

FOR IMMEDIATE RELEASE

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Toyohashi Plant First in Japan^{*1} to Implement Truck Loading Using Automated Forklifts^{*2}

Fully Automated, from Receiving Products to Truck Loading

Kao Corporation successfully implemented Japan's first^{*1} truck loading operation using automated forklifts^{*2} at its Toyohashi Plant, which produces high-mix low-volume products, in July 2024, at the plant's next-generation warehouse. Accomplished together with Toyota Industries Corporation, the project will be fully introduced in October 2024. In addition to product reception from the production plant to shipping out from the warehouse, trucks are loaded using a fully automated process, which is expected to improve work efficiency and help relieve labor shortages.

^{*1} As researched by Toyota Industries Corporation.

^{*2} Using automated forklifts to load orders and products onto trucks in a semi-exposed environment without installing equipment or modifying road surfaces, pillars or other structures.



Next-generation warehouse, completed in March 2023 (left)



An automated forklift loading actual orders and products onto a truck (right)

Background

The introduction of stricter overtime limits on commercial drivers in 2024 is increasing the need for improving logistics efficiency and automating the process. Kao is committed to *Yoki-Monozukuri* integrated with ESG by delivering just the right quantities of unique products meeting diverse needs, to contribute to a resource-circulating society and reduce the burden on resources and the environment.

By integrating production and logistics functions, the Toyohashi Plant's Toyohashi Connected Flexible Factory concept aims to achieve lean product supply, shorten lead times, cut down on logistics costs and reduce CO₂ emissions. Adopting automation improves the work environment and allows work to be performed flexibly and efficiently.

Introducing Automated Forklifts^{*2} for a Fully Automated Next-Generation Warehouse

At the Toyohashi Plant, which produces a variety of high-mix low-volume products such as skin care and hair care products, a next-generation warehouse was completed in March 2023 to implement a flexible logistics system automating all processes from receiving products from plants to sorting and shipping them out. However, the system still needed to refine forklift operation based on the skills of experienced operators, to deal with different-sized cargo and differently-configured trucks, adjust forklift stop positions and take proper precautions to prevent load shifting during long-distance transport.

To automate the loading process, Kao began working with Toyota Industries Corporation in 2021, successfully implementing automated forklift operation^{*2} in July 2024. Outside of an experimental environment, and working with real orders and transport, this is a first for Japan.^{*1} The automated forklifts will be fully introduced in October 2024 and are scheduled to begin regular operation in the near future. This means that a warehouse with fully automated processes, from receiving products to truck loading, will come into being.

Kao and Toyota Industries Corporation—Partnering for Implementation

At the Toyohashi Plant, Kao will be using the Autonomous Lift Truck for Truck Loading developed by Toyota Industries Corporation. In this system, truck position detection and guideless automated driving use 3D-LiDAR^{*3}, and AI-enabled image recognition and deep learning require no markers for detecting pallet location and positioning. The forklift automatically generates travel routes to trucks as it decides on the loading position, making automated loading possible even when truck stop position and load positioning are not uniform.

Kao designed a robot-friendly warehouse environment and operations permitting smooth automation of the entire process from receiving products to truck loading. Kao also set up a work process for handling truck transport and a connection to a Warehouse Control System (WCS) IT system controlling the warehouse equipment.

Utilizing Toyota Industries Corporation technology, Kao and Toyota Industries Corporation worked together to study specifications for introducing automated forklifts in the next-generation warehouse environment as soon as possible, which was successfully achieved. The two companies will continue working together to introduce further efficiency into the warehouse logistics process.

*3 3D-LiDAR is a sensor for accurately determining distance from an object by shining a laser onto it and measuring the time for the reflected light to return to the receiver. Used to grasp conditions around the vehicle.

In addition to the next-generation warehouse, Kao is also considering adopting automated forklifts at other Kao Group production sites and logistics centers in Japan and overseas. By spreading knowledge to encourage widespread adoption of the system within the industry, Kao will continue working to address the social challenge of labor shortages and promote efficient, flexible work styles.

The Supply Chain Kao Aspires for

With the corporate purpose “To realize a Kirei World in which all life lives in harmony,” the Kao Group adopted its ESG strategy, the Kirei Lifestyle Plan in 2019, and has been implementing the Kao Group Mid-term Plan 2027 (K27) with its vision of “protecting future lives” and “sustainability as the only path.”

Kao is promoting *Yoki-Monozukuri* with ESG integration which preserves resources and reduces the burden on the environment, and is working to help people live richer lives and create a caring and resource-circulating society that develops sustainably.

By utilizing rapidly evolving digital technology and collaborating with various partners, Kao aims to develop innovative technology and build a sustainable supply chain that meets the expectations of society and is kind to people, society and the Earth.

Related Information

- [Kao to Establish New Flexible, Efficient Production System and Logistics Model at Toyohashi Plant](#)
- [New Next-generation Warehouse Completed at Toyohashi Plant](#)

*This news release is a translation of a Japanese-language news release dated August 30, 2024.

About the Kirei Lifestyle Plan

Over the past 130 years, Kao has worked to improve people’s lives and help them realize more sustainable lifestyles—a Kirei Lifestyle. The Japanese word “kirei” describes something that is clean, well-ordered, and beautiful all at once. For Kao, this concept of “kirei” not only describes appearance but also attitude—a desire to create beauty for oneself, for other people, and for the natural world around us. Aiming to realize a more sustainable way of living, in April 2019, the Kao Group established its ESG strategy known as the Kirei Lifestyle Plan. By 2030, Kao aims to empower at least 1 billion people, to enjoy more beautiful lives. Kao also strives to have 100% of its products leave a full lifecycle environmental footprint that science says our natural world can safely absorb.

Please visit [the Kao sustainability website](#) for more information.

About Kao

Kao, a Japan-based manufacturer of personal care and household products, cosmetics, and specialty chemicals creates high-value-added products and services that provide care and enrichment for the life of all people and the planet. Through its brands such as *Attack* laundry detergent, *Bioré* and *Jergens* skin care products, *Laurier* sanitary products, *Curél*, *SENSAI*, and *MOLTON BROWN* cosmetics, and *Oribe* hair care products, Kao is part of the everyday lives of people across Asia, the Americas, Europe, the Middle East, and Africa. Combined with its chemical business, which contributes to a wide range of industries, Kao generates about 1,630 billion yen in annual sales. Kao employs about 32,600 people worldwide and has more than 130 years of history in innovation. As an enterprise that provides products people use on a daily basis, the Kao Group takes

responsibility to actively reduce the environmental footprint of its products throughout the product lifecycle. This is laid out in Kao's ESG strategy, the Kirei Lifestyle Plan, which launched in 2019. Please visit [the Kao Group website](#) for additional information.

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