

Companies from the Land of the Rising Sun set the standard at a competition hosted by the Hispack show in Barcelona, Spain earlier this year, with Japanese innovation leading the way in the second edition of the exhibition's Best in Class programme.

In all, three international projects were awarded for their dedication to showcasing the leading and transformative role of the packaging, process and logistics sector. Two of the projects were based in Japan.

Multilayered approach

Considered by some as a spearhead of brand innovation in Japan, Kao Corporation's environmental, social and governance (ESG) strategy is called the 'Kirei Lifestyle Plan', with the word 'kirei' describing something that is both clean and beautiful. For Kao, kirei encapsulates not only appearance, but also attitude, creating beauty for oneself, other people and for the world in general.

The threefold ESG strategy for 2030 focuses on empowering at least one billion people to enjoy better health, hygiene and confidence in self-expression, ensuring that 100 per cent of products leave an environmental footprint across their full lifecycle that the natural world can safely absorb, and targeting more than 50 per cent recycling of used plastics (by weight), and net-zero waste by 2040.

Four actions are being undertaken by the company to facilitate this: accelerating the reduction of fossil-based plastics usage; increasing use of bio-based/recycled plastics; expanding products using 'positively-recycled' plastics; and increasing the use of plastics that Kao can collect together with society.

Kao's packaging trends include more concentrated products – namely, more compact containers – and flexible packaging, such as its refill solutions.

"The latter technology is aimed at recycling and recovering all resins from collected refill pouches, which are quite popular in Japan," explains Tadashi Tachianami, who handles R&D packaging technology research projects for Kao.

Once collected, the pouches undergo kneading (resin modification-pelleting) by the Kao research team. The flakes are ground up, foreign objects or materials like aluminium foil, nylon (polyamide), adhesive and inks are removed, and then the remaining material is transformed into pellets.

"The technology prevents the mixture of materials from clumping using mesh filter, by laser processing under special conditions during kneading to remove these foreign materials," says Tachianami. "These pitted and uneven surfaces can reduce physical properties. To prevent the formation of holes, a compatibilising agent is added during the mixing and dispersal of PE, PET, nylon, and other materials, while inks and adhesives are pulverised."

A class above

Students of recycling were captivated by the latest projects being revered at a recent packaging show in Spain. **Dominique Huret** reports

Last year, Kao used the recycled pellets to create multilayer refill pouches of approximately 100-250 micron thickness for its Kao Attack Zero liquid laundry detergent packaging in conjunction with Lion Corporation.

The pouches are approximately 80 per cent PE, 10 per cent PET and 10 per cent nylon, ink and adhesive. The packaging contains 10 per cent recycled material, some of which came from refill packs collected by Kao through municipalities, but also through field-testing collaboration with Lion, where refill packs were collected from Ito-Yokado Hikifune supermarkets and Welcia Yakkyoku stores. The used refill packs collected accounted for around 1 per cent of the total material used, while the remaining 9 per cent came from refill packs manufactured but ultimately unused.

The recycling process is a joint development between Kao and Japan's Tosoh Corporation, which produces chemicals and speciality materials.

Collect and recycle

Launched in October 2022, the 'PET Bottle Cap Collection and Recycling Project' was the recipient of the second Best in Class award. It was established by the Japan Circular Economy Partnership (J-CEP), a consortium of companies, organisations and individuals working to promote the circular economy in the country. J-CEP's mission is to identify opportunities for circular business models, promote circular design and innovation, and increase awareness of the benefits of the circular economy.

The project in question aims to recycle PET bottle caps collected from consumers in a community-based resource collection



A consumer returns a reusable cup to an automated collection point



“The latter technology is aimed at recycling and recovering all resins from collected refill pouches, which are quite popular in Japan”

Tadashi Tachianami, Kao



Tadashi Tachianami (left) and Ryo Shibutani from Kao Corporation’s R&D packaging technology research team, celebrate the success of their horizontal recycling concept

system. Using this material flow, a ‘Traceability System Proof of Concept’ has been created with a digital product passport, developed in collaboration with the Dutch company Circularise.

As part of its commitment to making the sustainability of plastics a community-focused issue, the city of Kobe has embraced the digital passport concept.

A collection station has been established in Nagata-ku, one of the nine wards within Kobe. The station features separate collection boxes for different types of items, as well as spaces for interaction, making it a community hub where local residents can connect through waste disposal. The collected plastics resources are used for what is commonly known in the country as horizontal recycling, where materials are recycled back into the same type of product, or for testing new recycling methods.

The initial trials with Circularise, which provided the traceability software, resulted in the creation of two digital product passports designed to trace plastics bottle caps. These caps were sorted into PE and PP types, and then successfully recycled into high-quality consumer goods, marking a significant step forward in sustainability efforts.

“Our work with J-CEP shows the potential of digital product passports to transform the recycling industry,” says Circularise ▶

Tomra says its three-year pilot project in the Danish city of Aarhus has reached ‘cruising speed’

co-founder Jordi de Vos. “Our vision is to arm more companies with this technology, driving a tangible shift towards a circular economy. This initiative has also sparked the potential for widespread adoption of digital product passports in the recycling industry, demonstrating how this technology can lead to more efficient resource use and waste reduction.”

The initiative aims to establish digital product passports, not just as a regulatory requirement, but also as a strategic advantage for businesses and a benefit for consumers.

“The ongoing recycling initiative aims at efficiently circulating plastics resources by focusing on collecting items that are easy to recycle through group collections, collection points, and in-store collections,” adds Kaori Suzuki, special assistant to the chief executive at Amita Corporation, which specialises in helping businesses and municipalities develop sustainability strategies.

Automated takeaways

Claimed to be the world’s first open managed system for reusable takeaway packaging, a three-year pilot project between Tomra and the Danish municipality of Aarhus also received recognition at Hispack.

The system trialled in Aarhus enables a shift from single-use to reusable takeaway



The Aarhus pilot requires a deposit to be paid on takeaway food and drink

packaging, by offering an infrastructure that entire cities can use. It is designed as an open system, meaning that packaging from different providers can be returned 24/7 to a shared infrastructure of automated collection points throughout a city.

“High packaging return rates are ensured by having monetary return incentives, which in the Aarhus pilot takes the form of a deposit that is paid when purchasing the takeaway food/drink, and afterwards reimbursed in full to the consumer when

the packaging is returned to a collection point,” explains Geir Saether, Tomra senior vice-president for the circular economy.

In the first stage, the system focuses on hot and cold drinks containers, such as takeaway coffee cups. When returning the reusable cups to one of the automated Tomra collection points specifically used for takeaway packaging, the customer receives the deposit reimbursement directly on their card/account. This is achieved by tapping a contactless payment credential (such as a card, phone, or smartwatch) to activate the dedicated Tomra collection point.

“Approximately 200,000 people live in the city of Aarhus, and at the end of May, 200,000 cycles had been completed, an average of one cup used per inhabitant,” continues Saether.

“In the first month, 36,000 cups were used and returned, and now we have reached a cruising speed. For the moment, the system has not reached cost balance for us, or the town. It is quite financially demanding for the city in terms of washing units, but this remains a very important project and a key part of our ambitious plans.” EP

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- Kao Corporation kao.com
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