COILWORLD
"the magazine dedicated to coil coaters and processors"

Edge Tech Inspection System Delivers Quality Track Record for Coil Edge Trim Correcting Potential Problems Increases Yield and Cuts Cost for Coil Processors

By Michael Simonis, President, Unilux, Inc.

Sawtooth and burrs on coil edges are no longer a thorn in the side of seven coil processing operations that have installed the Edge Tech edge inspection system from Unilux. Process engineers and mill managers in the United States and China report that the power to see anomalies on both edges of a strip immediately after trimming enables them to make adjustments and verify the success of their corrections after less than 100 meters of coil at full production speed.

Avoiding burrs and other edge defects further enhances processing efficiency because those defects can frequently damage rollers and cause surface-quality problems.

As a result, one mill has reported more trimmed steel is staying within tight specifications,

yield is rising, and fewer coils are being downgraded or having to be re-trimmed. Better inspection has also reduced the number of coils rejected by customers from all Edge Tech users.

The return on investment for the Edge Tech inspection system could soon be measured in numbers of coils instead of months, as users now report. In addition, mills and coil processors can add an intangible benefit that comes from the productivity operators have gained by immediately knowing the edges' quality without having to wait for the coil to finish and have someone go down to the line and inspect a rewound coil. It allows them to schedule jobs more efficiently, and that allows mills and coil processors to schedule their deliveries with more certainty – without delays from rework or rescheduling additional coil processing.

When Unilux introduced edge inspection based on the combination of strobe lights and high-speed video cameras, steel and aluminum mills and coil processors immediately saw the value. They envisioned a higher-level tool that would enable them to inspect proactively and document production data. In addition to increasing yield, they needed to show quality-management data to their customers, and justify and quantify cost-savings for their own management.

Seeing Results

Since the Edge Tech system is mounted within 1 meter (39.33 inches) downstream of the knife, operators are able to see the edge quality and gain instant knowledge of any problem. Images of the edges provided immediately after the cut not only enable operators to assess the condition of the edge, but also of the knife and its effect on the coil trim. By knowing the knife wear, operators can either change knives early or extend trimming use, instead of just using a designated trim distance for knife changes. This becomes even more critical, knife manufacturers tell us, with new knives designed to work with the growing number of super steel materials. The 100 percent knife-circumference capture allows an assessment at the beginning, middle and end of each coil.

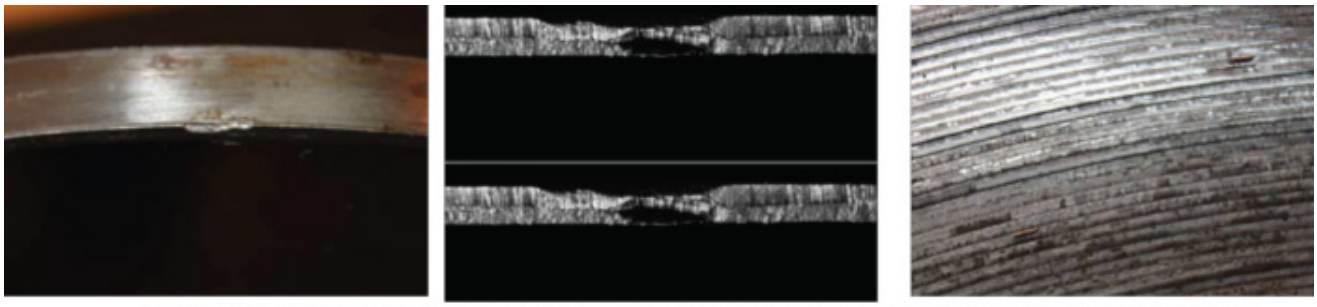
At any time during the processing of each coil, operators can look at a monitor in the safety of the control room or pulpit to see if trimming is close to tolerance and see if the knife requires adjustment. A visual display of the knife's nick-to-tear ratio can alert them when the ratio is out of range, enabling them to make an adjustment or just fine-tune the

settings for the best results.The inspection system then allows them to verify immediately that they've made the correct adjustment.

Before Edge Tech and its knife-circumference monitoring capability, one mill-management team said that three or four coils could have been processed – with high value added – before trim defects were discovered and corrected. Without this system, all corrections were merely an operator's best guess; three to four more coils could have defective edges, again leaving even more coils to either be re-trimmed or downgraded.

Beyond the Knife

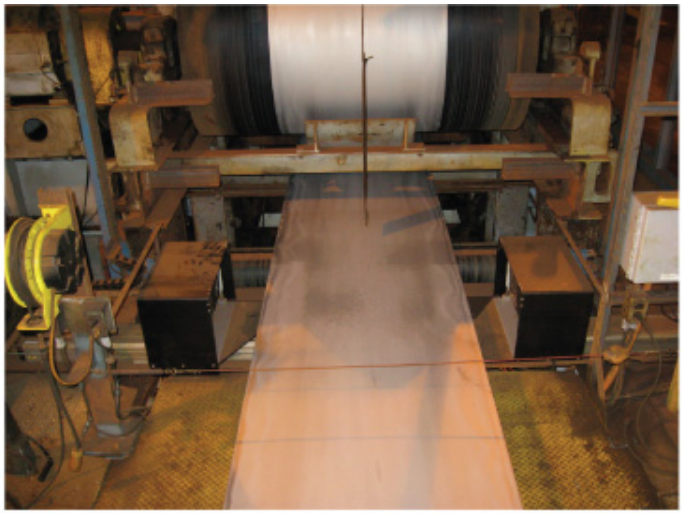
As welcome as coil-processing managers have found Edge Tech's monitoring capability, they are embracing two more coil-management factors associated with the system. One is the Level 2 connection to a mill's or processing facility's enterprise computer system. The other is accounting for the metallurgical variations from coil to coil. Both enter the production picture as the strip is being trimmed.



(left to right) show knife crack, how it appears on Edge Tech monitor and where it can be seen in a processed, rewound coil. Detecting the knife crack as soon as possible allows the operator to schedule knife replacement to minimize coil re-trimming.

The Level 2 computer connection collects data on all corrective actions taken by operators during coil inspection, and they become part of the records used for documenting quality for customers and internal data systems used to measure productivity and production costs. As operators make adjustments to trimming knives, the mill's computer system can automatically capture images and permanently store all the information in data packs related to the coil.

The Level 2 connection includes a documented error log for each sensor in the Edge Tech system, further allowing operations managers to search for information, such as the location of a defective edge in a coil. Process engineers can also reference the data when developing solutions to specific problems.



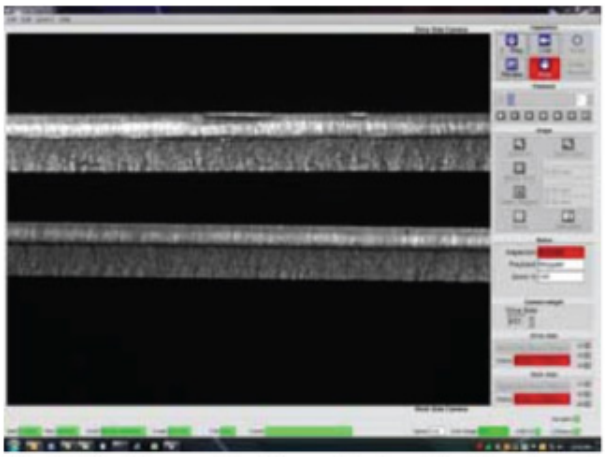
Mounted within 1 meter of the trim knife, Edge Tech provides immediate feedback on knife condition and quality of the trim.

Edge Tech's on-screen view of 100% of the knife circumference (inset) enable operators to make adjustments to maintain specifications and schedule knife maintenance before conditions lead to defects.

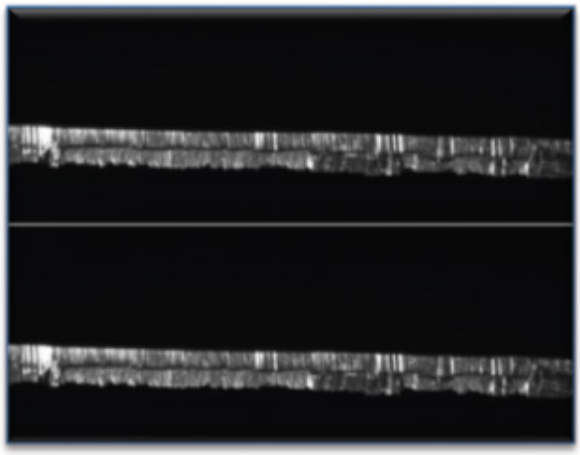
With the automatic image collection and storage capability, image-storage capacity is limited only by the storage space provided by the mill or coil processing facility. Further, IT administrators can set up internal systems to store those images and other production data in folders that will make them more accessible to personnel who need the information.

The net result of the Level 2 computer tie-in is that Edge Tech now becomes an integral part of a coil-management system instead of an add-on. This automated data capture can become more critical for pinpointing actions taken because of metallurgical differences in each coil.

Even though a number of coils being processed consecutively may have same composition specifications, a number of factors in the rolling process can change their properties in small, highly significant ways. Slight changes in tension or temperature can change metallurgical properties, and that, in turn, can affect how the trim knife interacts with the metal. While the differences in metallurgy are imperceptible to the human eye, their effects on trim quality can be picked up by the Edge Tech cameras, and operators can make necessary adjustments.



Edge Tech's window provides 8X magnification of the strip edge and comprehensive coil information.



Burrs on trimmed edges can frequently damage rollers and cause surface-quality problems.

Ongoing Upgrades

Now, for the first time, operators finally have the tool they have been asking for.Edge Tech's initial development and all upgrades are the result of working with customers and incorporating their requests and suggestions. By working together during a low-cost evaluation, they prove the cost-saving value for the mill. A free software upgrade period further enhances their system's effectiveness and ROI as their inspection process evolves. Operators finally have the true power to see improvements and increased cost-efficiency – all from the safety of the pulpit and the front office.

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