Annealing copper tubes to create formed tubes and pipes

Objective
To heat a variety of copper tubes for annealing applications; the end products are formed tubes and pipes for various industrial uses

Material
- Customer supplied copper tubes (height up to 5.5"/ 140 mm and a diameter up to 0.7"/ 17.8 mm)

Temperature
- 1200 ºF (649 ºC)

**Frequency**
24 kHz

Equipment
- Ambrell EKOHEAT 100 kW, 15-40 kHz induction heating system equipped with a remote workhead containing eight 10 µF capacitors for a total capacitance of 20 µF
- A multiple position ten-turn helical induction heating coil

Process
Initial testing was conducted to optimize the power delivered to the tubes. An EKOHEAT 35 kW/30 kHz induction power supply was used and the power requirements for actual production were calculated based on testing.

With a 100 kW power supply, copper tubes – up to the largest diameter required – can be heated to temperature within five seconds. A prototype coil was used during testing.

Results/Benefits
- Speed: Copper tubes of various geometries heated to temperature in a matter of seconds
- Repeatability: Induction offers the same result every time, which makes it ideal for a potentially high volume process such as this one
- Footprint: Induction requires a minimal footprint so it's easy to integrate into production environments
- Ambrell Lab Expertise: The client leveraged the lab to come up with the right induction solution based on their production requirements
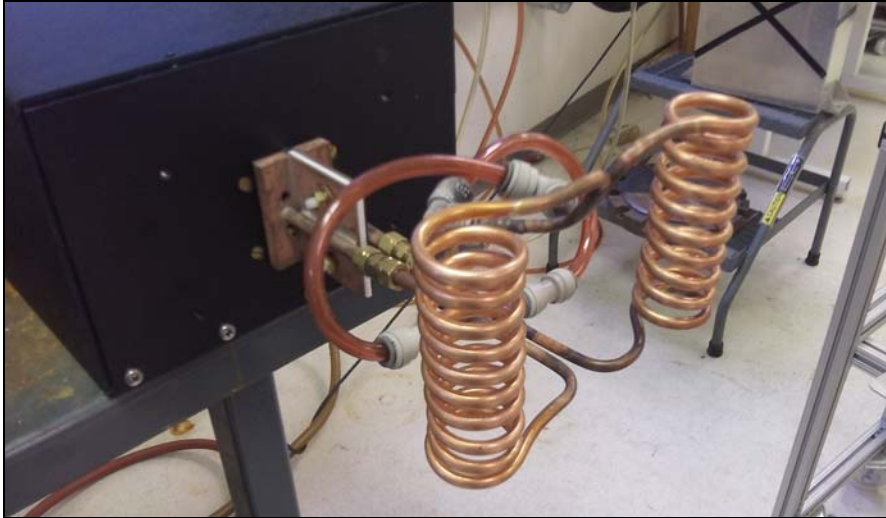
The prototype coil.

The smallest copper tube during heating.