

Steel Tube Production

Induction Pipe Welding



Q

Question

How do you control the temperature of a welded seam while minimizing temperature spikes caused by splatter during the induction welding process?

A

Answer

Situation Analysis

Hundreds of thousands of tons of steel tubing are produced every year for a variety of uses, including pipeline systems, structural members, electrical applications and general engineering purposes. Induction welding is a common method of steel tube production and temperature control is essential to maintain quality. The production of steel tubing uses sheet stock that is formed into a tubular shape by passing through a series of roller stands and an induction welder that heats the seam to a high enough temperature to enable a strong weld to be achieved as the metal is being forced together.

- Measurement temperature 1400°C (2552°F)
- Ambient temperature = up to 60°C (140°F)
- Process speed = 0.3 to 1.2 m/s (1 to 4 ft/s)
- Distance to measurement object = 0.75 m (30 in.)



A

Answer

Solution and Improvements

The Raytek Marathon FR fiber-optic pyrometer is the suitable choice for measuring the seam temperature of induction welded tubing for a number of reasons. The design of the FR makes it ideal for use in locations where high electromagnetic fields (EMF) occur, as they do around induction welding machines. By mounting the optical head and fiber-optic cable in the high EMF zone, the electronics may be mounted further away in a safe area, allowing for the signal output to be protected from electrical noise. The post processing abilities onboard the FR enable the temperature output to be conditioned to minimize spikes that are commonly caused by weld splatter in the pyrometer's field of view; use a half second of Valley Hold to prevent temperature spikes from occurring. The air purge collar and sight tube are almost always used in these harsh industrial environments to avoid lens damage. Raytek DataTemp® MultiDrop software is a great way to capture and record temperature data for the purposes of quality control and assurance.

Raytek Product

Marathon FR1BSF003



Rugged FR fiber-optic sensor

Benefits

- Improved Product Quality
- Reliable Temperature Control
- Increased Throughput
- Ability to maintain weld integrity, resulting in higher grade pipe that is sold at higher prices

Accessories

- Air purge collar with sighting tube (XXXFOHAPA)
- Aiming light for fiber-optic head (XXXFAFAL)
- Adjustable mounting bracket (XXXFOMB)
- DataTemp MultiDrop Software

For customized solutions to your process, please contact:

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