

NUCLEAR REACTOR
ENGINEERING

Chromalox®

Chromalox®
PRECISION HEAT AND CONTROL

**Precision Electric Heat and Control Systems
for the Nuclear Power Generation Industry**



NUCLEAR GENERATION

WHY CHOOSE ELECTRIC HEAT?

- Consistent pricing
- Clean-running operation
- No pollution
- Quiet operation
- Reduced footprint and envelope size
- Minimal maintenance
- Low operating cost
- Safety
- Large turndown / precise control

Glycol / Water Heating

Circulation heaters are used to warm coolant for standby / emergency generators.

Fuel Pre-Heating

Circulation heaters pre-heat #2 fuel oil for standby / emergency generators.

Lube Oil Heaters

Immersion heaters warm lube oil for lubrication of bearings and moving components.

Construction Areas

Blower heaters and air handlers provide construction comfort heating and aid in the curing of concrete in construction areas.

Boric / Boron Heating

Precipitate heaters maintain temperature to prevent solution from solidifying or freezing.

Hydrogen Storage

Immersion heaters provide heat input to ensure precise temperatures needed for process conditions.

Process Lines

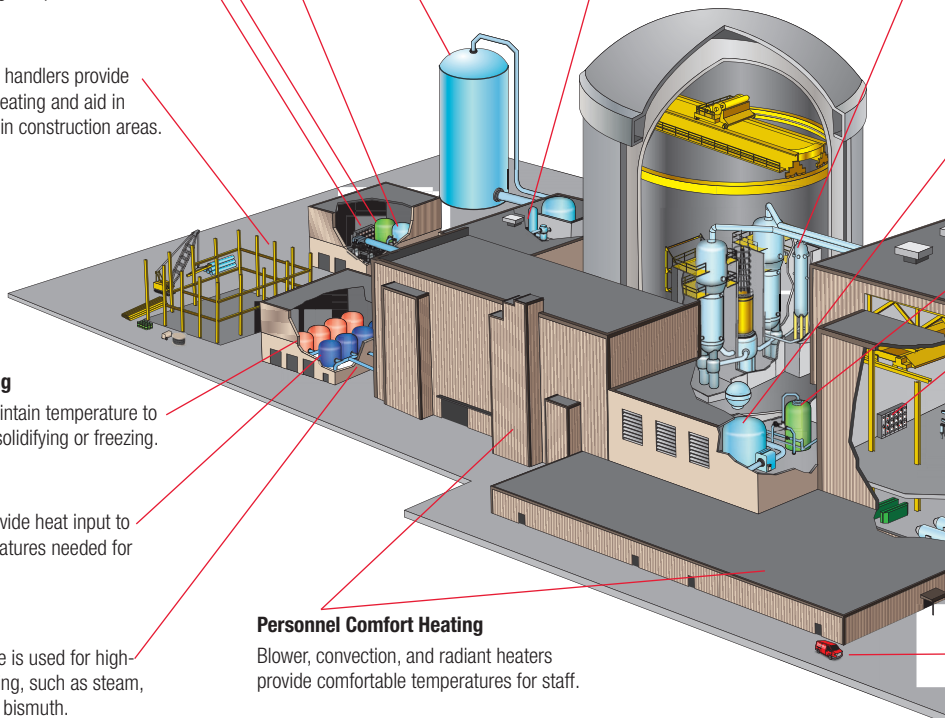
Mineral-insulated cable is used for high-temperature pipe heating, such as steam, boron, sodium, or lead bismuth.

Fire Water Storage

Large-tank heaters with replaceable elements ensure operational readiness for freeze protection applications.

Process Air

Duct heaters can be used for applications such as air heating or iodine absorbers.



Personnel Comfort Heating

Blower, convection, and radiant heaters provide comfortable temperatures for staff.

Large-Tank Heating Systems

Chromalox large-tank heaters employ metal-sheathed tubular or ceramic-insulated, open-coil pipe insert heating components for use in 2- and 3-inch nominal pipe sizes. This unique construction allows heating elements to be changed or field-serviced without draining the tank. Complete with Chromalox controls, these large-tank heating systems can be operated to maintain materials at the proper temperatures with little or no manual attention.



Immersion Heaters

Chromalox immersion heaters apply heat directly at virtually 100 percent efficiency. Basic mounting options include threaded, flanged, and over-the-side designs. Various temperature control options permit very tight process temperature control. Our circulation heaters are designed to heat a flowing medium using in-line or side-arm piping configurations. A wide selection of kilowatt ratings, materials, vessel sizes, terminal enclosures, control features, and mounting methods is available.



Comfort Heaters

Chromalox electric comfort heaters provide efficient, economical heat for warehouse, shipping/receiving, distribution, and manufacturing areas. Convection, forced-air, and radiant heaters provide safe, clean, fast heat. Heavy-duty construction affords long, dependable service.



Duct Heaters

Compact, safe, and lightweight heat sources, Chromalox process air duct heaters are available in sizes ranging up to 3.2 MW capable of producing temperatures up to 1,200°F (650°C) for heating air or other gases. Sheathed tubular, finned tubular, and finned strip elements consistently outperform gas, oil, and open-coil electric units in both heating efficiency and safety. Elements and special materials are available for use in custom designs.



Pressurizer Heaters

Pressurizer heaters heat and maintain water in the primary loop at the operating temperature and pressure required by the pressurized reactor vessel.

Recirculation Heater

Circulation heaters prevent the freezing of the liquids used in the containment cooling system and storage tanks.

DeminerIALIZED Water Storage

Immersion heaters provide freeze protection and temperature maintenance.

Process and Heating Control

Panels, controllers, and sensors direct heater control based on operating conditions.

Piping Distribution

Self-regulating and constant-wattage heat trace cables are used for pipe temperature maintenance and freeze protection.

Refueling / Make-Up Water

Circulation heaters provide temperature control for refueling water, make-up water, and plant water usage.

Condensate Storage

Immersion heaters provide the extra heat needed to maintain condensate return temperature.

Service and Maintenance

Yearly service visits ensure optimal operating conditions and help predict needed maintenance.

Heat Trace and Controls

Heat trace is used to counteract the heat loss from process equipment and piping through its insulation, to prevent solution precipitation and the increase of viscosity or solidification of product, and to provide freeze protection. Chromalox offers a variety of heat trace cable; temperature control, monitoring, and management in one, modular package; and all of the necessary components needed to complete the installation, including splices, power connection boxes, and water-resistant end-seal terminations.



Mineral-Insulated Cable

Ideal for the most demanding pipe tracing applications, Chromalox mineral-insulated cable can generate heat up to 1,100°F (590°C). Its INCOLOY* sheath is fire-resistant, does not support combustion, and provides a reliable ground for safe operation. It can be used in Division 1 and 2 hazardous areas. Custom configurations are available with single- or dual-conductor cable.



Control Systems

From basic, low-cost temperature and process controllers, to monitors and overtemperature controls, to more sophisticated control systems like the Chromalox® IntelliPANEL™ 3-phase SCR power control panel featuring unique color touchscreen technology, Chromalox can design the right system for your plant's needs. We are the only heating element supplier offering a complete line of controls, control panels, and accessories.



WHY CHOOSE CHROMALOX?

- Broadest product line and experience unmatched in the industry
- Precision-engineered heat and control systems for more power generation processes throughout the world than anyone
- Vertical integration in manufacturing capabilities
- Full design and engineering for virtually any electric process heat and control application
- Customized service ranging from startup and training, to ongoing maintenance diagnostics, to emergency response—all based on complete knowledge of your components parts and systems

NUCLEAR-CERTIFIED PRODUCTS

Chromalox is certified by ASME for construction of both "N" and "NPT" products. This certification entails rigid manufacturing and quality standards for the exacting standards of the nuclear industry. In addition to nuclear certification, Chromalox provides the largest breadth of third-party certifications including ASME, PED, CQST, CSA, UL, GOST, ISO 9001:2008, NQA-1, and ATEX.



*INCOLOY is a registered trademark of Huntington Alloys Corporation.

Chromalox Value-Added Products and Services Are Available Worldwide



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