

Annealing stainless steel caps for a dental application

Objective To anneal a variety of part sizes of a common shape in-line (continuously) from a high speed punch press.

Material 304L stainless steel caps

Temperature 1600-1800°F (870-980°C)

Frequency 308 kHz

Equipment

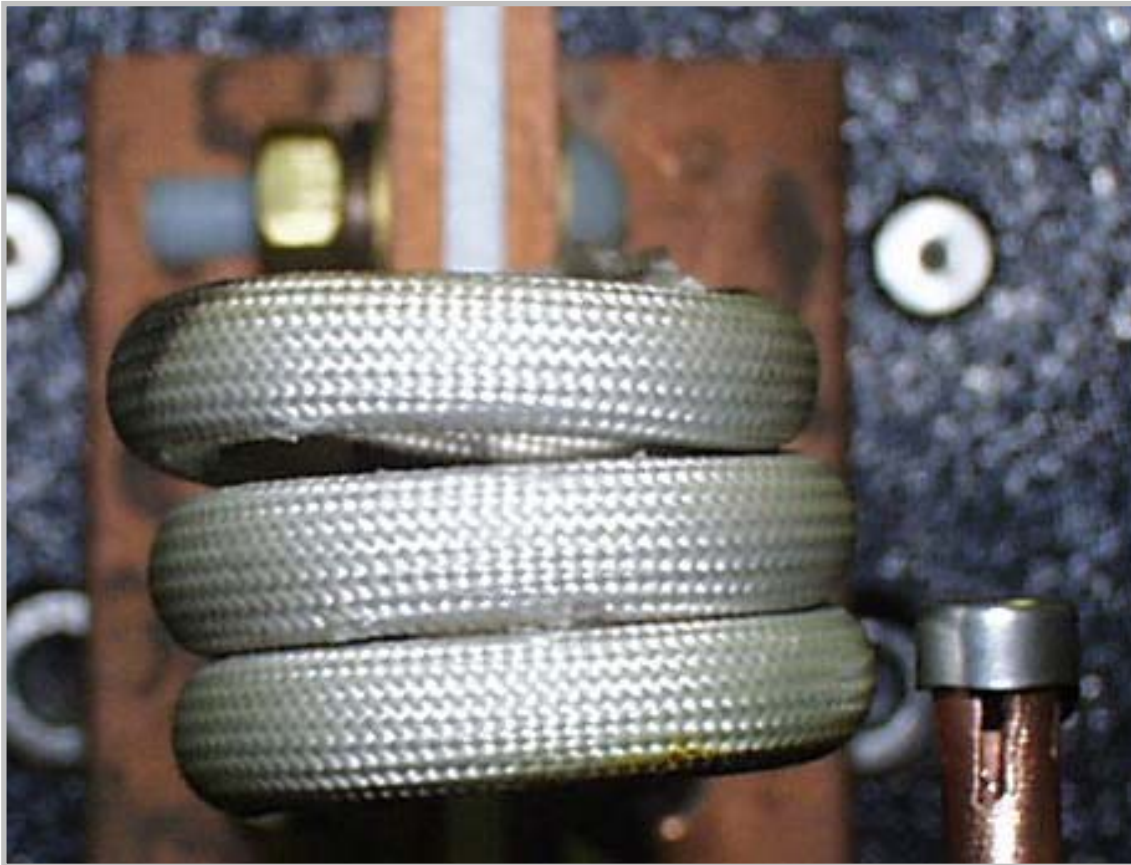
- Ambrell 3542LI 3.5kW induction heating system, equipped with a remote workhead containing two 1.5 μ F capacitors
- An induction heating coil designed and developed specifically for this application.

Process A 3-turn coil is used for the heating pattern. Sample cap is placed on a copper tube (slotted to reduce heat-loss) and inserted into a quartz tube which is filled with nitrogen. RF energy is applied for a cycle time of 500 milliseconds. Three S.S. cap sizes (0.295" to 0.397" OD) Each one of the three cap sizes were heated at two different settings.

Narrative Requirement to anneal large quantities of work-hardened crowns suggests induction for precise, controllable heating. Since oxidation is unacceptable in the finished product, Induction is the appropriate choice for heating in an inert atmosphere.

Results/Benefits Induction heating provides:

- Rapid, repeatable results
- Integration-friendly equipment for high-speed automation
- Operability in an inert atmosphere



Cap shown on supporting slotted copper