

ENSURING STEEL QUALITY

### Benefits of automated defect detection for hot band carbon steel processing



Automated surface inspection system significantly improves quality monitoring on a steel production line.



AMETEK Surface Vision recently delivered a state-of-the-art defect detection system to Samuel Nelson Steel that provided a reliable, integrated solution to help illustrate which defects are present. Samuel Nelson Steel, a major steel processing company based in Stoney Creek, Ontario, Canada, wanted a solution for monitoring defects on its push-pull pickling line, which is used to process hot band carbon steel.

The company processes steel coils provided by third-party steel suppliers, so it was important to be able to identify incoming defects and their location within each coil. The overall aim was to gain the ability to produce simple, one-page reports for customers summarizing the surface quality for each coil pickled.

Previously, Samuel Nelson Steel monitored quality through visual inspection, depending on its operators to inspect the strip and identify defects. This proved to be time-consuming and only gross defects and issues visible to the human eye were detected. In addition, operators were not able to devote 100% of their time to coil inspection, so defects were naturally missed.



Installation of SmartView® surface inspection system at Samuel Nelson Steel, Stoney Creek, Ontario, Canada.

**SMART  
VIEW®**  
DEFECT DETECTION & IDENTIFICATION

SmartView® Surface Inspection Systems  
on Push-Pull Pickling Lines

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SURFACE VISION

### SYSTEM CAPABILITIES

One of the key capabilities that Samuel Nelson Steel required was the unique side light technology used in the SmartView® solution. This creates a 3D effect that enhances the defect and helps show depth and helps classification and detection accuracy.

**Ralph Benincasa, General Manager at Samuel Nelson Steel, said:**

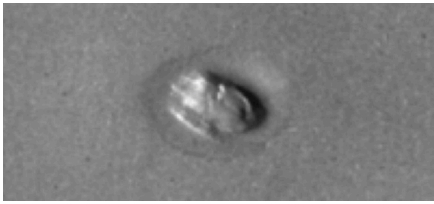
*"The competitor systems just weren't able to provide the same images."*

*"The additional insight provided by the system is really helping us accurately identify defects."*

*"The system has exceeded Samuel Nelson Steel's expectations, delivering several benefits to the steel production process. Operators are now able to spend more time processing as*

*opposed to having to visually inspect the steel surface, thus improving productivity."*

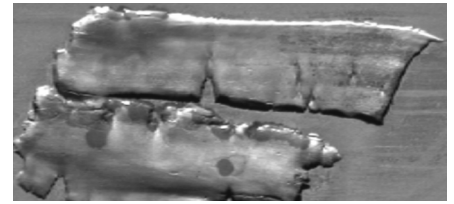
In addition, it has helped reduce customer rejections and non-conformances. Samuel Nelson Steel has had positive feedback from customers on the accuracy and detail they have been able to provide about coil quality.



A 3D image of a defect recognized by the SmartView system.



Lamination visualizations, highlighting defect areas of overlapping material of various shapes and sizes, irregularly distributed over the surface of the rolled material and often only partially bonded to the underlying surface.



### PRODUCTS FIT FOR PURPOSE

While customers were generally happy with the quality of the steel pickled by Samuel Nelson Steel, a common response in satisfaction surveys was that they would value an automated inspection system.

**Ralph Benincasa, General Manager at Samuel Nelson Steel, said:** *"Within the marketplace, there are competitors that have similar systems, so that forced us to look at our situation."*

*"We spoke to several steel processors with existing automated inspection systems, as well as some of our customers who were also investigating surface inspection. We worked with them to understand what they were looking for, noting all the pros and cons of the various systems."*

*"After working through them all, we ended up selecting AMETEK Surface Vision's SmartView® system for several reasons. We were happy with the clarity of the images, the classification accuracy of the defects, and the fact that the side light location was less likely to be hit by strip. Overall, we liked the capabilities AMETEK Surface Vision provided compared to some of the competitor systems."*

*"For example, we are able to provide additional detail on non-conforming coil tags – we can see exactly where in the coil, in terms of length and how far in from the edge, the defect exists. That's a definite benefit of having the AMETEK Surface Vision system."*

In addition to installing and commissioning the system, AMETEK Surface Vision also provided training for several key Samuel Nelson Steel personnel.

*"We now have a few people that know the system very well," Benincasa said. "The system is always learning so it's up to us to make sure that we continue updating and working with the classifier to make sure that we provide the latest images that we're seeing and identifying."*

*"Everybody that uses an automated surface inspection system says you have to devote the personnel and necessary time to get the maximum benefit from the technology. We have been fortunate that we have been doing that."*

### PROCESS LOCATIONS

Pickling Line

### ABOUT AMETEK SURFACE VISION

AMETEK Surface Vision is a world leader in automated online surface inspection solutions with a broad product portfolio optimized for web and surface inspection and monitoring and process surveillance applications.

Its product portfolio includes two distinct product lines: SmartView® systems and SmartAdvisor® systems. Each product line uniquely enables customers to inspect the surfaces of materials processed in a continuous fashion across the metals, paper, plastics, nonwovens and glass industries. Learn more by visiting [ameteksurfacevision.com](http://ameteksurfacevision.com).

AMETEK Surface Vision is a unit of AMETEK Process and Analytical Instruments, a division of AMETEK, Inc., a global manufacturer of electronic instruments and electromechanical devices with annual sales of approximately \$5 billion.



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