

Saturn™

Replacement Elements for Diffusion Furnaces



PROTEMP

ProTemp direct replacement furnace elements

Available for all applications

ProTemp elements are available for all furnace makes, in sizes from 4-inch to 18-inch I.D. Elements are compatible with existing furnace electrics for easy installation.

Three series of elements available

- **Standard** elements are the element of choice for all applications that match original equipment requirements.
- **HiTemp™** elements are designed for operating temperatures to 1400°C.
- **FasTemp™** elements employ light gauge heating wire to substantially reduce times to reach operating temperature and return to ambient. These elements are available for horizontal furnaces and for direct replacements on vertical furnaces.

Unique graded insulation

The alumina and silicon oxide fiber insulation system, together with other ingredients, makes ProTemp elements superior to other diffusion furnace elements.

Our vacuum molding process allows us to *grade* the insulation, keeping the high density at the coil. This grading provides a better insulation factor resulting in lower skin temperature, less power consumption, and a smaller O.D. Element.



Extended flat zone

Variable pitched ceramic spacers between the heating coils extend the temperature flat zone and eliminate “bat wings” at the end of the center zone. Typically, ProTemp elements exhibit a longer thermal flat zone than the original equipment, with temperature variations less than $\pm 1^\circ\text{C}$ within the flat zone.

Stainless steel encapsulation

The shell and end caps of ProTemp elements are fabricated from stainless steel to withstand the rigors of high temperature operation and provide a particle-free enclosure.

High temperature terminal connections

New stainless steel terminals are anchored to the element skin, preventing any tension from lead cables affecting connection or heating coils. Other manufacturers’ elements using wire material experience electrolysis to the lead cables which eventually burns off the lugs. Also, unsupported terminals can cause distortion of the heating wire at the connection.



Low cost upgrade to larger process tube

ProTemp replacement elements have a larger I.D. for the same O.D. as competitive elements because of their superior insulating technique. This allows installing larger process tubes in older furnaces and upgrading to bigger wafers, without the cost of replacing the entire furnace.

Superior low temperature operation

Most diffusion furnaces were designed before low temperature processing became a standard industry process. Elements designed for high temperature operation generally perform poorly at low temperature. ProTemp supplies elements designed specifically for high temperature (up to 1400°C) or low temperature (600°C and below) operation, to match your application. Using high density windings to avoid low frequency power cycling, our low-temperature elements provide superior performance over conventional elements for low-temperature operation.

Reduced power consumption

10 to 20% less power is required for the same process temperatures when using a ProTemp element, versus other elements, because of our unique vacuum molding process. This process grades the insulation density to produce high density at the element and low density at the outer surface, creating a superior insulation system.

Increased element life

ProTemp elements embody many unique design features to eliminate hotspots and overheating of the element wire and leads, resulting in extended life at high temperature operation. ProTemp elements incorporate a unique attached terminal which greatly reduces coil sag typically found at the terminal attachment point.

Pretested, oxidized, ready to use

Most heating elements made today have not been adequately “burned in” or pre-oxidized at high temperatures by the manufacturer before shipment, therefore requiring you, the customer, to perform this task. ProTemp elements are burned in to eliminate insulation binders and are pre-oxidized at high temperature to greatly reduce installation time.

Standard and HiTemp™ elements

Over 20 sizes available

ProTemp **Standard** and **HiTemp™** elements are available in a wide range of sizes, with inside diameters in more than 20 sizes from 4 to 18 inches.

The physical configuration of **Standard** and **HiTemp™** elements is the same.

Standard elements are designed for operating temperatures to 1200°C.

HiTemp™ elements use a special high temperature wire for reliable long-term operation at temperatures to 1400°C.



FasTemp™ low thermal mass elements



Shorter warm-up and cool-down time

ProTemp **FasTemp™** elements employ light gauge heating wire to reduce thermal mass. **FasTemp™** elements reach operating temperature faster, and cool in less time, than conventional elements.

Supply voltage can be tailored to existing low voltage through full line voltage.

Maximum operating temperature is 1000°C.

FasTemp™ elements are available in horizontal configurations, shown left, and vertical configurations, shown on next page.

FasTemp™ vertical low thermal mass elements



Easy retrofit for vertical furnaces

FasTemp™ vertical furnace elements are manufactured to the exact specifications of the original equipment for easy retrofit. Elements can be configured with three, four or five zones and any watt loading density to maximize special processing needs.

ProTemp products are backed by experience

ProTemp has been in the business of supplying high-quality elements, furnace systems and other furnace retrofit items since 1975.

We aim to meet your exact needs and provide a product that will give you complete satisfaction.

Tube adapters, collars and seals

ProTemp supplies tube adapters in any configuration, to match your specific needs. Tube adapters are made from vacuum formed high-purity fibered ceramic with a low-sodium inorganic bond. Tube adapters are surface hardened to prevent dusting and extend their life.

Soft collars and seals to reduce heat loss are manufactured by ProTemp to almost any size or shape.



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