

# Heating & Vaporizing Solutions for Industrial Gas, Cryogenic, and Air Separation



Cast Aluminum Solutions designs and manufactures innovative heating and vaporizing products to fit a range of industrial gas, cryogenic, and air separation applications.

The primary offering is our CAST-X Heater line: heated media flows through the heater's stainless steel or Inconel tube. Your media never touches the heating element, and flow-tubes are high pressure compatible.

CAS also manufactures custom-engineered heaters, providing customers with proprietary designs and unique features. Our New Product Development Team offers dedicated prototyping & performance testing services, strengthened by our state-of-the-art R&D Tech Center

We serve gas processors and equipment makers worldwide through our robust network of sales engineers and distributors with offices throughout North America, Europe, and Asia.

## PRIMARY APPLICATIONS:

- Cryogenic Gas Vaporization
- Gas Warming to Counter Joule-Thomson Cooling
- Gas Cabinet Trim Heaters
- Polymer Membrane Nitrogen Generation (infeed heating to maximize selective permeation output)
- Waste Gas Regeneration Applications for Temperature Swing Adsorption (TSA) Pre-Purification Units
- Desiccant Wheel Humidifiers (heating purge air in the regeneration column)
- Bulk Gas Purification (regen in the oxidizing catalyst vessel)
- Off-Loading and Decanting of Bulk Gases

## PRIMARY PRODUCT & SERVICE OFFERINGS

- CAST-X Heaters: Available in 6 sizes from 1 to 60 kW
- CAST-X High Temp Heaters: Temps to 600°C (1110°F)
- Custom-Engineered Inline Heaters, Vaporizers, Valve Warmers, and More for Liquids & Gases

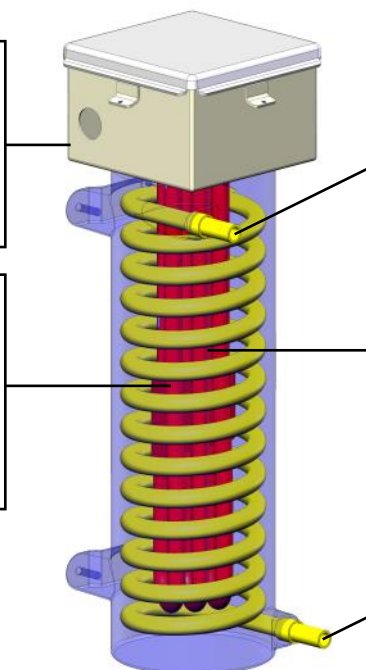
## The CAST-X Heaters: A Standard Product with Exceptional Capabilities

### Multiple Enclosure Options:

CAST-X Heaters are available with a Water Resistant or Explosion Proof terminal enclosure. These enclosures house the wiring for heat elements and temp sensors.

### "No Contact" Heating:

Heating elements are cast into the heater body, which transfers heat to the flow-tube and the media inside. Your media never contacts the heating elements: it is isolated in a high-pressure-compatible flow-tube.



### High-Pressure Compatible:

Standard CAST-X Heaters feature 316L stainless steel flow-tubes. CAST-X High Temp Heaters have Inconel tubes. Most configurations are capable of withstanding several thousand PSI.

### Temperature Sensors in Heater Body:

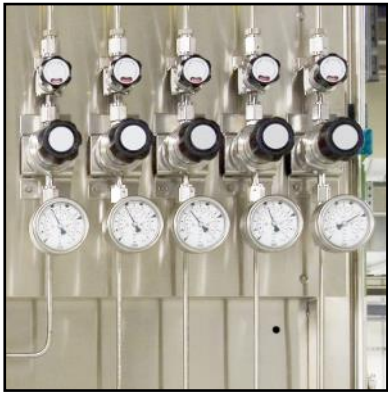
To accurately monitor operating temps, thermocouples (or RTDs) are installed in the heater body. Linked to the control panel, they help provide accurate, safe control of the heater.

### Tube Options:

Small CAST-X models have a single flow-tube. Larger models have 2 tubes standard, with single tubes as custom. Duals may be run in single tube mode, dual-tube parallel flow (high flowrate), or dual tube flow in series (long dwell time).



**Prevention of J-T Cooling, Icing**  
Installing a CAST-X Heater in-line warms expanding gases to prevent valve and component freezing.



**Trim Heaters for Gas Cabinets**  
For many OEMs, CAST-X is the trim heater of choice, providing moisture reduction (gas drying) and temperature optimization.

### CAST-X Heater Applications



**Cryogas Vaporization & Warming**  
CAST-X Heaters regulate the vaporization process, providing predictable, frost-free results.



**Air Separation & Gas Regeneration**  
CAST-X Heaters fit membrane-based nitrogen production systems, TSA style PPU's, plus several regeneration and dehumidifying processes.



**Decanting, Filling, De-Tanking**  
With CAST-X Heaters available in multiple sizes, they fit an array of filling, offloading, disbursement and transfer-based installations.



#### CAST-X HIGH TEMP: **OPERATING TEMPERATURES TO 600°C / 1110°F**

- CAST-X High Temp has the same isolated fluid path as standard CAST-X, but with a much higher operating temperature ceiling.
- CAST-X HT 500: Up to 1500 Watts, with 1/4" (6.3 mm) OD flow-tube
- CAST-X HT 2000: Up to 6000 Watts, with 1/2" (12.7 mm) OD flow-tube
- Perfect for test benches, high-temp nitrogen or air heating, and catalytic applications requiring high temperatures to trigger molecular transition.



#### CUSTOM-ENGINEERED HEATING DEVICES

- CAS designs and manufactures custom-engineered heated components and vaporizers to suit unique customer requirements.
- Available with cast-in or interference-fit heating elements and flow-tubes.
- Examples include valve warmers, ring heaters, vessel heaters, inline heaters, and more.



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