

THE NEW POMINI INSPEKTOR.NET

The new Pomini Inspektor.net system is the latest version of the Roll Inspection system designed and developed by Pomini Tenova and used in steel mills throughout the world to detect surface and subsurface defects with Eddy Current and Ultrasound technology.

Structural defects on the surface and in the body of rolls, and cracks and bruises that develop during the rolling process, or as a result of imperfections in the roll casting or forging process, affect the operation of rolling mills.

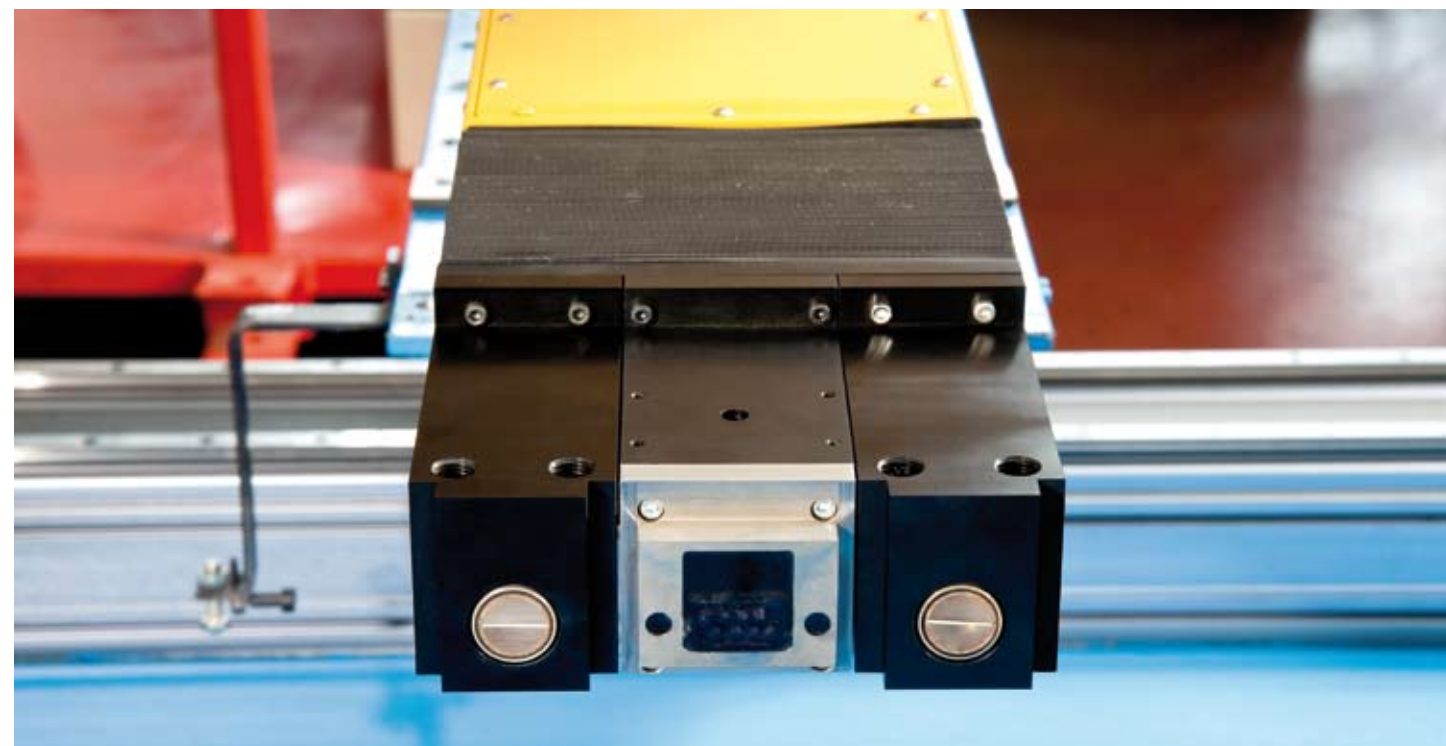
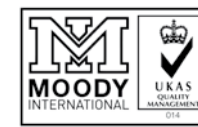
To keep these problems to a minimum, Eddy Current and Ultrasound systems are used daily in most roll shops to inspect rolls before sending them to the mill. As mill requirements and roll-shop performance needs become more demanding, inspection systems become more complex.

The new Pomini Inspektor.net system has been designed to:

- improve system performance by making sure smaller defects are detected with greater repeatability and reliability, faster and in more positions (e.g. deeper inside the roll);
- reduce hardware complexity and decrease the number of hardware boards;
- use off-the-shelf standard components wherever possible.

Using the Pomini Independent Caliper, each Eddy Current scan can be performed during the grinding cycle, thus saving roll-grinding cycle time and reducing overall costs. As a true, modular system, the Inspektor.net can be enhanced with Ultrasound functionality and Vibration analysis at any time.

Over the last 18 years, about 380 Pomini Inspektor systems have been sold in 16 countries and 4 continents, either as integral components of Pomini grinding machines or as stand-alone units on competitor machines. In the latter case, the systems may be mounted on the wheel carriage or on an independent guide-way.



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TECHINT GROUP



Inspektor.net

The complete Roll Inspection solution

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TENOVA is a world-wide supplier of advanced technologies, products and services for the metal and mining industries.

Tenova is a world-wide supplier of advanced technologies, products and services for the metal and mining industries providing innovative integrated solutions. Combined process automation and metallurgical know-how enhance the value delivered to the customers. Tenova is committed further to develop its technology in the areas that mostly impact the future of the industries it serves: quality of the products delivered by the customers, energy saving and environmental safeguard.

NEW TECHNOLOGY WITH INSOLUBLE ANODES

Through the Pomini brand, Tenova is worldwide leader in the design and supply of Roll Grinders for flat product rolling mills, as well as of special machines for grinding of heavy components. The Pomini Tenova product range comprises heavy-, medium- and light-duty, fully automatic CNC roll grinders, fully automatic CNC roll loaders, roll storage racks, chocking and dechocking machines for all roll types, and shear blade grinders. Pomini Tenova solutions speed up grinding, handling and maintenance operations, and guarantee the level of precision required by the most sophisticated rolling mills. Pomini also supplies other ancillaries such as washing machines and tilters for chocks, roll cooling systems and other devices used in daily roll shop operations. In addition it boasts extensive expertise in reconditioning, upgrading and fully automatic revamping of used roll grinders of any brand. The constant pursuit of innovation in automation and machine integration for the rolling mill process combined with the precision and reliability that have always distinguished Pomini Tenova, provide our customers with products that represent the state of the art in roll grinding worldwide.

Pomini Tenova designs, produces and delivers worldwide:

Heavy-, Medium- and Light-Duty Fully Automatic CNC Roll Grinders, for superb performance in terms of tolerances and surface finishing, high reliability and internationally patented measuring and control devices.

Fully Automatic CNC Roll Loaders, with either two or three controlled axes, combining high handling speeds with outstanding positioning accuracy, for faster roll handling and enhanced grinder productivity.

Roll Storage Racks, to optimize use of the Roll Shop floor in relation to crane and grinder availability, leveraging Pomini Tenova know-how in handling all roll types.

Chocking and Dechocking Machines for all roll types, to speed up maintenance operations and guarantee the level of precision required by the most sophisticated roll supporting systems.

Other Ancillaries such as shear blade grinders, washing machines and tilters for chocks, roll cooling systems and other devices used in daily roll shop operations.

Roll Shop Management System, a complete hardware and software solution developed by Pomini for full control of all roll shop operations, from actual grinding to collection and processing of production, consumption and requirement data, with minimum outlay of resources.

Roll Defect Management System, a software program that classifies roll defects as thermal or mechanical cracks, selects minimum stock removal necessary to eliminate the serious defect areas found and runs the appropriate grind program. Limiting stock removal results in substantial savings in roll-related costs as well as improvements in quality and safety.



EDDY CURRENT

Eddy Current inspection is carried out during the grinding cycle to detect cracks, bruises and voids caused by thermal and mechanical stress or mill accidents affecting the roll. Since roll surface quality is a top customer priority and since new rolls have very high costs, the Pomini Inspektor.net delivers a very high resolution to help operators identify roll surface defects immediately.

The test head consists of 8 sensors arranged in a continuous array. This eliminates the possibility of a gap between the area scanned by one sensor and the area scanned by the next one. The sensors have been designed and positioned to scan a 20 mm wide contiguous strip.

The system also measures absolute probe phase changes as well as amplitude changes, improving differentiation between different defect types.

Different frequencies can be selected via software, in a range from 250 to 2000 KHz, to improve defect detection in different roll materials. A very small sensor array head, with two integrated distance proximity sensors, is used to reduce mechanical interference with chocks and enable 100% scanning of the roll surface. The system measures surface cracks to a maximum depth of 5 mm. User-adjustable components have been removed from the hardware, to reduce installation and maintenance costs.

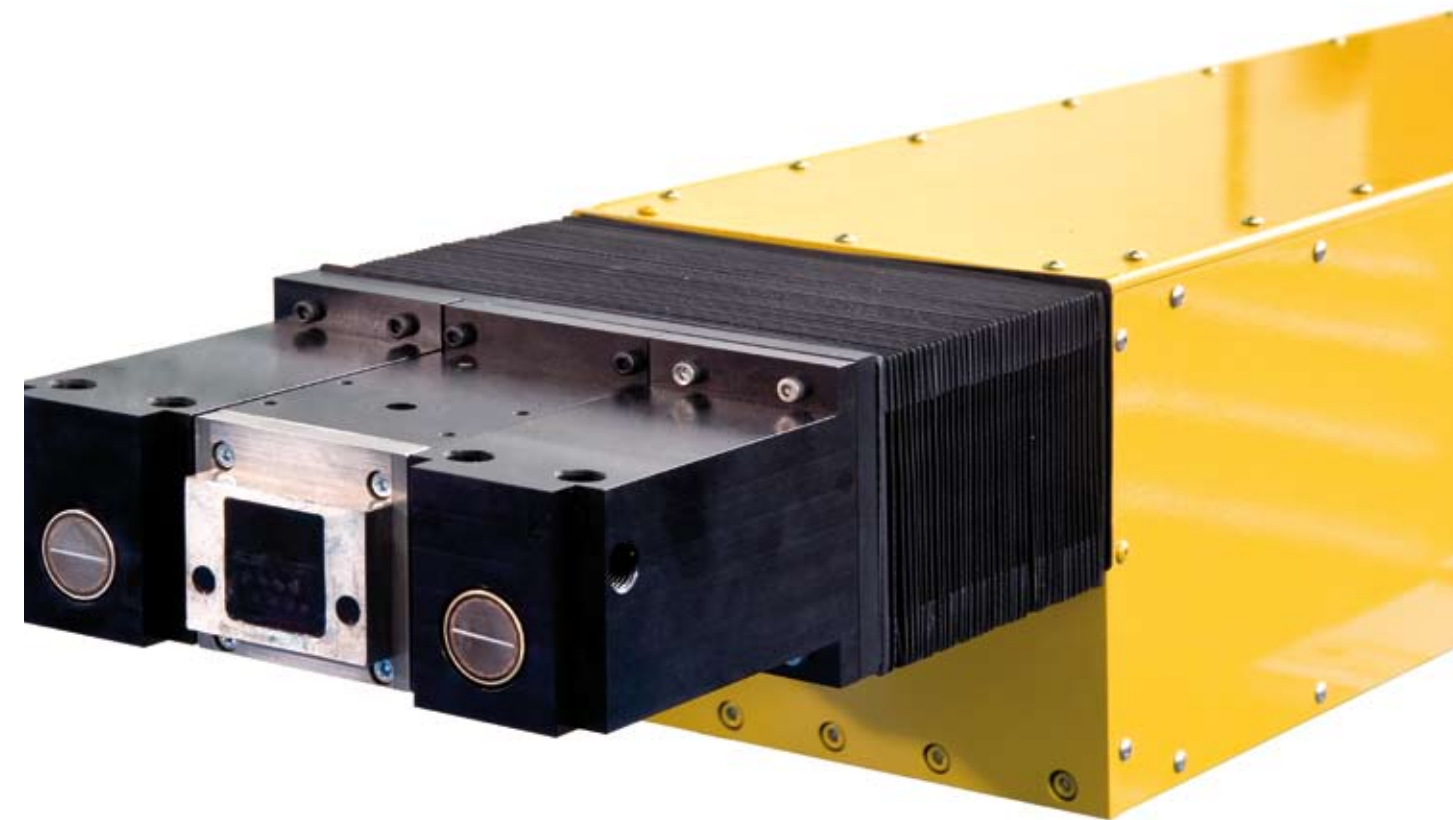


ULTRASOUND

Roll defects with potentially dangerous consequences are not limited to surface-breaking cracks. Maximum rolling stresses are located below the barrel surface and double-pour casting creates an interface between the roll core and shell that must be checked periodically.

The Pomini system can drive two ultrasound sensors simultaneously, each one focusing at a different depth inside the roll, to allow the system to detect defects closer to the roll surface and defects deeper inside the roll, up to a maximum depth of 350 mm. The two sensors can work with different frequencies, from 1 to 10 MHz, to scan different roll materials with different scatter properties. The repeatability of the new Inspektor.net has been significantly increased to 1000 impulses per second, enhancing measurement reliability and improving the ability to find smaller defects. The system can now measure a minimum defect of 2 mm in diameter. In addition, user-adjustable components have been removed from the hardware, to reduce installation and maintenance costs.

The Pomini Inspektor.net system is designed for failproof defect detection, while guaranteeing optimum roll life and performance in the mill.



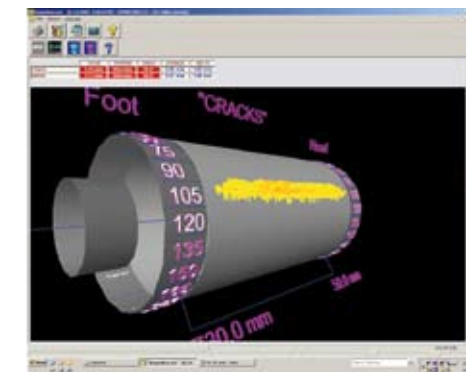
SYSTEM OVERVIEW

The Inspektor.net hardware architecture implements a very simple structure. There is no dedicated hardware inside the PC to process data coming from Eddy Current sensors, Ultrasound sensors or Vibration/Wheel balancer accelerometers: all data reaches the PC via a standard Ethernet network. All that is needed inside the PC is a standard Ethernet network card available off-the-shelf. The only hardware developed by Pomini is the Eddy Current head and one independent hardware board for each separate Inspektor.net feature.

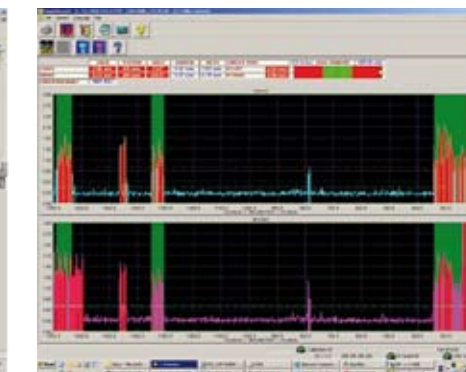
The fact that the Inspektor.net uses only one board designed and built by Pomini for each module (Eddy Current, Ultrasound, Vibration/Wheel Balancer) delivers in the following customer benefits:

- easy system maintenance
- minimum spare parts requirement at customer site
- easier, quicker operator training

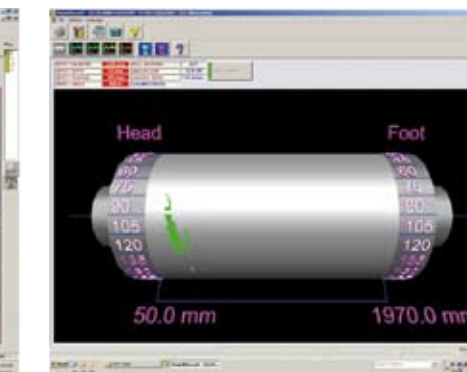
The result is a modular system where any feature can be added independently from the others at any time and without modifying the system already installed.



Eddy Current fire crack defect 3D



Eddy Current mechanical crack 2D



Ultrasound defect (mechanical crack) 3D

Cycle Time Examples

Roll surface speed = 1.5 m/sec

Eddy Current traverse speed = 20 mm/rev

Minimum Eddy Current measured defect = 1.0 mm along the table length

Ultrasound traverse speed = 10 mm/rev

Minimum Ultrasound measured defect = 2 mm diameter

Roll table length = 1700 mm

ULTRASOUND (min)	EDDY CURRENT (min)	RPM	ROLL DIAMETER
8.5	4.3	20	1450 mm (57.08")
7.7	3.9	22	1300 mm (51.18")
6.1	3.0	28	1000 mm (39.37")
5.3	2.7	32	900 mm (35.43")
4.9	2.4	35	800 mm (31.49")
3.8	1.9	45	650 mm (25.59")
2.9	1.5	58	500 mm (19.68")
2.1	1.1	80	350 mm (13.78")

MECHANICS

The Pomini Inspektor.net can be mounted either on the independent caliper of Pomini Roll Grinders or as a stand-alone system on any other grinder.

The mechanical platform provides the ideal environment for the scanning system; maximum stiffness and precision during operation are guaranteed.

Pomini's widely used independent measuring caliper allows operators to perform Eddy Current scans during the grinding cycle since the calliper is placed on the opposite side to the wheel carriage; the CNC selects the best traverse speed to match the headstock speed, for 100% scanning of the roll surface.

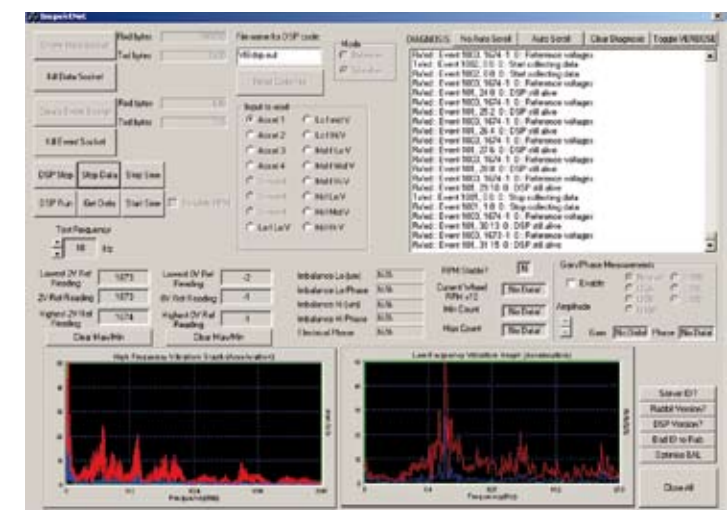
As a stand-alone unit, the Inspektor.net can be mounted either on a frame on the wheel carriage or on a separate frame on an independent guide-way (this configuration is patented by Pomini).



REMOTE SERVICE

The new Pomini Inspektor.net system can be connected, via modem or ADSL lines, directly to Pomini offices where Pomini personnel will immediately address any problems or doubts users working with the system may have.

The remote service enables Pomini engineers to connect directly to the grinder fitted with the Inspektor.net and analyze the working device in real time, without having to send a technician to the customer site. The solution is often just a phone call and a few mouse-clicks away, helping customers save time and money.



Inspektor remote control