

Brazing a Bourdon Tube Assembly

Objective To braze a thin copper oval tube to a brass fitting at 1400 °F and to cap the other end of the copper tube with a brass plate.

Material Brass fitting - 0.875 in² and 2.5 in long (22mm² x 64mm)
Copper tube 0.01 in (0.254mm) wall
Brass plate 0.10 in (2.54mm) thick and 0.5 in X 0.25 inch
Braze alloy shim and white flux

Temperature 1400 °F (760 °C)

Frequency 320 kHz

Equipment Ameritherm 20 kW induction power supply equipped with a remote heat station using two 1.32µF capacitors (total 0.66 µF)
Two custom-designed induction heating coils.

Process A split, four-turn induction coil is used to deliver the heat energy into the brass fitting (Fig. 1). To prevent over heating of the edges of the brass fitting and the thin copper tube, a smaller coil diameter (Fig. 2) was added to deliver heat into the brass fitting. A braze shim preform is placed at the joint area, and is then covered with white flux. The height of the coil is adjusted to deliver proportional heat to the assembly. This setting raises the temperature of the thicker brass piece and the thin copper tube at the same rate enabling a uniform flow of the braze shim preform. The other end of the copper tube is brazed successfully using a 2-turn helical coil (Fig.3.)

- Results/Benefits**
- Preservation of the copper's mechanical properties
 - Minimized heat migration along both ends of the tube
 - Reduced heat-up time (under 60 sec.)

Illustrations on next page

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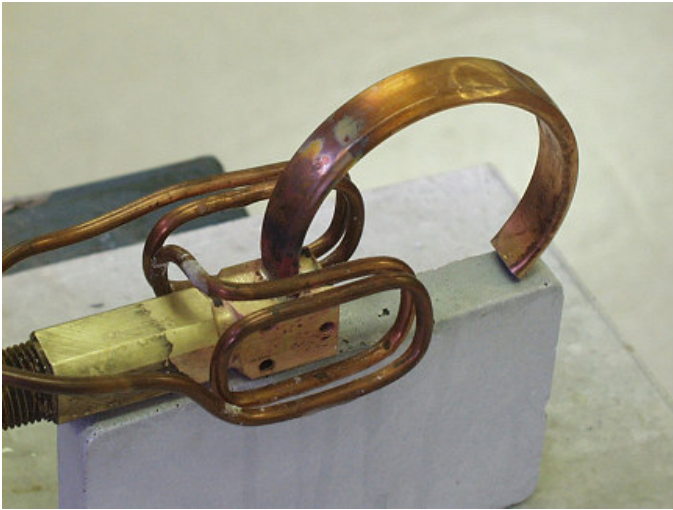


Figure 1



Figure 2



Figure 3

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