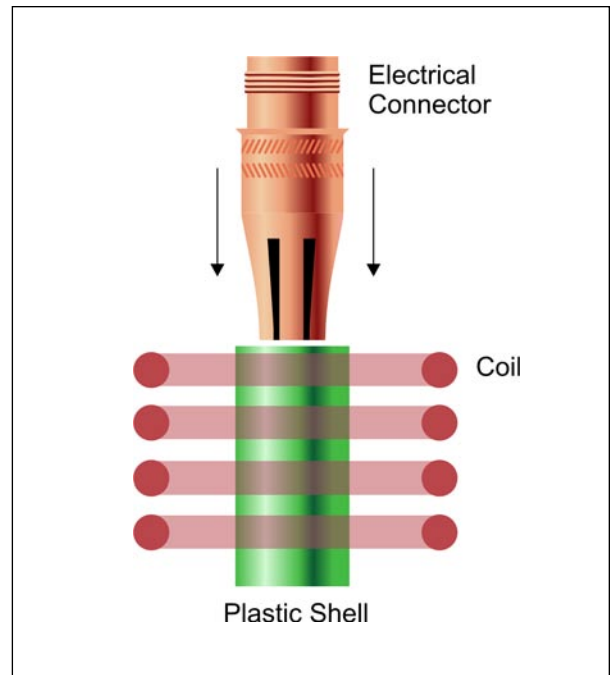


Heat Staking A Threaded Electrical Connector Into A Plastic Shell



Research Objective

To bond a threaded brass electrical connector to a plastic hollow plastic shell in an open-air atmosphere.

Parts & Materials Description

Threaded brass electrical connector, 0.85" OD round plastic shell, insertion guide/fixture

Temperature Required

500°F

Induction Heating Equipment

3 kW RF power supply, four-turn helical induction coil

Operating Frequency

275 kHz

Heating Procedure

The testing was done in an open-air atmosphere. A specially-designed, four-turn helical coil was used to provide optimal heating to the end of the electrical connector. Initial tests were conducted with bare parts and temperature sensing paints to establish time-to-temperature and heating profiles. The plastic shell was positioned inside the coil and parallel to the top coil turn. The brass connector was carefully positioned on top of the shell and a small 3-5 lb force was applied to the top of the connector. RF induction power was applied for approximately 10 seconds, first causing the connector to heat up and then gradually causing the plastic around the edge of the connector to reflow. Because of the slight downward pressure and the reflow of the plastic, the connector slowly dropped down inside the shell until the end stop was reached. The assembly was then removed and allowed to air-cool.

Conclusion

Consistent, repeatable results were achieved at 500°F with a 10 second heat cycle. The electrical connector was firmly bonded to the plastic shell without any flashing or discoloration.