

Mash Seam Weld Inspection for Coil Joining

TEMATE SI-MWC

Equipment Highlights

- Post-weld inspection independent of variables and material changes.
- Volumetric inspection for internal defects, not visible on the surface.
- Complete evaluation immediately after welding with a complete and traceable record for later post-analysis, tracking, and process monitoring.
- Self-calibrated sensor for reliable and repeatable inspections.
- Programmable settings to inspect different thickness and compositions.
- Completely automated operation.

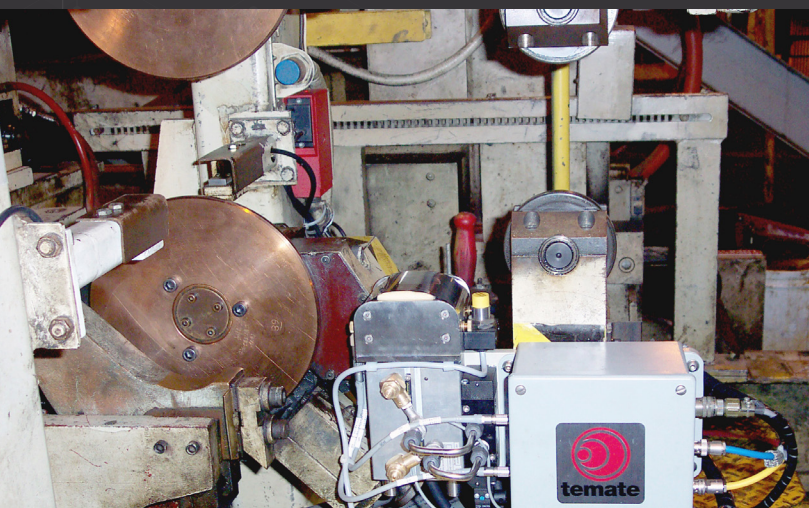
The TEMATE Si-MWC is designed for post-weld inspection of mash-seam (lap) welds in coil joining lines. The system integrates seamlessly with automated welders used in galvanizing, annealing, and other finishing processes. It uses Innerspec Technologies' ultrasonic EMAT (Electro Magnetic Acoustic Transducer) technology, the most reliable non-destructive method for volumetric weld inspection at production speeds in demanding industrial environments.

In Mash Welding (RSEW-MS) two sheets with a small overlap are mashed together while current is being applied to make a solid state joint. The joint is immediately flattened (planished) after welding to form a flatter bond for easier rolling through the line. Failures in the welding process, changes in materials, and contaminants entrapped between the faying surfaces can cause defects with detrimental consequences to weld quality.

Our proprietary system is a Non-Destructive Testing tool capable of detecting defects that affect the structural strength of the weld such as partial and full disbond, porosity, inclusions, poor or uneven overlap, poor planishing and weld skips.

An optional TEMATE Weld Process Control package adds instrumentation and data acquisition capabilities to automatically monitor, analyze and record welding parameters, controls and machine operations during the weld process.

The TEMATE Si-MWC installs on most automated welders and is endorsed and recommended by major manufacturers. It includes a complete self-diagnostics package.



TEMATE Si-MWC - Specifications

Materials Inspected	<ul style="list-style-type: none"> • Steel, all grades coated and uncoated. • 0.010" (0.25mm) to 0.125" (3mm) thickness.
Defect Detection	<ul style="list-style-type: none"> • Partial or complete disbond (1/8" (3mm) length with minimum 2:1 signal-to-noise). • Weld skips. • Poor or uneven overlap. • Poor planishing. • Porosity and Inclusions.
Inspection Technique	<ul style="list-style-type: none"> • Horizontally polarized shear wave technique. • Pitch-catch configuration with signal normalization. • Inspection speed of up to 1 m/s. • Maximum sample rate of 2000 pulses per second.
Sensor Head Assembly	<ul style="list-style-type: none"> • Includes pulsed electromagnet, EMAT coil circuit, protective wear pad, vertical compliancy unit and sensor electronics. • Replaceable protective wear pad is in contact with the coil surface during inspection and provides protection for the EMAT coil circuit. • Sensor is integrated within the welder carriage to provide inspection during the welder carriage retract cycle.
Data Acquisition Electronics	<ul style="list-style-type: none"> • Industrial enclosure; NEMA 12 and IP 55 per EN 60 529/10.91 protection rating, located up to 165 cabling feet (50 m) from sensor. • Enclosure is 24" (610mm) W x 32.3" (820 MM) L x 69" (1750 mm) H, weighing approximately 500 lbs (225 Kgs). • Includes EMAT T/R electronics, magnet pulser, power supplies, computer, communication interfaces, monitor, keyboard and mouse.
Software Features	<ul style="list-style-type: none"> • temate® software capable of operating under multiple operating systems. • Automatic and manual operation modes. • Easy-to-use interface to define and save inspection settings. • Simultaneous, real-time data acquisition and analysis. • Interactive and configurable windows to display results from sensors and previous inspection. • Defect map highlights relative location of defects on part bitmap image. • Programmable weld-specific defect thresholds for each ultrasonic channel. • Immediate weld disposition (pass/fail), both display and discrete outputs, following each weld inspection. • A-Scan (oscilloscope) display mode available for ultrasonic setup and diagnostics. • Self-diagnostics automatically performed during each inspection for immediate feedback on the maintenance condition of equipment and inspection. • Serial numbers and part specific comments are accepted using serial port messages. • Inspection data is tagged with the serial number identification and comments information. • Complete record of inspection settings, data and results are stored for each weld inspection. • Automatic storage of data to up to two locations (e.g. local and network drive). • Recall display of past inspection data. • Custom and standard inspection reports. • Complete Computer Training Based package.
Weld Machine Diagnostics (optional)	<ul style="list-style-type: none"> • Monitors various critical parameters during the weld process and provides immediate alarming on out-of-tolerance conditions. • Base system includes necessary instrumentation, mounting hardware, signal conditioners, and electrical interconnections used to monitor 8 welder inputs; welding voltage and current, welder wheel force and weld planishing force, carriage speed, pyrometer and spares (2). • Standard package includes statistical trend charts, time/amplitude plots, averages, max/min signal amplitudes easily customizable for each welder.
Power and Environmental Ranges	<ul style="list-style-type: none"> • 115VAC to 220VAC (+/- 10%) • Operating temperature 32°F(0°C)to 105°F(40°C) • Humidity non-condensing 5% to 95%