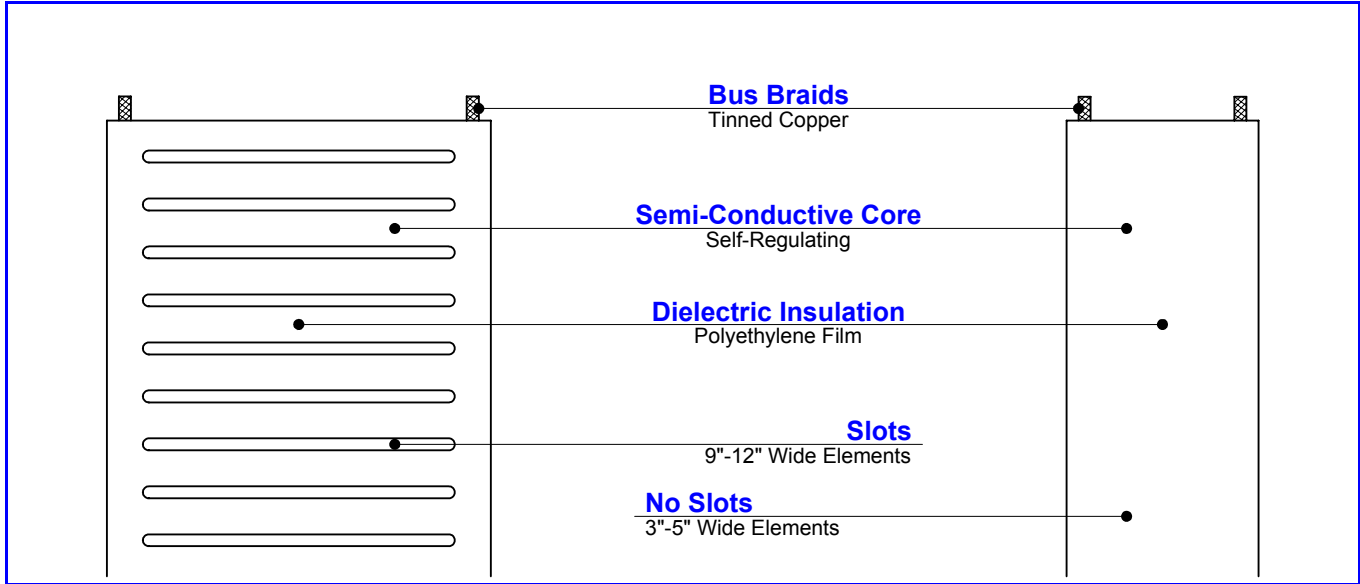


Construction...



The STEP Heating Element™ is constructed of two parallel bus braids embedded in a semi-conductive polymeric heating element. A polymeric dielectric jacket is applied at the time the

heating element is manufactured so that the jacket is thermally joined to the heating element. This creates a heating element that features a solid, or homogeneous, construction that will not separate

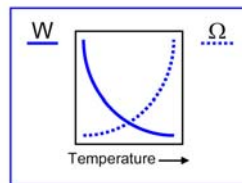
from thermal cycling or physical flexing.

Slots are fabricated into the 9" or wider STEP Heating Element™ to increase flexibility.

Description...

The STEP Heating Element™ is a self-regulating, thin, flat and flexible sheet heater that provides even heat with no hot spots. It is ideal for a wide range of applications that includes radiant floor heating (STEP Warmfloor™) and a limitless number of OEM applications found in the transportation, medical, veterinary, horticulture, sports, marine, military and consumer product markets.

heat-output. This self-regulating characteristic allows the STEP Heating Element™ to provide even, gentle heating with no burnout as typical of constant



wattage heating elements. In addition, this even heat-output allows the STEP Heating Element™ to be safely used in conjunction with a wide range of low-temperature materials such as man-made fabrics, vinyl, rubber and wood.

The STEP Heating Element™ has the added safety benefit of being a low voltage device. The heaters can operate using a 5V to 30V AC or DC source. The heaters can even operate from a battery pack or a solar or wind power source.

The STEP Heating Element™ can easily be incorporated into your OEM application as there are numerous widths and wattage outputs to choose from; the heaters are field cut to length to suit the application; and they can be powered from inexpensive low voltage power sources.

Being self-regulating, the element will vary the heat it generates relative to the surrounding temperature. The colder the temperature, the higher the heat-output and inversely, the warmer the temperature, the lower the

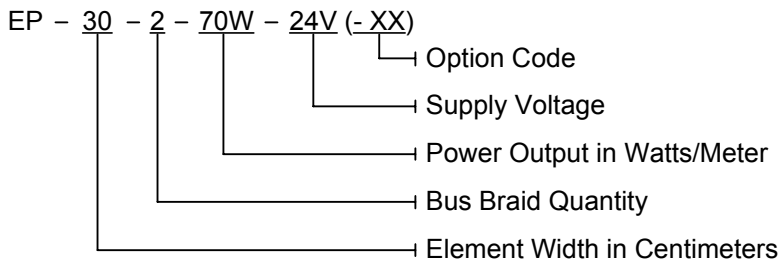
Product Specifications...

Heating element type	Positive Temperature Coefficient (PTC) semi-conductive polyethylene
Dimensions	Widths available: 3" (7 cm), 5" (13 cm), 8" (20 cm), 9" (23 cm) and 12" (30 cm) Thickness: 3/64" (1.2 mm) Length: cut to order with a 180 ft (55 m) maximum shipping spool length Weight: 3" Width – 0.08lb/ft (0.12kg/m) 5" Width – 0.11lb/ft (0.17kg/m) 9" Width – 0.18lb/ft (0.27kg/m) 12" Width – 0.23lb/ft (0.34kg/m)
Output wattage	1.0 W/ft (14 W/m) through 85 W/ft (280 W/m) @ 68°F (20°C)
Supply voltages	5V to 30V, AC or DC source
Bus braid	15 AWG tinned copper flat braid
Dielectric jacket	1 mil polyethylene film, thermally bonded to heating element
Minimum bending radius	3/32" (2.5mm) @ 32°F (0°C)
Maximum exposure temperature	176°F (80°C)
Chemical Compatibility	Do not use in conjunction with aggressive construction glues and adhesives or with asphalt or butyl sealants / membranes

Approvals / Certifications...

Electro Plastics, Inc. has various approvals and certifications for the finished products it manufacturers such as STEP Warmfloor™ or STEP Marine™ brand of heating systems. It is the responsibility of the OEM to secure the necessary finished product approvals that are market appropriate and industry required for the finished product they are manufacturing using the STEP Heating Element™.

Model Number Matrix...



Product Options...

Option Code	Description
NS	No slots, only applicable to the 9" – 12" wide STEP Heating Element™

Please Note: color coding of the dielectric jacket is available for orders over 5,000 ft (1,525 M), contact the factory for available colors

Product Performance...

STEP Heating Element™ Power Output in Watts per Foot at the Stated Supply Voltage

STEP Heating Element™ Model No.	Heater Width	Ohm/Ft @ 68°F (20°C)	W/sqft @ 68°F (20°C)	Power Output (W/ft) (1)				
				32°F (0°C)	50°F (10°C)	68°F (20°C)	86°F (30°C)	104°F (40°C)
12V(2) STEP Heating Element™ with 2 Bus braids								
EP-7-2-17W-12V	3"	26	22.2	6.3	5.8	5.5	4.6	4.0
EP-7-2-23W-12V	3"	21	27.4	8.2	7.7	6.9	6.2	5.3
EP-7-2-40W-12V	3"	12	48.0	14.0	13.0	12.0	10.0	9.0
EP-13-2-16W-12V	5"	28	12.3	6.0	5.5	5.1	4.4	3.9
EP-15-2-32W-12V*	6"	14	20.6	11.4	10.8	10.3	8.4	7.4
24V(2) STEP Heating Element™ with 2 Bus braids								
EP-13-2-55W-24V*	5"	35	39.5	19.7	18.1	16.5	14.5	12.8
EP-23-2-22W-24V	9"	85	9.0	7.8	7.4	6.8	5.8	5.0
EP-23-2-36W-24V	9"	50	15.4	13.0	12.3	11.5	9.6	8.3
EP-23-2-80W-24V*	9"	24	32.0	28.0	26.8	24.0	20.8	17.8
EP-30-2-24W-24V	12"	74	7.8	9.0	8.4	7.8	6.6	5.7
EP-30-2-29W-24V	12"	64	9.0	10.7	10.0	9.0	7.8	6.8
EP-30-2-32W-24V	12"	55	10.5	11.6	11.0	10.5	8.6	7.4
EP-30-2-44W-24V	12"	41	14.0	16.3	15.0	14.0	11.7	10.0
EP-30-2-70W-24V*	12"	27	21.3	25.0	23.5	21.3	18.5	15.7
24V(2) STEP Heating Element™ with 3 Bus braids								
EP-30-3-96W-24V*	12"	74/4 (19)	31.1	36.0	34.0	31.1	26.0	23.0
EP-30-3-116W-24V*	12"	64/4 (16)	36.0	43.0	40.0	36.0	31.0	27.0
EP-30-3-128W-24V*	12"	55/4 (14)	41.9	46.0	44.0	41.9	34.0	30.0
EP-30-3-176W-24V	12"	41/4 (10)	56.2	65.0	60.0	56.2	47.0	40.0
EP-30-3-280W-24V*	12"	27/4 (7)	85.3	100.0	94.0	85.3	74.0	63.0

Notes:

1. To determine a power output in Watts per Meter, multiply the Watts per Foot power output by 3.28.
2. Power outputs listed above are based upon the stated supply voltages. The use of other supply voltages will provide a variation in the power output. Consult the factory for your application specific values.
3. Power outputs at temperatures other than those listed above can be estimated by extrapolating between the listed values. Consult the factory for temperatures that are higher or lower than listed above.

Product Availability:

Electro Plastics, Inc. maintains an inventory only of selected heating elements. Available quantities of those standard inventoried elements will vary with production schedules and receipt of orders. The elements marked above with an asterisk (*) are not inventoried and will be manufactured only upon demand. A minimum 5,000 ft. (1,525 M) order is required for production of those elements.

STEP Heating Element™ OEM Application Suggestions by Market...

Automotive

- Seat heater
- Floor board heater
- Exterior mirror heater

Aviation

- Cabin radiant heat
- Cockpit heel plate comfort heat
- Jetway snow melting
- Helicopter deck snow-melting

Marine

- Ship deck anti-icing
- Ship superstructure de-icing
- Living/work space radiant heat

Trucking

- Shipping container heat
- Loading dock snow melting
- Truck trailer heat
- Truck comfort cab radiant heat
- Seat heater
- Floor board heater
- Exterior mirror heater
- Dump truck bed heater

Offshore Petrochemical

- Oil rig deck and walkway anti-icing
- Oil rig structure de-icing
- Living/work space radiant heat

Medical

- Hospital bed heater
- Operating table heater
- IV Fluid heater
- Body wrap for localized heat
- Ambulance radiant heat
- Ambulance pharmaceutical storage heat

Military

- Casualty warmer
- Torso warmer
- Gurney heater
- IV Fluid heater

Recreation Vehicle

- Radiant heat
- Tank frost prevention

Communications

- Satellite dish anti-icing and snow melting

Consumer products

- Heating pads
- Under rug heater
- Heated bedding

Food Service

- Heated food transport containers for caterers (bags, cases, trays)
- Heated pizza delivery bags
- Freezer frost heave prevention

Sports

- Stadium bench/seat heat
- Portable cushion heat
- Sleeping bag heat
- Body comfort heat

Horticulture

- All weather starting bed heater

Veterinary & Pet care

- Aquarium heater
- Reptile cage heater
- Heated blankets
- Transport trailer radiant heat
- Dog house radiant heat
- Operating table heater
- Animal pen comfort heat

Research

- Telemetry box heater
- Electronics heater
- Laboratory heater
- Product curing heater

Residential / Commercial Construction

- Radiant heat
- Floor warming
- Walkway snow-melting
- Stair and step snow-melting
- Roof snow-melting
- Gutter anti-icing
- Pool heat
- Work station comfort heat
- Septic tank heater



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