Heating a Nitinol spring assembly for shape setting

Objective
To heat a nitinol spring assembly to 800°F (426.6°C) for shape setting application

Material
0.018" (.457mm) Nitinol wire wrapped around a 0.08" (2.03mm) Nitinol mandrel 15" (381mm) long

Temperature
800°F (426.6°C)

Frequency
270 kHz

Equipment
• Ambrell 5.0 kW induction heating system, equipped with a remote workhead containing two 1.5µF capacitors for a total of 0.75µF
• An induction heating coil, designed and developed specifically for this application.

Process
A six turn split helical coil is used to heat the nitinol wire assembly to 800°F (426.6°C). The assembly is pulled through the coil at a steady rate to evenly heat a 1/2" (12.7mm) section of wire continuously in 4-5 second.

Results/Benefits
Induction heating provides:
• Hands-free heating that involves no operator skill for manufacturing
• Even distribution of heating along the wire
• Wire is heat treated on the winding machine, eliminating a secondary process
• Desired heat treating temperature can be adjusted by varying the time the wire assembly spends in the coil.
Nitinol wire moving through coil and reaching 800ºF (426.6ºC)