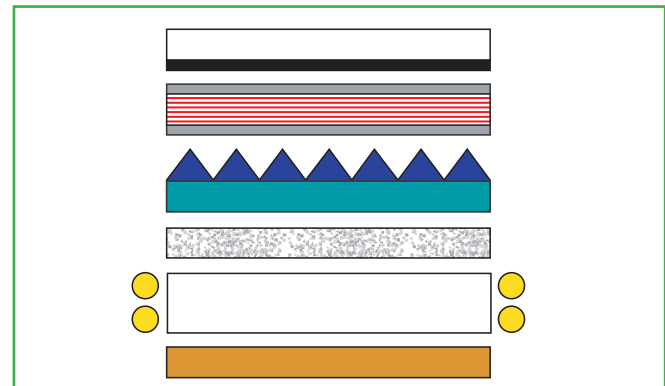
Vikuiti DBEF-D400 works through polarization recycling. The diagram shows a conventional backlight system emitting P1 and P2 light. A typical polarizer absorbs P2, but Vikuiti DBEF-D400 reflects P2 into the backlight, where it is recycled into P1 and P2 light. With Vikuiti DBEF-D400, more P1 light is available to be transmitted through the LCD, increasing on-axis luminance up to 50% for a slab backlight. Vikuiti DBEF-D400 achieves additional on-axis illumination performance in a wedge backlight display by redirecting available light to the viewer.



### Vikuiti™ DBEF-D400 for High Environmental Durability Applications



### TN type LCD-15" slab type backlight



### Nominal film properties

Film properties	Vikuiti™ DBEF II
Axial Luminance (cd/m <sup>2</sup> )	231
Integrated Intensity (lum/m <sup>2</sup> )	350
Number of Films	3
Haze	80%±4%
DBEF-D400 Thickness (µm)	400

Brighter  
brighter



## Warp Performance

Vikuiti™ DBEF-D400 has added protective layers which increase stiffness to help resist warp and improve ease of assembly.

## Testing

The polar plot measurement values indicated on the previous page were obtained through testing Vikuiti DBEF-D400 with Vikuiti™ Brightness Enhancement Film III (BEF III) and a bottom diffuser with a TN type LCD. We performed the test using our laboratory standard backlight and production films.

We measured the power to backlight and measured the axial luminance and expressed the result as Axial Luminance candelas/m<sup>2</sup>. Similarly, we measured the integrated intensity and expressed the result as Integrated Intensity (Lumens/m<sup>2</sup>).

We believe these measurements and reporting techniques clearly and concisely represent the benefits of Vikuiti DBEF-D400 while providing results that are readily comparable to other film stack combinations.

## Performance of Vikuiti™ DBEF-D400

Film properties	Monitor Applications	Notebook Applications
Axial Gain		
+ Vikuiti DBEF-D400	1.58	1.58
+ Vikuiti BEF II 90/50	2.0	–
+ Vikuiti xBEF II 90/50	–	2.21
Color	x=0.286 y=0.288	x=0.291 y=0.298
Axial Contrast Ratio	284	327
Haze	80%±4%	80%±4%
Environmental Performance:		
Cold (-40°C)	Stable	Stable
Dry Heat (*85% C)		
Heat & Humidity (65°C/95%RH)		
Thermal Shock (-35°C/85°C)		

The technical data for the products are typical, based on information accumulated during their life, and are not to be used in the generation of purchase specifications, which define property limits rather than typical performance.



## Important Notice to Purchaser

**The following is made in lieu of all warranties, express or implied, including any implied warranties of merchantability or fitness for a particular purpose.** 3M warrants that, at the time of shipment, product will meet 3M's published specification or that specification agreed in writing between 3M and purchaser. Should product not meet specifications at time of shipment, 3M will replace or refund the purchase price of such quantity of the product found not to meet specifications. Purchaser shall determine the suitability of the 3M product for purchaser's application. 3M shall not be liable under any legal theory, including in contract or in tort, for any injury, loss, or damage, whether direct, indirect, incidental, special or consequential, arising out of the use of or the inability to use the product. **The warranties and remedies set forth herein are purchaser's sole and exclusive warranties and remedies.**

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