

Brazing carbide tips to a steel cutter

Objective To heat a steel and carbide assembly to 1450 °F for a carbide tip brazing application where the customer needs to repair broken carbide tips on a copper cutter

Material • Customer supplied steel cutter blade and carbide pieces

Temperature 1450 °F (800 °C)

Frequency 275 kHz

Equipment • Ambrell EASYHEAT 5kW 150-400 kHz induction heating system equipped with a remote work head containing one 1.0 µF capacitor
• A single-turn helical induction heating coil designed and developed specifically for this application

Process This brazing application requires the application of high intensity heat to the joint area. This is so that thermal conduction of steel and carbide does not sink away heat delivered via induction. Consequently, a smaller 1/8" (3.175mm) copper tube coil was designed to deliver heat effectively to the joint area.

The cutter was held in a vice and the coil was presented to heat the assembly. A ceramic rod was used to press the carbide tip onto steel cutter during brazing. The heating process was successful.

Results/Benefits • Part quality: The repaired assembly met all quality expectations
• Speed: While this particular client wasn't concerned about speed since the system is going to be used for repair and not be part of a production process, induction is faster than methods like torch brazing
• Safety: Induction is flameless and introduces less heat into the production environment than torch brazing



The assembly inside the induction coil prior to brazing



The assembly inside the induction heating coil after brazing