Heating Tool-Steel Circular Dies to 400°C in 10 minutes

**Objective**
A die is heated with induction in a thermal process of an enclosed powder

**Material**
Steel die with a compressed powder solid inside

**Temperature**
400 °C (750 °F)

**Frequency**
22 kHz

**Equipment**
- Ambrell EKOHEAT 50kW/30kHz induction heating system, equipped with a remote workhead containing one 53µF capacitor
- An induction heating coil designed and developed specifically for this application.

**Process**
Induction is evaluated to replace an oven/batch process. Advantages include reduced heating/cooling ramp times and floor space requirements. A nine-turn helical coil is used to heat the steel die while temperature of the die is monitored with a thermocouple. Die heating soak time is one hour.

**Results/Benefits**
Induction heating provides:
- heat generated within the part, saving energy and time
- easy integration with a press
- anticipated process energy savings
- greatly reduced footprint compared with oven, batch, carts
- precise controllable heat
- rapid ramp-up and cool-down times
- automatic ramp and soak capability
Typical time-temperature performance

Top-view of die surrounded by insulation and induction coil; thermocouple applied