Bonding a stainless steel needle to a plastic shank to manufacture a dental perforator

**Objective** Heating a stainless steel needle within a plastic shank to form a dental perforator

**Material** Stainless steel needle 0.017” (0.43mm) OD, plastic shank

**Temperature** 356 °F (180 °C)

**Frequency** 359 kHz

**Equipment**
- Ambrell 1 kW induction heating system, equipped with a remote workhead containing two 0.33 µF capacitors for a total of 0.66 µF
- An induction heating coil designed and developed specifically for this application.

**Process** A pancake/plate coil is used in this application. Ten assemblies are placed in the coil and power is applied for 1 second to melt the plastic to the stainless steel needle and achieve a 5 kg pull out strength. 3000 parts are processed per day

**Results/Benefits** Induction heating provides:
- Consistent, repeatable and reliable bond
- More stable and reliable bond compared to ultra sonic heating
- Faster process time
- Hands-free heating that involves no operator skill for manufacturing
- Even distribution of heating
Needle & plastic shank that form the perforator

Encapsulated coil holds ten parts per cycle

Complete system