

Hardening a steel fitting for a machined parts manufacturer

Objective Heat a steel fitting to 1600 °F (871 °C) for a hardening application

Material • Steel fittings (0.75"/19mm diameter)

Temperature 1600 °F (871 °C)

Frequency 368 kHz

Equipment • Ambrell EASYHEAT 8310 10kW 150-400 kHz induction heating system equipped with a remote heat station containing two 1.0 µF capacitors
• A three-turn pancake helical induction heating coil designed and developed specifically for this application

Process The coil design enabled the part to be raised into the heating coil from the bottom. The design was also made to ensure it will work well within the customer's current setup. Initial testing took place with temperature-indicating paints to evaluate the uniformity of the heating pattern and the heating speed.

With a good heating pattern achieved, samples were processed at time intervals of 1.0, 1.25 and 1.5 seconds. The samples were dropped into a water quench following heating to conclude the hardening process.

Results/Benefits

- Speed: The fitting was heated in well under two seconds
- Efficiency: Induction uses less energy than competitive heating methods
- Footprint/Design: Induction can be implemented while taking up modest floor space, plus the coil design fits within the customer's operational arrangement



The steel fitting that is being heated for this hardening application