PowerFilm Solar - FAQs

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What is PowerFilm®?

PowerFilm is a line of flexible solar modules with a thin film plastic substrate.

What is the base technology of PowerFilm®?

Thin film amorphous silicon photovoltaics.

How is PowerFilm® made?

PowerFilm is manufactured using breakthrough proprietary manufacturing processes. The core process is a true roll-to-roll process. The general process steps are Vacuum Deposition (Back Metal, Amorphous Silicon, Transparent Top Contact), Printing and Laser Scribing, Bus Bar/Lead Attachment, Encapsulation, and Die Cutting. PowerFilm is patterned on a 13 inch wide web on a roll up to 2400 feet long.

What are the benefits of PowerFilm® modules being produced on a true roll-to-roll process?

The proprietary roll-to-roll semiconductor manufacturing process of Iowa Thin Film Technologies™ enables lower-cost manufacturing and enhanced product functionality through ease of customization.

How thin are PowerFilm® flexible solar modules?

PowerFilm is very thin, like paper. Encapsulated modules range from 0.22mm (8 mil) to 1.22mm (44 mil) thick. The thin aspect of PowerFilm allows it to be ultra flexible.

How does PowerFilm® compare in flexibility to other solar cells or modules?

PowerFilm is so flexible it can be curved around a cylinder 2 inches in diameter. This is possible because PowerFilm has a plastic (polyimide) substrate. PowerFilm is the most flexible solar module.

What can PowerFilm® provide energy for?

PowerFilm can be used for both large- and small-scale power generation. It can power devices directly or recharge batteries from which devices draw power. The current focus is on small-to-medium-scale power generation. New products are being developed for large-scale power generation.

For which applications are PowerFilm® modules suitable?

PowerFilm is being used in a broad range of applications. The current application categories are Consumer Electronics, Outdoor and Recreation, Remote and Military, and Indoor Lowlight. We are also developing products for Building Integrated Photovoltaics (BIPV). The BIPV products have not yet been commercially launched.

The modules are available in a variety of encapsulants that enable their use in diverse operating environments, both indoor and out, from deserts to tropics to polar conditions

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What physical sizes are the modules offered in?

PowerFilm modules are made in a variety of sizes. For example, the size of some small modules are 1.5x2.5 inches, and 1x4.5 inches. For applications with significant volumes, custom modules can be made that are even smaller. Large modules are approximately 1 foot wide and several feet long. The modules can be connected in an array for larger-scale power generation.

What is the efficiency of PowerFilm® modules?

Overall efficiency is strongly dependent on the module design configuration which determines the percentage of the area which is actually collecting sunlight. You can use 5% as a starting point. We have ongoing research and development programs to continue to improve the efficiency of PowerFilm modules. Note: There are widely varying standards for module efficiency numbers. We encourage you to test actual commercially manufactured modules on a consistent basis.

What is the ideal temperature range for PowerFilm® to be used in?

The modules are guaranteed to perform in normal atmospheric conditions. The optimal temperature is usually 25-50 C. surface temperature. The module is guaranteed to perform in normal atmospheric conditions (50 C. surface temperature). For all solar modules voltage output drops with increasing temperature.

In what range of voltages do PowerFilm® modules come?

Standard products come in the following powerpoint voltages: 1.8, 3, 3.6, 4.2, 7.2, and 15.4.

What is the life expectancy for PowerFilm® modules?

The encapsulation of the PowerFilm module will determine the life expectancy of the encapsulated module.

Photovoltaic Semiconductor Device - No particular life expectancy limitation in protected environment.
Polyester Encapsulation - Limited to protected use (e.g., consumer electronics) or limited time outdoor use.
Tefzel®/EVA Encapsulation - Best protection for permanent outdoor use. Tefzel® is a registered trademark of DuPont.