Process Systems

- Line Heaters
- Heat Transfer Systems
- Fuel Gas Conditioning Systems
- Specialized Water Treatment Systems
- Seal Gas Heaters
- Nuclear Applications
- Ammonia Vaporization Systems
Thermon Heating Systems Inc. is uniquely positioned to offer fully integrated Process Systems for the most demanding industrial applications. The range of our technologies enables equipment from our various brand lines to be combined into one perfect turnkey package solution.

Adhering to the highest Quality Control and Manufacturing approvals and certifications, Thermon Heating Systems provides safe, well built, and fit for purpose systems.

Approvals and Certifications include:

- ASME Sec. I, IV, and VIII, Div. 1 & 2 - UM, U2, S, H, and UM stamps.
- ASME Sec. III Class 1, 2, and 3 - N and NPT stamps.

From Nuclear to Natural Gas, Power Generation to Petrochemical, Oil & Gas to Water & Environment, Thermon Heating Systems provides engineering, design, and manufacturing expertise unsurpassed in the industry. There is virtually no custom heating or filtration project we cannot achieve.
Engineering & Design Expertise

Thermon Heating Systems Inc. provides engineering, design, and manufacturing expertise unsurpassed in the industry. There is virtually no custom heating or filtration project we cannot achieve.

- Total integration of mechanical, electrical, instrumentation and controls into fully engineered process packages for hazardous and non-hazardous locations.
- Custom pressure vessels, process piping, heating, filtration and process engineering, design and manufacturing.

Process Analysis
- Process simulation and optimization – Aspen HYSYS
- Computational Fluid Dynamics (CFD) simulation

Seismic Analysis
- Finite element analysis
- Modal analysis
- Static equivalent analysis
- Response spectrum analysis
- Code compliance – NBC, CBC, IBC, ASCE-7

Stress Analysis
- Finite element analysis – ANSYS
- COMPRESS code calculation – ASME Sect. VIII Div. 1 and Div. 2
- MathCAD and in-house stress analysis software

Design Registration & Code Compliance
- ASME Sections I, III Div. 1, IV, VIII Div. 1 & 2
- CSA B51 & N285
- ASME B31.1, B31.3

Manufacturing Capabilities
- Fabrication in carbon steel, stainless steel, duplex, super-duplex, aluminum or specialty/exotic materials
- GMAW, SMAW, SAW, and GTAW welding methods
- Robotic welding
- Extensive library of approved welding procedures
- In-house machining, blasting and painting
- In-house and third-party NDE testing
- PLC programming and testing
- In-house pressure and performance testing
Line Heaters

Cata-Dyne™ LH Line Heaters prevent equipment freezing and possible hydrate formation during pressure reduction at natural gas regulating sites. Line Heaters heat the gas stream using infrared radiant heat transfer, eliminating the use of burners, glycol fluid and high maintenance heat exchange systems. It is also used to condition fuel gas for natural gas fired turbines or engines, and for heating of gas and diluent streams in a variety of process applications.

Custom engineered units for non-standard applications are available. As a subset to custom engineered units, only Thermon Heating Systems offers a Catalytic/Electric Hybrid Line Heater. A secondary electric gas circulation heater augments the capabilities of the base catalytic line heater providing enhanced responsiveness to gas flow transients and deeper turn-down capabilities.

- Infrared radiant energy provided by the silent Cata-Dyne™ WX Gas Catalytic Heater is NOX free for the cleanest and quietest heating system available.
- Thermon Heating Systems’ Cata-Dyne™ heaters are the first and only explosion proof catalytic units conforming to the ANSI Z83.20a-2010/CSA 2.34ab-2010 standard for Gas-Fired Low Intensity Heaters and are CSA and FM certified for use in Class 1, Division 1 or 2, Group D hazardous locations.
- Available standard sizes from 40,000 to 160,000 BTU/hr input; standardized 300,000 BTU/hr modules for combined systems of up to 1,200,000 BTU/hr.
- Enclosures feature galvanized steel structures with stainless-steel cladding, limiting corrosion and maintenance.
- Optional automatic units feature engineered control panels with PLC control systems.
- The flanged, multi-pass coil heat exchanger is designed and built to the ASME B31.3 Code for Process Piping.
- Fuel gas system designed and built in accordance with CSA/Can – B149.1 and NFPA 54.
- Electrical system designed and built in accordance with CSA/Can – C22.2 and NEC (NFPA 70).

Line Heater Applications

Prevent freezing and hydrate formation at pressure regulating stations, condition fuel gas for gas turbines and engines, heat gas and diluent streams in process applications.

- Fully automatic control.
- Certified for Class 1, Div. 1 locations.
- 80,000 BTU/hr.
- Manual controls.
Fuel Gas Conditioning Systems

Fuel Gas Conditioning Systems (FGCS) treat fuel gas supplies by removing detrimental impurities and moisture content, and adjusting gas process parameters such as temperature and pressure to protect equipment life, ensure operational efficiency and control emissions. Gas metering may also be configured. FGCS respond to fuel property variations to control and optimize fuel gas quality and delivery ensuring reliable, safe and economic equipment operation.

- Design and manufacturing in accordance with worldwide standards and codes including ASME, NACE, CSA, UL, NEC, IECEx, ATEX and EAC.
- Design and manufacturing of systems utilizing electric process heating and/or catalytic heating technology where electric power is a constraint.
- Multiple stages of conditioning including gas separation, particle filtration, adsorption, pressure reduction, superheating, and dew point control.
- Pressure vessel design and fabrication to ASME Section VIII, Division 1 & 2 with U or U2 stamps, Canadian Registration Number (CRN) and National Board registration available.
- Process piping designed and fabricated to ASME B31.3.
- Electronic controls and algorithms incorporating PLC technology, distributed modules and wired or wireless data transmission.
- Ancillary equipment availability includes flow metering, gas analysis, and Wobbe index monitoring.
- Additional third party certifications such as Lloyds, TUV, and others available.

Fuel Gas Conditioning System Applications

Prepare fuel (natural) gas for use in gas turbines, gas furnaces, gas burners, etc. Used by gas turbine manufacturers, combined cycle power plants, natural gas turbine installations, gas fired furnaces, and small off-shore and on-shore power generators.

- Fuel gas conditioning including liquid separation and 215 kW electric heating.
- 11,000 lbs/hr natural gas.
Seal Gas Heaters

Seal Gas Heaters are used in pipeline compressor stations, process compressors, and anywhere that gas compression equipment with dry gas seals is operating. The seal gas must be heated above the dew point to prevent the introduction of moisture into the seal, as the presence of moisture will compromise the seal, releasing process gas.

Seal Gas Heaters provide precise temperature control for seal gas. These systems are designed to operate under high pressure with widely variable flow conditions. Heat is transferred to the sealing gas process either directly using an immersion circulation heater, or indirectly using an electric heater immersed in an oil bath or aluminum casting containing the process coil.

- Generally < 50 kW.
- Voltages up to 690V AC.
- Global certifications including CSA C/US, UL, IECEx, ATEX, and EAC.
- ASME design and construction on all pressure boundary parts.
- All wetted parts in 304 stainless steel for indirect heaters and 1800 elements and C5 pressure vessels for direct heaters. Other metallurgies are available.
- Integral process temperature sensing for outlet temperature control.
- Local or remote control panel: NEMA 12, NEMA 4, or Class I, Division 1 and 2 ingress protection. Full SCR control is recommended for high process accuracy.

**Seal Gas Heater Applications**

Pipeline compressor stations, process compressors, and anywhere that gas compression equipment with dry gas seals is operating.

- 6 kW hot oil bath heater with expansion tank.
- 75 kW seal gas heater
- Certified for Class 1, Div. 2 locations
- Direct electric heating.
Ammonia Vaporization Systems

Ammonia Vaporization Systems are designed for changing the state of anhydrous and aqueous ammonia from liquid to gas form while maintaining the desired pressure conditions and delivering the gas vapors to selective catalytic reduction (SCR) reactors. Caloritech™ designs Vaporization Systems for anhydrous and aqueous ammonia used to control Nitrous Oxide (NOx) emissions in Selective Catalytic Reduction (SCR) applications.

- Anhydrous and aqueous ammonia is electrically heated.
- Custom designed for each application.
- Control enclosure, CSA C/US or UL certified.
- All welded construction.
- Level sensors and pressure sensors, temperature controller, flow controller, feed ratio indicator and pressure reducing valve are available.
- Highly accurate temperature control.
- Moisture resistant terminal housing and anti-condensation heaters.
- Power, voltage, phase to spec.
- Safety interlock system for ammonia line electric heater to shut down in the event of a failure.
- CSA certified, UL and ASME VIII, Division 1 equipment.
- Additional options are available upon request, such as:
  - Hazardous location electrical equipment.
  - Seismic analysis and qualifications.
  - ATEX & IECEX electrical certification.
  - SELO Chinese pressure vessel certification.

Ammonia Vaporization System Applications

Utility plants, power generation plants, cogeneration power plants, refineries, peaking facilities, industrial and gas turbines.

- 39 kW ammonia vaporization system/superheater.
- Certified for Class 1, Div. 2 locations.
Heat Transfer Systems

Liquid Heat Transfer Systems are custom designed to provide high temperature process heat without the need for high pressure design common to saturated steam transfer systems. Heat transfer fluid, such as hot oil, is circulated through electric circulation heaters and the process in a closed loop.

Systems are supplied as fully prewired and piped packaged assemblies with every detail tailored to the customer’s specific application.

- Custom designed, skid-mounted unit provides process heat utilizing electric heaters to heat water, glycol, oil, or heat transfer mediums.
- Custom designs can incorporate water or steam boilers, super heaters, and filtration equipment.
- Available in wattages up to 5,000 kW and voltages from 110 to 690V AC.
- Carbon steel or custom alloy materials.
- PLC or hard-wired controls.
- Certified to CSA C/US, IECEx, CE/ATEX or EAC.
- ASME Section VIII, Division 1 and 2.
- Even at very high process temperatures system functions at a pressure less than 30 psig while using appropriate heat transfer fluid.
- Easy and convenient installation - simply connect the process pipes to the system inlet and outlet, mount the separately supplied expansion tank and connect to your electrical supply.
- Features low density EX circulation heaters mounted on a structural steel frame.
- Centrifugal, direct drive pumps are standard; positive displacement pumps available upon request.
- Special inlet and outlet valves with high temperature packing and flanged connections are standard; bypass, drain, fill and bleed valves are installed in the piping loop with all welded connections for pipes with 1/2” NPT or larger.
- Mechanical devices provided include expansion tank with sight glass and vent, pressure gauge(s), low and high pressure switches or optional differential pressure switch.
- Motorized valves for heating and cooling applications are available.
- Fully prewired control panel features disconnect, HRC fusing, derated magnetic contactors, electronic indicating and fully adjustable temperature control, electronic high temperature limit control, optional step controller and pilot lights.
- All components are connected with factory-tested, leak-proof joints.

Heat Transfer System Applications

Provide accurate process temperatures in molds, platens, presses and jacketed vessels or pipes under practically negligible pressure conditions.

- 300 kW Heat Transfer System.
- Non-hazardous locations.
- 300 kW Heat Transfer System.
- Certified for Class 1, Div. 2 locations.
- 68,000 lbs/hr.
Specialized Water Treatment Systems

Specialized Water Treatment Systems are composed of a variety of sub-sets of components depending on the specific solution required. At its simplest, a water treatment system removes suspended solids in a single stage through the use of either cleanable or disposable media. More complex systems may utilize multiple stages to achieve desired water quality.

• Custom designed for each application.
• Multiple stages of conditioning including: particle filtration, hydrocarbons separation, chemical removal (such as phenols, H₂S and chlorine), ozone injection to reduce BOD and COD levels, flocculent injection to precipitate various elements such as Ca, Mg, Ba, Sr and Fe and pH adjustment through chemical injection and deep bed vessels.
• Pressure vessel design and fabrication to ASME Section VIII Div 1 & 2 with U or U2 stamps, Canadian Registration Number (CRN) and National Board registration available.
• Process piping designed and fabricated to ASME B31.1 and B31.3.
• Electronic controls and algorithms incorporating PLC technology, distributed modules and wired or wireless data transmission.
• Ancillary equipment availability includes flow metering and water analyzers.

Specialized Water Treatment System Applications

Anywhere that requires water quality improvement. This can include frac water clean-up, process water clean-up prior to discharge, and other similar applications.

• Oil/water separator comes with pH control using chemical injection.
• Duplex stator coding filters.
• ASME Section VIII Div. 1.
• 730 GPM.
Nuclear Applications

Thermon Heating Systems has exceeded the most demanding Nuclear heating and filtration requirements for over 40 years. We design and manufacture products and complete Process Systems for nuclear applications in PWR, BWR and PHWR nuclear reactors.

Our nuclear quality program complies with:

- ASME NQA-1
- 10 CFR 50 Appendix B
- ANSI N45.2
- CSA N285.0.

Along with a broad range of standard and custom products, Thermon Heating Systems designs, engineers and manufactures a variety of Process Systems for Nuclear Applications including:

- High pressure and low pressure filters.
- Electric pressurizer heaters.
- Electric de-gasser heaters.
- Tube and shell heat exchanger.
- Ion Exchange Columns for deionizing reactor coolant or condensate water.
- Vapour Recover Dryers for removing heavy water vapour from reactor buildings.
- Tritium Removal Facility Dryer Skid for removing heavy water from deuterium gas.

- Vapour recovery dryer for tritiated D$_2$O and H$_2$O.
- 200 SCFM Twin Tower, two (2) drying stages.
- In line evaporative cooler tower.
- Close loop regeneration cycles.
- Category 2 control system.
- ASME Section VIII, Div 1.

- Vapour recovery dryer.
- 6000 SCFM.
- ASME Section III Class 3.
## Certifications

<table>
<thead>
<tr>
<th>Certificate No.</th>
<th>Agency</th>
<th>Application Symbol or Standard</th>
<th>Description/Product Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-3578</td>
<td></td>
<td>[N]</td>
<td>Construction of Class 1, 2 &amp; 3 Vessels; Class 1, 2 &amp; 3 Piping Systems; and Class 1, 2 &amp; 3 Shop Assembly.</td>
</tr>
<tr>
<td>N-3579</td>
<td></td>
<td><img src="image1" alt="logo1" /></td>
<td>Class 1, 2 &amp; 3 Fabrication Without Design Responsibility and Class 1, 2 &amp; 3 Fabrication With Design Responsibility for Appurtenances and as a Material Organization Supplying Ferrous &amp; Nonferrous Material.</td>
</tr>
<tr>
<td>27,443</td>
<td></td>
<td><img src="image2" alt="logo2" /></td>
<td>Manufacture of Pressure Vessels.</td>
</tr>
<tr>
<td>48,340</td>
<td></td>
<td><img src="image3" alt="logo3" /></td>
<td>Manufacture of Pressure Vessels.</td>
</tr>
<tr>
<td>38,138</td>
<td></td>
<td><img src="image4" alt="logo4" /></td>
<td>Manufacture of Miniature Pressure Vessels.</td>
</tr>
<tr>
<td>Stamps</td>
<td>National Board</td>
<td><img src="image5" alt="logo5" /></td>
<td>Manufacture of Boilers, Pressure Vessels or Other Pressure Retaining Items to ASME Code – H, S, U, U2 and UM Stamps.</td>
</tr>
<tr>
<td>R-7613</td>
<td>National Board</td>
<td><img src="image6" alt="logo6" /></td>
<td>Metallic Repairs and/or Alterations.</td>
</tr>
<tr>
<td>QA 02215</td>
<td></td>
<td>ASME Sec. IV CSA B51</td>
<td>Heating Boilers to ASME Boiler and Pressure Vessel Code, Section IV and CSA Standard B51 Boiler, Pressure Vessel, and Pressure Piping Code.</td>
</tr>
<tr>
<td>QA 02216</td>
<td></td>
<td>ASME Sec. VIII Div. 1 CSA B51</td>
<td>Manufacture of Pressure Vessels to ASME Boiler and Pressure Vessel Code, Section VIII Division 1; and CSA Standard B51 Boiler Pressure Vessel and Pressure Piping Code.</td>
</tr>
<tr>
<td>QA 181</td>
<td></td>
<td>CSA N285.0</td>
<td>Construction of Class 1, 2, 3 &amp; 4 Vessels; Class 1, 2 &amp; 3 Pumps, Vessels, Line Valves and Piping Systems; Class 2 &amp; 3 Storage Tanks; Class 1, 2 &amp; 3 Shop Assembly; as a Material Organization Supplying Ferrous and Nonferrous Material. In Accordance with CSA Standard N285.0, General Requirements for Pressure Retaining Systems and Components in CANUDU Nuclear Power Plants.</td>
</tr>
<tr>
<td>QA 03538</td>
<td></td>
<td>CSA N285.0</td>
<td>Fabrication of Class 1, 2, 3 &amp; 4 Welded and Non-Welded Category A, B, E &amp; H Type Fittings in Accordance with CSA Standard N285.0, General Requirements for Pressure Retaining Systems and Components in CANUDU Nuclear Power Plants.</td>
</tr>
<tr>
<td>QA 04487</td>
<td></td>
<td>CSA N285.0</td>
<td>Appurtenances.</td>
</tr>
<tr>
<td>QA 05067</td>
<td></td>
<td>ASME Sec. VIII CSA B51</td>
<td>Manufacture of Pressure Vessels to ASME Boiler and Pressure Vessel Code, Section VIII, Division 2 and CSA Standard B51 Boiler, Pressure Vessel, and Pressure Piping Code.</td>
</tr>
<tr>
<td>QA 05091</td>
<td></td>
<td>CSA N285.0</td>
<td>Repair or Modification.</td>
</tr>
<tr>
<td>QA 05198</td>
<td></td>
<td>ASME B51</td>
<td>Repair.</td>
</tr>
<tr>
<td>TS2200550-2013</td>
<td>SELO</td>
<td>—</td>
<td>A2/Pressure Vessels A2.</td>
</tr>
<tr>
<td>TS2200D85-2018</td>
<td></td>
<td>—</td>
<td>Pressure Vessels D2.</td>
</tr>
<tr>
<td>6N/E01/2-2009</td>
<td></td>
<td>—</td>
<td>Technical Capability to Design, Manufacture, Test and Guarantee the Nuclear Class and Non-Nuclear Class (Class 6) Filtration Components and Pressure Vessels for Romania According to the Applicable Specific International Technical Standards and to Applicable ISCIR Technical Requirements from ISCIR Collection.</td>
</tr>
<tr>
<td>2N-E01.6-2015</td>
<td></td>
<td>—</td>
<td>Nuclear Class and non-Nuclear Class (Class 6) Heating and Filtration Components, Pressure Vessels according to the requirements of the agreement no. 6N-E01 / 2-2011.</td>
</tr>
<tr>
<td>0286275</td>
<td>EAC (Russia)</td>
<td><img src="image7" alt="logo7" /></td>
<td>CX, MX, EX.</td>
</tr>
<tr>
<td>0286278</td>
<td></td>
<td><img src="image8" alt="logo8" /></td>
<td>Vessels – Pipe Body.</td>
</tr>
</tbody>
</table>
As a leader in advanced heating and filtration solutions with facilities across North America, Thermon Heating Systems manufactures six of the top brands in industrial heating in addition to a comprehensive line of engineered industrial filtration products including:

**Cata-Dyne™**
Explosion-Proof Gas Catalytic Heaters

Cata-Dyne™ is the industry standard in infrared gas catalytic heaters, enclosures, pipeline systems and accessories. Customers across a wide range of industries rely on Cata-Dyne™ to supply them with safe, reliable, efficient and versatile infrared catalytic heating equipment for a variety of applications in both hazardous and non-hazardous environments.

**Ruffneck™**
Heaters for the Harshest Environments

Ruffneck™ is renowned for its rugged, reliable and versatile heavy-duty explosion-proof heaters, heating systems and heating accessories. Ruffneck™ has a long and proud history of supplying quality heating products for the harshest industrial environments to a worldwide customer base for over 30 years. Ruffneck™ is well-known in the industry for its “ship the heat in a week” policy, where 95% of all standard orders are shipped within one week of order placement.

**3L Filters™**
Engineered Filtration Systems

3L Filters™ has satisfied the most demanding industrial filtration requirements for over 40 years. A broad range of standard and custom products includes liquid filters, strainers, separators, pressure vessels, and engineered products and systems. 3L Filters™ has special expertise for nuclear, petrochemical, water treatment and environmental applications.

**Caloritech™**
Engineered Electric Heat

Caloritech™ electric heaters, heating elements and heating accessories are well-known in the industry for their quality, reliability, performance and versatility. In addition to standard “off the shelf” industrial heaters and heating systems components, Caloritech™ also offers engineered heating solutions custom designed, manufactured and tested to satisfy customer specifications. No matter what your application or environment, Caloritech™ has a solution to fit your heating needs.

**Fastrax®**
Track and Switch Heaters

Fastrax® has manufactured railroad track and switch heating since 1995. Fastrax® engineers complete heating packages for the rail industry. Fastrax® track and switch heaters are designed to provide the most efficient heat transfer on rail equipment and components for the coldest environments. In addition to heaters, Fastrax® manufactures fully automatic energy saving controls to complete the rail heating system.

**Norseman™**
Electric Explosion-Proof Heaters

Norseman™ is the most technologically advanced line of explosion-proof electric air heaters and heating accessories, including both forced air heaters and natural convection heaters, as well as unit heaters, panel heaters and thermostats. Norseman™ offers innovative, low maintenance solutions for a wide range of applications in a variety of industrial and commercial environments. Custom engineered heaters or heating systems are available for specialized applications.

Visit www.thermon.com for detailed product information.