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APPLICATIONS LABORATORY
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Heating a Steel Shaft for Metal-to-Plastic Insertion

Objective: To heat a knurled steel shaft prior to staking into plastic; the shaft is used in the hinge of a consumer device.

Equipment: Ambrell EASYHEAT™ 2 kW, 150-400 kHz induction heating system with a workhead and coil specifically designed for this application

Material:

- Steel shaft samples

Temperature: 465 ºF (240 °C)

Frequency: 298 kHz

Testing: A single-turn channel style coil was used to generate the required heat pattern. The knurled end of the shaft was heated to the required temperature in 3 seconds. The lower portion of the shaft did not exceed 200 °F (95 °C), which was the desired result. Controlling the heat successfully preserved the lubricant applied to the unheated end.

Benefits:

- Localized application of energy limits temperature drift, which was critical for this application
- Hands-free heating that involves no operator skill for manufacturing, boosting repeatability
- Rapid heating which can benefit production
- Even distribution of heat

The steel shaft during heating.