

Adding final-stage inspection for quality control in premium paperboard



An experienced customer



Based in Finland, Metsä Board is a leading European producer of premium paperboards. The company operates at several sites, including an integrated board and pulp mill in Husum, Sweden.

The Husum mill produces folding boxboard, food service board, uncoated white kraftliner, and extrusion coated board as well as kraft pulp. It operates two board machine lines (BM1 and BM2), a coater machine (CM1) and extruder (EM1).

Inspection systems are essential for all quality sensitive paper and board products, so Metsä Board has had inspection systems in place at its operations for many years. The mill switched production from paper to board in 2016, and existing surface inspection systems were upgraded at this time.

BM1, dealing with three layers of board, had been using AMETEK Surface Vision's SmartView® system with 26 cameras. This was upgraded in 2015/16, and then replaced in September 2020 with a new SmartView system. A 26-camera SmartAdvisor® system was added

in 2011, along with the SmartSync system to combine web inspection and web monitoring. This was also upgraded in 2015/16.

A SmartView system was installed on the CM1 line in 2015/16, adding top and bottom surface inspection.

This was used to detect coating problems such as blade scratches and wrinkles on either surface, using linescan technology. Later in 2021, a 20-camera SmartAdvisor® system will be installed and the WIS-system will be upgraded to SmartView 8.

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IN SEARCH OF CONTINUOUS PRODUCT QUALITY

Metsä Board was looking to minimize or eliminate quality claims on board leaving the Husum mill, ensuring that a 100% inspected product leaves the factory, consistently meeting customer satisfaction requirements.

To accomplish this, the company wanted a stable solution that would be easy to use and maintain. This would monitor the processes to ensure continuous product quality, with excellent detection results.

Polyethylene (PE) coating, as delivered by the EM1 extruder line, is the most challenging application, requiring the most complex installation.

EM1 required high-resolution detection on both surfaces – the top side is glossy while the reverse side has a matte finish. Low and high angle detection was required to detect even small spots, dents, streaks and coating problems.

A significant proportion of the final product is used in applications such as cups, plates and food packaging, so is likely to come into direct contact with food or beverages. The quality of the PE coating is important to ensure the board is resistant to grease and water.

The end product needs to be 100% defect-free to meet customer expectations. The EM1 is the last process adding value to the product, so defects identified here provide information for the final decision on what material is shipped to customers.

EM1 operates with a speed of 300-400 m/min, with an inspection area of 3600 mm, so a solution that can provide accurate defect detection and classification for those parameters was essential.

AN INTEGRATED, RELIABLE SOLUTION

Metsä Board has had experience with many technologies and suppliers of web inspection and web monitoring systems. The company approached AMETEK Surface Vision to supply a solution, based on the positive experiences it had had from existing systems, especially in terms of the reliability of the system and high performance of the linescan technology.

Mill operators had found the SmartAdvisor solution in particular to be highly effective in machine troubleshooting, using its long-term video buffer to review production over a period of four to five days. In addition, SmartView had proven easy to integrate into its production and maintenance processes.

After consultation between AMETEK Surface Vision and Metsä Board, a SmartView 7 system was installed on the EM1 line, using fast 4K linescan cameras. These were positioned to inspect both sides of the board in brightfield and darkfield arrangement. This installation allows the use of Synchronized View technology for better defect detection. It is especially effective if the defect visibility is affected by the level of reflection.

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DELIVERING HIGH-PERFORMANCE RESULTS

The SmartView system delivered effective inspection of board, coated board and extrusion-coated material. Subtle streaks in the coating process were detected at an early stage, allowing action to be taken immediately to avoid scrap material. Repeating defects detected by SmartView proved highly useful in rapidly identifying the cause, allowing the issue to be remedied quickly. Coating defects such as coating voids, streaks, blade scratches and dents are highly relevant to product quality, since the product often goes into the

luxury packaging segment, where defect-free appearance is critical. All inspection data provided by the SmartView system is transferred through an open interface to the centralized mill system. This allows the thorough analysis of defect occurrences and trends and permits detailed analysis of the production quality. An Operating Technician from Metsä Board said: "We have been able to compare the features and capabilities of many inspection systems over the years, and clearly identified the SmartView system as solid and reliable.

"Production is able to take full advantage of the easy-to-use, open-platform system, while maintenance has benefited from the simple, modular design. We have had all the support required to optimize the system performance.

"Overall, the AMETEK Surface Vision system entirely met our expectations, and has provided very good, reliable detection results that enable us to supply high-quality products to the market."



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.

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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