Selectively Annealing Thread Ring Gauge Blocks

Objective To selectively and uniformly anneal two sections of a thread ring gage block from the hole to the outside surface from a hardness of Rc 59-61 to Rc 45. The gage blocks are made from O6 steel and range in size from 1" to 8 1/2" in diameter and run from 1/4" to 1" thick. Production is currently performed using a flame torch at an approximate rate of 250 to 300 of each part per month. Process goals include possible automation, production rate increase, and elimination of stress cracking resulting from flame heating.

Material Gage blocks made from O6 oil-hardened steel.

Temperature 1300°F

Frequency ~200 kHz

Equipment NovaStar 7.5 kW solid-state induction power supply and a remote heat station containing three (3) busses and two (2) capacitors with a total capacitance of 0.66 µF

Process The NovaStar 7.5 kW solid state induction heating power supply was utilized to achieve the following objectives:

- Production time is reduced to less than 12 seconds per part due to a unique coil, designed specifically for heating both zones simultaneously.
- Stress cracking, previously experienced with flame annealing, is eliminated through uniform heating attained from the uniquely designed coil.

Automation is now possible, because the two annealing zones can be heated simultaneously in a front load coil.

Results The final cycle time through induction heating ranged from 7.5 to 12 seconds, depending on the part size, which satisfies the present production rate of 250 to 300 parts per month.

Application illustration on next page

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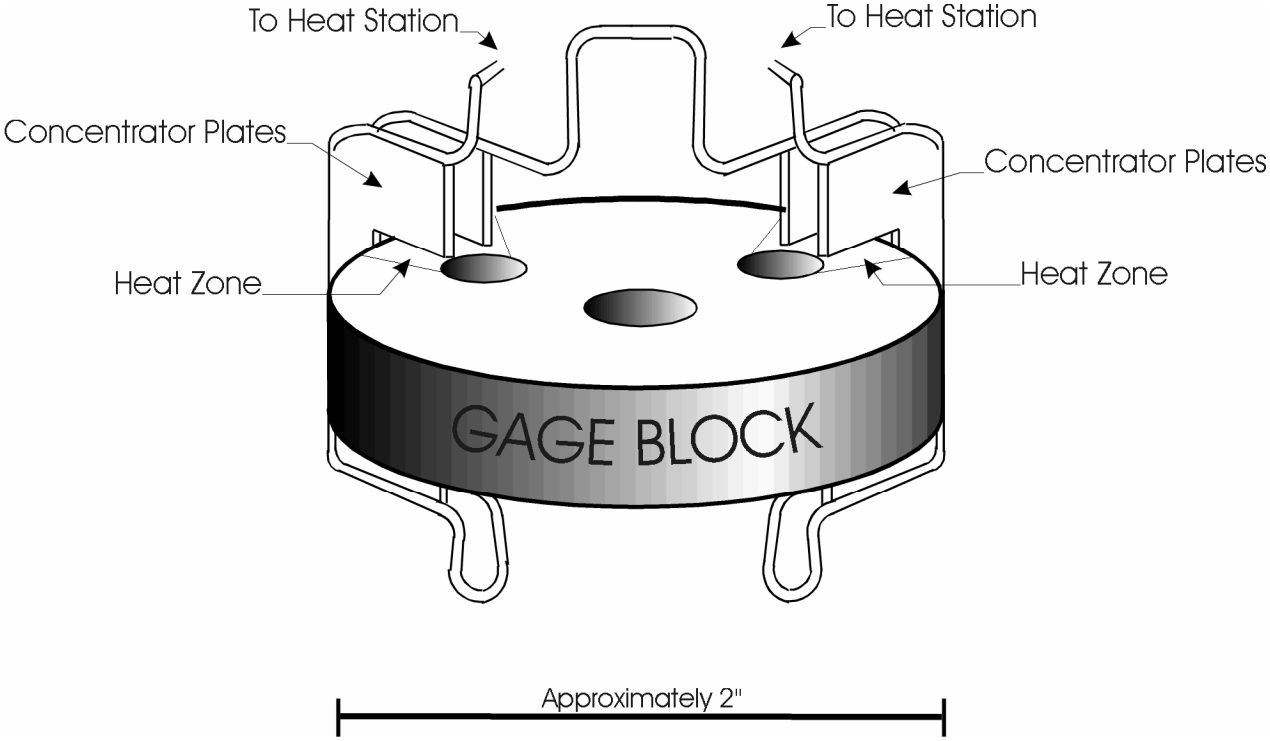

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