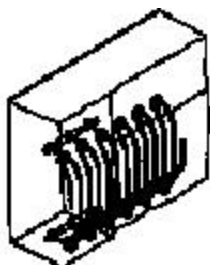


The custom engineered element supports are an integral part of the Pyro-Bloc EES System design. There are three basic types of heating elements that we manufacture: rod and ribbon overbend, and helical coil. Each have their own individual advantages. Thermal Ceramics also offers ceramic or alloy hangers and washers in a variety of shapes.

Rod Overbend Heating Elements are manufactured of heavy gauge solid rod into continuous serpentine loops. They are suspended at the top and bottom ceramic hangers. Maximum wall loading ranges from 1.5 to 2.5 kilowatts per square foot. The heavy cross section of the rod material gives superior life in high temperature environments.

Sidewall elements - Two Break Offset



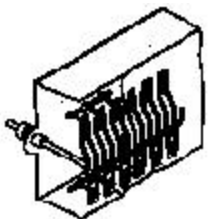
Below 2200F:

T/C-538, 85% alumina 3" S hook
T/C-535, Cordierite washer 1.5" diameter

2200F and above:

T/C-538, 85% alumina 3" S hook
T/C-536, 95% alumina rectangular washers

Sidewall elements - Four Break Offset



All temperatures:

T/C-538, 85% alumina 3" S hook
T/C-536, 95% alumina rectangular washers

Roof elements - Three Break Offset (Two Break Offset same as sidewall)



Below 2200F:

T/C-538, 85% alumina 3" S hook
T/C-535, Cordierite washers 1.5" diameter
T/C-530, Cordierite tube

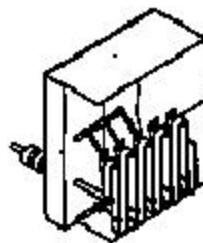
2200F and above:

T/C-538, 85% alumina 3" S hook
T/C-536, 95% alumina rectangular washer
T/C-530, Mullite tube

Ribbon Heating Elements are manufactured into serpentine loops and are supported in the same manner as rod elements. Ribbon elements are made from thin sheets of alloy, slit to the desired width. The advantage of the ribbon elements is the capabilities of the higher wall loadings. Maximum wall loading ranges is 1.75 to 3.0 kilowatts per square foot.

Sidewall elements - (Element height over 9")

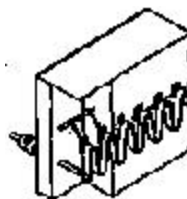
Below 2200F:



T/C-541, 95% alumina ribbon top hanger, 1.5" wide ribbon
T/C-542, 95% alumina ribbon top hanger, .75" wide ribbon
T/C-537, 95% alumina ribbon washer
T/C-517, 330 SS rotated bottom hook, 4" and 5" available
T/C-535, Cordierite washer 1.5" diameter

Sidewall elements - (Element height 6 - 9")

Below 2200F:



T/C-541, 95% alumina ribbon top hanger, 1.5" wide ribbon
T/C-542, 95% alumina ribbon top hanger, .75" wide ribbon
T/C-537, 95% alumina ribbon washer

Helical Coil Heating Element are rod wire manufactured into a spiral configuration. They are supported by inserting ceramic tubes through the coils and the tubes are then supported from hangers. Coil elements which are completely exposed to the furnace chamber have wall loadings similar to rod overbend.

Sidewall element

Below 2200F:



T/C-538, 95% alumina 4¹/₈" S hooks
T/C-535, Cordierite washers 1.5" diameter
T/C-530, Cordierite tube
Above 2200F:
T/C-538, 95% alumina 4¹/₈" S hooks
T/C-536, 95% alumina rectangular washers
T/C-530, Mullite tube

Pyro-Bloc EES System Elements and Components

Product Information

Physical Properties

Element Materials

Elements available in numerous alloys, commonly used are 80-20 Nickel-Chromium, 70-30 Nickel-Chromium and Iron-Chromium-Aluminum alloys

Standard rod wire diameter: #5/0 to #8 (0.500" to 0.128" diameters)

Standard ribbon strip: 0.020" to 0.130" thick by 0.125" to 1.5" wide

Component Materials*

Terminal Assemblies: Available in 330SS and FeCrAl alloys, and are sized by amperage and an added safety factor.

Maximum amperage

½" diameter, T/C-500	up to 120 Amps
¾" diameter, T/C-501	up to 240 Amps
1" diameter, T/C-502	up to 400 Amps

(Terminal assemblies for atmosphere furnaces are also available)

Alignment pins: (One pin required per tube embedded in module)

330 SS straight 4" alignment pins, T/C-520 for flat walls

Available in 2.5° increments up to 20°, cylindrical linings require alignment pins ordered in degrees, T/C-522.

Design and Installation

There are a number of factors which must be considered when designing a Thermal Ceramics Pyro-Bloc EES System, including temperature, atmosphere, contaminants and type of furnace. The provided examples are as a guide only. Contact your nearest Thermal Ceramics representative for further information.

*The hanging systems are available in numerous alloys, ceramics and styles depending upon the application.

Data are average results of tests conducted under standard procedures and are subject to variation.

Data contained in this brochure are intended as a guide only. For specifications and estimating purposes, contact your nearest Thermal Ceramics representative.

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