

Tailor Welded Blank Inspection temate® Si-WB



Equipment Highlights

- Market leader for fully automated inspection of Laser Welded Blanks.
- Best correlation in the market between inspection results and weld structural integrity.
- Designed for all Carbon Steel grades (uncoated and coated), Aluminium and Stainless Steel.
- 100% weld-length coverage.
- Self-calibrated sensor for inspections at line-speeds up to 60m/min.
- Full volumetric inspection detecting internal weld defects such as porosity and lack of fusion.
- Over 150 temate® Si-WB Inspection Stations installed.
- Conforms to SEL-100 and endorsed by all major manufacturers and users of Tailor Welded Blanks.
- Enables real-time process control for welder optimisation.

The **temate®** Si-WB uses Electro Magnetic Acoustic Transducer (EMAT) methods to perform volumetric non-destructive testing of welds in thin metallic materials. The system provides rapid, full-length, volumetric inspection of the weld seam, and can detect weld defects such as pinholes, lack of fusion, lack of weld penetration, porosity, concavity and mismatch. 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.

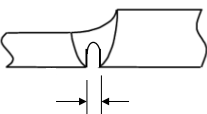
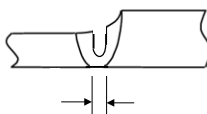
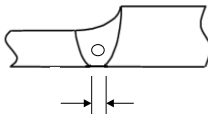
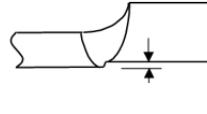




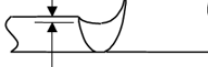

Apart from providing an instantaneous weld OK/NOK status and fulfilling the basic quality control requirement, the system adds extra value as a process control tool for welder optimisation and maximum resource utilisation, and greatly reducing the overall scrap rate of the system. Reject rates also significantly reduce in the short-term due to welds rejected by visual quality control systems due to “cosmetic” problems that do not affect their quality.

Customers value the system for its speed, reliability and ease of use. It offers very easy integration options especially when being retrofit into existing welding lines. The system can be installed in-line or off-line and adapted to any welding line configuration including Conti-welding lines, Batch welders and Rotary lines. The temate® Si-WB can be installed on a motorized linear guide, robotic positioner or on a stationary mount in the blank conveyors.

Custom turn-key Integrations for welding lines, including construction of motorized support gantries and modification of Welder PLC/HMI are also available.



temate® Si-WB Specifications

Materials Inspected	<ul style="list-style-type: none"> • Steel and Aluminium. All automotive grades (coated and uncoated). • Standard thickness range: 0.3 mm to 3.5 mm. • Extension model available for thickness range: 3.5 mm to 12 mm.
Defect Detection	<div style="display: flex; justify-content: space-around; text-align: center;"> <div>Pinhole (bottom side) ¹ </div> <div>Pinhole (top side) ¹ </div> <div>Pore/Void ¹ </div> <div>Mismatch ² </div> </div> <div style="display: flex; justify-content: space-around; text-align: center; margin-top: 10px;"> <div>Lack of Fusion/Penetration (bottom side) ² </div> <div>Lack of Fusion/Penetration (top side) ² </div> <div>Lack of Fusion (internal) ² </div> <div>Concavity (bottom side) ² </div> <div>Concavity (top side) ² </div> </div> <p style="font-size: small; margin-top: 10px;">(1) Minimum 0.3 mm diameter by 50% thru thickness (2) Minimum 10% depth by 4 mm length</p>
Inspection Technique	<ul style="list-style-type: none"> • Ultrasound volumetric guided waves for full weld inspection (i.e. Top & bottom seam surfaces and internal).
Inspection Station	<div style="display: flex;"> <div style="flex: 1;"> <p>Sensor Head Assembly</p> <ul style="list-style-type: none"> • Dimensions: W:126 mm x L:171 mm x H:173 mm. Weight: 3.5 kg. • Lightly contacts the part surface via a replaceable protective wear pad. • Vertical compliance (Sensor to part surface): ± 6 mm. • Parallel compliance (Angle of sensor to weld seam): ± 2°. • Horizontal compliance (Sensor centre-line to weld seam): ± 6 mm. <p>Signal Conditioning Box</p> <ul style="list-style-type: none"> • Dimensions: W:165 mm x L:240 mm long x H:70 mm. Weight: 2.2 kg. • Supports extended distances (upto 80 m) between Sensor Head and Data Acquisition Electronics. • To be located upto 1.5 m cabling distance from the Sensor Head. </div> <div style="flex: 1; text-align: center;">  </div> </div>
Data Acquisition Electronics	<ul style="list-style-type: none"> • Industrial enclosure; NEMA 12 and IP 55 per EN 60 529/10.91 protection rating. • Dimensions: W:610mm W x L:820 mm x H:1750 mm. Weight: 225 kg. (Further cabinet options on request). • Automatic and manual operation modes. • Supports up to 3 inspection stations.
Software Features	<ul style="list-style-type: none"> • Simultaneous, real-time data acquisition and analysis. • Immediate weld disposition (pass/fail), both display and discrete outputs, following each weld inspection. • Defect map highlights relative location of defects on part bitmap image. • Programmable weld-specific defect thresholds for each ultrasonic channel. • Automatic self-diagnostics during inspection for immediate status condition of equipment and inspection. • Admits automatic inputs of serial numbers and part specific comments to be tagged to the inspection data. • Complete record of inspection settings and results stored locally for each inspection. (Remote server optional). • Recall display of historical inspection data from remote terminals.
Power and Environmental Ranges	<ul style="list-style-type: none"> • 115 V AC or 230 V AC. • Operating temperature 0°C to 40°C. • Humidity non-condensing 5% to 95%.