Optical Surface Inspection for

Aluminium & Non-Ferrous Production Optimization

Fast, Reliable, Efficient

Leading the Way in Aluminium & Non-Ferrous Process Improvement

BEYOND INSPECTION

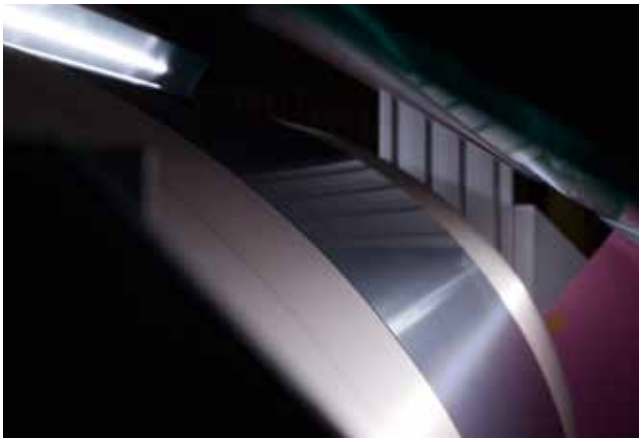
ISRA VISION

parsytec

Production Optimization Along The Process Chain

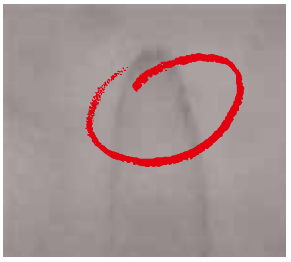
The Benefits

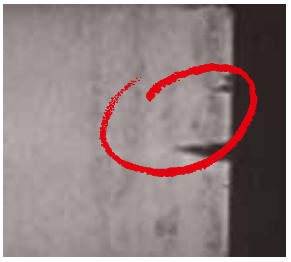
The ISRA VISION Group provides solutions for the full range of surface inspection tasks for continuous web and sheet-based products. Our goal is to provide standard solutions for the entire production chain. Thousands of successfully installed systems confirm the benefit of many years of experience and technological competence. ISRA's product portfolio is complete with inspection solutions for the entire aluminium production chain and market. Whether it be hotrolling, annealing, coating or the finishing process - all are covered, just as well as automotive, can, and packaging applications. One of the key objectives is that the solutions from ISRA help make manufacturing both more productive and more cost-effective. By employing leading-edge inspection systems, the tools for process monitoring and for yield optimization, not only are the defects being recognized, but also the solutions can help pinpoint where and why the defects occurred. In this way, manufacturers are given important information enabling them to significantly improve their production and thereby achieve greater success. All systems integrate seamlessly into any process environment, providing perfect inspection and yield monitoring at all stages of production, leading inevitably to unbeatable product quality.



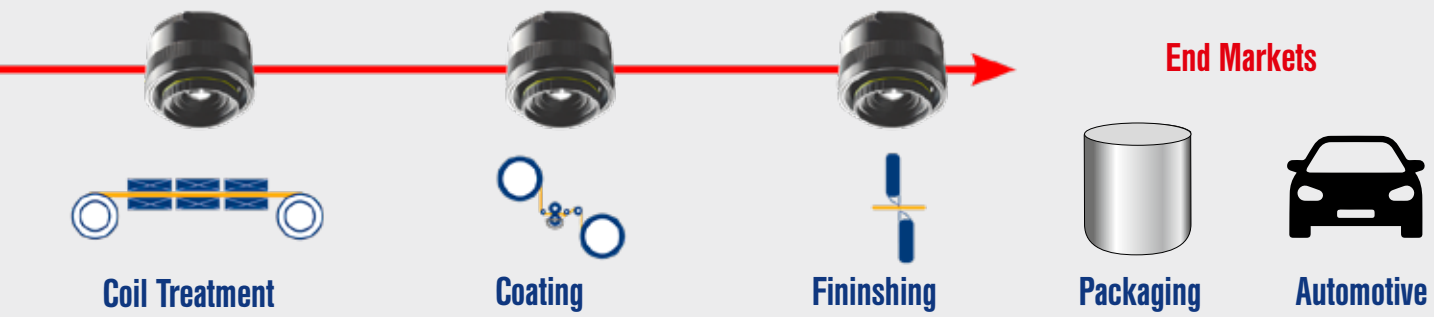
The benefits at a glance::

- Improve quality with accurate and reliable defect recognition.
- Reduce manufacturing costs by increasing line yield.
- Optimize production process.
- Reduce waste dramatically.
- Reduce process malfunctions and manual maintenance
- Validation against defined quality rules.





Reduce Scrap, Save Money



Quality Control

MORE Than Just Surface Inspection:

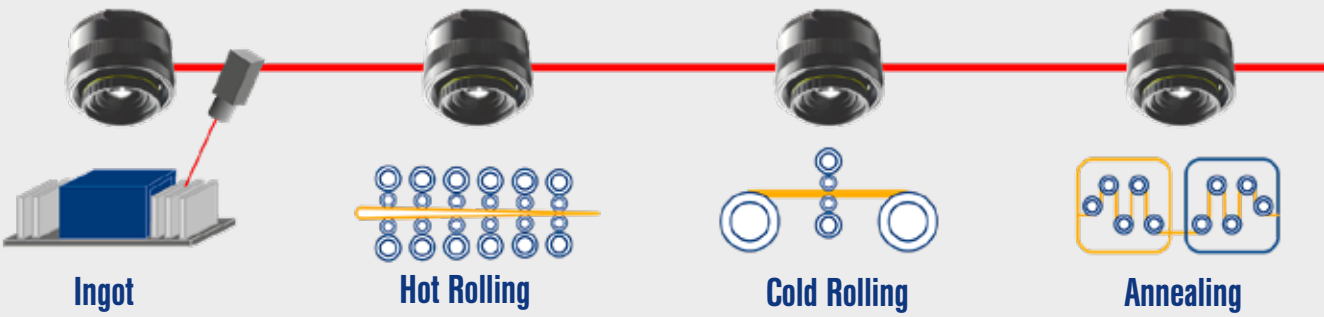
The Challenges

Demands for aluminium are increasing year by year. The application ranges from the automotive and aerospace industries to the lithography sheets of the printing industry. The challenging requirements of high quality foods, pharmaceutical and medical applications are also met.
Aluminium flat rolled products are characterized by a broad range of requirements with highest demands for surface quality. Manufacturing challenges vary from light weight resistant material to aluminium products achieving a barrier function to recycling processes for beverage or food cans. Meeting high quality expectations for the customer's high-end products is essential in order to maintain a qualified supplier status and to be able to expand in the market. Yet, in order to meet these very specific production challenges, aluminium mills and alloys are usually specialized for dedicated application mills - having as a consequence though, that if a coil does not fit the quality requirements of that specific application, chances are high that an alternate customer order cannot befound for that production run. With work rolls in hot mills being changed only once per week, with the high production speeds and with the strip being inspected manually for the first time only at a late production step - automatic inspection helps dramatically in optimizing aluminium hot strip processes.

The challenges at a glance:

- Highest quality demands due to high-end products
- Very diversified needs due to wide range of products
- Loss due to specialized production for dedicated applications without reassignment
- Hot mill work roll changes only once per week
- No visual inspection possible due to high-speed production

Leading the Way to Process Optimization



Advanced Optical

The **Power** for Alu & Non-Ferrous Processing

Increase processing reliability and productivity

By incorporating innovative automated inspection combined with tools for process optimization, the rate of return is maximizedand ensures that its users are ahead of the competition in the global market.

Reliable defect recognition, waste reduction and process optimization - get the most out of your production

At hot rolling for example, aluminium producers take immediate corrective actions on detected roll marks to minimize defective hot rolled material on larger batches of coils or longer periods. Precise information regarding critical defects and their location on the coil is necessary. In coated aluminium production, especially for food packaging, immediate feedback is equally important for avoiding coating defects. Thus, surface inspection enables process optimization in various ways along the aluminium and non-ferrous production chain. It helps monitor the defect occurrences, in order to increase product quality.

- By analyzing each defect, 100 % of the critical defects can be identified
- By determining exact defect data such as position, size and appearance, the defect cause can be easily determined.

This way, automated optical inspection with its superior defect classification helps to improve production quality and reduce scrap significantly. At the same time, the overall process knowledge of the process increases, resulting in higher yields and minimized production costs. The result: Highly satisfied customers.

Optical process monitoring along the process chain, fully automated - for fast action

Defect detection and process optimization is accomplished by newest automated optical process monitoring. It allows the reliable recording and analysis of critical machine events that lead to production failure. Seamlessly integrated at any production step, detailed analysis of the defect causes, as well as automated alarms to avoid catastrophic effects are possible.

- Reduction of critical events and machine downtime
- Root cause analysis for fast corrective action

Process analysis - Trends and causes at a glance

Another helpful tool - yield management software, supports aluminium manufacturers in the analysis of their production processes by using:

- Surface inspection data from ingot to finishing
- Product and process data from any gauge

Advanced technology for the improvement of aluminium production. Discover the details for yourself.

Standards in Optical Surface Inspection ...

Standards in fully automated surface inspection with 100 % defect recognition for applications like:

Hot rolling, annealing and grinding

Cost effective, compact 100 % surface inspection systems equipped with a complete set of tools for process automation and optimization. Special system advantage: Diffuse IR illumination for optimum contrast and detection of all surface defects.

Features:
- Reliable and broad detection of all surface defects
- Extremely robust
- Universally applicable
- Fastest commissioning, line integration and system ramp-up

Colour coating and tension levelling

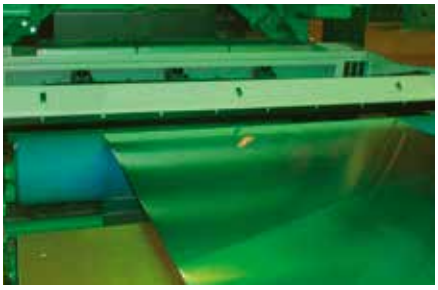
Advanced, powerful surface defect detection and classification solution based on direct light inspection to detect extremely small topological defects on clean surfaces

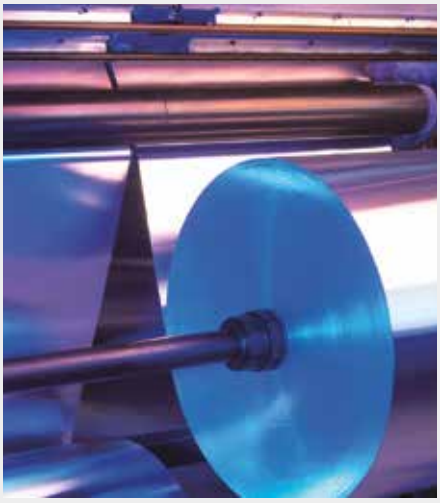
Features:
- For all materials such as: reflectors, plated material, coated and color painted
- Based on high-speed, high resolution line scan cameras

Finishing

Inspection systems for extreme requirements to provide reliable, comprehensive information about all relevant critical surface defects: a leading edge inspection solution with best available detection performance to meet the highest quality expectations for highest profitability. The highlight: a unique Dual Sensor™ configuration which provides a complete, stable detection of very different types of critical surface defects.

Features:
- Unique combination of line scan and matrix cameras for highest performance
- Direct illumination to enhance topographic surface imperfections
- Diffuse illumination to allow detection of low contrast defects





. . .and **Real Time** Monitoring and Processing

Real-time software solutions for monitoring, analysis and processing

Targeted strip stoppage on recoiling, continuous annealing and colour painting lines

This tool is used for the analysis of inspection results and strip stopping at the exact position of severe defects for verification. Being able to stop the line, enables the operator to examine the defect and to take countermeasures, if necessary.

Width measurement for all processing and slitting lines

This software solution uses the results of calibrated cameras for measuring the strip position on the line (center deviation) and other shape aspects, in particular the strip width.

Defect marking for continuous annealing lines

When coil repair is not the ideal solution, strip marking identifies drop-out sections. The rule-based software includes interactive review terminals and direct control of markers. The result: Maximization of material usage by marking defective parts on the high quality aluminium areas, such as in automotive manufacturing.

Automatic sheet sorting for cut-to-length/slitting lines

Rule-based software to reduce customer claims by analyzing inspection results for critical defect conditions, including direct control of sorters.

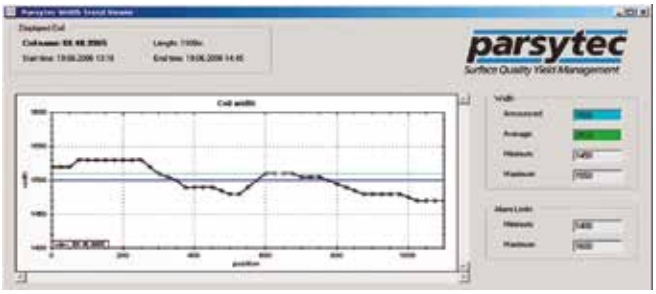
Live view for e.g. hot strip mills

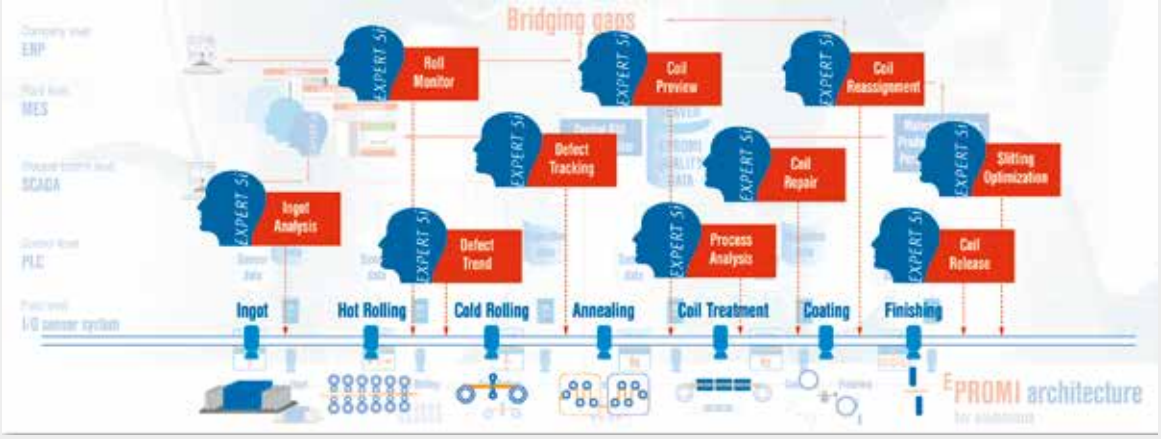
The “live view” tool allows a review of the entire strip surface at any time, even for defect-free sections. It presents the entire strip surface in parallel to the “normal” inspection screen, the advantage: an outstanding quality control.

But this is not all! - More than just inspection

To get more out of production and to make economic decisions easy, software, consisting of several modules, is available. They are the extended arm of the plant management, taking action down to the plant floor without getting caught up in the mass of operational details. The efficient *EXPERT*^{5i} modules quickly help to find the right answers to many questions concerning yield and process optimization. By using the modules, the potential for increased productivity is reached.

Quality becomes plannable, processes and production are systematically optimized.





THE FUTURE: For Every Process the Right Answer

All information is utilized To make a decision, the modules access all the available production-relevant data of the product (surface, thickness, width, flatness, etc.) via standardized quality databases. The same applies to the order, resource and planning data, as well as information about material logistics and personnel planning from the MES and ERP systems. The *EXPERT*[5i] modules analyze and weigh all of this information according to specific criteria and generate knowledge based suggestions for the decision makers

IngotAnalysis shows areas of the ingot suspected of defects and allows an interactive defect analysis. Results are precise repair instructions and a simplified release decision. Process optimization for Casting.

DefectTracking isolates the origin and cause of defects and tracks the defects through the entire production process. Defect causes are quickly resolved, reducing scrap while optimizing repair decisions. Process optimization for Hot Rolling, Cold Rolling, CAL and Coating.

ProcessAnalysis provides a visual correlation of process parameters with the resulting surface quality, offering concrete analysis of the cause of the defects. Process defects can then be quickly identified. Process optimization for Hot Rolling, CAL and Coating.

CoilReassignment reassigns blocked material to different customer orders with matching requirements, thereby ensuring improved material utilization and higher profit. Process optimization for Hot Rolling, CAL and Coating.

SlittingOptimization uses the surface quality data and flexible quality rules to optimize the slitting plan to achieve the highest yield. Process optimization for Finishing

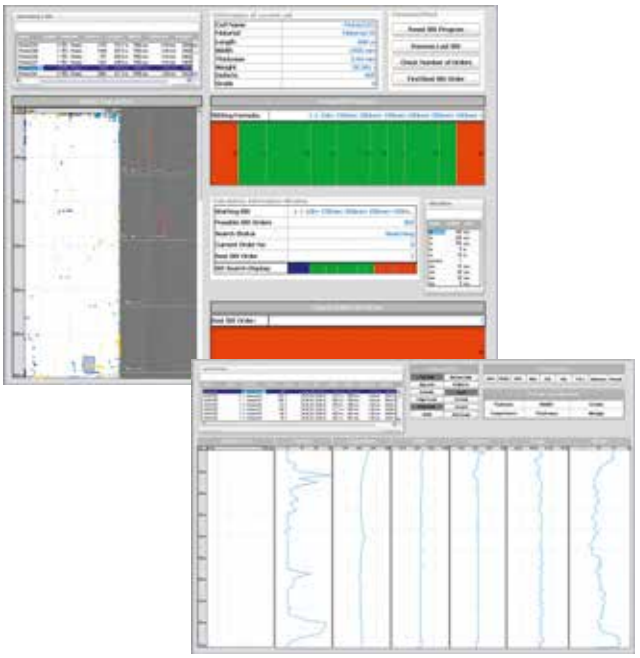
RollMonitor evaluates and provides a visual image of the severity and cause of periodic roll marks. If several rolling stands are involved, the stand that causes the defect is identified. Timely roll changes help prevent defective coils. Process optimization for Cold Rolling..

DefectTrend shows synchronized long term trend data of relevant process variables spanning multiple coils. Process variables affecting coil quality can be easily isolated and improved. Process optimization for Hot Rolling, Cold Rolling, CAL, Coating and Finishing.

CoilPreview shows defects from one or several previous production processes, issues warnings and reduces processing of defective material, repairs and downtime. The throughput is optimized. Process optimization for Cold Rolling, CAL, Coating and Finishing.

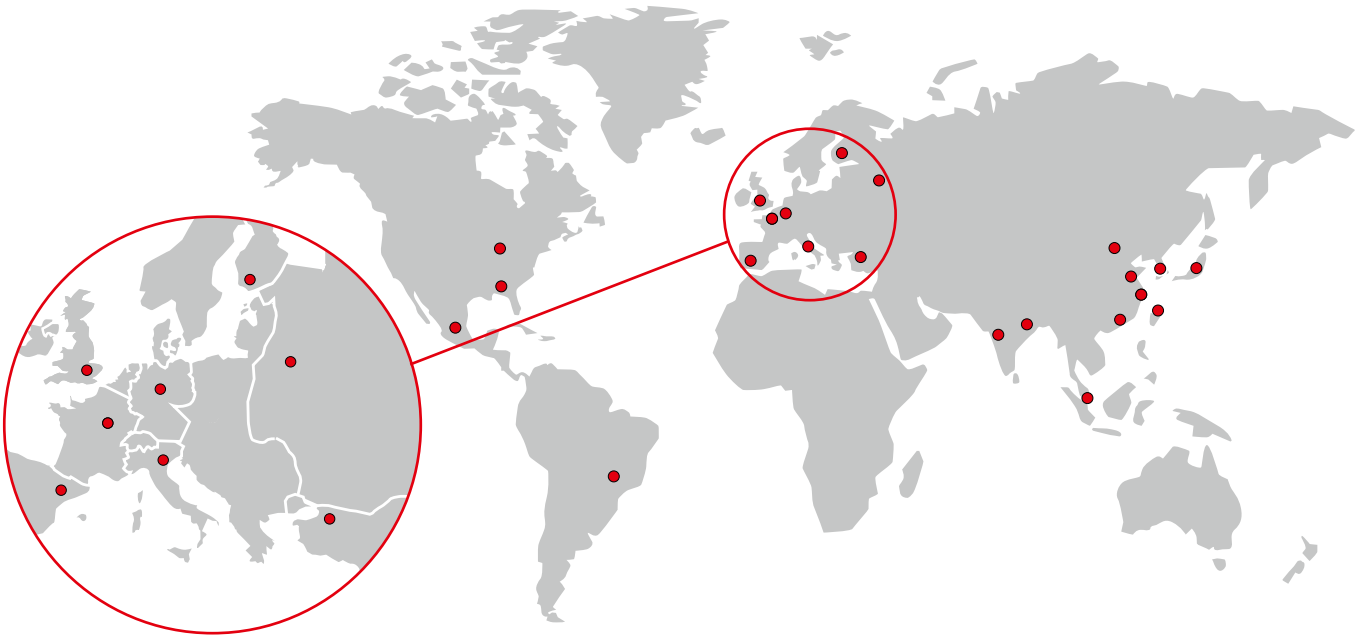
CoilRepair evaluates the quality of repair measures that have been taken and frequently prevents the downgrading of coils. The advantage: Improved material utilization and higher profit. Process optimization for CAL, Coating and Finishing.

CoilRelease provides a quality analysis of the coils and issues a release suggestion for the next process or for the end customer. Process optimization for Hot Rolling, Cold Rolling, CAL, Coating and Finishing.



EXPERT[5i] for aluminium	Hot Rolling	Cold Rolling	CAL	Coating	Finishing
CoilRelease	•	•	•	•	•
CoilReassignment	•		•	•	
Ingot Analyses	•				
ProcessAnalysis	•		•	•	•
CoilPreview		•	•	•	•
DefectTracking	•	•	•	•	
CoilRepair			•	•	•
DefectTrend	•	•	•	•	•
RollMonitor	•	•			
Slitting Optimization					•

Innovations for Automatic Surface Inspection



Your competent partner

A business relationship with the ISRA VISION group is the beginning of a long term partnership.

Our clients benefit from the experience of our highly qualified team of experts, who work with them to design and implement solutions for the quality inspection applications of the future.

The ISRA VISION group is a global enterprise that guarantees its customers excellence in every aspect: from consulting, service, and confidentiality, to complete solutions and worldwide support.

- We can make your business more competitive and productive
- We view ourselves as a partner and supplier of application oriented standard systems for selected industrial sectors

Challenge us.

24/7 Support & Service

On the safe side ... with ISRA VISION PARSYTEC

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