Brazing stainless steel tree injector

Objective

1st Application: Braze hub assembly to needle holder
2nd Application: Braze Large tube to ring joint

Material

1st Application: Steel hub assembly and needle 0.1” dia (2.5mm)
2nd Application: Steel tube 1” OD (25.4 mm) and ring

Temperature

1400 °F (760 °C)

Frequency

325 kHz for brazing the needle 0.1” dia (2.5mm)
259 kHz for brazing ring to steel tube 1” OD (25.4 mm)

Equipment

- Ambrell 2.0 kW induction heating system, equipped with a remote workhead containing two .66 µF capacitors for a total of 1.32 µF
- Two induction heating coils, designed and developed specifically for this dual application.

Process

1st application: A two-turn helical coil is used to heat the hub assembly on the needle holder for 10 seconds. The coil concentrates the heat on the hub only, as the needle is magnetic and the hub material is non-magnetic. A small diameter braze wire is used to supply sufficient amount of braze creating a strong aesthetically pleasing bond.

2nd application: A three-turn helical coil is used for brazing the large tube to the ring joint for 3-5 minutes. A braze ring is used to supply sufficient amount of braze to create an aesthetically pleasing bond.

Results/Benefits

Induction heating provides:

- Even distribution of heating, provides even flow of braze alloy for an aesthetically pleasing bond
- System flexibility allows for the same unit to be used for two different applications which is a cost saving.
1\textsuperscript{st} Application

Brazing of hub assembly to needle holder

Finished hub and needle assembly

2\textsuperscript{nd} Application

Brazing of large tube to ring joint

Finished ring joint