

A photograph of a nuclear power plant at night, featuring several large cooling towers illuminated from within, with their lights reflecting on a body of water in the foreground. The sky is dark with some clouds, and a red vertical bar is on the left side of the image.

Products for
Nuclear Power Applications







Caloritech™ electric heaters, heating elements and heating accessories are well-known in the industry for their quality, reliability, performance and versatility. Caloritech™ offers engineered heating solutions custom designed, manufactured and tested to satisfy nuclear specifications. No matter what the application or environment, Caloritech™ has a solution for any specialty project.

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™ & 3L Filters™ Nuclear Products



CCI Thermal Technologies Inc. custom-engineered products for nuclear applications are designed and manufactured to suit CANDU, PWR and BWR Nuclear Reactors. Our products for nuclear applications adhere to a rigorous Quality Assurance program based on ASME Section III NCA 4000 in accordance with CSA N285.0 ASME NQA-1, 10 CFR 50 Appendix B, 10 CFR Part 21 and ANSI N45.2.

Capabilities



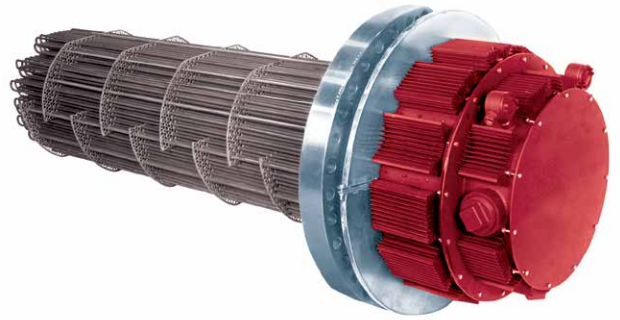
- Fabrication in carbon steel, stainless steel, aluminum or specialty/exotic materials
- GMAW, SMAW, SAW, and GTAW
- Experienced qualified welders
- Large library of approved welding procedures
- 25 ton lift capacity
- In-house machining, blasting and painting
- In-house and third-party NDE testing
- In-house pressure and performance testing
- Control and instrumentation system design
- PLC programming and testing
- Heating, filtration, and pressure vessel technology selection
- Application expertise
- Design and manufacture for skids or packages
- Materials selection
- Pressure vessel design
- Project engineering management
- Safe or hazardous area selection
- FEA analysis, including stress, seismic and thermal analysis
- Design registration

Electric Heaters

Caloritech™ Electric Heaters are custom engineered and manufactured for specific process heating applications. Electric heating equipment is designed and manufactured for heating most gaseous or liquid media, including water and air. CCI Thermal designs and manufactures its own heating elements, enabling customized application to a variety of requirements including energy output, watt density, pressure rating and mechanical configuration. CCI Thermal also designs and manufactures power delivery and control equipment to provide complete process heating solutions.

Electric Heater Applications

Pressurizer heaters, degasser condenser heaters, regeneration heaters, emergency generator fuel conditioning heaters, duct heaters for Balance of Plant (BOP) applications.



Filters

3L Filters™ designs and manufactures filter systems for Nuclear Steam Supply System (NSSS) and BOP applications.

- Specific designs are available for CANDU, PWR, and BWR.
- Filter systems include ASME compliant vessels together with filter media validated for nuclear applications.
- Filter cartridges are available down to 0.1 micron and are optimized for high dirt holding capacity and low differential pressure.
- Filters may be designed for remote or robotic operation to minimize exposure of maintenance personnel to radiation hazards.

Filtration Applications

Primary heat transport, spent fuel pool cleaning systems, steam generator blowdown filtration, seal water injection filters, resin retention filters, laundry water rinsing filters, borated water filters, boric acid evaporator feed demineralizer filters, Control Rod Drive mechanism (CRD) pump suction and discharge filters, and other applications.



Strainers

Nuclear class strainers are used for protection of downstream equipment and are available as cast Y strainers, T strainers, fabricated in-line strainers, pipe insert strainers, and duplex strainers.

- Strainers employ removable baskets designed using woven wire-mesh sandwiched between perforated stainless steel sheets to provide high rupture strengths.
- Basket volume is selected based on dirt loading and desired frequency of change.

Strainer Applications

Pump suction and discharge, seal water systems, resin retention system strainers, fuel oil strainers, Chemical Volume Control System (CVCS) borated water system strainers, sea water wash system strainers, emergency core cooling strainers and other systems requiring gross filtration.



Engineered Modules

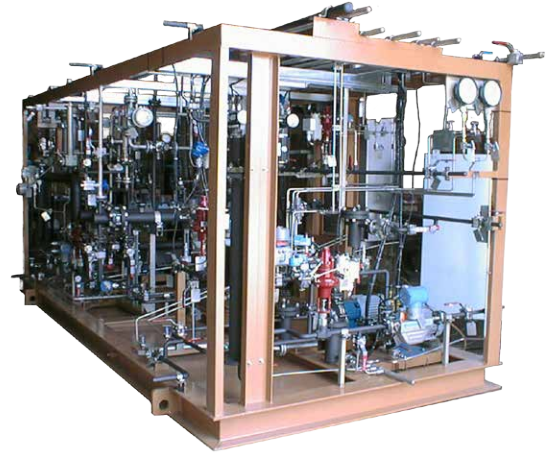
CCI Thermal Technologies engineered module systems are custom designed and manufactured to enable modular installation at power plant locations.

Engineered modules often incorporate 3L Filters™ together with Caloritech™ heating, power, and control components to create complete process systems.

- Module systems are fully integrated with all instrumentation and control components, and are ready for site installation.
- Module systems are performance tested prior to shipment.
- State of the art 3D design tools are used for configuring modules. This ensures adequate clearances for maintenance of equipment while keeping the module compact
- Equipment, piping, and the entire assembly are stress and seismically analyzed as per required codes and standards.

Engineered Module Applications

Tritium removal liquid phase catalytic exchange skid, tritium removal facility dryer skid, tritium removal air clean-up skid, D₂O vapour recovery dryer packages, automatic backwash condensate polishing filtration system, PWR condensate polishing filtration system, and miscellaneous modular filtration packages.



Vapour Recovery Dryers

Vapour Recovery Dryers remove D₂O heavy water vapour within reactor buildings and process equipment. Desiccant adsorbs atmospheric moisture during an absorption cycle. A regeneration cycle directs hot dry air through the desiccant, expelling moisture to condense and reprocess for reuse. Units are available in the following configurations:

- Single tower where continuous operation is not necessary
- Dual tower where continuous operation is desired
- Rotating drum design

Vapour Recovery Dryer Applications

Vault area recirculation dryer, vault exhaust dryer, moderator area recirculation dryer, accessible area recirculation dryer and boiler room recirculation dryer.



Ion Exchange Columns

Ion exchangers employ vessels or columns containing nuclear grade ion exchange resins to remove undesirable ions from process water.

- Supplied with cation, anion, or mixed bed resins.
- Designed to avoid channeling and provide uniform flow across resin beds
- Designed for easy maintenance with internal removable screens.

Ion Exchanger Applications

Process water demineralization, boiler feed water demineralization, boric acid evaporator feed demineralization and de-borating demineralization.



Restriction Orifices & Flow Elements

Restriction orifices and flow elements are used for flow restriction, pressure control, and accurate flow measurement.

Restriction Orifices

- Available as flat plate orifices mounted between two pipe flanges.
- Designed for unidirectional or for bi-directional flow.

Flow Elements

- Consists of a single orifice or multiple orifices machined inside of a tube.
- Available as single stage or multiple stage units for achieving very high pressure differential.

Orifices and flow elements are designed to maintain 1% accuracy over extended periods of operation.

Restriction Orifice & flow Element Applications

Calandria feed tube, moderator purifications system, heat transport auxiliary system, primary head transport pressure system and vent system, boiler blowdown system and emergency core cooling system.

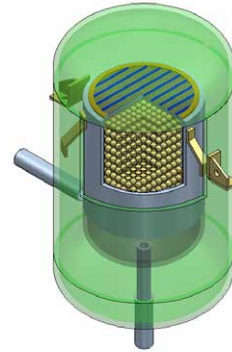


Catalytic Recombiners

Catalytic Recombiners utilize palladium on alumina catalyst to reduce atmospheric hydrogen in nuclear plants by means of a recombination reaction with oxygen. Catalyst is contained in a sealed pressure vessel.

Catalytic Recombiner Applications

Liquid zone control system, main moderator control system.



Nuclear Specific Certifications

Certificate No.	Agency	Application Symbol/Standard	Description/Product Class
N-3578			Construction of Class 1, 2 & 3 Vessels; Class 1, 2 & 3 Piping Systems; and Class 1, 2 & 3 Shop Assembly.
N-3579			Class 1, 2 & 3 Fabrication Without Design Responsibility and Class 1, 2 & 3 Fabrication With Design Responsibility for Appurtenances and as a Material Organization Supplying Ferrous & Nonferrous Material.
QA 181		CSA N285.0	Construction of Class 1, 2, 3 & 4 Vessels; Class 1, 2 & 3 Pumps, Vessels, Line Valves and Piping Systems; Class 2 & 3 Storage Tanks; Class 1, 2 & 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 CANDU Nuclear Power Plants
QA 03538		CSA N285.0	Fabrication of Class 1, 2, 3 & 4 Welded and Non-Welded Category A, B, E & H Type Fittings in Accordance with CSA Standard N285.0, General Requirements for Pressure Retaining Systems and Components in CANDU Nuclear Power Plants
QA 04487		CSA N285.0	Appurtenances.
QA 05091		CSA N285.0	Repair or Modification.
6N/EO1/2-2009		—	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.
2N-E01.6-2015		—	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



As a leader in advanced heating and filtration solutions with facilities across North America, CCI Thermal Technologies Inc. manufactures six of the top brands in industrial heating in addition to a comprehensive line of engineered industrial filtration products including:



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™ 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.



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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® 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™ 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.



DriQuik™ provides components for infrared drying ovens. DriQuik™ utilizes a pioneered radiant oven technology established in the 1930s providing the industry standard in infrared radiant heating components.

Visit www.ccithermal.com for detailed product information. Email: info@ccithermal.com

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