SUCCESS STORY 67
INDUCTION HEATING FOR THREAD ROLLING OF AEROSPACE FASTENERS

Q How can correct sighting through a small aperture be ensured between induction coils, to prevent overheating of the fastener prior to rolling the thread?

A ### Situation and background
Thread rolling of bolts can require that the blank work piece is heated by an induction field prior to rolling. Often this is controlled on a power, frequency and time basis. A number of induction machines also control the process with the use of an infrared (IR) thermometer and PID controller. The thermometer is typically mounted in close proximity to the coil, so it can easily be moved and become misaligned. Regaining correct alignment between the induction coils is difficult. Using laser sighting, re-alignment is done by adjusting the position of the work piece holder and sometimes the sensor itself, which can take 5 to 10 minutes. Lens contamination by oil mist was also a problem and purge options were not available.

The winning solution
- The Raytek® MM3M sensor with video sighting was selected to save time and improve ergonomics of the alignment process.
- The sensor's wide temperature range ensures compatibility with the existing control system.
- Improved optical performance allows the sensor to be mounted further away and avoid contamination and misalignment.
- Correct alignment prevents under reading and thus, overheating of the work piece.

Savings made
- Setup is reduced time by 60%, using video output to adjust the sensor.
- Consistent metallurgy is made consistent through better control of the set-point.

PRODUCT AND BENEFITS

MM3M with video sighting
(RAYMM3MVF1V)

- Short wave sensor with wide temperature range – provides "ramp up signal" for low set point
- Fast response time reduces overshooting set-point
- Video sighting reduces sighting errors
- 70:1 optics allow greater distance, reducing alignment errors
- Field calibration software for in-house quality department