Forming Tubular Elements

The MgO insulation used in tubular heating elements is compacted by reducing the element diameter in a roll reducing mill. The elements are then annealed in a controlled atmosphere furnace to relieve the metal stressing (work hardening) that takes place during the rolling to size reduction of the sheath. Annealing brings the metal back to a soft state, allowing the element to be bent into virtually any configuration. However, since forming also work hardens the metal, some precautions must be observed in order to prevent the sheath from breaking during bending or developing stress cracking marks.

**Note:** Elements with tight bends and some applications require the bends to be recompacted in special dies to restore the integrity of the insulation density and maintain dielectric strength. Large bends do not need to be recompacted.

### Tubular Element Minimum Bending Radius

<table>
<thead>
<tr>
<th>Element Diameter</th>
<th>Factory Bend</th>
<th>Field Bend</th>
<th>Minimum S</th>
</tr>
</thead>
<tbody>
<tr>
<td>in</td>
<td>Minimum R (in)</td>
<td>in (mm)</td>
<td>Minimum R (in)</td>
</tr>
<tr>
<td>.260</td>
<td>6.6</td>
<td>3/8</td>
<td>9.5</td>
</tr>
<tr>
<td>.315</td>
<td>8.0</td>
<td>1/2</td>
<td>12.7</td>
</tr>
<tr>
<td>.375</td>
<td>9.5</td>
<td>9/16</td>
<td>14.3</td>
</tr>
<tr>
<td>.430</td>
<td>10.9</td>
<td>3/4</td>
<td>19.1</td>
</tr>
<tr>
<td>.475</td>
<td>12.0</td>
<td>7/8</td>
<td>22.2</td>
</tr>
</tbody>
</table>

**Note:** Smaller inside bending radius than listed in the table can be factory accomplished. It requires special forming techniques to prevent damage to the tubular heater. Consult Tempco with your requirements.

### Tubular Heater Standard Bend Formations

Avoid bends within a minimum of 1/2" of the terminal pin and resistance wire junctions unless the bending radius is a minimum 3" (75 mm).

We do custom formations. Contact Tempco with your requirements.

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**TYPICAL Bend Formations**

- **FT1**
  - [Diagram of FT1 formation]
- **FT2**
  - [Diagram of FT2 formation]
- **FT3**
  - [Diagram of FT3 formation]
- **FT4**
  - [Diagram of FT4 formation]
- **FT5**
  - [Diagram of FT5 formation]
- **FT6**
  - [Diagram of FT6 formation]

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