

**Chromalox**<sup>®</sup>  
PRECISION HEAT AND CONTROL

Highly Refined Heating Solutions  
for the Petrochemical Industry

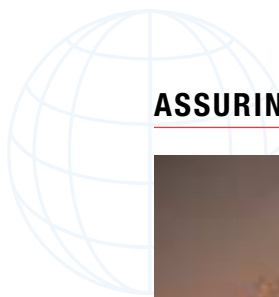


PETROCHEMICAL

# VALUE ADDED

## CHROMALOX HAS YOUR HEAT AND CONTROL SOLUTIONS

With the broadest product line in the industry, Chromalox provides precision heat and control systems for more processes than anyone in the world. We provide solutions for industries as diverse as transportation, pharmaceuticals, power generation, the military, . . . and petrochemicals.



### ASSURING YOUR PROCESS PERFORMANCE WITH CHROMALOX



#### The Chromalox Difference

Some companies build heaters and controls. Chromalox does more. We provide value-added heating solutions throughout petrochemical plants.

The difference between these two approaches is the difference between uncertainty and assurance. It's the difference between having a supplier who just sells equipment and having a partner who can help you save time and money even before startup, who works with you to maximize process efficiency and minimize downtime, and who provides the field service and technical support to get the job done. That's value-added. And you get it from Chromalox.



## TECHNOLOGIES THAT REFLECT AN UNDERSTANDING OF PETROCHEMICALS PROCESSING



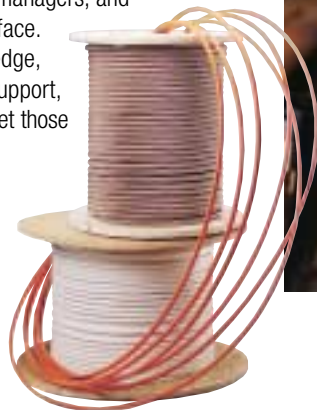
### Chromalox Understands Every Facet of the Process

From explosion-proof heaters for freeze protection to self-regulating heat trace to prevent overtemperature. From circulation heaters that superheat steam to large tank heaters that warm viscous materials for pumping. Our expertise, combined with the most stringent material and manufacturing standards you'll find in the industry, provides you with an array of products you can count on to perform at each critical process phase.



### Chromalox Meets Your Specific Challenges

With that kind of experience behind us, Chromalox understands the unique challenges that petrochemical plant builders, managers, and maintenance personnel face. And we have the knowledge, experience base, local support, and technical skills to meet those challenges with you.



## CHROMALOX HAS A LONG HISTORY OF INNOVATION IN THE PETROCHEMICALS INDUSTRY

Chromalox has been developing better means of applying electrical heat for the petrochemicals industry since 1915. That year, we introduced the world's first metal-sheathed heating element.

# REFINING

## CHROMALOX HEAT AND CONTROL SOLUTIONS . . .

### Polyethylene, Propylene, and Ethylene Plants

- Catalyst Regeneration Heaters
- Nitrogen Preheaters
- Hot Oil Heating Systems

### Air Separation—Bulk Gases

- Defrost Heaters
- Thaw Heaters
- Regeneration Heaters

### Ammonia/Urea Production

- Tank Heating
- Frost Heave Prevention
- High-Pressure Nitrogen and Hydrogen Gas Heaters

### On-Shore/Off-Shore

- Fuel Gas Pre-Heating and Super Heating
- Fuel Oil Pre-Heating
- Gas Drying
- Glycol Re-Boilers and Molecular Sieve Regeneration
- Knock-Out Drum Heaters and Vaporizers
- Tank Heating
- Pipe/Heat Trace Temperature Maintenance
- Sea Water Separation Heaters
- Oil/Gas Separation Heaters

## Large Tank Heaters

Chromalox large tank heaters provide cost-efficient heating of stored viscous materials by precisely sequencing operation to take advantage of off-peak electricity rates. They require very little upkeep and maintenance. That helps reduce both labor cost and the time and material costs of inefficient heating. Chromalox offers a number of large tank heater solutions to meet the needs of petrochemical plants.

### Flanged Immersion Heaters

Flanged immersion heaters provide virtually 100 percent energy efficiency for the heating of large oil tanks. Their bayonet styling provides high watt densities, and available temperature control options permit extremely tight process temperature tolerances. A wide range of standard designs is available for immediate delivery, or Chromalox can design a custom solution for you.

### Flexible Tank Heaters

Chromalox flexible tank heaters are ideal for underground tanks or units without side entry. They spread heat evenly in tanks made from steel, concrete, or Fiberglass®, preventing hot spots and carbonization. In addition, they install through normal manhole openings, so no modification is required. They also allow for tank system operation with little or no manual attention, and using them enables maintenance work to be done without draining the tanks.

### Unitary Large Tank Heaters

Chromalox unitary large tank heaters offer low watt density heating over large heated surfaces with precise temperature control. They are self-contained, can be maintained with little or no manual attention, and eliminate the need to drain tanks. Designed for work under tight space constraints, some models require only three feet of space for installation or removal. And local control panels, complete with weatherproof enclosures, help prevent overtemperature operation and damage from power surges.

### Catalyst Regeneration

Chromalox prewired, skid-mounted circulation heat systems provide high performance for the burning, reduction gas, and calcination gas heaters inside catalyst regeneration units. Flanged immersion elements provide superior strength and rigidity, and can be easily removed for cleaning and inspection. Heater vessels come in an array of sizes and meet virtually any kilowatt or corrosion resistance requirement. And their metal skid mounts, with vessel and control panel securely attached to the frame supports, enable easy handling.



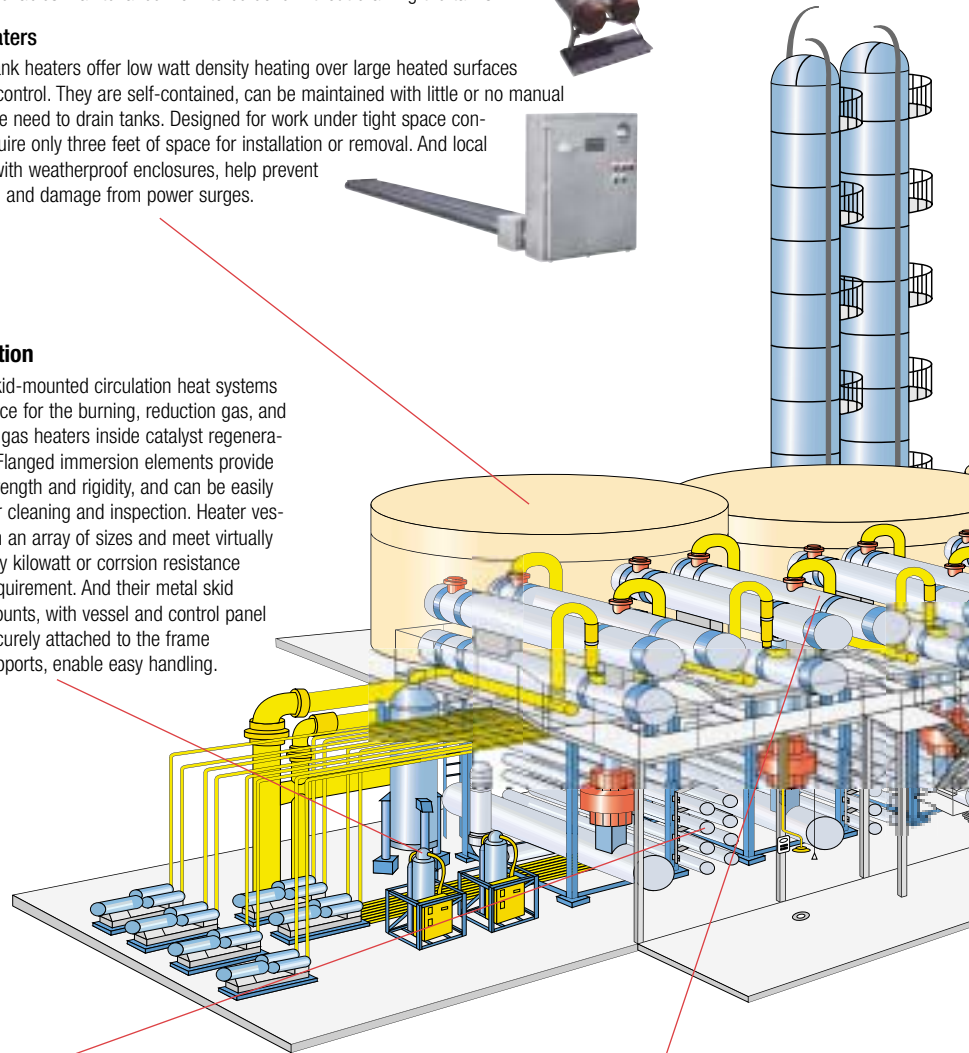
### Steam Superheaters

Chromalox circulation heaters also superheat steam, either for higher process temperatures or to clean the steam itself. Our smaller units also help make up line losses during transportation from central steam generation systems. High watt densities and operating temperatures are obtainable with Chromalox steam superheaters, thanks to the high quality of their INCOLOY® flanges and ASME-certified, carbon steel sheaths.



### Circulation Heaters

Chromalox circulation heaters afford high energy efficiency, fast heating, and uniform heat distribution for numerous petrochemical plants heating applications such as H<sub>2</sub>-rich and Claus gas heating, desulphurization, and air and flue-gas heating. They also provide high turndown capability, tight outlet temperature control, and variable flow rates. And Chromalox offers a variety of electrical terminal enclosures to meet the unique requirements of petrochemical facilities.



## Heat Trace and Controls

Heat tracing helps avoid process temperature drops that can lead to freeze-ups in plant areas like cooling towers, instrumentation lines, process water, safety showers, fire protection piping, and condensate piping. Providing temperature stability helps prevent unacceptable viscosity increases and solidification of fluids in the lines.

### Self-Regulating Heat Trace Cable and Controls

Chromalox self-regulating heat trace and control systems can save energy, reduce maintenance, and the risk of overtemperature. The cable can be single-overlapped without burnout, cut to length in the field, and easily spliced. Outperforms industry competitors in field life, insulation integrity, and resistance against increasing temperatures.

### Constant Wattage Cable

Provides accurate temperature and reliable heat to 300°F. Heating output is uniform through its entire length thanks to its parallel heating core. Flexible and rugged. Withstands steam cleaning to 190 psi at 392°F when de-energized. Can be cut to length in the field, making installation easier.

### Mineral Insulated Cable

Ideal for the most rugged pipe tracing applications, up to 1,200°F. Fire-resistant and does not support combustion. Provides reliable electrical ground for safe operation. Custom configurations available with single or dual conductor cable.

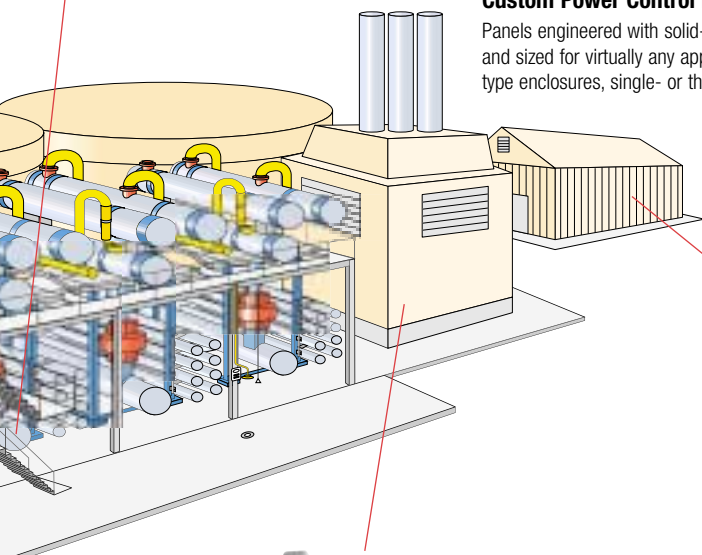
### IntelliTRACE™ Controls

A complete control solution for heat trace applications with a modular design for selection of only the features needed for specific heat trace installations, minimizing the purchase price and simplifying system configuration. Single-channel system using microprocessor-based control. Comes completely pre-wired and assembled. Easily programmed standard features further simplifies installation, start-up, and use. All IntelliTRACE systems are designed for universal inputs. Each unit comes in a NEMA 4X glass fiber reinforced enclosure that includes a solid-state relay (30A at 40°C), mounted on a heatsink, and with a current transformer to measure operating current. Optional GFI modules have a shutdown contactor and illuminated reset switch. A terminal block is used for field connections on all units.



### Custom Power Control Panels

Panels engineered with solid-state controls built to the most rigid standards and sized for virtually any application or specification. Select from many NEMA-type enclosures, single- or three-phase load requirements, voltages, transformers, fusing, contactors, firing cards, and more. We can design the power control panel best-suited for your specific application.



### Auxiliary Electric Steam Boilers

Chromalox auxiliary steam boilers can be placed anywhere steam is required and electricity is available. They are ideal for remote locations where plant steam is not economical, providing hot water or steam on demand for emergency or maintenance downtime backup. They are simple to use, operate cleanly, and require minimal maintenance.

### Hazardous Duty Convection and Blower-Type Heaters

Chromalox hazardous duty convection and blower-type heaters provide comfort, freeze protection, and moisture protection in areas like switchgear, control rooms, outbuildings, and pump houses—particularly where the possibility of explosion or fire exists. Ruggedly designed Chromalox convection and blower-type heaters are UL-listed and CSA- and MSHA-certified. Models are available for wall or ceiling mounting.



... FOR A  
VARIETY OF PROCESS  
APPLICATIONS

#### Aromatics Plants

- Catalyst Regeneration
- Reduction Gas Heaters
- Precision High-Temperature Heaters for Promoting Reaction in Platinum Catalyst

#### Butane, Pentane, and Hexane Products

- Hydrogen Pre-Heaters for Upgrading Octanes

#### LNG

- Defrost Gas Heaters for Liquification
- Feedstock Pre-Heaters for Condensation Prevention
- Hydrocarbon Stream Heaters

#### MTBE

- Catalyst Regeneration Heaters
- Reduction Gas Heaters
- Benzene Reduction and Regeneration Heaters

# VALUE ADDED

## LOCAL TECHNICAL SUPPORT, CUSTOM DESIGN

The industry's largest and most experienced engineers are right there in the field with you. The majority of our 300+ field sales representatives are degreed engineers, and all are experienced with Chromalox heating products and applications. Our innovative design engineers are ready to work with your local Chromalox representative to custom-build a precision heating and control system for any application need you have.

## ADDING VALUE WITH UNRIVALED DESIGN CAPABILITIES, SERVICE, AND SUPPORT



### Chromalox Can Save You Time and Money Even Before Startup

#### Lower maintenance and installation expenses

Chromalox electric process heaters require minimal cleaning and calibration. Our standardized designs reduce your installed cost as well as your eventual replacement cost. From heater assemblies and skid fabrication to integration with controls and sensors, our complete engineered systems reduce installation labor, reduce startup time, and ensure proper operation to specifications.

#### Reduced insurance premiums

Using Chromalox ASME- and FM-certified electric package systems may result in lower insurance premiums for you—lower than those offered to competitors using fuel-fired boiler systems.

#### Broadest third-party approval

Chromalox is the only manufacturer with extensive systems manufacturing in the U.S. and Europe. Approvals and certifications include, but are not limited to, CE, NEC, UL, VDE, cUL, FM, CSA, MSHA, BASEEFA, Cenelec, ASME, PED, ATEX, GOST, and ISO9000.

#### Lower training costs

Our in-house engineering and software capabilities allow us to design simple operator interfaces. These advanced designs can reduce your business' training time and expense, as well as increase repeatable operation. In addition, Chromalox has available training tools and resources to assist you in installation, startup, and operation.

### Chromalox Can Improve Your Process Efficiency

#### Custom-design for special needs

Chromalox can design heating solutions for any spatial requirement you might face. Our engineers will custom-design the right product to meet your unique application needs. If an element, sensor, control, or packaged system that we carry in stock doesn't exactly fit your needs, we'll custom-build it—either expertly adapting an existing product or designing and manufacturing a completely new one. We are responsive partners, eager to help you produce prototypes for new products and systems. With our experienced design engineers and extensive manufacturing capabilities, we'll work with you to develop innovative designs in the shortest possible turnaround times.



### Reducing process variation

Control panels coupled with heaters optimize temperature control and shrink variations in efficiencies, allowing a better burn.

### Flattening out electrical fluctuations

Chromalox power controls, SCRs, and proprietary software precisely sequence heaters, balance electrical loads, control soft starts, and correct power factors.

### Chromalox Can Help Minimize Your Downtime

#### Quick parts replacement

Chromalox maintains vast inventories of repair and replacement parts for immediate shipment and same-day or next-day delivery. Our toll-free service line can answer your questions quickly at 1-800-368-2493.

#### Tightening process control with enhanced diagnostics

Chromalox offers proprietary controls and software for shorted SCRs, ground fault, current monitoring, partial load failure detection, and other failure modes. These provide process controls and alarms that protect your processes and equipment.

#### Support marked by prompt, expert troubleshooting

In addition to information available in product literature and at our website, factory and local engineers can offer answers that return your equipment to service quickly. Call 1-800-443-2640 for the representative closest to you. Or visit [mychromalox.com](http://mychromalox.com).

### Technical Assistance on the Internet at [www.chromalox.com](http://www.chromalox.com)

#### Answering your questions 24 hours a day, 7 days a week

This website offers product specs, training manuals, and technical documentation day or night. You can find answers to questions about anything from electronic temperature controllers, pumps, and fluids to material compatibility, corrosion, and wire sizing.



**UNMATCHED STOCK,  
RAPID DELIVERY**

Chromalox maintains an inventory of nearly one million items. We also operate the fastest delivery system in the business. We can ship any component or system we stock within 24 hours through our [chromalox.com](http://chromalox.com) electronic direct order entry system.

Same-day delivery is available for many items. In addition, factory offices, stocking representatives, and over 2,000 authorized distributors carry Chromalox systems and components for same-day pickup.

# Chromalox Value-Added Products and Services Are Available Worldwide

## Worldwide Customer Service

Argentina	Ecuador	Iran	Puerto Rico
Australia	Egypt	Israel	R.O.C. (Taiwan)
Austria	El Salvador	Japan	Russia
Belgium	England	Korea	Saudi Arabia
Bolivia	France	Kuwait	Singapore
Brazil	Germany	Lebanon	Sweden
Canada	Greece	Malaysia	Switzerland
Chile	Guatemala	Mexico	Thailand
China	Honduras	Netherlands	Turkey
Colombia	Hong Kong	Nicaragua	United Arab Emirates
Costa Rica	Iceland	Norway	United States
Dominican Republic	India	Pakistan	Venezuela
	Indonesia	Peru	

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PRECISION HEAT AND CONTROL

103 Gamma Drive Ext.  
Pittsburgh, PA 15238  
USA

Phone: (412) 967-3800  
Fax: (412) 967-5148

Toll-Free: 1-800-443-2640

email: [sales@chromalox.com](mailto:sales@chromalox.com)  
[www.chromalox.com](http://www.chromalox.com)

### Eltron Chromalox

Eltron House  
20-28 Whitehorse Road  
Croydon, Surrey, CR9 2NA, UK

Tel: +44 (0)20 8665 8900  
Fax: +44 (0)20 8689 0571

email: [uksales@chromalox.com](mailto:uksales@chromalox.com)  
[www.chromalox.co.uk](http://www.chromalox.co.uk)

### Etirex Chromalox

Route de Château-Thierry  
Noyant et Aconin  
F-02203 SOISSONS Cedex, France

Tel: +33 (0)3 23 74 39 39  
Fax: +33 (0)3 23 74 39 00

email: [etirexchromalox@wanadoo.fr](mailto:etirexchromalox@wanadoo.fr)  
[www.chromalox.fr](http://www.chromalox.fr)