3M™ EPE Film Application Guidelines

3M™ EPE Films are a multi-layer film product consisting of an EVA layer bonded to both sides of a polyester film. These films can be used with crystalline silicon and thin film solar cells in both rigid and flexible modules. 3M EPE Films are designed to provide electrical insulation between components and serve as a cosmetic mask to provide consistent appearance.

3M EPE Film is designed for easy use by module manufacturers. It can be used with common production equipment and lamination cycles. During lamination, strong, stable bonds are formed to most encapsulants. When handling 3M EPE Film, care must be taken to prevent damage to the film.

The information provided in these guidelines is general or summary in nature and is offered to assist the user in developing their own process for using 3M EPE Films. The information is not intended to replace the user's careful consideration of the unique circumstances and conditions involved in using 3M EPE Films, or to supersede any safety or site policies or procedures that a user may have. The user is responsible for determining whether the information contained in these guidelines is suitable and appropriate for the user's particular intended application.

(a) without 3M™ EPE Film

(b) with 3M™ EPE Film

Figure 1 – Solar module without (a) and with (b) 3M EPE Film used as a cosmetic mask.

Typical Product Forms: 3M EPE Films are provided in roll form which are suitable for slitting, sheeting or die cutting for specific forms as needed in your application.

Product	Color	Nominal Product Thickness µm (mils)		
		EVA	PET	Total
EPE D300	White	2 × 100 (2 × 4)	100 (4)	300 (12)

Table 1. 3M EPE Film Products

Cosmetic Masking with 3M EPE Films:

When solar modules are incorporated into roofs and walls it is desirable to cover electrical connections so that the module has a uniform and appealing appearance. 3M EPE Films can be used to cover bus bars in photovoltaic modules to make the appearance more uniform as shown in Figure 1.

Dielectric Insulation using 3M™ EPE Films:

The electrical isolation of bus bars or other electrical connections within a solar module can be easily accomplished by using 3M EPE Films. Isolation of lead wires that connect the junction box to a solar module can be accomplished by using a die cut patch of 3M EPE Films as shown in Figure 2. Specific dimensions of the die cut patch are determined by the module and junction box design.

3M EPE Films are easily repositionable during lay up as they are not tacky until heated. If required, temporary bonding of the 3M EPE Film to the laminate construction can be accomplished by local heating with a hot bar. In this way the 3M EPE Film will stay in a fixed location relative to the module components prior to full lamination.

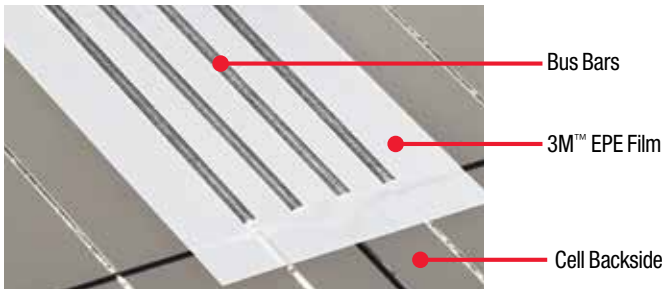

Figure 2 – 3M EPE Film used as dielectric insulation near the junction box in a solar module.

Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

Material Compatibility: 3M™ EPE Films are compatible with most commercially available backsheets including 3M™ Scotchshield™ Film backsheets. Commercially available encapsulants, solar cells, solar cell substrates, and bus bar materials are also compatible with 3M EPE Films. Typical encapsulants used include EVA and polyolefin. Examples of cell materials include c-Si, CdTe, CIGS, and amorphous Silicon. Typical cell substrate materials include silicon, stainless steel, and coated polymeric films such as polyamides.

Typical Lamination Conditions: 3M EPE Films can be incorporated into solar modules using several lamination technologies including conventional vacuum lamination or roll to roll lamination. Temperature and pressure needed for lamination depends on the specific materials employed with the 3M EPE Films. Typical conditions are shown in Figure 3.

Lamination Technology	Temperature (°C)	Applied Pressure atm (PSI)
Vacuum	120-160	1 (14.7)
Roll to Roll	140-160	0.3-2.3 (5-35)

Figure 3 – Typical lamination conditions for 3M EPE Film products.

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82 2 3771 4043

India
91 80 22231414

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For more information on our solar manufacturing product line, contact 3M Renewable Energy at 800-755-2654 or visit us at www.3M.com/solar.

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