



Annealing both ends of copper tubing for refrigeration

Objective To heat both ends of a copper tube to anneal as soft as possible 1.5" (38.1mm) from end and retain full hardness next to anneal

Material 1.625" (41.275mm) dia x 24" (609.6mm) long copper tube

Temperature 1500 °F (815.5 °C)

Frequency 100 kHz

Equipment

- Ambrell 45 kW induction heating system, equipped with a remote workhead containing eight 1.0µF capacitors for a total of 8.0 µF
- An induction heating coil designed and developed specifically for this application.

Process A four turn helical coil is used for this annealing process. The copper tube is placed in the coil and power is applied for a total of 7.5 seconds. At 3.75 seconds the copper tube is rotated half a turn to insure uniform annealing. The copper is tube immediately quenched to guarantee the annealed area is only 1.5" (38.1mm) from end of tube. The tube is then flipped to anneal the other end.

Results/Benefits Induction heating provides:

- Controlled application of heat to very specific area
- Faster process time, increased production
- High efficiency, low energy cost
- Hands-free heating that involves no operator skill for manufacturing



Copper tube in coil prior to annealing application