

Fuse thermoplastic catheter tubes

Objective Fuse elastomer (TPE) tubes together in two ways, as a butt joint and as an 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

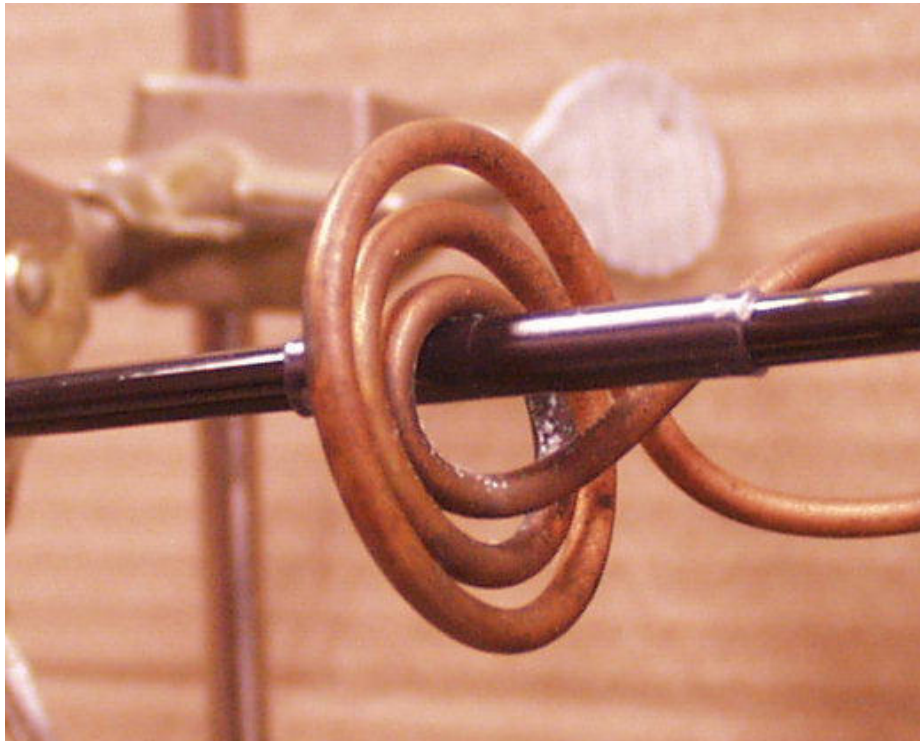
- Ambrell 1 kW induction heating system, equipped with a remote workhead containing two (2) .33 μ F capacitors (for a total of .66 μ F).
- Induction heating coils designed and developed specifically for this application.

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



Fusing of the butt joint.