

Chromalox[®]
PRECISION HEAT AND CONTROL

INSTRUMENTS • CONTROLS • VALVES

[CLICK TO VISIT OUR WEBSITE](#)

ARCO

Engineering, Inc.

SINCE 1954

www.arcoengineering.com

3317 Gilmore Industrial Blvd.
Louisville, KY 40213

Ph: (502) 966-3134

Fx: (502) 966-3135

Heat Trace Systems



HEAT & TRACE

HEAT TRACE SOLUTIONS

- Cables
- Controllers
- Sensors
- Accessories

HEAT TRACE APPLICATIONS

- Process temperature maintenance
- Freeze protection
- Roof/gutter de-icing

CAPABILITIES

EXPERT TECHNICAL SUPPORT

Chromalox heat trace products and services save you time, reduce the cost of ownership, and protect valuable plant equipment and products. For new systems or easy expansion, repair and retrofitting of older systems, Chromalox will:

- Reduce design efforts
- Reduce component cost
- Reduce installation time
- Reduce monitoring costs
- Reduce yield losses
- Reduce maintenance down-time



Products

A large inventory of cable types, controllers and accessories makes it easy to quickly construct a system that is just right for your application. From a single loop installation to those with 24 loops or more, Chromalox supplies everything needed to design, build and operate efficient heat trace systems.

Tools

Whether you are specifying components or a complete heat trace system, contracting or building your own, Chromalox supports you with a wide array of tools:

- Computer aided design software
- Design tutorials
- Engineering specifications
- Installation instructions
- Maintenance checklist
- Online pricing and ordering
- Application specific design guides
- Online webcast seminars
- Web-based interactive demos
- Specifying guides and forms
- Detailed user manual
- Troubleshooting guide
- Online order status reporting

Services

Chromalox speeds up development and delivery of your heat trace system with one-to-one application assistance, system design, product cross-reference and selection, electrical layout/drafting services, and fast RFQ response. Our services are also available for on-site installation supervision, system start-up, troubleshooting, and maintenance.

BROAD PRODUCT LINE AND COMPREHENSIVE INVENTORY

Chromalox has a broad line of heat trace cable to support your application needs. You can rely on the industry's most comprehensive inventory and FASTShip™ same day shipping. Moreover, our cable performance tops anything else on the market. Chromalox cables have the most stable resistance and insulation integrity you can find, thereby assuring more accurate temperatures and safer operation. See the "Quality and Performance" section of this brochure for more information.

Chromalox self-regulating and constant wattage cables include those that are IEEE 515 compliant and carry Factory Mutual approvals for Class I–Division 1, Class II–Division 1 and Class III operation. These products are currently being used in applications as diverse as:

- Co-generation systems
- Hydro-power facilities
- Automotive production
- Food processing
- Retail stores
- Sports stadiums
- Petrochemical processing
- Steel mills
- Fiber processing plants
- Water treatment facilities
- Office buildings
- Plus a host of other applications

Chromalox Heat Trace Cable Selection Guidelines

Selection Criteria	Industrial Applications				Commercial Applications		
	SRL	SRM/E	CWM	MI	SRF	SRF-RG	
Max. Maintenance Temp. (°F)	150	302	320	900	100	50	
Max. Exposure Temp. (°F, Pwr Off)	185	420	400	1100	185	185	
Max. Watts/Foot of Cable Length	10	20	12	50	8	12	
Max. Circuit Length (Feet)	95-660	150-780	225-900	330-1000+	180-660	75-275	
Line Voltages	120, 208-277	120, 208-277	120, 208-277, 480	Up to 600	120, 208-277	120, 208-277	
Third Party Approvals	General	UL, CSA, FM	UL, CSA, FM	UL, CSA, FM	Contact factory	UL, CSA	UL, CSA
	C1-D2	CSA, FM	CSA, FM	CSA, FM	Contact factory	CSA, FM	None
	C1-D1	CSA, FM	CSA, FM	FM	Contact factory	None	None
ATEX Approvals	Zone 1	No	No	No	No	No	No
	Zone 2	EExe112GD	EExe1126D	No	No	No	No
Use on Plastic Piping	Yes	No	No	No	Yes	Yes	
Cut-to-Length/Splice in the Field	Yes	Yes	Yes	No	Yes	Yes	
Can be Overlapped	Yes	Yes	No	No	Yes	Yes	
Output Varies with Temperature	Yes	Yes	No	No	Yes	Yes	
Output Varies Along Cable Length	Yes	Yes	No	No	Yes	Yes	
Fire Resistance	Fair	Fair	Fair	Excellent	Fair	Fair	

General Descriptions: SRL – Self-Regulating, Low Temperature for pipe and tank tracing, and general use
 SRM/E – Self-Regulating, Medium Temperature - Enhanced for pipe & tank tracing, & general use
 CWM – Constant Wattage, Medium Temperature for applications needing a constant power output
 MI – Mineral Insulated for constant wattage, high-temperature use in demanding environments
 SRF – Self-Regulating Freeze Protection for buildings and general use
 SRF-RG – Self-Regulating Roof and Gutter Freeze Protection for building damage prevention



Self-Regulating

Chromalox self-regulating cables are available in low and medium temperature ratings for service up to 300°F, and power-off exposure to 420°F. These cables use a composite polymer system with a positive temperature coefficient (PTC) that is optimized for stable regulation with repeated temperature cycling. Compared to EFTE jackets used by other heat trace cable manufacturers, Chromalox FEP jackets have negligible shrinkage over their service life, and therefore, less chance of a short to ground, end seal, splice or termination.



Constant Wattage

Chromalox supplies two versions of its constant wattage cable: CWM for medium temperature service (up to 250°F) and Mineral Insulated for high temperatures (up to 900°F). CWM cables use nichrome wire in a parallel zone construction that provides a precise wattage output. CWM cables have a corrosion resistant jacket and can be cut to length in the field, but are not suitable for plastic piping.



Mineral Insulated

Mineral insulated cables have a series resistance wire that is insulated with a magnesium oxide (MgO) refractory material and contained within a corrosion resistant metal sheath. Constant output power up to 50 W/Ft and 600 V is possible. These cables tolerate exposures up to 1100°F. Typical applications include those that require high watt densities, have long lengths of metal pipe, or involve high temperature environments.



Accessories

Chromalox is your one-stop source for all the components in a heat trace system, including accessories for connection of heating cables to customer-supplied wiring. These vital components are available for both standard and hazardous duty service. Chromalox accessories include cold lead connection kits, power connection boxes, splice and tee kits, end seal fittings, replacement cable connectors, Fiberglas® and aluminum tape for cable mounting, pipe straps, nylon cable ties, caution labels and signal light kits.

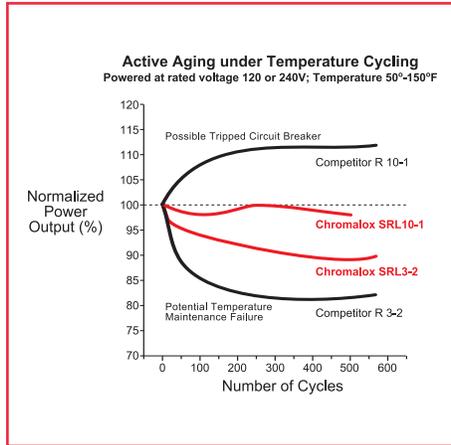
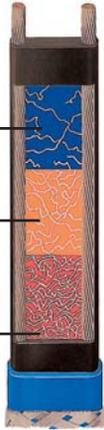
QUALITY AND PERFORMANCE GUARANTEED

If you need heat trace, you need it to work consistently year after year. This is particularly important in process applications where poor temperature regulation can result in lower product yields. Chromalox understands this and does extensive testing on its heat trace cables. These tests help assure stable power outputs and insulation integrity as cables age at elevated temperatures and are continually cycled on and off. (See graphs.)

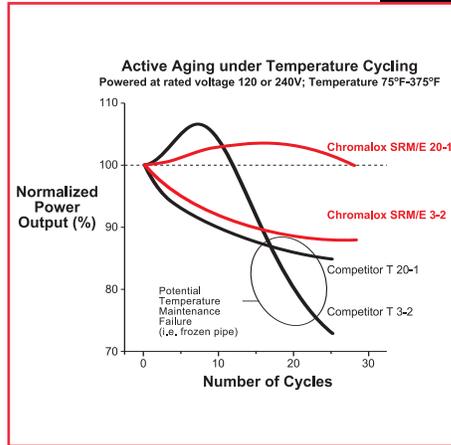
As cable temperature changes, the self-regulating polymer expands and contracts. This creates more conductive pathways between the wires when the pipe is cool, thereby increasing current flow, power dissipation, and temperature. As the cable and pipe increase in temperature, the conductive pathways decrease, thereby limiting current flow. With innumerable cable expansions and contractions, the keys to a stable, long-life system are adhesion of the polymer to the conductive wires, and polymer "memory." As the Active Aging graphs show below, Chromalox cables have superior temperature cycling stability.

Chromalox Self-Regulating Cable

- Warm Pipe**
Fewest conductive paths
Minimum watt output
- As Pipe Temperature Increases**
Fewer conductive paths
Reduced watt output
- Cold Pipe**
Most conductive paths
High watt output



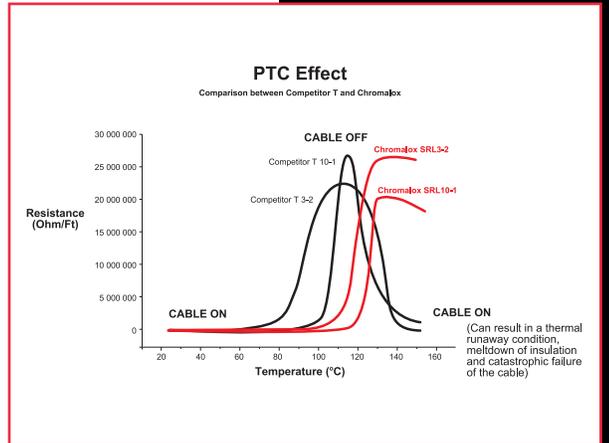
Division 1 – Low Temperature



Division 1 – Medium Temperature

Positive Temperature Coefficient

With increasing temperature, the resistance of heat trace cable can either increase (positive temperature coefficient (PTC)) or decrease (negative temperature coefficient (NTC)). For some cables, the coefficient can change from PTC to NTC as temperature increases (see PTC Effect graph). A constant or PTC resistance characteristic is highly desirable, as this limits current flow and power dissipation as the cable or ambient temperature increases. **With an NTC characteristic, current flow and power dissipation increases with temperature. This eventually results in a thermal runaway condition, meltdown of the insulation, and catastrophic failure of the cable.** As the PTC Effect graph shows, Chromalox cable maintains a PTC or essentially constant resistance, while competitive cable resistance begins to decrease at around 115°C (240°F).



Insulation Integrity

Chromalox self-regulating heat trace cables have an FEP insulating jacket for increased safety as the cable ages. Compared to ETFE jackets used by some manufacturers, FEP minimizes shrinkage at elevated temperatures. The adjacent photograph illustrates the ETFE jacket shrinkage after high temperature aging. Initial dimensions of both cables were virtually identical. FEP shrinkage was negligible. **This is important to prevent shorts** to the ground braid in the connections, which would cause tripped breakers and increased maintenance.

PRECISION HEAT TRACE CONTROLS



The intelliTRACE™ from Chromalox® is a complete control solution for heat trace systems. These controllers feature single and multi-loop versions in pre-configured and custom-built panels. For the lowest cost per loop, a power distribution option provides a single box solution for set-up, control, monitoring and output power routing to a multi-zone heat trace cable installation. Panels are pre-wired for significant cost savings compared to buying, assembling and wiring individual components. A color touch panel provides the shortest learning curve available for system set-up and operation. It gives the user virtual pushbuttons, input values, loop status, alarm information and all monitored parameters, such as process temperatures, setpoints, and currents. An RS-485 port with MODBUS interface allows remote monitoring. See table for additional features.



Standard Control Panels¹

PRODUCT SERIES	SENSING METHODS	SENSOR INPUTS	CONTROL METHOD	POWER OUTPUT METHOD	NO. OF LOOPS	AREA CLASSIFICATION
HTLS-10000	Line and Ambient	Universal ²	ON/OFF PID SMART	Solid-State Relay, Power Contactor	1	Safe
HTLS-20000	Line and Ambient	Universal ²	ON/OFF PID SMART	Solid-State Relay, Power Contactor	2	Safe
HTLS-30000	Line and Ambient	Universal ²	ON/OFF PID SMART	Solid-State Relay	3	Safe
HTLS-40000	Line and Ambient	Universal ²	ON/OFF PID SMART	Solid-State Relay	4	Safe
HTLSC1D2-1	Line and Ambient	Universal ²	ON/OFF PID SMART	Solid-State Relay	1	Class 1 Division 2
HTLSC1D2-2	Line and Ambient	Universal ²	ON/OFF PID SMART	Solid-State Relay	2	Class 1 Division 2
HTLS-80000	Line	RTD	ON/OFF with adjustable deadband	Power Contactor ³	8	Safe, or with C1D2 Option
HTLS-120000	Line	RTD	ON/OFF with adjustable deadband	Power Contactor ³	12	Safe, or with C1D2 Option
HTLS-240000	Line	RTD	ON/OFF with adjustable deadband	Power Contactor ³	24	Safe, or with C1D2 Option
HTAS-80000	Ambient	Universal ²	ON/OFF PID SMART	Power Contactor ³	8	Safe, or with C1D2 Option
HTAS-120000	Ambient	Universal ²	ON/OFF PID SMART	Power Contactor ³	12	Safe, or with C1D2 Option
HTAS-240000	Ambient	Universal ²	ON/OFF PID SMART	Power Contactor ³	24	Safe, or with C1D2 Option
FPAS	Ambient	RTD/TC	ON/OFF PID SMART	Power Contactor ³	12, 18, 20, 30 42	Safe, or with C1D2 Option
FPASM	Ambient with weatherTRACE™ Sentinel ¹	RTD/TC	ON/OFF PID SMART	Power Contactor ³	12, 20, 30 42	Safe, or with C1D2 Option
FPLS	Line	RTD	ON/OFF	Power Contactor ³	12, 18, 20, 30 42	Safe, or with C1D2 Option
FPLSM	Line with weatherTRACE™ Sentinel ¹	RTD	ON/OFF	Power Contactor ³	12, 20, 30 42	Safe, or with C1D2 Option

INTELLITRACE

HEAT TRACE TOOLS



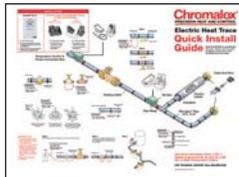
ChromaTrace™ Design Software

ChromaTrace™ 2.01 software helps you design a complete heat trace system, and automatically generates a bill of materials.



Heat Trace Design Guide

The Heat Trace Design Guide contains more than 40 pages of design data, product specifications, worksheets and calculation tables.



Quick Install Poster

The wall mountable Quick Install Guide provides easy viewing of illustrations and calculation tables for specifying heat trace systems.



Heat Trace Sizing Pocket Guide

This pocket guide can be easily carried to job sites for quick calculation of heat trace system needs.



Same Day Shipment of stock items – more than 30,000 part numbers in inventory.

Your local distributor is:

Chromalox®
PRECISION HEAT AND CONTROL

103 Gamma Drive Ext.
Pittsburgh, PA 15238
Phone: (412) 967-3800
Fax: (412) 967-5148
1-800-443-2640
www.chromalox.com