

Low Mass with High Versatility

The versatile Watlow® coil/cable heater can be formed into a variety of shapes. Small diameter, high performing cable heaters are fully annealed and readily bent to a multitude of configurations.

The heater can be formed into a compact, coiled nozzle heater supplying a full 360 degrees of heat with optional distributed wattage. A straight cable heater can snake through an equipment application. Flat, spiral configurations can be used in high-tech manufacturing while a star wound cable can be used for air and gas heating.

Different applications require different construction methods, including one, two or four resistance wires; parallel coil or straight wire; drawn or swaged sheaths; with or without internal thermocouples; leads exiting from one or both ends, and round, rectangular or square cable cross sectionals.

Whatever the application requirement, a Watlow coil/cable heater can be shaped to fit.

Performance Capabilities

- Continuous operating temperatures up to 1200°F (650°C) with intermittent operating periods achieving up to 1500°F (815°C) dependent on the type of element wire used
- Watt densities up to 33 W/in² (5.1 W/cm²)
- Sheath watt densities on the cable to 30 W/in² (4.65 W/cm²), and as high as 75 W/in² (11.62 W/cm²) subject to factory approval
- Maximum voltage up to 240V

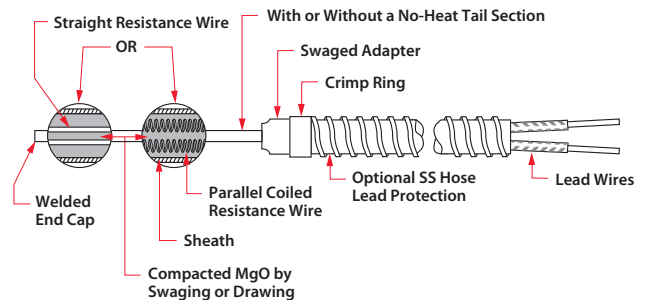
Features and Benefits

High ductility

- Allows the heater to be cold-formed into almost any shape

Low mass

- Allows quick response in both heating and cooling



Features and Benefits (con't)

Constructed with no open seams

- Enables operation in unusual environments, including cryogenic and sub-freezing temperatures, high vacuum, gaseous and liquid immersion heaters
- Decreases opportunity for corrosion

Constructed of standard 304 stainless steel, optional 316 stainless steel or alloy 600

- Provides high-temperature corrosion and oxidation resistance along with ideal expansion properties

Heater sheath can be brazed

- Allows the permanent attachment of mounted fittings to the heater, contact a Watlow representative for further information

Sizes range from 0.040 in. (1.02 mm) to 0.188 in. (4.8 mm) diameter

- Delivers a high volume of heat into a tiny space

Internal construction options

- Allows internal thermocouples and no-heat sections (not available in all sizes)

Typical Applications

- Plastic injection molding nozzles
- Semiconductor manufacturing and wafer processing
- Semiconductor pedestal heating and showerhead
- Hot metal forming dies and punches
- Sealing and cutting bars
- Medical, analytical and scientific instruments
- Restaurant and food processing equipment
- Cast-in heaters
- Laminating and printing presses
- Air heating
- Textile manufacturing
- Heating in a vacuum environment

Electrical Data and Coiling Limits

Sheath Diameter		Max. Voltage	Surface Area Per Linear Foot		Min. Bend Radius		Min. Coiled Inside Diameter	
in.	(mm)		in.	(cm)	in.	(mm)	in.	(mm)
0.040 ± 0.002	(1.016 ± 0.051)	48	1.51	(9.740)	¹ / ₁₆	(1.6)	¹ / ₈	(3.2)
0.062 ± 0.002	(1.575 ± 0.051)	120	2.34	(15.098)	¹ / ₈	(3.2)	¹ / ₄	(6.0)
0.094 + 0.002 - 0.003	(2.388 + 0.051 - 0.076)	240	3.54	(22.840)	³ / ₁₆	(4.8)	³ / ₈	(9.5)
0.102 square ± 0.003	(2.591 ± 0.076)	240	4.90	(31.615)	¹ / ₄	(6.0)	¹ / ₂	(13.0)
0.102 ± 0.003 x 0.156 ± 0.005 rectangular	(2.591 ± 0.076) x (3.962 ± 0.127)	240	6.19	(39.938)	¹ / ₄	(6.0)	¹ / ₂	(13.0)
0.125 ± 0.003	(3.175 ± 0.076)	240	4.71	(30.389)	¹ / ₄	(6.0)	¹ / ₂	(13.0)
0.157 ± 0.004	(3.988 ± 0.102)	240	5.92	(38.196)	⁵ / ₁₆	(7.9)	⁵ / ₈	(15.9)
0.188 + 0.003 - 0.006	(4.775 + 0.076 - 0.152)	240	7.09	(45.745)	³ / ₈	(9.5)	³ / ₄	(19.0)
0.128 square ± 0.003	(3.251 ± 0.076)	240	6.31	(40.712)	¹ / ₄	(6.0)	¹ / ₂	(13.0)

In most cases 30 W/in² (4.65 W/cm²) is the safe allowable limit for cable watt density. Please contact your Watlow representative prior to ordering >30 W/in² cables.

Resistance/Wattage Tolerance ±10%.

Cable heaters can run on both ac and dc. Contact your Watlow representative for amperage limitations.

Coiling Tolerances

Cable Diameters	Coiled Width Tolerances		Coiled I.D. Tolerances			
	Coiled Width in. (mm)	Tolerances in. (mm)	Coil I.D. Range in. (mm)		Tolerances in. (mm)	
All Diameters	Below 6 (152)	+ 0 - ¹ / ₈ (+0.00 - 3.18)	Below 0.625	(Below 15.88)	+0.000 - 0.015	(+0 - 0.38)
	6 to 10 (152 to 254)	+ ¹ / ₈ - ³ / ₈ (+3.18 - 9.53)	0.625 to 0.999	(15.88 to 25.38)	+0.000 - 0.030	(+0 - 0.76)
	Over 10 (Over 254)	+ ¹ / ₄ - ¹ / ₄ (+6.35 - 6.35)	1.000 to 1.999	(25 to 50.78)	+0.000 - 0.062	(+0 - 1.58)
			2.000 to 2.999	(51 to 76.18)	+0.000 - 0.125	(+0 - 3.18)
			3.000 to 3.999	(76 to 101.58)	+0.000 - 0.250	(+0 - 6.35)
			4.000 to 4.999	(102 to 126.98)	+0.000 - 0.375	(+0 - 9.53)
			5.000 and Over (127 and Over)	+0.000 - 0.500	(+0 - 13.00)	

When the O.D. of the coil is required as the critical dimension, it must be specified at the time of ordering so that proper coiling procedures can be determined. I.D. and O.D. dimensions cannot be held on the same unit. Please contact your Watlow representative prior to ordering coiled cable heaters requiring other than standard tolerances.

Cable Straight Length Tolerances

Length	≤ 24 in.	>24 in. ≤ 60 in.	>60 in. ≤ 100 in.	>100 in.
Tolerance	± ³ / ₈ in.	± ¹ / ₂ in.	±1 in.	±1%

Watlow® is a registered trademarks of Watlow Electric Manufacturing Company.

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