



# DAICEL CHEMICAL INDUSTRIES, LTD. Environmental, Safety and Social Report 2008



## Contents

Message from Management	A Message from the President	1
Philosophy & Vision	The Leading Priorities of the Daicel Group	2
Outline	Outline of the Daicel Group	4
Network	Global Network	6
Chronology	Chronology of the Daicel Group	8
2007 Highlights	Closure of the Sakai Plant	10
	Environmental Preservation Initiatives	12

### Working with the Markets

The Major Applications of Our Products: Daicel's Role in Society	14
Products and Technologies that Contribute to a Healthier Environment	16

Feature Story: Ensuring Stable Production	Production Innovations	18
Feature Story: Ensuring Stable Production	Operation Training Center	20

### Together with Our Employees

Human Resource Cultivation Efforts	22
Our Commitment to Our Technicians	23
Personnel System	24
Promoting Good Health	25

Feature Story: Innovations in the Manufacturing Process	NI Catalyst Technology	26
---	------------------------	----

### For Safety and the Environment: The Responsible Care Initiative

Responsible Care: Basic Policies and Implementation System	28
Total Environmental, Health and Safety Assessment System for New Projects	29
ISO 14001 International Standards for Environmental Management Systems	29
Business Activities and Their Environmental Impacts (Results for Fiscal 2007)	30
Environmental Accounting	31
Environmental Preservation	32
Chemical and Product Safety	34
Occupational Health and Safety	35
Dialogue with Society	36
Process Safety and Disaster Prevention	38
Distribution Safety	38
Responsible Care Initiatives for Fiscal 2007 and Targets for Fiscal 2008	39

### Corporate Governance

Corporate Governance	40
Risk Management	40
In-house Audits	41
Our Commitment to Corporate Ethics	42
Conduct Policy and Code of Conduct	43
Fair Transactions	44
Opinions of Third Parties	45

### Environmental, Safety and Social Report 2008

This report is primarily a compilation of the environmental, safety, and social initiatives of Daicel Chemical Industries, Ltd. for fiscal 2007 (ended March 31, 2008) presented for readability and ease of understanding. We have listed detailed data separately at the following website (Japanese version only); it includes a breakdown of substances subject to the PRTR as well as the environmental impact of our plants and research center.

<http://www.daicel.co.jp/rescare/index.html>

In order to ensure the accuracy of this report, Daicel has been submitting it for third-party verification by the Japan Responsible Care Council (JRCC) annually since 2004.

### Organizations Responsible for Calculating Environmental Performance

Unless otherwise stated, the data contained in this report cover the workplaces (plants and research center) of Daicel Chemical Industries, Ltd. and the workplaces of the Daicel Group companies located within Daicel Chemical Industries.

#### ◇ Plants and research center of Daicel Chemical Industries, Ltd.

Sakai Plant (closed in December 2007)  
Kanzaki Plant  
Himeji Production Sector/Aboshi Plant  
Himeji Production Sector/Hirohata Plant  
Harima Plant  
Arai Plant  
Ohtake Plant  
Himeji Research Center

#### ◇ Workplaces of the Daicel Group companies located within Daicel Chemical Industries, Ltd. (Plants)

(within the Sakai Plant)	(within the Himeji Production Sector/Hirohata Plant)
Daicel Sakai Jitsugyo Co., Ltd.	Daicel Polymer Ltd.
(within the Kanzaki Plant)	(within the Harima Plant)
Daicel Pack Systems Ltd.	Daicel Safety Systems Inc.
Daicel Value Coating Ltd.	Daicel Logistics Service Co., Ltd.
(within the Himeji Production Sector/Aboshi Plant)	(within the Arai Plant)
Kyodo Sakusan Co., Ltd.	Daicel FineChem Ltd.
Daicel-Evonik Ltd.	Daicel Logistics Service Co., Ltd.
Daicel FineChem Ltd.	Kyoei Shokusan Co., Ltd.
Daicel Membrane-Systems Ltd.	Daicel Arai Chemical, Ltd.
Daicel Logistics Service Co., Ltd.	Arai Sangyo Co., Ltd.
Daicel Aboshi Sangyo Co., Ltd.	(within the Ohtake Plant)
Kyoei Shokusan Co., Ltd.	Daicel-Cytec Company, Ltd.
	Daicel Ohtake Sangyo Co., Ltd.
	Daicel Logistics Service Co., Ltd.

# A Message from the President

### A ceaseless approach to creation

Since its establishment in 1919, Daicel Chemical Industries, Ltd. has been committed to exhibiting its creativity by developing new products useful to all; thus, by providing such products, we have upheld the basic philosophy of contributing to the development of society. Moreover, in keeping with this philosophy, we have decided to evolve into a “value-oriented chemical producer.” We define this term to mean a manufacturer capable of creating significant value and contributing to both society and customers alike by providing solutions through our new products and value creation.

Acknowledging that we cannot become a value-oriented chemical producer without developing innovations, we have been focusing on three types of innovations: product innovation (as applied to commercial products); process innovation (as applied to production and process); and management innovation (as applied to management systems). By implementing these innovations, we will continue to provide useful and valuable products that benefit not only our direct customers but also those who use the products of our direct customers. These innovations will also eventually contribute to the betterment of both society and the environment.

### Responsible Care and corporate ethics: The foundations of corporate social responsibility

Daicel Chemical Industries formulates medium-term plans as a means of implementing its long-term plans. Regarding the medium-term plan for fiscal years 2004–06, we were pleased that our results exceeded our targets. We are now implementing a medium-term plan for fiscal years 2007–09. The targets for the final year specified in this medium-term plan are ¥450 billion in consolidated sales, ¥55 billion in consolidated operating income, and an ROA exceeding 9 percent. We are now making a unified and highly focused effort to achieve these targets. In addition, we believe that, to meet our responsibilities to society and continue developing together with society, we must pursue our business operations with due consideration for social and environmental realities.

Another basic philosophy of the Daicel Group is “to continue to grow and develop together with society as an attractive people- and environment-friendly chemical company.” In this spirit, we have prepared the Daicel Code of Conduct as our approach to corporate social responsibility, which focuses on Responsible Care activities and the corporate ethics initiatives.

### A persistent approach to addressing environment issues

We believe it is our duty to implement measures to address global environmental issues. This is particularly important when we consider that the growth of our business will lead to increased emissions of CO<sub>2</sub>. In light of this, we are committed to adopting measures to prevent global warming such as improving our energy efficiency, employing recyclable materials and fuels, using biomass, developing innovative and highly efficient technologies, and adopting modal shifts (shifting to more environment-friendly means of transportation).

### Focusing the attention of all our employees on CSR initiatives in compliance with our Code of Conduct

To meet the demands of various stakeholders, Daicel remains dedicated to meeting its responsibilities to society by adopting the Daicel Group Conduct Policy. In addition, we have prepared a Code of Conduct to ensure that each employee of the Daicel Group readily understands our Conduct Policy and is capable of properly implementing our CSR initiatives. Through various seminars and training programs, the Daicel Group will ensure that all our executives and employees understand the value of our stakeholders and the importance of observing all relevant laws and regulations. Further, by promoting close and candid communication among all members, we will strive to maintain an active and lively workplace.

### Promoting close communication with society is our next agenda.

In the months and years ahead, the Daicel Group will remain dedicated to establishing a firm corporate foundation by engendering public trust through activities such as Responsible Care and through a commitment to corporate governance, corporate ethics, and various other initiatives.

Our company's Responsible Care activities and our various initiatives designed to justify the public's confidence in our company are outlined in this report. I invite the reader to become more informed about the scope of our efforts in this report, and I look forward to receiving your candid comments and opinions.

September 2008



Daisuke Ogawa  
President and Chief Executive Officer

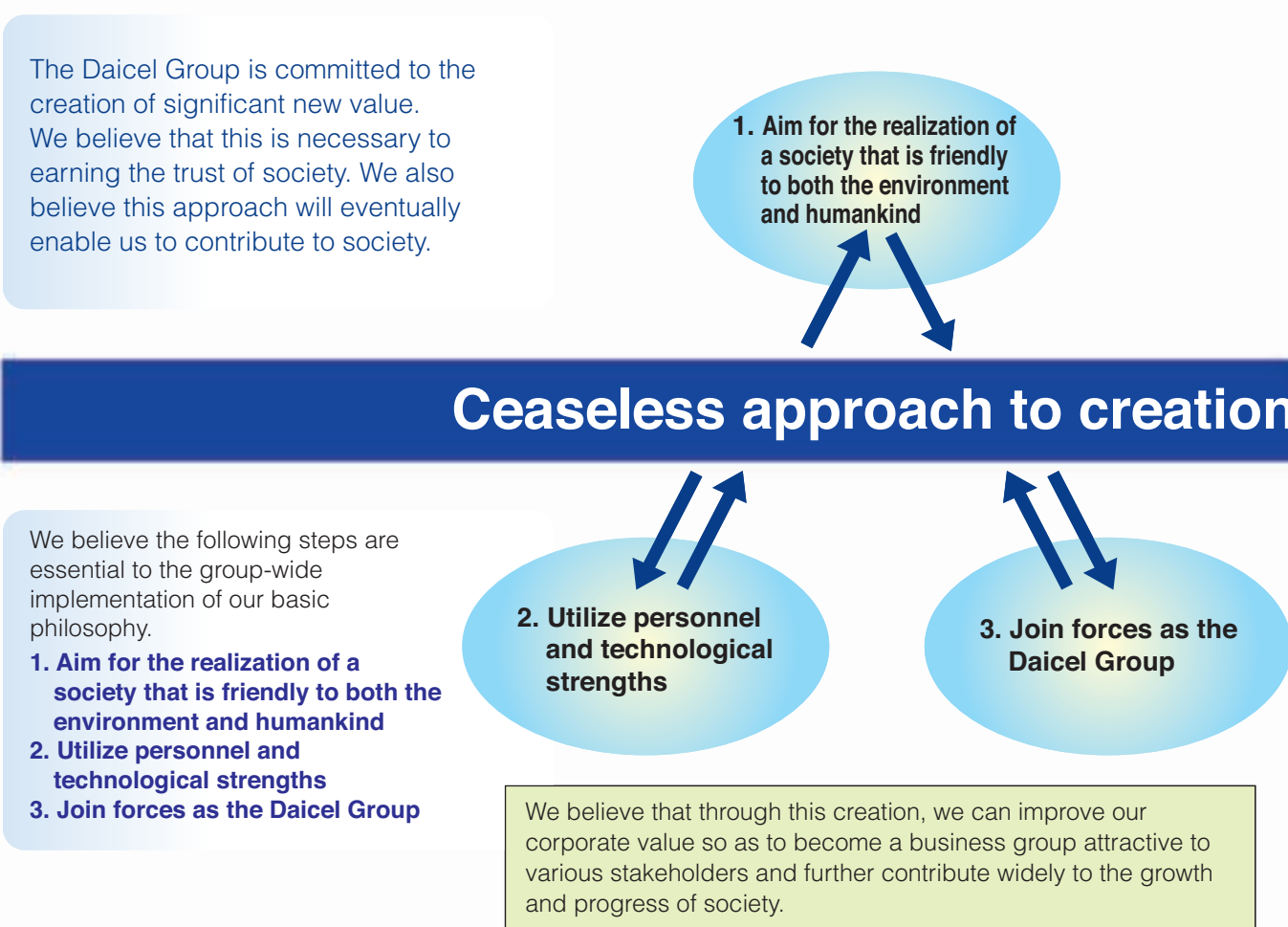
# The Leading Priorities of the Daicel Group

In July 2006, the Daicel Group adopted a basic philosophy we have characterized as “a ceaseless approach to creation.” This philosophy sets out the objective of the Daicel Group to engage in a ceaseless quest of product development, contribute to the market through our creativity, advance together with our employees, and grow together with society.

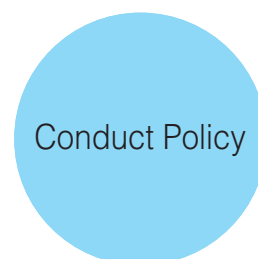
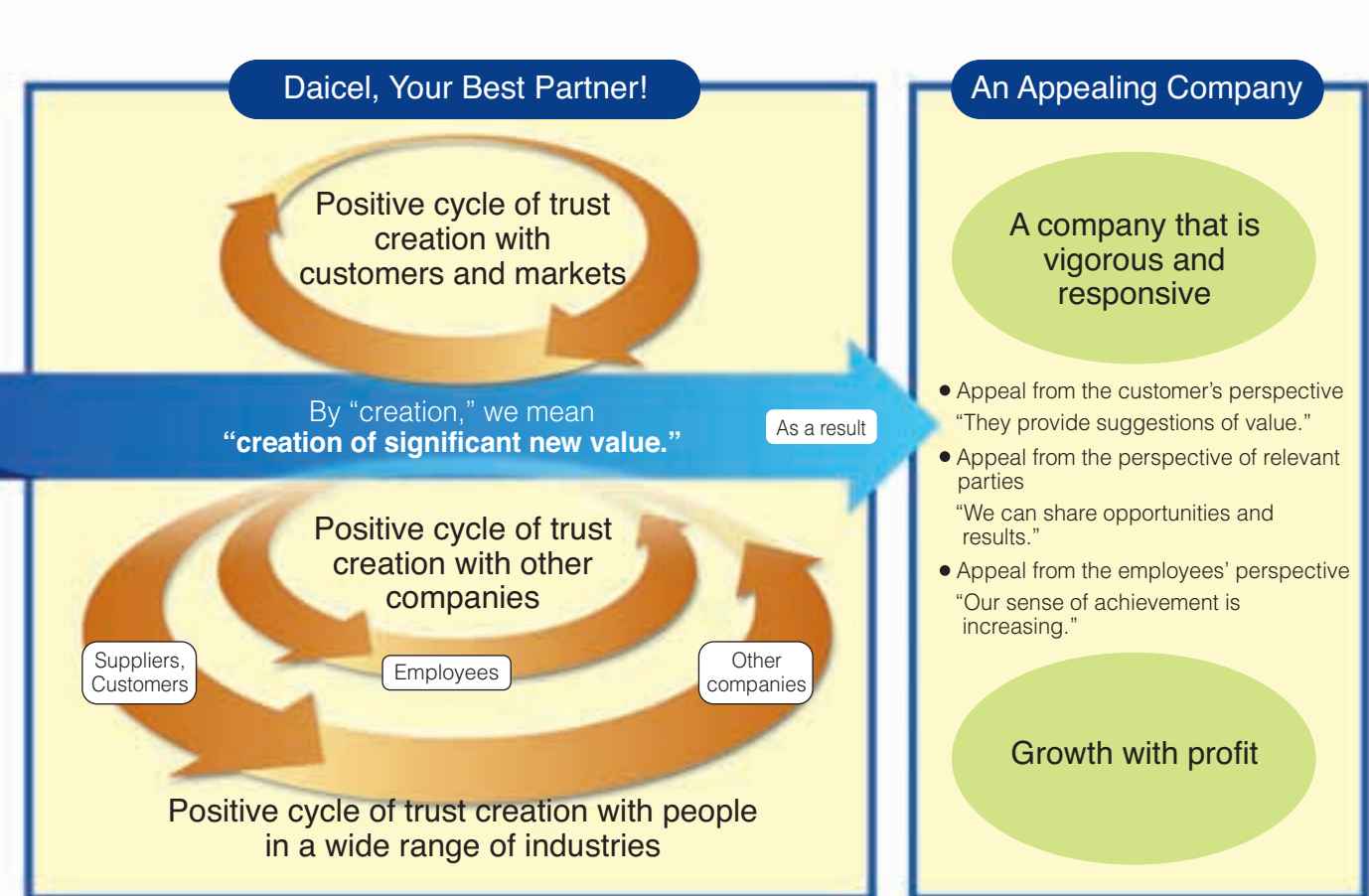
Our second long-term plan targets the creation of significant value by implementing this philosophy. These initiatives are intended to increase the appeal of the Daicel Group to stakeholders by establishing a relationship of trust with the market, with our employees, and with society.

In the process of implementing our philosophy and vision, we apply our Conduct Policy and the Code of Conduct of each group company as guidelines for all employees. Daicel is committed to “practicing the Daicel Chemical Industries Code of Conduct” with a focus on our Responsible Care initiative and corporate ethics as our CSR activities.

## ..... Daicel Group Basic Philosophy .....

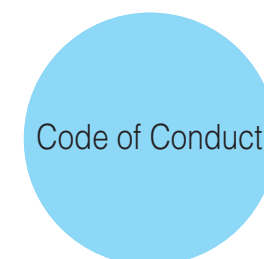


## ..... Vision (Second long-term plan for 2000–09) .....



**Conduct Policy**

Every member of the Daicel Group shall fully understand and voluntarily consider this Conduct Policy and shall put it into practice in their daily activities. By doing this, we believe we can gain the trust of many stakeholders while contributing to the development of society.



**Code of Conduct**

Daicel stipulates its Code of Conduct as the criterion for implementation of the Conduct Policy. The Code of Conduct stipulates specific details based on the operations of the respective group companies.


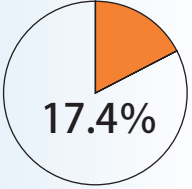
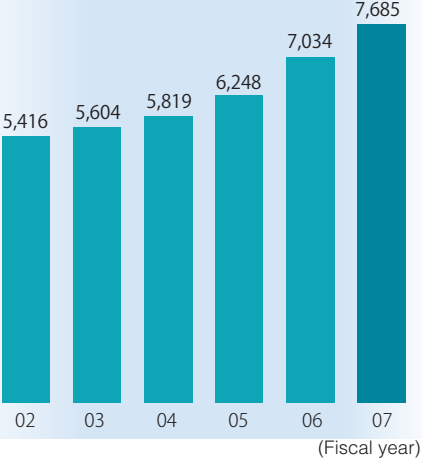

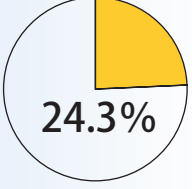
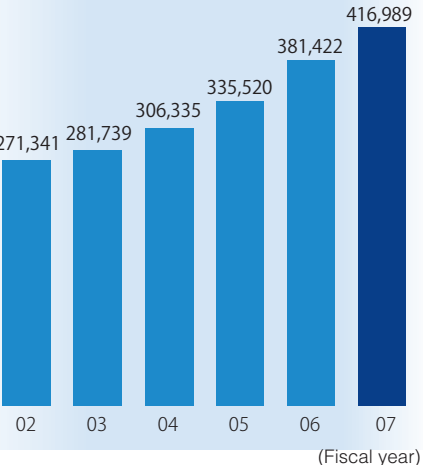

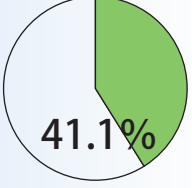
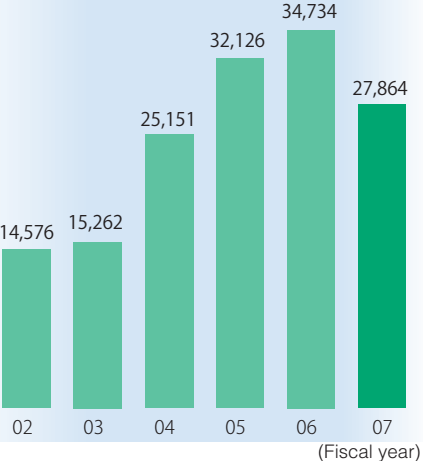

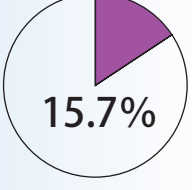

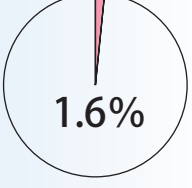
\* See page 43 for details of our Conduct Policy and Code of Conduct.

# Outline of the Daicel Group

The Daicel Group includes Daicel Chemical Industries, Ltd., its 58 subsidiaries, and 14 affiliated companies. The company's primary business is the manufacture and sales of cellulosic derivatives, organic chemicals, plastics

and films, pyrotechnic devices and other products. The business segments of Daicel Chemical Industries, Ltd., its subsidiaries, and affiliated companies are shown below.

## List of Products by Segment and Manufacturer

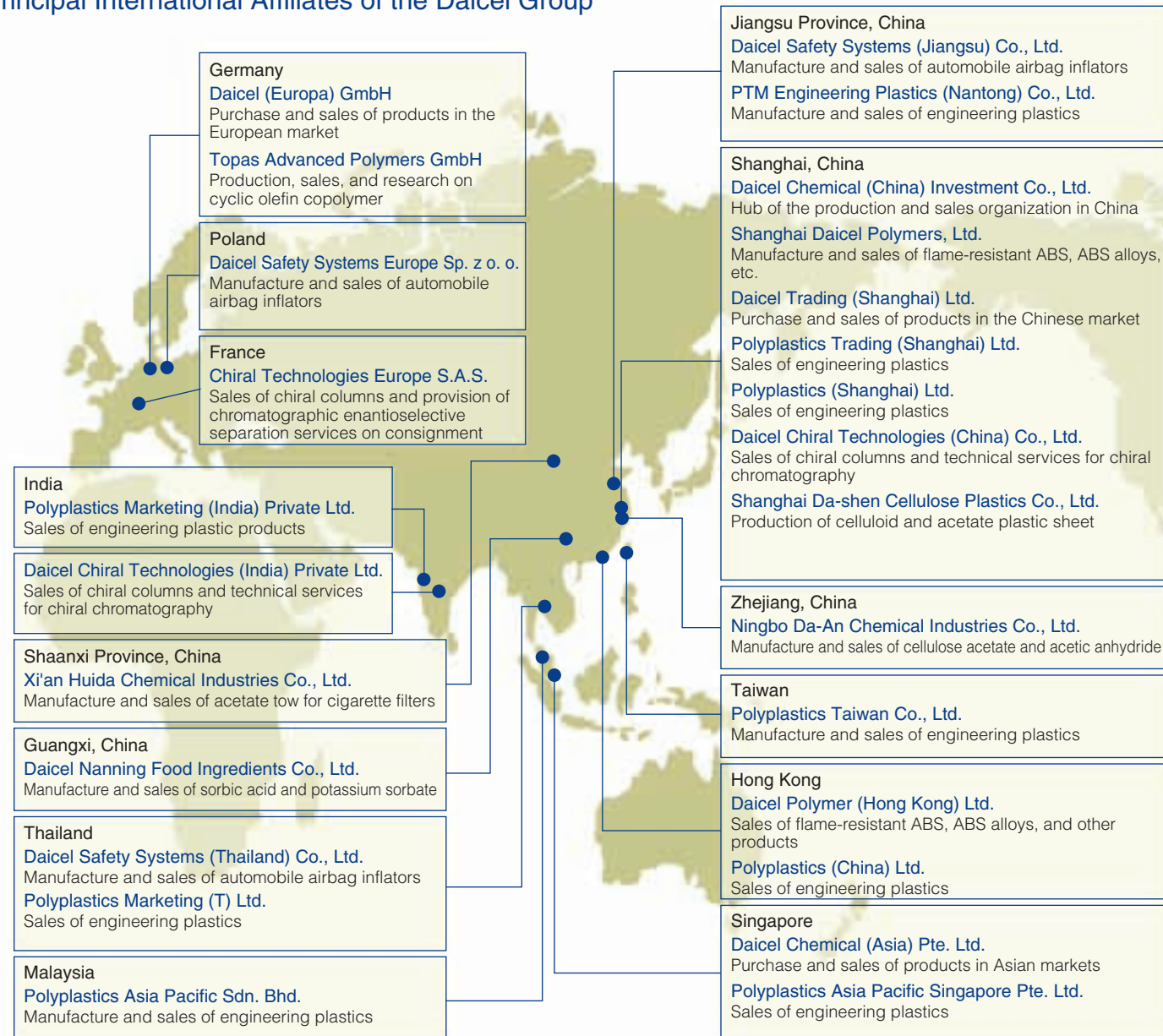
Segments	Principal Product Applications	Principal Products	Principal Group Companies	Share of Total Consolidated Sales by Business Segment	Number of Employees (consolidated)
Cellulosic Derivatives		Cellulose acetate, acetate tow for cigarette filters, carboxymethyl cellulose, and other products	<b>Domestic</b> Daicel Chemical Industries, Ltd. Daicel FineChem Ltd. <b>Overseas</b> Xi'an Huida Chemical Industries Co., Ltd. Ningbo Da-An Chemical Industries Co., Ltd.		
Organic Chemicals		Acetic acid and its derivatives, caprolactone derivatives, epoxy compounds, photoresist materials for semiconductors, chiral columns, and other products	<b>Domestic</b> Daicel Chemical Industries, Ltd. Kyodo Sakusan Co., Ltd. Dainichi Chemical Corp. <b>Overseas</b> Chiral Technologies, Inc. Chiral Technologies Europe S.A.S.		
Plastics and Films		Polyacetal resin, PBT resin, SAN/ABS resins, engineering plastic alloys, various synthetic resins for molding products, and other products	<b>Domestic</b> Polyplastics Co., Ltd. Daicel Polymer Ltd. Daicel Pack Systems Ltd. Daicel Value Coating Ltd. Daicel-Evonik Ltd., Mikuni Plastics Co., Ltd. Daicel Novafoam Ltd. <b>Overseas</b> Shanghai Daicel Polymers, Ltd. Daicel Chemical (Asia) Pte. Ltd		
Pyrotechnic Devices		Automobile airbag inflators, emergency-escape systems for aircraft crew, propellants, and other products	<b>Domestic</b> Daicel Chemical Industries, Ltd. Daicel Safety Systems Inc. Japan Shotshell Ltd. <b>Overseas</b> Daicel Safety Systems America, LLC Daicel Safety Systems (Thailand) Co., Ltd. Daicel Safety Systems Europe Sp. z o. o. Daicel Safety Systems (Jiangsu) Co., Ltd.		
Others		Membrane separation modules for water treatment, transportation & storage services, and other products	<b>Domestic</b> Daicel Chemical Industries, Ltd. Daicen Membrane-Systems Ltd. Daicel Aboshi Sangyo Co., Ltd. Daicel Ohtake Sangyo Co., Ltd. Daicel Arai Chemical, Ltd. Daicel Logistics Service Co., Ltd. <b>Overseas</b> Daicel Chemical (China) Investment Co., Ltd.		

# Global Network

The Daicel Group has continued its global expansion since Daicel (U.S.A.), Inc., our first international affiliate, was established in Los Angeles, U.S.A. in 1984. The group now lists 36 international affiliates. For the fiscal year ended

March 31, 2008, international sales totaled ¥15,820 million, or 37.9% of total consolidated sales, a percentage that has been increasing annually. Clearly, our international business operations are increasing in importance.

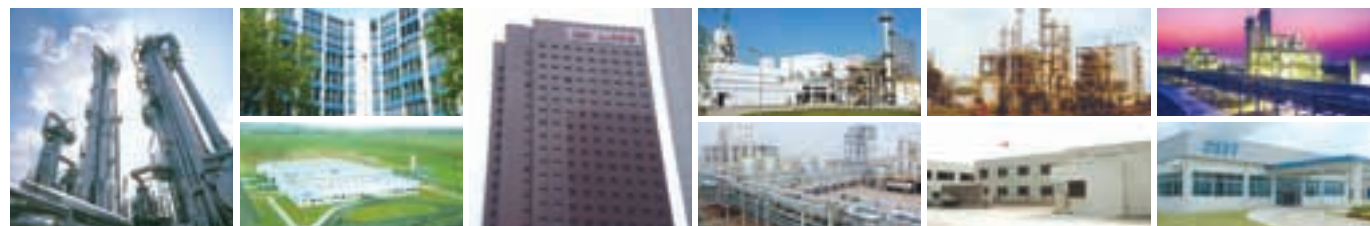
## Principal International Affiliates of the Daicel Group



## Principal Domestic Locations



Osaka Head Office	Mainichi Intecio., 4-5, Umeda 3-chome, Kita-ku, Osaka 530-0001, Japan
Tokyo Head Office	JR Shinagawa East Bldg., 2-18-1, Konan, Minato-ku, Tokyo 108-8230, Japan
Himeji Technology Head Office	1239, Shinzaike, Aboshi-ku, Himeji-shi, Hyogo 671-1281, Japan
Nagoya Sales Office	Horiuchi Bldg., 25-9, Meieki 3-chome, Nakamura-ku, Nagoya-shi, Aichi 450-0002, Japan
Fukuoka Office	Fukuoka Central Bldg., 15-33, Daimyo 1-chome, Chuo-ku, Fukuoka-shi, Fukuoka 810-0041, Japan
Kanzaki Plant	12-1, Kanzaki-cho, Amagasaki-shi, Hyogo 661-0964, Japan
Himeji Production Sector/Aboshi Plant	1239, Shinzaike, Aboshi-ku, Himeji-shi, Hyogo 671-1281, Japan
Himeji Production Sector/Hirohata Plant	12, Fuji-cho, Hirohata-ku, Himeji-shi, Hyogo 671-1123, Japan
Harima Plant	805, Umaba, Ibogawa-cho, Tatsuno-shi, Hyogo 671-1681, Japan
Arai Plant	1-1, Shinko-cho, Myoko-shi, Niigata 944-8550, Japan
Ohtake Plant	1-4, Higashisakae 2-chome, Otake-shi, Hiroshima 739-0695, Japan
Himeji Research Center	1239, Shinzaike, Aboshi-ku, Himeji-shi, Hyogo 671-1283, Japan
H.R. Training Center	14-1, Kouto 3-chome, Kamigori-cho, Akou-gun, Hyogo 678-1205, Japan
Polyplastics Co., Ltd./Fuji Plant	973 Miyajima, Fuji-shi, Shizuoka 416-8533, Japan



# Chronology of the Daicel Group

Daicel was established in 1919 through the merger of eight celluloid producers. Today, we lead the industry in terms of both product quality and production volume. Since our earliest days, we have engaged in R&D of natural high-polymer resins to replace celluloid. In 1935, we succeeded with the integrated production of cellulose acetate and contributed to

the development of incombustible photographic films. We also developed technology used for organic chemicals such as fine chemicals and active pharmaceutical ingredients.

With the emergence of the petrochemical boom in the 1960s, we participated in a petrochemical complex project and initiated production of plastics. Building on our celluloid

technology, we entered the pyrotechnic devices business with products such as gunpowder. This segment eventually bore fruit with the development of automobile airbag inflators. In addition, we have been promoting decreased dependence on petroleum-based raw materials by using methanol as a substitute in the manufacture of acetic acid. And in 2007, we

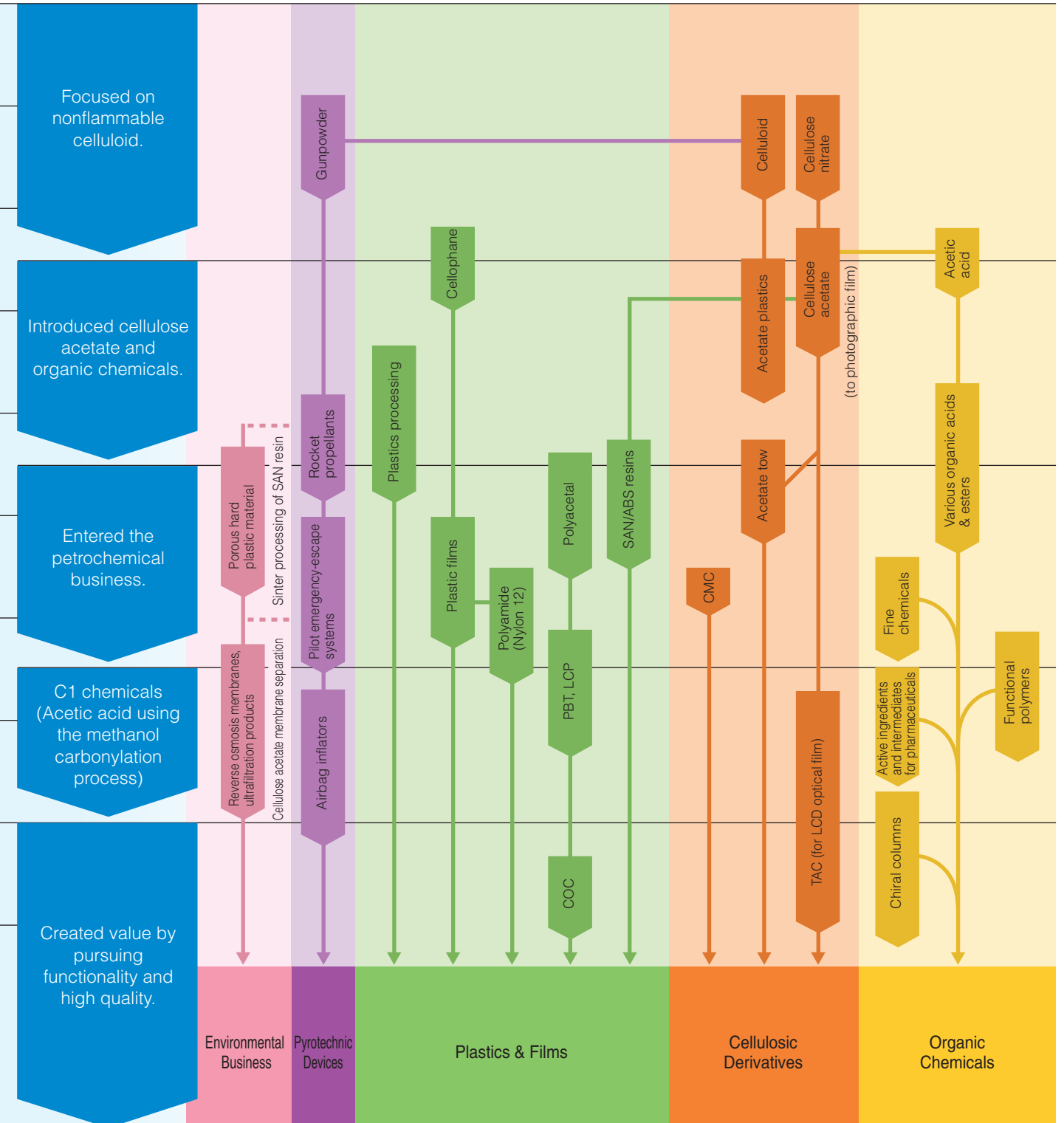
began operation of a plant using ethanol produced from biomass.

Clearly, the Daicel Group is doing more than simply providing materials needed by society—it is also contributing to the development of a sustainable chemical industry.

## Daicel Chronology

1910s	<ul style="list-style-type: none"> <li>The end of the First World War leads to a postwar recession.</li> </ul>	Dainippon Celluloid Company Limited is established in 1919 through merger of eight celluloid producers. Plants are established in Sakai, Kanzaki, Aboshi and Tokyo.		Our Aboshi Plant, a source of high-quality celluloid
1920s	<ul style="list-style-type: none"> <li>The Great Kanto Earthquake strikes (1923).</li> <li>The crash of the New York Stock Exchange triggers a global depression (1929).</li> </ul>	Amid a severe economic climate, the company undertakes research on photographic films as a successor to the celluloid business.		
1930s	<ul style="list-style-type: none"> <li>World War II breaks out (1939).</li> </ul>	Fuji Photo Film Co., Ltd. (currently FUJIFILM Corporation) is established and is spun off as a photographic film business. The company begins integrated production of cellulose acetate from its raw material, acetic acid, as part of a research project undertaken soon after the Company's establishment.		
1940s	<ul style="list-style-type: none"> <li>World War II ends (1945).</li> </ul>	The entire plant focuses on production of materials for the war effort, and some plants are damaged. After the war, plants that remained free from war damage return to production of goods for the peacetime economy. The company overcomes the challenges of designated compensation payments and the crisis of the call for the breakup of the company.		Film Research Center established in our Tokyo Plant
1950s	<ul style="list-style-type: none"> <li>Japan signs a peace treaty and regains its independence (1951).</li> <li>TV broadcasting begins (1953).</li> <li>Japan's first petrochemical complex opens in Yokkaichi (1959).</li> </ul>	The acetate business begins full-scale production. Cellulose acetate replaces cellulose nitrate as the base for photographic film, which renders film incombustible. Synthetic high-polymer plastics are introduced, and demand for celluloid declines. The plastics business is expanded.		
1960s	<ul style="list-style-type: none"> <li>The Japanese economy enters a period of rapid growth.</li> <li>The Tokaido Bullet Train line opens (1964).</li> <li>The Tokyo Olympics are held (1964).</li> <li>The first manned moon landing takes place (1969).</li> </ul>	With the rise of the petrochemical industry, Daicel becomes a member of the Iwakuni-Otake petrochemical complex and enters the petrochemical business. The high-polymer business is expanded.		Daicel enters the petrochemical business by establishing the Ohtake Plant.
1970s	<ul style="list-style-type: none"> <li>Expo 70 is held in Japan (1970).</li> <li>Okinawa is returned to Japanese control (1972).</li> <li>The first oil crisis occurs (1973).</li> </ul>	Excessive competition emerges in the petrochemical industry, resulting in low revenues, and 20% of employees accept an offer of voluntary early retirement. The oil crisis dampens economic growth and the cellophane business undergoes reorganization.		
1980s	<ul style="list-style-type: none"> <li>The Equal Employment Opportunity Law is enacted (1986).</li> <li>The Japanese economy enters the "bubble" phase.</li> </ul>	The use of non-petroleum-based raw materials is promoted and the manufacture of products using acetic acid from the methanol carbonylation process is expanded. A foundation for the production of functional chemicals and fine chemicals is created. The company enters the automobile airbag inflator business in earnest.		Acetic acid production facility in the Aboshi Plant employs the methanol carbonylation process.
1990s	<ul style="list-style-type: none"> <li>End of the Cold War.</li> <li>The Great Hanshin Earthquake strikes (1995).</li> </ul>	The Responsible Care initiative is introduced. The company enters the chiral chromatography business in earnest. The development of functional chemicals and fine chemicals is promoted. Domestic production of acetate tow for cigarette filters is increased and offshore production in China is begun.		
2000s	<ul style="list-style-type: none"> <li>Japan and Korea jointly host the World Cup of Soccer (2002).</li> <li>The Kyoto Protocol comes into force (2005).</li> <li>Economic growth accelerates in the EU and in the economies of Brazil, Russia, India, China and South Africa.</li> </ul>	The Integrated Production Center is completed in the Aboshi Plant. The automobile airbag inflator business is launched internationally, starting in the U.S.A. Cellulose acetate production is begun in China. In Japan, manufacturing facilities for cigarette filter tow and cellulose acetate and a circulation fluidized bed boiler are installed at the Ohtake Plant. This increases the plant's production capacity and supplants the Sakai Plant's production following its closure.		Production of acetate tow for cigarette filters in China is begun.

## Process of Business Development



## The manufacturing facility for cigarette filter tow is transferred from the Sakai Plant to the Ohtake Plant and manufacturing performance is increased.

Construction of the Yamatogawa Route of the Osaka Prefectural Expressway resulted in expropriation of a portion of the Sakai Plant site; consequently, production of acetate tow for cigarette filters was transferred to the Ohtake Plant. In addition, the Osaka Head Office in the city of Sakai—the birthplace of our business—was relocated to Osaka City. At the same time, we integrated our Osaka Sales Office within this new head office; seven group companies also relocated to this new head office.

### The cigarette filter tow manufacturing facility begins operation in the Ohtake Plant.



Manufacturing facility for acetate tow for cigarette filters in the Ohtake Plant

In October 2007, the Ohtake Plant completed construction of a manufacturing facility for acetate tow for cigarette filters, assuming the function previously filled by the Sakai Plant. After starting operation, this new facility increased acetate tow production by about 20 percent compared with the Sakai Plant. Our acetate tow for cigarette filters has earned praise for its quality and for our production/supply system and technical services. We are now developing our acetate tow business on a global level.

We recently expanded our Ohtake Plant site by purchasing three adjacent parcels of land. As a result, the Ohtake Plant now covers an area of roughly 470,000 square meters, twice the initial area of the plant. In addition, in July 2007 the Ohtake Plant started operating a cogeneration system mainly comprising a circulation fluidized bed boiler for thermal recycling of used tires. Moreover, a cellulose acetate manufacturing facility for protective film for LCD polarizing boards was constructed in the Ohtake Plant. These innovations have enhanced the manufacturing performance of the Ohtake Plant; as a result, it is being used to manufacture cellulosic derivatives as well as conventional organic chemicals. The Ohtake Plant, together with the Aboshi Plant in the Himeji Production Sector, function as two of our most important manufacturing hubs and help to ensure the continued growth of our company.

### Mainichi Intecio is home to our new Osaka Head Office in Kita-ku Osaka.

In August 2007, we relocated our Osaka Head Office to the Mainichi Intecio building in Kita-ku, Osaka City. In a new city center complex known as Osaka Garden City, it has direct links to JR Osaka Station, Nishi-Umeda Subway Station, and three other railroad stations through underground passages.

Mainichi Intecio is a 21-story office building opened in August 2007. It features environment-friendly air conditioning systems and advanced security systems. Our head office occupies the 19th to the 21st floors of the building, which is located at 4-5, Umeda 3-chome, Kita-ku, Osaka.

#### The Group companies listed below also relocated to Mainichi Intecio in August 2007.

- Kyoei Shokusan Co., Ltd.
- Daicel Logistics Service Co., Ltd.
- Daicel FineChem Ltd.
- Daicel Polymer Ltd.
- Daicel Value Coating Ltd.
- Daicel-Evonik Ltd.
- Daicel Membrane-Systems Ltd.



Mainichi Intecio

## Constructed to herald the emergence of the Japanese chemical industry, the Sakai Plant existed for a century, manufacturing a variety of essential products.

### The Sakai Plant ceased operations in December 2007.

The forerunner of the Sakai Plant was Sakai Celluloid, Ltd., an enterprise established in 1908 by the Mitsui family. It began production of celluloid in 1911, and in 1919, eight celluloid companies merged to create Dainippon Celluloid Co., Ltd., our flagship plant.

In 1948, we started production of acetate filament, and in 1958, we applied our outstanding acetate filament manufacturing technology to begin production of acetate tow for cigarette filters. Today, we supply this acetate tow to countries around the world. Later, when plastics became prominent, we started producing ABS resins, and when filtration technology became widely adopted, we started production of separation membranes. Transparent touch panels became our next product once demand for data entry devices increased. Throughout our history, we have been developing and manufacturing products demanded by the market.

One hundred years have now passed since our company was founded. Evolving in step with the modernization of the Japanese chemical industry, the Sakai Plant developed and provided a variety of products. In December 2007, however, the Sakai Plant finally ceased operations after completing its important function.

#### Established in 1908, the Sakai Plant ceased operations in 2007.

- 1908: The company is established as Sakai Celluloid, Ltd. and begins construction of the Sakai Plant.
- 1911: The completed Sakai Plant begins production of celluloid.
- 1919: Eight celluloid companies merge to create Dainippon Celluloid Co., Ltd.
- 1948: Production of acetate filament begins.
- 1958: Production of acetate tow for cigarette filters begins.
- 1961: Production of Cevian-N SAN resin begins.
- 1968: Production of Cevian-V ABS resin begins.
- 1975: Production of reverse osmosis membranes begins.
- 1976: The Filter Tow Technical Service Center is established.
- 1983: The compound manufacturing facility is upgraded. The Plastic Development Center is established. Production of touch panels begins.
- 1989: The plant is awarded the PM Excellence Prize (1st class).
- 1994: The plant is awarded the "Excellent Workplace that Handles Hazardous Substances Prize" from the Commissioner of the Fire and Disaster Management Agency.
- 1995: The plant is granted certification of ISO 9002 registration for production of acetate tow for cigarette filters.
- 1997: Touch Panel Systems K.K. obtains certification of ISO 9002 registration. Daicel Membrane-Systems Ltd. obtains certification of ISO 9002 registration.
- 2007: The Sakai Plant is closed to accommodate construction of an expressway and the acetate tow manufacturing facility is transferred to the Ohtake Plant. As a result, manufacturing performance is improved.



The plant started out manufacturing celluloid products. Celluloid was one of the main plastic products until the 1960s.



American engineers designed the brick structures.

### The Monument for Safety is transferred to the H.R. Training Center.

On August 21, 1982, the Sakai Plant was the site of a disastrous explosion and fire. The story of this accident has remained in our memories, and we have made it part of our history to ensure it is never forgotten. This disastrous accident took the lives of six employees and caused significant damage to the surrounding neighborhood.

To ensure this accident and the importance of ensuring safety remain in our consciousness, we established the Monument for Safety at the Sakai Plant in 1984. Because we have had to cease operations at the Sakai Plant, however, we have decided to transfer the Monument for Safety to the H.R. Training Center.

In the future, whenever a new generation of employees undergoes training, they will be brought to the Monument to swear their commitment to upholding safety.



The head office and Sakai Plant shortly after the company was founded.



The Monument for Safety is being transferred to the H.R. Training Center.

### The Sakai Plant site is subjected to a voluntary soil survey, resulting in an interim report and pollution control measures

In October 2007, following the closing of the Sakai Plant, we launched a voluntary soil survey on the site. As a result, we discovered mercury and five other contaminants exceeding environmental standards on part of the site. We took the results of this survey very seriously and decided to implement measures to ensure the contaminated soil is removed under the direction of the Sakai City government.

For additional details, please refer to our website, indicated below (Japanese version only).

<http://www.daicel.co.jp/news/data/08040101.pdf>

**Whether introducing a new feedstock and process or devising ways of making and shipping our products, we remain committed to environmental preservation.**

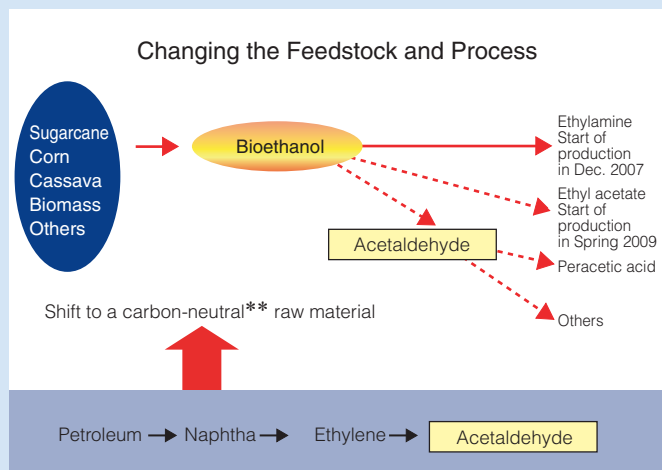
**Feedstock and processes** | We use bioethanol in place of oil to reduce greenhouse gas emissions.

As a substitute for crude oil, biomass\* is now attracting considerable attention because its use can reduce emissions of CO<sub>2</sub> to zero. Bioethanol, produced from biomass, can be used for production of various chemical products (see accompanying figure). It is, therefore, now regarded as key to development of a sustainable and petroleum-free chemical industry.

Daicel has changed the feedstock to bioethanol and also changed the process.

The Ohtake Plant has become our first plant to use bioethanol. The ethylamine manufacturing system in this plant began operation in December 2007. (Ethylamine is used as a raw material in pharmaceuticals and agricultural chemicals.)

In addition, in spring 2009, we are planning to become the first in Japan to produce ethyl acetate from bioethanol. Ethyl acetate is used exclusively for products such as paint, ink, adhesives, pharmaceuticals, and agricultural chemicals, and demand for this product has recently grown. In Japan, naphtha, produced from petroleum, is now mainly used as the feedstock for ethyl acetate. For this reason, our bioethanol-based production method for ethyl acetate is attracting considerable attention.



\* An organic biological resource containing no fossil fuels.  
 \*\* Biomass such as wood is "carbon neutral" because combustion of biomass does not increase carbon dioxide in the atmosphere.

**Transportation** | Further reducing greenhouse gas emissions through a modal shift to marine transport

Since most of our plants are situated along the Seto Inland Sea, we have been promoting marine transport in order to reduce energy consumption and CO<sub>2</sub> emissions attributable to transportation. Marine transport allows for both increased cargo volumes and reduced transport frequency. Consequently, compared with truck transport, marine transport offers considerable reductions in energy consumption and CO<sub>2</sub> emissions.

Since the construction of the acetate tow manufacturing facility in the Ohtake Plant in Hiroshima Prefecture was completed in October 2007, the Daicel Chemical Group has implemented a modal shift for physical distribution from land transport to marine transport for the Hanshin-Himeji-Ohtake route. Acetate tow is a fiber used in cigarette filters, and the Daicel Group is now developing its acetate tow market globally.

The Ohtake Plant is now targeting a modal shift of 180,000 tons/year by adopting marine transport not only for product shipments but also for receiving shipments of cellulose diacetate (the raw material used for acetate tow) and pulp (the raw material for cellulose acetate used in the manufacture of LCD films). We have estimated that this modal shift will reduce energy consumption by 12% and reduce CO<sub>2</sub> emissions by 3,200 tons/year.

**New Energy and Industrial Technology Development Organization (NEDO) subsidizes land transport. However, we are now promoting the modal shift from land transport to marine transport.**

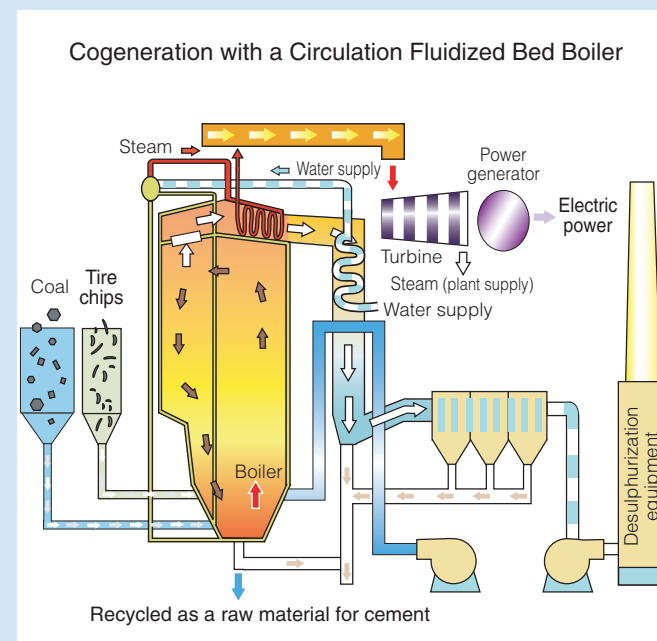


Container ship anchored in the Port of Ohtake

**Production** | Our new cogeneration system is fuelled by discarded tires.

In an effort to reduce the environmental impact generated by our plants, we have adopted environmentally sound methods for our electric power and steam generation systems.

For example, in July 2007 our Ohtake Plant introduced a cogeneration system equipped with a circulation fluidized bed boiler. By circulating hot sand in the combustion chamber, this boiler ensures good combustion even when burning a recycled fuel source such as used tires.



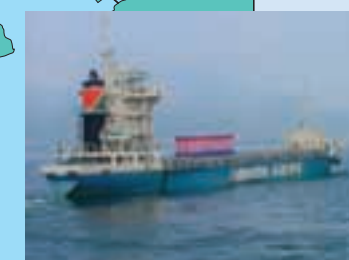
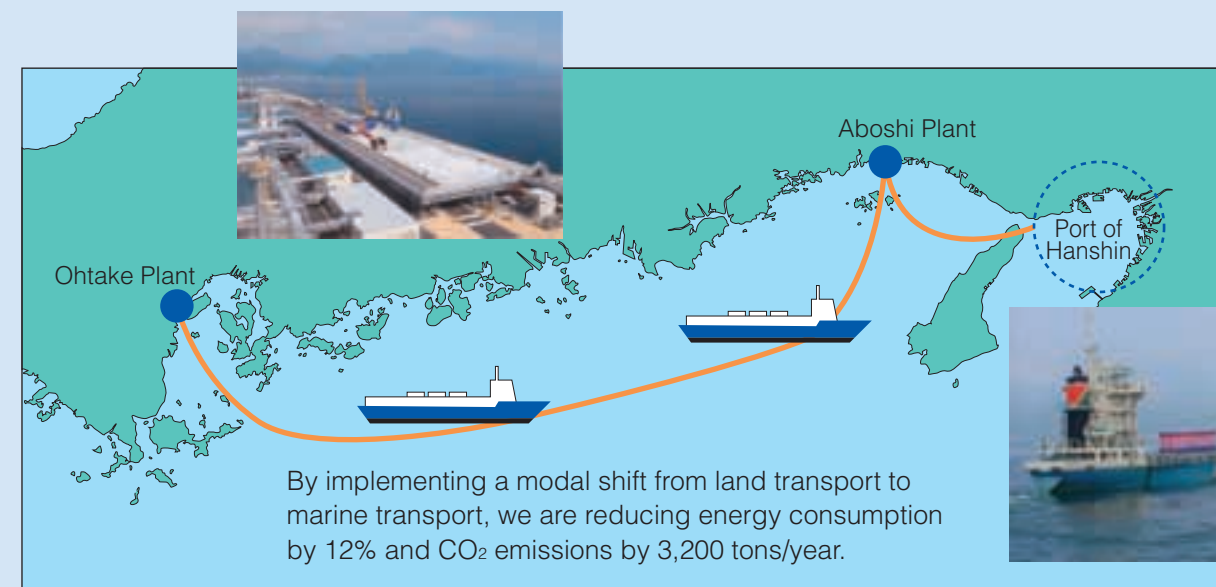
The Ohtake Plant's circulation fluidized bed boiler

With this system, the Ohtake Plant can generate electric power and steam very efficiently. In addition, the plant will be able to dispose of 110,000 tons of used tires every year. Moreover, the ash that remains from the combustion process is being recycled outside the plant as a component of cement.

The Fuji Plant of Polyplastics Co., Ltd., a member of the Daicel Group, has introduced a gas engine cogeneration system fuelled by city gas, a much cleaner energy source than petroleum. Cogeneration systems are highly efficient systems that generate both heat and electric power at the same time. As a result, they are very effective at reducing both energy consumption and CO<sub>2</sub> emissions.

In December 2007, the Port of Ohtake introduced regular service of a new line of international container ships. We have been promoting the use of this port for shipment of our acetate tow and other

products. Since the port is adjacent to our plant, it is reducing our costs while contributing to a more eco-friendly approach to physical distribution.





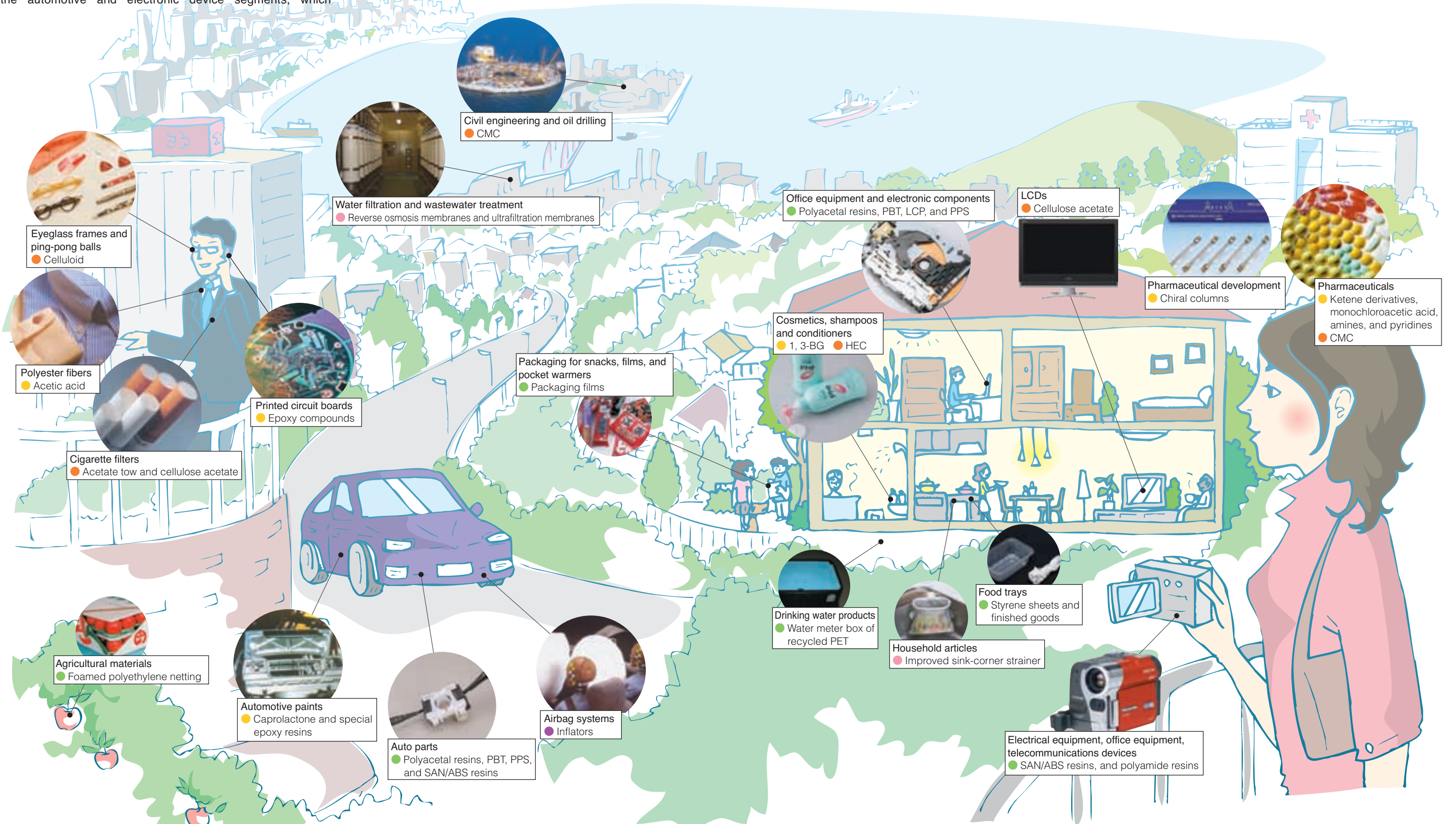
# The Major Applications of Our Products: Daicel's Role in Society

Many of the products of the Daicel Group have been developed for specific applications—such as acetate tow for cigarette filters and cellulose acetate for LCD films—and offer the high added value for which the Daicel Group is known. We boast industry-leading technologies and raw materials for the pharmaceutical and agricultural chemical segment as well as the automotive and electronic device segments, which

represent the strongest segments of the Japanese economy. However, many of the products manufactured by our Group are raw materials, and the general public has little opportunity to see them. Here, we introduce the familiar products we make that have been developed with our own materials and technologies.

Legend:

- Main product application — LCDs
- Segment and product — Cellulose acetate
- Organic chemicals
- Cellulosic derivatives
- Plastics and films
- Pyrotechnic devices
- Others



## Products and Technologies that Contribute to a Healthier Environment

### Daicel Pack Systems Ltd. Celcompact

Celcompact is an eco-friendly, lightweight, and volume-reducible plastic container manufactured and sold by Daicel Pack Systems Ltd., a member of the Daicel Group.

Although quite thin, this plastic container does not break easily. This innovative plastic container is unlike others, as it can be easily twisted and crushed by hand. In addition, a crushed container retains its crushed shape. Consumers frequently complain that plastic containers are too bulky to dispose of and require a great deal of storage space. Celcompact, however, overcomes these problems. In addition, this plastic container contributes to the efficient collection of waste plastic containers.

To reduce the environmental impact, we have made efforts to conserve the resources used to produce containers. As a result, we developed containers that are 20% to 30% lighter than conventional containers produced in 2005.

Daicel Pack Systems Ltd. is participating in the "Container & Package Diet" initiative promoted by the prefectures of Saitama, Chiba, Tokyo, and Kanagawa and the cities of Yokohama, Kawasaki, Chiba, and Saitama.

For a detailed description of our lightweight container manufacturing operations, refer to the following website on the "Container & Package Diet" initiative (Japanese version only): [http://www.diet-youki.jp/jirei.php?u\\_id=25](http://www.diet-youki.jp/jirei.php?u_id=25)



We've developed containers that are 20% to 30% lighter than the conventional containers produced in 2005.

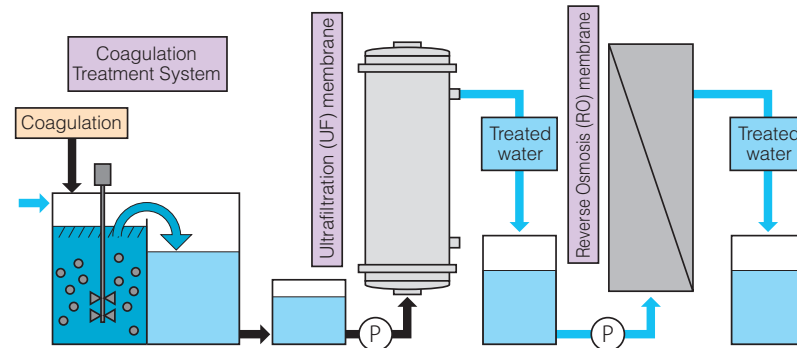


Logo of "Container & Package Diet" initiative being promoted by eight cities and prefectures

### Daicem Membrane-Systems Ltd. Industrial Wastewater Treatment System Incorporating Coagulation Membrane

Daicem Membrane-Systems Ltd., a Daicel Group company, is marketing a revolutionary industrial wastewater treatment system combining coagulation sedimentation, an Ultrafiltration (UF) membrane, and a Reverse Osmosis (RO) membrane. The UF membrane employed in this system quickly coagulates sediments, oil, and impurities in wastewater and removes

suspended solids. The RO membrane also removes various environmentally hazardous dissolved solids. The COD removal ratio exceeds 95 percent, and the system is capable of supplying high-purity treated water without the use of activated sludge treatment or activated carbon treatment.



### Daicem Membrane-Systems Ltd. PEARLCOMB Membrane Diffuser

The PEARLCOMB Membrane Diffuser (a membrane-type ultrafine foam diffuser) was developed through a joint venture between Daicem Membrane-Systems Ltd. and Japan Sewage Works Agency. Designed for wastewater treatment, this diffuser is now being sold by Daicem Membrane-Systems Ltd.

Since this diffuser generates ultrafine foam, it can efficiently move oxygen and reduce the air volume by 30% (measured value) compared with conventional diffusers. In addition, unlike conventional ultrafine foam diffusers, the PEARLCOMB Membrane Diffuser can be installed on existing equipment easily without

complex piping work or any other remodeling work.

The results (data on oxygen movement efficiency of diffusers) for this product are being presented at the 45th Sewage Research Meeting scheduled for July 22–24, 2008.

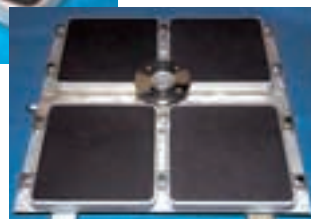
In March 2007, this product was recognized with the awarding of the Certificate of Construction Technology. This certificate can be viewed on our website at the following link (Japanese version only): [http://www.daicem.co.jp/topics/topics\\_parts/topics\\_070302.html](http://www.daicem.co.jp/topics/topics_parts/topics_070302.html)



Model PMD-P300 (panel type)



Model PMD-P300R (panel type)



### Daicel Polymer Ltd. PLASTRON

To protect the Earth from the threat of global warming, the automobile industry is now developing lighter weight vehicles that consume less fuel. As part of this effort, metal auto parts are now being replaced with plastic parts.

At the same time, wind power generation systems are now attracting considerable attention as an eco-friendly source of power. Since larger wind power generators are needed for such systems, it is necessary to manufacture increasingly lightweight generators. For this reason, generators are now being made with plastic parts; however, wind power generators are used under difficult conditions. For this reason, demand has grown significantly for stronger and more heat-resistant plastics.

PLASTRON—a plastic manufactured by Daicel Polymer Ltd., a member of the Daicel Group—exhibits high mechanical strength, excellent heat-resistance, and outstanding weatherability. Previously, it has been difficult to use plastics for vehicle bodies, engine parts, and wind power generators. However, because of its outstanding strength, PLASTRON is now being used for such parts.



Wind power generator made of PLASTRON (Manufactured by Nasu-Denki Tekko Co., Ltd.)

### Daicel Polymer Ltd. CELROOT, an Innovative Resin Ingredient for Plating

Although hexavalent chromium is toxic to humans, it is still in wide use in industry. In the process known as etching, which makes use of metal-plated plastic, hexavalent chromium is indispensable for strengthening the adhesive bond between the plastic substrate and the metal. Daicel Polymer Ltd., in collaboration with Okuno Chemical Industries Co., Ltd., has developed an innovative new product known as CELROOT resin (trademark pending) for use with plating. This innovative product has made it possible to perform resin plating without the use of any hexavalent chromium, even though it is not significantly different from the conventional process. This product has garnered a tremendous response from those customers who are highly focused on environmental concerns.

### Daicel Polymer Ltd. CELPURGE Cleaning Agent for Molding Machines

The vast majority of diverse plastic products we use in our daily lives are manufactured by heating plastic resins until molten and injecting them into a mold. During product changeovers at worksites using plastic processing machinery such as injection-molding machines and extruders, it is necessary to purge the plastic resin from inside the machinery. This procedure generates a large amount of industrial waste.

CELPURGE, a product of Daicel Polymer Ltd., generates less waste during product changeovers and effectively reduces power consumption thanks to the reduced changeover time. As a result, applications for this product are expanding.

To accommodate customer requests, the company has developed a new grade of this product that is easier to handle while enhancing the effectiveness of the cleaning agent.



CELPURGE cleaning agent for molding machines



A molded item with decorative plating made of revolutionary CELROOT material

Applying this excellent plating to the exterior adds outstanding heat resistance (200°C). Plated resin decorated components are used in a wide range of useful applications such as sports equipment; as parts for plumbing, bathrooms and kitchens; and as auto parts such as emblems and radiator grilles and the like.

### Daicel Chemical Industries, Ltd. Airbag Inflators

An airbag inflator, a central component of automobile airbag systems, dispenses gas to the protective airbag at the moment of impact in the event of a collision.

Daicel had been actively involved in environmental measures since inflators were first developed.

In order to contribute to improved automobile fuel consumption, we have been developing lightweight inflators. This effort has achieved a 22% weight reduction compared to our 2001 product.

The Law Concerning Recycling Measures for End-of-life Vehicles (The End-of-life Vehicle Recycling Law) came into effect in Japan on January 1, 2005. In response, we launched the full-scale operation of our inflator recycling business. This business utilizes the airbag inflator recovery and processing system demonstrated and established by the Japan Automobile Manufacturers Association, Inc., the Japan Auto Recycling Partnership, and other organizations in 1998. As a result, inflators that have been removed and recovered from end-of-life vehicles can be safely recycled.



Automobile airbag inflators



Processing facility for recovered airbag inflators

# Production innovations lead to remarkably improved productivity.

The adoption of innovative systems through comprehensive standardization has made it easier to transfer the necessary skills to new employees, resulting in highly stable production.

## Background Many operators now approaching retirement age

Our chemical products have a wide range of application in society, and we see it as our responsibility to ensure a stable supply of these products. Consequently, we have implemented continuous improvements in our production technologies; for example, in the 1980s, we introduced general-purpose computers for plant control; and in the latter half of the 1990s, we adopted production innovations by thoroughly reviewing our personnel training, organizations, and production methods as well as our operation control systems. As a result, we have achieved remarkable progress; in fact, these production innovations tripled our productivity per plant employee.

Our decision to initiate these production innovations was triggered by the realization that many of the operators at the Aboshi Plant were approaching retirement age.

## Initiatives Improving personnel training and systems for the transfer of advanced skills

In the first half of the 1990s, several operators managed the plant by monitoring about 10 computer terminals (representing 4,000 pages of screens). The information displayed on these terminals alerted the operators to any problems that arose so that they could respond immediately with preventive measures. The operators remained carefully focused on all operations, and their jobs required a high level of skill. The prospect of many skilled operators retiring at around the same time clearly presented a challenge to maintaining the stability of our production.\*

To ensure production stability following the retirement of many of our experienced operators, we organized a project team mainly comprising personnel from our Production Division of the Aboshi Plant. This project team used an experimental approach to finally develop an innovative system we call the Intellectual and Integrated Production System. This system required that we completely renew the core of the plant; specifically, we addressed our personnel training, organizations, information system, and production system.

\* Operation shuts down automatically if a problem is detected, and the process of restarting operation requires a great deal of time and energy. The result is a significant negative impact on productivity. Therefore, operators must be able to detect the signs of impending problems before a shutdown is required. In a chemical plant, continuous operation ensures stable operation, and stable operation ensures efficient production. Clearly, therefore, operators are an important link in the chain that contributes to stable operation.

### 1. Devising a system for the systematic transfer of skills to the next generation

For our personnel, we have established a system and organization to ensure the systematic transfer of skills to the next generation from our personnel who are highly experienced in operation and equipment control. Management is cooperating with the Operation Training Center to train the next generation of employees to become professionals in the realm of innovative manufacturing and is achieving good results. (See page 20 for a detailed description.)

### 2. To encourage manufacturing innovation, reorganization by function is accorded the highest priority.

We also greatly modified our organization. Previously, our Aboshi Plant was organized into many small sections according to the various products of our companies and business divisions.

We reorganized the Aboshi Plant according to the four important functions of innovative manufacturing: production, manufacturing technology, environmental safety, and assurance of functionality. We also considered the flow of manufacturing from raw material to intermediate product and final product.

#### Outline of Our Production Innovations

1. Compiling all our knowledge and experience related to manufacturing
2. Standardizing all compiled knowledge and experience
3. Systemizing our standardized knowledge and experience to create the Intellectual and Integrated Production System
4. Training our personnel in the management and operation of our Intellectual and Integrated Production System
5. Reorganizing to accommodate integrated production for manufacturing

#### Innovations Introduced at the Aboshi Plant

Organization	Personnel	Systems
Management according to function	Comprehensive optimization with emphasis on personnel	Consolidation of information
Horizontal assignment of functions and intellectual integration	New role-sharing and assignment of employees and systems	A single control room for the entire plant (Integrated Production Center)
Vertical assignment of functions and intellectual integration	Shifting of personnel toward creative tasks	Consolidation of information and control systems
	Decision-making based on reliable forecasting and estimation	

The Integrated Production Center responsible for the entire Aboshi Plant

The Aboshi Plant produces acetic acid using the methanol carbonylation process.



### 3. The Intellectual and Integrated Production System: Ensuring any single operator can maintain stable operation

Our Intellectual and Integrated Production System integrates the expertise of highly skilled operators to ensure that any single operator who has passed the specified training course can maintain stable operation. In implementing this system, we have standardized the decision-making process of experienced operators and adopted a logical judgment process. Specialized experience of particular importance and “fuzzy areas” are described in readily accessible lists of expert information.

The single window hierarchical monitoring screen enables an operator to gain a comprehensive and detailed understanding of plant status.

In addition to developing this outstanding system, we established the Integrated Production Center in the heart of the plant in an effort to centralize the information and personnel needed for manufacturing. This centralization has resulted in faster communication between employees and divisions while removing the barriers that had existed between the various divisions.

The themes common to the above improvement activities are comprehensive optimization and standardization.

In a chemical plant that operates on a 24-hour-a-day basis, operators work three shifts every day on very difficult tasks. One major target of production innovation is to reduce the stress on operators so that they can engage in work that is more creative.

## Main achievements A model case of production innovation in a domestic processing plant

In June 2000, we first established our Intellectual and Integrated Production System in one area of the Aboshi Plant, eventually enlarging the system application area. Today, all our products are manufactured with this system. Since the Intellectual and Integrated Production System was introduced, we have managed to reduce the frequency of alarm activations by about 80%. This has greatly reduced the number of problems capable of suspending operations; in other words, this system has contributed to the stability of our operations. As a result, we have tripled our productivity. Moreover, since this system has eased the burden on our operators, they can now engage in creative tasks such as improving quality.

The expertise gained through production innovations—including

detection of latent problems, standardization of experience, and comprehensive optimization—is now being used and refined in our processing plants (Ohtake Plant and Arai Plant). In addition, this expertise is being used for improvements of back-office sections or divisions; therefore, to maintain this production innovation, we established our Production Innovation Center.

In 2002, the Society of Chemical Engineers of Japan awarded the Aboshi Plant the Technical Assistance Award for this production innovation, and it is now attracting considerable attention from the Ministry of Economy, Trade and Industry and many other corporations and organizations. So far, 4,000 persons from 500 companies have visited our plant. Since many manufacturers are interested in our production innovation method, we have collaborated with Yokogawa Electric Corporation in the launch of a consulting service for these manufacturers. Through this initiative, we are contributing to development of a process-oriented raw material sector.

As our key plant, the Aboshi Plant (photo) manufactures cellulose acetate, acetate tow for cigarette filters, and other products from methanol, wood pulp, and other sources.



# Our Operation Training Center transfers skills to the next generation of employees.

We established our Personnel Training System as a means of contributing to production innovation. This system trains our employees as professionals who can help maintain stable production.

## Background Automation does not transfer skills to the next generation.

Even as we promote automation to the maximum, we should also preserve the skills of our operators and supervisors. The production innovations we have implemented since the latter half of the 1990s are intended to simultaneously accommodate the contradictory requirements of automation and the transfer of skills to the next generation.

In the 1980s, most of the operations of chemical plants were automated. Plant facilities, however, comprise an enormous number of parts, so minor problems occur frequently; human errors, although less frequent, also occur. Operation control systems are designed to solve problems automatically; however, if an unexpected problem occurs, a manual solution will be required.

From the vast amount of information displayed on computer terminals, operators can determine the status of the plant and detect latent problems. Maintenance personnel know all the parts of the vast plant, such as valves, in great detail. Moreover, advanced operation control systems have been introduced. With the support of experienced personnel and such systems, a chemical plant can maintain stable production.

Conventionally, experienced maintenance personnel have become familiar with all the valves and the pipes running in various directions throughout the plant. Since they were very skilled, they were almost able to sense problems from the atmosphere of the plant. In the 1980s, it became difficult for such veterans to transfer their skills to younger employees, mainly because of the use of advanced operation control systems. Since these control systems greatly reduced the number of problems, new maintenance personnel had little opportunity to acquire the technical skills needed for a chemical plant.

The Operation Training Center, located in the Aboshi Plant, features a training plant where anyone can learn to operate the reaction, evaporation, and distillation processes as well as the plant operation room and the training room. This training center is staffed by the head of the training center and three full-time training staff.

## Initiatives Establishment of the Operation Training Center

Considering this background, we have promoted production innovations while emphasizing both system development and personnel training. When we launched the Intellectual and Integrated Production System, an advanced automated system, the requirements for our employees were as follows.

1. All employees should know the system, observe the rules, and follow the procedures specified in the manuals. In addition, all employees should develop the skills necessary for the above.
2. All employees should develop the skills to respond appropriately when the system encounters an unexpected problem.

It is difficult to train employees for the skills specified in item 2 above, but such skills are very important and should be transferred to the next generation. Why is this skills transfer so difficult? Because acquiring problem-solving skills requires that employees experience problems. Clearly, such skills can only be acquired personally and cannot be clearly shown to others.

To resolve this problem, we established the Operation Training Center in April 2002. The Center features a small-scale training plant containing the reaction, evaporation, and distillation processes, and the operation control system is equipped with computers. This training plant is used to simulate problems. At the system development stage, we thoroughly compiled the experience and skills of our employees and standardized the operation methods of skilled operators in order to transfer their methods to the younger generation of operators. For this reason, the Operation Training Center enables employees to gain practical experience in dealing with real problems using the methods of skilled operators.

According to Yoshiyuki Harano, General Manager of the Operation Training Center, "In 1998, in the midst of implementing production innovations, we launched our second long-term plan. We determined that the approach to our operations would be that of 'a company operated by a professional group.' This means that the company requires that all employees obtain advanced skills and simultaneously provides full support for all employees who are obtaining such skills. In light of this policy, we established the Operation Training Center to train professional operators capable of promoting production innovations.

"The Operation Training Center allows employees to experience the production process in order to teach them not only the method of operating the Intellectual and Integrated Production System but also the technologies common to the entire company and the 'routines of Daicel Chemical.'"



In the operation room of the small-scale training plant, trainees monitor the information displayed on computer terminals to learn how to respond if a problem occurs in the plant.



The training room contains cutaway models of various pieces of equipment found in the plant. This enables the trainees to learn the mechanisms of the plant equipment and the maintenance methods.

## Main achievements Establishing a curriculum for transferring skills to the next generation

The Operation Training Center successfully implements the Intellectual and Integrated Production System by integrating on-the-job training. The Center greatly accelerated the operator training period thanks in part to the curriculum we established for the purpose of transferring skills to the next generation while promoting automation.

The curriculum comprises three areas: knowledge, experience, and action. "Knowledge" refers to knowledge of the substances we are manufacturing, knowledge of chemistry and chemical engineering, and knowledge of equipment and instruments. "Experience" includes experience in plant operation, troubleshooting, and other aspects. Knowledge and experience clearly complement each other. "Action" refers to the basic actions required to ensure safety and product quality; action requires knowledge and experience.

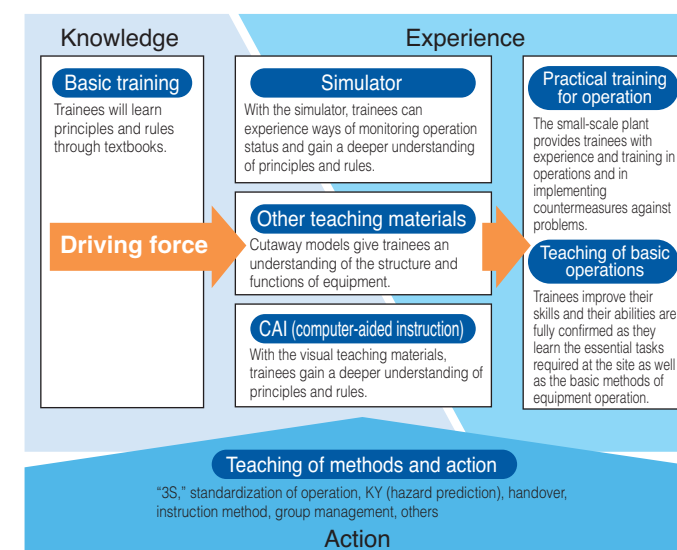
We analyzed and standardized the experience of many veteran operators and facility controllers and found that their skills consist of the above three elements. After analyzing their skills from the perspective of these three elements, we were able to reflect their intangible experience into tangible intellectual property that can be systematically transferred to the next generation.

The Operation Training Center has prepared several curriculums to teach knowledge, experience, and action and to transfer to the next generation the expertise developed after years of plant control and operation. Since its establishment in 2002, the Operation Training Center has trained more than 1,000 employees in these curriculums. In this way, the Center is making a significant contribution to improving our technologies.

It is difficult to show to what extent these skills have been transferred to the next generation, but our employees in each plant are now independently taking actions as professionals while observing the rules and fundamentals.

Initially, the Center was established to provide operators with basic training. Today, however, the Center is providing basic training courses to all new employees, training technicians, and providing training courses for core technicians who will become leaders in the near future. In this way, the Operation Training Center is playing an important role and meeting our high expectations.

### Basic Structure of the Training Curriculum



## We train our employees to contribute to society through manufacturing.



**Yoshiyuki Harano**  
General Manager of the Operation Training Center

Professionals are people who can continuously improve their own skills and increase their own value by offering their high degree of expertise. By integrating on-the-job training, the Operation Training Center provides motivation as well as knowledge, experience, and action. As a result, with the motivation they gain as professionals, our employees contribute to society through manufacturing. In this way, the Operation Training Center is training professionals.

## Human Resource Cultivation Efforts

The roles and responsibilities of the corporation, all workplaces, and all employees have been clarified to maintain our group professionalism.

We believe that the growth of our employees will result in the growth of our company. We are therefore making efforts to provide our employees with extensive training to ensure we remain a company characterized by group professionalism. We define a professional as someone with the following qualities:

1. A person capable of independently determining his or her own future
2. A person capable of continuously improving his or her skills in order to increase his or her value and offer his or her advanced expertise to the company
3. A person who understands his or her role and responsibilities and follows his or her own beliefs to attain good results

Our company supports all employees in their efforts to develop into true professionals. Since each employee develops through exposure to work experience, we are promoting the following employee support programs:

1. an MBO (management by objectives) framework that helps employees develop by allowing them to challenge objectives;
2. identification of objectives for programmed personnel development targeting each individual employee (Personnel Plan);
3. a voluntary reporting system through which all employees express their wishes and consider their future careers (Personnel Development Report); and
4. implementation of various educational and training curriculums.

As described above, we support our employees by implementing training programs and establishing training systems and facilities that encourage our employees to develop as professionals.

Introductory training for all new employees provided by our personnel group

We provide all new employees with one year of training for manufacturing. This is introductory training, and the new employees learn company policy (including Responsible Care, corporate ethics, and health care), our personnel system, and basic skills and the like. In addition, our employees participate in external practical training courses, such as an experience course with the Self-Defense Force and a practical training course held in the plant. This enables the trainees to learn teamwork, rules, discipline, and the "3S" of *seiri* (tidying), *seiton* (putting everything in order) and *seisou* (cleaning). From such training, our employees gain the common sense needed to become working members of society and corporate employees and learn the basic skills needed for employment.



Introductory training for new employees

### A training center that brings employees together for study and interchange

Our H.R. Training Center is located in Harima Science Garden City, which houses scientific research institutes (including SPring-8), New SUBARU, the Hyogo Ion Beam Medical Center, and others. Daicel opened the H.R. Training Center in 1998 in order to provide a facility in which Daicel employees can study together, communicate, and refresh themselves. Situated at a distance from Daicel's other facilities, this training center gives trainees the opportunity to think deeply, discover new ideas, and develop intellectual skills.

In total, more than 7,000 employees use this training center annually. In addition to providing education and training, this center is used for company projects and improvement activities and the like.



H.R. Training Center

## Our Commitment to Our Technicians

Training technicians to become professionals capable of promoting innovation

Continuous growth is the responsibility of all companies, and product innovation and process innovation are the driving forces that provide this continuous growth. Our technicians play very important roles in promoting product innovation and process innovation. It is, therefore, indispensable that we train our technicians to become a group of professionals.

We have established a technician training system (described below) to support the development of each technician.

### Technician training system

The technicians we train are employees working in our technical divisions (our Production Technology, Engineering, and R&D divisions) as common employees (below a leadership rank) and graduates of a technical college or better. Even those technicians who do not meet the above conditions can attend the training course if a superior recommends them for such training.

#### Training for manufacturing

Intended for: Technicians in their first year with the company  
Trainees can experience and acquire the basics required for manufacturing.

This new technician training course includes training at the production site (including working on three shifts) that enables new technicians to learn and understand the basics of the production site. With the knowledge thus obtained, the trainees should absorb the four key aspects of plant management—safety, quality, cost and environment—to ensure so that they know all aspects of their work.

#### Special training for technicians

Intended for: Technicians with at least two years with the company  
To make them eligible for promotion to a leadership role, our technicians should acquire the following skills:

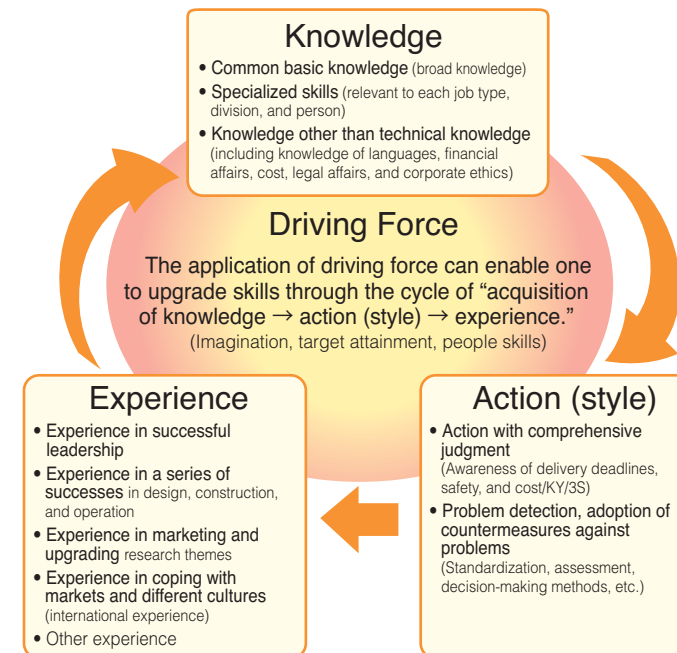
1. **Common basic skills**  
Minimum required skills currently being taught in training for manufacturing and the like (common to all fields and job types)
2. **Common application skills**  
Depending on the field or job type, some technicians may be required to refine some common basic skills. (The target level is above that of common basic skills.)
3. **Specialized skills**  
This is our company's expertise as required in the R&D, production technology, and product manufacturing technology divisions.
4. **Official qualifications**  
These include licenses (a hazardous substance handling license and the like) that employees of a chemical company should obtain as well as licenses that should be obtained as specific requirements of certain divisions.
5. **Knowledge other than technical knowledge**  
This includes basic knowledge (knowledge of financial affairs, legal affairs, corporate ethics, languages, etc.) needed for all fields and job types, excluding technical knowledge.

### Profile of our technicians

Our technicians should acquire the following skills at the specified levels and should have advanced techniques in their field of specialization. In addition, our technicians should lead their own technical fields by acting as senior players or managers with advanced specialist knowledge.

1. **Knowledge**  
Our technicians should have a broad range of knowledge as required for their work.
2. **Action**  
Our technicians should know how to act to solve problems (with a high awareness of cost, safety, and delivery deadlines as well as the skills to solve problems).
3. **Experience**  
Our technicians should have achieved a high level of skill in their field of specialization. In addition, they should have demonstrated results in their field.
4. **Driving force**  
Our technicians should have the power (imagination, target attainment, and people skills) to achieve good results with their technical skills.

### Technician Training Methods (How to improve skills)



Training provided at our Operation Training Center

## Personnel System

For enhanced productivity, we have adopted a system of human resource development based on merit.

◇ **Human resource development with an emphasis on merit**  
We evaluate the actions, abilities, and achievements of all our employees fairly according to merit. The results of these evaluations are reflected in their wages and opportunities for promotion. Through this approach, we can place a high value on those employees who contribute to development of our business.

As one of our management tools, we have introduced the "management by objectives" (MBO) framework. This allows us to evaluate not only the results but also the processes (such as planning processes and implementation processes). We also emphasize communication between superiors and their staff when training our employees.

In addition, we consider the abilities and the aptitudes of our employees so that we can provide each employee the optimal training and offer the optimal working arrangements.

### ◇ Self-actualization

Employees actively adopt the Plan-Do-Check-Act (PDCA) cycle in their work. As a result, they improve their abilities and experience a series of successes.

Since our employees engage in proactive self-evaluation, they can determine whether they are suitable for their jobs and can consider their careers with a long-term perspective. In addition, our employees use a self-reporting system (using human resource development sheets and the like) to fulfill themselves through their jobs, and at Daicel we support our employees so that they can develop on their own.

### Creating satisfying workplaces

In light of Japan's declining birthrate, aging population, and trend toward nuclear families, we welcome a more diverse workforce. For example, we are proactive about employing persons of advanced age and persons with disabilities; moreover, we provide a satisfying work environment so that our employees can work with a sense of security while devoting themselves to child rearing and nursing care responsibilities.

#### ○ Employment of persons of advanced age

In 2003, we launched our retired person reemployment system so that retired persons could make use of their skills and experience. We will continue to reemploy retired persons because many workplaces require the skills and experience of veteran employees.

#### ○ Employment of persons with disabilities

We actively employ persons with disabilities to enable many more of them to participate in society through work while experiencing the joy of work and a purposeful life. As for workplace assignments, we identify appropriate employment according to the degree of disability faced by the individual and we carefully consider ways in which we can enable such employees to demonstrate their capabilities to the maximum in accordance with the special qualities exhibited by each individual. In fiscal 2007, our employment rate for persons with disabilities reached 1.8% (the employment rate specified by law).

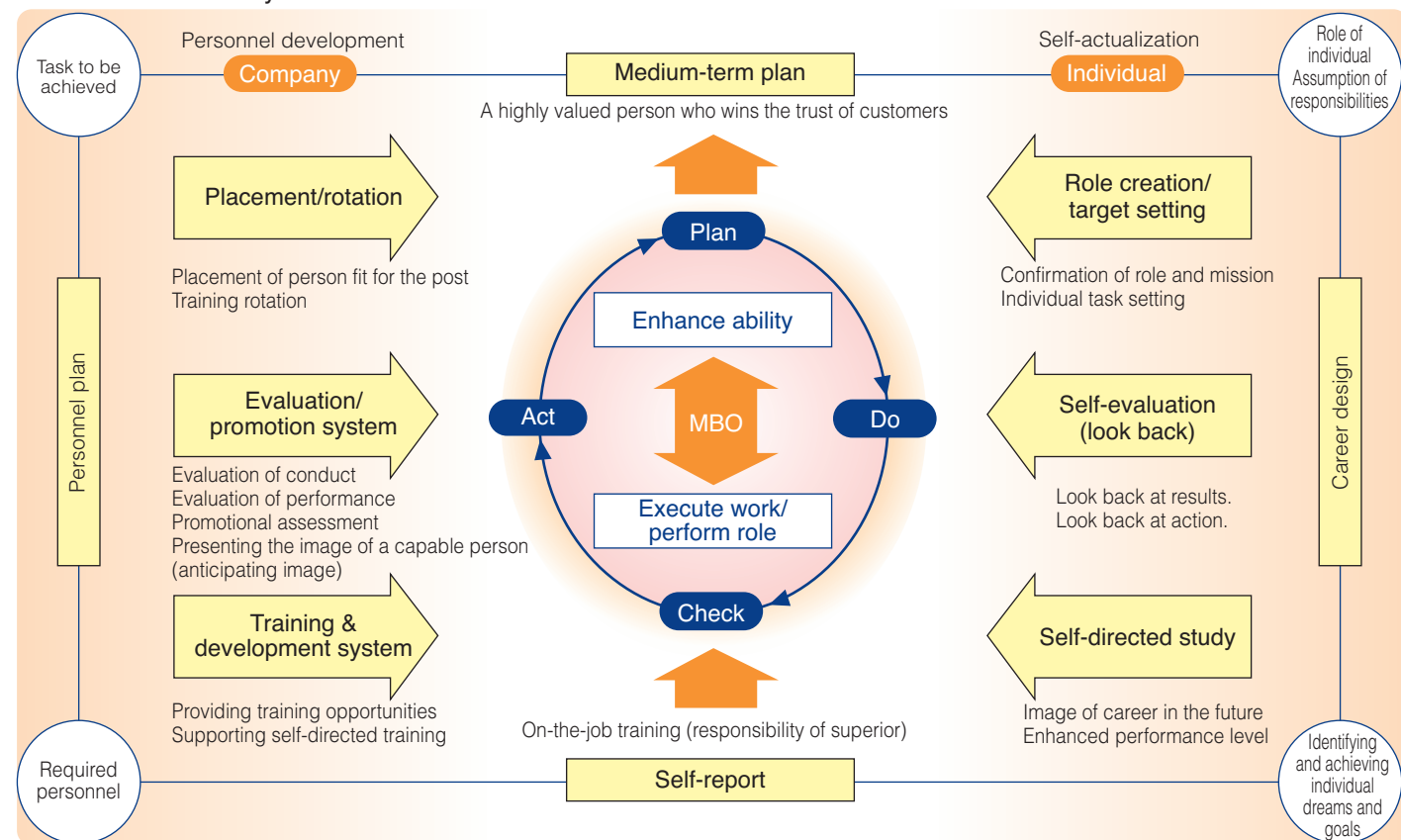
#### ○ Child-rearing leave and nursing care leave

Employees are entitled to take advantage of child-rearing leave until their child has reached the age of one year (or 18 months for certain prescribed cases). For nursing care leave, employees are entitled to a maximum leave of 93 calendar days in total.

#### ○ Reduced work hours

Employees have the option of reducing their working hours by a maximum of two hours per day for reasons of pregnancy, childbirth, child-rearing, and nursing care.

### A Varied Personnel System



## Promoting Good Health

We have created lively workplaces by enhancing the mental and physical health care system.

Established in 2003, Daicel's Health Care Committee is promoting company-wide health management of mental and physical health issues. It encourages the creation of a pleasant environment in the workplace while contributing to worker health.

The following describes the promotion system of the Health Care Committee and the implementation themes.

### Promoting organizations

#### Central Health Care Committee

Located in the Osaka Head Office (Daicel, Labor union, Health Insurance Society)

##### 1. Planning and promoting policies associated with the maintenance and promotion of company-wide health

- [1] Provision of mental and physical checkups and company-wide provision of treatments for any resulting diagnoses
- [2] Training in health maintenance and promotion in coordination with external specialist organizations
- [3] Skill development for industrial health staff and environmental improvement

##### 2. Support and assessment of activities of the Workplace Health Care Committee

#### Workplace Health Care Committee

Osaka Head Office, Tokyo Head Office, and each plant & research center

##### 1. Promoting mental and physical health for a positive worksite

- [1] Guidance regarding treatment of any diagnoses resulting from routine health checkups
- [2] Provision of workplace initiatives regarding mental health diagnoses
- [3] Creating an environment and system that simplify consultations for employees

##### 2. Supporting the return to work of employees who have developed mental disorders

Relevant management and assessment of the workplace return program

### Health maintenance activities provided by the Health Care Committee

#### Mental health checkups

Daicel offers its employees mental health checkups with the intention of enabling all Daicel employees to maintain good mental and physical health through a clearer understanding of their own mental health. These checkups have been offered every two years since 1999. When implementing checkups, each workplace uncovers problems in the workplace and takes steps to make improvements together with all employees.

#### Stress Management Handbook (revised in 2007)

This book describes the metabolic syndrome, countermeasures for the metabolic syndrome, and aspects of mental health so that our employees gain sufficient knowledge and remain free from stress by controlling their health on a day-to-day basis. Everyone can easily understand the stress check method, the key points for finding the sources of stress, and counseling methods.



Stress Management Handbook

#### Health care course

Using the Stress Management Handbook, we provide position-specific health care training to new and existing employees and to employees at each plant so that they can maintain their health and make their workplaces lively. In addition, each plant has a health counselor's office so that employees can easily talk with the counselor whenever necessary.



Health study course under the instruction of a hygienist

# Developing Chemical Processes with a Minimal Environmental Impact

We are working to industrialize a new chemical process that releases no greenhouse gases or hazardous substances.

## Background NI catalyst technology: A long-awaited chemical breakthrough takes center stage

In 1994, Prof. Yasutaka Ishii of Kansai University invented N-hydroxyphthalimide catalyst ("NI catalyst") aerobic oxidation technology. This technology contributes to a substantial reduction in greenhouse gases and toxic substances that are released during the manufacture of various chemical substances.

NI catalyst technology is an innovative technology that offers numerous advantages; the reaction proceeds efficiently at low temperatures; hazardous by-products are not generated; raw materials for catalysts are produced as by-products; and a variety of chemical compounds can be oxidized.

Daicel is working to develop practical applications for NI catalyst technology; specifically, in the fine product field, we have succeeded in commercializing several products. Moreover, with the goal of developing practical applications in the bulk product field, we have constructed pilot plants in which we carry out a wide range of tests.\*

In a social climate that is calling for a more environment-friendly chemical industry as represented by the practical use of biomass, the development of practical applications for NI catalyst technology is being driven by great expectations on a worldwide level, as it is considered a radical technological development offering significant environmental benefits.

## Initiatives Promoting industrialization of NI catalyst technology

In 1999, the Himeji Research Center began to examine the industrialization of NI catalyst technology in cooperation with Professor Ishii's group at Kansai University. They verified the potential to gradually scale up this process from the laboratory and have been promoting industrialization of the process.

NI catalyst technology is an innovative technology using what is known as high-performance organic catalysts that enable efficient aerobic oxidation at room temperatures. While this technology has high potential, the use of high-performance organic catalysts is also unprecedented; therefore, industrialization of the technology has compelled us to make the maximum use of our accumulated expertise and take on greater challenges.

According to Tatsuya Nakano, Research Director of Corporate R&D Center in the R&D Management, "Daicel employs a variety of oxidation technologies in its business, such as peracetic acid oxidation, aerobic oxidation, and hydrogen peroxide oxidation, and we have a thorough knowledge of both the advantages and disadvantages of oxidation technology. NI catalyst technology is our forte, but developing the technology was one of the most difficult challenges we have ever faced."

As a result of its involvement in the manufacture of adipic acid, the Himeji Research Center has succeeded in reducing the

The development and industrialization of NI catalyst technology in the bulk product field started in the laboratory and continued with bench testing. The verification stage involved the application of virtual machines in a pilot plant.



required amount of catalyst to several hundredths compared with the conventional approach and establishing a self-reproducing catalyst system that uses succinic acid, a secondary product obtained during the process, as a raw material for catalysts. This achievement is contributing to reduced manufacturing costs.

We have confirmed that we can synthesize alcohols—which are a raw material for synthetic resins, fibers, and agrichemicals—from alkane (a by-product produced when naphtha is used as a chemical raw material) under moderate conditions. We also confirmed that, when cobalt or manganese is used as a catalyst in combination with NI catalyst, we can compound raw materials for PET resin, hydrogen peroxide (used for cleaning semiconductors), propylene oxide (a raw material used in synthetic resins and adhesives), and butanol (a gasoline additive).

as the leading technology in the semiconductor manufacturing process. We are also promoting development of many other functional materials employing NI catalyst technology.

Regarding adipic acid, a commodity in the bulk product sector, we responded to a proposal from the Ministry of Economy, Trade and Industry in 2005 by establishing the Research Association for Ishii Oxidation Technology jointly with Mitsubishi Chemical Corporation and Maruzen Petrochemical Co., Ltd. In 2006 and 2007, supported by the Research Association, we constructed a pilot facility to manufacture adipic acid at a production rate of 30 tons annually. For the final facility, we assumed a plant with annual production of 150,000 tons, and we are now reproducing and verifying our research results. We intend to verify this expanded scale using the actual output of each machine.

Regarding commercialization, we are considering expansion of adipic acid manufacturing into China and other countries where demand for nylon and urethane is rapidly increasing.

We will promote our research and development furthermore and, assuming the negotiation of licenses and business tie-up, we shall strive to advocate the adoption of NI catalyst technology around the world, thus contributing to reductions of greenhouse gas emissions.

## Main achievements Moving toward mass application following the development of fine chemical products

In 2003, the Minister of Education, Culture, Sports, Science and Technology recognized the invention of NI catalyst technology with the presentation of the 3rd Green and Sustainable Chemistry Award. This innovation received high praise for its advantages in substantially reducing energy consumption; minimizing greenhouse gas emissions; serving as a substitute for environmentally harmful oxidants; and enabling the manufacture of chemical compounds under moderate conditions. In 2004, the highly rated effort to industrialize NI catalyst technology garnered the CSJ Technical Development Award.

In the field of functional materials, the development of semiconductor photoresists is already being promoted through the development of a material for which a key compound is adamantane oxides manufactured with NI catalyst technology. Moreover, we have constructed a commercial plant in the Arai Plant and have started the manufacture and sales of photoresist polymer for ArF (argon fluoride) excimer lasers that is recognized

## Developing a broad range of practical applications in the lead-up to greenhouse gas emissions trading



**Tatsuya Nakano**  
Research Director  
Corporate R&D Center,  
R&D Management

By employing NI catalyst technology, our seminal reaction technology, we are developing products and technologies for the environmental and electronic materials field. At Daicel, we believe that, in the area of product design, environmental harmony is an important added value. In the future, in dealing with new business models such as green procurement and emission trading, we intend to develop the application of our technologies by building on our key NI catalyst technology.

### What is NI catalyst technology?

NI catalyst technology is a revolutionary technology that radically improves aerobic oxidation, an important chemical process employed during the manufacture of roughly 60% of all chemical products. Conventional methods for aerobic oxidation require high temperatures and pressures and consume enormous amounts of energy. Moreover, the low conversion efficiency of the conventional approach necessitates the use of an auxiliary process such as nitric acid oxidation or halogen oxidation. Of course, in addition to the energy consumed to provide the high-temperature and high-pressure conditions required, these auxiliary processes generate greenhouse gases and hazardous substances that are released as by-products.

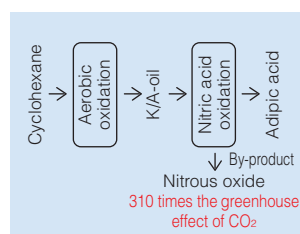
For example, in the case of adipic acid, a main ingredient of nylon 66 (see figure at right), the efficiency of aerobic oxidation in the first stage is low, so nitric acid oxidation is employed as the second stage. However, nitrous oxide (N<sub>2</sub>O) is released as a by-product, and it has 310 times the greenhouse effect of CO<sub>2</sub>.\*\*

On the other hand, in NI catalyst technology, the reaction proceeds at high efficiency even around 100°C; therefore, no auxiliary oxidation is needed. This is obviously an energy-efficient technology that does not release greenhouse gases as by-products.

### Comparison between Existing Technology and NI Technology in the Manufacture of Adipic Acid

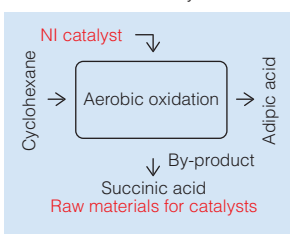
#### Existing technology

- Reaction at high temperature and high pressure
- Low conversion ratio (production efficiency)
- Two stages
- Nitrous oxide is released.
- Secondary products such as succinic acid are generated.



#### NI technology

- Reaction under moderate conditions
- High conversion ratio (production efficiency)
- Single stage
- No nitrous oxide is released.
- Secondary products such as succinic acid are generated, but they are used as raw materials for catalysts.



\* A project supported by the Research Association for Ishii Oxidation Technology

\*\* It is estimated that global production of adipic acid results in the annual release of 200 million tons (CO<sub>2</sub> conversion) of greenhouse gases as by-products. This figure indicates that the by-products of adipic acid alone contribute to the release of about one-seventh of Japan's greenhouse gas emissions.

Moreover, a toxic organic halogenide is released during the manufacture of terephthalic acid, a raw material used in the production of PET resin. In addition, one to two times the amount of sulfate is released in the manufacture of caprolactam, a raw material for nylon 6.

## Responsible Care: Basic Policies and Implementation System

We will strive to implement Responsible Care throughout our company in order to contribute to a viable sustainable society.

In 1995, Daicel established its basic policies for Responsible Care. Daicel is deeply aware of its responsibility as a corporate citizen to protect the environment and ensure the health and safety of all those involved with the Company in whatever capacity and

whatever stage of its operations—from the design of products to their manufacture and disposal. Daicel's basic policies reflect the guiding principles for improvement of environmental, health and safety condition of the Japan Chemical Industry Association and are in accordance with the

Responsible Care Code prescribed as part of the implementation of Responsible Care. Because Daicel is strongly conscious of the need to contribute to an affluent but sustainable society, all Daicel employees uphold Responsible Care practices.

### Basic Policies for Responsible Care

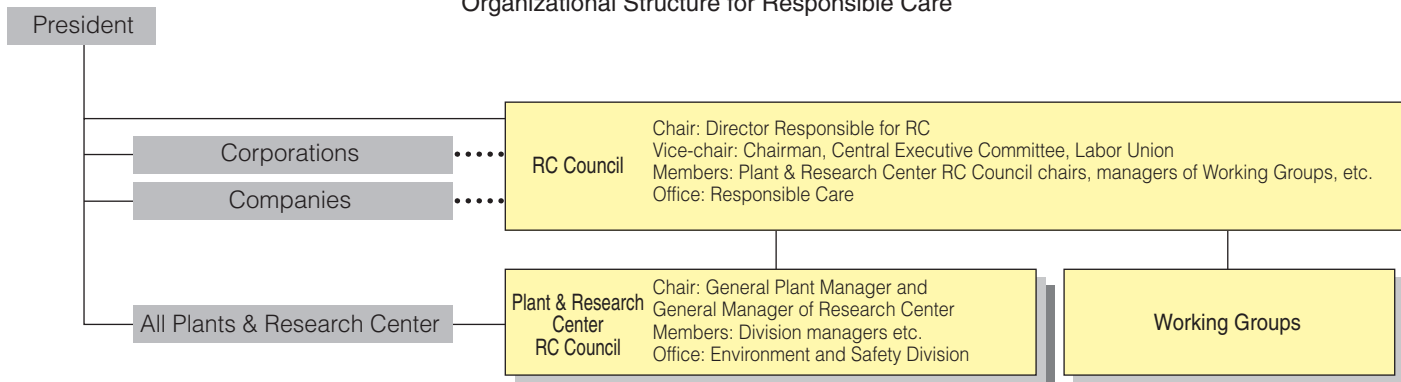
In all aspects of our business operations, Daicel is making the utmost efforts to ensure Environmental Preservation, Process Safety and Disaster Prevention, Occupational Health and Safety, Chemical and Product Safety,

Distribution Safety, and Dialogue with Society in accordance with the Responsible Care Standards of the Japan Chemical Industry Association (JCIA). Daicel is making steady and continuous progress in all these areas.

- 1 While strictly abiding by laws and regulations currently in effect, in its business operations, Daicel will strive to uphold the principles of environmental preservation and attention to safety. All employees will be made aware of policy measures and their assistance will be secured during implementation to ensure sustained effort.
- 2 Daicel will conduct a thorough assessment of its new products' impact on health, safety, and the environment at every stage—development, manufacture, distribution, use, and disposal—prior to bringing them to market and installing facilities for their production. Daicel will also strive to produce and offer products that are considerate of people's health, safety, and the environment.
- 3 Daicel will collect and maintain a database of information regarding environmental and safety issues that relate to its products and the substances it handles. To ensure their safe handling and use, the Company will provide all necessary information to users and distributors.
- 4 Daicel will promote raw material-saving and energy-saving initiatives as well as the recycling of waste products and restraints on their production to protect the environment and economize on the use of limited raw materials.
- 5 Daicel will seek to constantly raise safety standards to achieve a no-accident, no-disaster record at the manufacturing stage. The Company will ensure that appropriate emergency response procedures are in place, training is undertaken, and, in the event of an accident, appropriate countermeasures are taken at once.
- 6 Daicel will research, develop, and introduce technologies and products that are healthier, safer, and more environment-friendly than ever.
- 7 Daicel pledges to strictly abide by regulations in force in the relevant jurisdictions and give due attention to the environmental and safety concerns of the other parties involved when engaging in international transactions involving chemical products, conducting international business, and transferring technologies abroad.
- 8 Daicel will actively lead and support the environment- and safety-related activities of the Daicel Group companies with the aim of securing a better and safer environment for all.
- 9 Daicel will participate in and cooperate with environmental preservation activities undertaken by the communities in which it operates and seek to gain the trust and understanding of society as a whole by establishing a dialogue with it on safety and environmental matters.

[Established in 1995 when Daicel joined the Japan Responsible Care Council]

### Organizational Structure for Responsible Care



## Total Environmental, Health and Safety Assessment System for New Projects

All new projects undergo prior assessments for environmental, health and safety concerns.

Since 1995, Daicel has undertaken prior assessments based on the unique Total Environmental, Health and Safety (ESH) Assessment System. Such assessments, which are undertaken right from the project planning stage, are intended to ensure all new projects follow Responsible Care policies. Under this system, a prior assessment is initiated at the planning stage for all business operations—

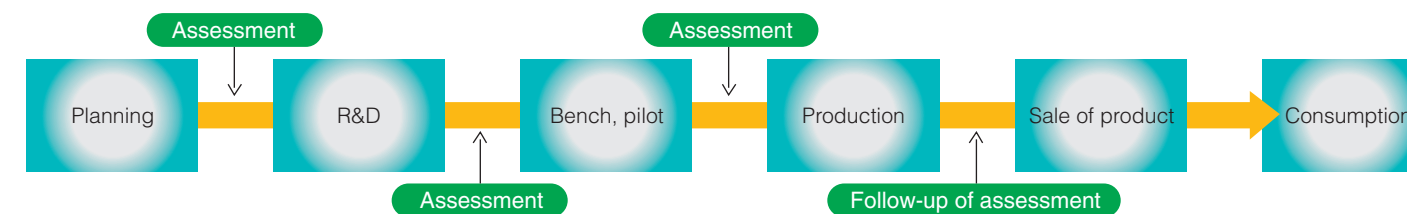
including planning, R&D, production, consumption, and disposal—in order to ensure thorough environmental, health and safety planning.

From a risk management perspective, the implementation of the total assessment system is indispensable to ensuring effective company management. New plans are categorized by rank according to

importance, which allows for the implementation of a method of total assessment by rank. Moreover, the implementation of total assessment system has become a precondition for the issuance of an approval.

The total number of assessments to date exceeds 450 for Class I plans (new plans with a profound impact on management).

### Model Flowchart of Total ESH Assessment



## ISO 14001 International Standards for Environmental Management Systems

All Daicel's plants as well as research center have acquired certification of ISO 14001 registration. Our Group companies are currently in the process of acquiring this certification.

We have committed ourselves to a program to ensure that all Daicel's plants as well as research center acquire certification of registration with ISO 14001, the international standards for environmental management systems. This is intended to promote environmental preservation, an important aspect of Responsible Care. Consequently, by the end of 2001, all Daicel's plants as well as research center had acquired certification of registration. As of April 2006, all Daicel's plants as well as research center had passed assessments based on the revised 2004 versions of the standards.

Daicel Group companies are committed to acquiring certification of ISO 14001 registration. Four companies have already acquired this certification.

Furthermore, the workplaces of Group companies within the premises of Daicel plants are engaged in ISO 14001 activities targeting each plant. Group companies involved in manufacturing activities are certified as associated companies on the premises of Daicel plants.

### Certification Acquisition Dates and Certificate Numbers (Plants & Research Center)

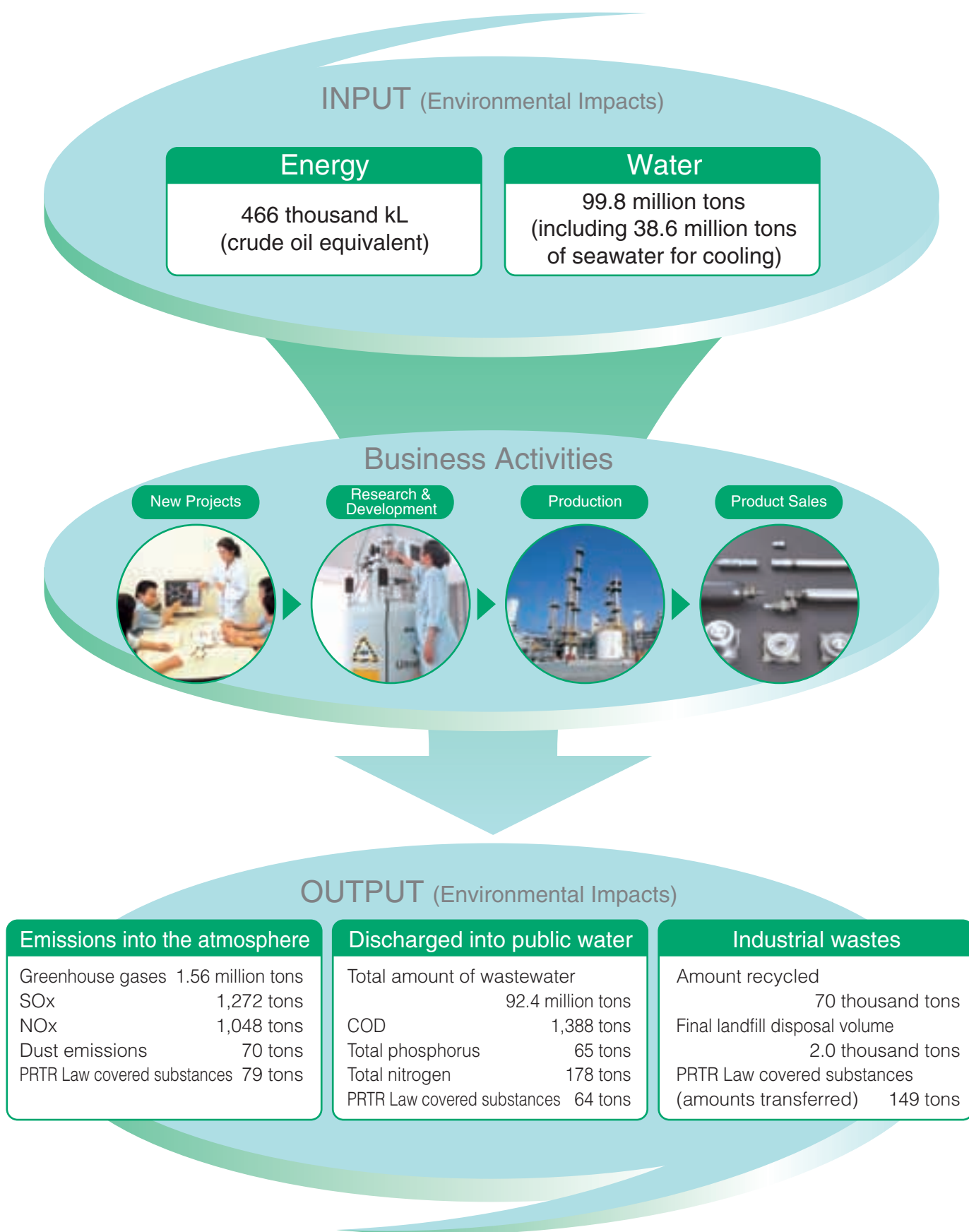
Plant or Research Center	Year and Month	Certificate No.
Ohtake Plant	August 1999	JQA - EM0492
Himeji Research Center	June 2000	JQA - EM0894
Aboshi Plant	December 2000	JQA - EM1229
Hirohata Plant (Acquired under the name of Daicel Polymer Ltd.)	April 2001	JQA - EM1511
Harima Plant	July 2001	JQA - EM1683
Kanzaki Plant	December 2001	JCQA - E - 0329
Arai Plant	December 2001	JCQA - E - 0339

### Certification Acquisition Dates and Certificate Numbers (Group Companies)

Group Companies	Year and Month	Certificate No.
Polyplastics Co., Ltd. (R&D Division)	February 1999	JQA - EM0337
Polyplastics Co., Ltd. (Fuji Plant)	April 1999	JQA - EM0414
Daicel Polymer Ltd. (Hirohata Plant)	April 2001	JQA - EM1511
Mikuni Plastics Co., Ltd.	June 2002	JCQA - E - 0388
Daicel Novafoam Ltd. (Head Office, Nagano Workplace)	February 2003	C2003-00362 Perry Johnson Registrars Inc.
Daicel Novafoam Ltd. (Okayama Workplace)	June 2004	C2004-01523 Perry Johnson Registrars Inc.



## Business Activities and Their Environmental Impacts (Results for Fiscal 2007)



## Environmental Accounting

Daicel introduced an environmental accounting system in fiscal 2001 with the goal of implementing efficient environmental preservation activities; ensuring further corporate transparency; and quantitatively assessing and evaluating the investments, costs, and effectiveness of our environmental preservation activities. The values determined from our environmental accounting have been

calculated according to the Environmental Accounting Guidelines, Year 2005 Edition, published by the Ministry of the Environment of Japan, and the Environmental Accounting Guidelines for the Chemical Industry published by the Japan Chemical Industry Association (JCIA). The amounts of investments are actual sums for capital investment in

environmental preservation in fiscal 2007 (settlement basis). The cost amounts are the totals for actual expenses of equipment depreciation, maintenance, management, and labor related to environmental preservation. The economical achievements in fiscal 2007 are indicated as monetary benefits. The physical effects are summarized in the section "Environmental Preservation (page 32 – 33)."

Environmental Preservation Costs

Classification	Major efforts	Investment (¥ million)	Cost (¥ million)
(1) Environmental preservation costs of controlling the environmental impacts in our production and service business activities (business area costs)		1,193	4,414
Breakdown	[1] Pollution prevention costs	357	3,601
	[2] Global environmental preservation costs	656	10
	[3] Resource recycling costs	180	803
(2) Costs of controlling environmental impacts of production and service activities occurring upstream or downstream (upstream and downstream costs)	Costs of recycling containers and packing materials and green purchasing	0	9
(3) Environmental preservation costs in management activities (environmental management costs)	Labor costs of environmental management, expenses for EMS operations and maintenance, costs of environmental education, costs of environmental impact alleviation	0	517
(4) Environmental preservation costs in R&D activities (R&D costs)	R&D work for reducing environmental impacts of products and technologies	500	104
(5) Environmental preservation costs in community activities (community activities costs)	Costs of environmental promotion activities, and participation in community events	0	34
(6) Costs of environmental damage (environmental damage costs)	Environmental remediation costs, compensation for damages related to environmental preservation, and insurance premiums and transfers to reserves for environmental damage	0	80
Total		1,693	5,158

Item	Amount (¥ million)	Environmental rate (%)
Capital expenditures in the applicable period	35,802	4.7
R&D expenditures in the applicable period	8,006	1.3

Economic Effects (Monetary Benefits) Resulting from Environmental Preservation Activities

Item	Amount (¥ million)
[1] Cost reduction through energy conservation	-510
[2] Improvement of total thermal efficiency through in-house power generation	2,657
[3] Cost reduction through resource conservation	9
[4] Benefits obtained by recycling	320
[5] Reduction of expenses for waste treatment or disposal	52
Total	2,528

◇ Reported totals are the same as those appearing on the inside front cover of this report.

## Environmental Preservation

### Energy Conservation and the Prevention of Global Warming

#### Committed to achieving the targets of our voluntary action plan for energy conservation

Daicel has long been committed to the voluntarily energy conservation initiatives and to reducing emissions of greenhouse gases. Specifically, we have been focusing on reducing our energy consumption rate index to the target level of 90 (relative to the fiscal 1990 level of 100) by the end of fiscal 2010 as defined in the Chemical Industry Voluntary Environmental Preservation Action Plan proposed by the Japan Chemical Industry Association (JCIA).

As a result of our initiatives, our energy consumption rate index for fiscal 2007 was 95, which fell short of the target of our voluntary action plan. However, this is a temporary figure due to the phased suspension of operations caused by the closure of our Sakai Plant and the opening of our new cigarette filter tow facility in our Ohtake Plant.

In addition, our emissions of energy-derived CO<sub>2</sub> for fiscal 2007 totaled 1.395 million tons, and our total emissions of greenhouse gases totaled 1.56 million tons.

Daicel remains committed to implementing an energy-saving initiative

that makes full use of the thermal pinch analysis technique (an energy conservation technique for optimizing the recovery and utilization of thermal energy). At the same time, we are controlling greenhouse gas emissions through conversion of fuel for boilers and other applications from fuel oil to natural gas and city gas.

In fiscal 2007, our Aboshi Plant converted the fuel for its industrial cracking furnace from fuel oil A to city gas. Moreover, as a part of our energy conservation initiatives, the Ohtake Plant introduced circulation fluidized bed boilers to promote the use of waste tires as fuel.

We remain committed to implementing our energy conservation initiatives and to reducing greenhouse gas emissions well into the future. We will also actively strive to take steps to counter the prospect of global warming by switching to recyclable raw materials and developing new technologies.

### Reduction and Recycling of Industrial Waste

#### Strong proponents of the “3Rs”—Reduce, Reuse and Recycle

Daicel has adopted the target of reducing the amount of disposal by landfill to a maximum of 20% of the fiscal 1990 level by the end of fiscal 2010. This target is identical to that proposed by the Japan Chemical Industry Association (JCIA), and we are continuing to implement initiatives to reduce the amount of industrial waste we generate.

In fiscal 2007, we generated more industrial waste than we had in the preceding fiscal year due to the phased suspension of operations caused by the closure of the Sakai Plant, the opening of a new cigarette filter tow facility in the Ohtake Plant, and increased production, resulting in the generation of about 100,000 tons of waste. The primary cause for this increase was the coal ash generated by our introduction of circulation fluidized bed boilers; however, we were able to make effective use of this coal ash, as it is valued as a component of cement. Consequently, we succeeded in reducing the final landfill disposal amount to roughly 2,000 tons, thus achieving our target.

We intend to maintain our strong commitment to the “3Rs” of reduce, reuse, and recycle and are working to actively to reduce waste.

#### Daicel Novafoam’s Okayama Workplace earns Okayama Eco Business certification.

In February 2008, the Okayama Workplace of our group company Daicel Novafoam Ltd. was awarded the Okayama Eco Business certification from Okayama

Prefecture in recognition of its waste reduction efforts.

The Okayama Eco Business certificate can be viewed in greater detail at the following website (Japanese version only): [http://www.pref.okayama.jp/seikatsu/junkan/ecojigyosyo/ej\\_main.htm](http://www.pref.okayama.jp/seikatsu/junkan/ecojigyosyo/ej_main.htm)



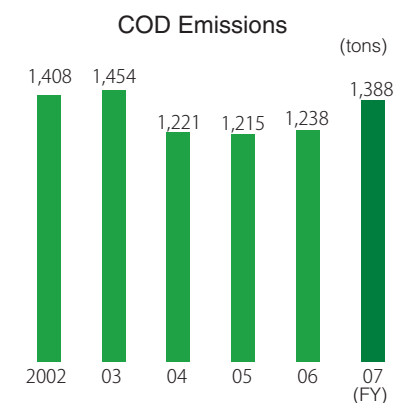
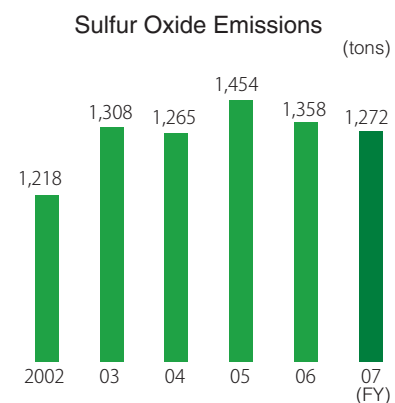
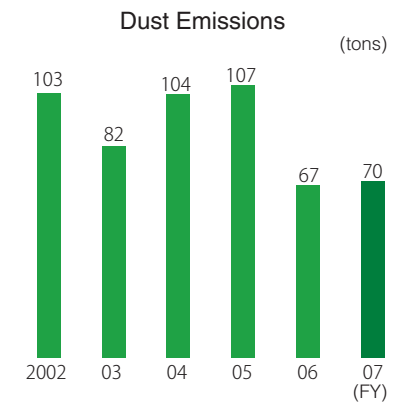
### Reducing Emissions of Substances that Adversely Affect the Air and Water Environments

#### Complying with laws and regulations as well as values negotiated with local communities; reducing emissions of substances that adversely affect the air and water

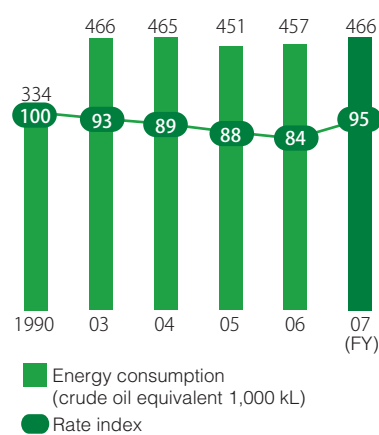
Daicel has actively implemented air and water pollution controls. We comply with laws and regulations covering emissions of air pollutants and water pollutants as well as values each plant has negotiated with its neighboring community.

In fiscal 2007 as well, we complied with all laws and regulations as well as the values negotiated with local communities concerning air and water pollution.

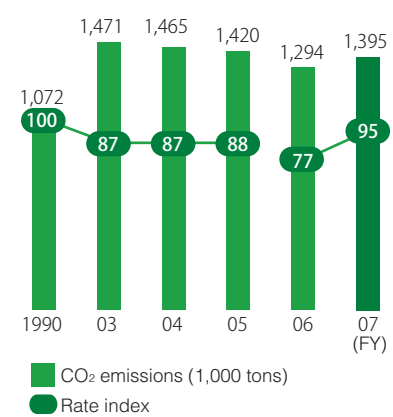
The following graphs show the trends in our emissions of air pollutants and water pollutants.



Energy Consumption and Rate Index

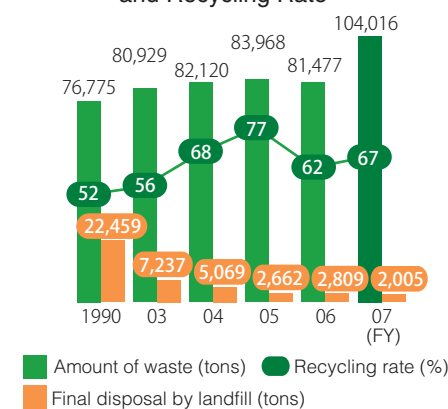


Amounts and Rate Index of CO<sub>2</sub> Emissions



Our emissions of energy-derived carbon dioxide for fiscal 2006 and fiscal 2007 are calculated from the greenhouse gas emissions calculations and report manual.

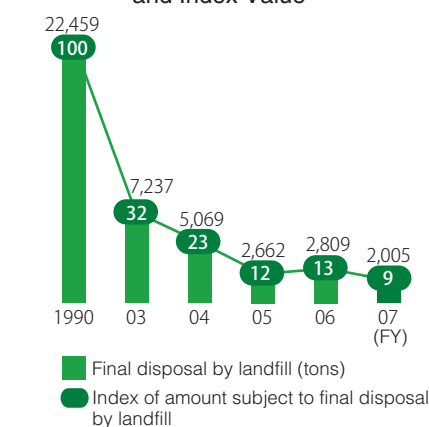
Amount of Industrial Waste Generated and Recycling Rate



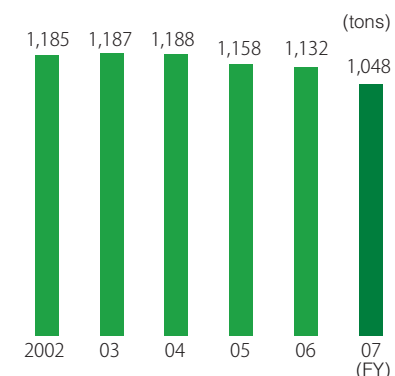
#### Recycling Rate

This term represents the ratio of the amount reused and recycled to the amount of waste generated or emitted. Daicel defines the term as the ratio of the amount reused and recycled (including heat recovery) by Daicel and by treatment contractors to the amount of industrial waste generated.

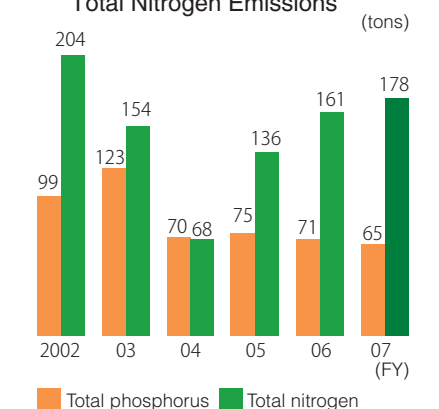
Amount of Final Disposal by Landfill and Index Value



Nitrogen Oxide Emissions



Total Phosphorus and Total Nitrogen Emissions



## Chemical and Product Safety

### Relevant Management and Controlled Emissions of Chemical Substances

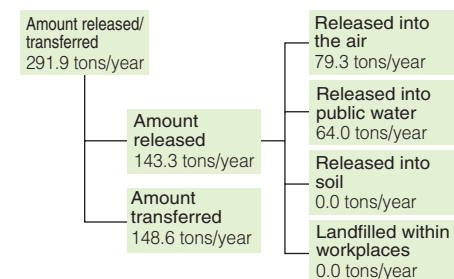
#### Investigation of chemical substances released or transferred

Since 1996, Daicel has been voluntarily participating in the Pollutant Release and Transfer Register (PRTR) project of JCIA. In accordance with the enforcement of the PRTR Law, we are properly investigating and reporting to the national government the amounts of the 354 specified substances being released or transferred.

We have disclosed our PRTR data on our website at the following link (Japanese version only):

<http://www.daicel.co.jp/rescare/index.html>

#### Released or Transferred Amounts of Substances Subject to PRTR Law (fiscal 2007)



#### Reducing emissions of specified hazardous air pollutants

Under its priority initiative, the Air Pollution Control Law specifies a number of air pollutants that are considered a significant health risk. Daicel handles seven of these substances: acrylonitrile, acetaldehyde, ethylene oxide, 1,3-Butadiene, 1,2-dichloroethane, benzene, and formaldehyde. We have devised systematic emissions reduction measures for these seven substances. The amounts of these substances released into the atmosphere in fiscal 2007 totaled 27.3 tons, representing a reduction of 10% from the total at the initial implementation of this initiative in fiscal 1996.

#### PRTR (Pollutant Release and Transfer Register)

This system calculates the extent to which the production, use, and storage of chemical substances result in the release and transfer of those substances into the environment. To encourage the development of a system to reduce the amounts of chemical substances released or transferred, the PRTR Law was originally enacted in July 1999. According to the PRTR Law, an amount transferred is defined as the total sum of amounts commissioned to waste disposal and treatment contractors and amounts released into public sewage systems.

#### Reducing VOC emissions

The Revised Air Pollution Control Law of May 2004 targets control of emissions of volatile organic compounds (VOCs), which are believed to be harmful to human health as they contribute to the formation of photochemical oxidants and suspended particulate matter in the atmosphere. The national government has targeted a 30% reduction in VOC emissions from stationary sources by fiscal 2010 compared with the fiscal 2000 level.

We are now implementing measures that respond to legally mandated VOC regulations. We also set out the third term of our voluntary plan to reduce chemical emissions, particularly through controls of VOC emissions; moreover, since fiscal 2006 we have been promoting this plan, which targets a 30% reduction in VOC emissions in fiscal 2010 compared with the benchmark level of fiscal 2000. In fiscal 2007, we opened our new cigarette filter tow facility in our Ohtake Plant and undertook an unplanned extension to our closure of our Sakai Plant; these factors resulted in parallel plant operation that contributed to a temporary increase in VOC emissions from these facilities. However, we largely succeeded in achieving our planned reductions of VOC emissions from other facilities. Going forward, we intend to actively implement reductions in VOC emissions according to our plan.

#### Appropriate control of PCBs

In compliance with the Law Concerning Special Measures against PCB Waste, Daicel's workplaces practice appropriate storage of objects contaminated with polychlorinated biphenyls (PCBs) as well as capacitors and transformers containing PCBs.

### Safety Assessments of Chemical Substances

#### Promoting safety assessments of our products and responding to new legal controls

To ensure the safety of the chemical products we supply to our customers, Daicel has incorporated Product Safety Assessment Standards and Chemical Substance Safety Assessment Standards under the Total Environmental, Health and Safety (ESH) Assessment System and has been actively promoting product safety assessments.

We are also participating in the High Production Volume (HPV) Program and the Japan Challenge Program, both of which are designed to compile information on chemical substances with the cooperation of the government and the public; through these activities, we are promoting the collection and improvement of safety data for chemical substances.

In addition, as control of chemical substances has intensified worldwide, we are taking steps to monitor trends both inside and outside Japan and promote appropriate responses to new legal controls such as REACH.

#### Responding to the new REACH law

The European Union law on chemicals known as REACH (Registration, Evaluation, Authorization and Restriction of Chemicals) entered into force in June 2007. The law requires the registration and safety assessments of all chemical substances that are newly manufactured in or imported into the EU, as well as those chemical substances already on the market, if they are manufactured or imported in quantities of one ton or more.

To comply with this law, we have been taking appropriate steps for products we export to the EU. In fiscal 2007, we regularly held liaison meetings to promote information sharing and cooperation among related departments, and we properly prepared for pre-registration.

We also offer support to companies of the Daicel Group. Pre-registration began in June 2008 and we have already completed preparations for products that will be registered.

As the next step, we will prepare to register for implementation of safety tests and the like.

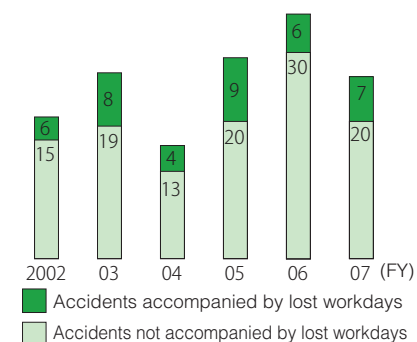
## Occupational Health and Safety

### Continual Improvement through the PDCA Cycle

#### Targeting zero labor accidents through the adoption of "Why & Why Analysis"

Each workplace has established its own industrial health and safety initiatives according to its size and manufacturing pattern and repeatedly implements the PDCA cycle to promote continual improvement. In addition to this initiative, we sought to determine the cause of accidents in fiscal 2007 by introducing "Why & Why Analysis" — a technique that repeatedly asks "Why?" in order to determine the cause of an accident — and by engaging in exhaustive discussions at Safety and Environment meetings and other meetings. As a result, we have reduced the number of labor accidents from the preceding year; however, accidents caused by unsafe actions still frequently occur. In an effort to decrease labor accidents further, we will promote the adoption of Why & Why Analysis in fiscal 2008 and establish basic company-wide rules to prevent accidents caused by unsafe actions.

#### Frequency of Labor Accident at Daicel (including partner companies)



#### Using simulations to promote safe practices

Since 2007, the Harima Plant has been giving new employees training that enables them to experience static electricity, a simulated accident in which they are wedged or caught in a machine, and the use of safety devices so that they can easily master and routinely employ safe practices. For this training, the plant has either purchased or manufactured the necessary equipment.

In keeping with our medium-term plan, we will promote the adoption of a company-wide program for simulation-based training.



Simulation training

### Evaluation by Society

#### The Labor Standards Association recognizes the Aboshi Plant and Harima Plant.

The Aboshi Plant's active efforts to address safety issues have eliminated serious accidents at the plant and have attracted significant praise. As a result, the plant was presented with the Safety Excellence Award of the Himeji Labor Standards Association Chairman's Awards. Moreover, the Harima Plant was recognized for actively promoting a health and hygiene initiative and for eliminating serious accidents. The Association thus presented the plant with the Health and Hygiene Excellence Award.



Harima Plant: Award certificate and plaque of the Health and Hygiene Excellence Award

#### Collection of poster designs and slogans: Production of Responsible Care calendar



I was transferred to my current workplace five years ago, so I am now quite accustomed to my job. Therefore, in order to raise my own safety awareness, I expressed this concept in my drawing. I hope that this drawing gives everyone a good understanding of the importance of basic actions.

As a part of the safety-awareness initiative, Daicel solicits the submission of poster designs and slogans from its own employees, from employees of group companies who work in our workplaces, from employees of partner companies, and from their family members.

Poster Design First Prize Winner

**Masaki Sakao**  
Aerospace & Defence Systems/Safety Systems  
Company  
Harima Plant

#### Committed to actively addressing the asbestos issue

We conduct medical examinations of all workers, including those who were previously engaged in tasks that resulted in exposure to asbestos. We were thus able to confirm that no worker suffered any health issues attributable to asbestos exposure. We are also taking steps to ensure safe practices in dismantling work and the like. As for gaskets containing asbestos, we are promoting a project to complete the phase-out of asbestos gaskets by fiscal 2008 according to the terms of an independent substitution plan submitted to the Ministry of Economy, Trade and Industry.

## Dialogue with Society

### Maintaining Communication with Local Residents

At Daicel, we remain aware of the importance of maintaining harmony with local communities. In order to earn the confidence of local residents, we carry out a variety of communication activities, such as supporting and participating in local events and volunteer activities, hosting plant tours for local residents and students of local elementary and junior high schools, providing school lectures as well as courses for members of the public, and dispatching lecturers to universities. In this way, we are creating opportunities to engage in dialogue and exchange opinions with local residents.

#### The Arai Plant hosts a tour for elementary school children.

In response to a request from Arai Elementary School, situated in the neighborhood of the Arai Plant, the plant hosted a tour as part of its social education program. On the day of the tour, the plant hosted 61 fifth-grade pupils and screened a video introduction to the plant. The students were then taken on a guided bus tour of the plant facilities and a question-and-answer session was held.

During the question-and-answer session, many of the students' questions were focused on products and manufacturing, including, "Why does the word 'poison' appear on Daicel's tankers?" and "What quantities of your products are manufactured daily?" As well, many questions were related to the workers in the plant, including, "How long do people keep working without a rest?"; "Are all items manufactured by machines?"; and "Where are the workers and what are they doing?" One student asked the unique question, "Are there any robots working in the plant?" The students' curiosity ensured a lively question-and-answer session.



Elementary school children on a plant tour

#### Discussing airbag inflators at elementary schools in the Naka-Harima and Nishi-Harima districts

As a part of the Social Studies Education Convention for the Naka-Harima and Nishi-Harima District Elementary Schools involving some 400 elementary school teachers in the Naka-Harima and Nishi-Harima districts, an open class was held in classroom 3 of Grade 5 in Tatsuno City Mitsu Elementary School. One social studies textbook used by the district contains a description of automobile airbags; as Daicel is a local manufacturer of airbag inflators, one of our employees served as a guest lecturer and provided an introduction to these inflators.

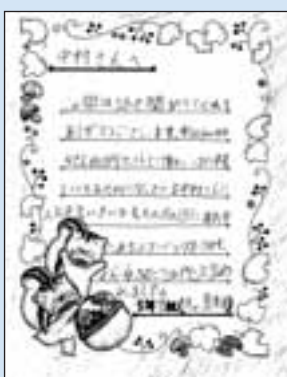
In response to requests by other teachers who observed the open class, we also presented an introduction to the Harima Plant—with a special focus on airbag inflators—to all 110 fifth-grade pupils at the elementary school.



Participating in a fifth-grade social studies class

#### Introducing our products as an industry of the city of Tatsuno at a college for the aged

When the city of Tatsuno was formed through the consolidation of several municipalities, a cultural course was offered to teach residents about the industries in Tatsuno. As part of this initiative, Daicel held a lecture at Akatombo Gakuen, a college for the aged in Tatsuno. About 150 persons attended the lecture, which focused mainly on an introduction to airbags and on Daicel products one would encounter in daily life. The participants viewed a video showing how an airbag functions and gained a deeper understanding of our products. The lecture meeting was very well received by those in attendance.



Thank-you notes created by elementary school pupils

### Nature Conservation and Volunteer Activities

#### Ongoing tree-planting activity on China's Loess Plateau

Mikuni Plastics Co., Ltd., a member of the Daicel Group, maintains a corporate policy of promoting material recycling and providing environment-friendly products. In keeping with this policy, and to contribute to the prevention of global warming, the company became a member of the Green Earth Network.\* Its responsibility in this network is to dispatch employees on a tree-planting project every year. The company's website contains a history of the employees' tree-planting initiative.



Employees of Mikuni Plastics planting trees

\* An NGO established under the slogan, "Cross-border cooperation to protect the global environment." The network promotes cooperation on greening projects such as the tree-planting project on China's Loess Plateau, where desertification has been worsening.

<http://homepage3.nifty.com/gentree/>  
(Japanese and Chinese versions available)

#### Many employees participate in the Myoko Eco Trek.

Since 2006, the Arai Plant has participated in an "Eco Trekking" event hosted by the City of Myoko.

"Eco Trekking" is an environmental conservation initiative to collect trash in the beautiful natural environment of the Madarao Plateau, the Sasagamine Plateau, and the Ikenotaira Hot Spring while on a guided hike. In 2007, a total of 56 employees took part and enjoyed the beautiful natural surroundings with local residents; at the same time, they worked hard to collect trash.

According to Mr. Tanabe of the Arai Plant, reflecting on his experience, "The guide taught us about the natural aspects of the Myoko Plateau, and I felt that it was necessary to preserve this area. I was pleased to be able to do even a little to protect the environment of Myoko by participating in this activity. I think this effort should be continued in the future."

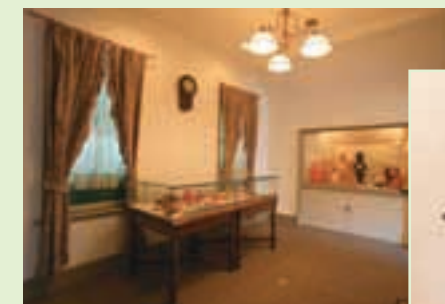


Many employees took part in this Eco Trek.

#### The Aboshi Plant opens the Ijinkan and celluloid products to the public.

The Daicel Ijinkan is a Western-style building designed by Sadao Shidara, the architect who designed the first Tsutenkaku Tower in Osaka and the Shurakukan Theater in Kobe. In the days when Japan Celluloid Jinzo Kenshi Co., Ltd., the predecessor of the Aboshi Plant, was founded, the Ijinkan was used as accommodations for engineers who were visiting from Britain and Germany. In October 1987, the Daicel Ijinkan was selected as one of Hyogo prefecture's One Hundred Best Residential Buildings; in July 1989, the City of Himeji designated the building as an important urban landscape structure. More recently, the building has become part of a strolling route for various events, attracting many visitors.

At present, one of the two buildings is open to the public. The exhibition section within the building displays a variety of celluloid products, such as a black kewpie doll (one of only several known to exist in Japan), ping-pong balls, patterns for pachinko machines, a celluloid telephone with a checked pattern, and nostalgic toys from the past.



Free of charge Open 10:00 – 17:00  
Closed on Saturdays, Sundays and public holidays  
Allow about 15 minutes to view all exhibits

## Process Safety and Disaster Prevention

### Initiatives to Eliminate Plant Accidents

#### Marking two consecutive years of achieving zero fire, explosion, and leakage accidents

Each of our workplaces has established daily process safety and disaster prevention initiatives and has reinforced our emergency response capability. They have achieved this by practicing process safety and emergency drills relevant to the situations in individual workplaces, resulting in two consecutive years of zero fire, explosion, and leakage accidents (referred to as "serious plant accidents").

As a part of our effort to strengthen our process safety and disaster prevention activities in fiscal 2007, we conducted a general inspection to determine whether countermeasures established after past fire or explosion accidents have been consistently implemented. As a result, we confirmed that these countermeasures are being implemented.

In addition, in order to further improve our level of security, we are taking steps to extend to other workplaces the Process Safety Management System established in the Aboshi Plant.

### Strengthening our Emergency Response Capability

#### The Aboshi Plant participated as an organizer in the Hyogo Prefecture General Emergency Drills for Petrochemical Complexes and Other Facilities.

As an organizer, the Aboshi Plant participated in the Hyogo Prefecture General Emergency Drills for Petrochemical Complexes and Other Facilities hosted by Hyogo Prefecture, the City of Himeji, the Himeji Coast Guard Office, and the Himeji Waterfront Disaster Prevention Council. In cooperation with the organizations concerned with disaster prevention and specified business establishments, the plant planned and implemented emergency training exercises within the Aboshi Plant site and in the surrounding marine area and demonstrated a rapid fire-fighting response.



General emergency drill in progress

## Distribution Safety

### Initiatives to Eliminate Logistics Accidents

#### Achieving the annual plan target of zero at-fault logistics accidents

Daicel has continued its initiatives to ensure distribution safety; in fiscal 2007, we again achieved zero at-fault logistics accidents. In order to respond to the total prime contractor system of Daicel Logistics Service Co., Ltd., which started in fiscal 2006, and to reinforce the logistics safety control system, we clarified the role-sharing between Daicel, a shipper, and Daicel Logistics Service Co., Ltd. in fiscal 2007 and reviewed the safety control system of Daicel Logistics Service. In fiscal 2008, we will begin implementing the revised Logistics Safety Control Rules under which we reviewed our emergency response in the event of a logistics accident and we will strive to ensure the rules take hold. Through these steps, we aim to maintain our achievement of zero at-fault logistics accidents.

Looking to the logistics environment, Daicel and Daicel Logistics Service jointly drew up an energy conservation plan in logistics and submitted periodical reports to the Ministry of the Environment in compliance with the revised Law Concerning the Rational Use of Energy. We are committed to promoting energy-efficient transportation under this plan.

## Responsible Care Initiatives for Fiscal 2007 and Targets for Fiscal 2008

Measures	Measures for Fiscal 2007			Targets for Fiscal 2008	Targets in the RC Medium-term Plan (Fiscal 2007-09)
	Targets	Results	Reference Page		
<b>Environmental Preservation</b> • Respond to the Kyoto Protocol Target Achievement Plan. (Achieve and maintain the targets of our voluntary action plan for environmental conservation.) • Implement a medium-term plan to reduce the amount of waste.	Maintain the more than 10% improvement in the energy consumption rate compared with the fiscal 1990 level.	The energy consumption rate for fiscal 2007 was 95% compared with the fiscal 1990 level. The failure to achieve the target resulted from a temporary suspension of operation caused by the closure of the Sakai Plant and the opening of a new cigarette filter tow facility in the Ohtake Plant.	P32	Improve the energy consumption rate by 20% compared with the fiscal 1990 level. • Operation Division: Review energy conservation activities in offices and report energy consumption results. • Household Division: In response to a request made by the JClA, declare our participation in the ABC activity and, as a part of our CSR initiative, conduct a trial run of energy conservation activities in households.	Maintain energy consumption rate index at less than 90 (relative to the fiscal 1990 level of 100).
	Limit final landfill disposal index to a maximum of 20 (relative to fiscal 1990 level of 100).	Total final disposal by landfill for fiscal 2007 was 9% compared with the fiscal 1990 level. The target was achieved.	P32	Manage the amount of industrial waste according to the unit rate and set specific unit rate targets.	Limit final landfill disposal index to a maximum of 20 (relative to the fiscal 1990 level of 100).
<b>Chemical and Product Safety</b> • Comply with REACH regulations.	Complete preparations for pre-registration of products.	Established a system to comply with the REACH regulations. Achieved the target on the whole.	P34	Improve the company-wide system to comply with REACH regulations; complete pre-registration of products requiring pre-registration; and prepare for registration.	Register with REACH all products intended for export to the EU and undertake safety tests.
<b>Occupational Health and Safety</b> • Eliminate labor accidents.	To achieve zero labor accidents, standardize basic actions as well as occupational safety rules and methods and implement the Daicel version of the occupational health and safety management system (without examinations).	Standardization of rules and methods is being extended into the next fiscal year. The Daicel version of the management system (without examinations) is being continuously implemented in all workplaces. By introducing "Why & Why Analysis" and having exhaustive discussions, we sought to determine root causes; consequently, the number of labor accidents decreased from fiscal 2006. We achieved the target on the whole.	P35	To attain zero labor accidents, review the accident information system; standardize basic actions and occupational safety rules (criteria); and standardize and establish the "Why & Why Analysis" technique.	Eliminate labor accidents.
<b>Process Safety and Disaster Prevention</b> • Eliminate all fire, explosion, and leakage accidents.	To achieve zero fire, explosion, and leakage accidents, horizontally extend the Aboshi Plant Process Safety Management System (methods and structure) to other workplaces and strengthen preparedness through process safety and emergency drills corresponding to the circumstances of individual workplaces.	• Horizontal extension of the Process Safety Management System is ongoing. • We conducted a general inspection on the implementation status of measures established as a result of previous fire and explosion accidents. • All workplaces conducted process safety and emergency drills. • We achieved the target of zero fire, explosion, and leakage accidents over two consecutive years.	P38	To achieve zero fire, explosion, and leakage accidents, take steps to prevent accidents similar to large-scale accidents that have occurred at other companies and conduct drills to improve company-wide emergency preparedness according to disaster response rules.	Zero accidents leading to fire, explosion or leakage
<b>Distribution Safety</b> • Eliminate at-fault accidents to achieve zero logistics accidents.	To eliminate at-fault accidents for zero logistics accidents, establish a health and safety control system based on the total prime contractor system in Daicel Logistics Service Co., Ltd.	• Strengthened the safety control system of Daicel Logistics Service Co., Ltd. and clarified role sharing in the Ohtake Plant (shipper). • Achieved again zero at-fault logistics accidents.	P38	• Maintain zero at-fault logistics accidents. • Clarify the main activities of Daicel Logistics Service Co., Ltd. and the responsibilities of shippers. Begin implementing the revised Logistics Safety Control Rules and aim to inculcate the rules.	Elimination of at-fault accidents for zero logistics accidents
	Comply with the revised Law Concerning the Rational Use of Energy and promote energy conservation measures as a shipper.	Drew up an energy conservation plan in logistics and submitted periodical reports. Achieved the targets.	P38	To comply with the revised Law Concerning the Rational Use of Energy and promote energy conservation measures as a shipper, follow up on energy conservation plans and confirm achievement of CO <sub>2</sub> reduction targets.	Reduce energy consumption by logistics by more than 1% annually.
<b>Dialogue with Society</b> • Publish reports and promote communication with local communities.	1. Schedule an earlier publication date (during June). Continuously disclose information in reports on all workplaces. 2. Increase to five the number of workplaces that publish reports.	• Published the <i>Environmental, Safety and Social Report</i> in June. Achieved the target. • Four workplaces published reports. The target was not achieved.	P36	Strengthen the system to create reports and review and improve their content.	Clarify and publicly disclose Daicel's policy on corporate social responsibility (CSR).

### Eliminating traffic congestion at the main entrance to the Arai Plant with a new logistics gate

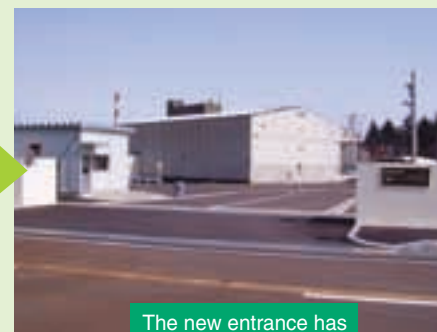
The Arai Plant has used the road in front of the main entrance as a truck route for logistics purposes. However, the road is narrow and trucks awaiting reception in the early morning hours have tended to cause traffic jams. This situation has impeded pedestrians and neighboring residents have requested that we resolve this issue.

Moreover, the plant anticipated an increase in truck transport with the discontinuation of rail transport. To counter these issues, the Arai Plant built a new logistics gate along a wide prefectural road and provided an adequate waiting area for trucks on the plant site.

Since the gate was put into service on January 15, 2008, no serious problems have arisen, and use of the gate has proceed without any issues; the traffic jams that had previously been a problem in front of the main entrance have been resolved and local residents are pleased with the improvement.



The previous entrance contributed to traffic congestion.



The new entrance has eliminated congestion.

# Corporate Governance

## Basic Approach

Daicel recognizes corporate governance as an important aspect of business that can contribute to improved corporate value. As a publicly listed enterprise, Daicel is committed to carrying out its social mission and responsibilities. We believe in the need to strengthen our relationships with various stakeholders.

We ensure our maneuverability by clarifying the role-sharing of various organs, and we have implemented an agile management system capable of timely decision-making and execution.

We can respond quickly to opinions from outside the Company and can apply them to our corporate operations. We intend to maintain our company management by improving the transparency and fairness.

### Major Corporate Governance Initiatives

- We revised the regulations for the board of directors meeting in order to strengthen the supervisory functions of the board of directors and transfer responsibility with the aim of speeding up decision-making regarding the management of corporate affairs.
- Under the Project to Implement Internal Controls for Financial Reporting established in April 2007, we prepared the foundation for accommodating J-SOX, the Japanese version of the Sarbanes-Oxley Act of the U.S. introduced in the fiscal year ending March 31, 2009.
- As part of our effort to strengthen our internal control system, we strengthened internal regulations such as various rule-management regulations, document-management regulations, and division-of-duties regulations.
- In order to respond to the increased risks of information networks, we revised policies for information system security with a focus on reinforcing oversight of employee computer terminals.
- Regarding the guideline for responding to a hostile takeover bid, such as planned purchases of large amounts of Daicel's shares, the guideline was partially revised to more directly reflect shareholders' intentions regarding the pros and cons of extending the guidelines and to invoke countermeasures against a takeover bid.

## State of the Internal Control System

According to the Financial Instruments and Exchange Act enacted in June 2006, a submission of the Internal Control Report is required from corporations with publicly listed shares beginning in fiscal 2008. In order to ensure the reliability of the financial reports of the Daicel Group, Daicel established the Project to Implement Internal Controls for Financial Reporting and undertook full-scale implementation of this initiative in April 2007.

This project not only supports the legal requirement for enhanced reliability of financial reporting, but also addresses risk management as the Daicel Group expands its business. In order to strengthen the foundation for risk management and devise an improved system that will enable us to accommodate growth with peace of mind, we must take a medium-to-long-term perspective. For some time to come, we will take steps to focus on issues to ensure the reliability of our financial reporting.

Regarding the development and improvement of internal controls, we use the results of work standardization that has been implemented through the existing internal control system and innovation activities to improve the system in support of sound and continuous development ensuring true effectiveness without waste or wasted effort.

As for specific project activities under the project, we have organized teams for each area targeted for improvement and have been taking steps toward the company-wide and group-wide initiatives listed below.

Furthermore, according to the Company Act executed on May 1, 2006, the board of directors meeting held on May 10 of that year voted on the Basic Guidelines for Development of an Internal Control System. We are appropriately reviewing our Internal Control System and, at the board of directors meeting on March 27, 2008, voted on resolutions to implement revisions.

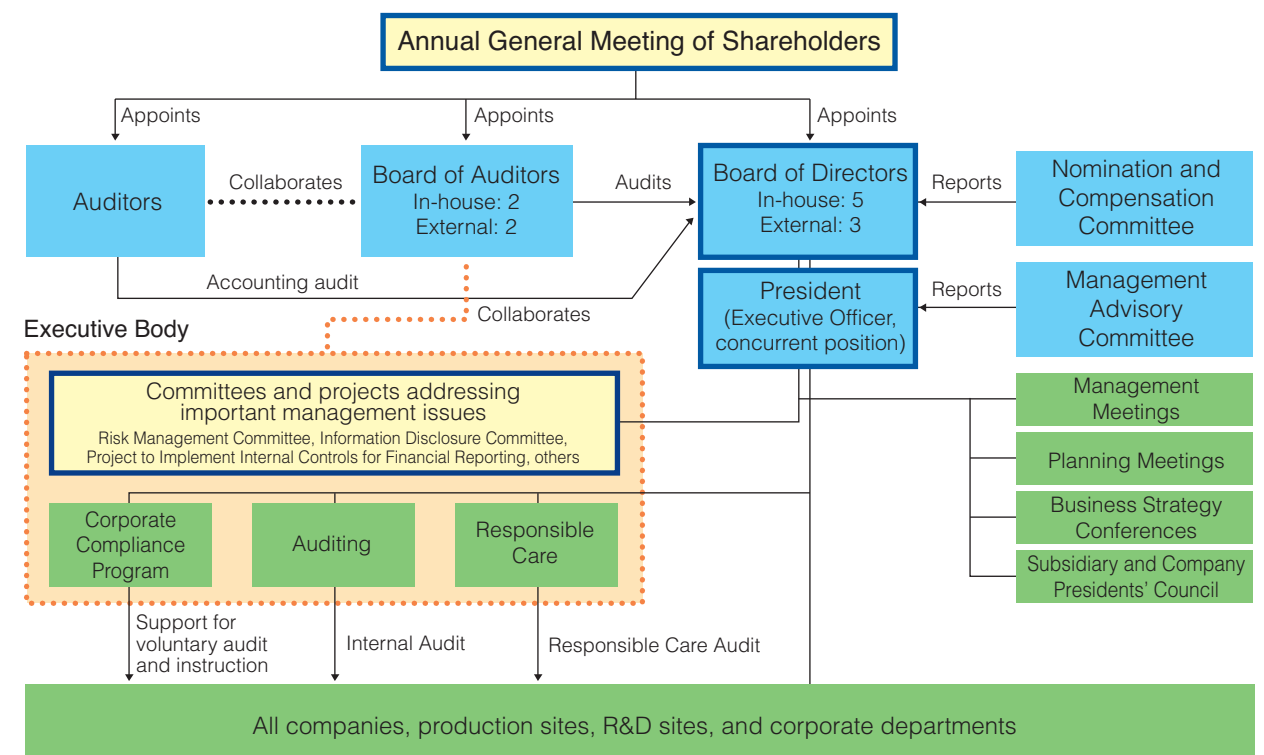
1. Internal Control Audit (assessment) Construction Team
2. Company-wide Internal Control Improvement and Assessment Team
3. Improvement and Assessment Team for the Balance Sheet and Financial Reporting Process
4. Work Process Construction and Improvement Team covering sales, purchasing and production inventory

activities with a focus on developing a risk inventory.

Regulations responding to risk identification were established in January 2008. These regulations set out the initial response to be undertaken for establishing networks and an emergency measures headquarters when a significant risk is identified. According to these regulations, we intend to provide training for all group companies by conducting drills that assume the realization of significant risks in order to improve our initial response in an emergency.

In our fiscal 2006 Medium-term Plan, we targeted the reinforcement of our foundation and identified two key initiatives: risk management and internal controls. We will improve these initiatives and link them to the creation of a foundation for our corporate social responsibility.

Corporate Governance Framework



Note: Executive officers include heads of companies, heads of sites, and heads of corporate departments who administer corporate affairs.

## In-house Audits

### Internal Audits by the Auditing

In accordance with the basic principles of the internal control system, we are striving to ensure appropriate business operation.

The Auditing draws up audit master plans relating to the principles, scope, period, and target items of internal audits; carries out internal audits; and makes suggestions for correcting problems. The office supports appropriate business activities and reports to management with the results of the audit.

### Voluntary Audits and Company-wide Reviews Relating to the Corporate Ethics

In order to ensure the establishment, practice, and continuous improvement of corporate ethics, we have employed a PDCA cycle to create a corporate ethics management system through which all divisions operate independently.

To verify that our corporate ethics are appropriate and that their practice is effective, each division conducts voluntary audits. The Corporate Compliance Program uses the results of these audits to carry out a company-wide review. Management responds by undertaking a top management review. These results are incorporated in corrective and preventive actions relating to corporate ethics; the courses of action, rules of conduct, and corporate ethics management system are revised accordingly.

### RC Audit

In conformity with the Guideline for Implementation of Responsible Care Internal Audits established by the Japan Responsible Care Council (JRCC), we undertake an annual audit of the status of implementation of RC activities and the status of compliance with RC-related laws and regulations. Daicel's plants and research center conduct annual reviews of their RC activities, while audit members carry out an RC audit, draw up a report on the results of the RC audit, and provide feedback to the plants and research center. These audit results are reported to management.

The RC audit results are incorporated in the action plan for the subsequent fiscal year of the Company, including the research center and all plants, and are reflected in continuous improvements and enhancement of RC activities.

The in-house audits were carried out jointly (Auditing, Responsible Care, Corporate Compliance Program, and Personnel Group) in fiscal 2007 as efficient and effective audits of our plants and research center. In examining the effectiveness of these joint audits, we were able to exclude items common to the audits and reduce the burden on the audited divisions. In addition, the audited divisions made use of this opportunity to exchange information, resulting in deeper understanding of the scope of the audits.

## Our Commitment to Corporate Ethics

### Daicel's Corporate Ethics Management System

We believe that each employee's adherence to corporate ethics is an essential management issue and are promoting this initiative company-wide.

This is not a temporary initiative; in order to ensure it is practiced continuously, we established our Corporate Ethics Management System by following the PDCA cycle. Through activities involving the participation of all employees, we are striving to maintain and improve this system.

### Practical Implementation of the Daicel Chemical Industries Code of Conduct

To ensure the specific practice of the Daicel Group Conduct Policy (see page 43) within the Company as a standard, we established the Daicel Chemical Industries Code of Conduct and made a concerted effort to advise all employees of its existence. Each division has established and is targeting its own specific behavioral guidelines based on the Daicel Chemical Industries Code of Conduct.

We formulated this code of conduct to incorporate the requirements for corporate social responsibility (CSR). By ensuring the thorough implementation of this code of conduct, we are seeking to raise the CSR awareness of all employees.

### Promotion System

We established the Corporate Compliance Program to promote corporate ethics activities and appointed our representative director as our corporate ethics officer. The Corporate Compliance Program supports the independent initiatives of each division based on the Corporate Ethics Management System and continuously promotes activities to ensure compliance.

We are also taking steps to comply with laws and ordinances in various committees by establishing in-house rules on export management to guarantee security and on personal information protection, among others.

### Corporate Ethics Training Program

Daicel provides position-specific training to union members, leaders, directors, and presidents of group companies. Carefully planned corporate ethics training is provided at important occasions when employees are promoted. Moreover, Daicel is offering in-house seminars to impart the knowledge of laws and regulations required for business operations.

#### Implementation Themes Extracted from In-house Seminars

- Antitrust Law
- Act on the Protection of Personal Information
- Whistleblower Protection Act
- Export Management
- Labor Relations Law
- Regulations on Insider Trading
- Act against the Delay in Payment of Subcontract Proceeds, etc., to Subcontractors
- Law Concerning Securing the Proper Operation of Worker Dispatching Undertakings and Improved Working Conditions for Dispatched Workers



Daicel Group Basic Philosophy  
Daicel Group Conduct Policy  
Daicel Chemical Industries Code of Conduct  
[Established July 1, 2006]

### The consultation and report system (Corporate Ethics Help Line)

With the intent of establishing a system to protect whistleblowers who act in the public interest, Daicel is taking steps to ensure that the employees of each workplace are able to issue reports and hold consultations without difficulty; however, where circumstances prevent a superior from devising a quick solution, we have put in place a Corporate Ethics Help Line—a unique in-house reporting system—to ensure that appropriate advice is available.

To further promote use of this initiative, we have also provided an external Corporate Ethics Help Line.

We have ensured that the Corporate Ethics Help Line addresses the following items, and we regularly monitor issues such as dismissal, adverse treatment, and harassment of individuals for having submitted a report ("whistleblowers") or attended consultations.

- Protection of personal information and privacy of whistleblowers and those attending consultations
- Ban on adverse treatment in response to whistleblowers and those attending consultations
- Feedback on whistleblowers and those attending consultations

An external Corporate Ethics Help Line was launched in fiscal 2007 for the principal domestic companies of the Daicel Group.

## Conduct Policy and Code of Conduct

### Daicel Group Conduct Policy

1. We shall not only comply with all laws and regulations but also act with high ethical standards and sound judgment.
2. We shall contribute to the development of society as good corporate citizens.
3. We shall offer safe, high-quality products and services that satisfy and gain the trust of our customers.
4. We shall contribute to the development of local communities by complying with international rules and each country's laws and regulations and by respecting local cultures and customs.
5. We shall willingly and justly disclose reliable corporate information.
6. We shall conduct honest trade in accordance with the basic principles of fair and free competition.
7. We shall work positively to conserve the natural environment and to ensure safety.
8. We shall properly manage corporate assets and information.
9. We shall respect the diversity, personality and individuality of every member of the Daicel Group and shall maintain a healthy and comfortable work environment that is free from discrimination and harassment.

### Daicel Chemical Industries Code of Conduct

The Daicel Chemical Industries Code of Conduct lists the criteria and steps to be taken for each area of interest, including the economy, the environment, and society.

Although it provides detailed descriptions for each item, only the main items are listed below.

The Economy	The Environment	Society	
<p><b>[Commerce]</b></p> <ul style="list-style-type: none"> <li>• Offer of products and services that are of use to society</li> <li>• Safety and quality assurances of products and services</li> <li>• Provision of product quality information</li> <li>• Response to incidents involving products</li> <li>• Procurement transactions</li> </ul> <p><b>[Finance]</b></p> <ul style="list-style-type: none"> <li>• Disclosure of corporate information</li> <li>• Fair accounting procedures</li> <li>• Prohibition of insider trading</li> </ul>	<p><b>[The Global Environment]</b></p> <ul style="list-style-type: none"> <li>• Reduction of environmental impact</li> <li>• Realization of a sustainable society</li> </ul> <p><b>[Safety and the Environment]</b></p> <ul style="list-style-type: none"> <li>• Safe working environments</li> </ul>	<p><b>[Compliance]</b></p> <ul style="list-style-type: none"> <li>• Compliance with laws and ethics</li> <li>• Maintenance of effective internal systems and training</li> <li>• Compliance with international rules and the laws of each country</li> <li>• Compliance with antitrust laws</li> <li>• Compliance with laws relating to imports/exports</li> <li>• Handling of confidential information</li> <li>• Maintenance and protection of intellectual property (IP) rights</li> <li>• Control of personal information</li> <li>• Appropriate use of information systems</li> </ul> <p><b>[Accommodating Society]</b></p> <ul style="list-style-type: none"> <li>• Response with integrity to stakeholders</li> <li>• Response to antisocial influences</li> <li>• Social contribution activities</li> <li>• Coexistence with society at national and local levels</li> <li>• Contribution to the development of local society</li> <li>• Advertisements</li> <li>• Highly transparent political and governmental relationships</li> <li>• Business entertainment, etc.</li> </ul>	<p><b>[Humanity]</b></p> <ul style="list-style-type: none"> <li>• Contribution to the development of local society</li> <li>• Effective use of corporate resources</li> <li>• Behavior causing damage to the Company</li> <li>• Human rights/discrimination, harassment</li> <li>• Lively workplace environment</li> </ul>

## Fair Transactions

### Establishment and Disclosure of Policies Stipulating the Purchase

Our Raw Material Purchasing Center has established policies and is conducting its purchasing activities in conformity to the Daicel Group Conduct Policy and the Daicel Chemical Industries Code of Conduct. Specifically, we are implementing secure procurement of fuels and raw materials in light of today's focus on risk management. Our policies for purchasing fuels and raw materials are available to the public on our website at the following link (Japanese version only): <http://www.daicel.co.jp/purchase/index.html>

### Manual Developed for Compliance with Antitrust Laws

In March 1993, Daicel developed a Manual for Compliance with Antitrust Laws in order to ensure it maintains the fairness of all transactions. The Manual for Compliance with Antitrust Laws briefly introduces the information required to understand all antitrust laws. As for conduct of employees engaged in business operations, this manual presents the conduct guidelines for ensuring compliance with antitrust laws by plainly indicating descriptions of the prohibited conduct that is likely to raise antitrust concerns if practiced.

As for international business, we have compiled a practical guide to U.S. antitrust law called "Do's & Don'ts." The content to this guide is revised as necessary.

At our in-house legal seminars and position-specific training, we also deal with antitrust law in our curriculum in order to cultivate a better understanding of fairness in our business dealings. As for the Act against Delay in Payment of Subcontract Proceeds, Etc., to Subcontractors, we are addressing this issue as a theme of seminars and training by providing training materials that have been prepared and we will check the state of compliance at that time.

Our website includes a list of the fuels and raw materials we purchase as well as our procurement policies for fuel and raw materials (Japanese version only).



### Policies Regarding the Purchase

#### Fair & Rational Transactions

- We remain committed to operating on a basis of economic rationality under our motto of remaining dedicated to just and fair transactions.
- Our overall considerations are matters of price, quality, stability of supply, technological development capability, and consideration for the environment.
- We conduct our purchasing activities in an open manner with no regard for previous dealings or for whether the provider is located inside or outside Japan.

#### Confidentiality and Compliance with Laws and Regulations

- We comply with laws and regulations relating to purchasing activities.
- We request that our suppliers comply with such laws and regulations and we select only those suppliers who demonstrate such a commitment.
- We maintain our duty of nondisclosure of confidential information obtained from our suppliers during such transactions.


#### Establishing a Relationship of Trust

- We strive to establish partnerships with our suppliers by pursuing mutual benefit.
- We conduct business with our suppliers with complete honesty and in good faith.

\* These policies have not been set forth in the form of a contract and should not be construed as an offer of a contract.

## Opinions of Third Parties

This document appearing below contains the opinions (in Japanese) of third parties regarding the 2008 edition of this report.



**ダイセル化学 環境安全・社会報告書 2008**  
第三者検証 意見書

2008年6月3日

日本レスポンシブル・ケア協議会  
検証評議会議長  
**山本明夫**  
レスポンシブル・ケア検証センター長  
**田中康夫**

**■ 検証の目的**  
レスポンシブル・ケア報告書検証は、ダイセル化学工業株式会社が作成した「ダイセル化学 環境安全・社会報告書 2008」(以後、報告書と略す)を対象として、下記の事項について、化学業界の専門家としての意見を表明することを目的としています。

- 1) パフォーマンス指標(数値)の算出・集計方法の合理性及び数値の正確性
- 2) パフォーマンス指標(数値)以外の記載情報と証拠資料・証拠物件との整合性
- 3) レスポンシブル・ケア活動の評価
- 4) 報告書の特徴

**■ 検証の手順**

- 本社において、各サイト(事業所、工場・研究所)から報告されるパフォーマンス指標の集計・編集方法の合理性に関する調査及び報告書記載情報と証拠資料との整合性の確認を各業務責任者及び作成責任者に質問すること並びに資料提示・説明を受けることにより実施。
- 権限工場において、本社に報告するパフォーマンス指標の算出・集計方法の合理性、数値の正確性に関する調査及び報告書記載情報と証拠資料・証拠物件との整合性の確認を各業務責任者及び作成責任者に質問すること並びに資料提示・説明を受けることにより実施。
- パフォーマンス指標及び記載情報の検証についてはサンプリング手法を使用。

**■ 意見**

- 1) パフォーマンス指標(数値)の算出・集計方法の合理性及び数値の正確性  
パフォーマンス指標の算出・集計方法は、本社及び権限工場において、合理的な方法を採用しています。具体的には、「環境・安全パフォーマンス指標作成手順」に従い、全社共通の EXCEL 集計表を用い、本社が各事業所のデータを集計しています。  
調査した範囲において、パフォーマンスの数値は正確に算出・集計されています。
- 2) 記載情報と証拠資料・証拠物件との整合性  
報告書に記載された情報は、調査した証拠資料・証拠物件と整合性があることを確認しました。  
原案段階では表現の適切性あるいは文章の分かり易さに関し、若干指摘事項が認められましたが、現報告書では修正されており、現在修正すべき重要な事項は認められません。
- 3) レスポンシブル・ケア(以後、RCと略す)活動の評価  
権限工場内、ダイセル・セイフティ・システムズ㈱に於ける 3S(整理・整頓・清掃)活動が、トヨタ生産方式を取り入れ、効果を上げている点の評価します。多数の派遣社員に対する教育・指導が良く行なわれ、定着率向上に寄与している点の評価します。  
権限工場に於ける、排水のマスバランス把握に関する精度アップを希望します。
- 4) 報告書の特徴  
前年度に比べ、ダイセルグループ概要・歴史、生産技術、製品説明、人材育成のページが厚くなり、ダイセル化学という企業を一般の人にわかり易く説明しようとしている姿勢を評価します。一方、事業所関連のパフォーマンスデータの一部がホームページの方に移行していますので、ホームページ掲載データ内容について、当該紙面でも触れるなど、データ公表の姿勢をより強く表現されることを推奨します。

以上





Inquiries:

**Responsible Care**

1239, Shinzaike, Aboshi-ku, Himeji-shi, Hyogo 671-1281, Japan

Tel: +81-79-273-7584 Fax: +81-79-273-7911

**Corporate Compliance Program**

JR Shinagawa East Bldg., 2-18-1, Konan, Minato-ku, Tokyo 108-8230, Japan

Tel: +81-3-6711-8110 Fax: +81-3-6711-8138

<http://www.daicel.co.jp>

Published September 2008  
Printed in Japan