

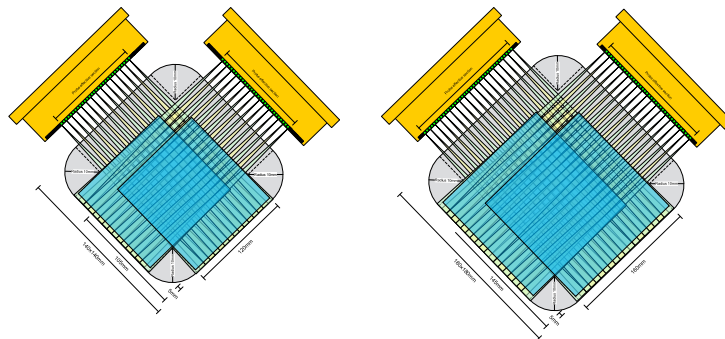
Square Billet Inspection System



In the forging industry, intermediate-stage pieces such as square billets, blooms, and bars are in high demand as they are used in multiple final products. These steel castings or rolled metals are shipped to manufacturers in other industries to undergo further processing. They are used to produce wire, round bar stock, or forged into train components, automotive parts, seamless pipes, and so on. To prevent poor-quality material from reaching these production lines, reliable inspection of square billets, bars, and blooms is key.

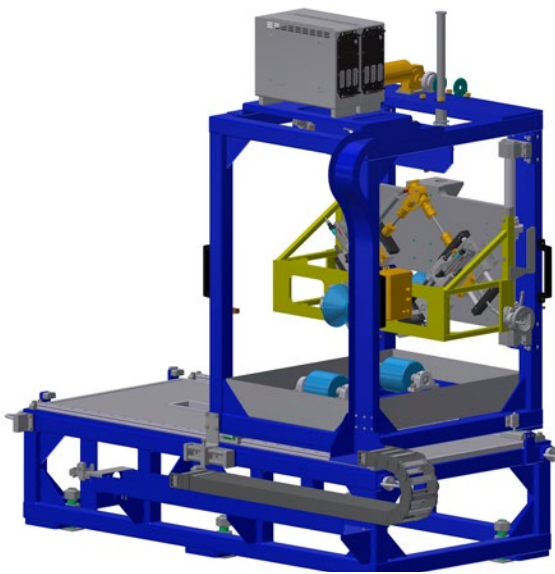
Advanced Water Wedge for Efficiency, Reliability, and Repeatability

To inspect the volume of large-diameter billets and blooms, Olympus developed an inspection system using phased array technology. Olympus' unique water-wedge design provides high repeatability on small reference defects. This is due to its special elastomer membrane, which requires only a thin film of water between the membrane and the surface for ultrasonic coupling, leaving the water path inside the water wedge undisturbed. The need for an inspection tank is eliminated, making it easy to manipulate the billets during the fabrication process to support a high production capacity.



Two-sided inspection coverage provided by phased array probes on bars of different dimensions

Probes are applied to two sides of the inspected products at once. Each water wedge and probe assembly are controlled by two pneumatic actuators, enabling easy adjustment to the product size and increasing the adaptability to geometrical variations. The inspection zone is defined electronically to adjust for the nominal dimensions of the billet, bloom, or bar by firing only the required elements of the PA probe.



The square billet automated turnkey solution features

- Unique water wedge design providing high repeatability
- In-line inspection configuration for an easier handling of billets, bars, and blooms
- Eliminates the need for an inspection tank
- Supports a high production capacity through rapid inspection with minimal product manipulation
- Electronic control of the probe enables setting the active element to the product's dimensions

The Square Billet Inspection System (SBIS) detects typical defects such as ≥ 1.0 mm FBHs or elongated defects at depths of:

- 50% of the nominal diameter
- 25% of the nominal diameter
- 5 mm from the back wall

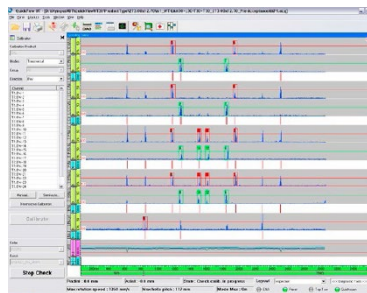
System Performance

Standard Product Range	Size	Standard 120 × 120 to 280 × 280 mm (4.7 × 4.7 to 11 × 11 in.), can be extended upon request.
	Speed	Typically: 30 m/min (140 × 140 mm or 160 × 160 mm (5.5 × 5.5 or 6.3 × 6.3 in.) square billets) for dynamic FBH detection.
	Coverage	PAUT 2- or 4-sided inspection, starting at 30 mm (1.2 in.) from the interface to 5 mm (0.2 in.) from the back wall, excluding corners. Eddy current array (ECA) inspection covers all four billet faces and corners.
Data Presentation	Real-Time Inspection Results	C-scan, A-scan, B-scan, strip charts, and alarms
Inspection Modes	Typical Inspection Modes	Longitudinal waves, volume inspection Eddy current array, surface inspection
Bar Temperature		Up to 60 °C (140 °F)
Detection Capabilities for Typical Reference Defects	Repeatability	≥ 1.0 mm FBH: <6 dB Depending on the material's condition.
Reporting and Data Storage	Report Types	Inspection, calibration, and calibration-check user-configurable reports
	Storage	Real-time database inspection data storage

This solution is powered by:



QuickScan™ Acquisition Unit



QuickView™ Software



Olympus Phased Array Probes

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is certified to ISO 9001, ISO 14001, and OHSAS 18001.

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www.olympus-ims.com

OLYMPUS

OLYMPUS CORPORATION OF THE AMERICAS
48 Woerd Avenue, Waltham, MA 02453, USA, Tel.: (1) 781-419-3900
110 Magellan Circle, Webster TX, 77598, USA, Tel.: (1) 281-922-9300
OLYMPUS NDT CANADA INC.
3415, rue Pierre-Ardouin, Québec (Québec) G1P 0B3, Tel.: (1) 418-872-1155

For inquiries - contact
www.olympus-ims.com/contact-us

