

## Brazing a stainless steel fitting to a stainless steel capillary tube

**Objective** To heat a stainless steel tube and fitting to temperature for a brazing application for a test instrument; they want to replace the torch they are using for brazing

- Material**
- Stainless steel fitting
  - Stainless steel capillary tube (0.094"/2.4 mm OD)
  - Brazing alloy
  - Black flux

**Temperature** 1400 °F (760 °C)

**Frequency** 176 kHz

- Equipment**
- Ambrell EASYHEAT 2kW induction heating system equipped with a remote workhead containing two 0.66 uf capacitors
  - A single-position, five-turn helical induction heating coil designed and developed specifically for this application

**Process** The fitting and capillary tube were fluxed and then assembled. The assembly was placed inside the coil. The larger hex mass was centered between coil turns to prevent overheating. The EASYHEAT was turned down to meet temperature in 35 seconds so that conduction in the steel could provide the best possible heating pattern. The gap in the coil also allowed the braze alloy to be fed to the part. Once the heating concluded, the parts were washed with water and a light-duty cleansing pad was used to clean the part.

- Results/Benefits**
- **Speed:** Induction enabled the brazing process to be completed in about 35 seconds
  - **Consistency:** Induction enables consistent joint quality, which a torch often doesn't deliver; in this case this is the primary reason for switching to induction
  - **Safety:** There is no open flame with induction, so it's a safer heating option than other options such as a torch
  - **Efficiency:** Induction delivers heat only where it's required, making it more efficient than many competitive heating methods like torch heating



The assembly heating to temperature inside the coil. Note the gap in the coil to prevent overheating.



The assembly after brazing.