

Soldering a rivet onto a steel tank cap with induction heating

Objective To solder a rivet onto a steel tank cap; the client was soldering with a torch but getting inconsistent results

Materials

- 6" (152 mm) steel end cap
- 0.156" (4 mm) steel rivet
- Solder paste

Temperature 450 °F (232 °C)

Frequency 300 kHz

Equipment

- Ambrell EASYHEAT 2 kW, 150 KHz to 400 KHz induction power supply, equipped with a remote workhead containing two 0.66 μ F capacitors for a total of 1.32 μ F
- A single-position two turn helical induction heating coil designed and developed specifically for this application

Process The steel end cap was placed on a slight angle to allow the solder to pool and the coil was located axially to the rivet and approximately 1/8" (3 mm) away from the end cap. The power was turned on and the end cap heated to temperature within 30 seconds and achieved favorable results. The slight angle of the end cap's placement was critical to the application's success.

Results/Benefits

- **Speed:** Induction proved faster than the client's previous heating process – a torch
- **Repeatability:** Induction is a repeatable heating process, so the client gets superior results with induction when compared to a torch
- **Efficiency:** Induction is more energy efficient than torch heating
- **Safety:** Induction doesn't have an open flame and introduces less heat into the work environment than a torch



The assembly during heating



The assembly after soldering