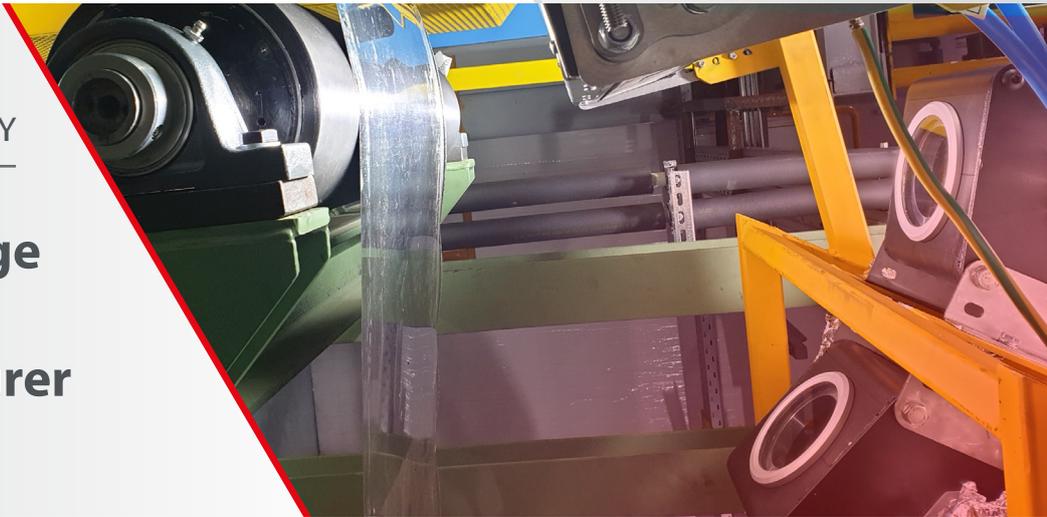


ENSURING COPPER QUALITY

### Metal insights forge greater ROI for copper manufacturer



Global demand for copper is expected to remain high, due to its versatile use in consumer goods and industrial applications.

### **SOFIA MED**

The current trends in copper processing are towards methods and equipment that use less energy and produce less air pollution and solid waste. This becomes challenging because of the stringent environmental controls and the very low-concentration copper ores that are available, increasing the production costs significantly. The industry's requirement to ensure high purity during production often depends upon thorough sampling, to determine whether any adjustment to the process is required.

**Sofia Med** is a subsidiary of ElvalHalcor Greece, which is part of the Viohalco holding company. Situated in Sofia, Bulgaria, on a 250,000 m<sup>2</sup> area, Sofia Med contains three production units comprising of foundry, rolling and extrusion mills. With 80 years of manufacturing experience and with

help from significant investments, Sofia Med has evolved into a competitive modern European company with an international client base, supported through the worldwide distribution channel network of Halcor.

Historically reliant on upstream and downstream manual inspections,

meeting the demands of high-end tinning for automotive manufacturers was becoming increasingly business critical to Sofia Med's growth. To meet the requirement for a reliable solution, the production team identified successful sample studies covering various alloys and dimensions.

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### DELIVERING AN APPLICATION-DRIVEN SOLUTION

Sofia Med was initially looking for an industry-respected inspection system for the slitting line on its rolling mill. The team's premise was that quality inspection could effectively capture any defects at the finishing process, before reaching the customer. The goal was to get the highest possible detection and classification of the defects and minimize the false detection.

The difficulty lay in inspection for copper strips after the tinning surface process as the surface results in a highly reflective, shiny surface.

An on-site technical review by a dedicated AMETEK Surface Vision project engineer revealed further advantages could be gained by implementing inspection earlier in the production process, where surface conditions

allowed for more effective detection of defects. Employing inspection at the cleaning line would identify what kind of defects were appearing on the coils and would also allow the operator to better plan the slitting process, reduce scrap and increase product yield.

### PRODUCTS FIT FOR PURPOSE

Using state-of-the-art cameras and high-intensity lights, AMETEK Surface Vision's SmartView® system was installed to provide unsurpassed image quality on sheet metals, in half the amount of space required by other solutions. The modular system helps reduce the camera count, improve detection, as well as simplify system installation and maintenance.

As a result of SmartView's successful implementation on the cleaning line, a further inspection system is now installed to monitor quality on the new tinning line at the mill. The resulting customized open web configuration makes use of collimated light. Two sets of cameras looking onto the surface from different angles at the same time. The Synchronized Web Viewer provides the user with total control of the interface, helping to reduce scrap product in the event of a process issue. The different process views allow a variety of queries in grading, line synchronization and system status monitoring, using intuitive dropdown menus and customizable windows to help narrow results with precision.

In addition, SmartView's collection of thresholding algorithms were optimized for

copper coil production, allowing measurement and reporting of the surface quality characteristics of strip, both over a roller and unsupported. This allows the measurement of overall surface properties without production interruption and can even predict post-processing properties of the product while it is being produced, giving operators the ability to remove sub-standard coil from the process at an early stage. The operator can also specify the behavior when no threshold value is selected. This allows potential changes to be evaluated without interrupting current production inspection.

Multiple cameras were mounted on a retractable frame on the cleaning line and configured for an open web configuration, as opposed to the deflection roll, with illumination to compensate for potential pass line variations, cross bow and angle change.

Cameras were additionally installed on the tinning line, providing an ultra-high-resolution system allowing for bright and dark field inspection on the rolls. These were connected to a rack mount data system supported by a Production Quality Advisor

(PQA). This powerful suite of data analysis and display tools allows the viewing of both current and historical production-quality data from surface inspection system database archive servers.

**Sofia Med Quality Assurance Automotive Expert, Stefan Grozev**, commented: *"The benefits of SmartView were immediately visible on installation. The illumination method installed on the cleaning line is giving us reliable results as for similar installations on the deflection rolls. The open web inspection for copper allows us to inspect the defects before dispatching coils to different slitting lines – enabling one inspection for multiple slitting lines."*

*"The adaptive thresholding and optical setup suggested by our AMETEK Surface Vision Field Engineer was based on an educated understanding of metal mill practices. Combined with the service helpdesk, the support we have gained has allowed us to operate a reliable detection system that is specific to our needs."*

With cameras installed on both the cleaning and the new tinning line, the customized SmartView system is set to provide production optimization with the highest surface quality of product.

### PROCESS LOCATIONS

Cleaning line

Tinning 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.

Surface Vision's 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.

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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