GENERAL INFORMATION

What is Induction Brazing?
Induction Brazing is a process for joining similar or dissimilar metals using a filler metal using the precision heating of an RF induction heating unit. The filler metal is heated slightly above its melting point so it flows, but the temperature remains lower than the melting points of the base metals it is joining. Flux or an inert atmosphere is used to protect the two metal surfaces being joined and the brazing material from oxidation during the heating process. The filler material flows over the base metals, and the entire assembly is then cooled to join the pieces together. Typical braze filler materials are copper, silver, zinc, nickel and aluminum.

While brazing is a similar process to soldering, the temperatures needed to melt the filler metal are higher for brazing, with temperatures typically 900°F – 2200°F (470°C – 1190°C). Brazing differs from welding in that brazing does not melt the base metals, therefore brazing temperatures are lower than the melting points of the base metals. For this reason, brazing is a superior choice in joining dissimilar metals, as it results in less part distortion and joint stress, while resulting in a strong joint. A properly-made brazed joint will in many cases be as strong or stronger than the base metals being joined.

Benefits
- Similar and dissimilar metals can be brazed and joined
- Uses lower temperatures than welding, resulting in less part distortion and joint stress
- Strong, durable joints
- Induction provides selective heating, better joint quality
- Reduced oxidation and acid cleaning
- Faster heating cycles
- More consistent results and suitability for large volume production
- Safer than using flame brazing

Typical Applications
- carbide tip to tool
- tube to tube
- tubes to housing
- Equipment and tool manufacturers
- Any manufacturing process that joins two pieces

APPLICATION QUESTIONS FOR BRAZING

<table>
<thead>
<tr>
<th>For all parts and assemblies used in the application, please identify:</th>
<th>Production Rate:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Composition: Identify the compositions of the parts being brazed.</td>
<td>Identify the target production rate.</td>
</tr>
<tr>
<td>Geometry: Identify the shapes and dimensions of the parts being brazed.</td>
<td>Identify the number of operating shifts.</td>
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<tr>
<td>Brazing Alloy: Identify the specific product name of the brazing alloy.</td>
<td>Part Feeding</td>
</tr>
<tr>
<td>Brazing Alloy Form: Identify the form of the brazing alloy.</td>
<td>Identify if parts are fed manually or automatically?</td>
</tr>
<tr>
<td>Atmosphere: Identify what atmosphere will be used (open air, vacuum, inert gas, etc).</td>
<td>For parts that are fed manually, identify the estimated load and unload times.</td>
</tr>
<tr>
<td>Drawings and/or Photos:</td>
<td>For parts that are fed automatically, describe the part feeding system.</td>
</tr>
<tr>
<td>If available, provide drawings and/or photos of the parts to be brazed.</td>
<td>Options</td>
</tr>
<tr>
<td>Process Type:</td>
<td>Identify if an induction coil required. If yes, identify if the coil is a new design, or existing.</td>
</tr>
<tr>
<td>Identify if the process is standalone, or integrated into an existing process.</td>
<td>Identify if temperature control and/or monitoring is required.</td>
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<tr>
<td>Identify if flexible leads are required (needed if the coil position will move).</td>
<td>Other Requirements</td>
</tr>
<tr>
<td>Identify if a water cooling system needed, or is this already available.</td>
<td></td>
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</tbody>
</table>

Ultraflex offers complimentary testing! If you would like to send samples for further review and testing, contact sales@ultraflexpower.com.
**Induction Brazing of Copper Tubing and Brass Fitting**

Induction brazing of copper tubing and brass fitting using brazing alloy and flux within 60 seconds.

**Equipment**
- UltraFlex UPT-SS
- Ultraheat 5 kW
- HS-8 Heat Station
- 2 Turn Helical Coil

**Materials**
- Brass Fitting
- Copper Tubing
- Silver Brazing Alloy (pre-formed)
- Flux

**Induction Brazing of Copper Tubing to Copper Tubing**

Induction brazing of Copper Tubing to Copper Tubing using the Ultraflex Handheld Brazing Assembly.

**Equipment**
- Ultraflex-SS System:
  - Ultraheat 5kW Power Supply
  - HS-8 Remote Heat Station
  - 2 Turn Helical Coil

**Materials**
- Copper Tubing
- Brazing Alloy
- Flux

**Induction Brazing of Wire**

The goal of the test application is to braze the wire to the studs of the post, with the wire as short as possible.

**Equipment**
- UltraFlex UPT-W10
- Ultraheat 5 kW Power Supply
- HS-4 Heat Station
- Plate concentrated coil

**Materials**
- Brazing paste
  (easy-flo 45)