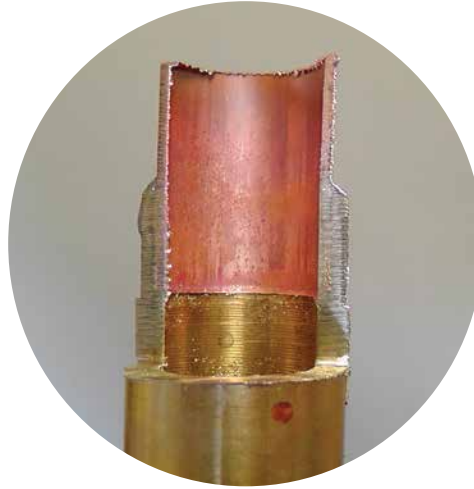


## GENERAL INFORMATION

### 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



*Cross-section of a completed induction braze.*

in many cases be as strong or stronger than the based metals being joined.

### Materials

Typical joining materials: steel-to-copper, steel-to-brass, brass-to-copper, and copper-to-copper.

Typical braze filler materials are copper, silver, zinc, nickel and aluminum.

### 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

### For all parts and assemblies used in the application, please identify:

**Composition:** Identify the compositions of the parts being brazed.

**Geometry:** Identify the shapes and dimensions of the parts being brazed.

**Brazing Alloy:** Identify the specific product name of the brazing alloy.

**Brazing Alloy Form:** Identify the form of the brazing alloy.

**Atmosphere:** Identify what atmosphere will be used (open air, vacuum, inert gas, etc).

### Drawings and/or Photos:

If available, provide drawings and/or photos of the parts to be brazed.

### Process Type:

Identify if the process is standalone, or integrated into an existing process.

### Production Rate:

Identify the target production rate.

Identify the number of operating shifts.

### Part Feeding

Identify if parts are fed manually or automatically?

For parts that are fed manually, identify the estimated load and unload times.

For parts that are fed automatically, describe the part feeding system.

### Options

Identify if an induction coil required. If yes, identify if the coil is a new design, or existing.

Identify if temperature control and/or monitoring is required.

Identify if flexible leads are required (needed if the coil position will move).

Identify if a water cooling system needed, or is this already available.

### Other Requirements

Identify the options for Power in the facility.

Identify the space availability for the equipment. If possible, provide the space footprint.

### Current Process

Identify the current process being used. If the current process is induction, identify what equipment is used.

Identify the key drivers for purchasing new equipment.

*Ultraflex offers complimentary testing! If you would like to send samples for further review and testing, contact [sales@ultraflexpower.com](mailto: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-S5  
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

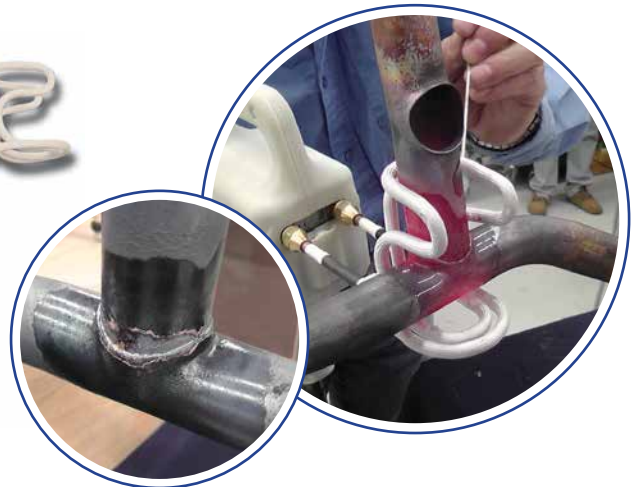
Ultraflex-S5 System:  
Ultraheat 5kW Power Supply  
HS-8 Remote Heat Station  
2 Turn Helical Coil

### Materials

- Copper Tubing
- Brazing Alloy
- Flux



*UBraze Handheld Brazing System*



## 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)

