

Shrink fitting a gear to a shaft: automotive application

Objective To heat a steel gear to 500 °F (260 °C) for a shrink fitting application

Materials

- Customer supplied steel gear
- Customer supplied steel shaft

Temperature 500 °F (260 °C)

Frequency 304 kHz

Equipment

- Ambrell EASYHEAT 0224 2kW, 150-400 kHz induction heating system equipped with a remote heat station containing two 0.17 μ F capacitors
- A single position two-turn helical coil designed and developed for this application

Process The part was placed into the helical coil on top of a ceramic cylinder. The ceramic cylinder had a hole in it with a depth of approximate 24 mm (2.4 cm). The induction power was turned on. After 30 seconds the gear heated to temperature. The shaft was then inserted into the part and the bottom of the ceramic cylinder acted like a stop and positioned the shaft to the correct height. The parts were then allowed to cool.

Results/Benefits

- Part quality: The customer was using a torch, which can lead to inconsistent part quality. Conversely, induction is highly repeatable
- Speed: The gear heated to temperature within 30 seconds, which is an improvement for the client
- Repeatability: Induction's fast, precise heating means the client can count on consistent results once it is implemented into their process.

Video <http://www.youtube.com/watch?v=F-z48KQx8nA>



The gear and the shaft prior to heating



The gear and shaft after shrink fitting