

AN AMBRELL COMPANY

Fuse thermoplastic catheter tubes

- **Objective** Fuse elastomer (TPE) tubes together in two ways, as a butt joint and as a overlap joint.
 - Material PeBax tubing 3/16" (4.76) OD, 1/8" (3.18 mm) ID and slightly larger Stainless steel Teflon coated mandrel 1/8" (3.18 mm) diameter
- Temperature 350 °F (177 °C)
 - Frequency 352 kHz
 - Equipment Ambrell 1 kW induction heating system, equipped with a remote workhead containing two (2) .33μF capacitors (for a total of .66 μF).
 - Induction heating coils designed and developed specifically for this application.
 - **Process** For the butt joint, two tubes of the same diameter with differing degrees of hardness are used. The tubes are slipped onto the Teflon coated mandrel and a short length of shrink tubing is placed over the tubes. Hot air is blown over the shrink tubing to gently heat it. The assembly is placed in the center of a three-turn pancake coil and heated for 8 seconds.

For the overlap joint, the two tubes have different diameters. The smaller diameter tube is placed over the mandrel first and then the larger diameter tube is slipped over it. A length of shrink tubing is placed over the assembly. Hot air is blown over the shrink tubing to gently heat it. A nine-turn helical coil is used to fuse the complete assembly together.

Results/Benefits Advantages of induction heating are:

- Heating of the mandrel is from the inside out providing a smooth finish on the outside of the assemblies.
- Precise, repeatable application of heat.
- Ambient temperature factors do not affect the process
- No over heating

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Precision Induction Heating

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Fusing of the butt joint.

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