



I SQUARED R ELEMENT CO., INC.



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RECOMMENDATIONS FOR CHANGING RR or SE ELEMENTS

- 1.) With the furnace in operation, determine which elements require replacement. This may be accomplished through, visual inspection or by checking the current draw of each element with a clamp-on ammeter.
- 2.) Turn off the electrical power and lock out the electrical disconnect.
- 3.) Remove the clamps and the straps from the ends of those elements which require replacement.
- 4.) Inspect the clamps to be sure that they hold the straps tightly to the element. If the clamp has lost its tension, it should be replaced.
- 5.) Inspect the strap for fraying and oxidation. If the strap is frayed or has an oxidized powder on it, replace it.
- 6.) Remove the two halves of the failed element if broken.
- 7.) Inspect the refractory hole to insure there is no build up or deposition in the opening. If deposits exist, ream the hole or remove them. The hole should be larger than the element diameter (See table B on page 7 of our RR brochure).
- 8.) If element guide sleeves are used, check them for cracks or build-up of condensation residue that could cause elements to be glued into position. Replace the sleeve if damage or condensation has occurred.
- 9.) Check the alignment and straightness of the holes through the refractory. Any binding of the element can cause element breakage during heat up.
- 10.) Slide the new element into the hot furnace quickly enough, so the aluminum at the end is not melted off but not so fast as to cause thermal shock. Avoid hitting the opposite wall with the element. Sometimes an alloy pipe can be used to guide the new element through the heating chamber. The element outside diameter fits inside the alloy pipe inside diameter in this process. Do not force the element into the terminal holes or exert any stress on the element during installation.

11.) Center the element in the furnace chamber by insuring the same amount of element protrudes from each side of the furnace.

12.) Lightly pack the open space around the element with bulk ceramic fiber. The bulk fiber should only be packed one half to one inch in from the cold face. After packing, the element should be easily rotated and must be free to expand upon heating. Never cement elements in place. Alternatively, use donut shaped washers made from ceramic fiber felt/blanket, with the ID of the washer made to the same diameter as the element. There is enough "give" in the fiber felt/blanket o be able to work the washers along the terminals for a snug fit. Carefully slide the fiber washers over the ends of the elements, and push up against the furnace casing.

13.) Also pack the element inside diameter with bulk ceramic fiber to a depth of one inch, if this has not been done by I Squared R. This will reduce the temperature the straps and clamps will see.

14.) Reconnect the straps and install the clamps on the aluminized ends of the element. Be sure the clamps and straps fit tightly to the radius of the element making a good electrical connection. Be sure there is slack in the straps, since the elements will expand and grow in length due to heating.

15.) Insure that there is clearance between the clamps and the furnace shell to prevent electrical short circuiting here.

16.) Remove the electrical lock and turn the power back on. Visually inspect the elements for proper operation or check the elements for appropriate current draw using a clamp on ammeter.

17.) Check the terminal connections to insure no arcing is evident.

18.) Turn off the electrical power and lock out the electrical disconnect.

19.) Carefully reinstall all guards or shields without hitting the elements.

20.) Remove the electrical lock and turn the power back on again.

21.) Be sure to reset the rotary tap switches to the lowest setting after changing all elements in a furnace zone. This may not be possible if only one or two elements are changed. If rotary tap switches are not available, insure that the elements are operating on the lowest transformer tap to prevent element overloading and premature aging while still being able to maintain the furnace control temperature.