Heat Setting A Shape Memory Alloy

Objective
Heat a steel die to 975°F (523.8°C) to set (cure) a shape memory alloy in the correct position.

Material
Nitinol wire, 2” (50.8mm) diameter tapered steel die, steel tube to house the die, instant adhesive

Temperature
975°F (523.8°C)

Frequency
131kHz

Equipment
- Ambrell 3kW induction heating system equipped with a remote workhead containing one 1.0 μF capacitor
- An induction heating coil designed and developed specifically for this application.

Process
A five turn helical coil is used to heat the steel die. The Nitinol wire is set into the die and tacked into place using instant adhesive. The die is placed inside a larger steel tube. The die cure is heated to 945°F (507.2°C) in 75 seconds. Successful heat setting of the Nitinol wire is achieved in 15 seconds.

Results/Benefits
Induction heating provides:
- Fast, accurate, repeatable heating
- Heat precisely delivered only to where it is needed