

Brazing a Copper Elbow and Tube Assembly

Objective To heat a copper elbow (4"/101.6mm OD) and a stainless steel coupling to temperature in 180 seconds for a brazing application. The end result is flexible tubing for the construction industry.

- Material**
- Copper elbow (4"/101.6mm OD)
 - Stainless steel coupling
 - Braze material

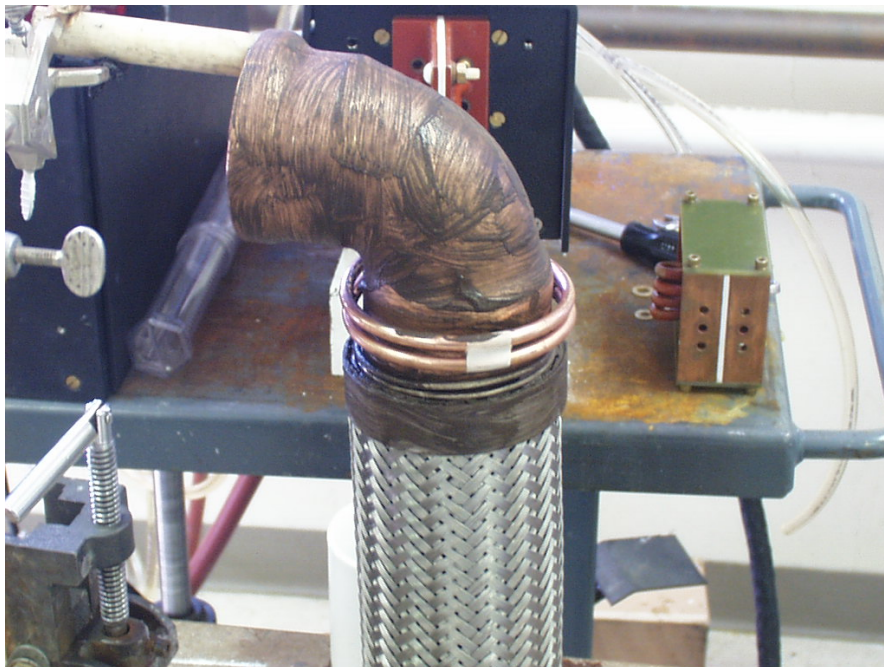
Temperature 1250 °F (677 °C)

Frequency 128 kHz

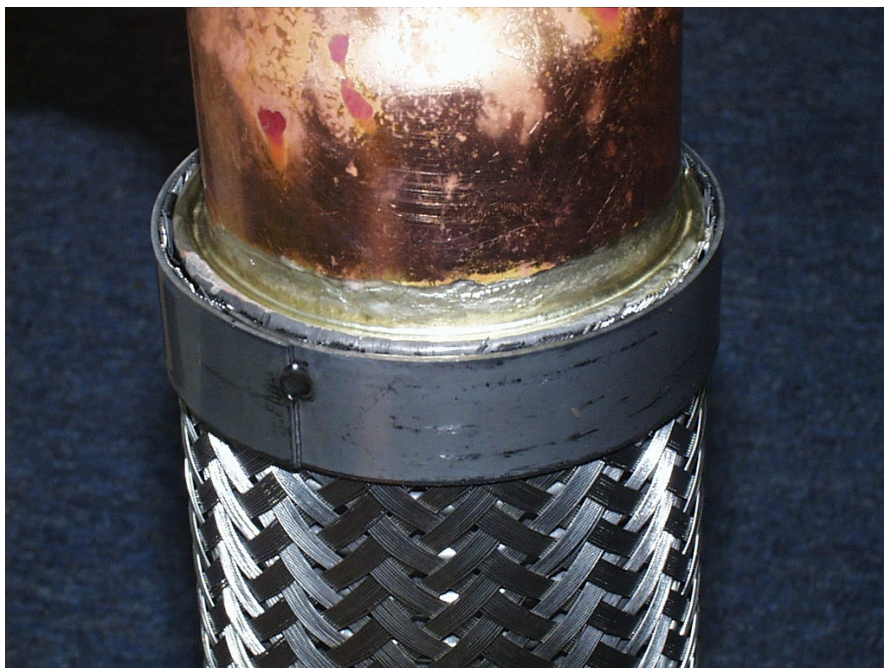
- Equipment**
- Ambrell EKOHEAT 10 kW, 50-150 kHz induction heating system equipped with a remote heat station containing two 1.5 µF capacitors
 - A single position, two-turn helical induction heating coil designed and developed specifically for this application

Process Initial testing was conducted to optimize power delivered to the part. Two braze pre-forms were placed around the copper elbow, and the elbow and stainless steel coupling were fluxed. The elbow and coupling were assembled inside the coil and then heated. The joint was heated within 180 seconds, which met the client's objective.

- Results/Benefits**
- Improved quality and repeatability: The client was using a torch, and induction offers more precise heating that is repeatable
 - Speed: Induction heating allowed the client to achieve the targeted heating time of 180 seconds
 - Superior efficiency: Induction heating applies heat only to the part, which means there's no wasted energy and cost savings are achieved when compared to a brazing torch
 - Safety: Unlike a torch, induction offers clean, flameless heating



The assembly inside the induction heating coil.



The joint area after being brazed.