### Sintering copper powder to a stainless steel shaft

**Objective**  
Sintering copper powder to a stainless steel shaft

**Material**  
Steel shaft & shell assembly, approx 2" (50.8mm) diameter, 2" (50.8mm) tall, copper powder

**Temperature**  
1600 °F (871 °C)

**Frequency**  
54 kHz

**Equipment**
- Ambrell 30.0 kW induction heating system, equipped with a remote workhead containing eight 1.0 μF capacitors for a total of 8.0 μF.
- An induction heating coil designed and developed specifically for this application.

**Process**
A four-turn helical coil is used to heat the assembly for five minutes. This provides slow, even heat for good penetration through the shell into the powder.

**Results/Benefits**
Induction heating provides:
- Even heat through the shell to sinter the powder.
- A method that is easily integrated into an automated production line. The design may be adapted to accommodate the indexed heating of several assemblies at the same time.
- Hand-free operation that involves no operator skill for manufacturing.