Brazing a steel tube and fitting assembly

Objective

To braze a steel connector onto a steel tube to create a hydraulic component. The tube would need to be heated to 1350 ºF (732 °C) within 10 seconds.

Material

- Flux
- Braze
- Steel 0.5” (12.77 mm) OD tube (Assembly 1)
- Steel 0.5” (12.77 mm) fitting (Assembly 1)
- Steel 0.25” (6.35 mm) OD tube (Assembly 2)
- Steel 0.25” (6.35 mm) fitting (Assembly 2)

Temperature

1350 ºF (732 ºC)

Frequency

339 kHz

Equipment

- Ambrell EASYHEAT LI 3542, 4.2 kW, 150-400 kHz induction heating system equipped with a remote heat station containing one 0.5 µF capacitor.
- A single position, three-turn helical induction heating coil designed and developed specifically for this application.

Process

The steel tube and steel fitting was placed in the three-turn helical coil with flux applied, and the 4 kW EASYHEAT LI 3542 was turned on. A good heat pattern for braze joints at the target temperature was achieved within eight seconds.

Results/Benefits

- Improved control: The company was outsourcing, and desired more process and quality control, which will be achieved via bringing the process in-house and using induction heating
- Reduced expenditures: Through bringing the process in-house, the provider has greater control over costs
- Higher production rate: With the target temperature being reached at a faster rate than expected, production will exceed initial expectations

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