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## **Vikuiti™ Brightness Enhancement Film II (BEF II)**

## **Vikuiti™ Brightness Enhancement Film III (BEF III)**

## **Vikuiti™ Thin Brightness Enhancement Film (TBEF)**

### **Description**

The prismatic structure of Vikuiti™ Brightness Enhancement Film (BEF) allows you to manage the angle of light exiting from your display. Vikuiti BEF films work by utilizing the principles of refraction and total internal reflection. The process of refracting usable light towards the viewer and reflecting most of the remaining light back into the display is called recycling. This form of light management can be done with a single sheet of Vikuiti BEF film or two sheets crossed at 90 degrees to each other. Vikuiti BEF films can also be used with Vikuiti™ Dual Brightness Enhancement Films (DBEF) and Vikuiti™ Enhanced Specular Reflector (ESR) to further increase the efficiency of your display.

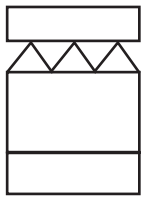
**Vikuiti™ BEF II Film** This is the current version of the original Vikuiti BEF I film, which has been out of production for some time. It features an acrylic resin prismatic structure coated on a polyester substrate. This is the highest performance member of the family, and incorporates structural features which helps avoid wet-out, which is an optical coupling that can mar the appearance of an LCD display. It is available in the standard 90/50 version, and a 90/24 version for additional moiré avoidance.

**Vikuiti™ BEF III Film** This is a newer version, featuring similar structural elements to Vikuiti BEF II film, but utilizing a randomized prism pattern for increased wet-out and reflective moiré avoidance. It has slightly lower performance than Vikuiti BEF II film. It is also available in an M (Matte) version. The M version softens the brightness fall-off at the edges and may allow the elimination of a separate diffuser from the display. Essentially, Vikuiti BEF III film is a slightly lower cost, slightly lower performance alternative to Vikuiti BEF II film.

**Vikuiti™ TBEF Film** The "T" stands for Thin. Vikuiti TBEF film has excellent optical performance, yet is less than half as thick as Vikuiti BEF III film. It is intended for those applications where the thickness of the entire display/module must be kept to an absolute minimum. Its thin nature makes it somewhat less robust, and should be restricted to relatively smaller displays where its reduced warp resistance and environmental stability will not be a factor.

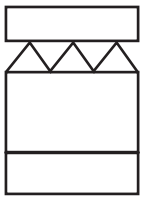
The figures below illustrate the film's basic constructions. All dimensions are approximate, and the figures are not drawn to scale.

### Vikuiti™ BEF II 90/50 Film



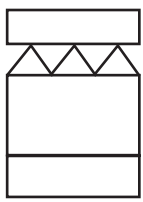
Removable Liner . . . . .	40 microns
Prismatic Structure . . . . .	23 microns
Polyester Substrate . . . . .	127 microns
Removable Liner . . . . .	<u>60 microns</u>
<b>Delivered Thickness . . . . .</b>	<b>250 microns</b>
<b>Applied Thickness . . . . .</b>	<b>150 microns</b>
<b>(excluding liners)</b>	

### Vikuiti™ BEF II 90/24 Film

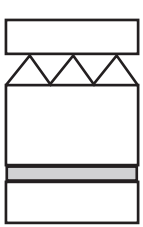


Removable Liner . . . . .	45 microns
Prismatic Structure . . . . .	13 microns
Polyester Substrate . . . . .	127 microns
Removable Liner . . . . .	<u>60 microns</u>
<b>Delivered Thickness . . . . .</b>	<b>245 microns</b>
<b>Applied Thickness . . . . .</b>	<b>140 microns</b>
<b>(excluding liners)</b>	

### Vikuiti™ BEF III-T Films

	<b>5T</b>	<b>10T</b>
 Removable Liner . . . . .	40 microns	40 microns
Prismatic Structure . . . . .	28 microns	24 microns
Polyester Substrate . . . . .	127 microns	254 microns
Removable Liner . . . . .	<u>60 microns</u>	<u>60 microns</u>
<b>Delivered Thickness . . . . .</b>	<b>255 microns</b>	<b>378 microns</b>
<b>Applied Thickness . . . . .</b>	<b>155 microns</b>	<b>278 microns</b>
<b>(excluding liners)</b>		

### Vikuiti™ BEF III-M Film



Removable Liner . . . . .	40 microns
Prismatic Structure . . . . .	28 microns
Polyester Substrate . . . . .	127 microns
Matte Coating . . . . .	5 microns
Removable Liner . . . . .	<u>60 microns</u>
<b>Delivered Thickness . . . . .</b>	<b>260 microns</b>
<b>Applied Thickness . . . . .</b>	<b>160 microns</b>
<b>(excluding liners)</b>	

### Vikuiti™ TBEF Film



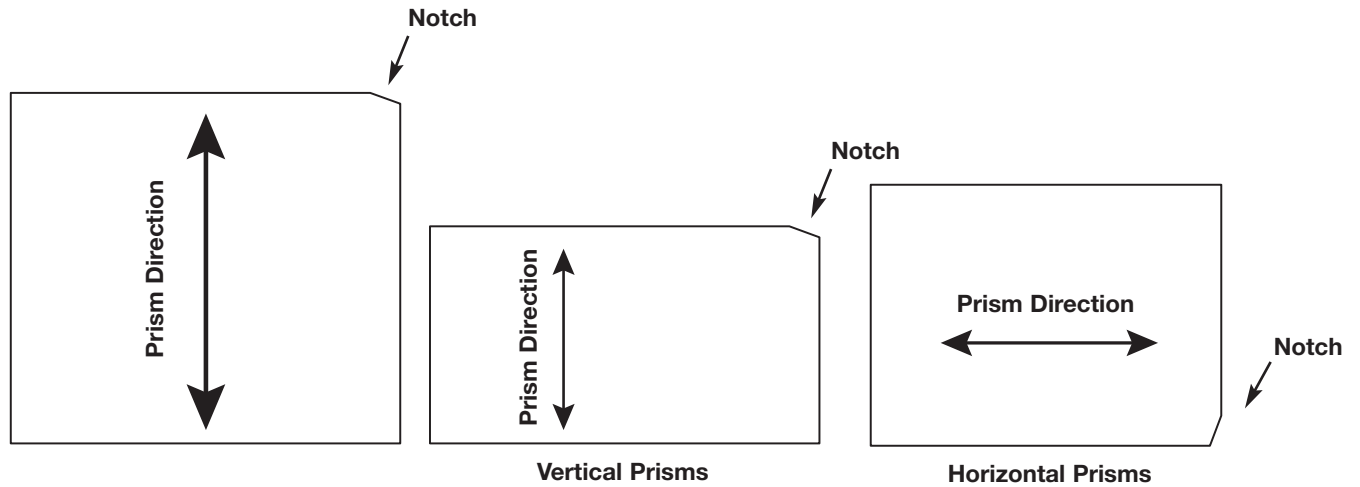
Removable Liner . . . . .	40 microns
Prismatic Structure . . . . .	12 microns
Polyester Substrate . . . . .	50 microns
Removable Liner . . . . .	<u>75 microns</u>
<b>Delivered Thickness . . . . .</b>	<b>177 microns</b>
<b>Applied Thickness . . . . .</b>	<b>62 microns</b>
<b>(excluding liners)</b>	

### Formats

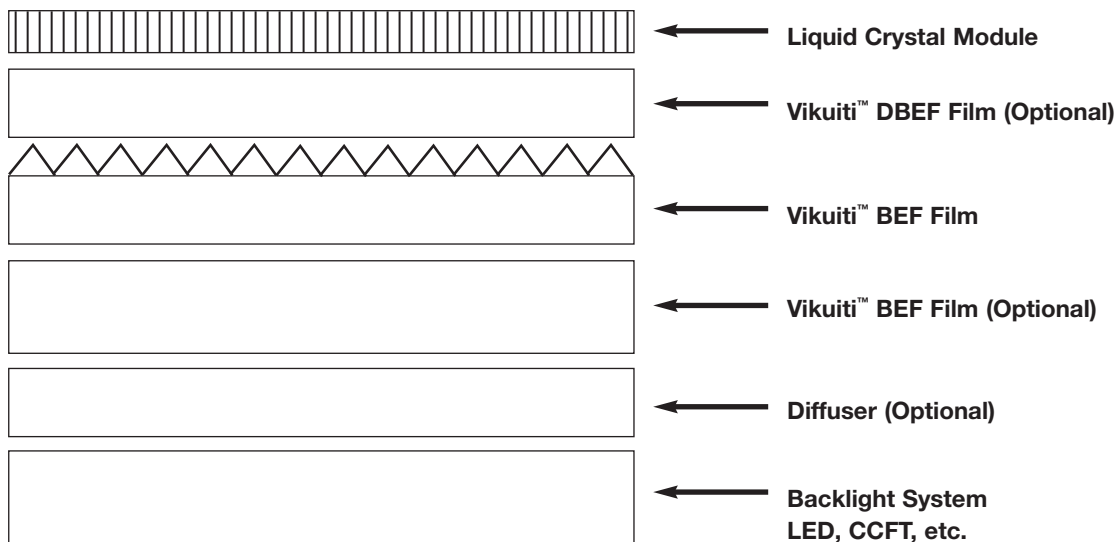
Reference the current price sheet or call customer service (1-800-553-9215) for information on part sizes.



To help you orient the film, the sheets will have a small notch cut into one of the corners. Hold the sheets with the cut notch in the upper right-hand corner to identify the prism direction for square parts and rectangular parts with vertical prisms. Orient the notch to the lower right hand corner for rectangular parts with horizontal prisms as illustrated below. When held like this, you will be looking at the upper surface with the prismatic structure, which must face the LC glass module, and away from the backlight.



### Typical Application



The Vikuiti BEF film family increases on-axis brightness by compressing light into a narrower viewing angle. It is mounted with the prisms running either vertically or horizontally. The compressed viewing angle will be primarily on the plane that is 90 degrees away from the direction of the prisms. In other words, if the prisms are running vertically, the viewing angle will be compressed in the horizontal plane, and with a slight compression in the vertical plane. Likewise, if the prisms are running horizontally, then the viewing angle will be compressed in the vertical plane, with a slight compression in the horizontal plane.

As is shown in the “Typical Application” above, Vikuiti BEF film must always be mounted with the prisms facing the LC module, and away from the backlight. If a second sheet of Vikuiti BEF film is to be used to gain even greater brightness, its prism direction must be 90 degrees away from the prism direction of the first sheet, and the viewing angle will then be compressed in both the horizontal and vertical planes.

If a sheet of the Vikuiti DBEF film family is to be included for maximum brightness, it should always be mounted on top of the Vikuiti BEF film, closest to the LC module.

## General Converting, Assembly, and Handling Recommendations

During converting operations, both the front and rear protective liners should remain on the film.

Die cutting is the recommended form of converting and will result in the cleanest edges, although shear cutting and laser cutting may also be acceptable. Whatever method used, you should ensure that the part has clean, crisp edges without any raggedness or other damage.

The part should be precisely cut to provide a close fit in the cavity, yet not so close to experience binding or warping problems from thermal expansion.

The part should be left free-floating in the cavity to avoid warping or buckling. If necessary, the part may be tacked down along one edge or two adjacent corners with a double coated tape, such as Scotch® Tape #415. Designs incorporating mounting tabs, or holes mated to mounting pins are also popular.

Remove both protective liners, if the film has them, by tacking near an edge or corner with a piece of aggressive tape and pull gently.

Be aware that handling any polymer film can generate electrostatic charges which can attract dust and debris.

Remove any loose debris from the film by using compressed air.

Avoid fingerprints and debris by wearing clean latex gloves and holding the product at the edges.

Keep the area very clean to lessen the likelihood of debris contamination. Maintaining class 1000 clean room conditions is recommended.

Using anti-static measures, such as ionized air blowers whenever possible, is recommended.

As always, protect the film, especially the edges, from any undue shock or stress.

## Storage

Material should be stored in its original packaging, laying in a horizontal orientation, away from direct sunlight.

Heavy objects should not be piled on top of it to avoid damaging the product. Ambient temperature and humidity should be controlled to 10 – 30 degrees C at 50 +/- 20% R.H.

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Minimum 10% Post-Consumer Fiber

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