

Mill Roll Inspection

ROLLMATE

Equipment Highlights

- Inspects rolls of any alloy, forged and cast.
- 18 ultrasonic channels and 2 magnetic channels.
- Detects surface and sub-surface defects, soft spots (bruises), core-shell disbond, and measures shell thickness.
- Surface crack detection, in all orientations, as small as 0.1mm in depth.
- Inspects while grinding at up to 2m/s surface speed with 20mm coverage per pass.
- Fully automated, installs on any grinder.

ROLLMATE is an automated inspection solution for inspecting mill rolls of any alloy, forged or cast.

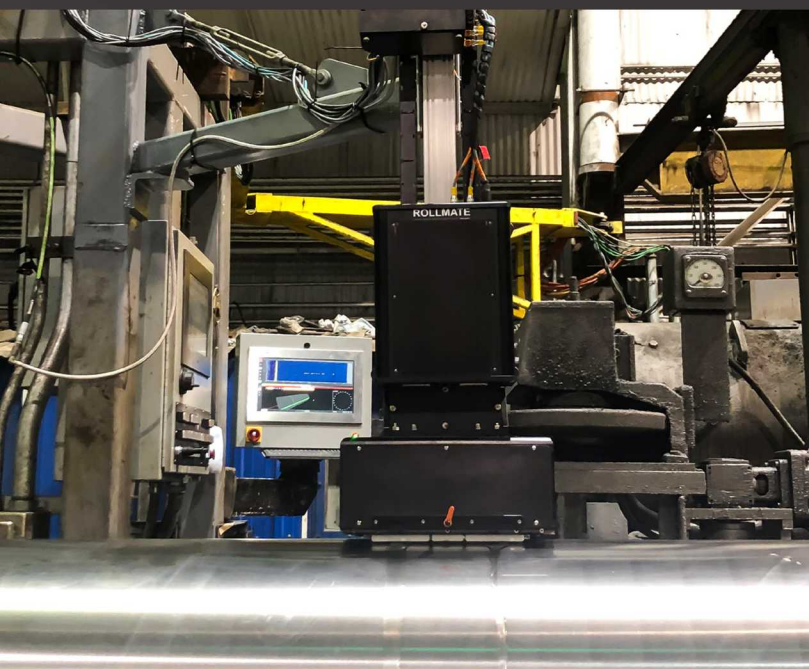
Innerspec Technologies' patented inspection technique uses 20 sensors, including 18 independent ultrasonic channels, to perform simultaneous detection of defects on the surface and subsurface of the roll, detect core-shell disbond, measure shell thickness, and detect soft spots (bruises) in one pass.

The results are presented in an easy-to-understand C-scan defect map, 3D renderings, and bar graphs. All the results and statistics are stored in a database together with roll details. The built-in expert system can be used to monitor roll performance and estimate remaining life.

The inspection is performed during the grinding process with no additional cycle time at up to 2m/s roll surface speed and 20mm coverage per pass. A 500mm diameter by 1900mm long roll can be inspected in less than 75s.

ROLLMATE has different integration options to be mounted on any grinder. The instrumentation can be installed with the PLC in one cabinet or mounted separately on the actuator and attached to the grinder at any angle.

The system has negligible operation and maintenance costs, and can be fully automated.



ROLLMATE - Technical Specifications

Materials Inspected	<ul style="list-style-type: none"> • All metallic rolls, both forged and cast (all grades and chemistries). • Rolls with diameters greater than 250 mm. • Surface may be wet or dry before testing. • Surface should be free of gross physical discontinuities such as spalls, missing material, grinder plunges, or similar that could cause damage to the transducer during scanning.
Inspection Technique	<ul style="list-style-type: none"> • Surface cracks (0 to 2 mm from the roll surface). • Sub-surface flaws (2 to 50 mm from the roll surface). • Core-shell disbond and other laminar flaws, (approximately 10 mm to 100 mm from the roll surface). • Near-Surface Laminar defects (from 2mm to 100mm) (defects of 3.5mm in diameter.) • Shell thickness measurement (from 10 mm to 100 mm). • Defects deeper than 50 mm. • Bruise detection (20% hardness variations on any spot greater than 10mm in diameter).
Sensor Head Assembly	<ul style="list-style-type: none"> • Modular design that can incorporate all currently available inspection techniques into one sensor assembly. The inspection modules include: <ul style="list-style-type: none"> - Axial surface and sub-surface inspection (rolling and counter-rolling direction). - Circumferential surface and sub-surface Inspection. - Core-shell disbond and shell thickness measurement. - Bruise (soft-spot) detection. • Modules designed for a helical scanning pitch of 20 mm.
Data Acquisition Electronics	<ul style="list-style-type: none"> • The instrumentation cabinet is housed in a NEMA 12 rated enclosure. • The cabinet can be mounted to the grinder deck floor or platform so that the actuator/sensor assembly is aligned to the center point of the roll. If actuator/sensor assembly is mounted separately, the cabinet can be located in any convenient location within 50 m (164') of the sensor assembly.
Software Features	<p>Real Time Acquisition & Processing</p> <ul style="list-style-type: none"> • Uses fast FPGA-based signal acquisition and processing. • Provides uninterrupted control and analysis of all time sensitive operations, including real-time display and disposition. <p>Processing Link</p> <ul style="list-style-type: none"> • Connects real-time acquisition & processing with the user interface. • Decouples acquisition from user interface for easy hardware upgrades, and rapid customization. • Organizes and prepares data received from real time acquisition & processing for representation. <p>NDT-WEB User Interface</p> <ul style="list-style-type: none"> • Provides display and user controls customized for the application using proprietary NDT-WEB real-time web technology. • Broadcasts its own Wi-Fi signal for simple access by any device using a regular browser and IP address (no client software needed). Alternatively, users can connect to the equipment using an external video monitor or ethernet port. • Permits easy customization of user controls and display without affecting the operation of the equipment. • Includes built-in features to connect to NDT-LINK, Innerspec's web portal for support, spares purchasing, and automated/remote operation and process control tools.
Power and Environmental Ranges	<ul style="list-style-type: none"> • Supply electrical power, single phase, 115/220 VAC (+/-10%), 60/50 Hz, minimum circuit capacity at 20/10 Amps, single phase. • Operating temperature 32°F (0°C) to 105°F (40°C). • Humidity non-condensing 5% to 95% RH.