Brazing aluminum adaptors to the end of aluminum tubes

Objective

To heat aluminum adaptors and aluminum tubes for a brazing application; truck components are the end product

Material

- Aluminum adaptors
- ½" (13 mm) O.D. aluminum tubes
- Aluminum braze paste

Temperature

1100 ºF (593 ºC)

Frequency

298 kHz

Equipment

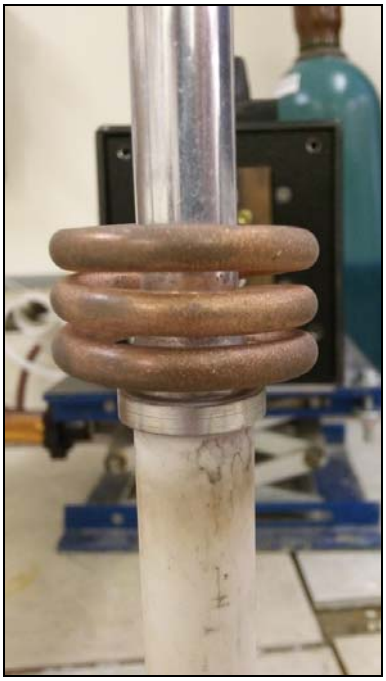
- Ambrell EASYHEAT 5 kW, 150 to 400 kHz induction heating system equipped with a remote workhead containing two 1.5 uf capacitors for a total of 0.75 uf
- A multi-turn helical induction heating coil designed and developed specifically for this application

Process

The joint was assembled and aluminum braze paste was applied to the joint area. The assembly was then placed inside the coil and heating began. Testing took place to determine the best cycle time for achieving the objective without melting the aluminum. 55 seconds was determined to be the ideal cycle time. To increase production, a multi-position coil was recommended so multiple parts could be heated while maintaining a cycle time of 55 seconds.

Results/Benefits

- Speed: Induction enabled the brazing process to be completed more rapidly than with a torch
- Consistency: Induction enables consistent joint quality, which a torch often doesn't deliver
- Safety: There is no open flame with induction, so it's a safer heating option than other options such as torch heating
- Efficiency: Induction delivers heat only where it's required, making it more efficient than many competitive heating methods



The assembly inside the coil

The brazed assembly