Communication with corporate customers (Chemical Business) 102-12,103-1, 103-2

Kao's approach

Kao aims to make a positive contribution to society by creating eco-chemical products that provide real value, and by sharing the benefits from this reduced environmental impact with our customers.

Kao's creating value to address social issues

As a result of population increase and economic growth, environmental pollution is steadily becoming a more serious problem throughout the world, and environmental problems are particularly becoming serious in emerging economies. In response to these issues, reducing the environmental impact of business activities has emerged as an important concept for the chemical industry. We are focusing on reducing the environmental impact both at our own product manufacturing operations and related to the use of our chemical products by our corporate customers.

Emphasizing the two axes of Green Innovation and Eco Technological Solutions, we are contributing to the sustainability of society through technology innovation by implementing measures to reduce environmental impact.

Green Innovation

Green Innovation involves creating materials that are competitive yet have a low environmental impact.

More specifically, we draw on our strengths and carry out global investment to increase our offerings of natural fats and oils derivatives with high added value. In addition, we will further cultivate the upstream and downstream domains for these derivatives.

For example, we are making use of non-edible raw materials in an effort to resolve the significant social issue of food shortages. We are also focusing on downstream raw material development, one of our areas of expertise, that uses biomass materials in place of fossil materials.

Eco Technological Solutions

We ascertain customer needs and issues from the perspective of reducing environmental impact, and provide solutions that boost customer value through groundbreaking product development.

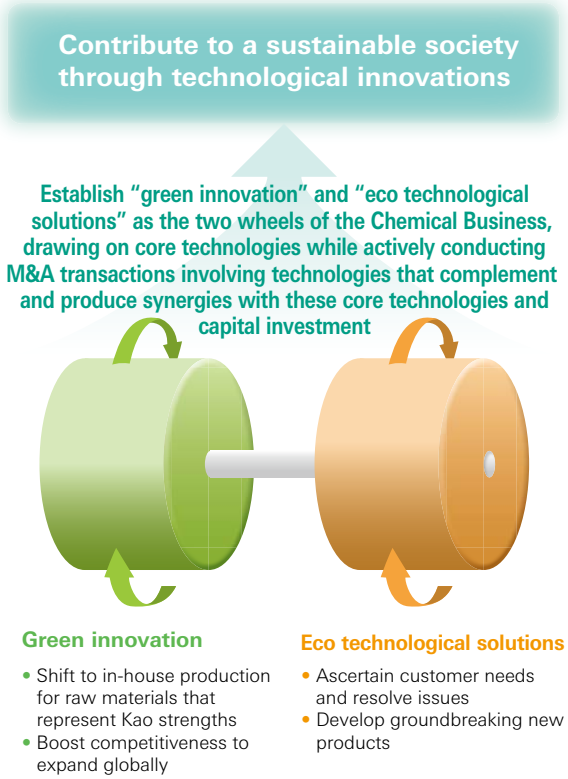
Product examples

- *Lunajet* water-based inkjet ink
- Low-temperature fixing toner
- *Visco Top* high-performance specialty thickener

➡p. 101 Our initiatives: Kao products that contribute to the conservation of the environment globally

Contributions to the SDGs

Green Innovation and Eco Technological Solutions



Communication with corporate customers (Chemical Business) 103-1,103-2, 404-2

Policies

By selling eco-chemical products, we contribute to the sustainability of society through technology innovation.

We continue to enhance *Yoki-Monozukuri*, contributing to a reduction in environmental impact in many industry sectors. We are working to increase the rate of environmental value-enhancing products on a global scale. To realize this vision, besides strengthening the relationships of trust that exist between Kao, our customers, and the market, we are also building connections with enterprises and industry associations across a wide range of industries, implementing measures that will enable us to contribute to the sustainability of society through technology innovation.

Framework

1. Systems to support development and production of eco-chemical products

- We maximize utilization of core technologies, such as nano-interface control, polymer function control, and precision conversion of oils and fats, through essential analysis based on research into fundamental technologies that can help demonstrate the structure of substances and phenomena.
- Construction of a global production system that takes reduction of environmental impact into account.

2. System to support the worldwide sale of eco-chemical products

- Sales within Japan: the sales system that use sales distributors with a high level of expertise and realize close communication with our customers.
- Business operation system outside Japan: the network that enables production and sales bases deployed in key countries to operate effectively.
- Global business support system through strengthening global chemical substance management and import/export management, based on close collaboration with the Product Quality Management Division.

Education and promotion

Internal training

- All Chemical Business managers are made aware of our Chemical Business Vision, decided at our semiannual Chemical Business Meetings.
- All Chemical Business managers are made aware of environment-related information (including ISO 14001).
- Compliance with local chemical substance laws and regulations by affiliates outside Japan is strengthened through global Responsible Care (RC) activities.
- Environmental education is implemented for new employees, and awareness-raising activities are conducted for chemical product sales distributors.

For distributors

- chemSHERPA explanation sessions: 30 companies, 74 employees
- New sales distributor employee training sessions: 20 companies, 79 employees
- Sales distributor manager meetings: 11 companies, 22 employees
- Information-exchange conferences with sales distributors: 11 companies, approx. 50 employees

Communication with corporate customers (Chemical Business) 102-11,102-44,103-1, 103-2,103-3

Kao's approach | Our initiatives

Mid- to long-term targets and performance

We position chemical products that can reduce the environmental impact at the manufacturing stage and at the use stage as "eco-chemical products." In the future, we will promote Green Innovation and Eco Technological Solutions, aiming to raise eco-chemical products' ratio of all Chemical Business products to over 80%.

Performance in 2017

- Development of a VOC-less water-based inkjet ink for developing film packages with less impact on the environment.
- Expansion of our business with products in the fields of civil engineering and road construction that reduce environmental impact and ensure longevity.

Collaboration with stakeholders

Business partners

- In order to strengthen collaboration with companies in Southeast Asia (including suppliers of raw materials for oils and fats) to facilitate promotion of our Green Innovation, we held discussions with related companies to clarify our approach.
- We are looking for new partners to assist in the promotion of Eco Technological Solutions.
- We conduct regular exchanges of information with sales distributors within Japan and affiliated companies outside Japan, in regard to laws and regulations on chemical substances (both within and outside Japan) and other eco-related information.

Government agencies

- We are a member of the Network for Strategic Response on International Chemical Management, whose management board includes representatives of Japan's Ministry of the Environment, Ministry of Economy, Trade and Industry (METI) and Ministry of Health, Labour and Welfare (MHLW), among others. As a member of this network, we participate in exchange and dialogue in relation to international chemical management strategic response several times a year with other companies, organizations, and government agencies in Japan and with government agencies and industry organizations outside Japan.

Industry organizations

- We attend monthly working group conferences by the Global Product Strategy (GPS)/Japan Initiative of Product Stewardship (JIPS) Promotion Council organized by the Japan Chemical Industry Association (JCIA), and contributes to the implementation of GPS activities and the issuing of GPS Safety Summaries. In 2017 we gave a lecture for the Japan Chemical Industry Association's JIPS Grand Prize Award, in addition to a lecture at the Chemical Management Seminar.
- We participate in monthly management committee and technical committee meetings of the Joint Article Management Promotion-consortium (JAMP), contributing to the operation and revision of the industry standard formats that are used for disclosure of information regarding chemicals in products (MSDSplus and chemSHERPA). During JAMP's general meeting in June, our corporate executive officer was appointed as JAMP chairperson.
- We attend the regular meetings of the Japan Surfactant Industry Association and the Japan Cosmetic Suppliers Association, contributing to a variety of activities and seminars, including those related to chemical substance management regulations.

➡p. 43 Conservation > Chemical substances management

International initiatives

- We are working to strengthen our cooperation with organizations both within and outside Japan, in order to promote sustainability activities, such as the Roundtable on Sustainable Palm Oil (RSPO).

➡p. 134 Corporate culture > Sustainable and responsible procurement

Communication with corporate customers (Chemical Business)

Our initiatives

Kao products that contribute to the conservation of the environment globally

Lunajet water-based inkjet ink

During further applications of the pigment nano-dispersion technology that we had developed thus far, we successfully developed the world's first water-based inkjet ink for use in printing on soft packaging film substrate that features a VOC-free design* with a low environmental impact. It is now possible for us to provide soft packaging film-printed material that combines high quality with a low environmental impact. We also confirmed that this water-based inkjet ink technology can be applied to water-based gravure-printing ink.

Low-temperature fixing toner

More than half of the electric power used by office photocopiers is consumed in generating heat energy to melt the toner. To reduce the environmental impact of copiers and printers, it is important to develop toner binders that can be melted and fixed at lower temperatures. Our polyester resin toner binder was developed to meet these requirements. Unlike conventional toners, our new toner uses a polyester resin binder, which can melt at temperatures more than 30°C lower than conventional toners. This toner is highly effective in affixing to paper, and it enables both high-speed printing and energy conservation.

Visco Top high-performance specialty thickener

When undertaking civil engineering work near water (for example, on riverbanks or on the coast), it is vitally important that measures are taken to protect the water from being contaminated, so as to prevent environmental pollution and deterioration in water quality. In the case of bridge pier construction for long bridges or suspension bridges that cross ocean straits, because the piers are actually built in the riverwater or seawater, special underwater concrete that has high viscosity and is resistant to washout is used. Furthermore, when construction is undertaken near underground watercourses, care must be taken not to contaminate the underground water. For work in this kind of water-related environment, the use of additives to increase the viscosity of inorganic materials such as grouting materials and concrete can enhance underwater anti-washout performance.

We have developed *Visco Top*, a high-performance specialty thickener that provides unprecedented viscosity for grouting materials and concrete, and makes it possible to undertake construction work without causing harm to the riverine or ocean environment. *Visco Top* was used in the removal of high concentration contaminated water from trenches at the Fukushima Daiichi Nuclear Power Plant.

* VOC-free design
"VOC-free" is defined as emitting less than 700 ppmC (in carbon conversion terms) of volatile organic compounds (VOC) during the printing process .
VOC (volatile organic compounds): VOC is a collective term for organic compounds that are volatile and are transformed into gaseous form in the atmosphere. In Japan, VOC emissions are regulated by the revised Air Pollution Control Act.

Topic

Water-based inkjet ink and high-performance specialty thickener *Visco Top* receive award

With the purpose of contributing to the improvement of science and technology and the development of industry within Japan, the National Invention Award of the Japan Institute of Invention and Innovation honors inventions warranting a great deal of merit. We were awarded the Invention Award for our *Lunajet* water-based inkjet ink at the National Invention Awards in 2017.

The JCIA Technical Award is a program that honors the creation of science technology and products that are innovative and superior, and that greatly contribute to the development of society as a whole as well as improving the environment. The Special Technical Award is awarded to creative products and technologies that contribute to the advancement of science and technology. Our *Visco Top* high-performance specialty thickener was awarded the Special Technical Award at the 49th JCIA Technical Awards.

National Invention Awards


JCIA Technical Award Ceremony

Communication with corporate customers (Chemical Business) 102-44

Cooperation with sales distributors

In recent years, the role of our distributors has expanded and become more and more important. Their role includes compliance with domestic and international regulations on chemical substances, appropriate management of chemical substances contained in our products through the entire supply chain, compliance with import and export regulations (GHS), as well as adjusting delivery schedules with customers when ordering and correspondence for earthquakes and other natural disasters.

We offer various venues for information exchange to major distributors related to our Chemical Business.

In 2017, we held our biennial Sales Distributors' New Employee Training Conference for sales distributor's new hires at our Wakayama Complex. We set up lectures on Chemical Business and products, ordering, and relevant laws and regulations, with 79 people from 20 companies in attendance. Additionally, in two-days program,we offered other abundant content, including observations of production site and laboratory, as well as Eco-Lab Museum.

In October, we held a Management Meeting for executives at our Sumida worksite.

From the end of November to December, we visited Chemical Business sales distributor managers to exchange information about the latest trends in chemical product-related laws and regulations within and outside Japan, and about the role of sales distributors within the supply chain.

With particular regard to communication forms about information on chemical substances contained in our products, we were ahead of the industry when it made the switch from MSDSplus to chemSHERPA in September 2017, and prior to this switch, we held briefing sessions for our sales distributors in Osaka and Tokyo in March. After the switch, we made the forms available not only on our website, but also on our extranet which connects our sales distributors and us, striving to actively disclose information.

In the future, we will continue to use these activities to foster close communication with distributors.

Sales distributors' new employees training session

chemSHERPA explanation session