

Brazing a steel block with a cutout for carbide

Objective To heat a steel block with a cutout for carbide to 1350 °F (732 °C) within 60 seconds for a brazing application to create cutting tools for flashlight manufacturing.

- Material**
- Steel block with carbide cutout (2" x 1.75" x 4" / 51mm x 44mm x 102mm)
 - Black flux
 - Carbide
 - Braze material

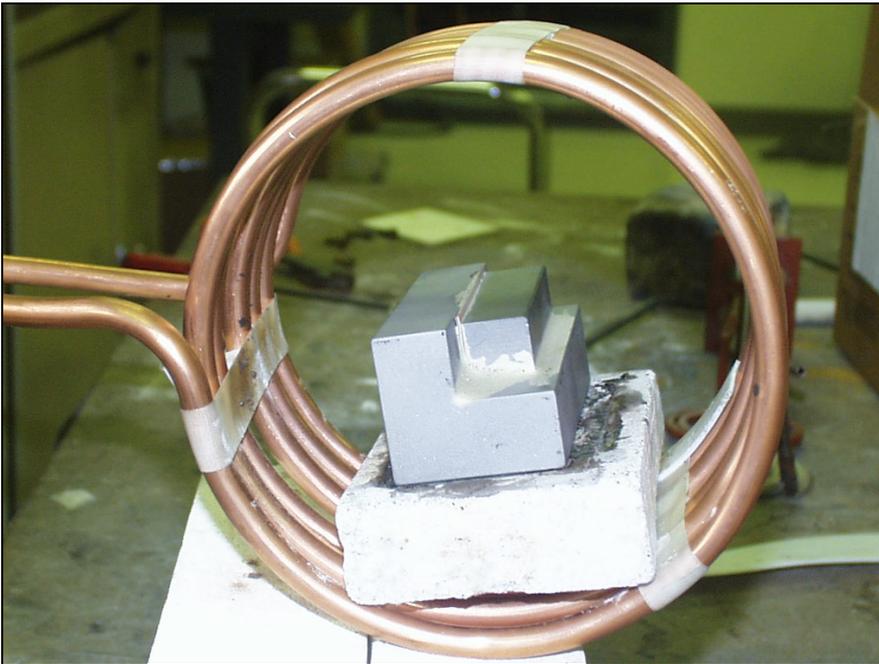
Temperature 1350 °F (732 °C)

Frequency 51 kHz

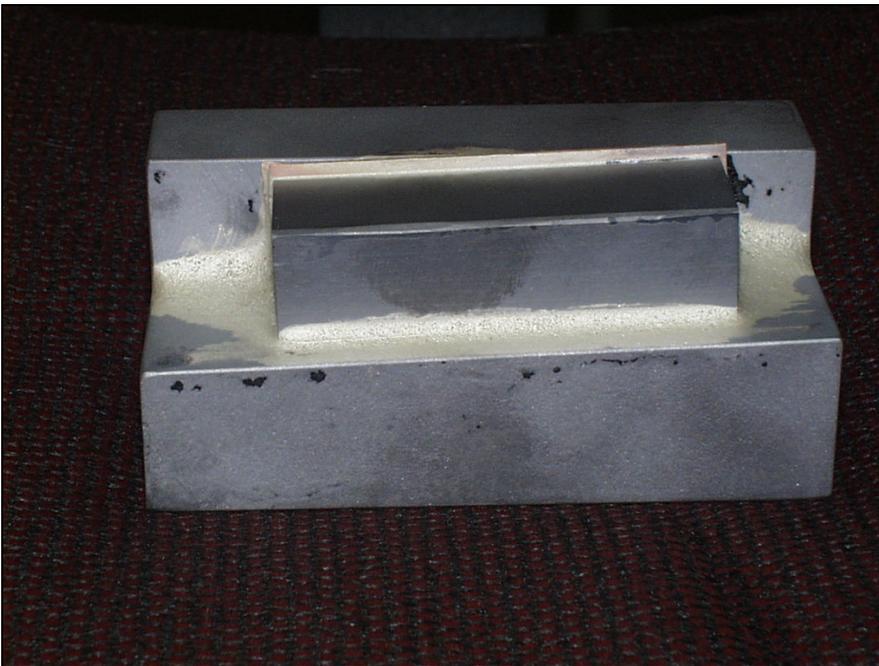
- Equipment**
- Ambrell EKOHEAT 45 kW, 50-150 kHz induction heating system equipped with a remote heat station containing eight 1.0 µF capacitors
 - A single position, six-turn helical induction heating coil designed and developed specifically for this application

Process Initial testing was conducted to optimize power delivered to the part. The part was fluxed and assembled with two braze shims per mating surface. The assembly was placed into the induction coil and the power was turned on. The part heated well and the braze alloy flowed nicely. The part heated to the desired temperature within the targeted time of 60 seconds.

- Results/Benefits**
- Improved quality and repeatability: The client was using a torch, and induction offers more precise heating that is repeatable, which is what the client desired
 - Speed: Induction heating allowed the client to achieve the targeted heating time of 60 seconds, which is faster than what the torch could deliver
 - Superior efficiency: Induction heating applies heat only to the part, which means there's no wasted energy and cost savings are achieved when compared to a brazing torch
 - Safety: Unlike a torch, induction offers clean, flameless heating



The assembly inside the induction heating coil.



The assembly after brazing.