



Soldering a kovar piece with glass to a copper base for a photon light source

Objective To solder a kovar piece with glass insert into copper base and then desoldering same pieces for repair

Material Kovar piece with glass insert 0.9375" (23.8mm) diameter, 0.5625"(14.3mm) wide and a copper base 1.5" (38.1mm) square

Temperature 423°F (217°C) for soldering, 536°F (280°C) for desoldering

Frequency 350 kHz

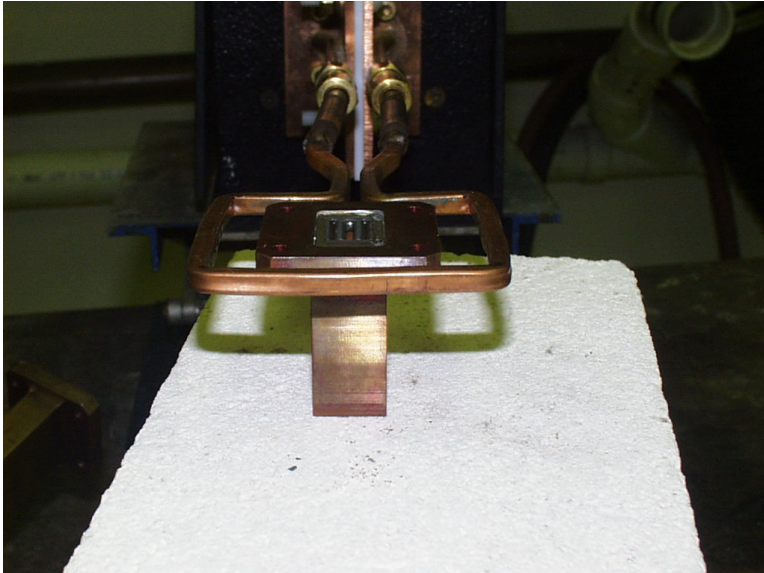
Equipment

- Ambrell 9.0 kW induction heating system, equipped with a remote workhead containing two 1.5μF capacitors for a total of 0.75μF
- An induction heating coil designed and developed specifically for this application.

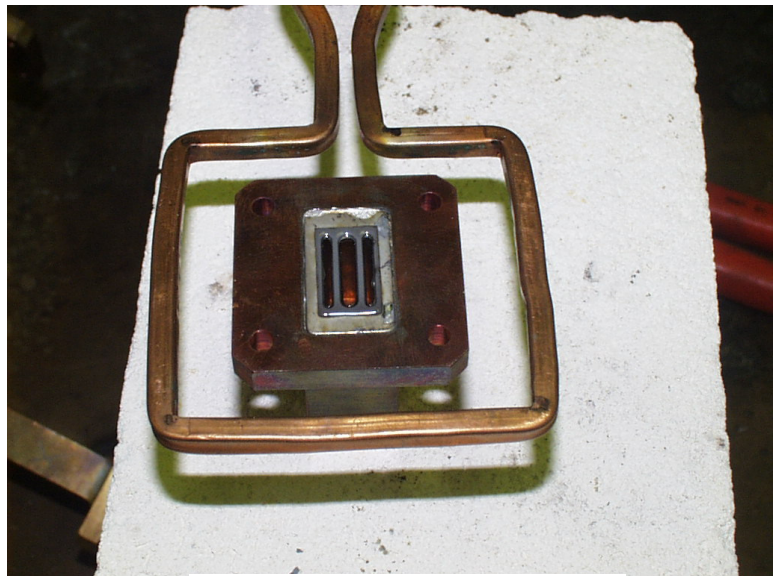
Process A one turn coil of square tubing is used to heat the copper and kovar insert with solder to 423°F (217°C) in 1.5 minutes. The copper heats slowly and expands so the kovar piece with glass drops in place and is soldered. Care is taken to cool the pieces slowly so that the glass insert does not break as the copper contracts. The desoldering application is for repair purposes. The soldered pieces are placed in the same coil and are heated to 536°F (280°C) for 2.5 minutes so the solder melts and pieces are separated while hot .

Results/Benefits Induction heating provides:

- Same equipment for both assembly and repair.
- Hands-free heating that involves no operator skill for manufacturing
- Uniform control of heat from part to part



End view of assembly
before heating



Top view of assembly
prior to heating