

CARTRIDGE HEATERS



GENERAL INFORMATION

A cartridge heater is a cylindrical industrial heating element that can be inserted into drilled holes. These heaters provide precise, localized heating and are commonly used in the heating process industry. They are often used to heat metal blocks from the inside, and can be custom-made to a specific watt density based on the requirements of the application.

The heater consists of a resistance coil wound around a ceramic core that is surrounded by dielectric and encased in a metal sheath. When powered, heat is transferred through the coil to the sheath, causing it to heat up. This heat is then transferred to the inside of the metal part that needs to be heated.

For easy installation, the heaters are made slightly undersize in comparison to their nominal diameter. Drilling holes with general-purpose drills is usually adequate for low and medium temperature applications (up to 600°F). However, in high watt density applications, it is important to drill and ream the holes for a tighter fit, which will improve heat transfer and increase the heater's life expectancy.

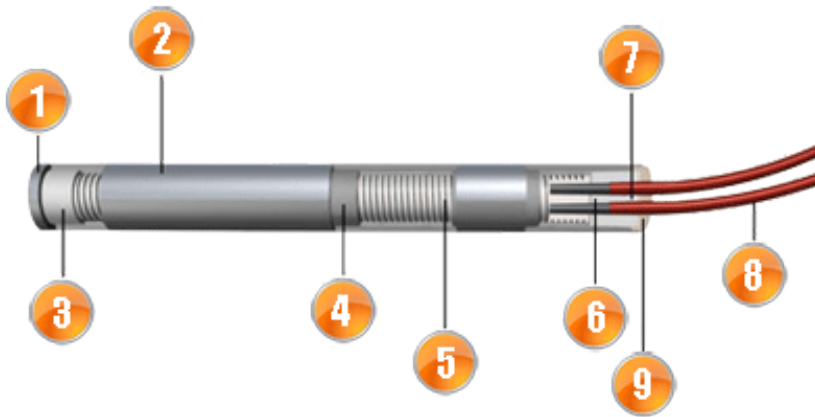
Cartridge heaters can operate at low, medium, and high watt densities and can withstand working temperatures of up to 1400°F. However, the

optimal operating temperature will depend on the specific application. Factors such as watt density, the tightness of the fit, and the thermal conductivity of the material being heated can all impact the actual temperature of the heater and the monitored temperature of the material during the heating cycle.

Cartridge heaters are commonly used for heating dies, platens, molds, and other metal parts by inserting them into drilled holes. They can also be used in liquid immersion applications, such as heating gases and liquids, hot runner molds, hot stamping, laminating presses, medical equipment, semi-conductor, plastic molding and scientific equipment.

To effectively control the temperature of a cartridge heater, it is important to use the appropriate temperature controller and sensor. These devices should be placed between the working surface of the part and the heaters. The temperature of the part approximately 1/2" away from the heaters is used in selecting the maximum allowable watt density. In high watt density applications, using thyristor power controls can extend the life of the heater by eliminating on-off cycling.

CONSTRUCTION



1. WELDED DISC
2. STAINLESS STEEL TUBE IN 304/316/321/ INCOLOY
3. CERAMIC DISC INSULATOR
4. PURE MAGNESIUM OXIDE
5. NICKEL-CHROME 80/20 HEATER WIRE
6. CERAMIC CORE
7. HARD CERAMIC HEAD
8. LEAD WIRE
9. OPTIONAL POTTING COMPOUND

DIAMETER SIZES

SIZE - Round

Nom Dia	min Dia	max Dia	max Amps	max Volts
1/8"	.119	.124	3.6	240
1/4"	.244	.249	9	30
6.5mm	.250	.255	9	300
8mm	.309	.314	9	300
3/8"	.369	.374	9	480
10mm	.388	.393	15	480
7/16"	.432	.437	15	600
12mm	.466	.471	15	600
12.5mm	.486	.491	15	600
1/2"	.494	.499	15	600
13mm	.506	.511	15	600
17/32"	.525	.530	15	600
14mm	.545	.550	26	600
5/8"	.619	.624	26	600
16mm	.624	.629	26	600

SIZE - Square

Nom Size	min Size	max Size	max Amps	max Volts
3/8"x3/8"	.369	.374	9	300
1/2"x1/2"	.494	.499	9	300
5/8"x5/8"	.619	.624	15	300

SIZE - Rectangle

Nom Size	Max wide	Max depth	Min watts	Max W/inch
1/8"x1/4"	.124	.249	10	30
1/8"x3/8"	.124	.374	10	50
1/4"x5/8"	.249	.624	10	70
1/4"x1"	.249	.999	10	100

SPECIAL CONSTRUCTION

PHOTO	TYPE	MAX. TEMP	NOTES
	MGT 1000°C	1832°F / 1000°C	Flexible, Not Waterproof
	MGT 750°C	1382°F / 750°C	Flexible, Not Waterproof
	Duraflex	1022°F / 550°C	Flexible, Not Waterproof
	MGT	842°F / 450°C	Flexible, Not Waterproof
	TGGT	482°F / 250°C	Durable, Flexible, Not Waterproof
	Teflon	500°F / 260°C	Abrasion Resistant, Small OD, Waterproof
	Silicone Rubber	355°F / 180°C	Very Flexible, Waterproof, Easy to Nick
	SEW2	392°F / 200°C	Very Flexible, Fair Abrasion Resist, Waterproof

TERMINATIONS

STYLE	HIGH TEMPERATURE SWAGED IN LEADS	HIGH TEMPERATURE CRIMPED ON	POST TERMINALS
PICTURE			
STYLE	HIGH TEMPERATURE LEADS W/ 90°	HIGH TEMPERATURE SWAGED IN S/S	HIGH TEMPERATURE LEADS W/ 90° EXIT & S/S ARMOR
PICTURE			
STYLE	HIGH TEMPERATURE LEADS W/ S/S	HIGH TEMPERATURE SWAGED IN S/S	
PICTURE			

END SEAL OPTIONS

TYPE	MAXIMUM TEMPERATURE	MOISTURE PROTECTION	CONTAMINANT PROTECTION	MECHANICAL STRENGTH	VIBRATION RESISTANCE
Ceramic	2500°F 1371°C	Poor	Poor	Excellent	Excellent
Teflon	300°F 149°C	Excellent	Excellent	Very Good	Excellent
Lava	3000°F 1649°C	Poor	Good	Good	Poor
Cement Potting	1800°F 982°C	Poor	Fair	Good	Poor
Epoxy Potting	650°F 343°C	Fair	Very Good	Very Good	Excellent
Epoxy Potting	265°F 129°C	Good	Good	Excellent	Excellent
Silicone Rubber	500°F 260°C	Excellent	Excellent	Fair	Excellent

ADD-ON FEATURES

TYPE	STAINLESS STEEL FITTINGS	BRASS FITTINGS	FLANGES	STRAIN RELIEF
NOTES	Single or Double-ended : 1/8", 1/4", 3/8"NPT 1/2", 3/4", 1"NPT	Single or Double-ended : 1/8", 1/4", 3/8"NPT 1/2", 3/4", 1"NPT	Standard Stainless Steel. Flanges can be round or irregularly shaped.	Provides extra support for leads. Great for Flexing applications
PICTURE				

SPECIAL CONSTRUCTIONS

TYPE	BENT HEATER	MULTIZONE/DISTRIBUTED WATTS	DOUBLE ENDED	INTERNAL T/C
NOTES	Must be bent in an unheated section	Multi Zone – Up to 3 zones Distributed Wattage – custom	Electrical Termination on Both Sides – either Lead Wires, Post terminals	(J/K)Type A: Center Core, Heater Temperature Type B: Middle-Block Temperature Type C: End-Disk End Temperature Flat Bottom
PICTURE				

CUSTOM SPECIFICATION FORM

INSTRUCTIONS:

DOWNLOAD PDF → FILL OUT FORM → SAVE → EMAIL FORM TO sales@mpimorheat.com.

REQUIRED INFORMATION

Quantity: _____

Required Lead Time:

SAME DAY 1-2 DAY 3-5 DAY

1 WEEK 2 WEEKS

Units: Inches Millimetres

OTHER OPTONS

PROCESS CONNECTIONS

NONE

FLANGE (DRAWING REQ'D)

LOCATING RING

NPT PROCESS FITTING

Specify NPT Process Fitting Material & Connection:

INTERNAL THERMOCOUPLE

TGGT (482°F/ 250°C)

MGT (900°F/ 450°C)

S/S OVERBRAID

S/S ARMOUR

GENERAL / ELECTRICAL SPECS

DIAMETER: _____

INSERTION LENGTH: _____

WATTAGE: _____

VOLTAGE: _____

FIBERGLASS SLEEVING

NO SLEEVING

1 SLEEVE OVER BOTH LEADS

1 SLEEVE OVER EACH LEAD

GROUND WIRE

YES

NO

EXIT & LEAD PROTECTION

STRAIGHT / NONE

90° / NONE

STRAIGHT / SS BRAID

90° / SS RAID

STRAIGHT / SS ARMOR

90° / SS ARMOR

POST TERMINALS

TERMINAL BOX

DRAWINGS & EXTRA INFORMATION

LEAD MATERIAL

MGT 1000°C

MGT 750°C

MGT 450°C

DURAFLEX 550° C

TGGT

TEFLON

SILICON RUBBER

SEW 2

LENGTH: _____

CUSTOMER CONTACT INFORMATION

Contact Name: _____

Company: _____

City: _____

Phone Number: _____

Email: _____