

Induction Brazing Carbide Tips on Drill Bits

United Induction Heating Machine Limited

We are experienced in Induction Heating, induction heating machine, Induction Heating equipment. They are widely used in induction heating service, induction heat treatment, induction brazing, induction hardening, induction welding, induction forging, induction quenching, induction soldering, induction melting and induction surface treatment applications
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Objective To braze carbide cutting tips to drill bits ranging in size from 0.5" to 1.5" in diameter. The brazing takes place at 1900°F and is presently done in 11 seconds for the 0.5" diameter bit and 39 seconds for the 1.5" diameter bit. Customer goals include decreasing the brazing times, especially for the larger drill bits, and repeatability must be adequate. Heating can be done using a helical coil since the drill bits are presently front-loaded into a double turn helical coil.

Material 4140 Leaded Steel Twist Drill Shanks and Tungsten Carbide Tips with Harris 870 Braze and Tricon Gray Flux.

Temperature 1900°F

Frequency 106 kHz

Equipment Power of 45kW output solid-state induction power supply with eight (8) capacitors and 5:3 RF transformer ratio.

Process The Power of 45kW solid state induction power supply along with specifically designed coils and laboratory research were combined to produce the following results:

- A brazing temperature of 1900°F was reached through the use of a unique 4 turn helical coil. Different coils were designed for each size drill bit to maximize efficiency through coupling.
- Quality braze joints were achieved due to the uniform heat pattern created by the induction field.

Results Heating times were met and surpassed. For the 0.5" drill bit 11 seconds was required to reach 1900°F while 32 seconds was necessary for the 1.5" drill bit. These results indicate a decrease in heating time of 7 seconds for the 1.5" drill bit while retaining quality and repeatability

Brazing-Carbide-Tips

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