Preheating a molybdenum anode for stress relief

Objective
Preheating a molybdenum anode for x-ray tubes to 752 °F (400 °C) for stress relief

Material
2.5” (63.5mm) diameter molybdenum tube welded to a 5” (127mm) diameter flange

Temperature
752 °F (400 °C)

Frequency
215 kHz

Equipment
- Ambrell 4.2 kW induction heating system, equipped with a remote workhead containing one 1.0μF capacitor.
- An induction heating coil designed and developed specifically for this application.

Process
A four turn helical pancake coil is used to heat the anode. The area on the anode to be preheated is the weld between the tube and flange. The part is placed in a fixture and placed in the coil. Power is applied for 1 minute to reach 752 °F (400 °C).

Results/Benefits
Induction heating provides:
- Integrates easily into existing production lines
- Faster production rates, increased production
- Flameless process
- Precise and controllable placement of heat
- Even distribution of heating
Anode in coil prior to heating weld for stress relief