Brazing an aluminum assembly (bicycle manufacturing)

Objective

Braze an aluminum assembly to 968 ºF (520 ºC) within 20 seconds

Material

- Customer supplied 1.33” (33.8 mm) O.D. aluminum tube and aluminum mating part
- Aluminum braze alloy

Temperature

968 ºF (520 ºC)

Frequency

10 kHz

Equipment

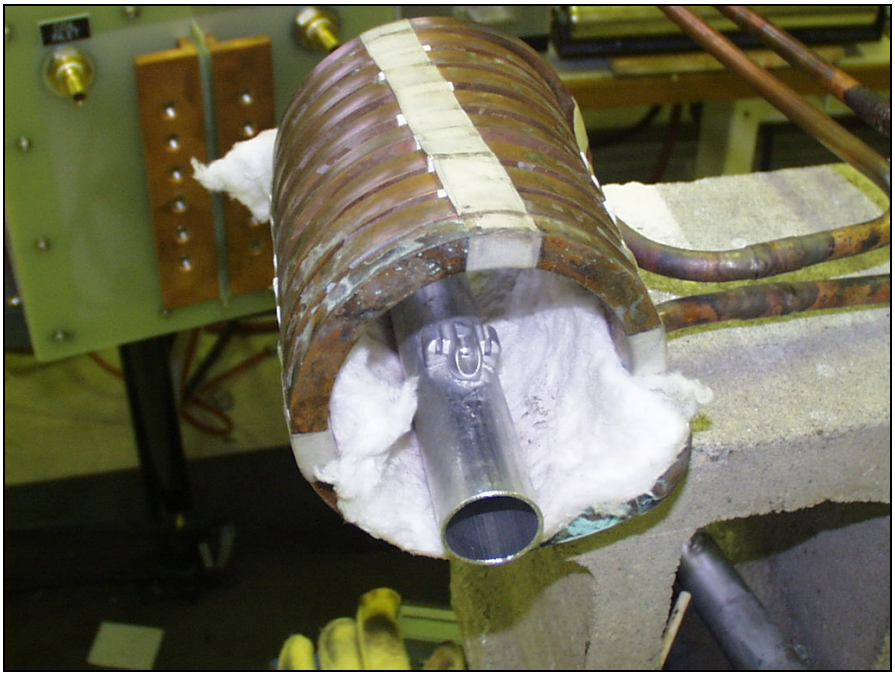
- Ambrell EKOHEAT 20/10 LI, 20kW 5-15 kHz induction heating system equipped with a remote heat station containing one 53 µF capacitor
- A two-position helical induction heating coil designed and developed specifically for this application

Process

Braze material was applied between the tubing and the mating part. The assembly was placed inside the coil and heated for approximately 40 seconds. With a two-position coil, two parts can be heated simultaneously, which means one part would be completed every 15-20 seconds. Braze material was stick fed, which created a good joint. The heating time with two parts being heated simultaneously meets the client’s objective, and represents a significant improvement in regards to speed over using a torch.

Results/Benefits

- Speed: The recommended approach cut their heating time in half when compared to using a torch
- Part quality: Induction heating is a repeatable method with more consistency than a torch can generally deliver
- Safety: Induction heating is a clean, precise method that does not involve an open flame like a torch, which results in a safer work environment
- Free lab testing: Ambrell’s Lab Service Request testing enabled the client to test their application to ensure induction heating would meet their desired heating time



The aluminum assembly inside the induction heating coil

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