Bulk heating a steel part prior to application of rubber molding

Objective  To preheat two irregularly shaped steel castings to be molded and bonded with synthetic rubber

Material  Two steel castings, 17 lb. irregularly shaped, approximately 6” (152mm) x 9” (229mm) x 1” (25.4mm)

Temperature  400 °F (204 ºC)

Frequency  92 kHz

Equipment  • Ambrell 30 kW induction heating system, equipped with a remote workhead containing four 1.0 µF capacitors (for a total of 1.0 µF).
  • An induction heating coil designed and developed specifically for this application.

Process  Two steel castings are placed onto an insulated plate with brass guide location pins. The plate is placed onto a table which slides into a large multi-turn helical coil. The parts are induction heated to 400 °F in 180 seconds. The slow heating time allows the parts to come up to temperature evenly. When the heating cycle is completed each part is placed into a press for the molding and bonding operation.

Results/Benefits  Induction heating for bulk preheating of steel castings produces:
  • efficient and repeatable heat vs. a torch or an oven.
  • even heating of parts throughout

Large multi-turn coils provide:
  • easy loading and unloading of the parts
  • flexibility for varying bulk castings sizes and geometries
Steel casting is located on an insulated plate inside a large multi-turn coil. The coil is supported by studs brazed to each turn and fixed on a slotted insulated rail.

End view of the coil with the table and part placed inside. The brass locating pins and the clearance of the part to the coil is shown.