

Application Note

Bonding Steel Wire Embedded in Rubber Molding

- Objective:** To heat steel wire embedded in rubber molding for a bonding application in the automotive industry; this was a new process for the customer.
- Equipment:** Ambrell EKOHEAT[®] 45 kW, 50-150 kHz solid state induction power supply with a workhead and coil specifically designed for this application.
- Frequency:** 85 kHz
- Material:** Magnetic steel wire
- Temperature:** 325 °F (163 °C)
- Testing:** A custom-designed single position multiple-turn helical coil was built to generate the required heating for this bonding application. Initial tests were conducted to optimize the power delivered to the part. Temperature indicating paint was then applied, which dissolves when the part reaches the target temperature. Ten rubber mold samples were heated at five different voltage settings (two samples per setting) to see if the wire bonded appropriately within the rubber mold. Testing from THE LAB confirmed the feasibility of the heating process for the customer.
- Benefits:**
- **Speed:** Induction met the client's time requirements and is often faster than other heating methods.
 - **Repeatability:** The client can expect the same result in the same amount of time every single time with induction heating.
 - **Precision:** Induction was able to heat the portion of the part (the two rubber strips) that required heating at the required temperature/ramp rate.



The part/assembly after heating.