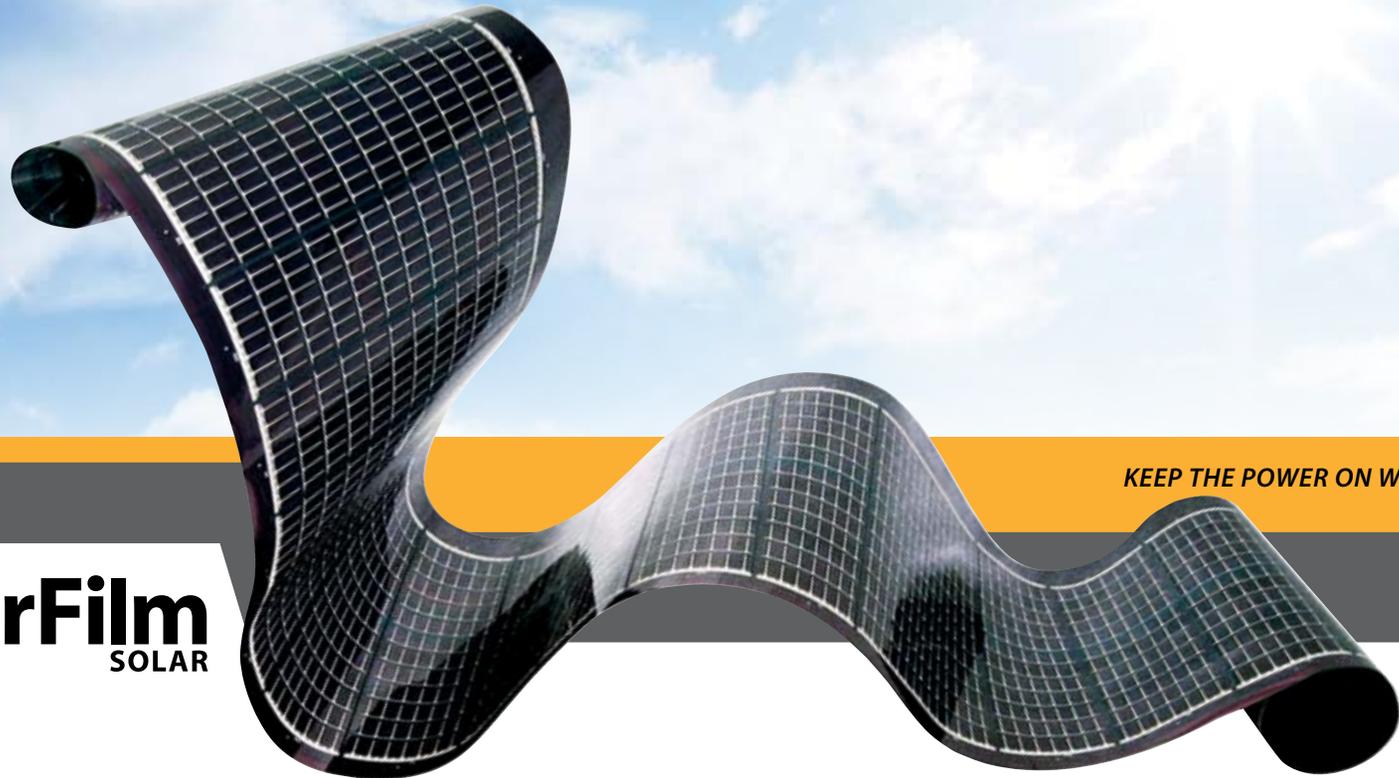


# POWERFILM



PRODUCT BROCHURE

*KEEP THE POWER ON WITH POWERFILM*

**PEI** **PowerFilm**  
SOLAR

PowerFilm, Inc. is a world-leading developer and manufacturer of thin, flexible solar modules using a proprietary low-cost production process.

PowerFilm was founded in 1988 by Dr. Frank Jeffrey and Dr. Derrick Grimmer, former 3M research physicists with a combined 65 years of experience in semiconductor and solar energy research and development.

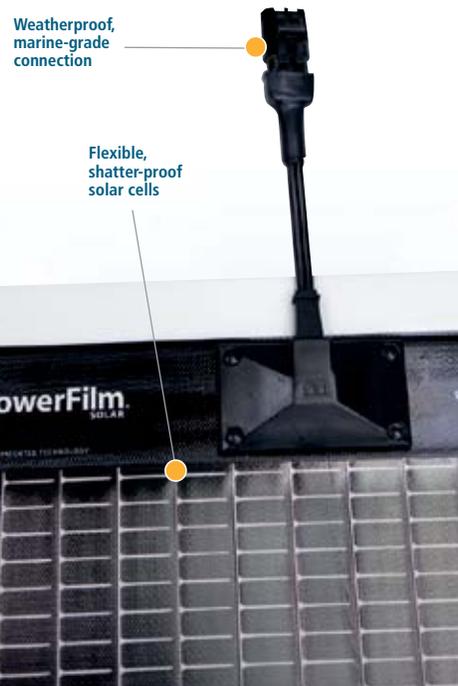
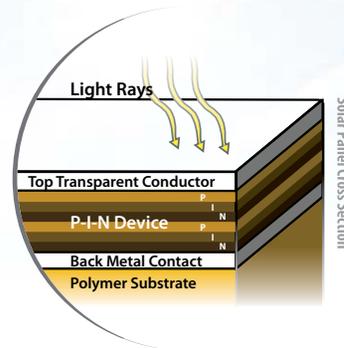
Since 1988, PowerFilm has focused on developing thin film solar module technology through an industrial scale manufacturing process. The result: low-cost solar modules on a high volume basis. Elements of the company's low-cost technology and manufacturing process include the use of:

- A durable, flexible plastic substrate
- Roll-to-roll manufacturing to minimize handling costs
- Amorphous silicon to avoid dependence on the silicon wafer market cycle
- Printed interconnect to automate the cell connection process

The company's primary objective is to supply solar solutions to select portable and remote power applications, custom and OEM solar module markets, and the building integrated market. PowerFilm is in the process of expanding production capacity to meet the rapidly growing demand for solar products in today's alternative power source marketplace.

**PowerFilm recognizes that solar by itself is not necessarily the ultimate solution, but rather a piece of the solution. Therefore, we actively look to identify partnership opportunities with other companies whose products, branding, and distribution channels are established to bring total solar solutions to the marketplace.**

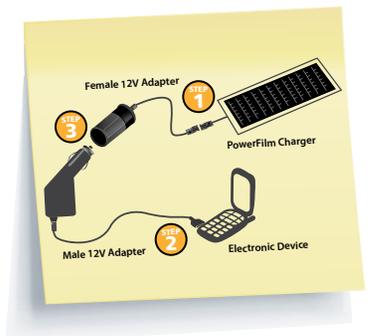
Contact us today at  
+1 888 354 7773 or online  
at [www.powerfilmsolar.com](http://www.powerfilmsolar.com)



# Easy to CONNECT

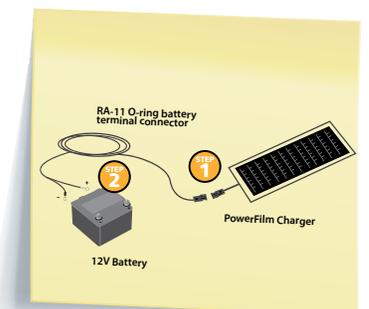
## ➤ CHARGE WIRELESS ELECTRONICS

- STEP 1:** Connect the 12V female cigarette lighter adapter to your PowerFilm Charger
- STEP 2:** Connect the electronic device to a 12V male cigarette lighter adapter
- STEP 3:** Connect the female adapter to the male adapter to start charging



## ➤ CHARGE 12 VOLT SYSTEMS

- To direct power or charge 12V batteries:**
- STEP 1:** Connect your PowerFilm Charger directly to an O-ring battery terminal connector
- STEP 2:** Connect the O-ring battery terminal connector directly to a 12V battery



## ➤ CHARGE LITHIUM, NiCAD or NiMH

- STEP 1:** Connect your PowerFilm Charger to a 12V female cigarette lighter adapter
- STEP 2:** Connect the 12V female cigarette lighter adapter to a 12V battery charger pack

# ROLLABLE LINE

## Rollable Chargers (4 sizes available\*)

Built with the same solar technology that goes into every PowerFilm solar module, the Rollable Solar Charger line is extremely durable, lightweight, and easily integrated to provide power for a number of charging applications.

- ✓ **PERFORMS EVEN IN LOW LIGHT** PowerFilm Solar chargers have been designed to absorb light even during low light conditions. The panel is able to charge for more hours per day than competing technologies
- ✓ **WATERPROOF** A perfect solar solution for wet and water-logged environments, PowerFilm Rollable Solar Chargers are fully waterproof and constructed with marine grade connectors to provide a portable solar solution for marine environments
- ✓ **EXTREME DURABILITY** PowerFilm Rollable Solar Chargers resist point damage extremely well, resulting in a charger that still functions, with minimal loss of output, even after being subjected to puncturing (*note: puncturing will affect the ability of the solar panel to repel water*)



*What can I use this for?*  
 SAFE Battery Charging  
 Camping  
 Trolling Motor  
 Trickle-charging a Boat Battery  
 ...And more!



Wattage:	7	14	21	28
Operating Voltage:	15.4	15.4	15.4	15.4
Rolled Dimensions:	4" dia. x 14.5"			
Unrolled Dimensions:	14.5" x 23"	14.5" x 42"	14.5" x 60.75"	14.5" x 79.75"
Weight:	0.59 lbs.	0.98 lbs.	1.42 lbs.	1.8 lbs.
Size of Electronics:	Small	Small - Medium	Small - Large	Large

*Includes:* RA-2 and RA-11



\*Also available: Rollable "Classic" Models (5, 10 and 20 Watt). Visit our website for more information.  
[www.powerfilmsolar.com](http://www.powerfilmsolar.com)

# FOLDABLE LINE

## Foldable Chargers

PowerFilm Foldable Chargers come in a wide range of power output configurations and are virtually unlimited in application.

✓ **PERFORMS EVEN IN LOW LIGHT** PowerFilm Foldable Solar Chargers have been designed to absorb light even during low light conditions. The panel is able to charge for more hours per day than competing technologies

✓ **EXTREME DURABILITY** PowerFilm Foldable Solar Chargers resist point damage extremely well, resulting in a charger that still functions, with minimal loss of output, even after being subjected to puncturing

✓ **INSTANT POWER** PowerFilm Foldable Solar Chargers DO NOT require any sun-soaking prior to use

✓ **ALL FOLDABLE PRODUCTS ARE AVAILABLE IN THE FOLLOWING FABRICS:**



Black DigiCam Khaki Woodland Desert Camo

Includes: RA-2



*The foldable line of solar chargers is designed to be used primarily in dry environments. Although the panel CAN get wet, prolonged exposure to moisture can affect performance and the panel should be fully dry prior to use after exposure to wet conditions. For solar power in wet environments, consider using the fully weatherproof Rollable Solar Charger line.*



<b>F15-300N Wattage:</b>	<b>5</b>
Operating Voltage:	15.4
Folded Dimensions:	3.3" x 10.5" x 1"
Unfolded Dimensions:	10.5" x 24.4"
Weight:	0.45 lbs.
Size of Electronics:	Small



<b>F15-450N Wattage:</b>	<b>7.5</b>
Operating Voltage:	15.4
Folded Dimensions:	3.5" x 10.5" x 1.5"
Unfolded Dimensions:	10.5" x 35"
Weight:	0.6 lbs.
Size of Electronics:	Small



<b>F15-600 Wattage:</b>	<b>10</b>
Operating Voltage:	15.4
Folded Dimensions:	3.5" x 10.5" x 1.3"
Unfolded Dimensions:	21" x 23.7"
Weight:	0.73 lbs.
Size of Electronics:	Small - Medium



<b>F15-1200 Wattage:</b>	<b>20</b>
Operating Voltage:	15.4
Folded Dimensions:	6.5" x 11" x 1"
Unfolded Dimensions:	31.7" x 30"
Weight:	1.27 lbs.
Size of Electronics:	Small - Large



<b>F16-1800 Wattage:</b>	<b>30</b>
Operating Voltage:	15.4
Folded Dimensions:	9.5" x 11" x 1"
Unfolded Dimensions:	31.7" x 41.3"
Weight:	1.76 lbs.
Size of Electronics:	Small - Large



<b>F16-3600 Wattage:</b>	<b>60</b>
Operating Voltage:	15.4
Folded Dimensions:	9.5" x 11" x 2"
Unfolded Dimensions:	43" x 59"
Weight:	3.19 lbs.
Size of Electronics:	Small - Large



<b>FM16-5400 Wattage:</b>	<b>90</b>
Operating Voltage:	15.4
Folded Dimensions:	11" x 14" x 3"
Unfolded Dimensions:	54.4" x 68"
Weight:	5 lbs.
Size of Electronics:	Small - Large

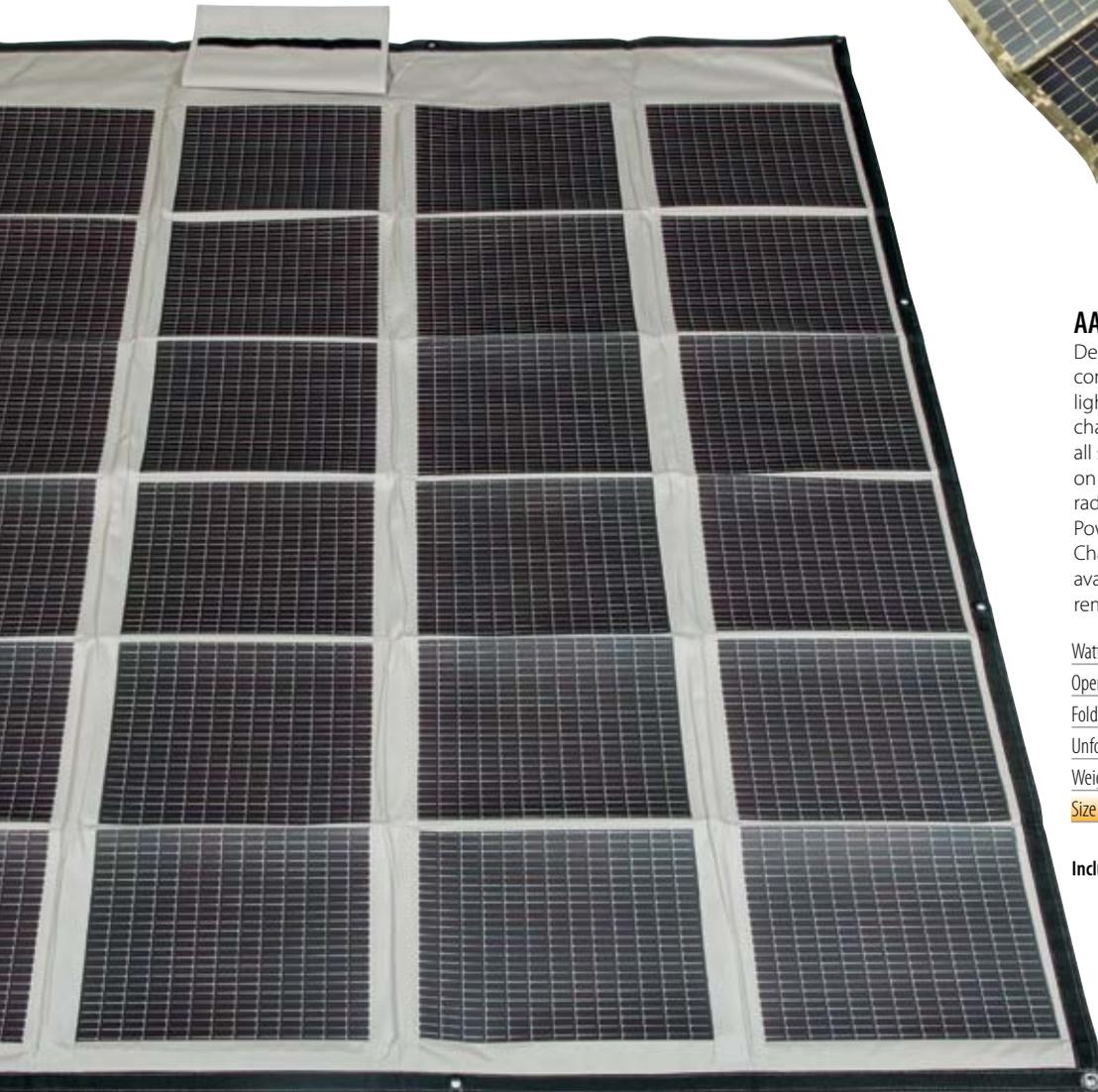


<b>FM16-7200 Wattage:</b>	<b>120</b>
Operating Voltage:	15.4
Folded Dimensions:	14" x 14" x 3"
Unfolded Dimensions:	86.5" x 54.5"
Weight:	6.5 lbs.
Size of Electronics:	Small - Large



What can I use this for?

Ham Radio  
Battery Charging  
12v Electronics Power  
(when properly sized)  
...And more!



### USB+AA Solar Charger

Go from fully spent to fully charged in just four hours (in direct sun conditions). In addition to battery charging, utilizing the universal USB port and working with two rechargeable batteries allows for direct charging of most small USB devices, like cell phones, smart phones, and iPods.

Wattage:	1.5
Operating Voltage:	3.6
Folded Dimensions:	5.5" x 3.25" x 1.38"
Unfolded Dimensions:	5.5" x 24"
Weight: (without batteries)	4.9 oz.
Size of Electronics:	USB 2.0 compliant devices

Includes: Two AA Rechargeable NiMH Batteries

### AA Solar Charger

Designed to provide a convenient, compact, ultra lightweight, portable battery charging solution. Perfect for all small electronics running on AA batteries, ranging from radios to gaming devices. The PowerFilm AA Foldable Solar Charger keeps fresh batteries available, no matter how remote the location.

Wattage:	2.2
Operating Voltage:	3.6
Folded Dimensions:	5.5" x 3.3" x 1.4"
Unfolded Dimensions:	5.5" x 31.5"
Weight: (without batteries)	4.18 oz.
Size of Electronics:	AA Batteries (2 or 4)

Includes: Four AA Rechargeable NiMH Batteries



# SPECIALTY LINE

## PowerTour RV Solar Panels

PowerTour RV Solar Panels offset all parasitic power loss from smoke or propane detectors, clocks, and other items that drain your battery. Maintains the primary battery, extends battery life, frees you from the need for a direct power source, runs the power jack and activates the power slide without plugging in. Comes complete with an optional installation kit with peel-and-stick adhesive backers.

	RV-15V-2700	RV-15V-3900
Wattage:	42	60
Operating Voltage:	15.4	15.4
Dimensions:	26.14" x 60.81"	26.14" x 86.05"

Includes:



## Solar Golf Cart Kits

Thin, lightweight, flexible solar panel with peel-and-stick adhesive backer designed to maintain charge and reduce depth of discharge in electric carts. Reduces costs associated with charging, increases range, extends battery life, and comes complete with all materials for easy self installation.

Wattage:	37/42
Operating Voltage:	15.4
Unfolded Dimensions:	26.25" x 51.3"



## E&P Solar Panels

The Emergency and Police (E&P) solar module was designed to provide additional power to fleet vehicles. Offsetting the additional power consumption used by radios, chargers, and computers, it is versatile and portable thanks to a magnetic backer for mounting to a variety of vehicles. Comes complete with all connections and wiring. Available exclusively at [www.soundoffsignal.com](http://www.soundoffsignal.com).

Wattage:	28
Operating Voltage:	15.4
Dimensions:	44.8" x 26.3"

### PowerPack +Plus

The PowerFilm solar panel charges the battery pack, which powers the LED fan/light combination to provide you with security and climate control when you need it. Use the PowerPack +Plus in areas lacking a power source such as cabins or caves, or even at home during power outages. In addition, the solar panel can be used for other charging applications – charging your car battery, RV camper and 12 volt battery products.

Wattage:	14
Operating Voltage:	15.4
Dimensions of Solar Panel:	14.5" x 42"

### PowerPier Solar Panels

The PowerPier solar panel maintains the charge in your boat lift battery and boat battery. Offsets parasitic power loads, such as hydraulic motors, bilge pumps, sound systems, electronics, and other items that drain your battery, so you are ready to go boating at a moment's notice.

	PP-300	PP-900
Wattage:	5	14
Operating Voltage:	15.4	15.4
Dimensions:	20.5" x 18.5"	40.75" x 18.5"



Solar field shelters available only in khaki.

### PowerShade™ Solar Field Shelters

Solar field shelters reduce dependence on fuel-fired generators that are noisy and require a constant supply of costly fuel. Used for a variety of purposes, ranging from lighting to ventilation to power for remote bases of operations, disaster relief and communication hubs when grid power is not available.

<b>1kW</b>	Clear Span Dimensions:	22' x 20'	<b>2kW</b>	Clear Span Dimensions:	22' x 40'
	Staked Dimensions:	38' x 36'		Staked Dimensions:	38' x 56'
	Crated Weight:	850 lbs.		Crated Weight:	1566 lbs.



### 190 Watt Solar Quad

The PowerFilm Solar Quad can be used for a wide variety of charging and power purposes for field communication radios, GPS systems, satellite phones, and laptop computers.

Wattage:	190	Stowed Dimensions:	13" (radius) X 19"
Operating Voltage:	15.4	Weight:	17 lbs.
Dimensions Unfolded:	96" x 114"		

Balance-of-system (BOS) equipment is available as an add-on option for both the 190 Watt Solar Quad and the PowerShade™ Solar Field Shelters.

# ACCESSORIES

All PowerFilm authorized accessories include marine-grade components with connectors that match the PowerFilm Series output cord.



## KITS:

### ADVENTURE

Outdoor Activity Charging Components

**Includes:** RA-1, RA-6, and RA-8

### ASSURANCE

Battery Charging Components

**Includes:** RA-6, RA-8, RA-9 and RA-11

#### RA-1 | 12 Volt Cigarette Lighter Adapter

Never get stranded again. The RA-1 adapter can be used to recharge your vehicle's battery from a PowerFilm solar charger, directly through the 12 volt power port.

#### RA-2 | 12 Volt Female Cigarette Lighter Adapter

Power your car charger devices without the car. With the RA-2 12 volt cigarette lighter adapter, you can directly charge wireless electronic devices from anywhere you can find sunlight – from the campsite to the worksite.

#### RA-3c | 12 Volt Battery Charger Pack for AA and AAA

Ensure your batteries are ready when you need them. Charge 1-4 NiCad or NiMH AA or AAA batteries with the RA-3c, one battery at a time or in pairs. Monitor power level with four independent charging indicators. Includes 12 volt cigarette lighter adapter and a USB connection.

#### RA-4 | 12 Volt Standard Battery Charger Pack (For 10W and larger)

Get more power faster. Charge 2-4 NiCad or NiMH AA, AAA, C or D batteries, or 1-2 9 volt batteries with the RA-4, a fast charger with 800 mA charging current and discharge function. Includes 12 volt cigarette lighter adapter.

#### RA-6 | Daisy Chain Accessory

Maximize your charging power. The RA-6 allows you to connect several PowerFilm® chargers in parallel for increased current output (amps). By connecting multiple panels, you can achieve a combined output of up to 20 amps.

4

1

2

9

8

3

11

#### RA-7 | 15 ft. Extension Cord

Add range to your charging power with the RA-7 extension cord. The extra 15 feet gives you the freedom to keep your device out of the sun, such as inside tents, RVs, boat cabins or buildings. Includes professional marine-grade components ready to attach to your PowerFilm Solar Panel.

#### RA-8 | 15 ft. Extension Cord with Alligator Clips

Protect yourself from being stuck with a dead battery, thanks to the RA-8 extension cord, which can conveniently connect to a car or boat battery. Includes professional marine-grade components ready to attach to your PowerFilm Solar Panel.

#### RA-9 | Charge Controller

Regulate your battery charge and protect from overcharging with the RA-9. It features 100% solid state electronics. All power switching is done with MOSFETs – no mechanical relays are used. Rated 4.5 amps @ 12 volts.

#### RA-11 | 15 ft. Extension Cord with O-ring Battery Terminal Connectors

The perfect solution for semi-permanent battery charging applications. The RA-11 extension cord features ring terminal ends, plus an extra 15 feet of range.

#### RA-13 | Anderson Power Pole Connector

Designed to provide a standard connection for amateur radio and emergency communications.



13

# OEM LINE

- ✓ **MULTIPLE ENCAPSULANTS** PowerFilm has the unique capability to encapsulate our solar modules with a variety of standard and custom encapsulants
- ✓ **VERSATILE SUBSTRATES** PowerFilm can mount solar modules on fabric, metals, plastic, foam, even magnets – giving you multiple options for product integration and development

- ✓ **WIDE ARRAY OF VOLTAGES AND CURRENTS** PowerFilm can modify the electrical characteristics of our solar modules to match your needs
- ✓ **STRONG PARTNERING MENTALITY** PowerFilm works as your partner all the way to market

## RC Aircraft Solar Module Series

The PowerFilm RC Aircraft Solar Module Series is designed to be easily integrated with remote controlled aircraft.



**RC7.2-75**  
270 mm x 90 mm | 7.2V | Current: 100 mA



**RC7.2-75 PSA**  
270 mm x 90 mm | 7.2V | Current: 100 mA

## Wireless Electronics Solar Module Series

Modules in the PowerFilm Wireless Electronics Series offer a new opportunity to solve the old problem of limited power for wireless electronics in both portable and remote electronic applications.



**SP3-37**  
64 mm x 37 mm | 3V  
Current: 22 mA



**MP3-25**  
114 mm x 25 mm | 3V  
Current: 25 mA



**MP3-37**  
114 mm x 37 mm | 3V  
Current: 50 mA



**MPT3.6-75**  
74 mm x 73 mm | 3.6V  
Current: 50 mA



**SP4.2-37**  
84 mm x 37 mm | 4.2V  
Current: 22 mA



**MPT3.6-150**  
74 mm x 146 mm | 3.6V  
Current: 100 mA



**MPT4.8-75**  
94 mm x 73 mm | 4.8V  
Current: 50 mA



**MPT4.8-150**  
94 mm x 146 mm | 4.8V  
Current: 100 mA



**MPT6-75**  
114 mm x 73 mm | 6V  
Current: 50 mA



**MPT6-150**  
114 mm x 146 mm | 6V  
Current: 100 mA



**MP7.2-75**  
253 mm x 73 mm | 7.2V  
Current: 100 mA



**MP7.2-150**  
253 mm x 146 mm | 7.2V  
Current: 150 mA



**MPT15-75**  
253 mm x 73 mm | 15.4V  
Current: 50 mA



**MPT15-150**  
253 mm x 146 mm | 15.4V  
Current: 150 mA

## WeatherPro Series

The PowerFilm WeatherPro Series is the perfect choice for permanent outdoor applications that are directly exposed to the elements.



**P7.2-75**  
270 mm x 100 mm | 7.2V  
Current: 100 mA



**P7.2-150**  
270 mm x 175 mm | 7.2V  
Current: 200 mA



**PT15-75**  
270 mm x 100 mm | 15.4V  
Current: 50 mA



**PT15-150**  
270 mm x 175 mm | 15.4V  
Current: 100 mA



**PT15-300**  
270 mm x 325 mm | 15.4V  
Current: 200 mA

## Downweb Modules



**DW-80**  
80 mm x 305 mm | 15.4V  
Current: 75 mA



**DW-160**  
305 mm x 160 mm | 15.4V  
Current: 150 mA

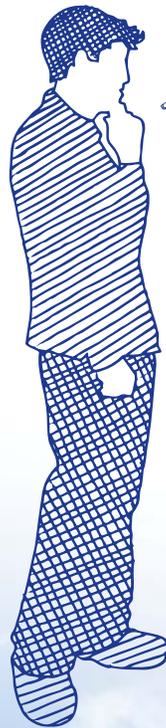
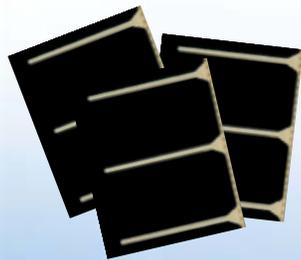
## CUSTOM LINE

### PowerFilm is the industry leader in custom OEM solar module solutions.

Possessing the most diverse product offerings, PowerFilm has the production agility and engineering expertise to meet client objectives of nearly any capacity. We offer an end-to-end solar module solution, working with clients from conception to development to production, which results in a 100% custom solar module.

- Create an optimized solar solution that matches your exact needs
- Develop innovative and situation-specific solar mounting techniques
- Diagnose ideal size and shape based on application as well as solar power and voltage requirements
- Provide consultation and engineering to create the best custom solar solution
- Offer versatility of solar module integration options, including on fabric, adhesive backings, magnetic backings, and many more

*PowerFilm actively looks to identify partnership opportunities with other companies to bring total solar solutions to the marketplace.*



PowerFilm Development

Integration

Final Product

**With the ability to adjust production characteristics and agile enough to alter direction quickly, PowerFilm is the only company in the solar industry that can offer a fully custom solar module solution with reasonable minimums and costs.**

### Benefits of Working with PowerFilm

- ✓ Quick turns
- ✓ 100% custom solutions
- ✓ Consultative and collaborative approach (please have power requirements calculated prior to beginning custom solar module manufacturing discussions)
- ✓ Variety of power requirements
- ✓ Variety of voltage requirements
- ✓ Size and shape flexibility
- ✓ Best in class integration techniques and technology, from encapsulates to mounting methods
- ✓ Engineering expertise and experience
- ✓ Low minimums

Contact us today at  
+1 515 292 7606 ext. 105  
and make your ideas a reality!



PowerFilm solar modules have passed the rigors of the Aberdeen Proving Grounds and Mil Standard 810F.

PowerFilm, Inc. has collaborated extensively with the U.S. Military to develop solar solutions for military use. In well over a decade of work with the military, PowerFilm has teamed with the Army Research Center at Natick to develop unique and field-ready alternative energy solutions, as well as developed top-secret solar applications for the Special Forces.

The knowledge and high standards gained from collaboration with the military go into all of PowerFilm's solar products.



- ✓ PowerFilm has been building products for government agencies, the military, and NASA for over 20 years
- ✓ With our unique manufacturing ability, PowerFilm seeks to assist in development and customization of solar solutions to fit the unique requirements of military application – if it doesn't exist today, PowerFilm can develop and manufacture it for tomorrow
- ✓ PowerFilm has long standing relationships working directly with government agencies and major defense contractors to create solar solutions
- ✓ The research and development department at PowerFilm is actively pursuing cooperative, leading-edge, alternative energy technology solutions for the future

Connect with us



PowerFilm, Inc.  
1287 XE Place  
Ames, Iowa 50014 USA  
Tel: +1 515 292 7606  
Toll Free: +1 888 354 7773  
Fax: +1 515 292 1922  
[www.powerfilmsolar.com](http://www.powerfilmsolar.com)

 **PowerFilm**  
SOLAR