

## Brazing a brass tube assembly for a valve manufacturing process

**Objective** Heat a brass tube assembly to 1305°F (707 °C) for a brazing application

- Material**
- Customer supplied brass tube assembly and steel threaded rod (3.5"/343mm long and 0.625"/16mm wide)
  - A50N braze material
  - Black high temperature brazing flux

**Temperature** 1305°F (707 °C)

**Frequency** 345 kHz

- Equipment**
- Ambrell EASYHEAT LI 8310, 10kW 150-400 kHz induction heating system equipped with a remote heat station containing two 1.0 µF capacitors
  - A single-position three-turn helical induction heating coil designed and developed specifically for this application

**Process** Three braze rings were placed on the outside diameter of the threaded rod and fluxed. The rod was then inserted into the brass assembly and the top of the joint area was fluxed. Two more braze rings were placed onto the top of the joint. The parts were fluxed, assembled and then placed into the induction coil. The power was turned on and the part heated. It heated for approximately 55 seconds and the braze material flowed well. The part was then removed from the coil and placed under hot water to rinse off the flux.

In an effort to reduce the cycle time, a four-position coil is recommended as it brings it to one part for every 15 seconds or four parts for every 60 seconds. This lab work was part of a process development job for the client.

- Results/Benefits**
- **Speed:** With the recommended coil configuration, the cycle time turned out to be 25% less than what the client was targeting, resulting in increased production efficiency
  - **Part quality:** A good braze joint was formed, and induction's consistency and repeatability proved valuable
  - **Precision:** Induction only heated the portion of the valve that required it
  - **Safety:** Induction is flameless and introduces less heat into the environment than other heating methods



The brass tube assembly inside the induction heating coil