Brazing a carbide cone to a stainless steel shaft for a gripper

Objective Brazing a carbide cone to a stainless steel shaft to create a gripper for use in oil fields

Material Cone shaped VC2 carbide 1.075 dia (27.3mm), 1.875" (47.6mm) tall, Stainless steel shaft 1.075 (27.3mm) dia with a post for carbide to sit on, silver solder washer and white braze flux

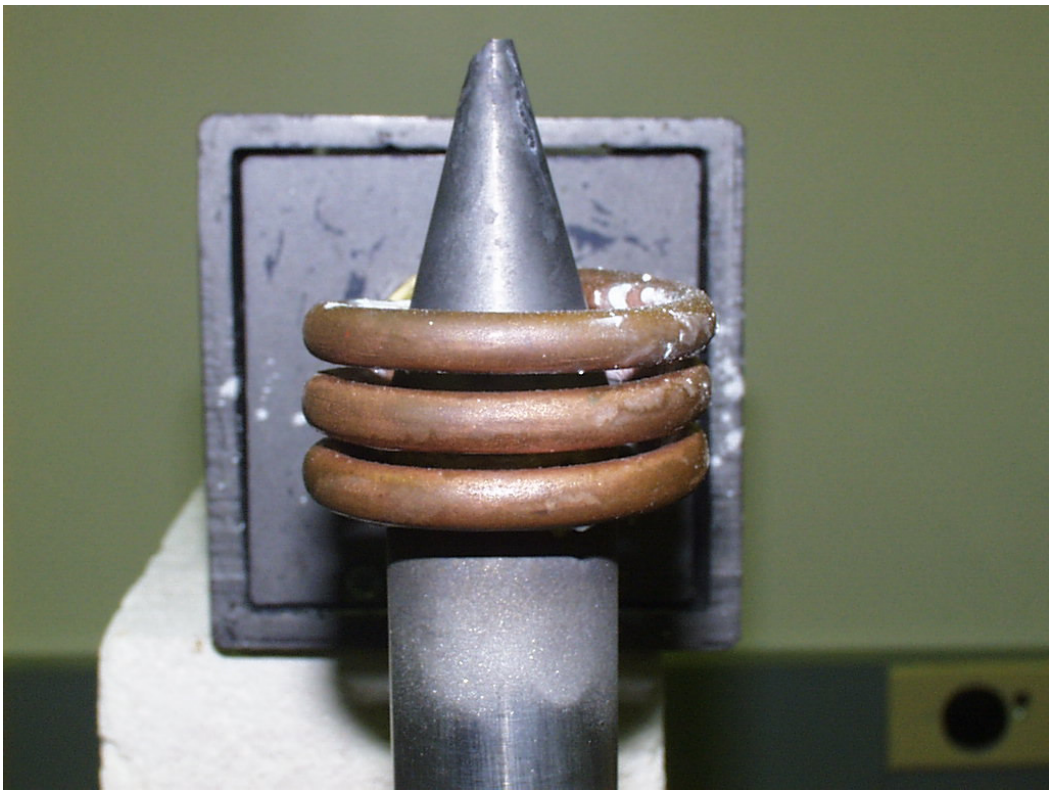
Temperature 1350 ºF (732 ºC)

Frequency 151 kHz

Equipment
- Ambrell 2.4 kW induction heating system, equipped with a remote workhead containing two 1.2µF capacitors for a total of 2.4µF
- An induction heating coil designed and developed specifically for this application.

Process A three turn helical coil is used to braze the carbide to the stainless steel shaft. A silver solder washer is placed over the post on the shaft, the carbide is placed on the washer and flux is applied. The assembly is placed in the coil for 75 seconds to braze the carbide to the shaft.

Results/Benefits Induction heating provides:
- Repeatable failure-resistant joints
- Precise application of heat zone
- Faster production with quick heat-up, cool-down cycles
- Hands-free heating that involves no operator skill for manufacturing



Carbide cone and stainless steel shaft assembly being brazed