

Brazing a magnetic steel tube and steel mating assembly

Objective Heating a 0.437" (11.1 mm) outside diameter magnetic steel tube and steel mating assembly to temperature for a brazing application to create an oil tube for the railroad industry

- Material**
- Customer supplied 0.437" (11.1 mm) O.D. steel tube and steel mating part
 - Customer supplied braze ring
 - Black braze flux

Temperature 1350 °F (732 °C)

Frequency 212 kHz

- Equipment**
- Ambrell EASYHEAT 7590 LI, 7.5kW 150-400 kHz induction heating system equipped with a remote heat station containing one 1.5 µF capacitors
 - A split helical induction heating coil designed and developed specifically for this application

Process The joint area was fluxed with high temperature brazing flux. The coil was then positioned to heat the joint area and the power was turned on. The joint area was heated in 25-30 seconds with a stepped heat profile – it was heated for 10 seconds at 300 amps and then heated for 15-20 more seconds at 190 amps. The braze material became visible at the top of the joint area, which indicated completion of the process. The assembly was removed and cooled with water and then bead-blasted to clean the assembly.

- Results/Benefits**
- Process: Induction heating to braze the assembly proved to be a fast, repeatable heating method
 - Control: The client wanted to bring this process in-house to enable them to have more control over product quality
 - Part quality: The end user was impressed with the quality of the part
 - Free lab testing: Ambrell's Lab Service Request testing enabled the client to test their application to ensure induction heating would meet their expectations



The joint being brazed by a split helical induction heating coil



The completed assembly