



Sharing more happiness
with more people through the
chemical business



Toagosei Group Report
2018



Sharing More Happiness with More People through the Chemical Business

Harness the power of chemicals to create new value that helps realize a sustainable society.

The Toagosei Group contributes to the development of society by supplying industry with various products from commodity chemicals such as caustic soda, acrylic esters and PVC piping equipment products, to high-value-added products based on distinctive technology, such as Aron Alpha[®] instant glues, ARONIX[®] UV-curable resin, the silver-based inorganic antimicrobial agent NOVARON[®] and Anju-brand nursing care products.

Going forward, by thoroughly ensuring safety and operational stability as well as reliable manufacturing, Toagosei will strive to meet the expectations of shareholders, customers, business partners, local communities, employees and other stakeholders by creating original value that contributes to realizing a sustainable society.

A handwritten signature in black ink, appearing to read 'M. Taken'.

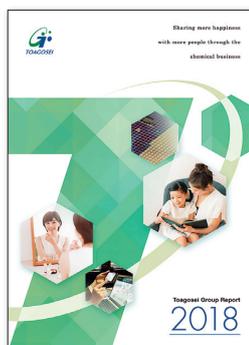
President and Representative Director

Editorial policy

The Toagosei Group publishes the Toagosei Group Report to facilitate stakeholders' understanding of the Group's business strategies and initiatives. In addition to the management orientation, strategies, and business overview, non-financial information on environmental and social aspects is included

Degrees of achievement indicated in PDCA tables

- ★★★★ : Target achieved
- ★★★ : Progress slower than originally envisaged and target not achieved (target achievement rate of 80% or higher)
- ★ : Target not achieved (target achievement rate of less than 80%)



Organizations covered

Toagosei Co., Ltd. and Toagosei Group companies are covered by this report. The environmental data reported in this report are aggregate data corresponding to companies and sites in Japan engaged in manufacturing specified on Page 49 ("Business Activities and Environmental Impacts"). If the name of a plant is not preceded by a company name, it means it is a Toagosei plant.

Reference guidelines

Environmental Reporting Guidelines (Fiscal Year 2012 Version) published by the Ministry of the Environment of Japan
The International Integrated Reporting Council (IIRC) International Integrated Reporting Framework

Date of issue of the Japanese version

March 2018 (Previous issue: March 2017. Next issue scheduled for March 2019)

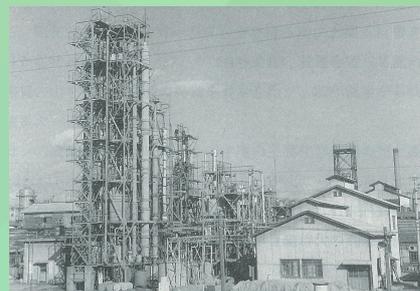
Period covered

Graphs and tables in this report present aggregate data for one year from January 1 to December 31, 2017. Some articles include information on activities conducted in 2018.

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Our communication tools

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For all users



Toagosei Corporate Website
<http://www.toagosei.co.jp/english>

For shareholders



Shareholder Newsletter for the 105th Term

For all stakeholders



Toagosei Group Report 2018

Corporate History

The Toagosei Group has been creating new value by leveraging the power of chemicals to meet the needs of a rapidly changing society.

In 1960, Toagosei was the first company in Japan to commercialize acrylic esters (acrylates). First produced in 1963, Aron Alpha® redefined adhesives for the world.

Going forward, the Toagosei Group will develop new products and new technology that meet the expectations of society and make every effort to enhance medium- to long-term corporate value.

- 1963** The Company commenced manufacturing of the Aron Alpha® instant glue.
- 1972** The Company commenced manufacturing ARONIX® UV-curable resin.
- 1989** The Company's first overseas subsidiary was established in the U.S.
- 1990s-** The Company established manufacturing and sales bases of functional products around the world, mainly in Asia.
- 2006** The Company established a joint venture for the manufacturing and sale of water treatment chemicals.

Phase 3

- 1950** Oaklite Industrial (current Aronkasei) was established.
- 1951** Oaklite Industrial (current Aronkasei) became the first in Japan to successfully manufacture rigid PVC pipes.
- 1960** The Company successfully commercialized Japan's first acrylic ester production line plant.
- 1983** Oita Chemical was established in Oita Prefecture to produce acrylic acid.



The first Aron Alpha® at launch

- 1916** Tokai Soda, the origin of the Company, was established.
- 1933** Yahagi Kogyo, the predecessor of the Company, was established to produce chemicals such as ammonium sulfate, sulfuric acid and nitric acid.
- 1944** Yahagi Kogyo merged with Showa Soda, Hokkai Soda and Rayon Soda to form "Toagosei Chemical Industry," marking the founding of the Company.
- 1957** The Company opened a new plant in Tokushima (Tokushima Plant) to produce caustic soda and organic solvents.

Phase 2

1960s-

Development of petrochemicals

Besides electrolysis products, Toagosei developed a presence in petrochemicals, including acrylic esters, polyvinyl chloride resin, and chlorinated organic solvents.

Phase 1

1910s-1960s

Development of commodity chemicals

The business was initially built mainly on soda, ammonia, ammonium sulfate and sulfuric acid, during a period when Japanese industry needed electrolysis products as basic materials and Japan's farmers needed fertilizer to boost food production.

■ Net sales (non-consolidated)
■ Net sales (consolidated)



Product Guide (early 1950s)

1950

1960

1970

1980

1990

Phase 4

Gaining a strong presence in technologies and high-value-added products

Accelerating the Phase 3 strategy, Toagosei aims to promote a qualitative shift in the business base by expanding sales of functional and high-value-added products while strengthening overseas business development.

2019
The 75th anniversary of the Company's founding

1970s– Development of functional chemicals

In order to overcome the challenges posed by the oil crises, including lackluster demand for mass-produced products and to make the business less sensitive to economic fluctuations, Toagosei leveraged its original technology and fostered functional products such as Aron Alpha® and ARONIX®, positioning them as mainstays of the business.



1993 Groundbreaking ceremony for the instant glue plant in the U.S.



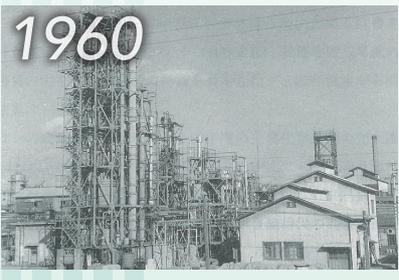
2011 Opening of the General Center of R&D



2011 Opening of the Monozukuri Center of Aronkasei Co., Ltd.



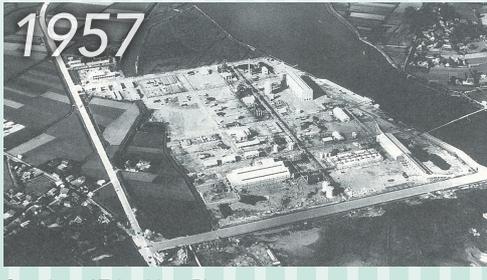
1951 Holding Japan's first rigid PVC pipe



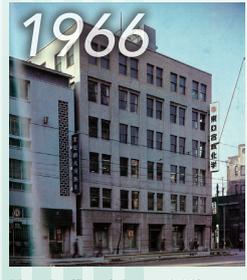
1960 Acrylic ester plant of the Nagoya Plant



1983 Oita Chemical is established



1957 Opening of Tokushima Plant



1966 Head office (circa 1966)



1985 The electrolysis equipment of the Nagoya Plant is changed to the ion exchange membrane method.

2000

2010

2018

Toagosei Group's Profile

Since its establishment on July 17, 1944, Toagosei has achieved continued growth in line with the development of the chemical industry in Japan.

The Toagosei Group is expanding its technology and product fields by displaying unique strengths in five business fields: Commodity Chemicals, Polymer & Oligomer, Adhesive Material, Performance Chemicals, and Plastics.

Company Profile

Establishment	July 17, 1944
Head Office	1-14-1 Nishi-Shimbashi, Minato-ku, Tokyo, Japan
President	Mikishi Takamura
Capital	20,886 million yen
Number of employees	2,393 on a consolidated basis (as of December 31, 2017)

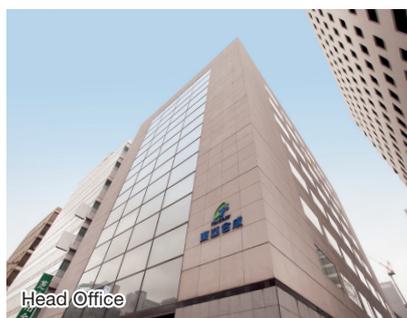
Main business lines

Segment	Products
Commodity Chemicals	Caustic soda, caustic potash, sodium hypochlorite and other inorganic chlorides, sulfuric acid, acrylic monomers, industrial gases, etc.
Polymer & Oligomer	Acrylic polymers, polymer flocculants, UV-curable resins, etc.
Adhesive Material	Instant glues, functional adhesives
Performance Chemicals	High-purity inorganic products, inorganic functional chemicals
Plastics	Piping equipment, products for construction and civil engineering, nursing care products, elastomer compounds, and environmental related products



About the corporate logo

Featuring the “T” of Toa and “G” of Gosei, the logo embodies Toagosei’s aspirations to demonstrate ingenuity based on “Trust” and “Technology” expressed by the “T” emphasized in the logo. The element of “T” expresses “power,” the loop of “G” symbolizes “sensitivity,” and the three dots express the possibilities inherent from their integration.



ASIA

China

- Toagosei Hong Kong Limited
- Toagosei (Zhuhai) Limited ▶ P.64
- TOA-DIC Zhangjiagang Chemical Co., Ltd. ▶ P.64



TOA-DIC Zhangjiagang Chemical Co., Ltd.

Taiwan

- Taiwan Toagosei Co., Ltd.
- Toa-Jet Chemical Co., Ltd. ▶ P.64

Singapore

- Toagosei Singapore Pte Ltd. ▶ P.64

Thailand

- Toagosei (Thailand) Co., Ltd. ▶ P.64

South Korea

- Toagosei Korea Co., Ltd.

- Commodity Chemicals
- Polymer & Oligomer
- Adhesive Material
- Performance Chemicals
- Plastics
- Others



AMERICA

USA

- Toagosei America Inc. ▶ P.64
- Elmer's & Toagosei Co.



Toagosei America Inc.

JAPAN

Toagosei Co., Ltd.

- Head Office, Osaka Branch, Nagoya Branch, Shikoku Sales Office, Fukuoka Sales Office, Nagoya Plant, Yokohama Plant, Takaoka Plant ▶ P.62
- Tokushima Plant, Sakaide Plant, Kawasaki Plant, Hirono Plant ▶ P.62
- General Center of Research and Development, Institute for Advanced Sciences ▶ P.63

Principal Affiliated Companies

- Aronkasei Co., Ltd. ▶ P.63
- MT AquaPolymer, Inc.
- Oita Chemical Co., Ltd. ▶ P.63
- Toa Techno-Gas Co., Ltd.
- TG Corporation
- Toa Business Associe Co., Ltd.
- Toa Kogyo Co., Ltd.
- Toa Logistics Co., Ltd.
- Hokuriku Toa Logistics Co., Ltd.
- Shikoku Toa Logistics Co., Ltd.
- Aron Packaging Co., Ltd.
- MT Ethylene Carbonate Co., Ltd.
- Toa Kenso Co., Ltd.



Nagoya Plant, Aronkasei

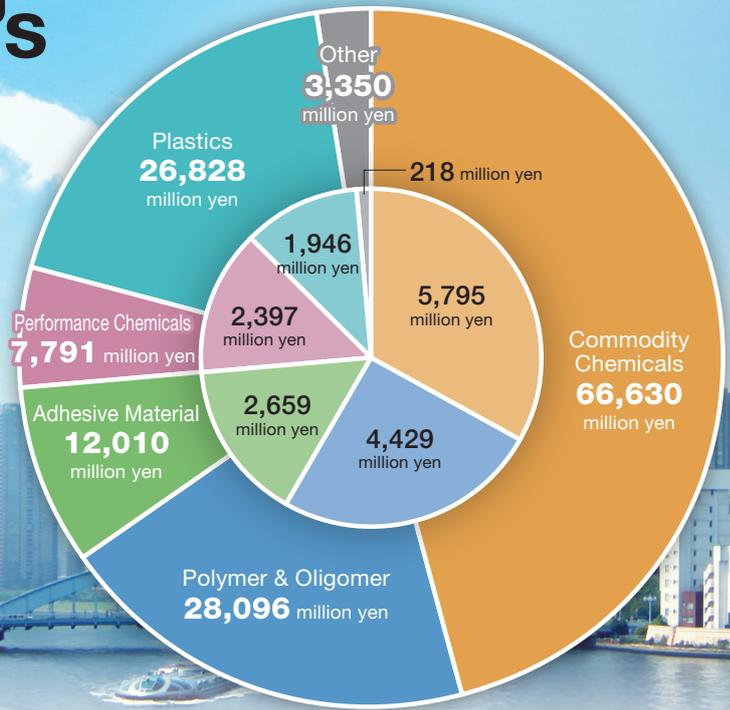


Sakaide Plant, MT AquaPolymer

Toagosei Group's Products Serve Society

Toagosei Group's earnings structure (2017)

Net sales (outer circle) **144,708** million yen
 Operating income (inner circle) **17,446** million yen



Businesses with core roles in the growth strategy

Polymer & Oligomer ▶ P.21

Polymers Acrylic polymers

We offer a wide range of acrylic polymers, such as dispersants and thickeners, for various uses such as cosmetics and toiletries.



ARONFLOC® polymer flocculant

This chemical agent is widely used in wastewater treatment not only at sewage treatment plants but also for treating wastewater from paper manufacturing and food processing plants.



Adhesive Material ▶ P.23

Aron Alpha® instant glues (U.S. brand name: Crazy Glue)

Aron Alpha® and Crazy Glue are the top brands in instant glues. Our wide range of organic-solvent-free, environmentally friendly adhesives satisfy diverse consumer needs.



Functional adhesives

We offer a range of functional adhesives for industrial applications including reactive, hot-melt, and light-curable types. These adhesives are widely used in the assembly of automobile components and electronic components, among others.



Performance Chemicals ▶ P.25

High-purity inorganic chemicals

High-purity inorganic chemicals, such as liquid hydrogen chloride used in the manufacture of silicon wafers and semiconductor devices, are essential in various cutting-edge industrial fields.



NOVARON® inorganic antimicrobial agent

Effective against a wide range of microbes as well as for disabling various viruses, NOVARON® is contributing to clean, comfortable living.





Commodity Business

Commodity Chemicals ▶ P.19

Caustic soda

Caustic soda is a fundamental raw material used in a wide range of products such as synthetic fibers, paper, pulp, chemicals, etc.



Sodium hypochlorite

Sodium hypochlorite is used for sterilizing swimming pool water, as well as tap water and in sewage treatment. Our products with minimal chloric acid or bromic acid underpin the supply of safe and clean water.



Acrylic monomers

Acrylic acid is a raw material for highly water-absorbent resins, polymer flocculants, etc. Acrylate esters are raw materials for tape adhesives, paints, and various other products.



Industrial gases

We handle a wide range of industrial gases including oxygen, nitrogen and argon, meeting the extensive needs of various industries ranging from the steel, chemical and other key industries to state-of-the-art industries such as semiconductor-manufacturing and medicine.



Plastics ▶ P.27

Small-diameter polyvinyl chloride chambers and manhole covers

We propose piping systems effective for the drainage of every type of urban structure and contribute to the construction of infrastructure that supports our daily lives.



Oligomer ARONIX® UV-curable resins

The ARONIX® series is used in many fields, ranging from paints and inks to adhesives and electronic materials. These environmentally friendly resins are free of organic solvent.



SQ Series

Applications include contamination-resistant coatings exploiting the high resistance of these resins to radioactive and ultraviolet rays. Used for protecting the vehicle identification mark (Japanese flag) on transfer vehicles to the Space Station, the SQ Series is helping extend the lives of materials used in space.



(C)JAXA/NASA

KESMON® inorganic deodorant

KESMON functions as a deodorant in various situations, such as deodorizing toiletries, clothing and the interior of cars. Odors are adsorbed through a chemical reaction, preventing the unpleasant odor from being re-emitted.



Construction materials

Waterproofing coating materials made from acrylic rubber protect roofs and exterior walls from rainwater penetration, thus contributing to longer lifespans of buildings and total maintenance.



Anju-brand nursing care products

We are addressing the growing demand associated with the aging population, developing products that match the needs of the nursing care field and everyday life so that seniors can live a full and comfortable life.



Elastomers

Elastomers are used in a wide range of products in various aspects of everyday life, thanks to their rubber-like elasticity and their ease in being molded, similar to general-purpose plastics.



Financial and Non-financial Highlights

Financial data

		95th term 2007 (Dec. 2007)	96th term 2008 (Dec. 2008)	97th term 2009 (Dec. 2009)	98th term 2010 (Dec. 2010)
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Key financial results

Net sales	(millions of yen)	162,729	162,615	140,033	153,779
Operating income	(millions of yen)	12,719	11,668	11,158	21,271
Ordinary profit	(millions of yen)	13,462	11,057	11,538	20,941
Net income attributable to owners of parent	(millions of yen)	6,403	1,895	3,541	13,133
Net assets	(millions of yen)	118,939	113,048	113,700	125,027
Total assets	(millions of yen)	182,681	172,464	161,609	173,847
Cash flows from operating activities	(millions of yen)	15,651	13,280	22,701	24,843
Cash flows from investing activities	(millions of yen)	△4,209	△8,776	△6,174	△10,155
Cash flows from financing activities	(millions of yen)	△15,894	△4,057	△13,992	△4,117

Key indicators

Net assets per share (*1)	(yen)	807.02	761.96	788.06	874.34
Net income per share (*1)	(yen)	49.04	14.54	27.70	104.10
Net worth ratio	(%)	57.7	57.6	61.5	63.4
ROE (ratio of net income to shareholders' equity)	(%)	6.1	1.9	3.6	12.5
ROA (ratio of ordinary profit to total assets)	(%)	7.1	6.2	6.9	12.5
Price earnings ratio	(times)	14.5	36.9	25.2	7.3

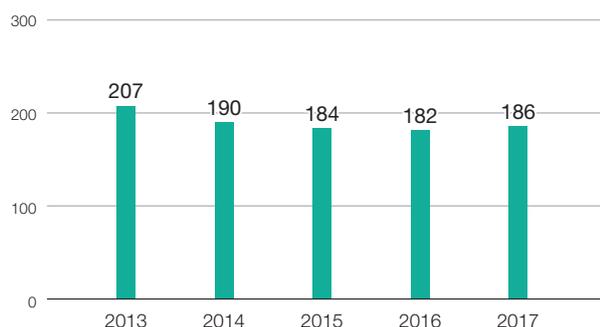
Other indicators

Capital investment	(billions of yen)	6.9	6.7	5.9	10.3
Research and development expenses	(billions of yen)	4.8	4.8	4.5	4.5
Interest-bearing debt	(billions of yen)	26.5	25.5	15.7	13.5
Cash dividend (*2)	(yen)	8.00	8.00	6.00	9.00
Payout ratio	(%)	32.6	110.0	43.3	17.3
Number of employees		2,552	2,617	2,561	2,533

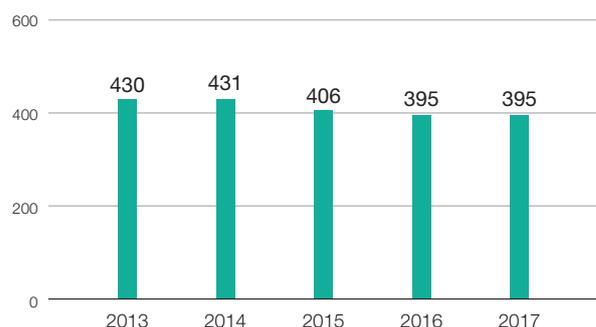
*1 The Company has implemented the share consolidation of common stocks at a ratio of one share per two shares effective on July 1, 2015. Net assets per share and net income per share are calculated assuming that the share consolidation was executed at the beginning of the 95th term.

Non-financial data

Energy consumption (Thousand kL, crude oil equivalent)

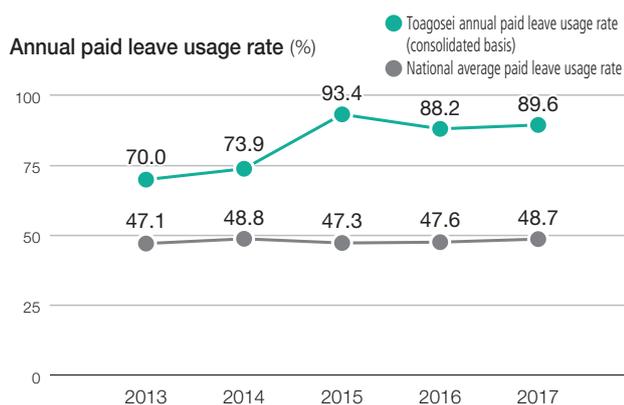


CO₂ emissions (Thousand tons, CO₂ equivalent)

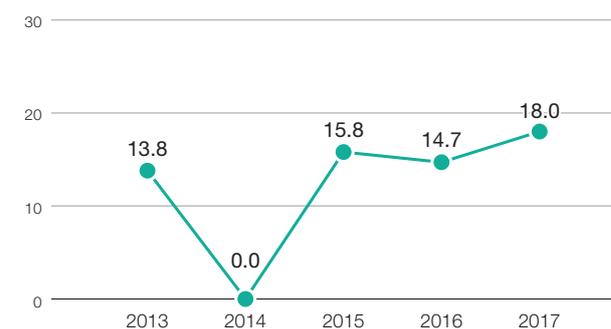


99th term 2011 (Dec. 2011)	100th term 2012 (Dec. 2012)	101st term 2013 (Dec. 2013)	102nd term 2014 (Dec. 2014)	103rd term 2015 (Dec. 2015)	104th term 2016 (Dec. 2016)	105th term 2017 (Dec. 2017)
153,007	148,203	151,081	148,912	139,848	135,382	144,708
17,338	14,583	14,501	12,015	12,347	16,147	17,453
17,569	15,250	15,346	12,892	13,201	16,935	18,492
13,000	9,699	9,605	8,414	6,696	13,801	12,911
127,776	136,240	148,148	157,349	163,020	173,003	187,487
171,046	181,451	193,086	201,168	208,018	219,520	239,338
17,828	23,293	18,023	16,098	23,313	21,989	15,166
△9,041	△15,041	△6,852	△13,981	△4,592	△17,673	△23,186
△7,320	△3,377	△2,094	△3,063	△3,949	△3,939	△4,047
939.23	1,001.99	1,090.91	1,159.65	1,201.46	1,276.10	1,387.36
101.99	73.58	72.88	63.88	50.86	104.83	98.08
72.4	72.8	74.4	75.9	76.0	76.5	76.3
11.1	7.6	7.0	5.7	4.3	8.5	7.4
10.2	8.7	8.2	6.5	6.4	7.9	8.1
6.2	9.2	12.3	15.0	20.5	11.0	14.6
10.4	12.8	7.4	7.8	5.8	5.1	10.0
4.6	4.4	3.8	3.9	3.7	3.6	3.7
12.5	12.2	13.1	13.2	12.6	12.3	12.1
10.00	10.00	10.00	12.00	18.00	26.00	26.00
19.6	27.2	27.4	37.6	47.2	24.8	26.5
2,534	2,509	2,483	2,442	2,441	2,411	2,393

*2 For the 103th term (fiscal 2015), the total annual dividend of ¥18 per share consists of an interim dividend of ¥6 per share and a term-end dividend of ¥12 per share. As the Company implemented the share consolidation of common stocks at a ratio of one share per two shares effective on July 1, 2015, the interim dividend of ¥6 per share is an amount before the share consolidation and the term-end dividend of ¥12 per share is an amount after the share consolidation.



Percentage of female employees hired (%)





Mikishi Takamura

President

Message from Management

We will harness the power of chemicals to create new value that helps realize a sustainable society.

Review of 2017

We are beginning to see the effects of the medium-term management plan, which began in January 2017.

The Toagosei Group has for many years focused on a strategy that places greater weight on high-value-added products. In terms of R&D, I feel that the fruits of our labor accumulated through our work at Toagosei's General Center of R&D and the Monozukuri Center of Aronkasei Co., Ltd., which were both launched in 2011, are beginning to take shape, and that initiatives to expand our high-value-added products have taken root throughout the Group. Under the medium-term management plan, "Trajectory Toward Growth 2019," which began last year, we conducted a reorganization of the Group by classifying our businesses into "businesses supporting the management base" and "businesses with core roles in the growth strategy." Businesses with core roles in the growth strategy have been divided into the three business units of "Polymer & Oligomer," "Adhesive Material" and "Performance Chemicals," and the strategies of each business unit have been articulated. These measures have been extremely successful in the sense that it has deepened our cooperation with our various users and has made it easier to formulate our next step.

Looking back on the chemical industry in 2017, we witnessed the balance of supply and demand for chemical products in general tighten, while the demand for electronics- and automobile-related products remained strong. As a result, in fiscal 2017 ended December 31, 2017, we posted consolidated net sales of ¥144,708 million, operating income of ¥17,453 million and operating margin of 12.1%, exceeding the results of fiscal 2016.

Among the high-value-added products, downstream acrylic products, functional adhesives and high-purity inorganic chemicals for semiconductors reported growth.

The Company has been reinforcing high-value-added products including downstream acrylic products such as acrylic polymers, adhesives and

high-purity inorganic chemicals to clean semiconductors. The sales volume of adhesives for high-performance information terminals such as smartphones has also been on a constant increase reflecting the rise in demand. Meanwhile, sales of high-purity inorganic chemicals for semiconductors had been sluggish at one point, but the semiconductor market has entered a new cycle by capturing the needs of data centers and vehicle-mounted sensors, and is once again growing rapidly, which in turn has led to a significant increase in demand.

Materials and chemicals are making their presence known in the field of cutting-edge technology. For example, as semiconductors are becoming increasingly miniaturized and highly integrated, the quality of each raw material used directly impacts the quality of the semiconductor product. Consequently, semiconductor manufacturers will be tracking back to more upstream suppliers and assessing whether the supplier would be capable of providing a steady supply of products with reliable quality. The Company has not only been refining the performance and quality of its products, but also the added value of its logistics including analysis technology and container management, as well as other aspects of its entire supply chain. These efforts, we believe, will ultimately benefit both our customers and ourselves.

In terms of general-purpose products, we are promoting reforms of our business structure to fulfill our social responsibility as a safe and stable supplier.

Electrolysis products manufactured by the Company include caustic soda, which is used in the manufacture of paper and pulp, and sodium hypochlorite, which is indispensable for sterilizing tap water and sewage treatment, as well as a disinfectant. These products support the very foundations of industries and society, and the Company has a responsibility to provide them in a safe and stable manner. On the other hand, many of these general-purpose products are at the center of the problem of aging facilities. The cost of maintaining and preserving such facilities is high, and in many cases, such facilities are not particularly productive. To address these issues and

look toward the future, the Company renewed its caustic potash production line last year, and by adopting the latest technology, has ensured a safe and stable supply system and reinforced its cost competitiveness. Furthermore, Aronkasei Co., Ltd. has been rebuilding its framework for the production of piping equipment products. Going forward, we will continue to assess and determine the products that require our focus and the issues that need to be addressed, while reinforcing the competitiveness of the core products that support our management base.

Initiatives toward creating value

By leveraging the Group's strengths, we will aim for product development that will be recognized for our uniqueness.

In 1960, Toagosei became the first company to successfully commercialize acrylic esters (acrylates) used as a raw material in adhesives and paints. Aron Alpha®, which was initially manufactured for industrial use in 1963, subsequently came to be sold for household use in the Japanese, U.S. and Hong Kong markets, and continues to be a perennial seller. During this time, products underwent changes (or evolution, as the Company, prefers to call it) by capturing customer needs. Furthermore, ARONIX®, which was later developed in response to society's increasing awareness for

the environment, does not contain any solvents that could have major impact on the environment, and as a resin that cures with light, is used in the bonding of electronic components and as resistance material for semiconductors. The wide range of products from upstream to downstream and the ability to meticulously deal with each product are major strengths of the Group. For example, when developing new adhesives including those that are pressure sensitive, we are capable of not only changing the composition, but also going back to the monomer and making something completely new that did not exist before, through our synthetic technology and polymerization technology. We are focused on the manufacturing of products that our users, and ultimately, society, recognize as something that only Toagosei is capable of making.

We will accelerate our overseas expansion to meet global needs.

In May 2017, the Company started construction of an acrylic polymer plant as part of the first phase of a project at Toagosei (Thailand) Co., Ltd., and plans to commence operation in June 2018. In the second phase of the project, we have decided to manufacture elastomers, which are products of Aronkasei. Both projects aim to meet the needs of our users, i.e., the Japanese companies expanding overseas, in a timely manner, as well as to expand our operations in the fast-growing Asian market. By steadily completing the first phase of construction, we will work to accumulate the necessary expertise in sales and marketing, as well as manufacturing, and focus on establishing a business foundation rooted in the region.

The Company promotes human resources recruitment and development, as well as diversity and changing the way we work.

The source of a company's sustained growth is its "people." It is particularly important to reinforce the development and marketing functions, which explore the direction to be taken by development with the user. The Group seeks talented people

Operating income from high-value-added products and general-purpose products (Billions of yen)



who can think for themselves, regardless of whether they majored in the arts or sciences. For example, Human Resources looks at the job entry sheets to see if the candidates have been able to express themselves in their own words, and assesses their potential through discussions on topics such as how the candidates overcame adversity whenever they were faced with failure in meeting challenges. Furthermore, even after the candidate joins the Company, he or she will be provided with a wealth of training and development, personal development opportunities, as well as on-the-job-training (OJT).

The Company is also actively engaged in working style reforms. The Toagosei Group boasts a high annual paid leave usage rate at around 90%. Nevertheless, to further improve the employees' work-life-balance, the Company in January 2018, established a Health Management Promotion Section in the Human Resources Department to create an open and inclusive working environment that allows diverse human resources to work lively. In terms of promoting the active participation of women, we have set numerical targets such as the percentage of female employees hired and the percentage of women in management positions based on the Act on Promotion of Women's Participation and Advancement in the Workplace, and we are steadily implementing our action plan.

We are promoting thorough business process reforms in an effort to enhance office productivity.

Japan has the lowest office productivity among the seven industrialized nations. When the Company was experiencing financial difficulties in 2000, it embarked on management reforms and lowered the percentage of personnel in the indirect sections. To further enhance business efficiency, it conducted a survey on administrative work such as accounting, human resources and purchasing of the plants and branches of the entire Group including its affiliates, to determine where and how such work was being performed and how much time was being taken. Based on the survey results, the Company has been standardizing these tasks through consolidation and concentration, and to get the work done efficiently with as few personnel as possible, it has decided to outsource the

majority of its administrative work to the Group company Toa Business Associe Co., Ltd. This system, which started in January 2018, is expected to greatly contribute to enhancing the productivity of office work and the indirect sections.

Commemorating the 75th anniversary and beyond

We hope to step beyond the status quo to establish a fourth core.

The Company will commemorate its 75th anniversary in 2019. The history of Toagosei consists of Phase 1, the period before and during World War II, in which it expanded into the commodity chemicals business handling chemicals such as caustic soda and ammonia, followed by Phase 2, corresponding to Japan's era of high economic growth, in which Toagosei delved into petrochemicals such as acrylic esters and polyvinyl chloride resin. Subsequently, Toagosei entered Phase 3, the current phase, which has been focusing on the development of functional products such as Aron Alpha[®] and ARONIX[®] (see pages 3-4). The medium-term management plan, "Trajectory Toward Growth 2019," sets the Group Vision for 2025 (see page 17), however, if we are going to look beyond 2025, new products and technology to form the fourth core business that will support the Toagosei Group's future will become indispensable. As the first step, we intend to reap the fruits of the current strategy based on high-value-added products, create products and technology that will become the next core business and use them as part of our arsenal to make our foray into overseas markets. However, we believe that a further step in a different direction is also necessary. Various possibilities come to mind: expansion into fields requiring a higher level of processing such as films and sheets which can be developed by further mining existing products and technology, and expanding collaborations with other companies including possible M&As both in Japan and overseas. Although only future generations will know what this fourth core will be, we will make every effort so that this fourth core takes shape sooner rather than later and to be able to proudly say, "the Toagosei Group was able to grow because of this fourth core."

Sharing more happiness with more people

I feel that we have finally entered an age where we can assert the significance of chemistry.

A total of 17 Sustainable Development Goals (SDGs) to transform our world by 2030 were adopted by the United Nations Sustainable Development Summit. Chemical companies to date have been known for their contributions to high economic growth but have also been plagued by negative images of causing pollution. To dispel these negative images, we have reduced waste and emissions, promoted the appropriate management of chemical substances and have come to lead the world in environmental conservation technology. However, as a chemical company, I feel especially committed to our original mission of contributing to

society through products, technology and services born out of our main business. For example, one of the SDGs is "Clean water and sanitation." Since the very beginning, the businesses of the Toagosei Group have always had an affinity with "water." In our founder's business of electrolysis, sodium hypochlorite, used to disinfect drinking water and sterilize swimming pool water, was produced from caustic soda and chlorine. ARONFLOC® polymer flocculant, a downstream acrylic product, has become an indispensable chemical in wastewater treatment. Furthermore, Aronkasei's PVC piping equipment products support tap water and sewage infrastructure, and nursing care products such as portable toilets contribute to a comfortable living environment. I believe that we have finally entered an age where we need to assert both to ourselves and others that our work is doing good for society and is connected to the goal of making the world a better place.



Mikishi Takamura

Profile

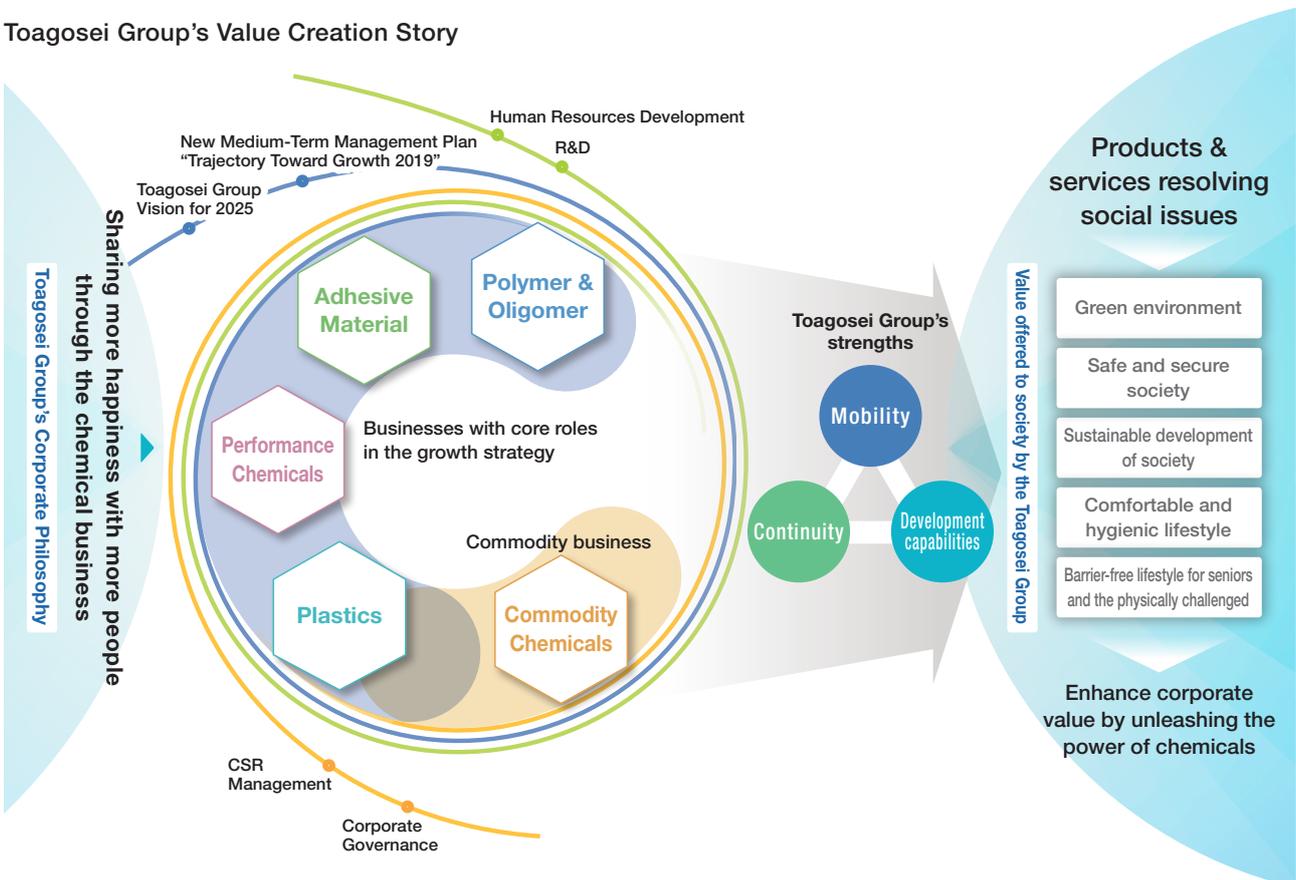
April 1980	Joined the Company
April 2002	General Manager, Finance Group, Administrative Department
April 2005	General Manager, Human Resources & General Affairs Group, Administrative Department
April 2006	General Manager, Human Resources & General Affairs Group and General Manager, Investor Relations & Public Relations Section, Administrative Department
April 2008	Deputy Plant Manager, Nagoya Plant
March 2010	Director, General Manager, Administrative Department
April 2012	Director, General Manager, Administrative Division
March 2013	Director, General Manager, Corporate Strategy Department
March 2015	Vice President and Representative Director and General Manager, Corporate Strategy Division
November 2015	President and Representative Director (to present)

We will continue to be a company that creates excellent materials used in making products that bring awe to users.

Products in every field, including semiconductors, home electronics, automobiles and daily necessities, are increasingly being required to be globally competitive. Fortunately, in Japan, the chemical industry has been able to continuously provide globally competitive products, and we must ensure that this momentum is not interrupted. Japan's chemical industry holds the key to the future prosperity of Japanese industries. We will continue to produce excellent materials, which users will use to make excellent products. When end-users are impressed with the excellence of these products, I hope that we can proudly say to ourselves as well as to users and society, "we are the ones that made those materials."

We have been contributing to society by fundamentally altering the chemical nature of substances and creating something new. However, creating such new products is a time-consuming process. This movement to increase ESG (Environment, Society and Governance) investment and the growth in the number of investors with long-term perspectives will work to our benefit. In closing, we sincerely ask shareholders, investors and other stakeholders for further understanding and continued support to the Toagosei Group.

Toagosei Group's Value Creation Story



Feature

Progress of the Medium-Term Management Plan

Based on our corporate philosophy of “sharing more happiness with more people through the chemical business,” the Toagosei Group is committed to sustainable growth by creating new products and new businesses, and to increasing its corporate value over the medium and long term.

Basic Policy for the Medium-Term Management Plan

Toagosei Group Vision for 2025

- A chemical corporate group with a strong presence in technologies and high-value-added products
- A chemical corporate group operating production and sales activities in Japan and overseas, with overseas net sales ratio of over 25%
- A chemical corporate group with abundant talented and motivated employees who drive business expansion
- A chemical corporate group having a stable profitable base, with net sales of over 200.0 billion yen

First step toward realization

Medium-Term Management Plan

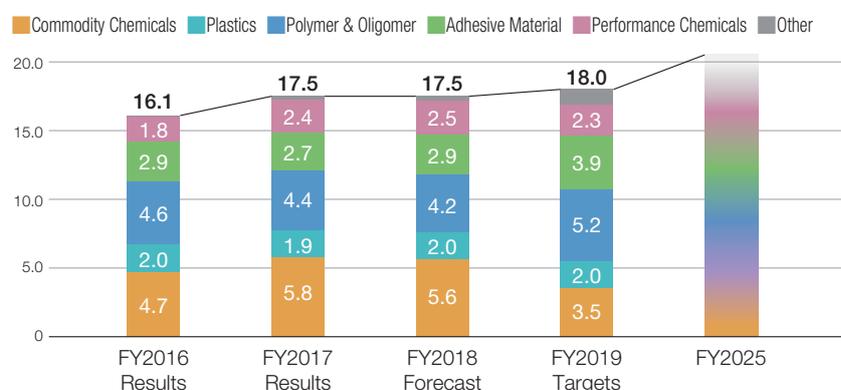
“Trajectory Toward Growth 2019”

FY2019 Targets

Net sales	155.0 billion yen
Operating income	18.0 billion yen
Operating income to net sales ratio	11.6 %
Net income attributable to owners of parent	12.5 billion yen

* Assumptions for FY2019 targets: naphtha price of 32,000 yen/kl, exchange rate of 105 yen/USD

Operating income by segment (Billions of yen)



Business units and major strategies

Businesses supporting the management base

Commodity Chemicals

Electrolysis products

- Renew the production facility and strengthen the production system

Acrylic monomer

- Enhance the facility utilization rate in Japan and restructure the Singapore business

Plastics (Aronkasei)

Piping equipment

- Optimize the production system of the three plants and launch new products focusing on disaster response and public infrastructure

Businesses with core roles in the growth strategy

Polymer & Oligomer

Acrylic polymers

- As Phase 1 of Toagosei (Thailand), launch acrylic polymers business (starting production in 2018), strengthen the local marketing system and develop the Phase 2 business plan

Oligomers (ARONIX®)

- Integrate the operation of three bases (Japan, China and Taiwan) and expand through mutual interchange of new product development and M&As

Adhesive Material

Functional adhesives

- Promote new product development focusing on electronic parts, automobiles and batteries

Instant glues

- Strengthen brand strategy by advertising, launching new products and enhancing sales activities in both Japan and the United States, thereby increasing market share

Performance Chemicals

High-purity inorganic chemicals and inorganic functional materials

- Promote new product development and strengthen the marketing system in Southeast Asia, China, Taiwan, South Korea, and the United States

Plastics (Aronkasei)

Construction materials and civil engineering

- Boost sales capabilities through cooperation between Toagosei and Aronkasei

Nursing care products

- Continue the launch of new nursing care products, and also expand to the Chinese market

Elastomers

- Launch products with new functions and expand the product lineup. Furthermore, develop production and sales systems in Southeast Asia

“Trajectory Toward Growth 2019” 2025

Review of 2017

Strengthening businesses supporting the management base

Starting anew caustic potash plant in energy-saving electrolytic cells

- Achieved high-efficiency facilities based on the concept of the world's top-level electrolysis technology for caustic potash.
- Significantly upgraded response capabilities towards quality needs of customers, such as high-purity products for cleansing semiconductors.



November 2017 - Powering up the new facilities

A new plant for Aronkasei's piping equipment business to commence operations in Spring 2018

- Integrated and restructured 3 plants used as bases for producing piping equipment. Newly established state-of-the-art injection-molding and extrusion-molding facilities in Nagoya. Proceeded with the enhancement of production efficiency by revising and optimizing the production line, and strengthened the management base.



Aronkasei Nagoya Plant - New production building

Expanding businesses with core roles in the growth strategy

Projects in Toagosei (Thailand)

Phase 1 project

- Acrylic polymer plant under construction

Products: Materials for cosmetics, etc.

Start of operation: June 2018



Example uses of acrylic polymer

Phase 2 project

- New elastomer plant and sales base to be established

Products: Various styrene-based elastomers marketing in the fields of home electronics, automobiles, foods, general goods, etc., is in progress

Start of construction: Second half of 2018 (Plan)

Start of operation: By the end of 2019 (Plan)



New Thailand plant under speedy construction



Example uses of elastomers

Initiatives for 2018 and Beyond

Sales expansion of Automobile-related line-ups

We will speedily develop products that meet user needs of lightweight vehicles and electrification, such as resin sheet alternative to glass, adhesives for different materials, materials for electric parts and materials for lithium ion batteries.

Cultivation of the cosmetics materials business

Utilizing the Company's technology, we are planning a full-fledged expansion into the cosmetics-related market with our functional powder polymer.

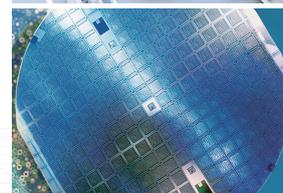
Strengthening of high-functional line-ups for semiconductors

As one of the leading manufacturers, we respond to market needs for higher quality and stable supply with our performance chemicals, such as liquefied hydrogen chloride.

We will strengthen precision products, such as IC encapsulant ion catchers and silicon wafer chemical mechanical polishing.

Further downstream development

We shall accelerate the film sheet processing business for adhesive materials, aiming for material development synergy.



Business Overview
and Growth Strategy

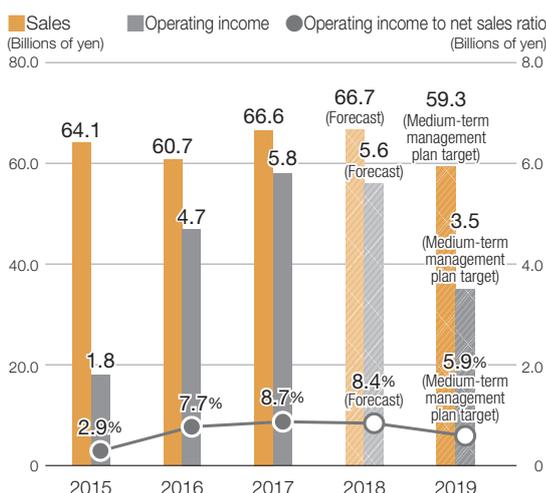
Commodity Chemicals



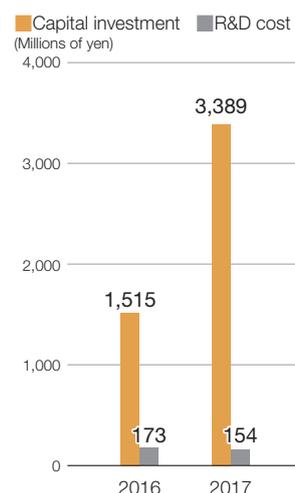
Fumito Furukawa

Executive Officer
General Manager,
Commodity Chemicals Division

Sales and Operating Income by Segment



Capital investment and R&D cost



Business Overview

Among Toagosei's businesses, the inorganic chemical business has the longest history. Caustic soda, chlorine, sodium hypochlorite, various chlorides, sulfuric acid, industrial gases, and the other inorganic chemicals Toagosei supplies are not only used as raw materials for chemical products, but are themselves also widely used as indispensable products in diverse industries and fulfilling important roles that contribute to contemporary affluent society.

The acrylic business is one of the core businesses of the Toagosei Group. We have established an integrated acrylic chain with product lines extending from upstream to downstream. Acrylic monomers are the starting point of this acrylic chain. Distinguished by high quality and cost competitiveness, the acrylic monomer business is underpinning business expansion of downstream acrylic derivatives, such as polymers and oligomers.



Acrylic ester plant at the Nagoya Plant

Topics

Acquired Halal Certification

Eight inorganic industrial chemicals such as caustic soda and sodium hypochlorite manufactured at the Nagoya Plant, have been certified as Halal Products by the Japan Muslim Association.



Updated the Electrolysis Equipment for Caustic Potash

To ensure the stable supply of caustic potash and to enhance its competitiveness, the aging electrolysis equipment was updated to the latest facility. We are aiming to build an optimal production structure including the production of high-purity products to keep up with the recent growth of these chemicals.



Medium- to Long-term Growth Strategy

As a commodity business that supports lifelines and industrial bases, Commodity Chemicals will engage in ongoing capital investment and the improvement of productivity to provide a safe and stable supply of products.

Electrolysis business

In the electrolysis business, we are striving for stable and efficient production, strengthening competitiveness through vigorous investments to ensure maintain and increase profit. In 2013, our Tokushima plant became the first in Japan to install an electrolysis machine for commercial operation using the gas diffusion electrode method, which can cut electricity consumption by 30%. In 2016, the Tokushima Plant installed a manufacturing facility for sodium hypochlorite that satisfies the special grade standards specified by the Japan Water Works Association (JWWA). Additionally, in 2017, we upgraded the electrolysis equipment for caustic potash.



Caustic soda and sulfuric acid is used in the manufacture of paper and pulp, and sodium hypochlorite is used in sterilizing tap water and sewage treatment.

Acrylic monomer business

In the acrylic monomer business, a new 80,000-ton facility for acrylic acids was launched at Oita Chemical in 2014 to prepare for increasing demand for downstream acrylic products over the medium to long term and to strengthen cost competitiveness. We are working to establish a new business scheme for production and sales in Japan and overseas, including the Singaporean operations, to further improve our earnings power.



Acrylic acid is a raw material for highly-water-absorbent resins and thickeners. Acrylic esters are used for raw materials for pressure-sensitive adhesives and paints.

Industrial gas business

In the industrial gas business, we have been pursuing an aggressive strategy to expand business by strengthening industrial gas sales in the Chubu and Hokuriku regions to boost facility utilization at the production base so as to establish an efficient production system. A large-scale capital investment plan with the objective of maintaining stable production far into the future is being implemented.

Addressing Social Issues

Prevention of global warming

Social issues

Reduction of the greenhouse gas CO₂ as a countermeasure to ongoing global warming, is a universal task faced by each country around the world. In terms of automobiles, which are a source of CO₂ emissions, expectations are high for the spread of hybrid vehicles with minimal carbon dioxide emissions and electric vehicles as new, eco-friendly alternatives to gasoline and diesel fuel vehicles.

Toagosei Group's initiatives

As the use of hybrid and electric vehicles becomes more widespread, high-performance lithium-ion rechargeable batteries, which hold the key to the performance of these vehicles, are becoming increasingly important. The Company produces refined ethylene carbonate, the raw material of the electrolytic solutions for lithium-ion rechargeable batteries. Initially ethylene carbonate was mainly used as an acrylic textile processing agent and a soil improvement agent, but from the end of the 1990s, it has been attracting attention as electrolytic solutions of lithium-ion batteries used in PCs and mobile phones. With the increase in the production of hybrid and electric vehicles in recent years, we have been addressing this growth in demand and formed MT Ethylene Carbonate Co., Ltd., a joint venture with Mitsui Chemicals, Inc. in 2010.



Business Overview
and Growth Strategy

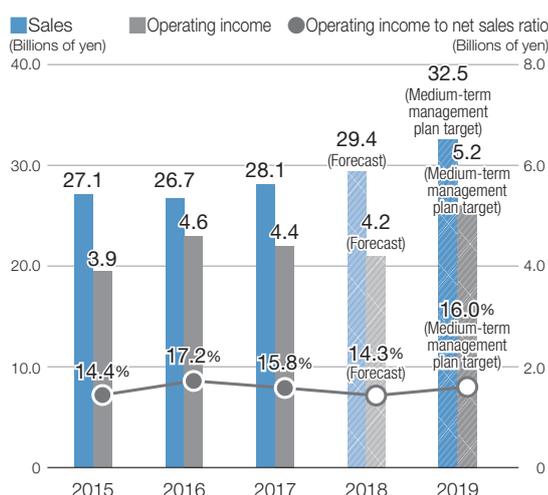
Polymer & Oligomer



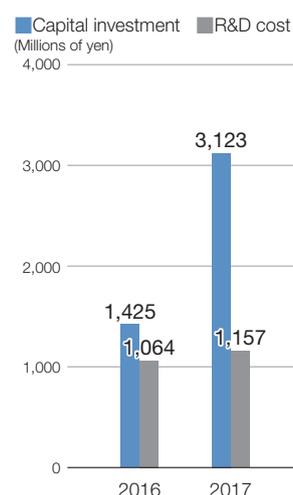
Hidenori Kobuchi

Executive Officer
General Manager,
Polymer & Oligomer Division

Sales and Operating Income by Segment



Capital investment and R&D cost



Business Overview

Acrylic polymers comprise a large group of products created from various combinations of molecular weights and copolymerization compositions based on acrylic acid or acrylic esters. These acrylic polymers, including dispersants, thickeners, gelling agents, flocculants, pressure-sensitive adhesives and coating agent, are contributing to society in various fields. We also have a wide product lineup developed utilizing proprietary technologies such as Toagosei's graft polymers, SYMAC[®] and RESEDA[®], solvent-free acrylic polymer, ARUFON[®] and high-performance powder products.

The Company offers two UV-curable resins: the special acrylic monomers and oligomers, ARONIX[®] and the cationic curable resins, ARON OXETANE[®]. These resins can be cured in a short time by exposure to UV light and do not require solvents, which eliminates the need for a drying process. They are equipped with superior qualities such as enhanced productivity, energy-saving and low environmental impact, and are used in a variety of products including adhesives, inks, paints and display materials.



The UV-curable resin, ARONIX[®] is used in a variety of applications ranging from printed materials to electronic materials.

Topics

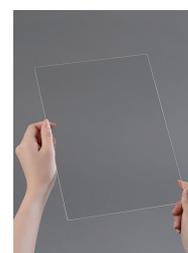
Absorbent Spherical Powders for Cosmetics

By leveraging our technology for controlling grain diameter of absorbent materials on the micro-level, we have developed a high-performance, highly-moisturizing, spherical powder that erases wrinkles. The wide application of this powder in the cosmetic field including skin-care products and gel-type lotions, is anticipated (see pages 31-32).



Resin Sheets as Glass Alternatives

By combining the compounding technology and the polymerization control technology of ARONIX[®], we have developed a clear, resilient and beautiful resin sheet as a glass alternative. Building on its excellent optical performance, heat resistance and abrasion-resistant qualities, its application is being further developed in the automobile and wearable-devices fields.



Medium- to Long-term Growth Strategy

We will aim to expand high-value-added products in the downstream acrylic products field, create new businesses based on outstanding seed technology and expand our international businesses.

Polymer business

In the polymer business we will aggressively engage in new development and expand our water-soluble polymer and high-performance powder product businesses both in Japan and overseas. In particular, Toagosei (Thailand) Co., Ltd. which is currently under construction, will become the core base in Asia for promoting high-performance and high-value-added products in Asia. Furthermore, we have been proceeding with the development of materials for the automobile and cosmetics sectors with the aim of establishing high-performance powder business as a new mainstay.



Polymer products are also used in cosmetics and eco-cars.

Oligomer (UV-curable resins) business

In the oligomer business, we will aim to expand the business by leveraging products differentiated through the adoption of new production methods and ARONIX UV Series, while at the same time, strengthening the competitiveness of general-purpose products. Furthermore, Taiwan Toagosei Co., Ltd. and Toa-Jet Chemical Co., Ltd. in Taiwan, and TOA-DIC Zhangjiagang Chemical Co., Ltd. in China are bolstering their local technology development capabilities, and expanding sales locally and to surrounding countries, thus further promoting local production for local consumption.



TOA-DIC Zhangjiagang Chemical



ARONIX® is also used as resistance material in electronic substrates

Flocculant business

The group's MT AquaPolymer, Inc. manufactures and sells the high-quality polymer flocculant, ARONFLOC®. We provide outstanding products and appropriate solutions for the process of purifying wastewater and sludge which are increasingly diversifying in kind. We are contributing to society through the development of high-performance and high-graded products that focuses on the environment including the reduction of CO₂ through the reduction of water content.

Addressing Social Issues

Development of products friendly to people and the environment

Social issues

One of the recent initiatives toward realizing a sustainable society involves the improvement of infrastructure. In accordance with the Act on the Promotion of Popularization of Long-life Quality Housing, initiatives are being taken both in the civil engineering and the construction fields to meet the rising needs of customers for environmentally-friendly and high-durability resin, concrete and timber building materials.

Toagosei Group's initiatives

ARUFON® is an environmentally-friendly, solvent-free acrylic polymer product obtained through Uniform Functional Oligomer (UFO) technologies, which require no solvents. UFO technology is used to manufacture acrylic polymers efficiently through the continuous polymerization of composite materials at high temperatures, giving the various products the qualities of weather resistance, high durability and improved physical properties.

It is used in a wide range of applications such as in sealants, adhesives and in resin modifying agents, in the construction field where long life is being called for, and contributing to meeting various market needs.



ARUFON® is used in sealants and adhesives in construction.

Business Overview
and Growth Strategy

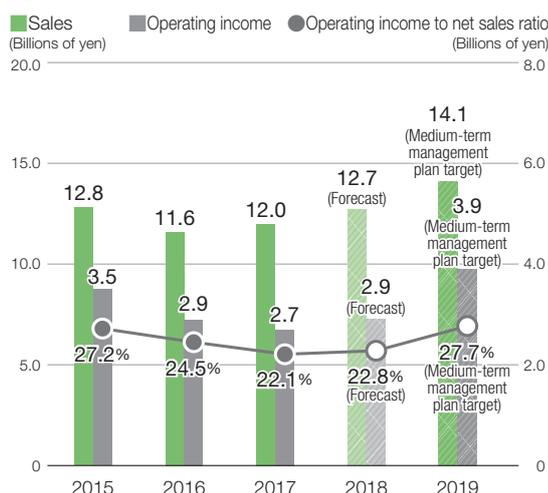
Adhesive Material



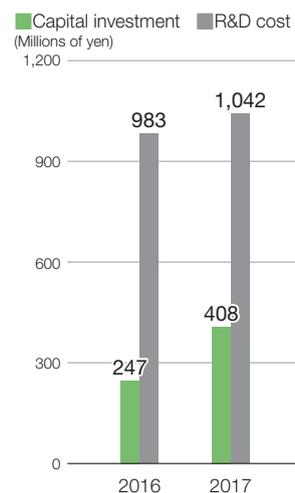
Takashi Nakaya

Executive Officer
General Manager,
Adhesive Material Division

Sales and Operating Income by Segment



Capital investment and R&D cost



Business Overview

The Adhesive Material Division has been contributing to accelerating the pace and reducing the costs of manufacturing, as well as technical innovations relating to new building methods through the adhesion of different materials such as plastics, metals, wood, rubber, leather and ceramics.

The Adhesive Material Division offers Aron Alpha[®], which is synonymous with household instant glues, as well as a wide range of functional adhesives including Aron Mighty[®], ARON MELT[®] and ARONIX[®] that meet diverse needs for industrial adhesives in the electronic materials, automobiles and precision equipment fields. In addition, we are striving to develop products that leverage our proprietary technologies such as Aron Powder[®], the powder paint, and the silsesquioxane derivatives, the SQ Series.

Our business provides countless opportunities to enrich our lives through the growth of our products.



A diverse product lineup for a wide range of uses including Aron Alpha[®], which is synonymous with instant glues

Topics

We Participated in the 1st JOINING JAPAN—Adhesion & Joining Expo—.

We presented the new products of Aron Alpha[®] and functional adhesives. The number of visitors significantly exceeded expectations, indicating the strong interest in Toagosei's products.



We Developed a Hybrid, Elastic Instant Glue

We developed a product equipped with both instant adhesion qualities, which is a feature of instant glues, as well as flexibility and durability, which had been difficult to achieve in hardened materials.



Medium- to Long-term Growth Strategy

Maintaining and increasing market share by bolstering the brand's capabilities and promoting customer-specific development in growth areas

Instant glue business

To maintain and increase our market share by bolstering the brand capabilities of instant adhesives, we will carry out vigorous advertising and launch new products in Japan as well as overseas. To capture new market needs, we will strengthen the development not only of adhesives, but also the containers while expanding sales channels.

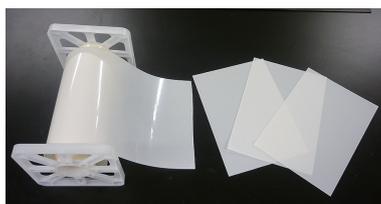


- **Renewal of the container and paper packaging of Aron Alpha®**
The container has been made more user-friendly and the new packaging design makes it easier to understand the features of the product
- **Aron Alpha® EXTRA Mini X 2**
We have begun marketing small, single-use containers of Aron Alpha®.
- **Launch of Aron Alpha® in Thailand**
We have begun marketing Aron Alpha® for household use in Thailand.

Functional adhesives business

We have been promoting product development of substrate-related materials and battery cell materials, targeting growth fields including information, communication, and mobility. Furthermore, in April 2018, a new Tokyo Technology Laboratory will be established to reinforce our capabilities for meeting diverse market needs.

- **Aron Mighty® AS-700**
We have developed a low-dielectric adhesive equipped to deal with high-speed transmission of large amounts of data in the information and communication field.
- **ARON MELT® PPET-1200F**
We have developed a film-type adhesive to bond different materials such as metals and resins, targeting the mobility field.
- **SQ Series**
We have commenced market development of heat-resistant, stain-resistant coatings by introducing silicon into SQ skeletal structure.



Addressing Social Issues

Efficient use of resources

Social issues

Given the increasingly serious problem of the depletion of resources, we must find ways of recycling old and broken objects and repairing them for continued use rather than throwing them away. Adhesives mend and reinforce our things and allow us to use them for a long time.

Toagosei Group's initiatives

Ever since its launch in 1971, some of the products of Aron Alpha®, the long-selling household instant glue, have been sold in the same type of container, i.e., containers that need to be pierced with a needle to be opened. However, we received words of criticism such as, "It's dangerous for children to use needles," "the product spurts out when opened and gets on our hands" and "it is difficult for the elderly to open the container" and we realized that this type of container was becoming a major obstacle for children and the elderly when they wanted use Aron Alpha® to mend their things. "General Use Aron Alpha®" was launched last year in response to such comments. The use of dangerous needles has been eliminated, and it is easier to control the liquid flow with a bigger section for squeezing, thus making Aron Alpha® a safe and user-friendly product.

Going forward, we will continue to listen to the voices of our customers and reinvent Aron Alpha®, thereby contributing to the effective utilization of resources.



The use of the needle has been eliminated and the container has been renewed so that it is easier to control liquid flow.

Business Overview
and Growth Strategy

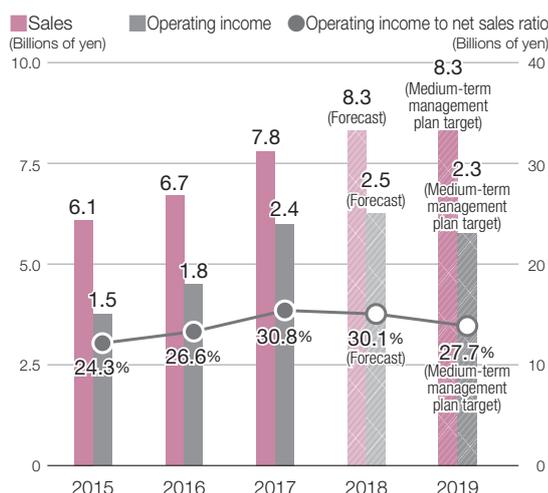
Performance Chemicals



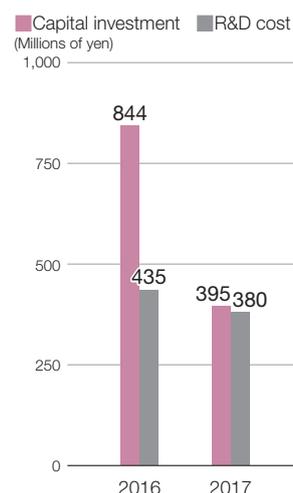
Hisashi Hara

Executive Officer
General Manager,
Performance Chemicals Division

Sales and Operating Income by Segment



Capital investment and R&D cost



Business Overview

The Performance Chemicals Division consists of two products – high-purity inorganic chemicals and inorganic functional materials. With our focus on “high-performance, inorganic products,” we target diverse areas from state-of-the-art electronic materials to daily consumer goods such as disinfectants and deodorants. The high-purity inorganic chemicals business manufactures chemicals such as high-purity liquid hydrogen chloride and high-purity liquid caustic potash with the maximum purity, which are supplied mainly to the semiconductor and electronic materials sectors. The inorganic functional materials business manufactures unique products such as IXE[®] ion-trapping agent, which is an additive that increases the reliability of electronic materials, and KESMON[®] and NOVARON[®], which perform antimicrobial, deodorizing and other comfortable functions in textile and plastic materials.



Topics

Filling Equipment at the Yokohama Plant is Updated

The former filling equipment of high-purity hydrogen chloride at the Yokohama Plant was updated and replaced by state-of-the-art equipment to keep up with increasing demand and further improvement in quality.



Lineup of New KESMON[®] Products

In recent years, deodorants have come to be used in a variety of situations. To meet these demands, KESMON[®] now offers a lineup that includes new products that come in different forms such as liquids and non-woven fabrics, as well as powder-type products.



Medium- to Long-term Growth Strategy

By leveraging the Group's strengths in enhancing the purity and functionality of inorganic chemicals, we will continue to meet diverse needs.

High-purity inorganic chemicals business

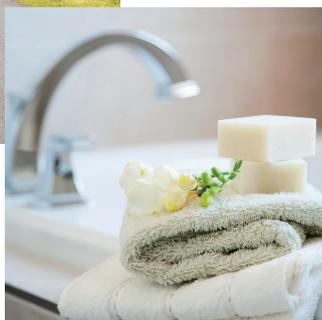
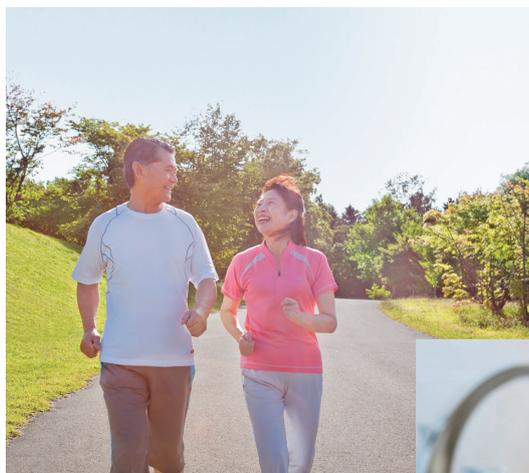
We have been enhancing our production and analytical technologies of various high-purity products such as liquid hydrogen chloride and hexachlorodisilane (HCD[®]), which are indispensable in semiconductor manufacturing, and Super Potash Ex, a high-purity caustic potash, used in the electronic materials field, and expanding beyond the Japanese market to markets overseas.



HCD container

Inorganic functional materials business

We are continuing to expand our marketing of IXE[®] ion-trapping agent, which supports increasingly thin membranes of electronic components, and the deodorant KESMON[®] and antimicrobial agent NOVARON[®], which create a clean and comfortable living environment. We are also strengthening our collaboration with our overseas bases in the growth markets of Asia including Taiwan and South Korea.



Addressing Social Issues

Contributing to the era of IoT

Social issues

With the growth of the Internet, we have entered an era in which everything can be connected to the Internet.

These changes extend to global applications such as cloud-based data and to our everyday lives such as automated driving, and are expected to support our lives in the future.

Toagosei Group's initiatives

Information communication, arithmetic processing and storage media all depend on memory, LSI and other semiconductor technologies. In recent years, the demand for semiconductors has skyrocketed and the volume of data handled has also increased dramatically. The memory capacity of 1 DRAM chip which reached 8Gbit in 2017 is expected to double to 16Gbit. For increasingly miniaturized semiconductors, even the smallest of impurities can become an obstacle. Therefore, the chemicals used are required to have the highest purity. To meet these demands, the Performance Chemicals Division is fulfilling its responsibility to provide a stable supply of these products as well as enhancing its manufacturing technology toward even greater purity and establishing a system of supply and analysis.



Business Overview
and Growth Strategy

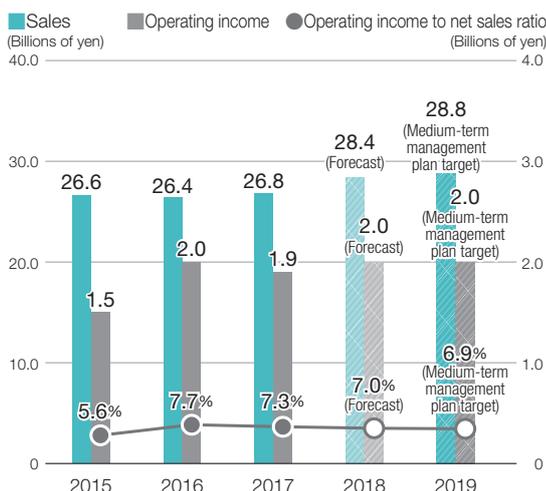
Plastics



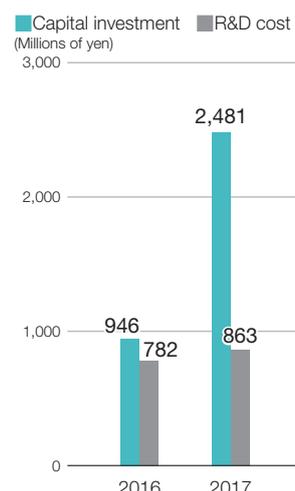
Shinichi Sugiura

Director
President and Representative
Director, Aronkasei Co., Ltd.

Sales and Operating Income by Segment



Capital investment and R&D cost



Business Overview

In 1951, Aronkasei Co., Ltd. developed the first rigid PVC piping product in Japan, called ARON PIPE. Since then, Aronkasei has been a pioneer in the field of piping equipment, offering joints, chambers and other items. Aronkasei has launched various products as a leading manufacturer of nursing care products, under the Anjyu brand. It also provides highly-flexible elastomers to users in Japan and overseas. With ingenious manufacturing that leverages the attributes of plastics, Aronkasei is broadening its business field, which currently centers on piping equipment, construction repair materials, nursing care products, and elastomers, from items that contribute to comfortable daily living to infrastructure development to sustain entire communities.



Aronkasei's strengths

Topics

Overseas Expansion of Elastomers

We will establish an elastomer manufacturing and sales base within Toagosei (Thailand) Co., Ltd. and aggressively market elastomers in the growing Asian market.



Business Expansion into New Domains

We have commenced marketing of the Ta-Da® Chair, which can be used both as a walking stick and a chair, targeting active senior citizens, and are focused on establishing businesses in new domains.



Medium- to Long-term Growth Strategy

We are utilizing our creative manufacturing capabilities, collaborating with each Group company and proactively taking on the challenge of expanding sales both in Japan and overseas.

Piping equipment business

In the piping equipment business, we have been increasing sales by focusing on the development and commercialization of products in the priority areas of flooding and water seepage measures, earthquake measures and measures against aging infrastructure, as well as our core business of sewage systems. In construction materials, we will aim for further increases in sales by bolstering our proposal-driven sales activities.



Nursing care products business

We have been reinforcing our competitiveness in the existing fields of the nursing care products segment with our high-value-added products, including the "Chair-type Automatic-wrap Toilet R," which alleviates the burden of caregivers by automatically treating excrement, while at the same time expanding our overseas sales to countries such as China.



Elastomer business

We have been developing high-performance products which have been adopted in various sectors including food, medicine, home appliances and automobiles. We will continue to work closely with customers in our development and contribute to society as a high-performance elastomer manufacturer.



Addressing Social Issues

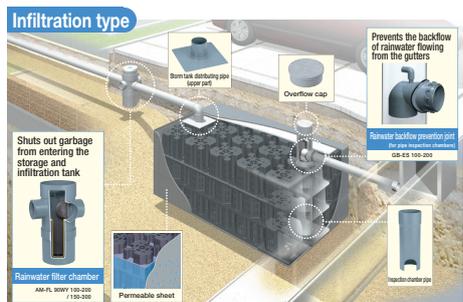
Measures against sudden torrential rain

Social issues

Sudden torrential rains are occurring more frequently and causing flood damage across the country. Increased storm water runoff due to urbanization has been named as a factor for this phenomenon. Consequently, there has been an increasing need to conduct flood management not only for the rivers but for the whole basin area, as part of integrated flood management measures which combine regional development and river improvement.

Toagosei Group's initiatives

We are proposing a "distributed storm water storage and infiltration system" to prevent flood damage as part of integrated basin area measures. As shown in the diagram below, the "distributed storm water storage and infiltration system" installs underground storage and infiltration tanks, which are box-like structures stacked one on top of each other, underneath parking lots, for example, to temporarily store rainwater. The system allows the stored rainwater to gradually and efficiently infiltrate the ground and adjusts the flow into the storm drains, thereby controlling excessive storm water runoff from sudden torrential rains into the rivers and preventing flood damage.



Example of installed storm water storage and infiltration system



R&D

to Support Growth Strategy

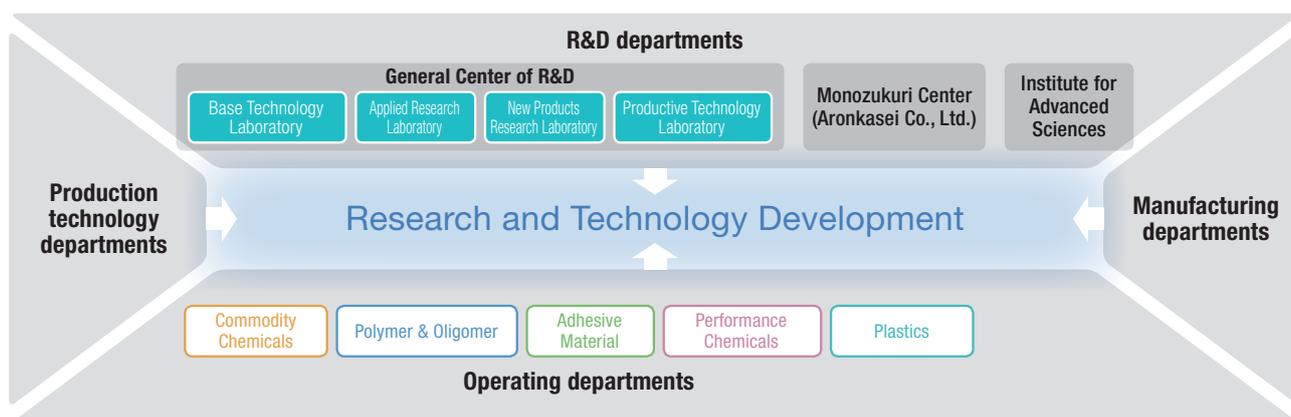
R&D at the Toagosei Group

Research and development needs to be focused on the businesses and technologies that will be needed 10 or 20 years from now. Leveraging the strengths of the Group, R&D teams strive to be the first to offer the world new high-value-added functionality rather than plain vanilla materials. On the research side, Toagosei endeavors to apply its technical core competences in new areas, conduct exploratory research to identify promising new technologies and functions, and gain the technical expertise needed to develop high-value-added products and new businesses.

R&D System

The Toagosei Group aims to benefit society while ensuring the Group's sustainable development by supplying a wide range of useful chemical products. To accelerate product development in existing areas and hasten the development of products in new areas with growth potential, the General Center of R&D management is organized so all R&D activities from basic and applied research to product and technical development are fully integrated, with research personnel deployed flexibly on key projects to maximize R&D efficiency. The Group invests significantly in personnel training to enhance the creativity and skills of individual researchers.

R&D System



“TREND,” the Group’s Annual R&D Report

Since 1998, the Group has published an annual R&D report entitled “TREND” to review the year’s activities in R&D and the development of production technology. Articles on the latest Group research can also be viewed on the company website.

“TREND” is available on the Toagosei website in Japanese.

From the top page, select R&D, and then select TREND.

<http://www.toagosei.co.jp/develop/theses/> (in Japanese only)



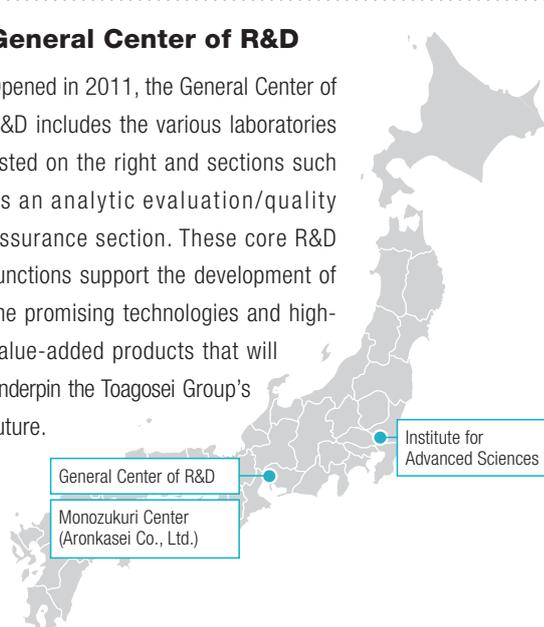


General Center of R&D

R&D bases and initiatives

General Center of R&D

Opened in 2011, the General Center of R&D includes the various laboratories listed on the right and sections such as an analytic evaluation/quality assurance section. These core R&D functions support the development of the promising technologies and high-value-added products that will underpin the Toagosei Group's future.



Base Technology Laboratory

- In addition to actively supporting research and development for your production lines, focusing on the four pillars of "analysis," "physical properties evaluation," "new synthesis," and "inquiry," we aim to establish elemental technologies that will constitute strengths of the Toagosei Group in the future.

Applied Research Laboratory

- We also conduct blue-skies research outside our current business and in areas where we lack the technologies to commercialize products, beginning from the first stage all the way to product realization.

New Products Research Laboratory

- We aim to develop new products in partnership with customers by leveraging the technologies we have cultivated through basic research, applied research, product development, and production technology development.

Productive Technology Laboratory

- In addition to improving production capability, reducing costs and enhancing qualities in existing business, we work together with the laboratories in the General Center of R&D to accelerate the development process.

Institute for Advanced Sciences

The mission of Institute for Advanced Sciences is to create new business from a mid- to long-term perspective. Our R&D ranges from basic research to applied studies based on the diverse biotechnologies we have cultivated, especially bioinformatics and peptide design technologies via joint programs with the Center for iPS Cell Research and Application, Kyoto University and with Keio University.



Monozukuri Center (Aronkasei Co., Ltd.)

Aronkasei utilizes its Monozukuri Center to strengthen manufacturing capabilities as a proposal-driven enterprise and for business process reengineering. In addition to developing piping equipment based on plastics technology as well as nursing care products, the Monozukuri Center is also developing new fabrication technology for elastomers and other products through collaboration with the General Center of R&D.



Comprehensive strengths that make innovation possible

Research and Development

Development of absorbent microparticles that leverage core technology

The Company's mainstay, acrylic polymers, come in a vast range of designs in terms of molecular weights and copolymerization compositions, and contribute to society by being applied to a variety of areas such as dispersants, thickeners, gelling agents and pressure-sensitive adhesives.

The Company, with its proprietary technologies to control polymer microparticles, manufactures a lineup of microparticle powder products, which have been precisely controlled in the size and attributes of its particles. We are engaged in research and development harnessing our core technologies accumulated through the development of these products to create new products of high added value.

These absorbent microparticles were also the result of fine-tuning existing technology, which had initially been developed to meet the needs of precision processing, into products intended for cosmetics.



Takashi Hasegawa
New Products Research Laboratory
General Center of R&D

Production Technology

Pursuit of the optimal manufacturing process

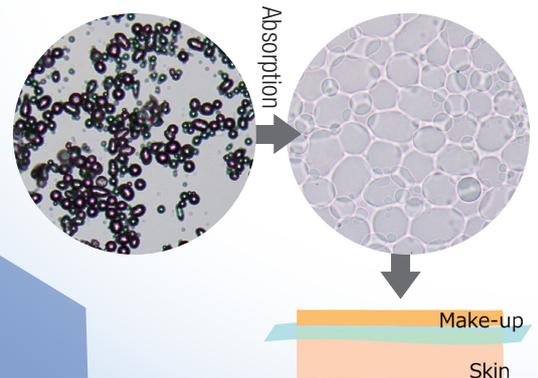
This product was based on a product, which had already been applied in another field but for it to be used in cosmetics, it needed to be finished as a product that could clear various rules and regulations. In addition, there was the issue of mass production. However, by closely coordinating with the research sections and by conducting small- to medium-scale tests, we were able to find a solution. In the mass production phase, by building on the manufacturing process of precision microparticles, and introducing the various manufacturing expertise we had accumulated to date, we were able to supply quality products demanded by the customers on schedule.



Takamasa Satonaka
Productive Technology Section, Hirono Plant

ARON

absorbent microparticles



Business opportunities may sprout from seeds sown by the Company or from the needs of customers. Regardless of whichever came first, the seeds and the needs will coexist, but they become business opportunities only when they are transformed into quality products that we can offer to our customers. Research to develop this seed technology, a deep understanding of such technology and marketing to match it with customer needs, and the plants that carry out manufacturing in a timely manner – it is through these comprehensive strengths of each section that we are able to create our innovative products.

As an example, we will present in this report absorbent microparticles which are gaining recognition as groundbreaking raw materials for cosmetics.

NT-Z

for cosmetics

ARON NT-Z (Labelled name: Acrylate Crosspolymer -2-Na) is a white absorbent microparticle with a diameter of 1-30 μ m. The particles absorb moisture, expand to an appropriate size and each particle adheres tightly to the irregular surface of the skin. In addition to erasing wrinkles and smoothing out the skin, it is also expected to have moisturizing effects. Nikko Chemicals Co., Ltd., a cosmetics materials company with extensive knowledge and experience, saw the potential for applying the Company's seed product to cosmetics and through joint development, we were able to create a product that leveraged the strengths of both companies. We are expecting to expand sales in both Japan and overseas.



Photo: courtesy of Nikko Chemicals Co., Ltd.

Sales

Proposals that capture customer needs



Seitaro Tajima
Polymer Department,
Polymer & Oligomer
Division

the irregular refraction of light caused by particles with the ideal diameter, thereby successfully expanding into different fields.

Our mission in the sales department is to deeply understand the seed technology of our company and match it with the needs of customers. Our sales department covers a wide range of sectors, and enjoys opportunities to launch new value-added-products and businesses, depending on how we improvise. While these absorbent microparticles had initially been developed for completely different purposes, we decided to expand its application to the cosmetics field, based on our knowledge that various microparticles are being used for a variety of uses in the cosmetics field. Our premonitions were proven right, and we were able to capture the customers' needs in minimizing the appearance of wrinkles through

Cosmetics materials company

Making the application of absorbent microparticles take shape through proprietary technology

When we considered the applications for absorbent microparticles in cosmetics, we found many characteristics other than the basic function of erasing wrinkles by smoothing over the irregularities of the skin.

- It can be used to improve the feel of the skin by reducing stickiness and roughness, and leaving the skin feeling clearer.
- Even greater effects of erasing wrinkles through the soft-focus (air-brush) effect
- It could be developed into a variety of forms (liquid, cream, gel, W/O emulsification, etc.)
- High level of safety (human patch test, human sensitivity, Ames, eye irritancy tests)

Awarded the Gold Prize at the "in-cosmetics Asia 2017" event

The cosmetics materials company, Nikko Chemicals Co., Ltd., exhibited ARON NT-Z at the "in-cosmetics Asia 2017" event, which was held in Bangkok, Thailand. This event is one of the biggest cosmetics trade shows in Asia with over 400 exhibitors. ARON NT-Z was awarded the Gold Prize as a cosmetics material demonstrating innovation, garnering attention both in Japan and overseas.



CSR Management

Toagosei Group's Corporate Philosophy and CSR

Corporate Philosophy

Sharing more happiness with more people through the chemical business

Management Philosophy

1. Contributions to society

Contribute to society through the chemical business

2. Business domains

Create chemicals-related businesses using unique core technologies

3. Business stance

(1) Management

- ① Generate new value
- ② Forward thinking ③ Global
- ④ Trustworthy ⑤ Appropriate profits
- ⑥ Products underpinned by technology

(2) An appealing and constantly growing company

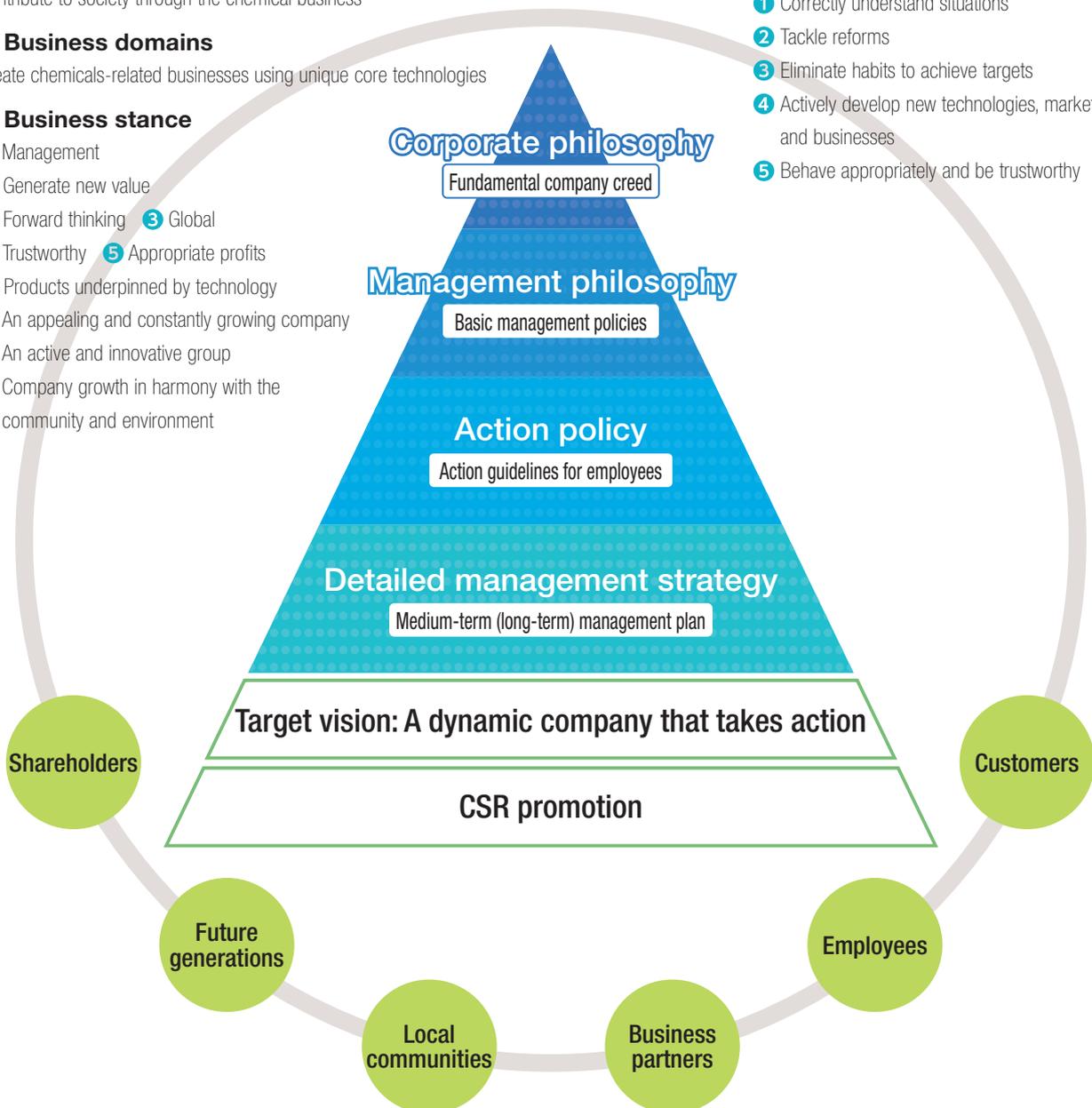
(3) An active and innovative group

(4) Company growth in harmony with the community and environment

Action Policy

Action Guidelines

- ① Correctly understand situations
- ② Tackle reforms
- ③ Eliminate habits to achieve targets
- ④ Actively develop new technologies, markets, and businesses
- ⑤ Behave appropriately and be trustworthy



Toagosei Group's CSR

CSR Policy

The Toagosei Group formulates its CSR policy and carries out comprehensive citizenship activities based on its corporate philosophy of "sharing more happiness with more people through the chemical business."

CSR Policy

- Management focused on the interests of stakeholders*
- Activities that ensure rigorous compliance (legal compliance)
- Systems for enhancing internal control and corporate governance
- Responsible Care activities
- Social contribution activities

*Toagosei's stakeholders: Customers, shareholders, employees, local communities, business partners, and future generations

2017 CSR targets and initiatives

The Toagosei Group is promoting CSR management as the foundation for the growth strategy. Based on this recognition, we formulated the Toagosei Group CSR Policy and Targets for 2017. Breaking down the Group's targets, each Group company and department established its targets and promoted CSR activities integral to business activities.

We implemented a PDCA cycle for CSR management, aiming to create a virtuous circle. Regarding human rights and diversity, we are committed to promoting initiatives for work-style reforms and women's participation and advancement to establish a work environment that enables a wide variety of human resources to work actively, while enhancing the recruitment and development of human resources. Regarding occupational health and safety and process safety and disaster prevention, we successfully reduced the number of lost-time injuries, whereas similar accidents and problems were not

eliminated. In 2016 and 2017, we have promoted initiatives to document "know why" in the workplace safety standards, etc. We aim to leverage such documentation to enhance education and the succession of technologies. Regarding environmental protection, we successfully reduced the energy consumption per unit of output owing to the introduction of new energy conservation technologies, including the renewal of the electrolysis system, despite heavier environmental impact caused by increased production volume. We will further develop and introduce technologies to reduce environmental impact with the aim of achieving the global targets until 2030 adopted in the Paris Agreement. Regarding product safety and quality assurance, our related divisions united to enhance their capabilities by establishing a system which enables us to respond to rapid changes in the global regulations for chemical substances and increasingly diversified customer requests.

Communication with Stakeholders

Stakeholders	Target	Engagement opportunities
Customers	<ul style="list-style-type: none"> ● Stable supply of high-quality, highly functional products 	<ul style="list-style-type: none"> ● Communication through sales & marketing activities, exhibitions, etc.
Shareholders	<ul style="list-style-type: none"> ● Enhancement of corporate value, appropriate information disclosure, stable dividend payment 	<ul style="list-style-type: none"> ● Holding of a general meeting of shareholders etc. ● Appropriate information disclosure (legal disclosure, voluntary disclosure)
Employees	<ul style="list-style-type: none"> ● Fostering of human resources ● Realization of a working environment conducive to employee self-fulfillment 	<ul style="list-style-type: none"> ● Provision of education and training ● Implementation of various systems ● Publication of the Group's internal newsletters
Local communities	<ul style="list-style-type: none"> ● Co-existence with local communities 	<ul style="list-style-type: none"> ● Various activities in response to the needs of local communities (social contribution activities, dialogues with local residents, etc.)
Business partners	<ul style="list-style-type: none"> ● Strengthening of the value chain through fair and equitable transactions 	<ul style="list-style-type: none"> ● Communication through purchasing activities
Future generations	<ul style="list-style-type: none"> ● Fostering of future generations 	<ul style="list-style-type: none"> ● Internships ● Plant tours

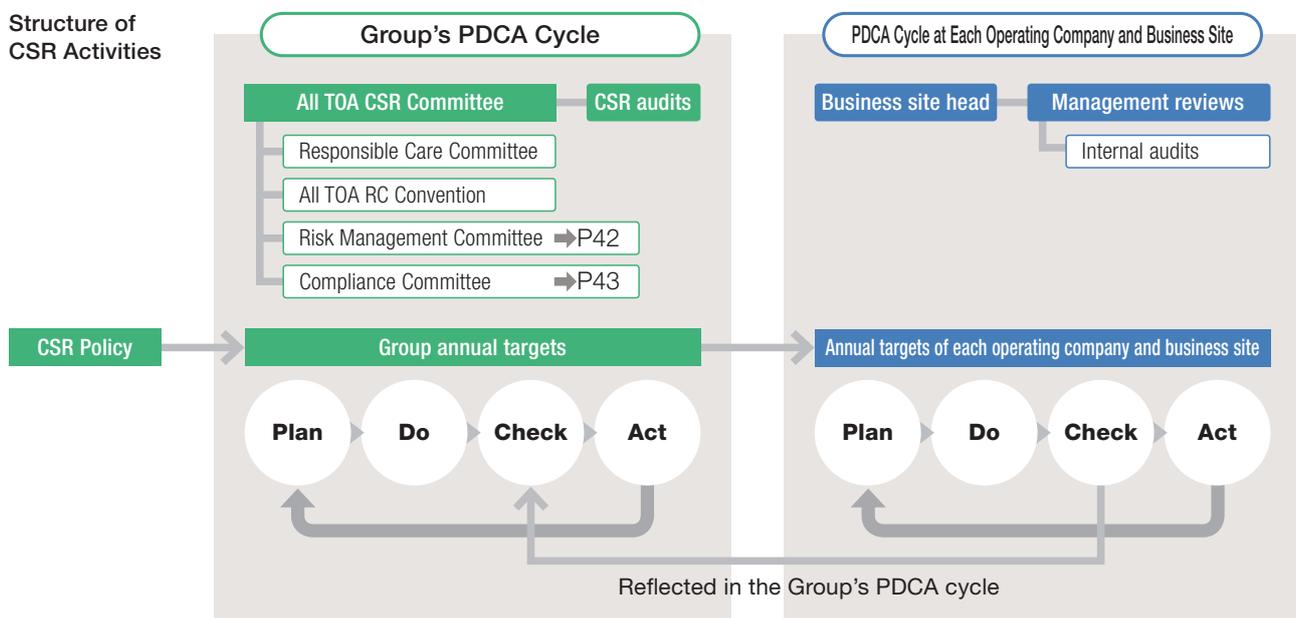
CSR Management

The Toagosei Group is continually improving CSR activities in accordance with the CSR Policy by implementing the PDCA cycle to improve its ISO certified environmental and quality management.

In light of the Toagosei Group's policy and targets, each operating company establishes its own policy and targets, based on which each operating company and its business sites draw up individual action plans to promote and review activities.

We hold meetings of the CSR Committee and the Responsible Care Committee and perform CSR audits in order to collectively monitor CSR activities at each operating company and business site as well as progress toward fulfilling policies and attaining targets. This information is used to make continual improvements across the entire Toagosei Group.

Structure of CSR Activities



Functions and Activities of the Responsible Care Implementation Organization

All TOA CSR Committee

The All TOA CSR Committee is the highest decision-making body for deliberating and deciding upon policies, targets and plans to maintain and improve the status of the entire Group's CSR initiatives.

The 2017 All TOA CSR Committee meeting was held on November 6. The Committee reviewed CSR activities in 2017 in the fields of compliance, corporate governance, RC management, and social contribution & communication, and deliberated on CSR policies and targets for 2018.

CSR Audits

CSR audits are carried out prior to the CSR Committee meeting. Audit Administrators, designated by the Chairperson of the CSR Committee, visit each operating company and business site to audit the status of CSR initiatives. The results of these audits are reported back to the CSR Committee.

In 2017 CSR audits of 15 business sites, including two overseas subsidiaries, were conducted in the period from May to September. As a result of audits, there were 299 findings and recommendations and 35 good practices were

noted. Audit results are shared throughout the Group to further improve CSR activities.

Responsible Care Committee

The Responsible Care (RC) Committee exhaustively examines the status of RC activities at each operating company and business site. It also considers how best to pursue RC activities in the following fiscal year.

The 2017 RC Committee meeting was held on October 25 and the Committee reviewed the status of implementation of RC activities and issues.

All TOA Responsible Care Convention

The All TOA Responsible Care (RC) Convention is held to enhance the quality of RC activities at each Group company and promote horizontal deployment of best practices.

At the 2017 All TOA RC Convention held at the Takaoka Plant on June 22 and 23, 12 cases of RC activities related to quality, the environment, and safety were presented. In addition, a guest speaker made a presentation on the theme "Derive a profit from quality."

CSR Management

History of CSR Activities

1958	<ul style="list-style-type: none"> ● Annual Environment and Safety Convention (current All TOA Responsible Care (RC) Convention) launched 	2010	<ul style="list-style-type: none"> ● Toagosei's ballast water purification agents gained final approval from the International Maritime Organization.
1993	<ul style="list-style-type: none"> ● Corporate Philosophy established ● Basic Policy for Responsible Care established 	2011	<ul style="list-style-type: none"> ● Security and Export Control Rules established
1995	<ul style="list-style-type: none"> ● Joined the Japan Responsible Care Council 	2012	<ul style="list-style-type: none"> ● Toagosei Group Risk Management Rules established ● Participation in the Japan Initiative of Product Stewardship (JIPS)*³, voluntary initiatives led by JICIA
1998	<ul style="list-style-type: none"> ● Social Contribution Committee established 	2013	<ul style="list-style-type: none"> ● Installation of an electrolysis system applying the gas-diffusion electrode method completed at Toagosei's Tokushima Plant. ● Mandatory retirement age raised to 65 years old.
2000	<ul style="list-style-type: none"> ● Environmental accounting system introduced ● Support of the Long-range Research Initiative (LRI) *¹ of the Japan Chemical Industry Association (JICIA), voluntary research programs on the potential impacts of chemicals on human health and the environment, initiated 	2014	<ul style="list-style-type: none"> ● Toagosei's president signed the revised Responsible Care Global Charter of ICCA. ● Construction of the Tahara Solar/Wind Electricity Generation Plant completed
2001	<ul style="list-style-type: none"> ● Executive officer system introduced ● 2001 Environmental Report (1st edition of the report) published 	2016	<ul style="list-style-type: none"> ● Compliance Handbook (1st edition) issued and distributed ● Toagosei Group Basic Policy on Corporate Governance established ● Transitioned to a company with an audit & supervisory committee ● Gained <i>Eruboshi</i> certification based on the Act on Promotion of Women's Participation and Advancement in the Workplace
2003	<ul style="list-style-type: none"> ● First outside directors appointed 	2017	<ul style="list-style-type: none"> ● First issue of "Toagosei Group Report" as integrated report ● Construction of new high-efficiency electrolysis system completed at Toagosei's Nagoya Plant
2004	<ul style="list-style-type: none"> ● Toagosei Group Code of Conduct and Toagosei Group Manual of Behavioral Standards established ● Compliance Committee and Corporate Ethics Helpline established 		
2006	<ul style="list-style-type: none"> ● Internal Control Section established ● Resolution on the basic policy for internal control systems 		
2008	<ul style="list-style-type: none"> ● CSR Policy, including the CSR Committee strengthening the CSR promotion system covering Group companies, established ● First issue of CSR Report 		
2009	<ul style="list-style-type: none"> ● Toagosei's president signed the CEO's letter of commitment to the Responsible Care Global Charter of the International Council of Chemical Associations (ICCA)*². ● Green Procurement Guidelines established 		

*1 LRI : Long-term Activities to Support Research into the Effects of Chemical Substances on Human Health and the Environment (Long-range Research Initiative)

*2 ICCA : International Council of Chemical Association

*3 JIPS : Japan Initiative of Product Stewardship

Initiatives for SDGs

SDGs, which stand for "Sustainable Development Goals," represent global targets until 2030 adopted at the United Nations General Assembly held in September 2015. SDGs consist of 17 goals (see the chart below) and 169 targets to create a sustainable society where the three aspects of economy, society and the environment are harmonized all over the world including developed nations and developing nations alike.

In pursuing its initiatives for SDGs, the Toagosei Group will cite the icons of SDGs related to CSR goals and promote its CSR activities with awareness of solutions for priorities listed in SDGs to fulfil its social responsibility.

Furthermore, we aim to contribute to a sustainable society by solving issues of SDGs through our Group's mainstay technologies, expertise and products offered.



Overview of CSR Activities

Classification	Focus in 2017	Relevant SDGs	Targets for 2017
 Corporate Governance	<ul style="list-style-type: none"> Strengthening of corporate governance 	 	<ul style="list-style-type: none"> Strengthening of corporate governance <ol style="list-style-type: none"> Efficient self-inspection Periodic check of Group companies
	<ul style="list-style-type: none"> Strengthening of responses to risk 		<ul style="list-style-type: none"> Strengthening of risk management <ol style="list-style-type: none"> Joint crisis response drill by the head office and sites Periodic risk assessment about BCP, etc., by the Risk Management Committee
	<ul style="list-style-type: none"> Timely and appropriate information disclosure to stakeholders 		<ul style="list-style-type: none"> Effective information dissemination from an all-Group perspective
 Compliance	<ul style="list-style-type: none"> Inculcation of awareness of the vital importance of compliance. Thorough understanding of laws and regulations relevant operations 	  	<ul style="list-style-type: none"> Inculcation of compliance awareness <ol style="list-style-type: none"> Ongoing compliance education Continuous monitoring and check by the Compliance Committee No major violation, including administrative guidance
	<ul style="list-style-type: none"> Mitigation of global warming Waste reduction and recycling 		<ul style="list-style-type: none"> CO₂ emissions: 393k tons or less Volume of waste discharged externally: 8,340 tons or less Final landfill volume: 1.5 tons or less
 Environmental Protection	<ul style="list-style-type: none"> Reduction of emissions of chemical substances 	    	<ul style="list-style-type: none"> Emissions of substances subject to PRTR: 51 tons or less
	<ul style="list-style-type: none"> Strengthening of accident prevention measures 		<ul style="list-style-type: none"> Zero explosion or fire accidents Zero serious leakage accidents of harmful substances or hazardous materials
	<ul style="list-style-type: none"> Promotion of the Zero-accident Campaign 		<ul style="list-style-type: none"> Zero lost-time injuries (employees and partner business sites)
 Product Safety	<ul style="list-style-type: none"> Enhanced management of chemical substances 	 	<ul style="list-style-type: none"> Enhanced management of product labels Preparation and registration of purchase specifications
	<ul style="list-style-type: none"> Continuous improvement of product quality 		<ul style="list-style-type: none"> Total number of complaints: 200 or fewer
 Physical Distribution Safety	<ul style="list-style-type: none"> Enhancement of quality and safety of physical distribution 		<ul style="list-style-type: none"> Reduction in the number of physical distribution problems
	<ul style="list-style-type: none"> Establish a fulfilling working environment for a diverse workforce 		<ul style="list-style-type: none"> Maintenance of an employment rate of people with disabilities of 2.0% Promotion of work-life balance (achievement of an average annual paid leave usage rate of 100%) Promotion of active participation by women (execution of the action plan for promoting active participation by women)
 Human Rights	<ul style="list-style-type: none"> Enrichment of social contribution activities 	  	<ul style="list-style-type: none"> Support for nature conservation, beautification and greening, and culture and sports activities Charitable donations and gifts Participation in the Human Resources Fostering Program in Chemistry, diversity promotion, and other projects
	<ul style="list-style-type: none"> Harmonious coexistence with local communities 		<ul style="list-style-type: none"> Thorough aesthetic maintenance activities in the vicinity of business sites Expansion of community dialogues Dissemination of company information
	<ul style="list-style-type: none"> Expansion of community dialogues Dissemination of company information 		<ul style="list-style-type: none"> Thorough aesthetic maintenance activities in the vicinity of business sites

Degrees of achievement indicated in PDCA tables

- ★★★★ : Target achieved
- ★★★ : Progress slower than originally envisaged and target not achieved (target achievement rate of 80% or higher)
- ★ : Target not achieved (target achievement rate of less than 80%)

D Results in 2017	C Achievement	A Targets for 2018	Relevant page(s)
<ul style="list-style-type: none"> ● Each site and operating company performed quarterly self-inspection, physical inventory count, internal control audits, etc., appropriately. ● Received minutes of meetings of the Board of Directors of Group companies and checked the details ● Effectiveness of the Board of Directors analyzed and assessed 	★★★★	<ul style="list-style-type: none"> ● Strengthening of corporate governance <ol style="list-style-type: none"> 1) Efficient self-inspection 2) Periodic check of Group companies 	P39
<ul style="list-style-type: none"> ● The head office and sites jointly conducted a crisis response drill. ● The Risk Management Committee performed periodic risk assessment about BCP, etc. ● Each site and Group company performed various measures for risk mitigation. 	★★★★	<ul style="list-style-type: none"> ● Strengthening of risk management <ol style="list-style-type: none"> 1) Clarification and sharing of risks per operating department; establishment of the system in preparation for emergencies 2) Periodic risk assessment about BCP, etc., by the Risk Management Committee 	P42
<ul style="list-style-type: none"> ● Toagosei Group Report issued, information, including shareholder newsletters/corporate website, enriched 	★★★★	<ul style="list-style-type: none"> ● Effective information dissemination from an all-Group perspective 	
<ul style="list-style-type: none"> ● Each site and Group company provided compliance education. ● Each overseas subsidiary provided compliance education by using the handbook, etc. 	★★★★	<ul style="list-style-type: none"> ● Continuous compliance education ● Continuous monitoring and check by the Compliance Committee 	P43
<ul style="list-style-type: none"> ● Target not achieved. Received administrative guidance 	★	<ul style="list-style-type: none"> ● No major violation, including administrative guidance 	
<ul style="list-style-type: none"> ● CO₂ emissions: 395k tons ● Volume of waste discharged externally: 11,684 tons ● Final landfill volume: 3.8 tons 	★★	<ul style="list-style-type: none"> ● CO₂ emissions: 386k tons or less ● Volume of waste discharged externally: 9,470 tons ● Final landfill volume: 1.5 tons or less 	P45
<ul style="list-style-type: none"> ● Emissions of substances subject to PRTR: 48 tons 	★★★★	<ul style="list-style-type: none"> ● Emissions of substances subject to PRTR: 44 tons or less 	P49
<ul style="list-style-type: none"> ● One serious leakage accident of harmful substances or hazardous materials 	★	<ul style="list-style-type: none"> ● Zero explosion or fire accidents ● Zero serious leakage accidents of harmful substances or hazardous materials 	P50
<ul style="list-style-type: none"> ● One lost-time injury (employee) 	★	<ul style="list-style-type: none"> ● Zero lost-time injuries (employees and partner business sites) ● Maintenance and improvement of mental and physical health (holding mental seminar; reducing overwork/long-time work; 100% uptake rate for those who need reexamination) 	P51 P52
<ul style="list-style-type: none"> ● Information registration into administrative database completed ● Preparation and registration completed as planned 	★★★★	<ul style="list-style-type: none"> ● Preparation and registration of purchase specifications ● Consistent response to revisions of laws regarding chemical management 	P53
<ul style="list-style-type: none"> ● Total number of complaints: 241 	★	<ul style="list-style-type: none"> ● Reduction in the number of complaints 	P54
<ul style="list-style-type: none"> ● Targets achieved with no serious leakage accident and 23% reduction in physical distribution accidents year on year 	★★★★	<ul style="list-style-type: none"> ● Reduction in the number of physical distribution problems 	P55
<ul style="list-style-type: none"> ● Maintained an employment rate of persons with disabilities above 2.0% ● Targets not achieved although the average annual paid leave usage rate improved year on year to 89.6% on a group-wide basis 	★★★	<ul style="list-style-type: none"> ● Achievement of an employment rate of persons with disabilities of 2.4% ● Promotion of work-life balance (achievement of an average annual paid leave usage rate of 100%) 	P56
<ul style="list-style-type: none"> ● Executed an action plan for promoting active participation by women based on the Act on Promotion of Women's Participation and Advancement in the Workplace ● Introduced the "Regulations for Spouse Overseas Transfer Leave System" and the "Regulations for Reentry System" in January onward ● Increased job categories open to women in manufacturing departments 	★★	<ul style="list-style-type: none"> ● Promotion of active participation by women (execution of the action plan for promoting active participation by women) 	P59
<ul style="list-style-type: none"> ● Tree planting and forest care activities, clean-up and beautification volunteer activities, support for sports events, etc., continued in the areas where our sites are located ● Donations made for victims of torrential rains in northern Kyushu ● Participation in and sponsorship for the Human Resources Fostering Program in Chemistry continued; donations to the "Tobitate! (Leap for Tomorrow) Young Ambassador Program" continued 	★★★★	<ul style="list-style-type: none"> ● Charitable donations and gifts beneficial to society ● Participation in and support for beautification and greening, and culture and sports activities ● Participation in the Human Resources Fostering Program in Chemistry, diversity promotion, and other projects ● Conservation activities for biodiversity 	P60
<ul style="list-style-type: none"> ● Periodically engaged in inspection patrols and cleanups on the periphery of plants 	★★★★	<ul style="list-style-type: none"> ● Thorough aesthetic maintenance activities in the vicinity of business sites 	P61
<ul style="list-style-type: none"> ● Conducted plant tours and workplace tours ● Participated and cooperated in community disaster prevention drills ● Business sites and Group companies held meetings with community groups and community dialogues. 	★★★★	<ul style="list-style-type: none"> ● Expansion of community dialogues ● Dissemination of company information 	



Corporate Governance



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> Strengthening of corporate governance <ol style="list-style-type: none"> Efficient self-inspection Periodic check of Group companies 	<ul style="list-style-type: none"> Each site and operating company performed quarterly self-inspection, physical inventory count, internal control audits, etc., appropriately. Received minutes of meetings of the Board of Directors of Group companies and checked the details Effectiveness of the Board of Directors analyzed and assessed 	★ ★ ★	<ul style="list-style-type: none"> Strengthening of corporate governance <ol style="list-style-type: none"> Efficient self-inspection Periodic check of Group companies
<ul style="list-style-type: none"> Strengthening of risk management <ol style="list-style-type: none"> Joint crisis response drill by the head office and sites Periodic risk assessment about BCP, etc., by the Risk Management Committee 	<ul style="list-style-type: none"> The head office and sites jointly conducted a crisis response drill. The Risk Management Committee performed periodic risk assessment about BCP, etc. Each site and Group company performed various measures for risk mitigation. 	★ ★ ★	<ul style="list-style-type: none"> Strengthening of risk management <ol style="list-style-type: none"> Clarification and sharing of risks per operating department; establishment of the system in preparation for emergencies Periodic risk assessment about BCP, etc., by the Risk Management Committee
<ul style="list-style-type: none"> Effective information dissemination from an all-Group perspective 	<ul style="list-style-type: none"> Toagosei Group Report issued; information, including shareholder newsletters/corporate website, enriched 	★ ★ ★	<ul style="list-style-type: none"> Effective information dissemination from an all-Group perspective

Directors



Outside Director	Outside Director	Director (Audit & Supervisory Committee Member)	Outside Director (Audit & Supervisory Committee Member)	Outside Director (Audit & Supervisory Committee Member)	Outside Director (Audit & Supervisory Committee Member)
Yasuhiro Koike	Satoru Nakanishi	Akira Komine	Tsutomu Harada	Yasuo Kitamura	Nobuhiko Takano
Director President and Representative Director, Aronkasei Co., Ltd	Director General Manager, Supply Chain Management Division	Director General Manager, Group Management Division	President and Representative Director	Vice President and Representative Director and General Manager, Corporate Strategy Division	Director General Manager, Administrative Division
Shinichi Sugiura	Moriyuki Kenjou	Katsuyuki Ito	Mikishi Takamura	Nobuhiro Ishikawa	Yoshitaka Suzuki
					Director General Manager, Technology & Production Administrative Division and General Manager, Research & Development Administrative Division
					Susumu Miho

Corporate Governance System

Basic Approach and System

The Toagosei Group established the Toagosei Group Basic Policy on Corporate Governance. Based on the corporate philosophy of “sharing more happiness with more people through the chemical business,” the Group strives to fulfil its corporate social responsibility by positioning the enhancement of corporate governance as a key priority for management. The Group pursues transparent, fair, swift and resolute decision-making through effective corporate governance, to achieve sustainable growth and to increase its corporate value over the medium and long term. The Group is committed to the continuous enhancement of corporate governance.

The Group's basic approach to corporate governance is as follows.

1. Respect shareholders' rights and ensure their equality.
2. Consider the interests of various stakeholders, including shareholders, customers, business partners, employees and local communities. Build good relationships with these stakeholders and cooperate appropriately with them.

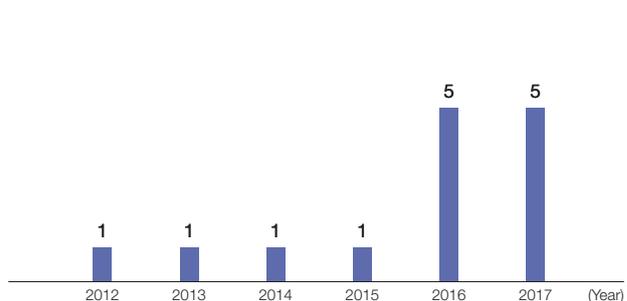
3. Disclose corporate information appropriately and ensure transparency.
4. Strive to ensure effective supervisory functions for business execution by the Board of Directors.
5. Engage in constructive dialogue with shareholders who have an investment policy that aligns with medium- to long-term shareholder profits.

Toagosei is a company with an audit & supervisory committee. Audit & Supervisory Committee members, including several independent outside directors, have voting rights on the Board of Directors so that audit and supervision over business execution have been strengthened. Furthermore, the Articles of Incorporation provide that important decision-making for management may be delegated in whole or in part to directors. Thus, a system is in place that separates supervision and business execution and enables swift decision-making with regard to business execution.

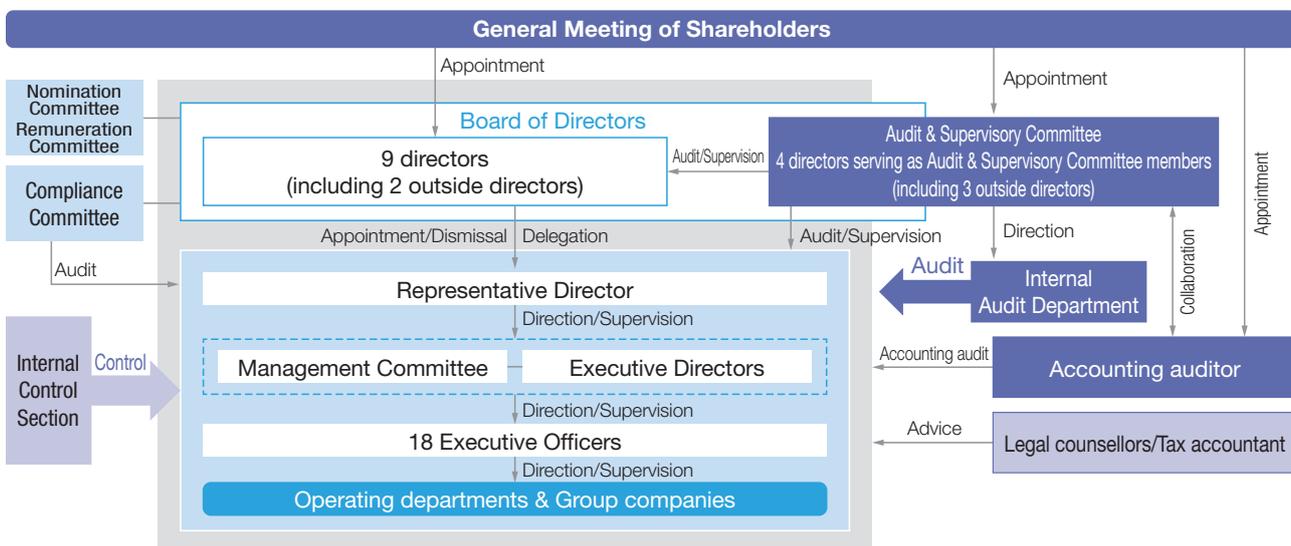
Measures for continuous strengthening of corporate governance

Fiscal year	Item
2001	Executive officer system introduced
2003	Appointment of outside directors started
2006	Internal Control Section established Basic Policy on Internal Control established by resolution
2016	Toagosei Group Basic Policy on Corporate Governance established Transition to a company with an audit & supervisory committee
2017	Assessment for the effectiveness of the Board of Directors initiated

Number of Outside Directors (Persons)



Corporate Governance System



Management System

The Board of Directors consists of seven internal directors, two independent outside directors, and four directors who also serve as Audit & Supervisory Committee members (of whom three are independent outside directors). Five independent outside directors mainly play the role of enhancing the management oversight function of the Board of Directors.

With respect to business execution, the Management Committee consisting of executive directors meets every week in principle to perform prior review of matters to be discussed by the Board of Directors and to deliberate, decide and discuss from an operational perspective the important matters delegated thereto based on a resolution by the Board of Directors. Toagosei adopts an executive officer system to realize swift decision-making and efficient business execution. Terms of office of directors (excluding directors who serve as Audit & Supervisory Committee members) and executive officers are one year to clarify their responsibilities for business execution.

Audit System

The Audit & Supervisory Committee consists of four directors (including three independent outside directors). In addition to the exercise of supervisory authority including voting rights at the Board of Directors, Audit & Supervisory Committee members attend important meetings and request the Group's directors, executive officers, employees, and the outside accounting auditor to provide timely and appropriate reports and thereby audit legal compliance with respect to performance of duties by directors and other officers,

the appropriateness of the Company's business operations, internal control, financial conditions, and other matters.

The Internal Audit Department has been established to assist Audit & Supervisory Committee members with their duties. The Internal Audit Department is staffed with several employees who are assigned to the Internal Audit Department on a full-time basis. The Audit & Supervisory Committee members are endeavoring to conduct effective audits by sharing necessary information with the outside accounting auditor and the Internal Control Section.

Assessment for the effectiveness of the Nomination Committee/Remuneration Committee and the Board of Directors

To enhance the objectivity and transparency of corporate management, the Nomination Committee and the Remuneration Committee, in which independent outside directors participate, have been established as an advisory body to the Board of Directors to consider and report thereto the appointment procedures, qualifications of candidates for director, the remuneration system and individual remuneration for directors.

The Board of Directors also analyzes and assesses the effectiveness of the Board of Directors based on the self-assessment of each director every year and discloses the outline of such assessment results. For issues recognized therein, improvement measures are considered in an effort to enhance the effectiveness of the Board of Directors.

Messages from Outside Directors



Tsutomu Harada, Outside Director
(Audit & Supervisory Committee Member)

Two years have passed since Toagosei transitioned from a company with a board of auditors to a company with an audit & supervisory committee. The Audit & Supervisory Committee, consisting of four directors serving as Audit & Supervisory Committee members including three outside directors, directly directs the Internal Audit Department, and audits and supervises the business execution by the Board of Directors and directors in cooperation with the accounting auditor and the Internal Control Section. In addition to 16 committee meetings held in 2017, the Audit & Supervisory Committee performed executive interviews, attendance at important meetings, on-site inspection of plants and interviews with the presidents of subsidiaries. Based on my knowledge and experience fostered at a financial institution, etc. so far, I continue to be committed to making a contribution to maintaining and ensuring Toagosei's fair and transparent corporate governance system and to achieving the "Trajectory Toward Growth 2019," i.e., sustainable growth and higher corporate value over the medium and long term.



Yasuo Kitamura, Outside Director
(Audit & Supervisory Committee Member)

The Toagosei Group supports the foundation of society through various chemical products including the "Aron Alpha[®]" familiar to everyone. Toagosei has established a highly-transparent corporate governance system by appointing five outside directors including myself (including three Audit & Supervisory Committee members) from among experts in respective areas so that Toagosei can make appropriate decisions in compliance with laws and regulations in its pursuit of advanced business in a variety of areas. I will make my best efforts to contribute to enhancing Toagosei's corporate value by leveraging my experience achieved through my activities as a lawyer mainly in the area of corporate legal affairs in cooperation with internal directors, who are experts in the chemical industry, as well as other outside directors, while having a sense of mutual tension.

Corporate Governance

Internal Control

The Basic Policy on Internal Control has been established by the resolution of the Board of Directors in order to strengthen corporate governance. In accordance with said policy, the Internal Audit Department carries out internal audits of the Toagosei Group's compliance status and the appropriateness of business operations.

In addition, the Internal Control Section confirms the operating status of internal control from an independent perspective, reports

such results to the Audit & Supervisory Committee members, and performs duties related to internal control (duties to ensure appropriate financial reporting), based on Japan's internal control reporting system (J-SOX). The Internal Audit Department and the Internal Control Section collaborate with each other and ensure that the Group's business operations as a whole are conducted appropriately in compliance with relevant laws and regulations.

Risk Management

Risk Management Committee

The Toagosei Group stipulates the basic framework for the management of risks arising in the course of business activities in the Toagosei Group Risk Management Rules, and in accordance therewith, has the Risk Management Committee in place. To manage risks to which the Group is exposed, the Committee regularly identifies and assesses risks, formulates risk countermeasures, and checks the status of the countermeasures.

Potential risks

- Natural disaster/infectious disease
- Other risks related to the external environment
- Environmental and safety risk
- Product risk
- Legal risk
- Public communications-related risk
- Financial risk
- Personnel and labor risk
- Geopolitical risk
- Economic risk
- Social risk

Business Continuity Plan (BCP)

The Toagosei Group lists the information to be gathered and matters to be considered in the event of a disaster and confirms the effectiveness of such list through training. The issues identified by the training were discussed at a meeting of the Risk Management Committee and actions for improvement have been implemented.

Response in the Event of a Crisis

The Toagosei Group has established the Toagosei Group Crisis Response Rules that specify concrete measures in the event of a crisis. Moreover, the Emergency Action Manuals have been prepared according to phenomena and sites and training is conducted regularly. In 2017, joint crisis training was held by Toagosei's head office and the Takaoka Plant.

Information Leakage Risk Countermeasures

In accordance with internal rules, the Toagosei Group has prepared and is continuously updating a list of confidential information in which trade secrets are identified as part of countermeasures for the risk of information leakage. In addition to education for spreading awareness of the importance of information management, we are continuously improving the information security system. In 2017, the Group enhanced countermeasures for information leakage through the introduction of thin clients* and also strengthened antivirus measures for the plant control systems.

* Computer systems where users perform their duties by accessing a virtual server without storing data or software on computers

Information Disclosure

Toagosei is endeavoring to disclose information on the Group appropriately in a timely manner based on the laws and regulations as well as rules and regulations stipulated by the Tokyo Stock Exchange. Moreover, we hold a briefing for the analysis of financial results. Our proactive information disclosure also includes the publication of the Toagosei Group Report, which comprehensively covers financial and non-financial information, and the enrichment of disclosure in English, in order to facilitate stakeholders' understanding of the Toagosei Group.



Toagosei's Corporate Website

We are enriching information disclosure on the corporate website.

<http://www.toagosei.co.jp/english>



Compliance



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> Inculcation of compliance awareness <ol style="list-style-type: none"> Ongoing compliance education Continuous monitoring and check by the Compliance Committee 	<ul style="list-style-type: none"> Each site and Group company provided compliance education. Each overseas subsidiary provided compliance education by using the handbook, etc. 	<p>★ ★ ★</p>	<ul style="list-style-type: none"> Ongoing compliance education Continuous monitoring and check by the Compliance Committee
<ul style="list-style-type: none"> No major violation, including administrative guidance 	<ul style="list-style-type: none"> Target not achieved. Received administrative guidance. 	<p>★</p>	<ul style="list-style-type: none"> No major violation, including administrative guidance

Corporate Ethics and Legal Compliance

Code of Conduct and Manual of Behavioral Standards

As fundamental guidelines and the basis for the correct behavior for all officers and employees to act as exemplary citizens, the Toagosei Group has established the Toagosei Group Code of Conduct and the Toagosei Group Manual of Behavioral Standards, both of which are included in the Compliance Handbook held by all employees to ensure employee understanding.

Compliance Committee

The Group has a Compliance Committee consisting of officers and a legal counsel who is an external member. The Committee periodically monitors the status of implementation of compliance measures at Toagosei's sites and Group companies (including overseas subsidiaries) and provides recommendations for improvement in order to ensure management that emphasizes compliance.

Corporate Ethics Helpline

The Group has both in-house and external Corporate Ethics Helplines, which are whistleblower hotline systems for early detection and resolution of compliance issues. Furthermore, in 2017, the Group has established a dedicated helpdesk for sexual harassment, etc., in an effort to provide a better work environment for women.

Compliance Education

In addition to education of employees according to positions and Group-wide education, the Group is promoting voluntary education at workplaces in order to inculcate compliance awareness. In 2017, we conducted education for new employees and for managerial personnel according to position, education about the Subcontractor Act for operating /purchasing/sales departments, and the enhancement of compliance education for overseas Group companies, among other efforts. Workplaces held education utilizing the Compliance Handbook. The Handbook describes various matters to be careful about in business activities, as well as relevant laws and regulations in the form of dos and don'ts in a user-friendly manner, contributing to comprehensively raising awareness among employees.

Compliance regarding Business Activities

To ensure that the Group's business activities are in compliance with laws and regulations, we establish rules and conduct reviews by internal organizations. For example, regarding the Antimonopoly Act and the Subcontractor Act, we stipulate Toagosei's guidelines and describe initiatives in the Antimonopoly Act Compliance Manual. In addition, we require a review by the Antimonopoly Act Compliance Committee upon the revision of product prices in an effort to prevent any violation of laws and regulations.

TOPICS

Distribution of Compliance Handbook in Chinese

The Toagosei Group Compliance Handbook in Chinese was completed and distributed to all employees of Toagosei (Zhuhai) Limited, Toagosei Hong Kong Limited and TOA-DIC Zhangjiagang Chemical Co., Ltd. Each overseas subsidiary will utilize the Compliance Handbook as the group-wide code of conduct in China, with its rapid economic growth.



Preparers at TOA-DIC Zhangjiagang Chemical Co., Ltd. (Ms. Li Jian, Mr. Zhang Guanghua and Ms. Xu Dan from left)



Preparer at Toagosei (Zhuhai) Limited (Ms. Liu Chuanmei)



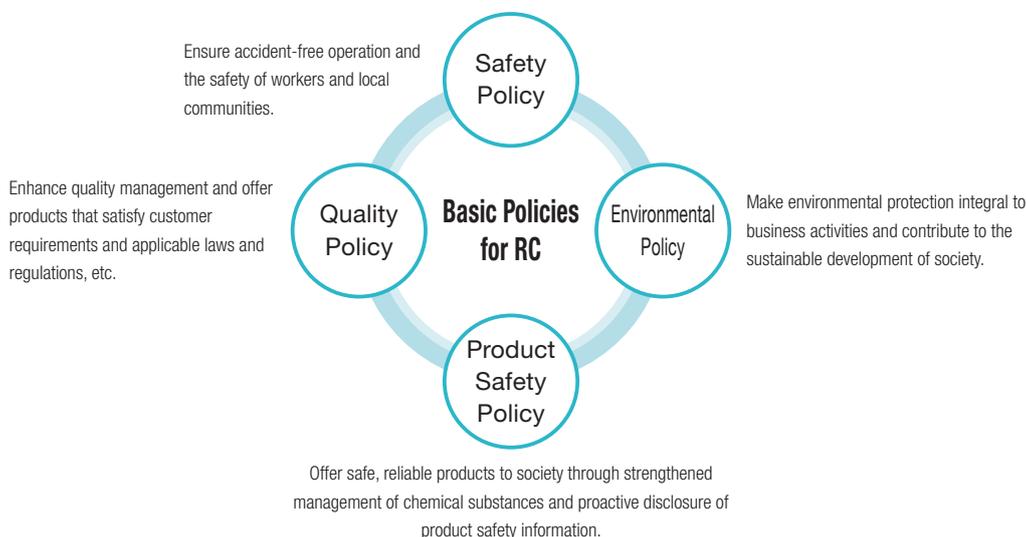
Responsible Care Management

Basic policies for RC

Mindful of its responsibilities as an enterprise engaged in the chemical business, the Toagosei Group is promoting Responsible Care (RC) activities under the Basic Policies for RC in order to ensure safety (occupational health and safety, process safety and disaster prevention, product safety, and physical distribution safety) and to protect the environment.

In accordance with the corporate philosophy and based on our policy of contributing to society by offering useful chemical products, our priority is to ensure safety of workers and people in society at large throughout our business activities. Our aim is to reduce environmental impacts of all our processes from procurement of raw materials to final disposal of products after use.

The Toagosei Group is committed to ensuring the safety of its products, as well as workforce safety and hygiene, and to reducing the impact on the environment of these products and their manufacturing processes at all stages from development through use to final disposal. By these means, the Group raises its reputation for trustworthiness among both its customers and society at large.



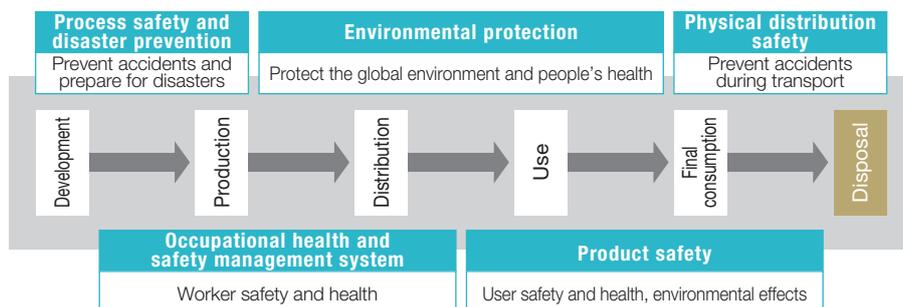
Toagosei Group and Responsible Care

Responsible Care (RC) activities are voluntary initiatives of companies handling chemical substances to ensure environmental protection and health and safety throughout product life cycles. Companies disclose the results of their activities and thus communicate with society.

Toagosei has been a member of the Japan Responsible Care Council (JRCC) since its establishment by the Japan Chemical

Industry Association (JCIA) in 1995 and is promoting RC activities throughout the Group.

Toagosei endorsed the Responsible Care Global Charter established by the International Council of Chemical Associations (ICCA) in 2009 and revised in 2014. The president of Toagosei is a signatory of this charter and Toagosei is committed to the vigorous promotion of RC activities.





Environmental Protection



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> CO₂ emissions: 393k tons or less 	<ul style="list-style-type: none"> CO₂ emissions: 395k tons 	★★	<ul style="list-style-type: none"> CO₂ emissions: 386k tons or less
<ul style="list-style-type: none"> Volume of waste discharged externally: 8,340 tons or less Final landfill volume: 1.5 tons or less 	<ul style="list-style-type: none"> Volume of waste discharged externally: 11,684 tons Final landfill volume: 3.8 tons 	★	<ul style="list-style-type: none"> Volume of waste discharged externally: 9,470 tons or less Final landfill volume: 1.5 tons or less
<ul style="list-style-type: none"> Emissions of substances subject to PRTR: 51 tons or less 	<ul style="list-style-type: none"> Emissions of substances subject to PRTR: 48 tons 	★★★	<ul style="list-style-type: none"> Emissions of substances subject to PRTR: 44 tons or less

Global Warming Mitigation Measures

Reducing CO₂ Emissions by Reducing Energy Consumption

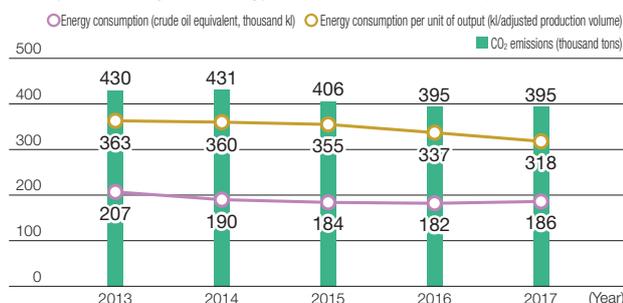
The Toagosei Group engages in efficient production and energy-saving activities to reduce CO₂ emissions. The energy consumption increased by 2.5% year on year on a crude oil equivalent basis and CO₂ emissions also increased slightly at manufacturing bases in Japan in 2017 in line with the rise in production volume at manufacturing bases in Japan. The energy consumption per unit of output, on the other hand, was reduced because of the effect brought by group-wide initiatives for efficient production balance, the centralization of manufacturing bases and the introduction of new energy-saving facilities, among other efforts. We expect an even greater reduction of energy consumption per unit of output going

forward since the construction of a new electrolysis system was completed at Toagosei's Nagoya Plant in November 2017, and new facilities for piping materials will be launched at Aronkasei's Nagoya Plant in the spring of 2018.

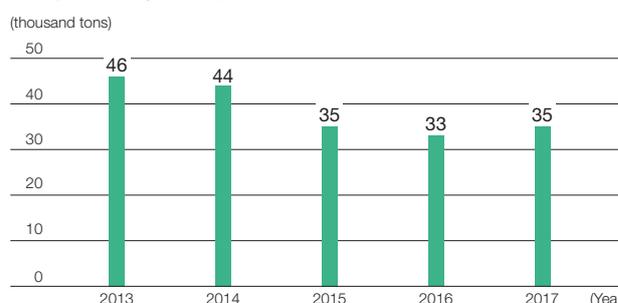
While we have gradually reduced CO₂ emissions at our five overseas production sites since 2013, the emissions in 2017 remained at the level of 2015 due to increased production volume.

We have worked to reduce group-wide CO₂ emissions targeting a 26% reduction from the emissions volume in 2013 in light of the global targets until 2030 adopted in the Paris Agreement (COP21).

Five-year Change in Energy Consumption and CO₂ Emissions



Four-year Change in CO₂ Emissions at Five Overseas Production Sites*



*Scope of reporting: five overseas production sites
 ● Toagosei America Inc. ● Toagosei (Zhuhai) Limited
 ● Toagosei Singapore Pte Ltd. ● TOA-DIC Zhangjiagang Chemical Co., Ltd.
 ● Toa-Jet Chemical Co., Ltd.

Environmental Communication

In pressing ahead with management that emphasizes compliance, the Group engages in business activities based on compliance with environment-related laws and regulations. Our business sites comply with the environment conservation ordinance and pollution prevention agreements in respective prefectures and municipalities and engage in environmental management in unison with government and local communities.

In 2017, there were no environmental accidents required to be reported to the competent authorities.

Each plant has enhanced the ability of its wastewater and exhaust facilities and performed emergency drills to prevent environmental

accidents even in the event of typhoons or torrential rains caused by extreme weather in recent years.

Status of Conclusion of Pollution Prevention Agreements

Company	Parties to pollution prevention agreements
Toagosei	Nagoya Plant (Nagoya City), Yokohama Plant (Yokohama City), Takaoka Plant (Takaoka City), Tokushima Plant (Tokushima Prefecture, Tokushima City, Kitajima Town), Hirono Plant (Hirono Town), Institute for Advanced Sciences (Tsukuba City)
Aronkasei	Kanto Plant (Koga City)
Oita Chemical	Oita Plant (Oita Prefecture, Oita City)
MT Ethylene Carbonate	Osaka Plant (Takaishi City)

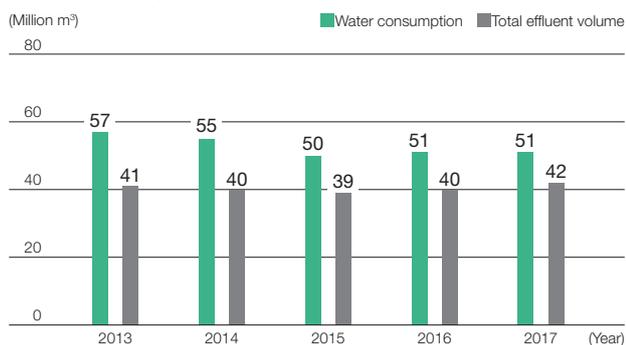
Environmental Impact Reduction Measures

Protection of Water Quality

The Toagosei Group considers water a limited resource and strives to promote its efficient use. Accompanying a production increase, the Group's water consumption in Japan in 2017 was 51 million m³ (almost at the level of the previous year), and total effluent volume was 42 million m³ (up 7.2% year on year). We set voluntary control values and rigorously control effluents. At plants adjacent to semi-enclosed sea areas (Tokyo Bay, Ise Bay, Seto Inland Sea), we have installed automatic measurement systems for total nitrogen and total phosphorous and support management of total volume control.

At our overseas production sites as well, we manage water resource consumption in compliance with the effluent regulations of each country. Total water consumption at the overseas production sites in 2017 was 0.23 million m³.

Five-year Change in Water Consumption in Japan



Protection of Air Quality

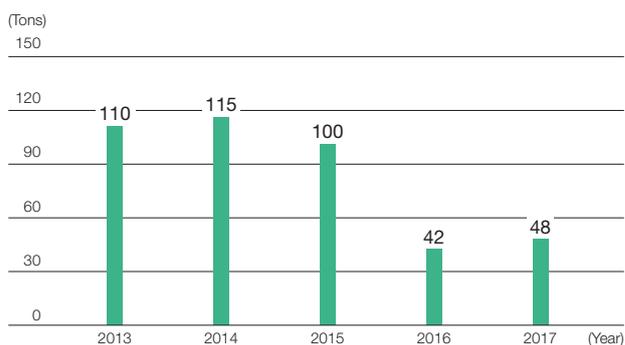
To comply with government emissions standards and regulation values in agreements with local communities for sulfur oxides (SOx), nitrogen oxides (NOx), and dust, the Group sets voluntary control values and rigorously controls exhaust. In addition, respective overseas production sites control their exhaust in accordance with applicable regulations in their jurisdictions.

Chemical Substance Emissions Reduction

The Group's business sites submit notifications in compliance with the Law concerning Pollutant Release and Transfer Register (PRTR Law).

We significantly reduced emissions of chloromethane (methyl chloride) at the Sakaide Plant, which accounted for a large proportion of PRTR-controlled substances up to 2015, with new absorption and removal facilities put into operation in November 2015. As a result, PRTR-controlled substances on a group-wide basis also decreased to less than half of the level in the past. In 2017, we accurately ascertained the Group's emissions volumes for other substances subject to PRTR. With the aim of further reducing emissions volume, we will continuously seek a more accurate understanding of emissions volume by introducing measuring instruments and reviewing calculation methods.

Change in Emissions of Chemical Substances Subject to PRTR



Emissions of Principal Substances Subject to PRTR (t)

Major emissions	2017
Chloromethane (methyl chloride)	20.9
Chloroethylene (vinyl chloride)	5.9
Methyl acrylate	3.8
Dichloromethane (methylene chloride)	2.4
Toluene	1.7

TOPICS GSC Encouragement Award

We received the GSC Encouragement Award from the Japan Association for Chemical Innovation in July 2017 for our proprietary acrylic acid production technology with propane oxidation catalyst. GSC stands for "Green and Sustainable Chemistry," meaning "chemistry that supports the development of a sustainable society friendly to people and the environment" to realize the "reduction of environmental impact" and a "sustainable society." The aforementioned technology has an advantage of lower emissions of air pollutants compared with the conventional method, represented by a 32% reduction in CO₂ emissions per unit of output.

We completed everything up to the demonstration test for this technology at Oita Chemical.



GSC Award Ceremony

Initiatives to Realize a Recycling Society

Reduction in Final Landfill Volume and Waste Recycling Measures

The Group's final landfill volume in 2017 was approximately 4 tons, and the final landfill rate was 0.01%.

We continuously seek to reduce the waste disposed of in landfills to nearly zero.

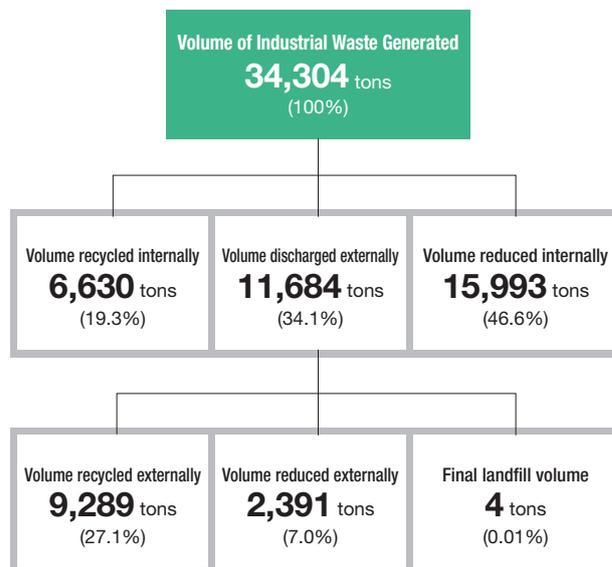
In 2017, the volume of industrial waste generated increased by 8.3% year on year due to increased production activities (up 8.8% year on year).

We select the destination of discharged industrial waste so that such waste is used for material recycling or thermal recycling.

Change in Volume of Industrial Waste Generated and Volume Discharged Externally



Industrial Waste Disposal Flow



Environmental Accounting

The Toagosei Group introduced environmental accounting in 2000 to ascertain costs related to environmental activities and their benefits and to utilize the data as a basis for decision-making for the purpose of engaging in more efficient environmental protection activities. We have disclosed the details to stakeholders to facilitate understanding of our environmental posture. In 2017, we focused on the transition to energy-saving equipment following 2016. We are continuously investing in facilities improvement, operation, and maintenance to prevent emissions of harmful substances into the atmosphere and hydrosphere. We also engage in research and development that contributes to environmental protection on an ongoing basis.

- Scope of calculations: The companies and business sites listed on page 49 (Business Activities and Environmental Impacts).
- Period covered: January 1 to December 31, 2017
- Calculation method:
 - 1) Calculations are based on Toagosei's accounting rules prepared with reference to the Ministry of the Environment's Environmental Accounting Guidelines (2005).
 - 2) Complex costs, which include costs for purposes other than environmental protection, are proportionately divided in accordance degree of impact on the environment and treated as environmental costs.
 - 3) Investment amounts are treated as budget amounts, and expense amounts are treated as actual costs.
 - 4) Items for which benefits can be clearly calculated are presented in monetary value and in physical units. However, benefits that are difficult to quantify, such as risk avoidance and deemed benefits, are excluded.

Environmental Protection

Environmental Investment and Cost by Category

Environmental Protection Cost Categories (Major items)		Investment (Millions of yen)	Cost (Millions of yen)
(1) Business Area Cost		2,117	5,894
Breakdown	1) Pollution Prevention Cost (cost for preventing air pollution, cost for preventing water pollution)	966	5,261
	2) Global Environmental Protection Cost (cost for preventing global warming and energy conservation, cost for preventing ozone depletion)	1,019	367
	3) Resource Circulation Cost (cost for efficient utilization of resources, cost for recycling and disposal of industrial waste)	131	266
(2) Upstream/Downstream Costs (cost generated in upstream and downstream business areas associated with production and service activities: green purchasing, etc.)		4	2
(3) Administration Cost (cost for the implementation and maintenance of an environmental management system, cost for monitoring and measuring environmental impacts, cost for environmental training of employees)		26	468
(4) R&D Cost (R&D cost to develop products that contribute to environmental protection, R&D cost to curtail environmental impact at the product manufacturing stage)		9	214
(5) Social Activity Cost (Cost for environmental improvement activities, including nature conservation and planting of greenery, cost related to donation to or financial support of environmental groups, cost associated with various social activities related to local communities)		0	39
(6) Environmental Remediation Cost (cost to restore the natural environment to its original state, cost to cover degradation suits connected with environmental protection)		0	11
(7) Other Cost		2	146
Total		2,158	6,774

Benefits in Monetary Value

Type of benefits	Volume	Benefit
Benefit of recycling of items with value	2,816 tons	58 million yen

Environmentally Friendly Products and Technologies

The Toagosei Group manufactures and develops environmentally friendly products in a variety of areas. We also develop technologies that contribute to reduction of CO₂ emissions for existing products.

Environmentally Friendly Products and Technologies

Business area	Product	Details
Commodity Chemicals	"Sodium Hypochlorite" "Aron Clean" [®] "Turukuron" [®]	We developed a grade with lower impurity content, such as chloric acid and bromic acid, and supply it stably in response to the growing demand for safer and more reliable drinking water.
	Ballast water treatment agents "TG Ballastcleaner" [®] "TG Environmentalguard" [®]	Our products contribute to the conservation and maintenance of the marine environment as safe treatment agents for ballast water of ships that adversely affects the ecosystems of marine organisms living in each region.
	Ethylene carbonate	This product is used as one of the main materials for lithium ion battery electrolyte for environmentally-friendly electric cars and hybrid cars, among other applications.
Polymer & Oligomer	Polymer flocculants "ARONFLOC" [®]	This product is widely used for the purification of sewage treatment plants, plant wastewater, etc.
	UV-curable resins "ARONIX" [®]	This product is used in various applications and fields, such as paints, inks and adhesives, as resin material with less environmental impact free of organic solvents.
Adhesive Material	Instant glues "Aron Alpha" [®]	This product is a solventless adhesive with which a wide range of materials can be bonded. More than 50% of the resin used for the container is made of recycled plastic with Eco Mark certification.
	Hot-melt adhesives (solid type)	Polyester-based PES, olefinic PPET, etc., are environmentally-friendly adhesives free of organic solvents and widely used for automobiles, construction materials, etc., because of their high productivity.
	Powdered paints "Aron Powder" [®]	This product is environmentally-friendly powder paint free of organic solvent. Powder paint causes no loss as uncoated paint can be collected and reused.
Performance Chemicals	Antimicrobial agent "NOVARON" [®]	This product is used for textile, plastic, paint, etc., with its sustainable antimicrobial effect.
	Inorganic deodorant "KESMON" [®]	This product has instant and more effective deodorant capability than activated carbon against odorous gas, such as ammonia, acetic acid, hydrogen sulfide and aldehyde, with excellent sustainability as well.
	Inorganic/organic hybrid anti-mold agent "Cavinon" [®]	This product enables the antifungal ingredient to infiltrate into the inorganic layered compound and exert the antifungal effect with excellent durability and weather resistance.
Plastics	Performance piping equipment "Rainwater Chamber" [®] "Switching Chamber" [®]	The performance piping equipment "Rainwater Chamber" performs the respective functions of "preventing incoming drips," "reducing outflow" and "preventing backflow" to contribute to longer life of the rainwater storage osmotic tank installed to counter sudden torrential rain. The "Switching Chamber" switches wastewater to a sewage tank for emergencies and enables people to use the toilet as usual even if the sewer main pipe is damaged by an earthquake, etc.
	Construction materials "Aron Wall" [®] "Aron Coat" [®]	These products help maintain the longer life of buildings by waterproofing the exterior walls and roof and protecting buildings from deterioration.
	"Elastomer AR"	Elastomer is a recyclable plastic product that has properties close to rubber but with excellent formability. With such functions, Elastomer AR is utilized in a wide range of applications such as medical purposes, home appliances and automobiles.

Environmental Protection

Business Activities and Environmental Impacts

Scope of calculations				Period covered
Toagosei Group	Toagosei	Plants	Nagoya Plant, Yokohama Plant, Takaoka Plant, Tokushima Plant, Sakaide Plant, Kawasaki Plant, Hirono Plant (Fukushima Prefecture)	One year from January 1, 2017 to December 31, 2017
		Research centers	General Center of Research and Development (Aichi Prefecture), Institute for Advanced Sciences (Ibaraki Prefecture)	
	Group companies	Aronkasei	Kanto Plant (Ibaraki Prefecture), Nagoya Plant, Monozukuri Center (Aichi Prefecture), Shiga Plant, Onomichi Plant	
		Oita Chemical	Oita Plant	

Energy Consumption

	2016	2017
Energy consumption (crude oil equivalent, thousand kl)	183	186
Per unit of output (kl/adjusted production volume, thousand tons)	337	318

Water Consumption

	2016	2017
Water resources (million m ³)	50	51

INPUT

Toagosei Group Production Sites in Japan



OUTPUT

Business Activities

	2016	2017
Production volume (thousand tons)	1,090	1,186

Industrial Waste

	2016	2017
Volume of industrial waste generated (tons)	31,689	34,304
Volume discharged externally (tons)	9,160	11,684
Final landfill volume (tons)	50	4

Environmental Impacts on Water Resources

	2016	2017
Total effluent volume (million m ³)	40	42
COD (tons)	109	116
Total nitrogen (tons)	30	33
Total phosphorus (tons)	1.2	1.4
Substances subject to PRTR (tons)	8	4

Environmental Impacts on Atmosphere

	2016	2017
CO ₂ (CO ₂ equivalent, thousand tons)	395	395
SO _x (tons)	27	40
NO _x (tons)	71	71
Soot and dust (tons)	7	7
Substances subject to PRTR (tons)	34	44

Safety and Disaster Prevention



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> Zero explosion or fire accidents Zero serious leakage accidents of harmful substances or hazardous materials 	<ul style="list-style-type: none"> One serious leakage accident of harmful substances or hazardous materials 	★	<ul style="list-style-type: none"> Zero explosion or fire accidents Zero serious leakage accidents of harmful substances or hazardous materials

Safety and Disaster Prevention Initiatives

Disaster Prevention Meetings

Before manufacturing a new product or changing production methods or facilities, Toagosei holds disaster prevention meetings. At these meetings, the details of plans are discussed from the perspectives of process safety and disaster prevention, occupational health and safety, environmental protection, product safety, and quality assurance, and any issues are addressed. Disaster prevention meetings are classified into a three-tier hierarchy according to the size and agenda of the meeting: formal disaster prevention meetings, simplified disaster prevention meetings, and disaster prevention manager meetings. These meetings also serve as venues for confirming details to be examined in the “risk assessment” and the “chemical substance risk assessment.”

Disaster Drills

Each business site regularly conducts disaster drills in cooperation with fire departments and other agencies to ensure readiness in the case of an emergency. At each plant for acrylic product manufacturing, for example, training in line with the actual situation, such as training for adding polymerization inhibitor assuming an abnormal rise in

tank liquid temperature, is performed. Business sites located in industrial complexes confirm coordination and roles in joint disaster drills with local joint disaster prevention councils so that they are able to deal with emergencies.

The Tokushima Plant performed the “hazardous material leakage/ fire prevention drill” jointly with the Imagire Disaster Prevention Committee and the Tokushima City Fire Department in June 2017.



Disaster Drill (i)
Treating injured person
(Tokushima Plant)



Disaster Drill (ii)
Dispatching aerial ladder truck
(Tokushima Plant)

We maintain safe and reliable manufacturing systems

VOICE

Accidents, regardless of their size, cause serious damages to the manufacturing industry. Accidents can cause labor injuries and have impact on the environment and local residents, production loss, shipping loss and an increase in manpower and costs to respond to them, and lead to the loss of business opportunities or even our social credibility.

Especially in the chemical industry, continuing stable operation without accidents is our mission, since erroneous handling can lead to explosion or fire, and an accident at a plant can have a broad impact as a large volume of materials, which are hazardous if leaked, are handled.

For this reason, we systematically and appropriately conduct routine inspections and the maintenance of manufacturing facilities in an effort to maintain the soundness of facilities. In addition, we focus on education for workers to operate manufacturing facilities properly, and also regularly perform response drills assuming emergency situations. While plant workers have been replaced by younger generations in recent years, we have promoted the documentation of “know why” in the manuals to ensure that abundant knowledge and experience of senior experts are passed on to the next generation.

Furthermore, in the event that changes in so-called 4M* occur in facilities, workflow, etc., we make it a rule to repeatedly perform preliminary assessment especially from a disaster prevention perspective to ensure a higher level of safety.

*4M represents the four elements in production, i.e., Man, Machine, Material and Method.



Susumu Miho

Director
General Manager, Technology &
Production Administrative Division
General Manager, Research &
Development Administrative
Division



Occupational Health and Safety



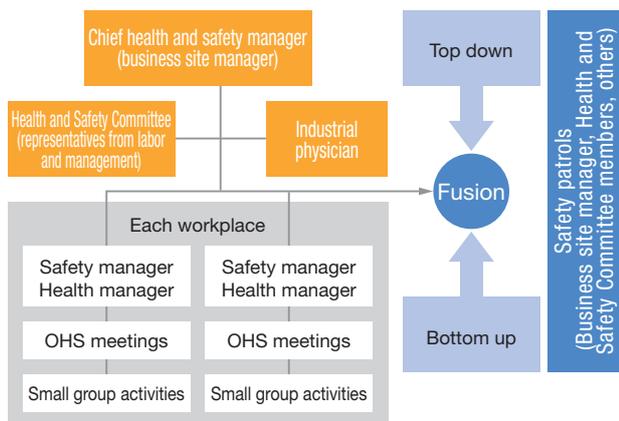
P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> Zero lost-time injuries (employees and partner business sites) 	<ul style="list-style-type: none"> One lost-time injury (employee) 	★	<ul style="list-style-type: none"> Zero lost-time injuries (employees and partner business sites) Maintenance and improvement of mental and physical health (holding mental seminar; reducing overwork/long-time work; 100% uptake rate for those who need reexamination)

Occupational Health and Safety Initiatives

Occupational Health and Safety Management System

The Responsible Care Committee has determined priorities for occupational health and safety (OHS) promotion and key policies and measures, and the Toagosei Group is engaging in health and safety activities accordingly. Each business site is raising the level of health and safety by fusing top-down initiatives originating from the site manager and bottom-up initiatives from workplaces.

OHS Management System



Health and Safety Committees and OHS Meetings

At each business site, a Health and Safety Committee organized in accordance with the Industrial Safety and Health Act meets each month, and management and labor jointly engage in health and safety activities. A monthly OHS meeting is held at each workplace, and the workers maintain and improve occupational health and safety.

OHS Activities

To promote the Zero-accident Campaign and prevent similar accidents throughout the Toagosei Group and share information on causes and countermeasures, Toagosei manages OHS activities using a common database for domestic and overseas operations.

In 2017, we conducted, and let the entire Group know, the revisions to the “General Guidelines for Safety and Health” in line with the most recent Industrial Safety and Health Act. (see the TOPICS on page 52.)

Each business site and workplace engages in its own OHS activities, and best practices are presented at the AII TOA Responsible Care Convention as takeaways for participants to utilize at their own workplaces.

Accident Prevention

In 2017, one lost-time injury occurred, and we were unable to achieve the target of zero lost-time injuries. Thirteen no-lost-time injuries occurred (eight involving employees and five at partner business sites). While the number of lost-time injuries was one, two people were injured. Similar accidents are being repeated due to insufficient awareness of anticipating danger in advance, such as suction of or exposure to harmful substances caused by a lack of thoroughness in wearing protective equipment or by inappropriate protective equipment. We also need to address the task of enhancing safety management and education systems for partner business sites and outside contractors.

Number of Occupational Accidents (Accidents)

	Toagosei Group		Partner business sites, others		Total	
	Lost-time injuries	No-lost-time injuries	Lost-time injuries	No-lost-time injuries	Lost-time injuries	No-lost-time injuries
2013	1	17	1	1	2	18
2014	1	7	3(1)	3	4	10
2015	4(1)	9	1	3	5	12
2016	1	10(1)	4	2	5	12
2017	1	8	0	5	1	13

*Numbers in parentheses indicate accidents at overseas business sites.

Approach to Health Management

Establishment of Health Management Promotion Section

In January 2018, we established the "Health Management Promotion Section" within the Human Resources Department amid the situation where corporate initiatives for health management are recognized as CSR activities.

Under the concept of health management, promoting the maintenance and improvement of employee health is considered as an investment that leads to improved corporate profits in the medium-term, and thus healthcare administration is conducted in a strategic, systematic and continuous manner.

Said Section will promote broad-based initiatives to encourage the maintenance and improvement of employee health and support the promotion of health management from a group-wide administrative position. More specifically, we will undertake such initiatives as improvement in the paid leave usage rate, the reduction of long-time work, the expansion of the insurance business through collaboration with the health insurance union, the promotion of work-life balance, the promotion of childcare leave, and the reduction of the mental and physical burden at operating sites. We aim to enhance our corporate value by improving productivity and creativity, as well as by suppressing an increase of medical expenses and the risk of absences due to sickness through such initiatives.

Employee Health Management

Toagosei conducts periodic medical examinations for the purpose of employee health management and provides health counseling to persons with abnormal findings. Each business site devises and engages in health improvement activities, such as holding seminars on the prevention of lifestyle-related diseases and works to raise employee awareness of health management. We also employ various

approaches to promoting employee health, such as the medical expense assistance campaign for employees who completed outpatient treatment to quit smoking. In accordance with the Industrial Safety and Health Act, we prevent health problems caused by chemical substances by conducting chemical substance risk assessments at each workplace.



Health workshop (Head Office)

Mental Healthcare

To create workplaces where people do not develop mental health issues and enable employees to accurately ascertain their own stress level, we conduct an annual stress check in cooperation with an external specialist medical institution. On the basis of the stress check results, we analyze causes of stress in each workplace and take measures such as arranging consultations with industrial physicians and providing mental health training for managers. Furthermore, we have set up a telephone consultation service to enable employees and their family members to anonymously obtain counseling. We will continue to engage in effective mental healthcare in accordance with the provisions of the Industrial Safety and Health Act and other relevant laws and regulations.



Mental health seminar (Shiga Plant, Aronkasei)

TOPICS

Revisions to the General Guidelines for Safety and Health

We reviewed the Toagosei Group "General Guidelines for Safety and Health" and issued the sixth revised edition in July 2017. We revised the composition to be more user-friendly and adapted the contents to the most recent situation including the revisions to the Industrial Safety and Health Act. We improved the description of matters requiring a cautious approach by focusing on the workflow and machine equipment which caused accidents repeatedly in the past. We added GHS labeling of chemical substances and the dangers/hazards of substances Toagosei frequently handles. The Guidelines also cover harassment and the prevention of infectious diseases. The Guidelines are distributed to employees of partners who regularly work at our sites, as well as to our employees, and used for the purpose of education and confirmation of daily work.

Cover page of the General Guidelines for Safety and Health



Minister of Health, Labour and Welfare's Special Award for Outstanding Foremen in Occupational Safety

Our two colleagues, Mr. Toshikazu Awata, Foreman at the Takaoka Plant, and Mr. Hiroaki Mishima, Foreman at the Onomichi Plant of Aronkasei, concurrently received the "Minister of Health, Labour and Welfare's Special Award for Outstanding Foremen in Occupational Safety" in 2017, following Mr. Ono, Foreman at the Kawasaki Plant, who received said award in 2016. Both of our colleagues expressed their pleasure in their comments on the award, stating that continuous daily efforts for safety made by all on-site workers are recognized.

It is a matter of course but a difficult task to continue zero accidents at a chemical plant. We will not get too pleased with ourselves with this award and continue our safety activities at manufacturing sites.



Minister of Health, Labour and Welfare's Special Award for Outstanding Foremen in Occupational Safety



Product Safety



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> Enhanced management of product labels Preparation and registration of purchase specifications 	<ul style="list-style-type: none"> Information registration into administrative database completed Preparation and registration completed as planned 	★ ★ ★	<ul style="list-style-type: none"> Preparation and registration of purchase specifications Consistent response to revisions of laws regarding chemical management

Appropriate Management of Chemical Substances

Chemicals Safety Management System

In the Toagosei Group, the first task at the product development stage is to conduct a safety examination. We also perform necessary safety tests when making notifications required by laws and regulations, such as when a product falls under the category of a new chemical substance.

At disaster prevention meetings held before test production or scaling up of production, we discuss the safety of materials handled and products, as well as disaster prevention during manufacturing. We check chronic effects as well as acute health hazards, such as the danger of chemical injury, through chemical substance risk assessments and also deliberate on compliance with legal and regulatory requirements, environmental impacts, and other matters.

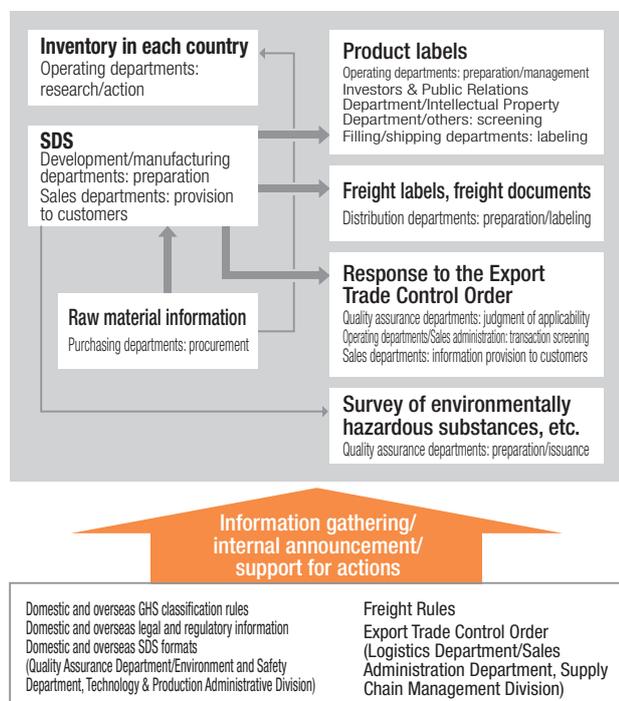
Provision of Safety Information

We provide chemical product safety information using safety data sheets (SDS), product labels, yellow cards, and other means.

SDS are documents prepared for communicating detailed information related to chemical product handling methods and safety. We issue SDS to customers, sales agents, transportation companies, and other companies that handle the Group's products. SDS for some products can be downloaded from the corporate website.

The mandatory provision of SDS and product labels in national languages in accordance with Globally Harmonized System of Classification and Labelling of Chemicals (GHS) has started in various countries around the world including Japan. We are updating product labels as needed in compliance with the laws and regulations of each country.

Many departments are involved to manage product information and appropriately communicate it to the supply chain. Members of the Technology & Production Administrative Division and the Supply Chain Management Division are engaged in information gathering, internal education, response to consultation and other tasks to support implementing departments.



Green Procurement

We disclose information on the chemical products we provide to enable customers to practice green procurement. Relevant information is provided through chemSHERPA* as well.

In addition, to provide environmentally-friendly, worry-free products, we have established the Green Procurement Guidelines, manage environmentally hazardous substances in raw materials and packaging materials, and conduct quality and environmental management surveys of business partners. We have put in place a mechanism for selecting raw materials that meet green procurement criteria beginning at the product development stage.

*chemSHERPA: the scheme designed for communicating information on chemical substances contained in products in the supply chain; released in October 2015 and fully used by each company since 2017.

Quality Assurance



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
● Total number of complaints: 200 or fewer	● Total number of complaints: 241	★	● Reduction of number of complaints

Quality Assurance System

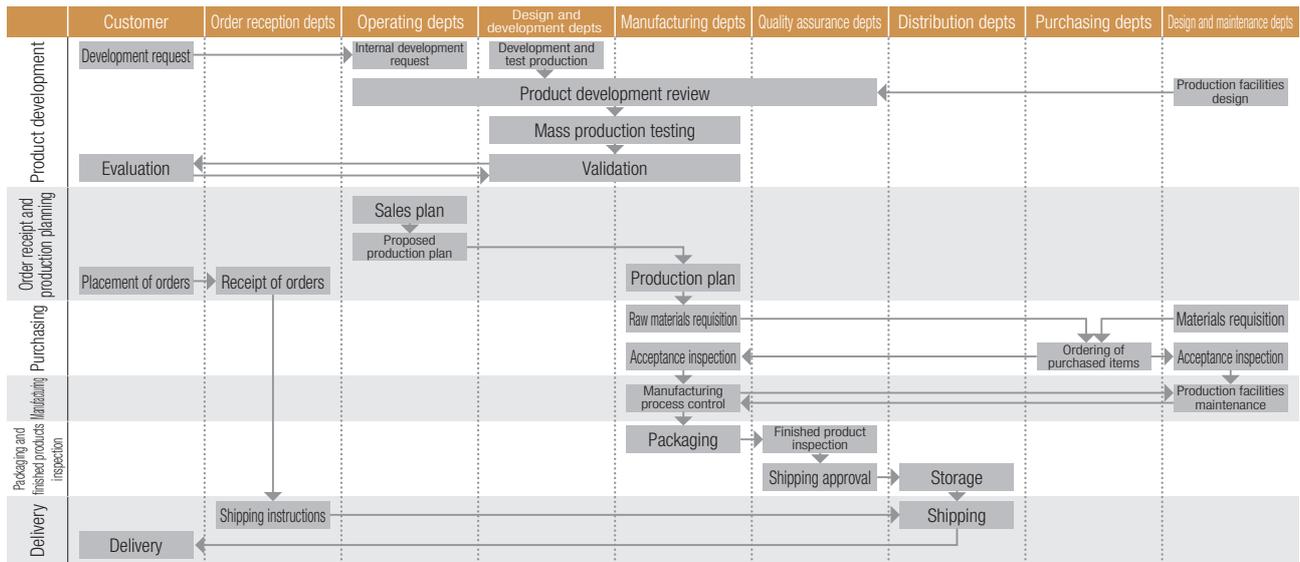
The Toagosei Group has established a quality policy to “enhance quality management and offer products and services that satisfy the customer,” and is working to enhance the quality assurance system. We promote quality activities so that we always achieve results through the integration of the appropriate operation of the quality management system and business operations.

Furthermore, we aim to improve the level of quality control and quality assurance not only for our proprietary products, but also for

the products from contract manufacturers by setting targets for complaints and ensuring the operation of internal standards.

As shown in the quality assurance system diagram, we have clearly defined the roles and responsibilities of each organizational unit with the aim of enhancing quality performance involving all departments.

Quality Assurance System



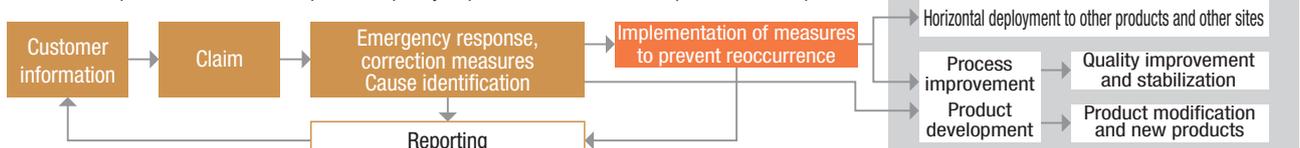
Initiatives in Response to the Voice of the Customer

We have put in place and operate a mechanism for responding to complaints and claims. A sales organization receives information and promptly communicates with the plant quality assurance group. Then the related departments and groups closely collaborate in determining the root cause, devise effective measures to prevent reoccurrence, promptly report to the customer, and implement

countermeasures. We summarize complaints received by factor and by site to promote target-focused activities in an effort to enhance the level of quality assurance on a Group-wide basis.

In addition, we significantly expedited the proceedings for the submission of documents to customers including delivery specifications year on year through the improvement of mechanisms.

Customer requests, claims redress process/quality improvement, reflection in product development





Physical Distribution Safety



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> Reduction in the number of physical distribution problems 	<ul style="list-style-type: none"> Targets achieved with no serious leakage accidents and 23% reduction in physical distribution accidents year on year 	<p>★★★</p>	<ul style="list-style-type: none"> Reduction in the number of physical distribution problems

Safety Management during Product Transport

Safe Transport and Delivery Promotion Structure

Each business site organizes conferences with carriers to promote safe transport and safe delivery. The business sites set annual targets at the conferences and confirm the progress and whether rules for carrying out safe operations are being observed through meetings and safety patrols. In the case of new clients, the business sites confirm clients' receiving facilities in advance to establish the system for safe delivery.

Horizontal Deployment of Problem Information

The logistics departments undertake sharing and horizontal deployment of information at all plants by registering problems in shipping and transport in a database. Each business site regularly holds meetings with carriers to share risk information such as examples of actual accidents and close calls. As a result of these initiatives, physical distribution problems have steadily decreased in number.

Conduct of Emergency Response Training

In the disaster prevention training periodically conducted at each business site, drills in preparation for the occurrence of leakage accidents are conducted with the participation of carriers as well. More specifically, we conduct drills to attach respirators placed on vehicles, the confirmation of emergency contact procedures, and the confirmation of methods to secure safety and to evacuate, etc., in preparation for the leakage of dangerous/poisonous products. We also provide education on the properties and toxicity of transported products, as well as on emergency measures upon leakage, and inspect and maintain the emergency materials placed on vehicles, etc. We have also prepared emergency equipment and materials at business sites and put in place a system for promptly forming and dispatching emergency response teams.

Emergency drill



Explanation to drivers

Safety confirmation from outside upon reversing a vehicle

Drill to attach a respirator

TOPICS Focus on Enlightenment on Physical Distribution Safety

In order to establish a safe and efficient shipping system, the Logistics Department regularly holds in-house training sessions with a focus on helping participants understand and obtain knowledge necessary for safe and stable transportation, including laws and regulations related to transportation. In September 2017, 96 people participated in the session titled "Briefing session on shipping/aerial transportation of hazardous materials," which was held as a TV conference connecting the head office and each site. In addition, we aim to strengthen and enrich international transportation capabilities by undertaking initiatives for developing human resources specialized in export operations in order to handle overseas transportation, which is expected to expand and increase in line with the global expansion of the Toagosei Group.



Enlightenment on physical distribution safety through the Group's internal newsletters



Human Rights



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> Maintenance of an employment rate of persons with disabilities of 2.0% 	<ul style="list-style-type: none"> Maintained an employment rate of persons with disabilities above 2.0% 	★ ★ ★	<ul style="list-style-type: none"> Maintenance of an employment rate of persons with disabilities of 2.4%
<ul style="list-style-type: none"> Promotion of work-life balance (achievement of an average annual paid leave usage rate of 100%) 	<ul style="list-style-type: none"> Targets not achieved, although the average annual paid leave usage rate improved year on year to 89.6% on a group-wide basis. 	★ ★	<ul style="list-style-type: none"> Promotion of work-life balance (achievement of an average annual paid leave usage rate of 100%)
<ul style="list-style-type: none"> Promotion of active participation by women (execution of the action plan for promoting active participation by women) 	<ul style="list-style-type: none"> Executed an action plan for promoting active participation by women based on the Act on Promotion of Women's Participation and Advancement in the Workplace Introduced the "Regulations for Spouse Overseas Transfer Leave System" and the "Regulations for Reentry System" in January onward Increased job categories open to women in manufacturing departments 	★ ★	<ul style="list-style-type: none"> Promotion of active participation by women (execution of the action plan for promoting active participation by women)

Respect for Human Rights

Human Rights Protection Initiatives

▶ Respect for Human Rights and Harassment Countermeasures

The basic stance of the Toagosei Group toward investors, customers, and employees is to be "a company that values people." We respect fundamental human rights and strive to create workplaces where the individuality of people from diverse backgrounds is appreciated and they can make full use of their abilities. We have prohibited sexual harassment, power harassment, and maternity harassment in the rules of employment and are working to raise awareness of human rights through education for managers and other employees to ensure that Group employees do not engage in discriminatory acts or human rights violations. We have set up internal and external reporting channels and, in the event that any type of human rights violation is detected, have made it possible to promptly take corrective measures following investigation by a committee whose members include outside specialists.



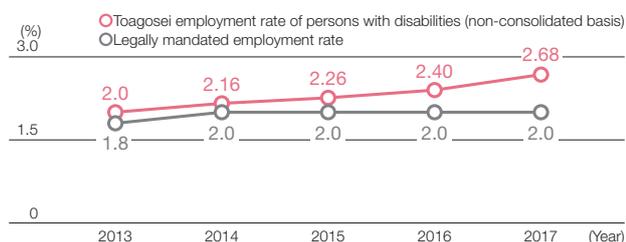
Human rights seminar
(Tokushima Plant)

Enhancement of Employment Systems

▶ Employment of Persons with Disabilities

To support the independence of persons with disabilities, the Group is striving to expand employment of persons with disabilities. The employment rate of persons with disabilities at the end of 2017 was

Employment Rate of Persons with Disabilities



2.68% for Toagosei Co., Ltd. and 2.63% for the Group as a whole. A total of 43 persons with disabilities work in the Group, 17 of whom have severe disabilities. In 2018 and beyond, we will continue to cultivate a workplace environment where persons with disabilities can work with peace of mind.

▶ Employment of Older Persons

The Group is actively enhancing measures for the employment of older persons in light of revision of the pension system and other factors. We raised the mandatory retirement age from 60 to 65 in April 2013 to respond to a change in the age of eligibility for public pensions and are endeavoring to utilize the abilities of seniors.

Initiatives for Work-Life Balance and Gender Equality

The Group aims to realize work-life balance for employees. To enable employees to successfully balance work and home life and have a positive impact in both spheres, we engage in initiatives such as conducting a review of working hours and controlling total working hours, introducing a shift working system that provides more holidays, introducing a work-at-home system, and encouraging employees to take annual paid leave. In 2017, 12 Group employees made use of childcare leave. We will continue to cultivate an environment that enables employees to develop their careers while balancing work and private life and assist them in realizing their own individual work styles.

Annual Paid Leave Usage



Source for national average: General Survey on Working Conditions (Ministry of Health, Labour and Welfare)
*Toagosei allows employees to retain annual paid leave even after the expiry of the statutory period of validity (up to 40 days); the above figures include the usage of such retained paid leave in the calculation.



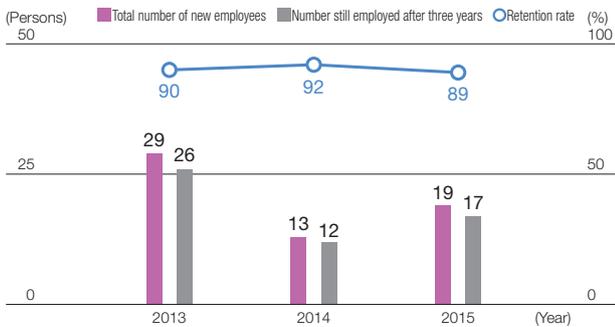
Human Resources Development

Human Resources Development

Recruiting Activities

The Toagosei Group seeks people with the enthusiasm and tenacity to think and tackle issues independently and see tasks through to the end. We make known the human resources we seek through company information sessions, websites, and other means to ensure understanding of our requirements by greater numbers of people. In selecting recruits, we place importance on interviews and consider whether people are able to contribute and flourish in the Group a more important judgment criterion than academic qualifications or past track record.

New Graduate Recruit Retention Rate (after Three Years) for the Previous Three Years



Human Resources Development Policy and Systems

To realize the Group Vision, the Toagosei Group is strengthening its high-value-added businesses and implementing a growth strategy that includes overseas development. Each individual employee is the source of power to achieve the Group Vision, and we consider our employees an important corporate asset that creates added value. With the aim of developing excellent, highly motivated human resources who will drive the Group's growth, we enhance and rebuild our human resources development system, mainly led by the Human Resources Development Department. To support employees pursuing self-growth and actualize and maximize the latent potential of each individual, the Department conducts a wide range of educational programs, including level specific training, training for promoted employees, and other group training as well as e-learning, distance learning, and overseas training.

Technical Education and Training

To further strengthen development of personnel with on-site skills and transmission of technologies and skills to the next generation of employees, we have assigned employees responsible for technical education to the Nagoya Plant, where they provide instruction on basic knowledge required by technical departments (operation, equipment, unit operation, safety, etc.).

Group training is a forum for participants to not only acquire basic knowledge, but also deepen their understanding of equipment by exchanging views about the equipment they use in their workplaces,

which they were required to study prior to the session. In the process of learning about the equipment, we endeavor to pass on knowledge and know-how from veteran employees.

We are also developing personnel who ensure stable operation through experience-based training, efforts to raise safety awareness, and enhancement of safety education, such as hazard prediction training.



Second-year training session for regular service employees

Self-development and Career Development Assistance

The Group has arranged distance education and e-learning courses that contribute to knowledge acquisition and skills development in areas such as basic business abilities, management skills, and job specific expertise. We support the growth of employees who have completed such training by operating a training expense assistance program and preparing an environment that facilitates employee self-development. In addition, we assist with employee career development by conducting the TOEIC test and actively supporting acquisition of public qualifications.

Global Human Resources Development

To develop human resources who respond to globalization of the business environment and support overseas expansion, Toagosei has instituted the Overseas Training Program. We seek to foster a global mindset among employees early on in their careers by dispatching employees to our overseas business sites and to external institutions to gain overseas experience.

Suggestion Scheme, Service Invention Compensation Scheme

Toagosei has instituted the Suggestion Scheme to identify original, ingenious inventions and ideas of individual employees and promote employee self-expression and workplace refinements and improvements. Also, when an employee has made a service invention, device, or design, we reward the accomplishment through the Service Invention Compensation System. Excellent suggestions and service inventions are recognized through the Awards System via a review committee. Through these initiatives, we continuously seek to energize employees and promote business process improvement and innovation.

Active Participation by Women

Action Plan Based on the Act on Promotion of Women's Participation and Advancement in the Workplace

The Toagosei Group made promotion of active participation by women a key CSR objective for 2017 and has started development of a structure to enable women to fully demonstrate their abilities and formulated an action plan for proactively promoting active participation by women. Toagosei has set action plan objectives of a female hiring ratio exceeding 30% each year and tripling of the ratio of female managers by January 1, 2021 (compared to January 1, 2016).

Eruboshi Certification

Toagosei has obtained certification from the Minister of Health, Labour and Welfare under the *Eruboshi* system as an outstanding company for promoting women's participation under the Act on Promotion of Women's Participation and Advancement in the Workplace. We have met certification criteria for four evaluation items: recruitment, continued employment, working hours and other working conditions, and diversity of career courses. We will continue to support active participation by women in the workplace.

Assignment of Women to Manufacturing Sites

In the interest of promoting active participation by women, Toagosei is preparing a suitable workplace environment and expanding job categories available to women to manufacturing sites, where few women have worked until now. Since 2015 we have assigned women to workplaces operating under the shift working system at manufacturing sites.

RICOCHALLE

Toagosei endorses an initiative that encourages selection of career paths in the fields of science and engineering by female students (RICOCHALLE, short for Science and Engineering Challenge) sponsored by the Cabinet Office, the Ministry of Education, Culture, Sports, Science and Technology, and Japan Business Federation (KEIDANREN). As part of our support for this initiative, in 2017 we conducted plant and research laboratory tours for female junior and senior high school students. Through the tours, we convey to the students the fascination and unlimited potential of science and the existence of workplaces where women can energetically work and flourish even in the chemical industry.



Plant visit by RICOCHALLE participants

Proportion of Women among New Graduates in Past Five Years



Expansion of Job Categories Available to Women First job leader in manufacturing departments

Five women work in the Functional Materials Section, Manufacturing Department at the Tokushima Plant, to which 20 employees belong. I took and passed the job leader exam for the first time in the plant manufacturing department. While I originally had some concern about whether I could work as actively as male job leaders, I have fulfilled my role by suggesting and implementing the reduction of workload and the improvement of the work environment from the unique perspective as a woman in cooperation with other female employees. I hope to create a reliable, safe and active workplace with the support of my colleagues while developing myself as a job leader.

VOICE



Mitsue Hashimoto
Functional Materials Section
Manufacturing Department,
Tokushima Plant

Human Resources Development

Creating an Employee-friendly Environment

Promotion of work-life balance

With the aim of realizing work-life balance for employees, Toagosei has controlled overtime work by stressing the importance of working efficiently and introducing in 2011 a no-overtime day throughout Toagosei. Subsequently, since the habit of working efficiently has taken hold, since fiscal 2015 we have further promoted the taking of annual paid leave. We will continue efforts to create an employee-friendly environment by promoting taking of annual paid leave.

Spouse Overseas Transfer Leave System and Reentry System

To assist employees in balancing work and family life, in January 2017 Toagosei introduced the spouse overseas transfer leave system, which allows leave of up to three years for employees accompanying their spouses on overseas assignment, and the reentry system for registering candidates for reemployment in cases where employees have resigned due to family circumstances such as transfer of a spouse, childcare, or nursing care. Through operation of these systems, we aim to deal flexibly with the family circumstances of employees.

Self-declaration System

To promote appropriate assignment of employees, Toagosei has instituted the self-declaration system. Once a year, employees express their thoughts and wishes about their own work to the company, and employees and their immediate managers discuss the declaration contents in an interview.

Other Systems

Toagosei has instituted the following systems to create an employee friendly environment.

- Leave systems such as marriage leave, mourning leave, nursing care leave, and half-day paid leave
- Flextime work system, short-time work system
- Dormitory and company housing system
- Spouse overseas transfer leave system
- Reentry system
- Work-at-home system



Risshi Dormitory

Balance of Work and Childcare through Work-At-Home System

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I am a mother raising children and my responsibility at work is receivables management. I started to use the work-at-home system twice a week since last year in order to balance childcare and work, inspired by the fact that the time is ripe for working at home with the advance of paperless operations. I collect bills and enter the data into the system during days I work at the office and carry out the processing work following the data entry when working at home. With a well-developed internal information infrastructure, I can communicate with my boss and colleagues at home in the same manner as in the office. In addition, I feel my work efficiency has improved because I can concentrate on my work at home. I now have more opportunities to interact with my children as less commuting has created more time. The system has resulted in great advantages from both work and private perspectives.



Makiko Nakae

Finance Group,
Shared Service
Business Department
Toa Business Associe
Co., Ltd.

TOPICS

Recognized as Exemplary Company by Singapore Ministry of Manpower (MOM)

Toagosei Singapore Pte Ltd. (TGS) was recognized as an exemplary company by the Singapore Ministry of Manpower (MOM). This means the TGS' initiatives for human resources development^{*1} and the provision of employment opportunities are recognized as fair and progressive^{*2}. TGS will continue its existing activities including human resources development.

^{*1} Initiatives for human resources development

- Actively dispatched local employees to training courses sponsored by the Singapore Government
- Passed on Toagosei's technologies and knowledge to local employees

^{*2} Provision of fair and progressive employment opportunities

- The vast majority of employees are locally employed (half of which continuously serve since TGS' foundation)
- Employment of a person subject to retirement at the age of 62 extended (1 person)





Enhancement of Contributions to Society and Communication



P Targets for 2017	D Results in 2017	C Achievement	A Targets for 2018
<ul style="list-style-type: none"> Support for nature conservation, beautification and greening, and culture and sports activities Charitable donations and gifts Participation in the Human Resources Fostering Program in Chemistry, diversity promotion, and other projects 	<ul style="list-style-type: none"> Tree planting and forest care activities, clean-up and beautification volunteer activities, support for sports events, etc., continued in the areas where our sites are located Donations made for victims of torrential rains in northern Kyushu Participation in and sponsorship for the Human Resources Fostering Program in Chemistry continued; donations to the "Tobitate! (Leap for Tomorrow) Young Ambassador Program" continued 	<p>★ ★ ★</p>	<ul style="list-style-type: none"> Charitable donations and gifts beneficial to society Participation in and support for beautification and greening, and culture and sports activities Participation in the Human Resources Fostering Program in Chemistry, diversity promotion, and other projects Conservation activities for biodiversity
<ul style="list-style-type: none"> Thorough aesthetic maintenance activities in the vicinity of business sites 	<ul style="list-style-type: none"> Periodically engaged in inspection patrols and cleanups on the periphery of plants 	<p>★ ★ ★</p>	<ul style="list-style-type: none"> Thorough aesthetic maintenance activities in the vicinity of business sites
<ul style="list-style-type: none"> Expansion of community dialogues Dissemination of company information 	<ul style="list-style-type: none"> Conducted plant tours and workplace tours Participated and cooperated in community disaster prevention drills Business sites and Group companies held meetings with community groups and community dialogues 	<p>★ ★ ★</p>	<ul style="list-style-type: none"> Expansion of community dialogues Dissemination of company information

Social Contribution Activities

Social Contribution Committee Activities

The Toagosei Group has set up a labor-management joint Social Contribution Committee at the Group and business site level and actively engages in social contribution activities, such as collection of used stamps, support of sports, and monetary donations in the event of a major disaster.

Activities for Aesthetic Maintenance and Conservation of Biodiversity, etc.

Each site is engaged in the activities described in the table below, in which many employees participate.

Activities for aesthetic maintenance and conservation of biodiversity, etc.

Site	Activity
Each site of Toagosei Group	<ul style="list-style-type: none"> Garbage cleaning, weeding, planting tree seedlings, etc., around each site Participating in the "CO₂ Reduction/Light Down Campaign" sponsored by the Ministry of the Environment
Nagoya Plant, Toagosei	<ul style="list-style-type: none"> "Forest Growing Activities by Aichi-based Companies"
Yokohama Plant, Toagosei	<ul style="list-style-type: none"> "Tsurumi Clean Campaign" and "Tsurumi River Clean Campaign" cleaning activities
Yokohama Plant, Kawasaki Plant and Head Office, Toagosei	<ul style="list-style-type: none"> "Kanagawa Forest Neighborhood Association" and "Forest Neighborhood Association" partly using paper that contributes to forest thinning
Takaoka Plant, Toagosei	<ul style="list-style-type: none"> "Fushiki Fureai Forest" volunteer activities for satoyama development
Tokushima Plant, Toagosei	<ul style="list-style-type: none"> "Takamaruyama Sennenomori (1,000-year Forest of Takamaru Mountain)" and "Tokushima Forest Growing Collaboration Project" volunteer activities for forest thinning and improvement Received from the prefectural governor certification of CO₂ volume absorbed by the forest in 2017 based on the above activities (120.36 tons)
Hirono Plant, Toagosei	<ul style="list-style-type: none"> "Weeding at Hirono Disaster Mitigation Green Zone" and "Hirono-cho Clean-up Program (clean-up of Asami River)"
Monozukuri Center, Aronkasei; Nagoya Plant	<ul style="list-style-type: none"> Tokai City Adapt Program "Shimpo Greenbelt Sports Park" clean-up activities
Monozukuri Center, Aronkasei	<ul style="list-style-type: none"> Maintenance and management of in-house biotope
TOA-DIC Zhangjiagang Chemical	<ul style="list-style-type: none"> Xiangshan Clean Program clean-up activities



Volunteer activities for the recovery from torrential rains in northern Kyushu (Oita Chemical)



Ceremony for certification of CO₂ volume absorbed by the forest of "Tokushima Forest Growing Collaboration Project" operated by Tokushima Prefecture (Tokushima Plant)

300 Blood Donations Achieved

The number of blood donations I have made over the years exceeded 300 times last year. I started blood donations naturally following my father, who continuously donated blood, without specific awareness of it being a social contribution. Donating blood is my hobby, it is beneficial to my health management and is useful for patients who need a transfusion; it has become my life's work with "three benefits gained from one donation." Regardless of whether you make it a hobby, I hope that many people donate blood, and obtain at least the two benefits of health management and making a social contribution from one donation.

VOICE



Satoshi Nyumura
Joint Production Section
Nagoya Plant
Aronkasei

Enhancement of Contributions to Society and Communication

Enhancement of Communication

Harmonious Coexistence with Local Communities

The Toagosei Group engages in business activities rooted in local communities, and it is essential to maintain harmonious coexistence and communication with these communities. Our domestic and overseas business sites strive to create many opportunities for direct communication with area residents and are vitalizing communities and building relationships of trust through dialogues and exchanges.

▶ Plant Tours

We hold plant tours on a regular basis at our domestic and overseas sites. We accept various stakeholders, including students from neighboring primary, junior high and senior high schools and members of neighborhood associations, and hold tours tailored to their requests to improve their understanding of the Toagosei Group.



Tour for trainees of Japan International Cooperation Agency (JICA) (Monozukuri Center, Aronkasei)



Tour for high school students from City of Fort Wayne in the U.S., the sister city of Takaoka City (Takaoka Plant)

▶ Fostering the Next Generation

The Group's domestic and overseas business sites offer internships for university, high school, and vocational school students and also conduct educational activities for primary, junior high, and senior high school students, such as hands-on learning and classes at schools. Through these learning opportunities, we seek to arouse interest in chemistry, promote understanding of business activities, and introduce youngsters to the world of work.



Work experience for students from Sanwa High School, Ibaraki Prefecture (Kanto Plant, Aronkasei)

▶ Support for Disaster Recovery

The Hirono Plant, located in the town of Hirono in Fukushima Prefecture, is fully engaged in support activities in collaboration with municipalities and organizations involved in local revitalization to assist communities stricken by the Great East Japan Earthquake of 2011 in their recovery efforts. These activities include support for community events, tree planting in a disaster mitigation green zone, and donations and gifts.



Donation ceremony for the recovery of J Village (Hirono Plant)

TOPICS

Local Communication in Zhangjiagang, China

As a member of the local community, TOA-DIC Zhangjiagang Chemical Co., Ltd. emphasizes cooperation and harmonious coexistence with local residents. In 2017, as part of its social contribution activities that have continued for more than 10 years since its foundation, TOA-DIC Zhangjiagang Chemical made donations and gifted stationery and sweets to Zhangjiagang City Special Education School. For the purpose of nurturing the next generation, TOA-DIC Zhangjiagang Chemical also provided internship workshops for local college students majoring in Japanese to gain a better understanding of the chemical industry through experiencing production management and experiment training. We will continue to engage in various activities to stimulate the local community while actively communicating with local people.



Visit to Zhangjiagang City Special Education School



Ms. Sun Yu, trainee (center), and the employees of TOA-DIC Zhangjiagang Chemical Co., Ltd. who provided the training

Site Report

Japan (Plants and Research Laboratories)

*Number of employees as of December 2017

Yokohama Plant

Number of employees: 104

The Yokohama Plant is endeavoring to achieve zero accidents and zero injuries while also eliminating serious environmental problems by engaging in process safety and disaster prevention activities and strengthening environmental measures. It will continue to strengthen systems for the stable supply of high quality products and quality assurance.



Principal production items

- Caustic soda, hydrochloric acid, sodium hypochlorite, high-purity liquid hydrogen chloride, easily soluble copper oxide, etc.

Tokushima Plant

Number of employees: 105

We worked to improve the overall level of CSR under the basic policy of "becoming a workplace where everyone can work comfortably." In terms of safety, we achieved zero injuries by thoroughly ensuring basic items and change management. On the environmental front, we have concluded an environmental conservation agreement and deepened cooperation with the region/administration.



Principal production items

- Caustic soda, hydrochloric acid, sodium hypochlorite, high-purity liquid hydrogen chloride, etc.
- Inorganic ion exchangers, silver-based inorganic antimicrobial agents, inorganic deodorant, etc.

Kawasaki Plant

Number of employees: 43

By targeting the continuation of safe and stable operation, we promoted the proper management of facilities and "know why" education on plant-specific operation technologies and equipment knowledge with a focus on the transfer of accumulated technologies from the past, and continuously achieved zero accidents/zero injuries, as well as no environmental accidents, this year.



Principal production items

- Polyvinyl chloride resin, special monomer with sulfonic acid group

Nagoya Plant

Number of employees: 367

We promoted RC activities under our plant slogan "communicate and succeed human resources development." Through these activities, we visualized the knowledge and "know why" to be passed down to the next generation as technical documents linked to workplace safety standards to ensure safe and stable operations.



Principal production items

- Caustic soda, hydrochloric acid, sodium hypochlorite, sulfuric acid, etc.
- Acrylic monomers, oligomers, polymers, etc.

Takaoka Plant

Number of employees: 145

In 2017, we reexamined and optimized our operations under the slogan "change & challenge." We also ensured thorough implementation and lateral deployment of disaster-response/troubleshooting measures and worked on prevention on the premise that the employees firmly understand the meaning and importance of their work.



Principal production items

- Aron Alpha® and other general-use adhesives and industrial adhesives
- Inorganic products related to potash, etc.

Sakaide Plant

Number of employees: 17

We achieved zero accidents/zero injuries through efforts to strengthen health and safety management through workplace patrols from a female perspective and joint patrols with outside safety promoters. In environmental conservation activities, we achieved CO₂ emissions and waste reduction targets.



Principal production items

- Acrylic polymer flocculants, etc.

Hirono Plant

Number of employees: 61

In 2017, we achieved zero accidents continuously since 2005 by ensuring that all employees and construction contractors thoroughly complied with the basic items during facility reinforcement work and the launch of new products. In 2018, we aim to achieve the waste reduction target.



Principal production items

- Acrylic polymers, etc.

General Center of Research and Development

Number of employees: 138

In order to accelerate research and development, we follow up on themes and optimize staffing from the perspective of the General Center of Research and Development as a whole, and also actively utilize external resources. In safety activities, we are continuing zero injuries through enhanced risk prediction activities and the succession of “know why.”



Research Organizations

- Base Technology Laboratory, Applied Research Laboratory, New Products Research Laboratory, Productive Technology Laboratory

Institute for Advanced Sciences

Number of employees: 6

We are promoting collaborative research on functional peptides (also participating in research projects through competitive research funding). In terms of safety, we review past disaster countermeasures and predict similar risks, and maintain and continue safety awareness through day-to-day close calls and individual risk prediction activities.



Research Area

- Bioinformatics-related

Oita Chemical

Number of employees: 48

We aim to strengthen plant management in an effort to enhance safety and stability further amid busier operation of the new acrylic acid plant, and maintain zero injuries which continues since the start of operation in 1984. The company places importance on building rapport with the local community through initiatives such as RC community dialogues and classes at nearby primary and junior high schools.



Principal production items

- Acrylic acids, etc.

Kanto Plant (Aronkasei Co., Ltd.)

Number of employees: 48

In 2017, we implemented countermeasures for falling and toppling as a priority item of safety activities. We took countermeasures such as the prevention of falling by installing safety fences on work stages and recurrence prevention by changing the steps that caused a falling injury into a slope and installing a handrail.



Principal production items

- Plastic joints, chambers

Nagoya Plant (Aronkasei Co., Ltd.)

Number of employees: 87

In order to achieve zero injuries, we strengthened on-site health and safety patrols, with a special emphasis on findings in activity aspects based on past injury trends. We also reviewed past injuries to prevent their recurrence over the passage of time.



Principal production items

- Plastic pipes, joints, chambers, manholes, etc.
- Elastomer compounds, etc.

Shiga Plant (Aronkasei Co., Ltd.)

Number of employees: 59

In an effort to promote safety and health activities, we revisited the basics of 5S and carried out “sorting” activities for all workplaces. Thorough extraction and disposal of unnecessary items at the site resulted in better work efficiency and safety, as well as higher employee awareness.



Principal production items

- Portable toilets made of resin, furniture style portable toilets, bathing chairs and stools, meter boxes, etc.

Onomichi Plant (Aronkasei Co., Ltd.)

Number of employees: 60

In order to implement countermeasures against the findings of the safety patrols in a timely manner within the deadline, we devised a method of pointing out issues when conducting patrols in an effort to build a safer workplace with no procrastination. In addition, we cleaned up the street between the plant and the parking lot twice as a regional contribution activity.



Principal production items

- Plastic joints, chambers, manholes, manhole covers, various parts, etc.

Monozukuri Center (Aronkasei Co., Ltd.)

Number of employees: 89

As part of our community contribution activities, we actively accepted plant tours including joint participation with the Nagoya Plant in an event that Tokai City held for primary school students (*Monozukuri Dojo*) for the first time. We also carried out clean-up activities at Shimpo Greenbelt Sports Park in collaboration with the Nagoya Plant.



Research Area

- New product discovery, intellectual property, design, technology development, materials research
- Business development (piping equipment, nursing care products, elastomers)

Overseas (manufacturing companies)



Toagosei America Inc. Number of employees: 60

We experienced two accidents (no lost time) and reported them to U.S. Occupational Safety and Health Administration in 2017. We will once again call attention to all employees and drive efforts for zero accidents/zero injuries.



Plant ● Ohio, USA

Principal production items

- General-use adhesives, industrial adhesives, etc.

Toagosei Singapore Pte Ltd. Number of employees: 28

Toagosei Singapore continuously engages in zero-accident activities, such as strengthening of safety education and risk assessment, and there were zero accidents or lost-time injuries in 2017. The company will continue to raise the CSR awareness through risk assessment and strive to ensure dissemination and sharing of the information obtained.



Plant ● Singapore

Principal production items

- Acrylic esters, acrylic polymers, etc.

Toagosei (Zhuhai) Limited Number of employees: 47

In 2017, we worked on improving productivity throughout the plant. Our productivity improved by 20% year on year as a result of proposal activities deployed for the improvement of the production process involving all employees, as well as through competition among sections that was promoted by posting their levels of productivity, and by learning about appropriate machine operating conditions.



Plant ● Zhuhai, Guangdong Province, China

Principal production items

- General-use adhesives, industrial adhesives, etc.

TOA-DIC Zhangjiagang Chemical Co., Ltd. Number of employees: 51

In 2017, we discussed the improvement of safety capability by utilizing the on-site safety capability matrix created through the promotion of zero accident activities. As a result, we confirmed that the further involvement of management in safety and the promotion of grassroots safety activities would be targeted as goals for next year.



Plant ● Zhangjiagang, Jiangsu Province, China

Principal production items

- Acrylic monomers, etc.

Toa-Jet Chemical Co., Ltd. Number of employees: 24

In 2017, we promoted risk prediction and pointing/calling as a custom as part of our zero accident activities. In 2018, we will also work to achieve zero lost-time injuries and zero serious accidents, and to continuously increase safety awareness among all our staff.



Plant ● Guan-Inn Industrial District, Tau-Yuan, Taiwan

Principal production items

- Acrylic monomers, etc.

Toagosei (Thailand) Co., Ltd. Number of employees: 9

We started construction in June 2017. We provided safety guidance to construction contractors before the new construction was initiated, detected unsafe areas through safety patrols, thoroughly confirmed the implementation of remedial measures for detected issues, and confirmed the work for the day at morning assemblies, etc. As a result, we achieved zero lost-time injuries and zero serious accidents.



Plant ● Chon Buri, Thailand

Principal production items

- Acrylic polymers, etc.



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