



Starbar[®]

Moly-D[®]

- ✓ **Experience Counts**
- ✓ **Superior Heating Elements**
- ✓ **Fast Deliveries**
- ✓ **Best Engineering (Application)**

Silicon Carbide Heating Elements

Molybdenum Disilicide Heating Elements

I Squared R Element Company, the only company under one roof that manufactures both silicon carbide and molybdenum disilicide heating elements. Located in Akron, NY, USA and 43 years old, I Squared R makes deliveries all over the world - sometimes within 48 hours after receipt of an order. We have agents in almost all industrialized nations. We have a staff of five engineers that will quickly reply to your requests for element recommendations for new furnaces. They can assist you with your temperature related process problem or performance problems with our elements or a competitor's element.

What's New? **Starbar[®] Type SEU**

I Squared R is the only company that manufactures this type of element. It was first developed to have the same resistance as the RR element has, from end to end. This SEU has that resistance across the terminals on one end.

A new feature has been added. We now offer this SEU element in a resistance specified by the customer. The resistance range is from an equivalent diameter RR element to an equivalent diameter SER of equal hot zone length. The resistance range capability permits you, the customer, to specify an element resistance to match your existing voltage supply. Both electrical connections are on one end. The maximum recommended furnace temperature is 1425°C (2600°F).

The hot zone is manufactured of high-density reaction-bonded silicon carbide. The hot zone has a double spiral slot and the cold end has two longitudinal slots. The cold end is larger in diameter than the hot zone, except

NEW



the 70mm, which is the same diameter. The cold ends are made from low-resistance silicon carbide material and furnace-welded to the hot section.

The SEU element is supplied with a ceramic collar cemented to the cold end. It has two flat braided aluminum straps clamped to the metalized extremities of the cold end. The hot zone diameter has a range of 13 to 70mm and lengths to 2300mm.



NEW

Starbar® Type RR – New 70mm diameter, up to 5.8m long

The Type RR Starbar® element is a high-density recrystallized silicon carbide element and is available in diameters from 10 to 70mm, in hot zone lengths up to 5100mm and overall lengths up to 5842mm. We offer it in two types--one piece and three piece construction:

One Piece RR element has no welds and can be used at furnace temperatures up to 1700°C (3100°F).

Three Piece RR element has low resistance cold ends which are lower in resistance than the one-piece cold ends. Therefore they are more efficient and the electrical energy is converted to heat energy in the furnace chamber not in the walls. The cold ends also operate cooler. The maximum recommended furnace temperature is 1425°C (2600°F).

Starbar® Type SE

For maximum life, this element is recommended for temperatures up to 1650°C (3000°F).

The SE element is manufactured of high-density reaction-bonded silicon carbide. The hot section has a spiral slot to increase the resistance of the hot zone. This element has the electrical connections at opposite ends.

The SE element is available in diameters from 10 to 70mm and in lengths up to 2360mm.

Starbar® Type U

The U Bar has both electrical connections on the open end of the U. Two resistance matched hot sections with cold ends attached are furnace welded to the ends of a silicon carbide bridge.

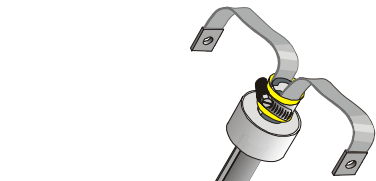
The maximum recommended furnace temperature is 1425°C (2600°F). The hot sections are high-density recrystallized silicon carbide. The cold ends are low resistance silicon carbide. U bars are available in diameters from 13mm to 54mm and overall lengths up to 2550mm.

Starbar® Type W – Three Phase

The Starbar type W is a three-phase element. There are three resistance matched hot zones with low resistance cold ends. The hot zones are attached to a silicon carbide bridge. The maximum recommended furnace temperature is 1425°C (2600°F). The element hot sections are manufactured of high density recrystallized silicon carbide. The cold ends are low resistance silicon carbide. The type W elements range from 13 to 54mm in diameter and up to 2550mm long.

Starbar® Type RA

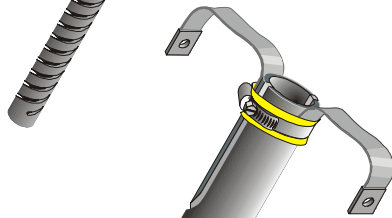
The right angle (RA) element is a heating element that has two cold ends welded at right angles to the opposite ends of the hot section. The maximum recommended furnace temperature is 1425°C (2600°F). The element is manufactured of high density recrystallized silicon carbide. The two cold ends are of low resistance silicon carbide. The diameters available range from 13 to 54mm and hot zone lengths up to 1500mm and cold ends up to 480mm.



Starbar® Type SER

For maximum element life with both electrical connections on one end, the SER element is recommended for furnace temperatures up to 1650°C (3000°F).

The element is manufactured of high-density reaction bonded silicon carbide. The hot zone is formed by cutting a double spiral slot. The cold end has two longitudinal slots along the length. The SER element is supplied with a ceramic collar cemented to the cold end and two flat braided aluminum straps clamped to the metalized area. SER elements are available in diameters from 13 to 70mm and overall lengths to 1550mm.



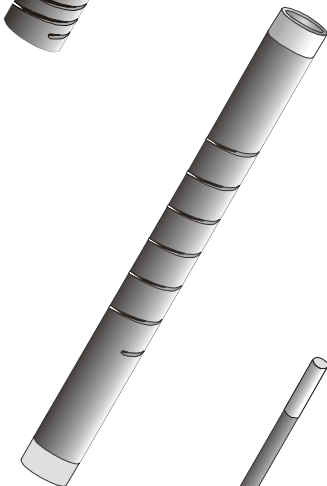
TUBULAR Starbar® Type TSR & TSE

In a Starbar tubular element the product to be heated is placed in the internal diameter of the heating element. The tubular elements are available with the electrical connections on opposite ends (TSE) and with the two electrical connections on one end (TSR). The elements are manufactured of high-density reaction bonded silicon carbide. The maximum chamber temperature for both elements is 1650°C (3000°F).

The hot section in the TSE element is formed by cutting a single spiral slot in the hot section. The hot section in the TSE element is located between the two cold ends.

The hot section in the TSR element (both connections on one end) is formed by cutting two spiral slots. The cold end has two longitudinal slots. There are two flat braided aluminum straps clamped to the aluminized extremities of the cold end.

The internal diameters available are from 37 to 67mm and overall lengths to 660mm. The outside diameters range from 44 to 75mm.



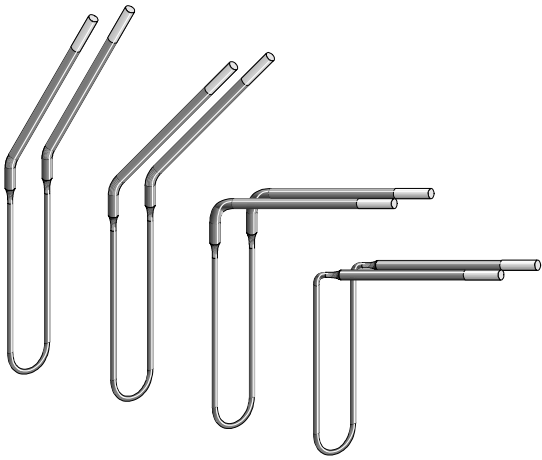
Moly-D® U Shaped Element

The Moly-D elements are manufactured of dense molybdenum disilicide. The elements are most frequently “U” shaped and suspended with the bottom of the “U” down. The element can be operated at temperatures up to 1800°C (3272°F).

The two-shank element consists of two cold ends (Lu) and a U-shaped hot section (Le). The cold ends are twice the diameter of the hot section and are welded to the hot zone. The extremities of the cold ends are metalized with aluminum to provide low-resistance contact surfaces to which electrical connections are made with flat braided aluminum straps.

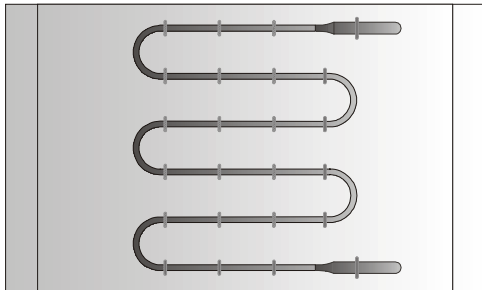
The diameters available are 3/6, 4/9, 6/12, 9/18 and 12/24. The first number is the hot zone diameter and the second number is the cold end diameter (both in millimeters). The maximum hot zone length is 1400mm but is diameter and temperature dependent.

The molybdenum disilicide softens at temperatures over 1200°C (2192°F) therefore will sag and must be supported if placed horizontally.



Moly-D[®] 2-Shank Bent Element

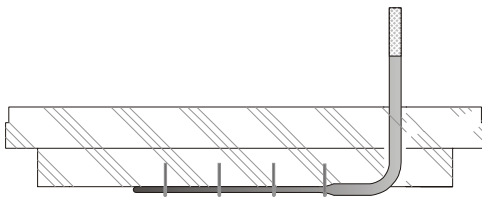
The cold ends (Lu) of the Moly-D Elements can be bent 30°, 45° or 90°. This permits the installation of more than one layer of elements on a wall of a furnace with a high chamber. Most are bent in the cold end (Lu) but they can also be bent in the hot section (Le).



Moly-D[®] Multi-Shank Elements

The Moly-D four-shank elements are manufactured of high-density molybdenum disilicide. The four shank element must be supported therefore the maximum element temperature is 1600°C (2910°F). It can be supported from beneath or stapled to high-temperature fiberboard and installed on the wall or roof of the furnace.

The Moly-D terminal ends account for a considerable amount of the energy lost and the cost of the element. The four shank and other multi-shank elements are therefore more energy efficient and cost less. The multi-shank elements are available in all standard diameters and terminal and hot section bends.

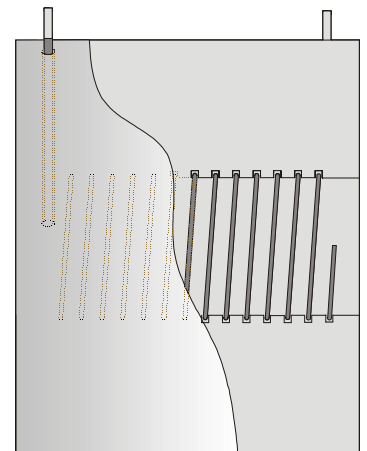
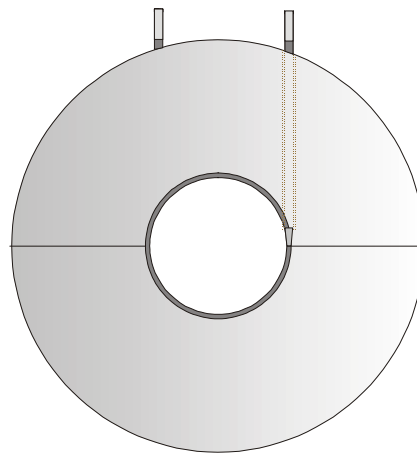
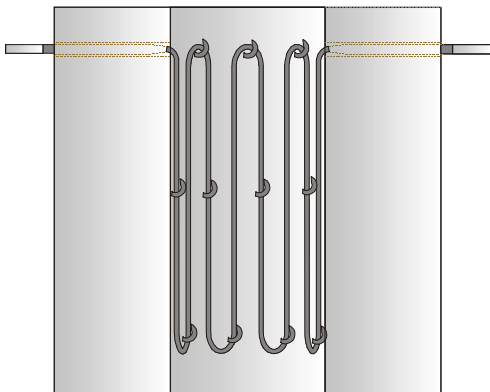
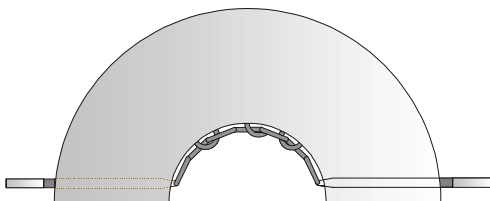


Moly-D[®] Heating Element Modules

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The module consists of a high temperature (1700°C) fiber insulation cylinder or two half cylinders with a Moly-D element in the internal diameter of the cylinder. The modules are rated to 1600°C (2910°F) in air continuously or intermittently. The 3/6 or 4/9mm diameter Moly-D element is used in these modules.

These compact modules can be used in labs or production furnaces and provide rapid heat up and uniform temperature profile. The tubes can be mounted vertically or horizontally. Module internal diameters are available from as small as 40mm with almost no upper limit.



I SQUARED R ELEMENT CO., INC.

PO Box 390, 12600 CLARENCE CENTER ROAD, AKRON, NEW YORK, USA 14001-0390 PHONE (01) 716 542 5511 FAX (01) 716-542-2100
 e-mail: sales@isquaredrelement.com, Web site: www.isquaredrelement.com