



Shrink fit a steel gear onto a steel gear motor shaft

Objective Heat the bore of a hardened spur steel gear to shrink fit onto a gear motor shaft. This is part of a chair for the disabled.

Material Steel gear 2.5" (63.5mm) OD, .75" (19mm) ID x .625" (16mm) thick, temperature indicating paint

Temperature 400 °F (204 °C)

Frequency 300 kHz

Equipment

- Ambrell 2 kW induction heating system, equipped with a remote workhead containing two 0.66 μ F capacitors for a total of 1.32 μ F
- An induction heating coil designed and developed specifically for this application.

Process A four turn helical internal coil is used to heat the gear bore. The coil is inserted into the gear bore and power is applied for 90 seconds to reach the required 400 °F (204 °C) and expand the gear bore. The gear is then placed on the shaft and allowed to cool, creating the shrink fit between the gear and the shaft.

Results/Benefits Induction heating provides:

- No pre-heat cycle, heat is available on demand
- Energy efficient, heats only the part, not the atmosphere around it
- Controlled, even distribution of heating
- Faster production times



Coil inserted into gear bore prior to heating. 400 °F (204 °C) (Pink) and 500 °F (260 °C) (Blue) temperature indicating paint is used.