

## Application Note

### Heating Steel Cannulas for a Bonding Application

- Objective:** To heat steel cannulas for a bonding application
- Equipment:** Ambrell EASYHEAT™ 4.2 kW, 150-400 kHz solid state induction power supply with a workhead and coil specifically designed for this application.
- Frequency:** 340 kHz
- Material:** Stainless steel (various sizes)
- Testing:** Using the style and dimensions of the customer's coil, a single turn channel coil was built to generate the required heating for this bonding application. Initial tests were conducted to determine whether the smallest of the cannulas would couple to the frequency of the EASYHEAT power supply. It was observed that they coupled to the induction field well and easily heated.
- For each size cannula, the power delivered to the part was optimized to create a bond between the cannula and its bushing, without discoloring the steel of the cannula or causing the bushing to become opaque. Each size was successfully bonded at a rate of ten parts per 3.0 second heat cycle.
- Benefits:**
- **Speed:** Induction met the client's time requirements.
  - **Repeatability:** The client can expect the same result in the same amount of time every single time with induction heating. This is particularly critical for medical applications like this one.
  - **Footprint:** Induction takes up a modest footprint compared to other heating methods, and the workhead can be placed away from the induction heating system.
  - **Safety:** There is no open flame with induction heating.



The cannulas setup in the induction channel coil.