

D-M-E Cartridge Heaters and Thermocouples

Optimizing heat
transfer performance
and temperature
sensing accuracy



Cartridge Heaters



D-M-E Standard Cartridge heaters employ a swaged construction using the finest resistance wire and insulation available for optimum heating performance, long life and maximum dependability. These heaters are furnished with 10" long flexible lead wires, ready for fast installation. Thermocouple cartridge heaters are also available.

NOTE: Lead wires can withstand temperatures up to 450°F. If temperatures will exceed this amount, leads must be insulated.

DIA.	LENGTH (INCHES)	VOLTS	WATTS	ITEM NUMBER
1/4	2	120	40	CU-202-1
	2	240	40	CU-202-2
	3	120	75	CU-203-1
	3	240	75	CU-203-2
	4	120	100	CU-204-1
	4	240	100	CU-204-2
	6	120	150	CU-206-1
	6	240	150	CU-206-2
3/8	2	120	75	CU-302-1
	2	240	75	CU-302-2
	3	120	100	CU-303-1
	3	240	100	CU-303-2
	4	120	150	CU-304-1
	4	240	150	CU-304-2
	5	120	185	CU-305-1
	5	240	185	CU-305-2
	6	120	225	CU-306-1
	6	240	225	CU-306-2
1/2	8	120	300	CU-308-1
	8	240	300	CU-308-2
	2	120	75	CU-402-1
	2	240	75	CU-402-2
	3	120	150	CU-403-1
	3	240	150	CU-403-2
	4	120	180	CU-404-1
	4	240	180	CU-404-2
	5	120	200	CU-405-1
	5	240	200	CU-405-2
	6	120	300	CU-406-1
	6	240	300	CU-406-2
	8	120	400	CU-408-1
	8	240	400	CU-408-2
	10	120	500	CU-410-1
	10	240	500	CU-410-2
	12	120	600	CU-412-1
	12	240	600	CU-412-2
16	120	800	CU-416-1	
16	240	800	CU-416-2	

DIA.	LENGTH (INCHES)	VOLTS	WATTS	ITEM NUMBER
5/8	2	120	100	CU-502-1
	2	240	100	CU-502-2
	3	240	200	CU-503-2
	4	240	250	CU-504-2
	5	120	300	CU-505-1
	5	240	300	CU-505-2
	6	120	375	CU-506-1
	6	240	375	CU-506-2
	8	120	500	CU-508-1
	8	240	500	CU-508-2
	10	120	650	CU-510-1
	10	240	650	CU-510-2
	12	120	775	CU-512-1
	12	240	775	CU-512-2
	14	240	900	CU-514-2
	16	240	1050	CU-516-2
3/4	3	240	225	CU-603-2
	4	120	300	CU-604-1
	4	240	300	CU-604-2
	5	120	375	CU-605-1
	5	240	375	CU-605-2
	6	120	450	CU-606-1
	6	240	450	CU-606-2
	8	120	600	CU-608-1
	8	240	600	CU-608-2
	10	120	800	CU-610-1
	10	240	800	CU-610-2
	12	120	950	CU-612-1
12	240	950	CU-612-2	
14	240	1100	CU-614-2	
16	240	1250	CU-616-2	

NOTE: Special heaters are available on special order.

High Watt Density Cartridge Heaters



Fit Tolerances

The cavity or hole, into which a cartridge heater is inserted, should be reamed* to the nominal diameter of the heater. D-M-E cartridge heater diameters are actually .002 to .007 undersize. High Watt Density Cartridge Heaters are .004 undersize, held to a tolerance of $\pm .002$. This sizing is maintained for easy installation and for best heat transfer. However, if close hole tolerances are not maintained, operating life of the heater may be drastically reduced. Also make sure that the heated area of the cartridge does not extend beyond the hole.

Spacing of Heaters

As a general rule it is not recommended to space heaters in a mold, die or platen any closer to each other than the diameter of the heater.

Contamination

Contamination consists of any foreign matter such as plastics, oil, grease, dirt or water entering through the terminal end or the end opposite the terminal. Care must be taken to protect the heater or these contaminants will shorten the effective heater life.

Proper Care and Maintenance

1. Heaters should be stored in a dry area, especially during periods of excess humidity.
2. Protect leads from abuse, abrasion, fatigue, etc.
3. Maintain temperature controllers and accessories in good working condition to avoid an overheating condition.
4. Transferring heaters from one die or platen to another is not recommended.

D-M-E High Watt Density Cartridge Heaters employ swaged construction for maximum heat transfer and high watt density for more demanding applications. Recommended for use when high temperatures are required (up to 1500°F) or where heaters will be subjected to vibration. Furnished with 10" long flexible lead wires. Special heaters are available on special order. Thermocouple cartridge heaters are also available.

DIA.	LENGTH (INCHES)	VOLTS	WATTS	ITEM NUMBER
1/4	1	120	100	CM-100-1
	1	240	100	CM-100-2
	1 1/2	120	150	CM-112-1
	1 1/2	240	150	CM-112-2
	2	120	200	CM-202-1
	2	240	200	CM-202-2
	3	120	300	CM-203-1
	3	240	300	CM-203-2
	4	240	375	CM-204-2
3/8	5	240	450	CM-205-2
	2	240	250	CM-302-2
	3	240	350	CM-303-2
	4	240	500	CM-304-2
	5	240	550	CM-305-2
1/2	6	240	600	CM-306-2
	2	240	250	CM-402-2
	3	240	300	CM-403-2
	4	240	400	CM-404-2
	5	240	800	CM-405-2
	6	240	1000	CM-406-2
	8	240	1200	CM-408-2
5/8	10	240	1500	CM-410-2
	12	240	2000	CM-412-2
	2	240	300	CM-502-2
	4	240	700	CM-504-2
	6	240	1000	CM-506-2
	8	240	1200	CM-508-2
	9	240	1400	CM-509-2
3/4	10	240	1500	CM-510-2
	14	240	2000	CM-514-2
	2	240	300	CM-602-2
	4	240	750	CM-604-2
	6	240	1200	CM-606-2
3/4	10	240	1600	CM-610-2
	14	240	2200	CM-614-2

*See D-M-E Equipment and Supplies Catalog for D-M-E machine reamers and D-M-E straight shank long drills.

NOTE: Lead wires can withstand temperatures up to 450°F. If temperatures will exceed this amount, leads must be insulated.

Nozzle Heaters for Injection Molds



Features

- Square coil design for improved heat transfer
- High watt density on nozzle ... up to 106 watts/in²
- Heat is conducted from entire heater circumference...360° heat
- Unheated tail section reduces temperature at adapter
- Moisture-resistant seal
- Low profile
- 1200°F maximum operating temperature
- Available from stock

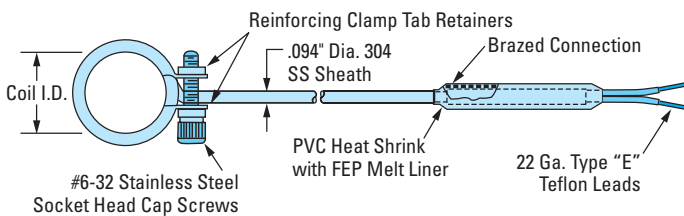
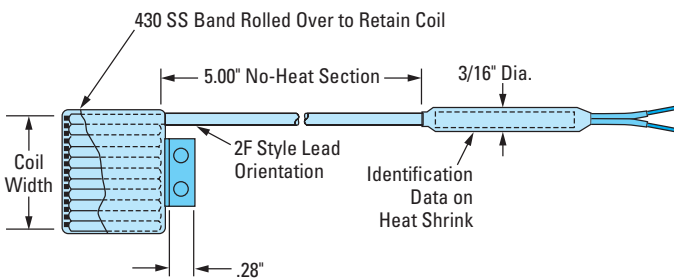
This nozzle heater features a five-inch long unheated tail section, and the adapter is provided with a moisture-resistant seal. These two design advantages practically eliminate failures in the adapter area due to overheating and moisture contamination.

As with all D-M-E heaters, these new nozzle heaters are designed to give long life even when operated at 1200°F. These are very low profile heaters to facilitate easy installation in the tight environment of multiple gate molds.

All units have a resistance tolerance of $\pm 5\%$ to provide consistent operation and reduced adjustment time when it is necessary to replace a heater or bushing.

A stainless steel clamping band is installed on all units.

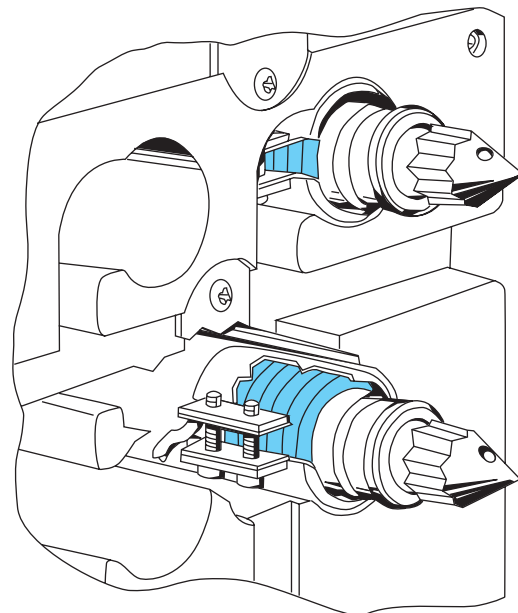
All units are stock coiled per the dimensions listed below. All units have Teflon covered power leads and fiberglass thermocouple leads as indicated.



Nozzle Heaters (240 VAC)

WATTS	COIL I.D.	COIL O.D.	COIL WIDTH	LEAD LENGTH	THERMO-COUPLE	ITEM NUMBER
125	.750	.980	1.0"	36"	NO	SCH0103
125	.750	.980	1.0"	72"	NO	SCH0104
250	.750	.980	1.0"	36"	NO	SCH0105
250	.750	.980	1.0"	72"	NO	SCH0106
125	.750	.980	1.0"	36"	YES*	SCH0107
250	.750	.980	1.0"	36"	YES*	SCH0108
125	.875	1.10	1.0"	36"	NO	SCH0109
250	.875	1.10	1.0"	36"	NO	SCH0110

*A thermocouple is externally spotwelded to the sheath.



This installation illustrates D-M-E's square coil design fit over a nozzle. This heater was designed to fit any industry nozzle as a replacement for runnerless molding.

High Watt Density Thermocouple Cartridge Heaters



D-M-E High Watt Density Thermocouple Cartridge Heaters employ swaged construction for maximum heat transfer and high watt density for more demanding applications. Recommended for use when high temperatures are required (up to 1500°F) or where heaters will be subjected to vibration.

Fit Tolerances

The cavity or hole into which a cartridge heater is inserted should be reamed* to the nominal diameter of the heater. D-M-E cartridge heater diameters are actually .002 to .007 undersize. High Watt Density Cartridge Heaters are .003 undersize, held to a tolerance of $\pm .002$. This sizing is maintained for easy installation and for best heat transfer. However, if close hole tolerances are not maintained, operating life of the heater may be drastically reduced. Also make sure that the heated area of the cartridge does not extend beyond the hole.

Contamination

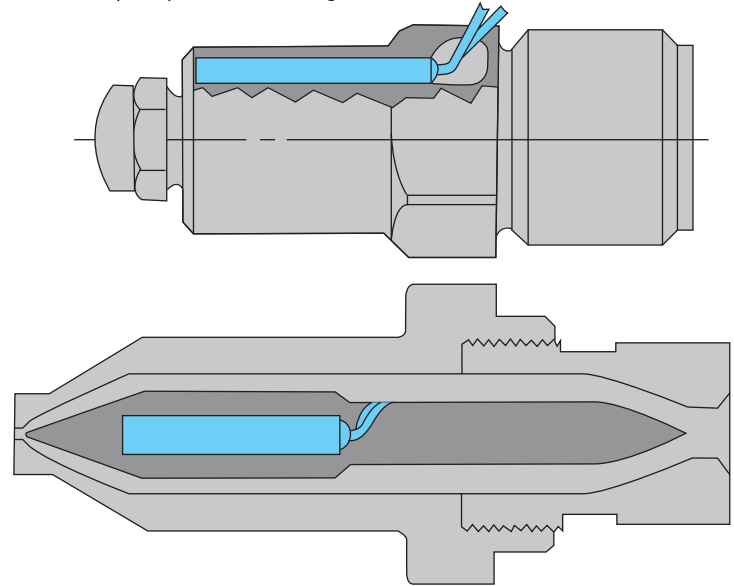
Contamination consists of any foreign matter such as plastics, oil, grease, dirt or water entering through the terminal end or the end opposite the terminal. Care must be taken to protect the heater or these contaminants will shorten the effective heater life.

Proper Care and Maintenance

1. Heaters should be stored in a dry area, especially during periods of excess humidity.
2. Protect leads from abuse, abrasion, fatigue, etc.
3. Maintain temperature controllers and accessories in good working condition to avoid an overheating condition.
4. Transferring heaters from one die or platen to another is not recommended.

*See D-M-E Equipment and Supplies Catalog for D-M-E machine reamers and D-M-E straight shank long drills.

These diagrams show typical installations of a thermocouple replacement cartridge heater.



High Watt Density Thermocouple Cartridge Heaters (240 VAC, Type J Thermocouple, 36" Long Leads)

DIAMETER	LENGTHS		VOLTS	WATTS	ITEM NUMBER
	IN	cm			
$\frac{3}{8}$ " (9.42mm)	1 $\frac{3}{4}$	4.445	240	200	TCH0001
	2	5.08	240	250	TCH0002
	2 $\frac{1}{2}$	6.35	240	250	TCH0003
	3	7.52	240	250	TCH0004
	3 $\frac{1}{2}$	8.39	240	320	TCH0005
	4	10.15	240	370	TCH0006
	4 $\frac{1}{2}$	11.43	240	420	TCH0007
	5	12.70	240	470	TCH0008
	5 $\frac{1}{2}$	13.97	240	525	TCH0009
	6	15.24	240	575	TCH0010
	6 $\frac{1}{2}$	16.51	240	625	TCH0011
	7	17.78	240	675	TCH0012
	7 $\frac{1}{2}$	19.05	240	725	TCH0013
	8	20.32	240	775	TCH0014
$\frac{1}{2}$ " (12.50mm)	3 $\frac{1}{2}$	8.89	240	420	TCH0015
	4	10.16	240	480	TCH0016
	4 $\frac{1}{2}$	11.43	240	550	TCH0017
	5	12.70	240	625	TCH0018
	5 $\frac{1}{2}$	13.97	240	700	TCH0019
	6	15.24	240	775	TCH0020
	6 $\frac{1}{2}$	16.51	240	850	TCH0021
	7 $\frac{1}{2}$	19.05	240	975	TCH0022

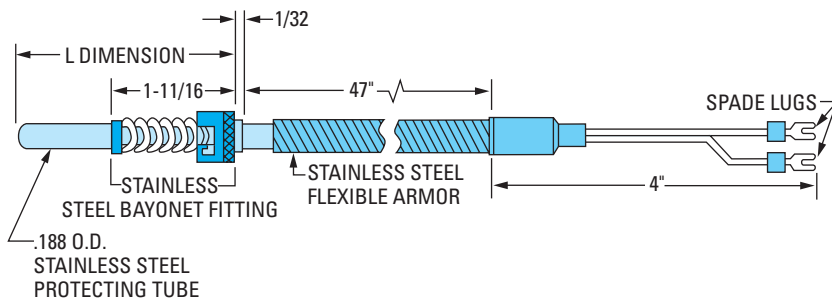
Thermocouples



D-M-E Bayonet Thermocouples are made of 20 gauge stranded glass-insulated wires. The grounded hot junction is in the end of a .188 O.D. stainless steel protecting tube for fast response and long life. Tube features a round tip and is fitted with a stainless steel spring loaded bayonet fitting. Lead wires are protected by rugged .188 I.D. flexible armor (lead wire calibration is ANSI Type J Iron/Constantan). Armor cable is 47" long; spade lugs are attached at the end of the lead wires for easy connection to terminal strip or plug.

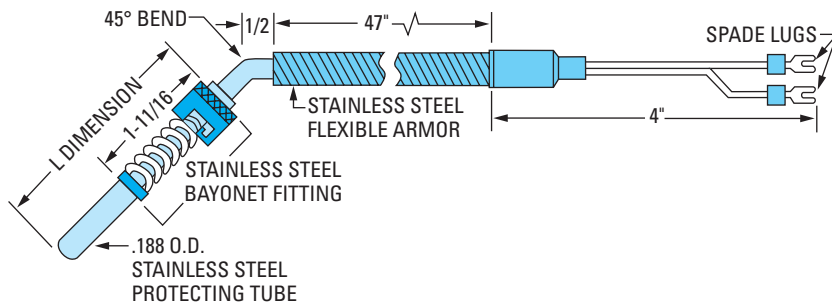
D-M-E Adjustable bayonet Type Thermocouples fit hole depths up to $10\frac{1}{2}$ " and will conform to any angle.

D-M-E Spade Type Thermocouples are used between band heaters and machine nozzles in applications where space will not permit bayonet type thermocouples. The stainless steel spade is only .025 thick and can be easily contoured to fit various diameters.



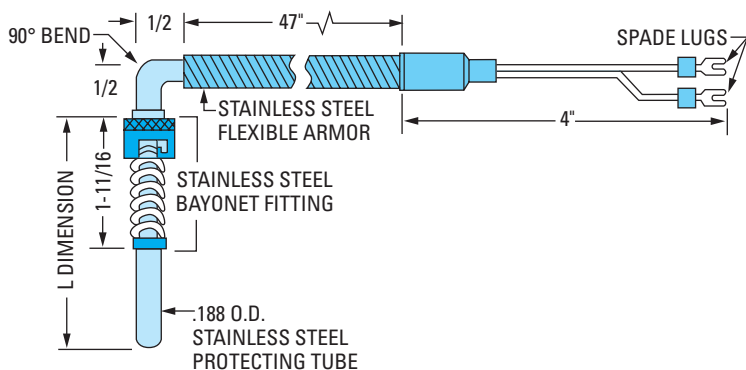
Straight Type

ITEM NUMBER	L
TC-2500	2 $\frac{1}{2}$
TC-3500	3 $\frac{1}{2}$
TC-6000	6"



45° Angle Type

ITEM NUMBER	L
TC-2545	2 $\frac{1}{2}$
TC-3545	3 $\frac{1}{2}$



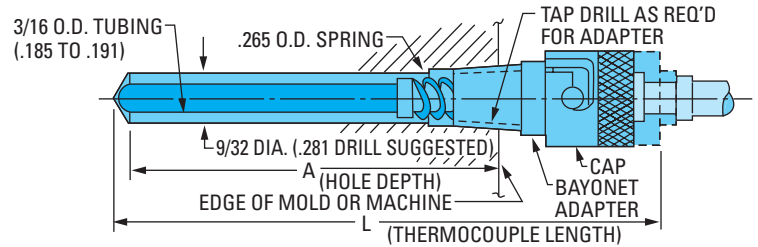
90° Angle Type

ITEM NUMBER	L
TC-2590	2 $\frac{1}{2}$
TC-3590	3 $\frac{1}{2}$
TC-6090	6"

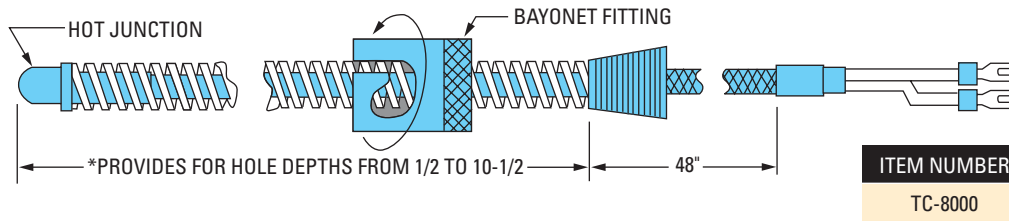
Thermocouples and Accessories

Hole Depth Chart

L THERMOCOUPLE LENGTH	A HOLE DEPTH FOR ADAPTER LENGTH	
	7/8	1 3/8
2 1/2	1" TO 1 3/8	1/2 TO 7/8
3 1/2	2" TO 2 3/8	1 1/2 TO 1 7/8
6"	4 1/2 TO 4 7/8	4" TO 4 3/8
10 1/2 ADJ.	1/2 TO 10 1/2	1/2 TO 10"



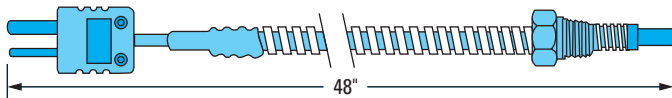
Adjustable Thermocouple



By turning the adjustable bayonet fitting along the spring, the D-M-E Adjustable Thermocouple can be set for the desired immersion length, from 1/2" to 10 1/2". Spring will conform to any angle. Hot junction of ANSI Type J I/C calibrated leads is inside round tip. Flexible metal braid is 48" long with 2 1/2" of lead wires at the end and spade lugs for ease of connection.

ITEM NUMBER
TC-8000

Threaded Type Thermocouple

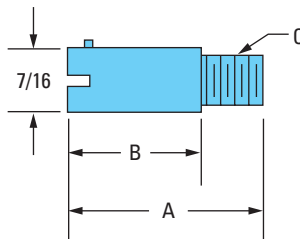


ITEM NUMBER
TCT-4

Threaded type thermocouple is spring loaded and supplied with cable and mini plug.

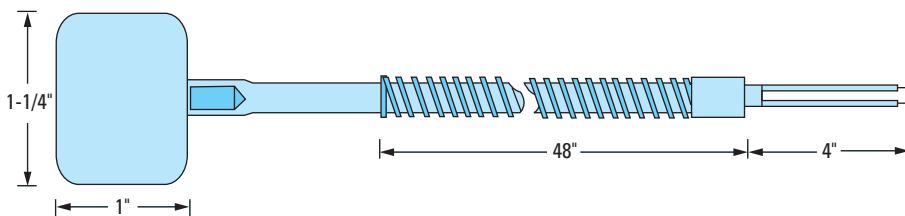
Bayonet Adapters

The stainless steel bayonet adapters accommodate the spring loaded bayonet fitting on the thermocouple, to bottom the hot junction where temperature sensing is desired. Adapter requires tapped hole for mounting.



ITEM NUMBER	A	B	C
BA1007	7/8	.465	1/8-27 NPT
BA1013	1 3/8	.934	1/8-27 NPT
BA4007	7/8	.465	3/8-24 NF
BA4013	1 3/8	.934	3/8-24 NF

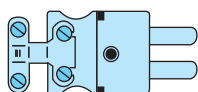
Spade Type Thermocouple



Used between band heaters and machine nozzles in applications where space will not permit bayonet type thermocouples. Stainless steel spade measures 1" x 1 1/4" x .025 thick and can be easily contoured to fit various diameters. Thermocouple is Type J I/C. Flexible stainless steel armor cable is 48" long with 4" of lead wires at the end.

ITEM NUMBER
TC-9000

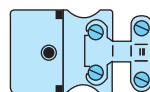
Plug (with Cable Clamp)



ITEM NUMBER
PL-10

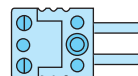
Jack (with Cable Clamp)

ROUND PINS AND SOCKETS (3/16 & 1/8)



ITEM NUMBER
PL-20

Mini Plug



ITEM NUMBER
M2MJ

Mini Jack

FLAT PINS AND SOCKETS



ITEM NUMBER
M2F-J

D-M-E, an essential resource to the customers it serves worldwide, offers the industry's broadest range of market-leading products, unsurpassed knowledge and expertise, a global logistics infrastructure that ensures speed and accuracy, and a support organization unrivaled for its ability to assist customers when and where they need it. A complete line of hot runner systems, control systems, mold bases, MUD quick-change mold systems, mold components, moldmaking and molding equipment supplies, and technical services helps customers compete every step of the way.



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