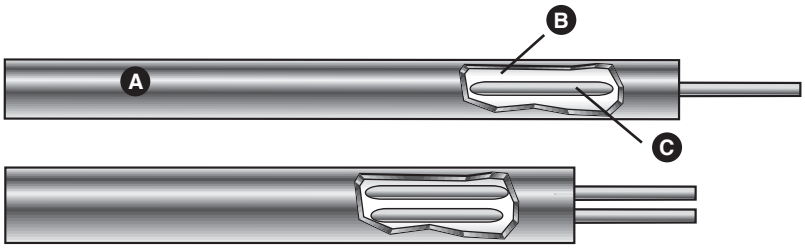
MI
Mineral Insulated High Temperature



- **Constant Wattage Series Resistance Heating Cable Sets**
- **Process Temperature Maintenance to 1100°F (593˚C)**
- **Maximum Exposure Temperature 1400°F (760˚C) (Power Off)**
- **Corrosion Resistant Alloy 825 or Stainless Steel Sheath**
- **Factory Assembled Cable Sets—Ready for Installation**
- **Fully Annealed Sheath allows Field Bending**
- **Min. Bend Radius 6X Diameter of Cable**
- **For Use on Metallic Pipes Only**

Description

Chromalox MI mineral insulated heating cables provide rugged and reliable heat tracing for a variety of demanding applications. The high nickel alloy sheath, magnesium oxide dielectric insulation and resistance wire construction allow the tracing of equipment up to 1100°F maintenance temperatures and excellent resistance to many corrosive environments. At lower temperatures, watt densities of up to 50 W/Ft can be designed. Please contact factory for cable maintenance temperature above 400˚F.

Construction

A Metal Sheath: High nickel content Alloy 825 is recognized for its use in high temperature applications, and use in many corrosive environments. This alloy has excellent resistance to pitting, chloride-stress, acid and alkali corrosion. Stainless steel is also available.

B MgO: Highly compacted Magnesium Oxide provides insulation of the resistance wire for voltages up to 600V. Completely sealed sheath protects the MgO from moisture & contamination.

C Resistance Wire: A large number of available resistances enables the design of a large range of lengths and wattages. Double and single conductor available

D Cold-Lead (Shown Below): Non-heating MI cable extends the leads away from the high temperature equipment. 4 ft. long is standard.

E Gland Fitting (Shown Below): Every set includes one or two 1/2" NPT fittings for connection to a junction box. The number of fittings depends on the configuration of the cable set.

WARNING — A ground fault protection device is required by NEC to minimize the danger of fire if the heating cable is damaged or improperly installed. A minimum trip level of 30mA is recommended to minimize nuisance tripping.

Approvals

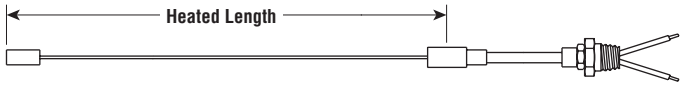
FM Approved*
Class I, Division 2, Groups A, B, C, D
Class I, Zone 2, Group IIC

CSA Approved
Class I, Division 2, Groups A, B, C, D
Class II, Division 2, Groups F, G
Class III, Division
Class I, Zone 1 and Zone 2, Group IIC

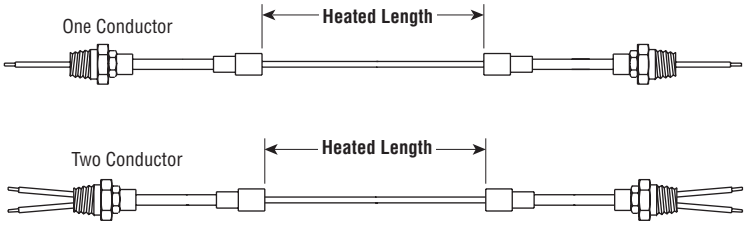
* Stainless steel not FM approved.

Available Designs

Form "A" (one cold section w/ 14 AWG - 12 in. pigtails and termination w/ end cap, 0.50" brass pressure fittings)
Available in two conductor only



Form "E" (two cold sections w/ 14 AWG - 12 in. pigtails, 0.50" brass pressure fittings)
Available in one conductor or two conductor



MINERAL INSULATED

MI

Mineral Insulated High Temperature *(cont'd.)*

Heating Cable System Design

1. **Heater Design**
   Determine heater design to use.

2. **Calculate Heat Loss**
   Using the Technical Section of this catalog (Determining Heat Energy Requirements), calculate the heat energy requirements of the pipe or tank to be heated. In addition, Chromalox® offers ChromaTrace, a heat trace design program to facilitate heat tracing system design.

3. **Determine Total Cable Length**
   In addition to the system piping, in-line equipment such as valves, flanges and pipe supports require additional heat tracing to maintain the system operating temperature. Refer to Technical Section of this catalog (Pipe Component Allowance Table) to determine the proper component cable allowances for your system. Add the heated pipe length and the component cable allowance lengths to calculate the total cable length.

   Guidelines for tracing tanks and vessels are also given in the Technical Section of this catalog

4. **Determine Available Voltage (V)**
   Determine what Voltage is available. At a given voltage, not every cable length and power output is available. For example, shorter lengths may require 120V supply. Trying several voltages may result in a more efficient design.

5. **Calculate Resistance per Foot (R/ft) using the desired Watts per Foot (W/ft) and cable length (L)**
   $R/ft_{desired} = V^2/(W/ft_{desired} \times L^2)$

6. **Select the Proper Resistance per Foot (R/ft) Rating**
   Choose a cable having equal or the next lower resistance per foot value from the Ordering Information Table

7. **Calculate Actual W/Ft. and Total Wattage (W_{TOTAL})**
   $W/ft_{actual} = V^2/(R/ft_{actual} \times L^2)$

   $W_{TOTAL} = W/ft_{actual} \times L$

8. **Determine Current Draw (I)**
   $I = V/(R/ft_{actual} \times L)$

9. **Select Heater Single or Double Conductor Length**
   The cold lead is determined by the customer or by using a standard 7 ft. Standard cold lead is #14 awg.

10. **Convert Design to a Model Number**.

Note:
Some cable resistances must be modified according to the resistance curves in the Order Information Table. Modify your resistance according to the following procedure:

a. Based on the desired power output in Watts/ft, use Graph-1 to determine the Sheath Temperature Rise for the particular cable diameter you select.

b. Add the sheath temperature rise to the desired maintenance temperature to determine the cable resistance at operating conditions.

c. From Graph-2, determine the cable resistance multiplier for your application. Multiply the resistance value given in the resistance tables by this multiplier to determine the cable resistance at operating conditions.

d. Determine the electrical and thermal conditions. Once the cable resistance has been selected, verify the performance of the cable you have selected from Graph-3 and 4.

Optional Construction Adders

Prefix	Suffix	Description
P		Pulling Eye for "A" form only
X		Oversized cold section current >25 Amps and <40 Amps
	EM	Mounting of hot-cold junction outside thermal insulation (freeze protection of lines over 600ºF)
	QT	QHT-3 High temperature adapter
	UG	UL listing tag**
	UH	UL hazardous area listing tag**

**Required volts, amps and watts with each cable order

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Mineral Insulated
High Temperature *(cont'd.)*

Available Resistances

Two Conductor, 3/16" Nominal O.D., Alloy 825, 300 Volts, 0.20 lbs/ft

Cable Number	Ohms/ft	Maximum Exposure Temperature Rating ˚F (˚C)	Resistance Curve
556K	0.043	600 (315)	1
658K	0.0581		1
674K	0.0742		1
693K	0.0926		1
712K	0.1170		1
715K	0.1470		1
721K	0.213		3
732K	0.319	1100 (593)	N/A
742K	0.416		
752K	0.520		
766K	0.660		
774K	0.740		
783K	0.830		
810K	1.00		
813K	1.30		
818K	1.80		
824K	2.34		
830K	2.96		
838K	3.70		
846K	4.72		
860K	5.60		
866K	6.60		
894K	9.00		
919K	18.00		

Two Conductor, 5/16" Nominal O.D., Alloy 825, 600 Volts, 0.27 lbs/ft

Cable Number	Ohms/ft	Maximum Exposure Temperature Rating ˚F (˚C)	Resistance Curve
588B	0.0071	600 (315)	1
614B	0.0149		1
627B	0.027		2
640B	0.040		3
670B	0.065	1100 (593)	N/A
710B	0.104		
715B	0.162		
720B	0.205		
732B	0.325		
750B	0.500		
774B	0.735		
810B	1.62		
819B	1.87		
830B	2.97		
840B	4.30		
859B	5.98		

One Conductor, 3/16" Nominal O.D., Alloy 825, 600 Volts, 0.18 lbs/ft

Cable Number	Ohms/ft	Maximum Exposure Temperature Rating ˚F (˚C)	Resistance Curve
145K	0.0046	600 (315)	1
189K	0.0090		2
216K	0.0165		3
239K	0.039	1100 (593)	N/A
250K	0.050		
279K	0.079		
310K	0.095		
316K	0.157		
326K	0.260		
333K	0.330		
346K	0.457		
372K	0.730		
412K	1.17		
415K	1.48		
423K	2.36		
430K	2.80		
447K	4.50		

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Two Conductor, Stainless Steel, 300 Volts

Cable Number	Ohms/ft	Maximum Exposure Temperature Rating ˚F (˚C)	Resistance Curve
110S	11.0000	1100 (593)	N/A
900S	9.0000		
750S	7.5000		
600S	6.0000		
400S	4.0000		
275S	2.7500		
200S	2.0000		
170S	1.7000		
114S	1.1400		
700S	0.7000		
472S	0.4720		
374S	0.3740		
293S	0.2930		
201S	0.2000		
150S	0.1500		
100S	0.1000		
734S	0.0734		
583S	0.0583		
458S	0.0458		
324S	0.0324		

Two Conductor, Stainless Steel, 600 Volts

Cable Number	Ohms/ft	Maximum Exposure Temperature Rating ˚F (˚C)	Resistance Curve
6110S	11.00000	1100 (593)	N/A
6900S	9.00000		
6600S	6.00000		
6414S	4.14000		
6200S	2.00000		
6115S	1.15000		
6700S	0.70000		
6505S	0.50500		
6286S	0.28600		
6201S	0.20000		
6150S	0.15000		
6100S	0.10000		
6775S	0.07750		
6561S	0.05610		
6402S	0.04020		
6281S	0.02810		
6202S	0.02000		
6130S	0.01300		
6818S	0.00818		
6516S	0.00516		
6324S	0.00324		
6204S	0.00204		
6128S	0.00128		

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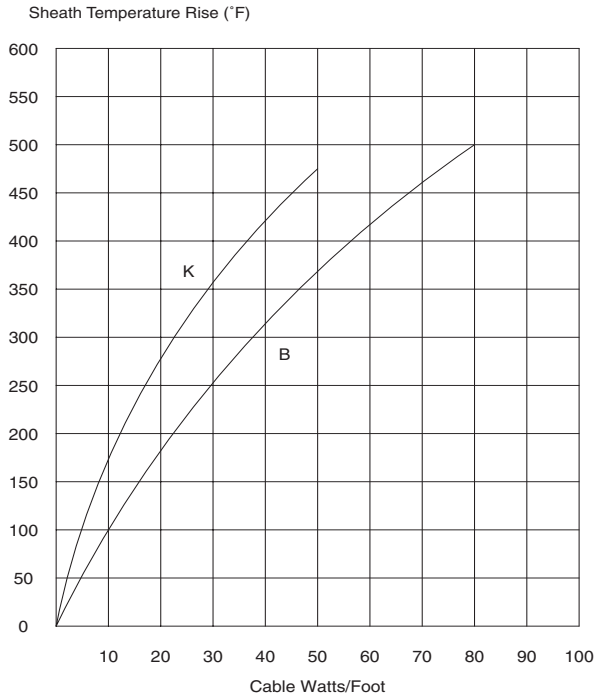
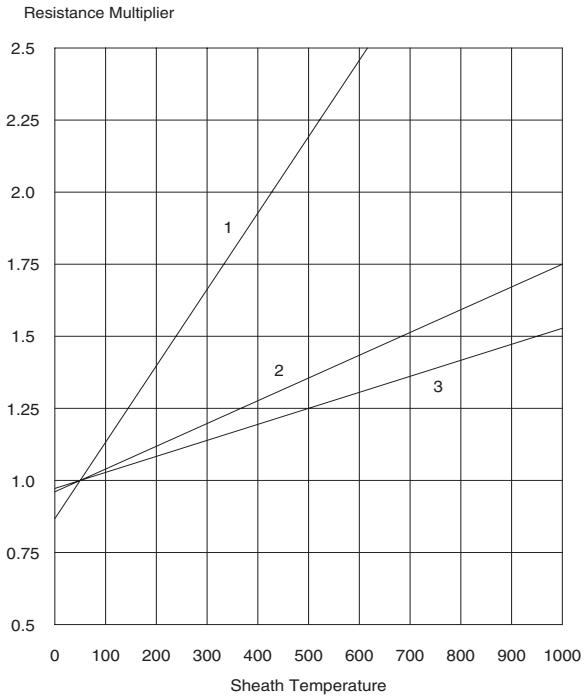
Mineral Insulated High Temperature *(cont'd.)*

Specification / Application Information

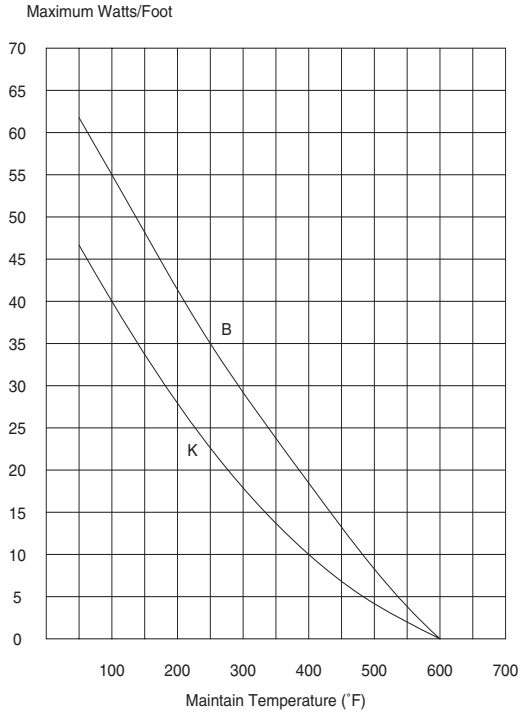
Graph-1
Cable Sheath Temperature Rise



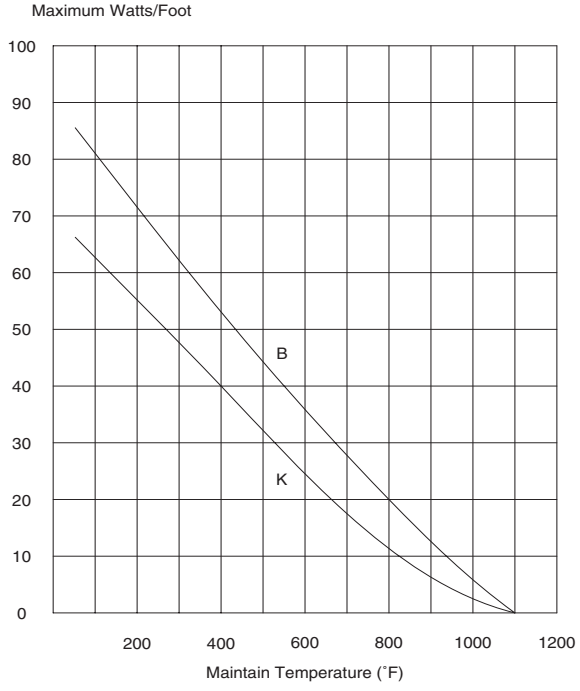
Graph-2
Cable Resistance Temperature Multiplier



Graph-3
Maximum Wattages - All Cables
With Hot/Cold Junction Under Insulation



Graph-4
Maximum Wattages - All 1100˚F Maximum Temperature
Cables With Hot/Cold Junction Under Insulation



MI

Mineral Insulated High Temperature *(cont'd.)*

Accessories

HTC-30-1 (392286)

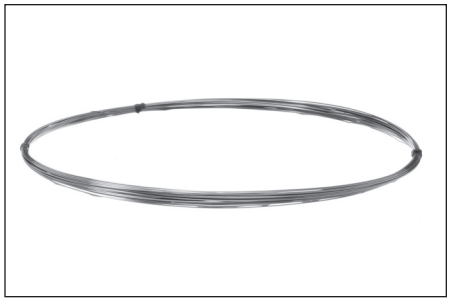
Heat Transfer Cement, 1 Gallon Pail

HTC-30-5 (392294)

Heat Transfer Cement, 5 Gallon Pail

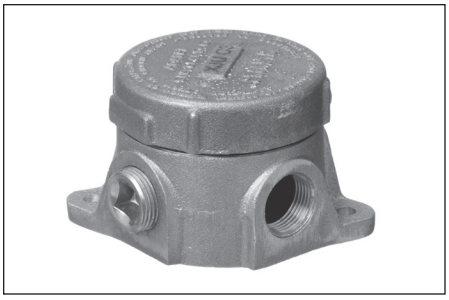
SSW-100 (392315)

Stainless Steel Tie Wire, 100ft Roll



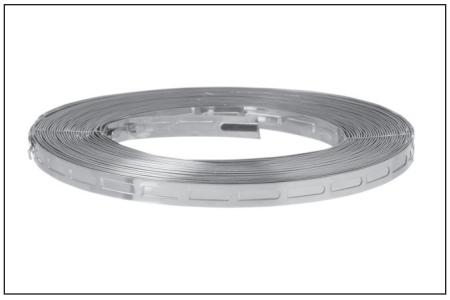
JB-7-4 (392307)

Four Hub, NEMA 7 Cast Aluminum Junction Box



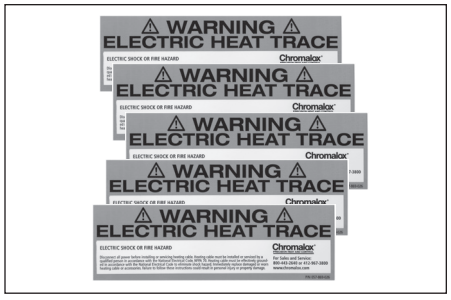
SSPS-82 (392323)

Stainless Steel Spacer Strip with 1" spaced tabs, 50ft roll



CL-1 (382424) Caution Labels

(5) electric heat tracing caution labels, weather resistant



Ordering Information

To Order — *Complete the Model Number using the Matrix provided.*

Model	Heater Set Design "A" or "E"	Cable Number (determined by resistance value required for needed wattage output)	Cable Heated Section Length in Feet	Cable Cold Section Length in Feet	Heater Set Total Wattage (W_{TOTAL})	Operating Voltage (V)	
MICI	A	670B	150	07	1477W	120V	Typical Model Number

(120V, 9.9 w/ft cable, 150 ft heated section, 7ft cold lead section)