

Brazing copper tubes to a brass manifold block

Objective Heating a brass block and two copper tubes to 1400 °F (760 °C) for a brazing application

- Material**
- Brass block (diameters of .25"/6.35mm and .375"/9.5mm)
 - Copper tubes
 - Braze pre-forms
 - Flux

Temperature 1400 °F (760 °C)

Frequency 106 kHz

- Equipment**
- Ambrell EKOHEAT 15/100c, 15kW 50-150 kHz induction heating system equipped with a remote heat station containing four 1.5 µF capacitors
 - A single-position six-turn helical induction heating coil designed and developed specifically for this application

Process The copper tubes and brass block were fluxed, assembled, and placed into the induction coil. There were two assemblies. The .375"/9.5mm copper block assembly had more mass and required 90 seconds to bring it to temperature. The .25"/6.35mm copper block assembly was heated to temperature within 60 seconds. Faster cycle times were tried in both cases, but localized melting occurred.

- Results/Benefits**
- Speed: The proposed process met the client's time objective, and is faster than oven heating
 - Part quality: The client was suffering from part quality issues and rejects while using an oven; induction offers a good quality braze joint
 - Floor space: Induction uses less floor space than an oven
 - Energy efficiency: Ovens take time to warm up and use more energy than induction, which has instant on/off



The assembly inside the coil being heated



The assembly after brazing