Ambrell
INDUCTION HEATING SOLUTIONS
an inTEST Company

Application Note

Induction Brazing Copper Busbars

Objective: To heat four types of copper busbars for a brazing application for a high voltage contracting business looking to move away from flame.

Equipment: Ambrell EKOHEAT® 30 kW, 50-150 kHz solid state induction heating power supply with a workhead and coil specifically designed for this application.

Frequency: 60 kHz

Material: Copper busbars and silver shims.

Temperature: 1400 ˚F (760 °C)

Testing: A custom-designed single position multiple-turn helical coil was built to generate the required heating for the application. Initial tests were conducted to optimize the power delivered to the part. Temperature indicating paint was then applied to the part, which dissolves when the part reaches target temperature. All four styles of parts were individually heated using the same power supply settings.

- 5” and 7” (127 and 178 mm) long copper busbars: These busbars were placed directly below the induction coil with the top portion slightly inside the coil. They took about 1 minute for the braze to flow.
- ¼” (6.4 mm) thick bent copper busbar: This bar was held about 0.5” (12.7 mm) under the induction coil. The braze started to flow within 1.5 minutes and the induction power was turned off at 2 minutes.
- ¼” (6.4 mm) thick straight copper busbar: This bar was heated about 0.25” (6.4 mm) above the induction coil and the braze flowed within one minute.

Benefits:

- **Speed:** Induction met the client’s time requirements.
- **Precision:** Induction heats only the area that requires it for brazing.
- **Repeatability:** The client can expect the same result in the same amount of time every single time with induction heating, which is not the case with methods like flame.
- **No Open Flame:** Which results in a safer work environment.

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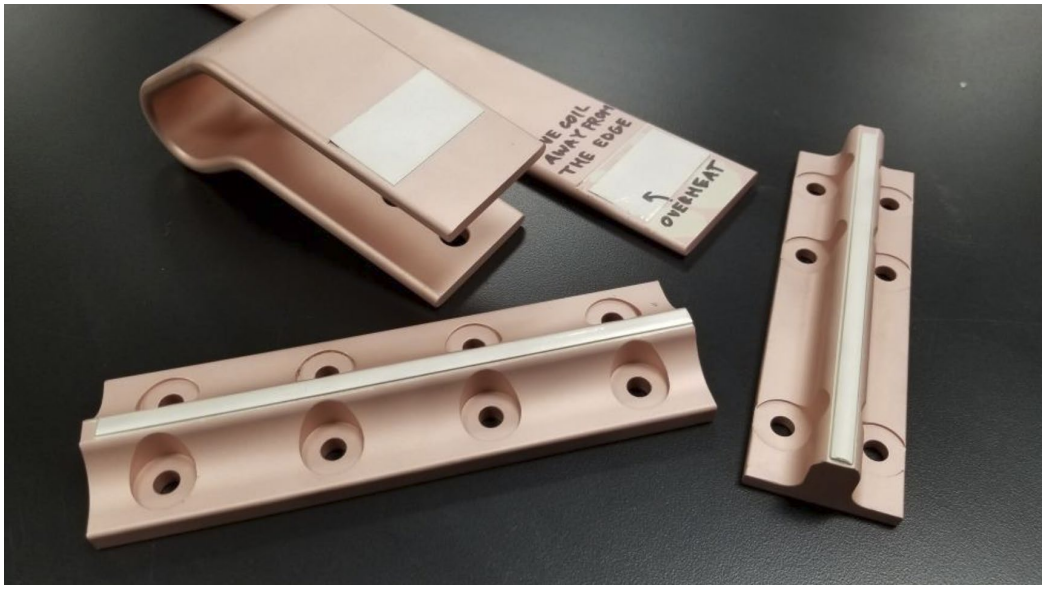

Finished samples from the brazing application.