

CONSUMER PRODUCT PACKAGING

Application Case Study – Sinopec Group, Beijing, China

Industrial Lubricant Manufacturer Relies on Machine Vision for Product Quality and Traceability

Company Profile

Petroleum and petrochemical manufacturer Sinopec Group, headquartered in Beijing, is a large producer of automotive and industrial lubricants. Given the role these products play in safeguarding the smooth operation of machinery, motor vehicles, and other moving parts, a production process that ensures consistent product quality and supply chain traceability is critical. Sinopec leads the industry in the adoption of advanced manufacturing techniques, incorporating lean manufacturing practices and automated systems into its process to maximize production output while reducing costs, minimizing waste, saving power, and optimizing resource allocation. Precise data tracking and process control have enabled the company to replace labor-intensive manufacturing techniques with modern, advanced information management systems.

The Challenge

Lubricant manufacturing is a large and complex process. Data must be collected and entered into the system from multiple sources and at numerous points along the production line, including data on raw materials, additives, filling and weighing, storage, and shipping. To ensure reliable product traceability, a seamless flow of information between the manufacturing and packaging lines is required. Sinopec's existing ERP and DCS systems were central to the company's process, but because the two did not communicate directly with each other, some manual data entry was required. This method was both inefficient and susceptible to human error. Sinopec needed a complete data acquisition and control system to ensure accurate traceability throughout the manufacturing process and supply chain.



A Vision HAWK smart camera confirms the presence and accuracy of labels on lubricant bottles as they make their way through Sinopec's production line.

The Solution

Sinopec worked closely with Microscan partner Beijing Nodes, a specialized system integration company, to design and implement a complete information management system to unify the facility's upstream and downstream operations. Timely and accurate data collection is crucial to the success of this system, and key inspection points were identified in the process to achieve Sinopec's objectives for traceability and labeling accuracy. The system required a data capture solution for both 2D codes and text characters on the bottle labels, as well as linear barcodes on the products' secondary packaging. Beijing Nodes' engineers selected Microscan's Vision HAWK smart camera as well as the MS-800 laser barcode scanner, to fulfill these requirements. "Microscan offered great support during this project," stated Beijing Nodes Manager Ms. Zhu. "From local sales to skilled engineers in the field, all levels of the company were involved in providing the customer with the best solution."

- **Requirement:** Incorporate data management system to improve production efficiency and reduce errors in lean manufacturing environment.
- **Project:** Integrated information system including data acquisition to unify upstream and downstream processes.

- **Solution:** Vision HAWK smart camera reads 2D codes and OCR on product labels for verification and product traceability. MS-800 laser scanner reads 1D codes on secondary packaging.
- **Result:** Improved efficiency and product traceability. Mislabeled products are identified before they leave the facility.

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The Sinopec Beijing facility manufactures hundreds of lubricant products and packages several different product types on the same line. Because bottles are labeled before filling and are loaded by hand onto the assembly lines, an incorrect or missing label occasionally makes it onto the line. The inspection capabilities of a machine vision system were required to ensure labeling accuracy and to prevent mislabeled products from leaving the facility. A Vision HAWK C-Mount smart camera was installed on the line to detect the presence/absence of each label by reading a 2D code printed on the label, to inspect the text on the label using OCR (optical character recognition) and validate its contents, and to report the results back to the information management system. The Vision HAWK, a member of Microscan's AutoVISION™ machine vision family, is ideally suited to applications that combine barcode reading with additional inspection tasks. It features a complete vision tool set in a compact housing for easy integration into industrial processes.

After the bottles have been filled, inspected, and weighed, they are placed in cases that have been printed with a 1D barcode to track product shipments. During the production process, the printer may become coated in oil, resulting in codes that are difficult to read. Sinopec's packaging line also moves at very high speeds, adding to this challenge. With these considerations in mind, Beijing Nodes chose Microscan's MS-800, an industrial laser scanner customized for the China market. The MS-800 was a perfect fit for the requirements: easy to integrate, highly reliable, and capable of reading linear barcodes at very high speeds. The barcodes are read, and the data is transferred to the integrated information management system, ensuring accurate traceability in the process.

Conclusion

Sinopec relies on accurate data collection and fully integrated information management to operate at high efficiency and to ensure product quality and reliable traceability. "Now, managers in the facility can respond quickly to any issues that arise, take corrective action, and ensure that the whole line works smoothly," explains Ms. Zhu. "The staff on site can also easily and efficiently monitor the process. With automatic data acquisition, products can be traced throughout the process."



Laser barcode scanners provide reliable, high speed reading of linear barcodes in a simple and easy-to-integrate package.

OVERVIEW

- **Customer:** Sinopec Group
- **Industry:** Consumer Goods
- **Application:** Reading 1D, 2D Codes and OCR
- **Product:** Microscan Vision HAWK C-Mount Smart Camera and MS-800 Industrial Laser Scanner
- **Reseller/Integrator:** Beijing Nodes, Beijing, China



Microscan's Vision HAWK Smart Camera combines a complete vision tool set with industrial protocols in a compact and flexible configuration.

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