Brazing carbide insert to steel pipe gripper chuck

Objective To braze carbide inserts into steel blocks in the assembly of pipe gripper chuck

Material Steel blocks,1” (25.0mm) wide X 3.5” (87mm) long and 2” (50mm) tall, toothed carbide inserts

Temperature 1450 ºF (780 ºC)

Frequency 192 kHz

Equipment
- Ambrell EASYHEAT 4.2 kW 400kHz induction heating system, equipped with a remote workhead containing one 1.0µF capacitor
- An induction heating coil designed and developed specifically for this application.

Process Blocks are fluxed and braze shims are sandwiched between the toothed carbide inserts and wells in the steel. A two-turn helical coil is used to heat the assembled part. A two-step heat profile flows the braze within 150 seconds per part

Narrative Induction heating is proposed to replace a hand/flame process, delivering significant reduction in per-part cycles.

Results/Benefits Induction heating provides:
- Direct heating of the part, saving energy
- Flameless process; doesn’t ‘blow’ the braze
- Precise control of heat
- Process precision and repeatability for consistent results
- Easy integrated into automated process
- Even distribution of heating
- Reduced flame hazard

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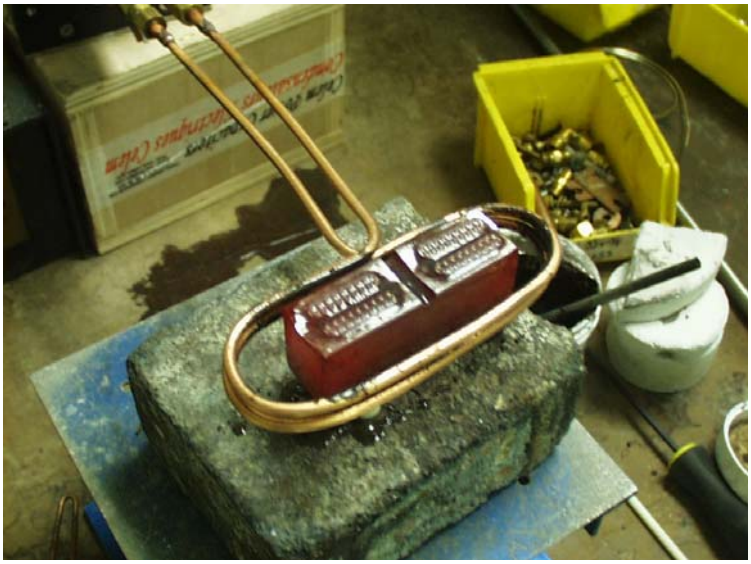
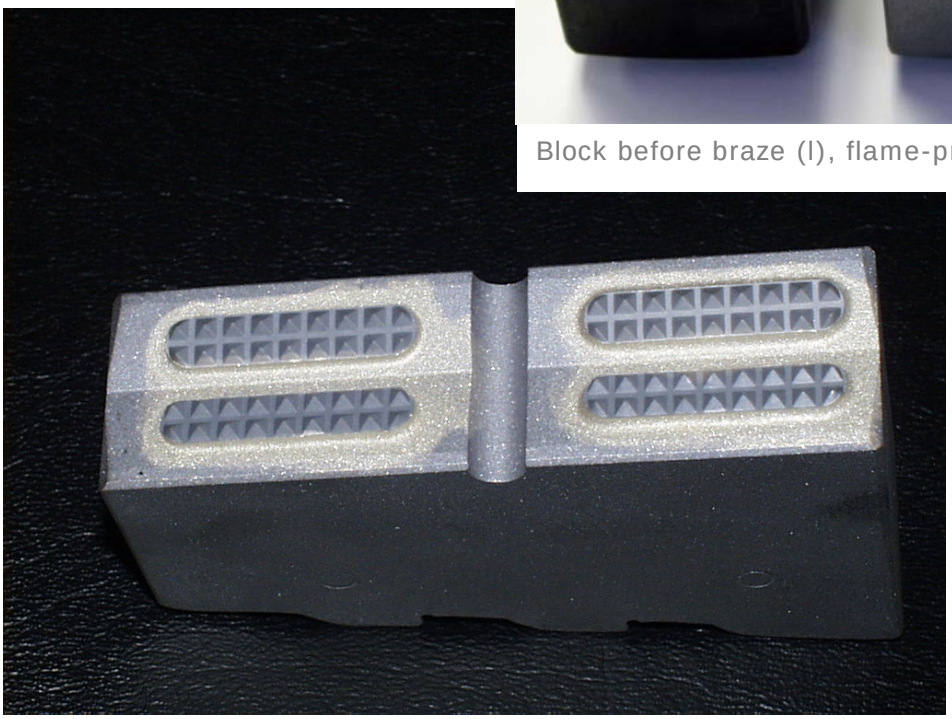


Testing configuration for feasibility

Block before braze (l), flame-processed (r)



Finished gripper block with clean, uniform braze