The temate® Si-CJ is an automated system for volumetric inspection of flash-butt welds in steel mills. Flash-butt welders are installed at the beginning of the pickle line to weld the end of one coil with the beginning of the next one.

The system uses Electro Magnetic Acoustic Transducer (EMAT) technology to detect weld defects such as; internal voids and inclusions, lack of fusion, strip mismatch (laps), strip misalignment, and under/over trim conditions. For each weld inspected, the system features an immediate disposition of weld quality, and saves a complete record for later post-analysis, tracking, and process monitoring.

Users consistently report complete elimination of weld breaks in pickle lines, and near-complete elimination in cold mill reduction.

Advantages of the temate® Si-CJ include:

- Non-contact EMAT technique.
- Inspects a variety of different steel types, including TRIP, Dual-Phase and all High-Speed Steel (HSS) grades.
- Self-calibrated sensor. No need for teaching period or regular calibrations.
- Inspects while trimming with no additional cycle time (Taylor Winfield & Miebach).
- Optional weld monitoring system (two options).
- Over 25 installations around the world.

The temate® Si-CJ is the only system for automated, volumetric inspection of flash-butt welds available for steel mills. Average payback for the system is less than six months, considering the reduction of inspection cycle time, break reduction and increased production speeds.
**temate® Si-CJ - Specifications**

| Materials Inspected | • Flat rolled carbon steel, all grades.  
|                     | • 0.060” (1.5mm) to 0.260” (6mm) thickness. |
| Defect Detection    | • Nominal detection of notches: 0.010” deep.  
|                     | • Plate mismatch (laps).  
|                     | • Strip misalignment.  
|                     | • Over/under trim.  
|                     | • Lack of fusion.  
|                     | • Full plate width inspection (no width limitations). |
| Inspection Technique| • Volumetric guided waves for inspection of the weld (i.e. top and bottom surface, and internal).  
|                     | • Pitch-catch configuration with signal normalization.  
|                     | • Maximum sample rate of 2000 pulses per second. |
| Sensor Head Assembly| • 4.25” (108mm) W x 5.50” (140mm) L x 25.69” (653mm) H when fully extended.  
|                     | • Weight 34 lbs (15 Kg).  
|                     | • Includes pulsed electromagnet, EMAT coil circuit, protective wear pad, vertical compliancy unit and signal conditioning electronics.  
|                     | • Replaceable protective wear pad is in contact with the part surface during inspection and provides protection for the EMAT coil circuit.  
|                     | • Vertical compliancy to the part surface accommodated in the sensor up to 4” (100mm). |
| Data Acquisition Electronics | • 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   | • 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 sensor 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.  
|                     | • Coil identification and information is accepted using serial or networked 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.  
|                     | • Monitors various critical parameters during the weld process and provides immediate alarming on out-of-tolerance conditions. |
| Weld Machine Diagnostic System (optional) | • Base system includes necessary instrumentation, mounting hardware, signal conditioners, and electrical interconnections used to monitor 8 welder inputs; welding voltage and current, platen movement on each side of the welder, and pressure on the high and low side of both upset hydraulic cylinders.  
|                     | • Standard package includes statistical trend charts, time/amplitude plots, averages, max/min signal amplitudes easily customizable for each welder. |
| Power and Environmental Ranges | • 220VAC (+/-10%) 3-phase at 25 Amps.  
|                     | • Operating temperature 32°F(0°C) to 105°F(40°C).  
|                     | • Humidity non-condensing 5% to 95% RH.