Brazing a carbide to a stainless steel shaft for a digger used in mining

Objective Brazing a cone shaped carbide to a stainless steel shaft for a digger

Material Cone shaped carbide 1.12" (28.4mm) dia, 1.5"(38.1mm) tall, stainless steel shaft 1.12" (28.4mm) dia and various length, black brazing flux and braze shims

Temperature 1500 ºF (815 ºC)

Frequency 277 kHz

Equipment

- Ambrell 10 kW induction heating system, equipped with a remote workhead containing two 1.0µF capacitors for a total of 0.5µF
- 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 shaft. The steel shaft is fluxed and the braze shim placed on top. The carbide tip is fluxed and placed on top of the shim, lining up the countersunk hole in the carbide. The hole is not fluxed because the flux outgases and causes the carbide to build up pressure and attempt to repel from the shaft. Power is applied for 85 seconds for the braze shim to flow and make a good joint.

Narrative

- This customer is new to Ameritherm and discovered Ameritherm through a web search. Ameritherm's customer has a customer who is unhappy with the braze quality of their digger so our customer is looking for a better quality brazing process. Ameritherm's customer is very happy with the sample brazed diggers and the help he received from the Ameritherm lab in developing his brazing process.

Results/Benefits Induction heating provides:

- Rapid localized heating only where needed
- Creates clean, controllable joints
- Hands-free heating that involves no operator skill for manufacturing
- Even distribution of heating

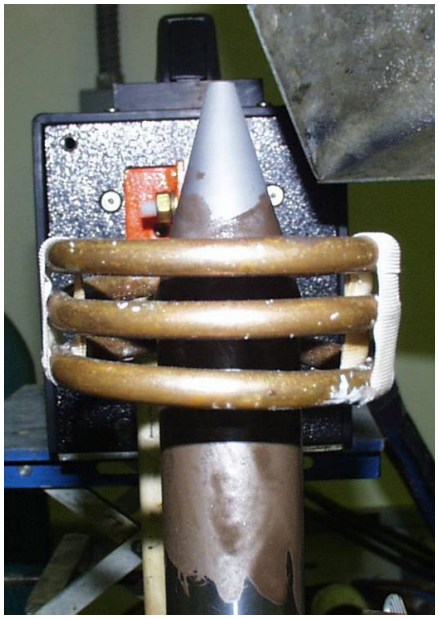
Ameritherm Inc.
www.ameritherm.com
+1.585.889.9000

Ambrell
fr.ambrell.com | www.ambrell.com
+33 (0)3 89 76 01 24 | +31 (0)548 659044

Cheltenham Induction Heating, Ltd.
www.cihinduction.com
+44 (0)1242 514042

Bottom of carbide (showing countersunk hole) and shaft

Shaft in coil before carbide is put in place



Complete assembly in coil