

Preheating a steel plate for forging

Objective Preheat a steel plate (3.9" x 7.5" x 0.75" / 100mm x 190mm x 19mm) prior to forging to create a hoe head with the goal of increasing production compared to preheating with a gas furnace.

Material • Steel Plate

Temperature 2192 °F (1200 °C)

Frequency 7 kHz

Equipment

- Ambrell EKOHEAT 125/100, 125 kW induction heating system equipped with a remote heat station containing three 26.8 µF capacitors.
- A three position, multi-turn helical coil designed and developed to generate the required heat for this application.

Process The steel plate was inserted into the three position multi-turn helical coil and the power supply was turned on. At 37 seconds, a second stainless steel plate was inserted, and at 75 seconds a third stainless steel plate was inserted. At 115 seconds, the desired temperature was achieved for the first part, and the process continued.

After startup, parts can be heated every 37 seconds from the sequence they were entered. While total cycle time is 115 seconds, a part can be removed every 37 seconds, which allowed for induction to achieve the desired production rate and realize considerable gains when compared to using a gas furnace.

Results/Benefits

- Higher production rate: The process achieved a production rate of 100 parts per hour, while a gas furnace produced 83 parts per hour
- Repeatability: This process is repeatable and can be integrated into a production process
- Precision and efficiency: Heating is precise and efficient, with heat only applied to the steel plates



Steel plates being heated with a three position, multi-turn helical coil