

Through the endless possibilities of chemistry,
we bring happiness created by
highly functional materials.



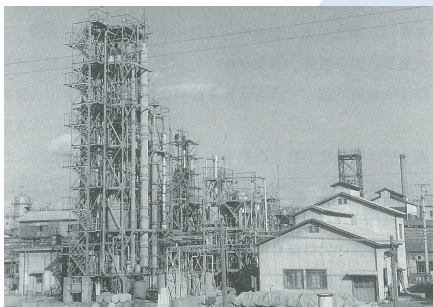
Turning chemistry's wonders
into future inspiration



Toagosei Group Report

2019

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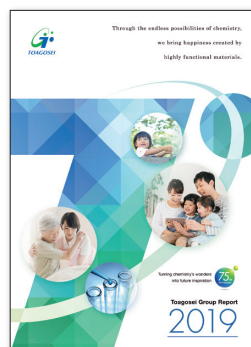
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Editorial policy

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 53 ("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 2018 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 2019 (Previous issue: March 2018. Next issue scheduled for March 2020)

Period covered

Graphs and tables in this report present aggregate data for one year from January 1 to December 31, 2018. Some articles include information on activities conducted in 2019.

Message from Management

Through the endless possibilities of chemistry, we bring happiness created by highly functional materials.

Under our new corporate philosophy, we will endeavor to become indispensable for our customers and society by continuing to challenge for new fields.

The Toagosei Group contributes to the development of society by supplying industry with high-value-added products such as Aron Alpha® instant glues, ARONIX® UV-curable resins, KESMON® inorganic deodorant and Anjyu-brand nursing care products, as well as general-purpose products that support industrial infrastructure such as caustic soda, acrylic monomers and PVC piping equipment products.

Going forward, based on safety and operational stability as well as reliable manufacturing, Toagosei will strive to meet the expectations of shareholders, investors, customers, business partners, local communities, future generations, employees and other stakeholders by leveraging our unrivaled product development and technology to challenge new areas and contributing to the development of an affluent society.



President and Representative Director



Our communication tools

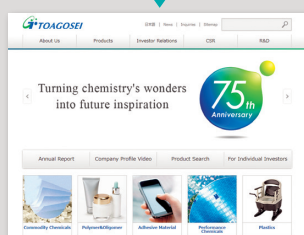
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For all users



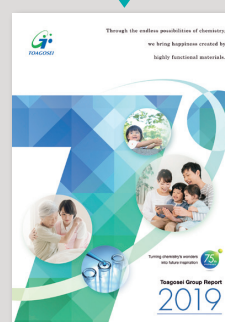
Toagosei Corporate Website
<http://www.toagosei.co.jp/english>

For shareholders



Shareholder Newsletter for the 106th Term

For all stakeholders



Toagosei Group Report 2019

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.

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.

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 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.



Product Guide (early 1950s)

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.

2016

The Company established Toagosei (Thailand) Co., Ltd.

Phase 3



The first Aron Alpha® at launch

1960s–

Development of petrochemicals

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

Phase 2

1950

1960

1970

1980

1990

Turning chemistry's wonders
into future inspiration

75th
Anniversary

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



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

2016



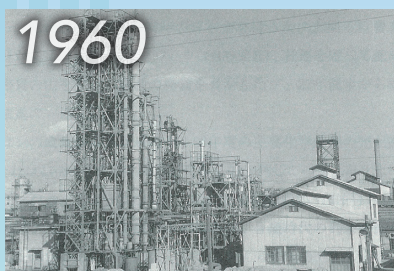
Toagosei (Thailand) Co., Ltd. is established

1951



Holding Japan's first rigid PVC pipe

1960



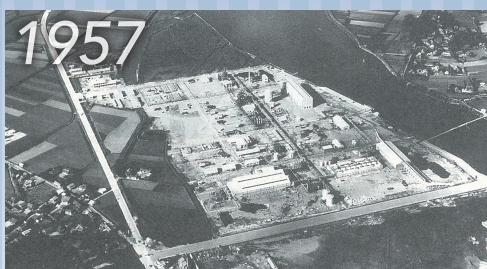
Acrylic ester plant of the Nagoya Plant

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	2,429 on a consolidated basis (as of December 31, 2018)

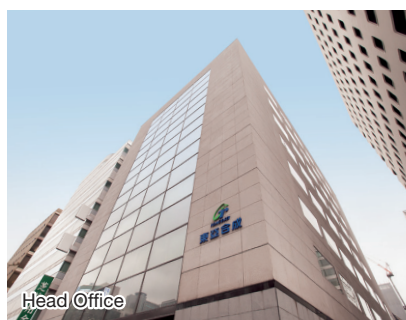
Main business lines

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 chemicals, inorganic functional materials
Plastics	Piping equipment, products for construction and civil engineering, nursing care products, elastomer compounds, and environmental 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.



Head Office



Nagoya Plant



Yokohama Plant



Takaoka Plant

ASIA

China

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



TOA-DIC Zhangjiagang Chemical Co., Ltd.

Singapore

- Toagosei Singapore Pte Ltd.

Thailand

- Toagosei (Thailand) Co., Ltd.
- Aronkasei (Thailand) Co., Ltd.

South Korea

- Toagosei Korea Co., Ltd.

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

AMERICA

USA

- Toagosei America Inc.
- 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
Tokushima Plant, Sakaide Plant, Kawasaki Plant, Hirono Plant
General Center of Research and Development, Institute for Advanced Sciences

Principal Affiliated Companies

- Aronkasei Co., Ltd.
- MT AquaPolymer, Inc.
- Oita Chemical Co., Ltd.
- 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

The Toagosei Group's products can be found throughout everyday life. These products help not only to make our lives more comfortable but also to protect the environment.

Businesses with core roles in the growth strategy

Polymer & Oligomer ▶ P.23

Polymers

● Acrylic polymers

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



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.



Adhesive Material ▶ P.25

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

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



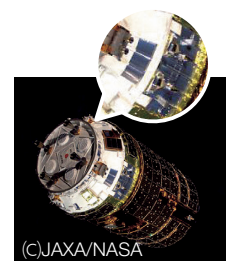
● Functional adhesives

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.



● 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

Commodity Business

Commodity Chemicals ▶ P.21

● 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.

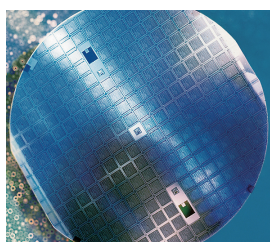




Performance Chemicals ▶ P.27

● 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.



● 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.



Plastics ▶ P.29

● 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.



● Anjyu-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.



● Elastomer compounds

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.



● Small-diameter polyvinyl chloride pipes, 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.



● 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.

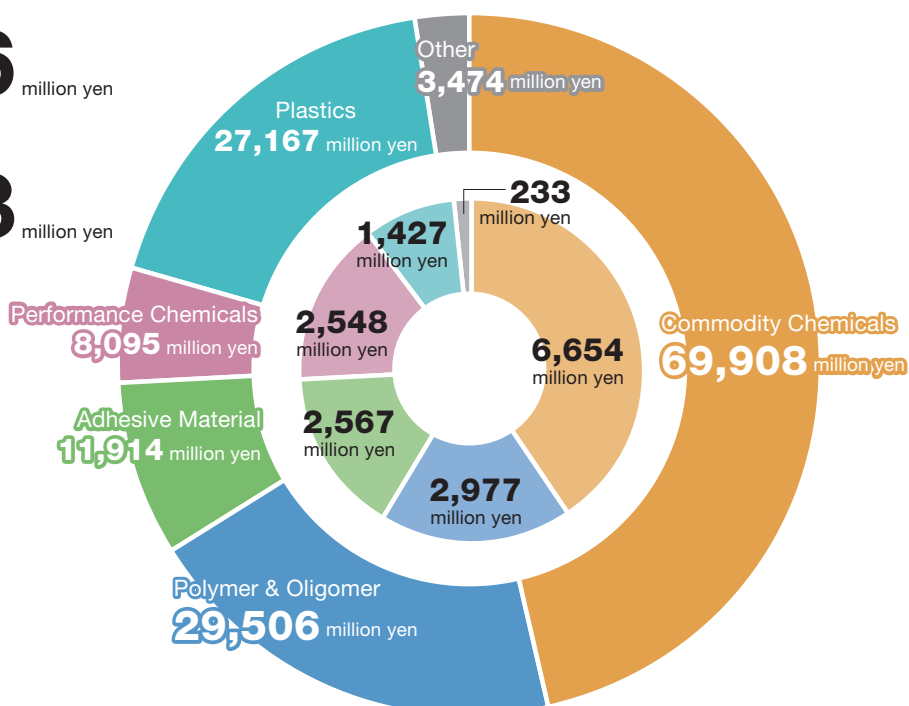


Presence of the Toagosei Group

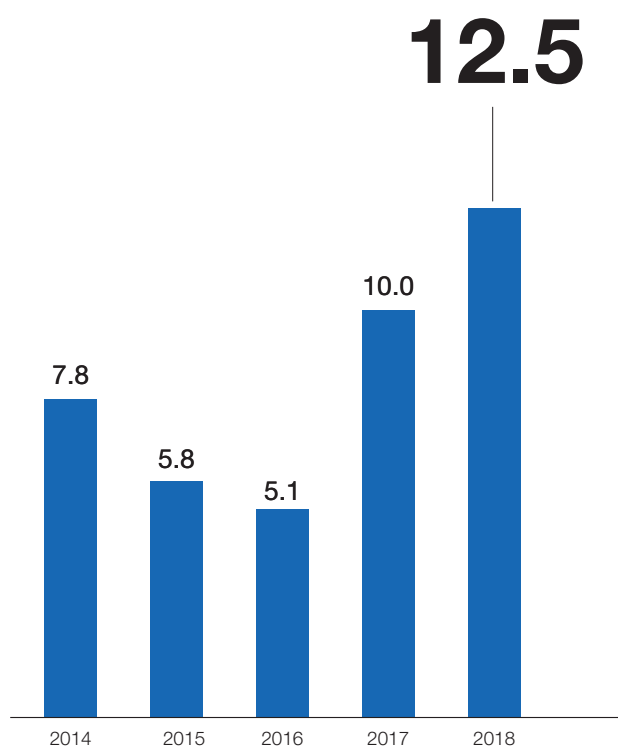
Toagosei Group's earnings structure (2018)

Net sales (outer circle) **150,066** million yen

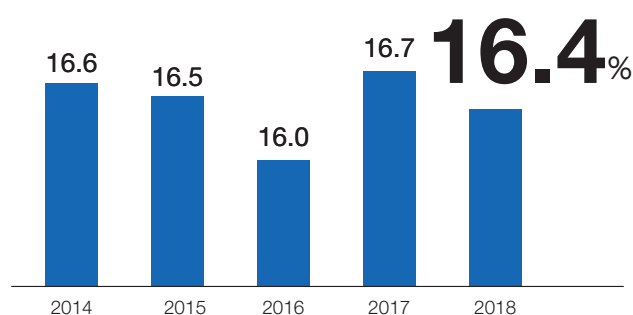
Operating income (inner circle) **16,408** million yen



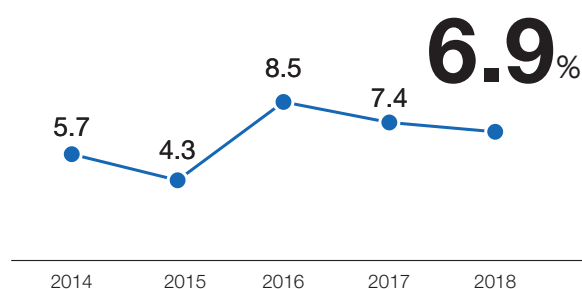
Capital investment (Billions of yen)



Overseas net sales ratio (%)

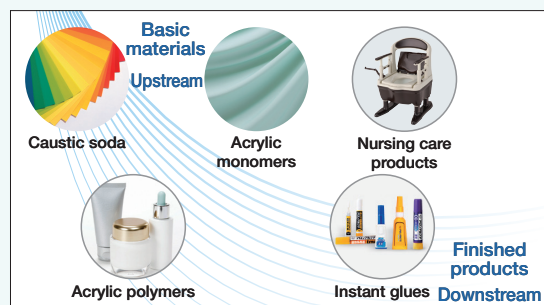


Ratio of net income to shareholders' equity (ROE) (%)



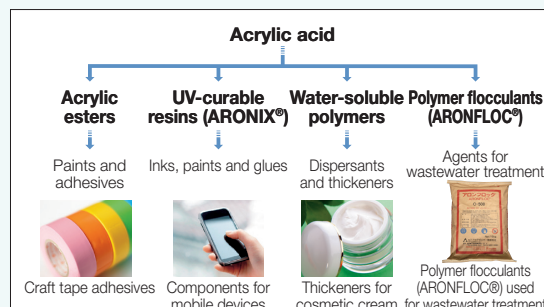
Well-balanced business structure

The Group's business, which consists of five segments, supplies a wide variety of products ranging from commodity chemicals including basic industrial materials such as electrolysis products and acrylic monomers to finished products for ordinary consumers such as Aron Alpha® instant glues and Anjyu-brand nursing care products. This diverse product lineup has enabled us to build a well-balanced business structure that is less sensitive to economic fluctuations.



Product structure from upstream to downstream

Originally engaging in businesses of electrolysis products and other commodity chemicals in Phase 1 "Development of commodity chemicals," we developed products such as acrylic esters in Phase 2 "Development of petrochemicals," and are currently in Phase 3 "Development of functional chemicals" mainly supplying glues and acrylic polymers. Throughout our long history, we have built a product structure from upstream to downstream in the electrolysis products business and the acrylic products business, enabling the Group to integrally perform business operations and establish a solid business foundation.



Products holding a top market share

We offer products holding a high market share both inside and outside Japan. These drivers of our business growth include Aron Alpha® instant glues, which are synonymous with the Group; ARONIX® special acrylic monomers and oligomers, which are used as a material of UV-curable resins; ARONFLOC® polymer flocculants, which are used to treat wastewater and sludge; and Anjyu, which is a pioneering nursing care product brand.



Effective response to ESG (Environment, Society and Governance)

The Group contributes to the sustainable development of society by not only focusing on its corporate social responsibility (CSR), including responsible care (RC) activities, but also pursuing ESG-conscious management through activities for harmonious coexistence with local communities, promotion of employees' work-life balance, strengthening of corporate governance, and achievement of SDGs.



Financial and Non-financial Highlights

Financial data

	96th term 2008 (Dec. 2008)	97th term 2009 (Dec. 2009)	98th term 2010 (Dec. 2010)	99th term 2011 (Dec. 2011)
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Key financial results

Net sales	(millions of yen)	162,615	140,033	153,779	153,007
Operating income	(millions of yen)	11,668	11,158	21,271	17,338
Ordinary profit	(millions of yen)	11,057	11,538	20,941	17,569
Net income attributable to owners of parent	(millions of yen)	1,895	3,541	13,133	13,000
Net assets	(millions of yen)	113,048	113,700	125,027	127,776
Total assets	(millions of yen)	172,464	161,609	173,847	171,046
Cash flows from operating activities	(millions of yen)	13,280	22,701	24,843	17,828
Cash flows from investing activities	(millions of yen)	△8,776	△6,174	△10,155	△9,041
Cash flows from financing activities	(millions of yen)	△4,057	△13,992	△4,117	△7,320

Key indicators

Net assets per share (*1)	(yen)	761.96	788.06	874.34	939.23
Net income per share (*1)	(yen)	14.54	27.70	104.10	101.99
Net worth ratio	(%)	57.6	61.5	63.4	72.4
ROE (ratio of net income to shareholders' equity)	(%)	1.9	3.6	12.5	11.1
ROA (ratio of ordinary profit to total assets)	(%)	6.2	6.9	12.5	10.2
Price earnings ratio	(times)	36.9	25.2	7.3	6.2

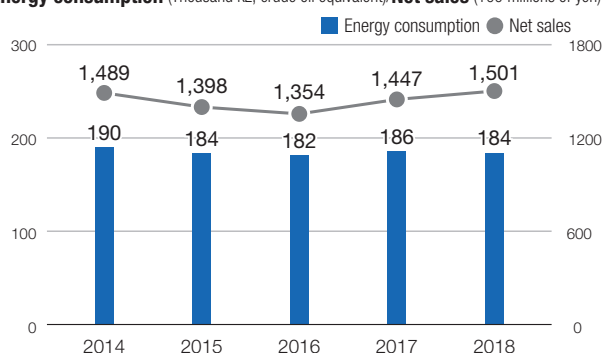
Other indicators

Capital investment	(billions of yen)	6.7	5.9	10.3	10.4
Research and development expenses	(billions of yen)	4.8	4.5	4.5	4.6
Interest-bearing debt	(billions of yen)	25.5	15.7	13.5	12.5
Cash dividend per share (*2)	(yen)	8.00	6.00	9.00	10.00
Payout ratio	(%)	110.0	43.3	17.3	19.6
Number of employees		2,617	2,561	2,533	2,534

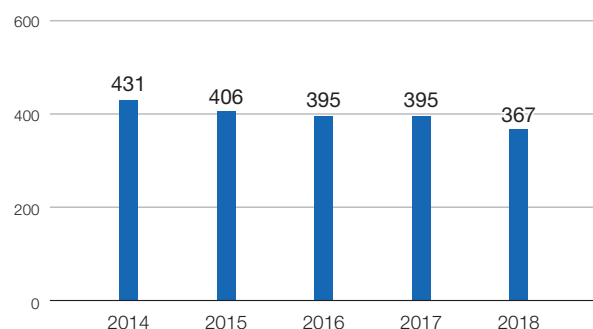
*1 The Company has implemented the share consolidation of common stocks at a ratio of one share per two shares effective on July 1, 2015. Net assets per share and net income per share are calculated assuming that the share consolidation was executed at the beginning of the 96th term.

Non-financial data

Energy consumption (Thousand kL, crude oil equivalent) / Net sales (100 millions of yen)

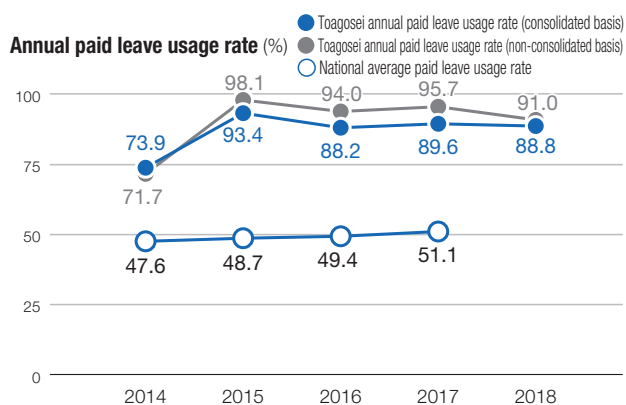


CO₂ emissions (Thousand tons, CO₂ equivalent)



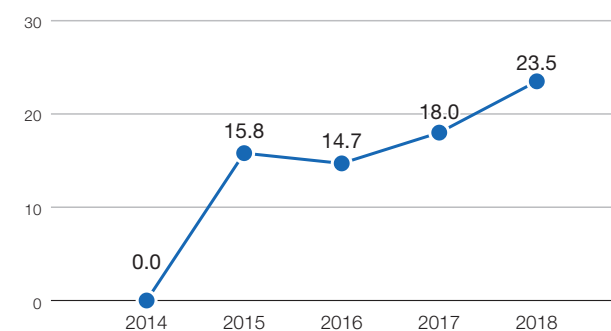
100th term 2012 (Dec. 2012)	101st term 2013 (Dec. 2013)	102nd term 2014 (Dec. 2014)	103rd term 2015 (Dec. 2015)	104th term 2016 (Dec. 2016)	105th term 2017 (Dec. 2017)	106th term 2018 (Dec. 2018)
148,203	151,081	148,912	139,848	135,382	144,708	150,066
14,583	14,501	12,015	12,347	16,147	17,453	16,408
15,250	15,346	12,892	13,201	16,935	18,492	17,403
9,699	9,605	8,414	6,696	13,801	12,911	12,748
136,240	148,148	157,349	163,020	173,003	187,487	191,296
181,451	193,086	201,168	208,018	219,520	239,338	241,971
23,293	18,023	16,098	23,313	21,989	15,166	19,841
△15,041	△6,852	△13,981	△4,592	△17,673	△23,186	△11,910
△3,377	△2,094	△3,063	△3,949	△3,939	△4,047	△4,908
1,001.99	1,090.91	1,159.65	1,201.46	1,276.10	1,387.36	1,416.24
73.58	72.88	63.88	50.86	104.83	98.08	96.85
72.8	74.4	75.9	76.0	76.5	76.3	77.0
7.6	7.0	5.7	4.3	8.5	7.4	6.9
8.7	8.2	6.5	6.4	7.9	8.1	7.2
9.2	12.3	15.0	20.5	11.0	14.6	12.5
12.8	7.4	7.8	5.8	5.1	10.0	12.5
4.4	3.8	3.9	3.7	3.6	3.7	3.6
12.2	13.1	13.2	12.6	12.3	12.1	11.6
10.00	10.00	12.00	18.00	26.00	26.00	28.00
27.2	27.4	37.6	47.2	24.8	26.5	28.9
2,509	2,483	2,442	2,441	2,411	2,393	2,429

*2 For the 103rd 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.



National average paid leave usage rate: General Survey on Working Conditions (Ministry of Health, Labour and Welfare)

Percentage of female employees hired (%)





Revision of corporate philosophy

We revised our corporate philosophy to enhance the sense of unity within the Group and link social changes with growth.

In recent years, we are seeing dramatic changes in society as well as our customers' businesses. Some say that the automotive industry is experiencing a once-in-a-century revolution with the advancement of electric operations and automatic driving technologies. The semiconductor industry is also witnessing a shift toward artificial intelligence (AI) as well as application of built-in computers not just for televisions and smartphones but in many household appliances, boosting the demand for highly integrated semiconductors. The Toagosei Group manufactures products that contribute to the improved performance of lithium

ion batteries, which are major parts of electric vehicles, and chemical agents with minimal impurities, which are indispensable for the formation of semiconductor circuits and cleansing processes, among others.

In addition, not only do we offer appealing and high-value-added items that can enhance the performance of finished products such as vehicles and semiconductor products, we also contribute to the realization of a sustainable society such as by preserving the global environment and creating foundations for industries through our general-purpose chemical products. In the Sustainable Development Goals (SDGs), targets adopted by the United Nations Sustainable Development Summit to transform our world by 2030, importance is also placed upon initiatives to solve social issues through business activities and partnerships. With the aim of linking such social changes with our reform efforts, we revised our corporate philosophy in 2018 to more clearly lay out initiatives that lead

Message from Management

Based on the Group's corporate philosophy that embodies our vision, we will create happiness with the power of chemicals and contribute to the development of a sustainable society.

Aiming to use social changes as an opportunity for growth, we had extensive discussions with internal and external stakeholders on our future vision and applied the revised corporate philosophy: "Through the endless possibilities of chemistry, we bring happiness created by highly functional materials." In 2019, which marks our 75th anniversary, and for years to come, we will create new value through the chemical business and contribute to the development of sustainable society.

President



to the development of an affluent society and to continuously create new products through our concerted efforts. In addition to revising the corporate philosophy, we will also prepare a commemorative book for the Group's 75th anniversary in Japanese, English, Chinese and Thai in an aim to deepen group-wide awareness by sharing our sense of value and promulgating the corporate culture.

Review of 2018

The Group strived to enhance high-value-added products for the automotive industry and the semiconductor industry, and accelerated overseas business expansion.

Based on the strategy to seek growth by placing greater weight on high-value-added products, we

actively perform research and development and improve facilities, centering on business fields of "Polymer & Oligomer," "Adhesive Material" and "Performance Chemicals," as well as "Construction Materials and Civil Engineering," "Nursing Care Products" and "Elastomer Compounds," which are operated by Aronkasei.

2018 was the second year of the medium-term management plan, "Trajectory Toward Growth 2019." During the year, in the field of Polymer & Oligomer, we advanced initiatives to expand our unique and appreciated downstream acrylic products such as by commencing production of polymers for lithium ion secondary batteries, which supports vehicle electrification, and establishing a production system for ARONIX® UV-curable resins through a new production method. In the field of Adhesive Material, such as Aron Alpha®, we carried out measures to accelerate the development of functional adhesives that are mainly used for industrial purposes. As for the field of Performance

Chemicals, we strengthened our capability to analyze liquid hydrogen chloride and improved the shipping system in an aim to respond to the robust demand for semiconductors. In addition, in an effort to speed up our services for customers in the Kanto region, we conducted sample rating and analysis at the Tokyo Technology Laboratory by operating the equipment together with customers, and this initiative has led to reduced time required to develop downstream acrylic products and adhesive materials as well as increased trust in the Group.

The Group's management base is supported by its core business of manufacturing general-purpose chemicals including caustic soda, which is used to manufacture pulp and paper, and sodium hypochlorite, which is indispensable for sterilizing and disinfecting tap water and sewage. Because these products support the very foundations of industries and society, the Company has a responsibility to provide them in a safe and stable manner. We strive to upgrade our manufacturing facilities to further improve the stable product supply system while enhancing efficiency to boost productivity. To this end, we made efforts in 2018 including implementation of quake-resistant facilities and improvement of infrastructure at respective plants in Japan. In the piping equipment business operated by Aronkasei, the production line was renewed as part of the first-phase construction to reform domestic plants.

Regarding overseas business expansion, an acrylic polymer plant was completed in July 2018 to become a base for high-functional and high-

value-added products in Asia as a first-phase project by Toagosei (Thailand) Co., Ltd. (TGT). The second-phase project to build an elastomer compound plant has also commenced, and Aronkasei (Thailand) Co., Ltd., which is a sales and marketing base for elastomer computers and other Aronkasei products, started operation in November. TGT's third-phase project is also under consideration pushing forward the rapid expansion of the Group's high-value-added product business in Asia.

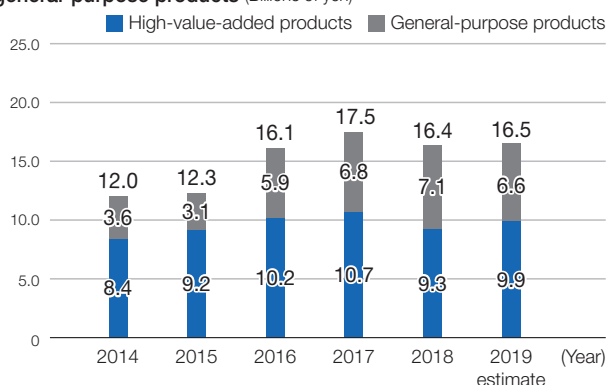
Initiatives toward creating value

I believe that the keywords “materials and functions” in the new corporate philosophy embody Toagosei's identity.

Let me explain further on the revision of our corporate philosophy. In preparing for the revision, ideas were proposed at the Management Committee and several groups formed by rank, such as young employees or management, discussed opinions on Toagosei's corporate image and how better the selling points can be highlighted. Furthermore, we sought cooperation from external parties who are familiar with Toagosei before eventually forming our future vision. Producing mainly business-to-business products, the Group values its dependable and diligent corporate culture. At the same time, we have been promoting awareness among employees and managerial members in an aim to become an organization that can maximize the latent possibilities of employees so as to respond to the age of rapid and dynamic change.

Regarding the new corporate philosophy, I believe that the words, highly functional materials, which consist of "materials and functions" embody Toagosei's originality. While numerous chemical manufacturers exist around the world, Toagosei contributes to dynamically increasing functions in customers' finished products by pursuing the endless possibilities of materials and functions. Products related to lithium ion batteries for electric vehicles and high-purity gas for semiconductors, among others, are state-of-the-art products that contribute to the realization of an affluent society. We are proud of these products that are unique to Toagosei.

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



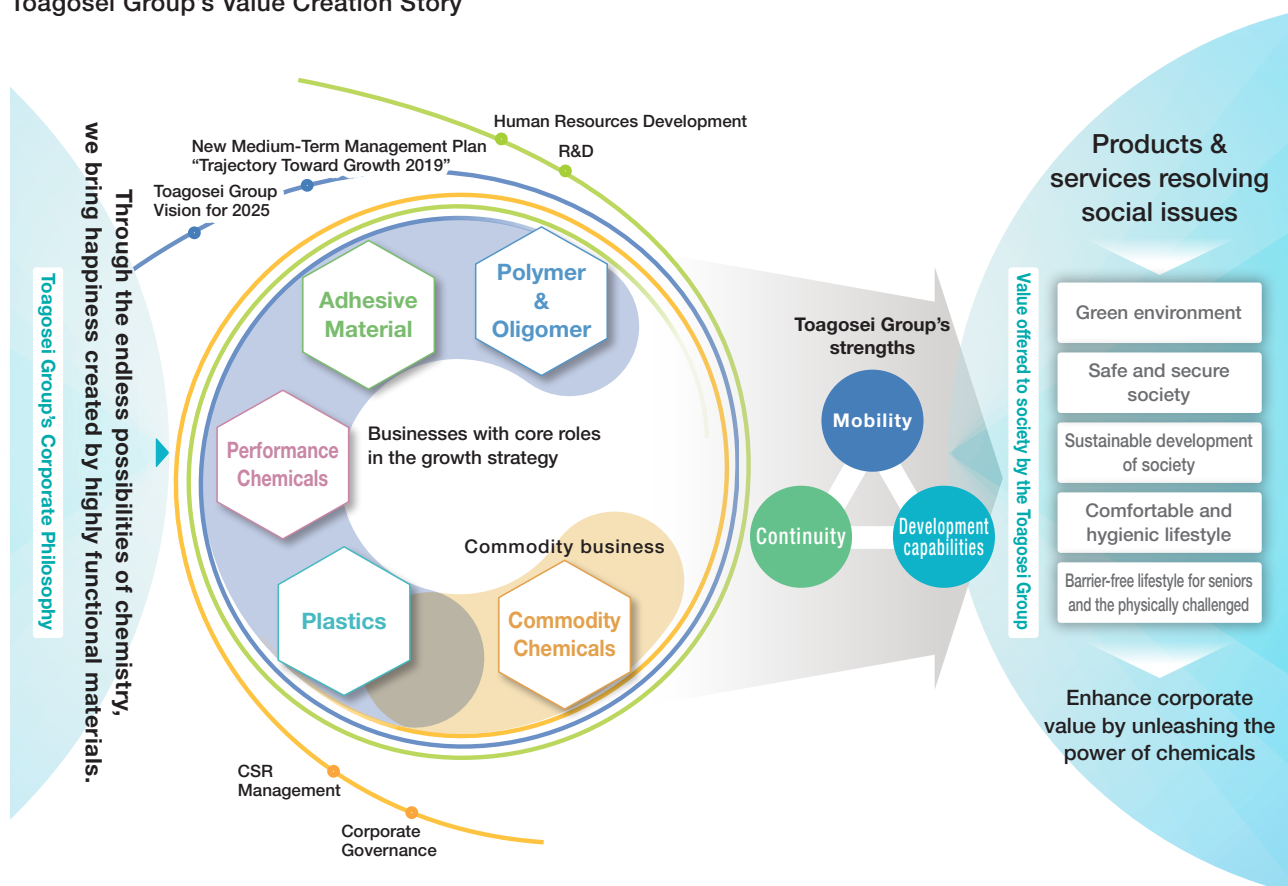
Moreover, to increase our social presence, we dedicate our energy into communication activities. The Aron Alpha® web movie series, which started in May 2018, has been highly recognized especially by young consumers and has helped to change the image of not just Aron Alpha®, but also the Toagosei Group in a surprising way. Furthermore, in November we became an official sponsor of T league, a new table tennis league, with the aim of increasing points of contact with society.

We are currently building a good foundation to establish the fourth core that will underpin the Toagosei Group's future.

The Company will mark its 75th anniversary in July 2019. The history of Toagosei can be classified into three development phases. During Phase 1, which

was before and during World War II, the Company expanded the commodity chemicals business including caustic soda and ammonia. In Phase 2, which took place during Japan's rapid economic growth, the business advanced to the field of petrochemicals such as acrylic esters and polyvinyl chloride. Finally, during Phase 3 in 1970s, the Company grew by focusing on development of functional products such as Aron Alpha® and ARONIX®. Through the course of these development phases, the Company has expanded its business to achieve today's scale. To realize further growth, it is indispensable to develop new technologies and products to form the fourth core business that will support the future of Toagosei Group. We are aware that the current product lineup alone would be insufficient to make further growth toward the 100th anniversary. By incorporating fresh viewpoints of young

Toagosei Group's Value Creation Story



researchers, active discussions have been going on regarding themes that would comprise the fourth core. We will create technologies and products that will lead the future of Toagosei Group through sharing risk awareness toward the next era.

Initiatives in 2019

We will press ahead with innovative products through partnerships.

Although the Toagosei Group has already been offering high-value-added products to automobile manufacturers and automobile parts manufacturers, the partnership-type manufacturing approach is sought after by mobility-related customers in recent years. This is because of an increasing need for automobile manufacturers and material manufacturers to jointly develop products through shared objectives, instead of combining existing products, to create something groundbreaking.

To respond to such customer needs and further advance Toagosei Group's growth, we established a group-wide mobility development organization on January 1, 2019. In the automotive industry, various changes have occurred including not only the advancement of electric operations and automatic drive technologies, but also the use of plastic parts even in gasoline vehicles to realize lightweight automobiles that emit less CO₂ for the purpose of compliance with environmental regulations. With an aim to address such issues together with customers, we have established a structure that enables us to offer one-stop solutions and comprehensive proposals for needs toward various products including materials for batteries, glues and coating agents.

We clarified role-sharing to enhance technology development capabilities at plants and realize safe operations.

Previously, manufacturing departments at our plants manufactured products serving functions of both technology development and operation; these functions were clearly divided in January 2019.

Departments with technological development functions will strive to improve technological

development capabilities in order to innovate the production process while seeking coordination with the Technology & Production Administrative Division and the Productive Technology Laboratory at the General Center of Research and Development. On the other hand, departments with operational functions will focus on the stable manufacturing of products with consistent quality, while passing on technologies beyond generations as well as between domestic and overseas plants. We believe that, by clarifying each role, the overall manufacturing technologies will be reinforced.

We will enhance work efficiency through the promotion of group-wide management.

The Toagosei Group has up until now concentrated its operations at indirect sections, including accounting, finance, order reception and shipment, to our affiliated company TOA Business Associate so as to achieve standardized, efficient, and sophisticated operation. In 2019, we intend to integrate Aronkasei's administrative departments work and intellectual property operation into Toagosei, thereby further propelling efficiency and standardization of indirect sections as well as sophistication of operation standards.

We are committed to promoting initiatives for work-style reforms and establishing a work environment that enables a wide variety of human resources to work actively.

In 2013, the Toagosei Group led the business community and increased its mandatory retirement age to 65 years old. We also adopted measures to promote work-life balance with a target annual paid leave usage rate of 100%, and have achieved the rate of about 90% as of today. In 2018, we established the Health Management Promotion Section within the Human Resources Department to focus on employees' health management. In recognition of these efforts, in February 2019, Toagosei was certified as a 2019 Health and Productivity Management Organization (White 500)

by the Ministry of Economy, Trade and Industry (METI) and Nippon Kenko Kaigi. In Japan, where population is aging rapidly, it is crucial to urgently establish a workplace where women and senior workers can play active roles and maximize their potential.

We will further enhance our corporate structure by strengthening governance.

In 2018, 5 out of 13 directors of Toagosei were outside directors; this will increase to 7 outside directors out of 15 directors in 2019. Not only did we increase the number of outside directors to strengthen the supervisory function, we also sought advice from experts in different areas, such as entrepreneurs, university professors in the field of chemistry, lawyers, accountants and tax professionals to develop the business and strengthen corporate structure. Outside directors newly appointed in 2019 include a female, who is also the first female officer at Toagosei, and we expect her to provide opinions from a new point of view on issues such as promotion of women's

participation and advancement as well as work-style reforms.

To our stakeholders

We will continue to be a company that produces useful products for society.

The Toagosei Group has actively made capital investments toward growth since 2016. We believe that 2019 is the year in which our past efforts will start producing operational results.

We have been contributing to society by offering new and high-value-added chemical products. However, creating such new products involves a time-consuming process. We feel that this movement to increase ESG (Environment, Society and Governance) investment and the growth in the number of investors with long-term perspectives is working to our benefit. In closing, we sincerely ask shareholders, investors and other stakeholders for further understanding and continued support to the Toagosei Group.



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)

Feature

Progress of the Medium-Term Management Plan

Based on our corporate philosophy of “Through the endless possibilities of chemistry, we bring happiness created by highly functional materials,” 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

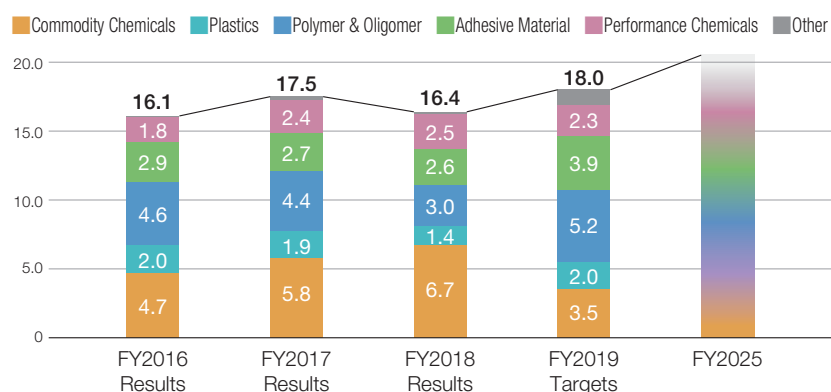
“Trajectory Toward Growth 2019”

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

Elastomer compounds

- 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 2018

Status of progress on Toagosei Thailand Project

The production of acrylic polymers began in August 2018. Thereafter, the construction of an elastomer compound plant began as part of the second phase of the project. The elastomer compound plant is scheduled to start operations in 2019.



Completion of a facility to manufacture polymers for LIB components

A facility to manufacture polymers for lithium batteries was completed at the Nagoya Plant, signifying full-scale entry into the growing electric vehicle (EV) material market.



Enhanced filling and shipment capacity of high-purity liquid hydrogen chloride

Cutting-edge filling equipment was built at the Yokohama Plant to respond to high quality requirements and increased demand in the semiconductor industry. Shipping equipment for mass transportation started operation at the Tokushima Plant.



Manufacturing facility at the Yokohama Plant

Development of “Aron Mighty AF700” low dielectric constant adhesive film

We developed a low dielectric constant adhesive agent for FPC compatible with high-speed, large-capacity telecommunications such as 5G telecommunications and 8K televisions. We accelerated the development for use as components for smartphones and telecommunication base station antennas.



Challenge for 2019

Creation of new products and new businesses

We will develop new products by targeting the mobility market and create a major theme that will be the core of the next generation from mid- and long-term perspectives.

Acceleration of overseas business expansion

We will make the project currently underway in Toagosei Thailand a fully operational strategic force at an early stage and expand sales of high-value-added products by reinforcing the functions of existing overseas offices.

Business reform efforts and productivity enhancement

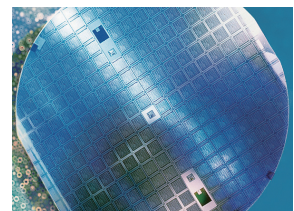
We will strengthen group management through the consolidation of the administrative departments of Toagosei and Aronkasei and promote reform efforts to enhance plant productivity.

Development of a work environment where employees can exhibit independent strength

We will establish a work environment and various systems to enable a wide variety of human resources work actively.

Strengthening of CSR activities

We will reinforce CSR management mainly on disaster prevention, environmental protection and compliance.



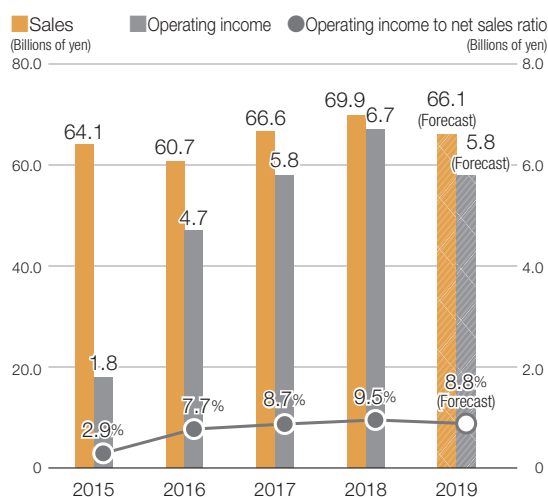
Business Overview and Growth Strategy

Commodity Chemicals

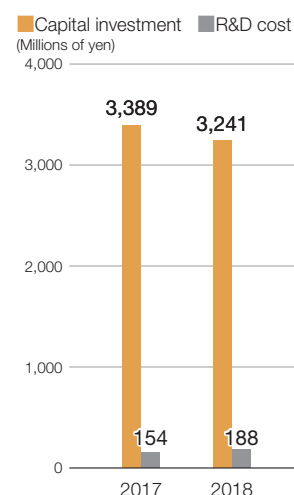
**Fumito Furukawa**

Executive Officer
General Manager,
Commodity Chemicals Division

Sales and Operating Income by Segment



Capital investment and R&D cost



Business Overview

Among the Company's wide variety of businesses, the inorganic chemical business has the longest history. Toagosei supplies such as caustic soda, chlorine, sodium hypochlorite, various chlorides, sulfuric acid and industrial gases are widely used as indispensable products in diverse industries, supporting people's lives.

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 contributes to the 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 with an outlook for increasing demand for Halal products 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 for caustic potash was updated to the latest facility. We are aiming to optimize the production structure including the production of high-purity products to keep up with the recent growth of these chemicals.



Relevant SDGs Targets

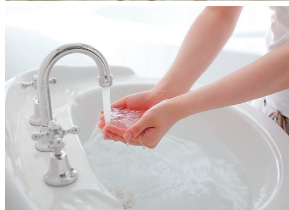
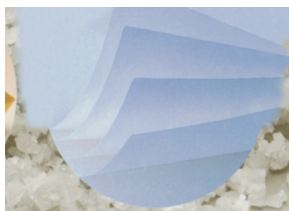


Medium- to Long-term Growth Strategy

By earning stable profit in three businesses—the electrolysis business, acrylic monomer business and industrial gas business—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 to establish a stable and efficient production base, 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, establishing an efficient supply system. A large-scale capital investment plan with the objective of maintaining stable production far into the future is being implemented.

Addressing Social Issues

Conservation of biodiversity

Social issues

Ballast water is local seawater or river water that is taken up in empty ships' special tanks at an unloading port for vessel stabilization. It is later discharged at the loading port. This treatment has caused issues where non-native marine organisms or bacteria carried with the ballast water have a potentially harmful effect on the biodiversity of that area.

Toagosei Group's initiatives

The ballast water management system developed by the Toagosei Group with JFE Engineering Corporation combines the filtration of large plankton and the chemical treatment of ballast water. Products used in this treatment include TG Ballastcleaner®, a chlorinated mixture for killing aquatic microorganisms in the ballast water (main ingredient: sodium hypochlorite) and TG Environmentalguard®, which detoxifies any chlorine residue in the treated ballast water (main ingredient: sodium sulfite). The combined use of these two products helps avoid any secondary pollution by the chemical treatment and realizes an environmentally-friendly solution. Toagosei is developing a global supply network and will work with business partner JFE Engineering Corporation to spread the ballast water management system.



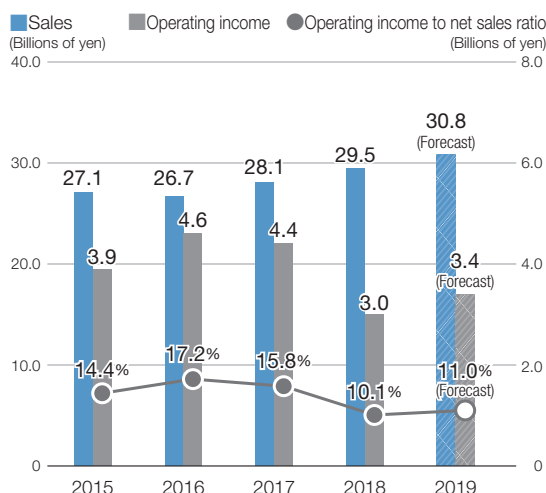
Business Overview and Growth Strategy

Polymer & Oligomer

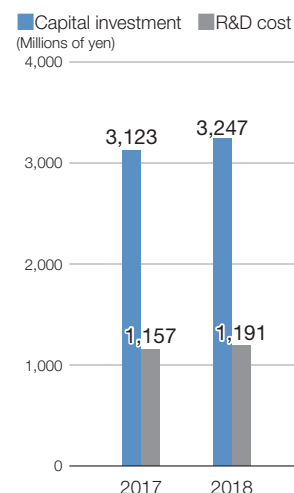
**Hidenori Kobuchi**

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[®], solvent-free acrylic polymer, ARUFON[®] and high-performance powder products.

Regarding UV-curable resins, the Company offers 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

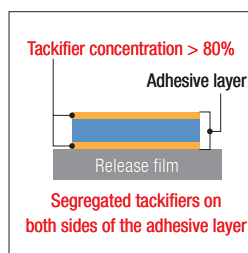
Ester Interchange ARONIX[®]

We succeeded in the development of special acrylic monomers and oligomers with a structure and property that had never been seen before through the application of a new production method using a proprietary ester interchange catalyst developed by Toagosei. They are expected to be used in the areas of electronic materials, where high-purity is demanded, as well as automobile materials, for which durability is required.



Segregated Adhesives

We have developed a new acrylic adhesive which uses specific segregated tackifiers for certain adhesive surfaces, resulting in the drastic improvement of heat resistance. It has been developed in the areas of consumer home electronics and automobiles, where strict standard for heat resistance is demanded.



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. will become the production base in Asia for promoting high-performance and high-value-added products in Asia. Furthermore, we will proceed with the development of materials for the automobile, medical and cosmetics sectors with the aim of establishing high-performance powder business as a new mainstay.



Toagosei (Thailand)

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

Flocculant business

The group's MT Aqua Polymer, 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.



Relevant SDGs Targets



Addressing Social Issues

Contribution to the advancement of electric operation

Social issues

To solve various social issues, such as global warming and air pollution, and to realize a sustainable society, there is strong demand for vehicle electrification. In pursuit of higher performance of batteries and lightweight vehicle bodies for full-scale market dissemination, customers are seeking new materials that will contribute to the realization of this goal.

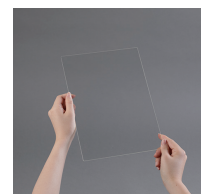
Toagosei Group's initiatives

We have developed special acrylic polymers for lithium ion batteries (LIB) using our unique polymerization technology. They are now used for negative electrodes as materials that improve battery performance. To respond to the demand for high product quality designed for such use, the product is produced in a new dedicated plant.

The Company also developed a resin as a glass alternative based on its unique compounding technology of acrylic oligomers. Highly regarded for its excellent optical performance and heat resistance, it is applicable for automobile displays and mirrors, etc. This product is attracting attention as a material that contributes to the production of lightweight vehicles.



Acrylic polymers for LIB



Resin as a glass alternative



Business Overview and Growth Strategy

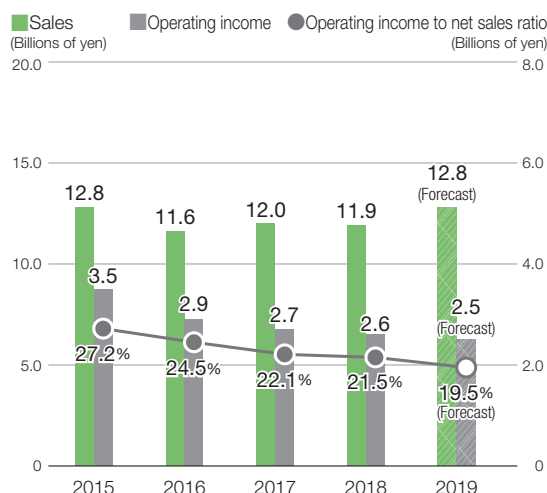
Adhesive Material



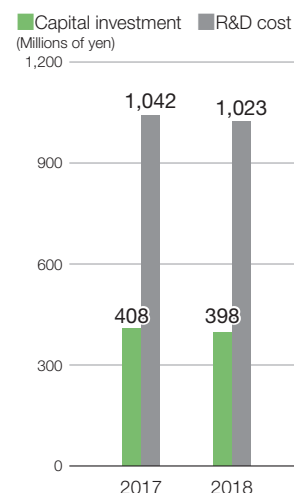
Kazutaka Yamada

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 2nd JOINING JAPAN—Adhesion & Joining Expo—.

We presented Aronkasei's elastomer compound products in addition to our adhesive materials, polymers and oligomers, and performance chemicals. We received a great number of visitors like the previous year, indicating the strong interest in Toagosei Group's products.



We Received Several Advertisement Awards for Popular Animated Commercials

We released three web-only commercials that were produced for the purpose of increasing recognition among young consumers and received a significant public response, particularly in the social media. Our first work "Kimi ni, Kuttsuke!" was awarded three advertisement prizes in four categories, including the "2018 ACC CREATIVITY AWARDS."



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

Aron Alpha® has been a well-known top brand of household instant glues for over 45 years since it was marketed in 1971. To maintain and increase our market share by bolstering its brand power, we are vigorously working on advertising and launching new products in Japan as well as overseas. In addition, we are expanding sales channels to capture new market needs.

Launch of "ShoeGoo® x Aron Alpha®" developed in collaboration with ShoeGoo®, a major manufacturer of shoe repair materials, in aim to expand sales network as a shoe-related product



Launch of single-use type to fix shoes in Hong Kong



Functional adhesives business

We have been promoting product development of substrate-related materials and battery cell materials, targeting growth fields that continue to grow rapidly including information, communication, and mobility. Demand for adhesives for more sophisticated devices and the downsizing of components and materials are increasing every year.

● Aron Mighty® AF-700 Series

With the commercialization of 5G communication and 4K/8K TVs, large-capacity, high-speed telecommunication is needed. Ahead of our competitors, we have developed a low dielectric constant adhesive agent with minimum communication losses.

● ARONIX® LCR Series

This UV-curable adhesive can indurate in a broad wavelength range from ultraviolet light to visible light. It is used for joining lenses because of its excellent adhesiveness and transparency.

Relevant SDGs Targets



Addressing Social Issues

Human- and eco-friendly adhesives

Social issues

To protect the earth from environmental pollution and maintain a safe and pleasant living environment, we need to consider how to produce and consume products and resources. For example, residual solvents, which are contained in adhesives, paints, etc., have a risk of entering our living environment, causing illnesses like sick building syndrome (SBS) or air pollution.

Toagosei Group's initiatives

We offer a wide range of solvent-free adhesive products, such as instant glues "Aron Alpha®," UV-curable adhesives "ARONIX®," hot-melt adhesives "ARON MELT®" and "EVER-GRIP®," as well as various film-type adhesives.

"ARON MELT®" is hot-melt adhesive that solidifies on an applied surface when it cools. This solvent-free adhesive has no risk of harming human health through scattering of solvents and does not require long heating operation in the drying process, demonstrating friendliness for both humans and the environment.

We will continue to develop a wide range of solvent-free adhesives that are human- and eco-friendly to contribute to solving customer issues.



Wide range of hot-melt adhesives

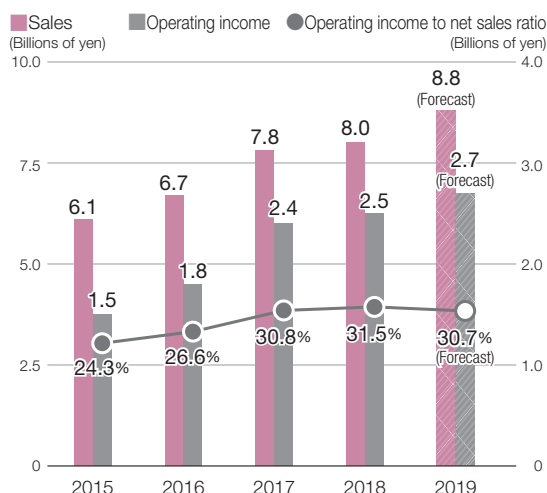
Business Overview and Growth Strategy

Performance Chemicals

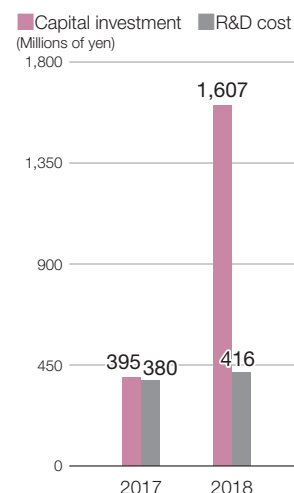
**Hisashi Hara**

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.



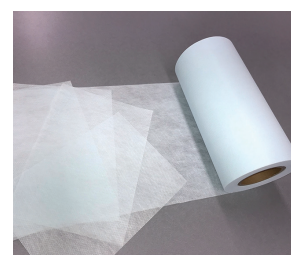
Topics

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

We are expanding our product lineup of “KESMON[®]” chemisorption deodorants, including liquid types and non-woven fabrics, in addition to the powder type products. We will contribute to smooth product development by proposing user-friendly 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

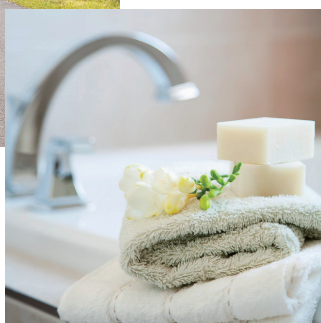
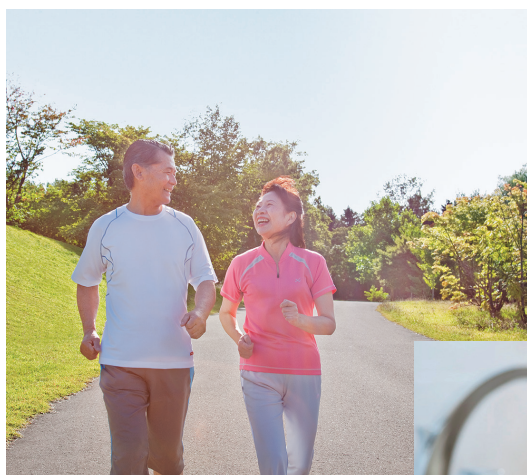
We have been enhancing our production and analytical technologies of various high-purity products such as liquid hydrogen chloride and hexachlorodisilane (HCD[®]), which are indispensable in semiconductor manufacturing, and Super Potash Ex, a high-purity caustic potash, used in the electronic materials 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 miniaturization 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, South Korea, China and Thailand.



Relevant SDGs Targets



Addressing Social Issues

Creation of comfortable space

Social issues

Formaldehyde and acetaldehyde are substances that potentially cause sick building syndrome (SBS). In Japan, measures to eliminate aldehyde gas in living spaces include replacement with an aldehyde-free material and the use of aldehyde deodorant. Today, efforts are being made in many Asian countries to eliminate aldehyde gas.

Toagosei Group's initiatives

We have developed the "KESMON[®]" series that absorbs various unpleasant odors existing in living spaces through a chemical reaction. This chemisorption deodorant has been used in various fields. The series lineup also includes a product with a powerful deodorizing effect on aldehydes, which are increasingly used in such industries as housing and building materials, interiors, and automobile interior materials. We intend on expanding the marketing area beyond Japan and throughout Asia so as to contribute to the creation of comfortable and safe living spaces.



Business Overview and Growth Strategy

Plastics



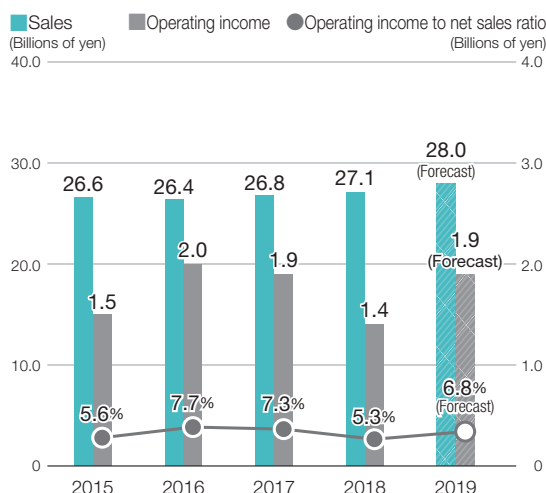
Shinichi Sugiura

Director

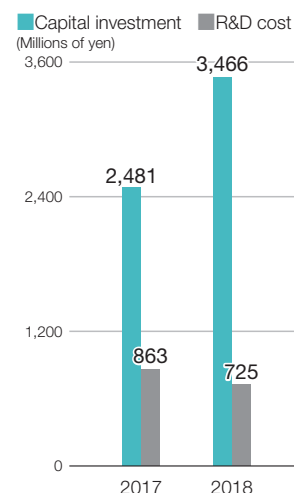
President and Representative

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 elastomer compounds 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 elastomer compounds, from items that contribute to comfortable daily living to infrastructure development to sustain entire communities.

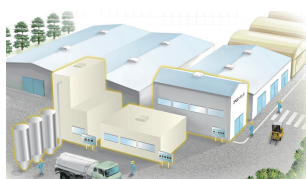


Aronkasei's strengths

Topics

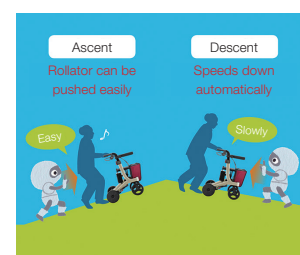
Reforming production framework for piping equipment business

To strengthen our business foundation of the piping equipment business, we will (1) optimize the production framework of three plants in Nagoya, Kanto and Onomichi, (2) introduce cutting-edge technologies, and (3) enhance logistic efficiency. In 2018, we started operating large injection molding machines introduced at the Nagoya Plant.



Safe and secure rollators

Rollators are nursing care equipment that assist walking. Our product lineup includes those with an electric assist function and a speed control function that are adjusted to suit physical conditions of patients, catering to a wide variety of users.

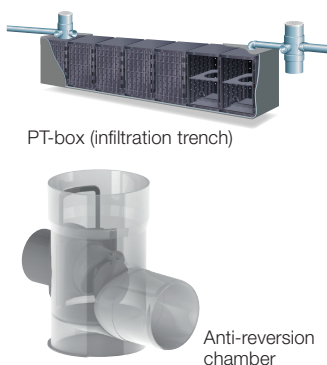


Medium- to Long-term Growth Strategy

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, in addition to our commitment to facility sections in the 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

In 2019, we celebrate the 25th anniversary of Anjyu-brand nursing care products. To aim for further expansion, we have released highly-functional products, including a bath shower chair and handrails for modular baths, thereby strengthening our competitive power in the nursing care and welfare area. In addition, we have entered new areas not covered by long-term care insurance and strengthened overseas sales.



Bath shower chair

Elastomer compound business

We have been developing products with new features and high functionality that have been adopted in various sectors including food, medicine, home appliances and automobiles. We are also expanding the marketing in the growing Asian market through the establishment of Aronkasei (Thailand) Co., Ltd. We will continue to work closely with domestic and overseas customers in our development activities and contribute to society as a high-performance elastomer compound manufacturer.



An example of elastomer compounds application (Shampoo brush)

Relevant SDGs Target



Addressing Social Issues

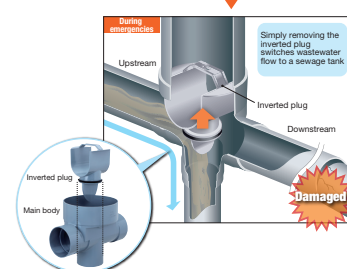
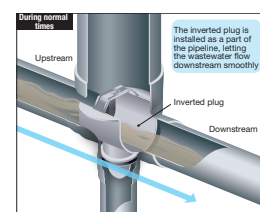
Maintaining Toilet Systems in Case of Disaster

Social issues

There are few countries that have safe and sanitary toilets like in Japan. However, when a large earthquake occurs, sewage pipes may be damaged, making toilets become unavailable for use. In many cases, people are forced to use temporary toilets and other alternative facilities in shelters, causing problems such as a lack of sanitation, concerns for privacy and a shortage of toilets until more permanent toilets are installed.

Toagosei Group's initiatives

Aronkasei proposes "Switching Chamber[®]" as a product allowing people to continuously use existing toilets even during a disaster. Although the toilet wastewater flows in sewage pipes during normal times, if the sewer pipe is damaged "Switching Chamber[®]" switches the wastewater flow to a sewage tank, enabling people to use existing safe and sanitary toilets as usual even during emergencies.



R&D

to Support Growth Strategy



General Center of R&D

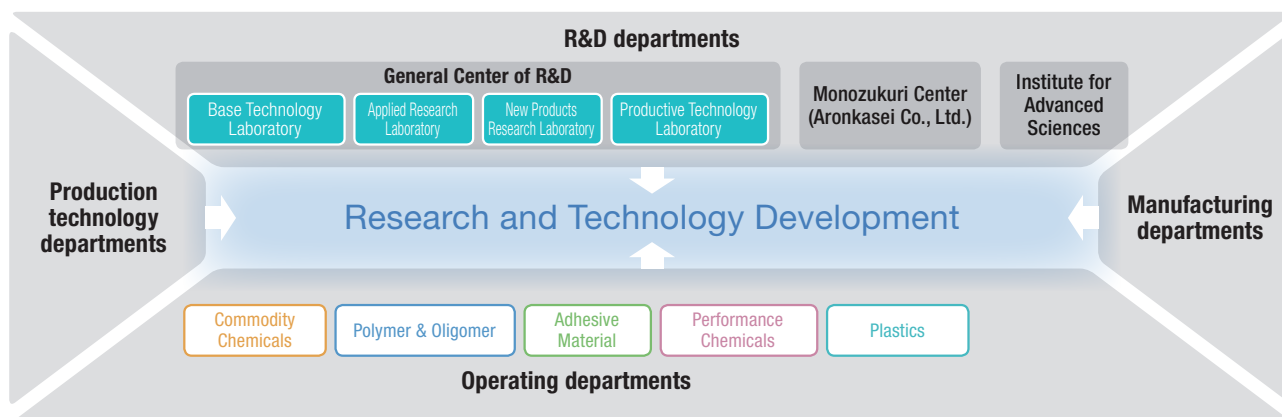
R&D at the Toagosei Group

The basic policy on research and development includes the creation of R&D themes from mid- and long-term perspectives and the achievement of results at an early stage, the continuous exploitation of new themes based on customer trends, and the strengthening of R&D capability through the self-sustaining growth of each individual. 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)





Institute for Advanced Sciences

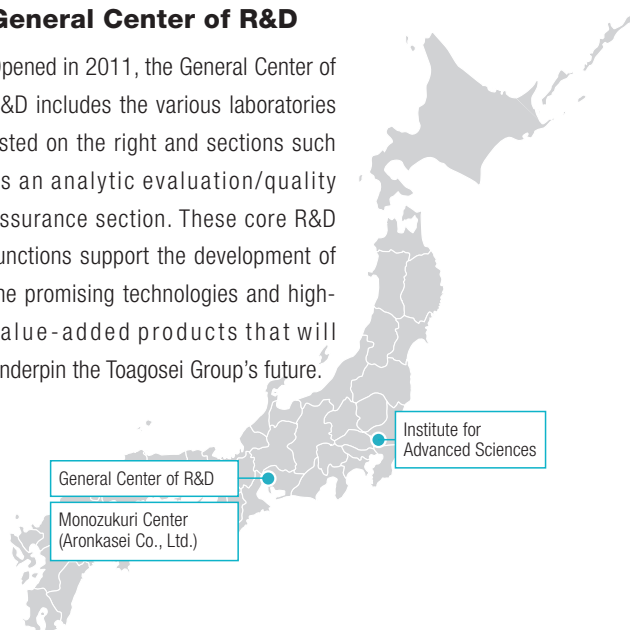


Monozukuri Center (Aronkasei Co., Ltd.)

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 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 elastomer compounds and other products through collaboration with the General Center of R&D.

Topics

Establishment of Tokyo Technology Laboratory

This facility was established in April 2018 in a building adjacent to Head Office. It is a development base that captures customer needs at an early stage and closely communicates with customers in the Kanto region where information is gathered.



Unique Expansion Continues in Development of Inorganic Functional Materials

Pursuit of functions and link with new technologies

In the inorganic functional materials business, our product lines range from additives for electronic materials to amenity care additives, which are useful to create sanitary and comfortable living spaces to realize diverse functions.

These functions have been produced by combining our synthetic technology of inorganic compounds with "ion exchange," "combination^{*1}" and "intercalation^{*2}."

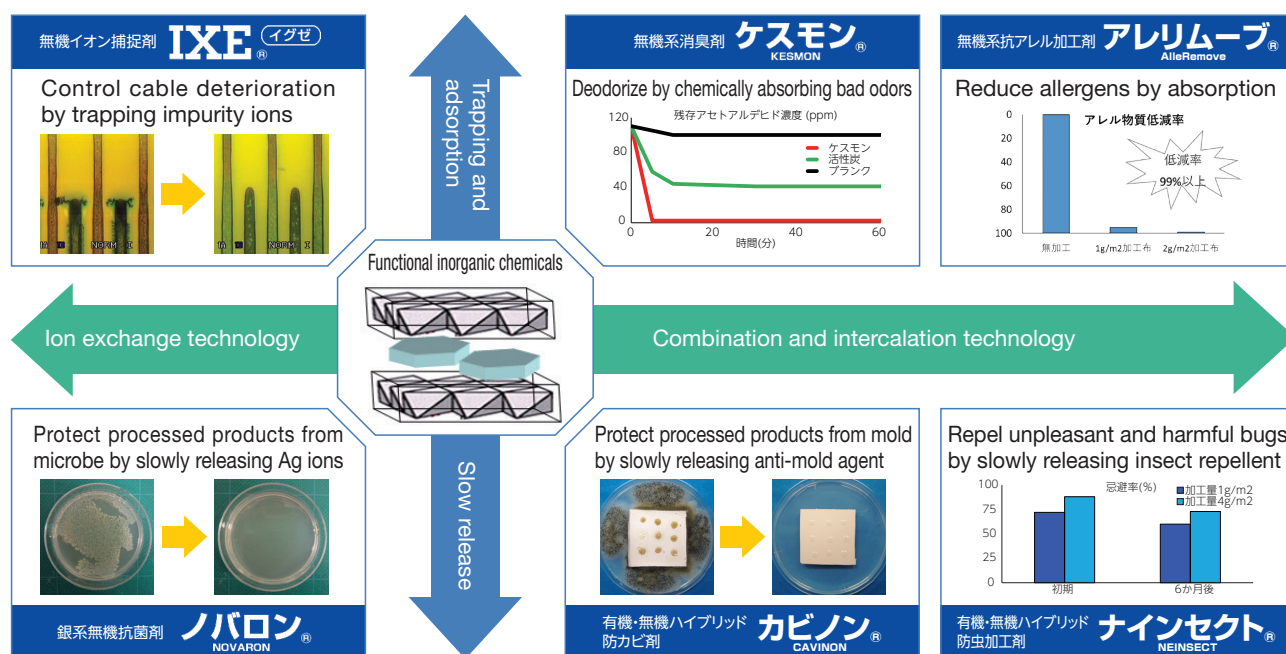
"IXE[®]" ion-trapping agent was produced through the application of ion exchange in the electronic material field. It traps impurity ions in electronic materials to control metal corrosion and enhance the reliability of electronic components.

In addition, "NOVARON[®]" antimicrobial agent uses the slow release of silver ions which are supported on through ion exchange. Meanwhile, we have a line-up of various products including "Cavinon[®]," a unique hybrid anti-mold agent that uses intercalation technology to absorb organic compounds inside inorganic compounds, and "KESMON[®]" deodorant, which eliminates unpleasant odors by chemically absorbing bad odors in living spaces.

We aim to meet various needs by further advancing the Group's expertise in enhancing functionality.

^{*1}. Technology to combine the strengths of inorganic compounds with organic compounds

^{*2}. Technology to absorb organic compounds inside inorganic compounds



Product development and performance evaluation technology

Additives for amenity care are inorganic products with excellent heat resistance that can be kneaded into plastic. They can also be used in coatings and are applicable and broadly used in various materials in clothes, cutting boards and other kitchen and bathroom goods, home appliances, etc.

To develop products that meet market needs, we conduct performance evaluations of the product to which an additive is applied and processed on items regarding deodorization,

antimicrobial and anti-mold properties, and feed back the results for improvement. By repeating this procedure, we produce highly-complete products.

While a number of evaluations are required, we are evolving the evaluation system to quickly develop products in pursuit of promptness and efficiency. This section shows our performance evaluation technology for antimicrobial agents in which the latest automatic evaluation technology is introduced.



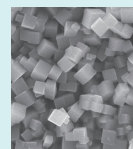
Introduction of a robot in evaluation tests

As automation technologies progress dramatically, robots are now able to carry out complicated motions. In the Inorganic Functional Materials business, we took on the challenge of the introduction of a robot in antimicrobial tests as the first phase of the promotion of automatic evaluation tests.



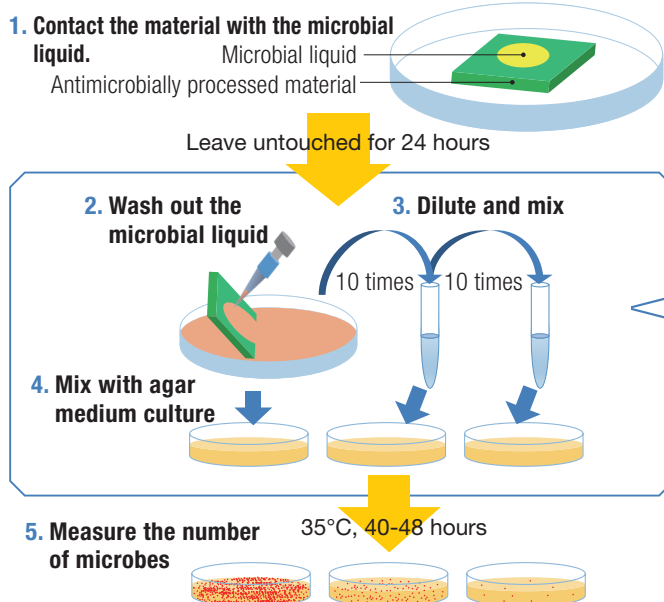
"NOVARON[®]" antimicrobial agent

"NOVARON[®]" is a proprietary inorganic antimicrobial agent developed by the Company. This agent has consistent particles with little hygroscopicity. It can be kneaded into textiles and films that are generally difficult in terms of processing, thanks to its excellent heat resistance property.



Antimicrobial evaluation

An antimicrobial evaluation is designed to evaluate how microbe propagation is controlled on the surface of antimicrobially processed products. The evaluation procedure is as follows:



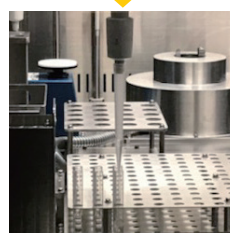
Determine the antimicrobial performance by comparing the number of microbes between a sample with antimicrobial processing and one without.

Automated tasks



Wash out the microbial liquid

Wash out the microbial liquid with saline solution. Shake and mix the liquid.



Dilute and mix

Dilute the microbial liquid 10-fold and mix. Repeat the procedure.



Mix with agar medium culture

Mix the obtained microbial liquid with the agar medium culture and solidify. Use the mixture to count the number of microbes.

Advantages of introduction of a robot to antimicrobial evaluation tests

1 The working speed of the robot is twice as fast as a general worker

2 It can carry out highly-reproductive motions, producing stable evaluation results

3 Workers can concentrate on research work, which cannot be automated

CSR Management

Toagosei Group's Corporate Philosophy and CSR

Corporate Philosophy

Through the endless possibilities of chemistry, we bring happiness created by highly functional materials.

Declaration

(Resolution to achieve the corporate philosophy)

New possibilities for society and the future happiness for everyone—these are the things that we will deliver through our highly functional materials.

We will continue to challenge ourselves. Building on the technologies we have acquired thus far, we will strive to enter new fields to provide the sort of value that only we can offer.

We will never stop moving. We will recognize the various changes in the world around us and be a societal leader through the power of chemistry, conducting ourselves as a company that co-exists with the people of society.

Guidelines for Conduct

(Code of conduct to be executed in day-to-day corporate activities)

• Vision

Have a vision for the future while creating superior key materials.

• Challenges

Push new boundaries with a strong will and imaginative ideas.

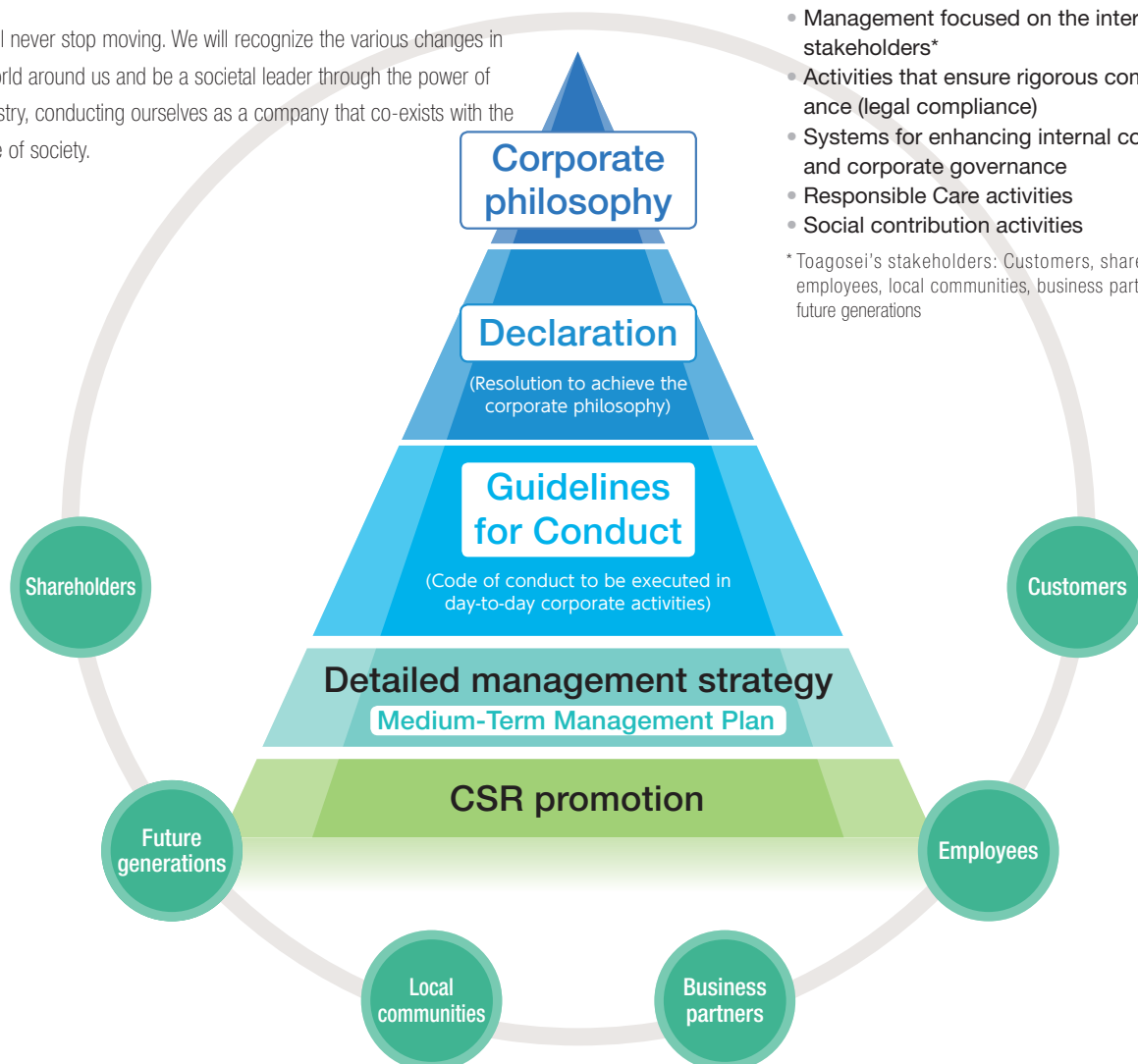
• Cooperation

Create new businesses together with our customers and partners.

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





Aiming for CSR activities that can contribute to both society and the Company

Susumu Miho

Director

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

Society's expectations and needs toward CSR are higher than ever before, and the trend has become evident in aspects of environment, society, and governance with the expansion of ESG investment. The Recognizing CSR activities as a foundation to support its growth strategy, the group promotes initiatives comprehensively in business activities. We must strive to make our CSR activities more beneficial for society.

Accident- and disaster-free operation is a paramount issue for a company to carry out sustainable business activities. Especially, in the chemical industry like our business, a single error may lead to a serious accident and disaster, causing significant inconvenience to society and stakeholders. Based on such recognition, we place emphasis on careful facility maintenance, thorough performance of risk assessment and the provision of educational training for workers. In recent years, the establishment of new offices and the new addition/ expansion of plant facilities took place one after another, boosting our production volume. To avoid an increase of accidents and disasters in proportion to such trend, we are reviewing conventional countermeasures.

In preparation for a great earthquake expected to strike along the Nankai Trough and tsunami that would follow as well as disasters caused by extreme weather and other similar events, we return to the basics and take appropriate measures without being negligent thinking "nothing had happened before."

In terms of environmental protection, we have established a firm foundation to enhance energy efficiency by introducing electrolysis facilities and other new technologies. Going forward, we will strengthen our initiatives to formulate our mid- and long-term targets to reduce global warming gas emissions as a measure against global warming.

With regard to quality assurance, issues on illegal quality control and manipulation by corporations have attracted public attention. We will devote our energy to establishing a framework that enables us to proudly state to customers and society that such injustice will never occur in the Toagosei Group.

In April 2019, the "Act on Work Style Reforms" will come into effect. In aiming to realize employees' work-life balance, we believe that developing a work environment that enables a wide variety of human resources with difference values to work actively will enhance organizational performance, improve productivity and generate innovation.

Aspiring to be an enterprise that continues to earn the trust of society, we will further strengthen CSR under the leadership of top management and through earnest activities at work scenes. While applying the SDGs (sustainable development goals) to management, we will strive to build sustainable and stable relationships with stakeholders, and remain a corporate group that never ceases to show strong presence.

CSR Management

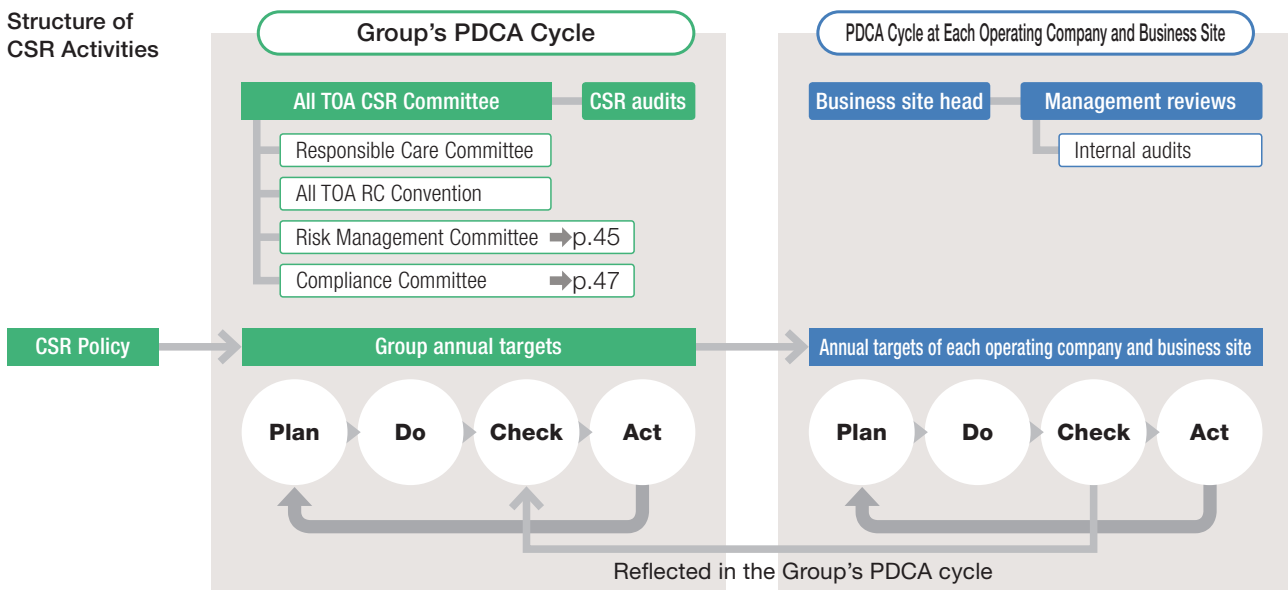
The Group is continually improving CSR activities in accordance with the CSR Policy by implementing the PDCA cycle to improve its ISO certified environmental and quality management.

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 2018 All TOA CSR Committee meeting was held on November 5. 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 2019.

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. For domestic plants, a manager and deputy manager of another plant are included as audit members.

In 2018 CSR audits of 11 business sites, including three overseas subsidiaries, were conducted. As a result, there were 151 findings, improvements and requests, and 47

good points were identified. 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 2018 RC Committee meeting was held on October 24 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 2018 All TOA RC Convention held at the General Center of Research and Development (Nagoya) on June 20 and 21, 10 cases of RC activities related to safety, the environment and quality were presented. In addition, we also invited a guest speaker who made a presentation on the theme "Learning from Accidents," and also organized an experience event at the Company's safety experience training facility.

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 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 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.

In 2018 we included an explanatory article regarding SDGs in the Group Newsletter for the purpose of familiarizing Group employees with SDGs, and also conducted a survey for the employees. As a result, it was found that over 90% of respondents think that “the Group should contribute to the achievement of SDGs through its mainstay business.” In addition, in February 2019 we invited a guest speaker to a seminar held on the theme of “chemical industry and SDGs.” We will continue to deepen understanding of SDGs and make efforts to realize a sustainable society.
















Group Newsletter



*CSR goals relating to SDGs are posted on pages 39 and 40.

*The Company's technologies and products relating to SDGs are introduced in the section of “Addressing Social Issues” in “Business Overview and Growth Strategy” (pages 21 -30).

Overview of CSR Activities

Classification	Focus in 2018	Relevant SDGs	Targets for 2018
 Corporate Governance	<ul style="list-style-type: none"> Strengthening of corporate governance Strengthening of responses to risk Timely and appropriate information disclosure to stakeholders 	 	<ul style="list-style-type: none"> Strengthening of corporate governance <ol style="list-style-type: none"> Efficient self-inspection Periodic check of Group companies 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 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"> Ongoing compliance education Continuous monitoring and check by the Compliance Committee No major violation, including administrative guidance
 Environmental Protection	<ul style="list-style-type: none"> Mitigation of global warming Waste reduction and recycling Reduction of emissions of chemical substances 	    	<ul style="list-style-type: none"> CO₂ emissions: 386k tons or less Volume of waste discharged externally: 9,470 tons or less Final landfill volume: 1.5 tons or less Emissions of substances subject to PRTR: 44 tons or less
 Process Safety and Disaster Prevention	<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
 Occupational Health and Safety	<ul style="list-style-type: none"> Promotion of the Zero-accident Campaign 	 	<ul style="list-style-type: none"> Zero lost-time injuries
 Product Safety	<ul style="list-style-type: none"> Enhanced management of chemical substances 	 	<ul style="list-style-type: none"> Preparation and registration of purchase specifications Consistent response to legal revisions regarding chemical management
 Quality Assurance	<ul style="list-style-type: none"> Continuous improvement of product quality 		<ul style="list-style-type: none"> Reduction in the total number of complaints
 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
 Human Resources	<ul style="list-style-type: none"> Establish a fulfilling working environment for a diverse workforce 	  	<ul style="list-style-type: none"> Employment rate of people with disabilities of 2.4% Promotion of work-life balance (achievement of an average annual leave usage rate of 100%) Promotion of active participation by women (execution of the action plan for promoting active participation by women) Maintenance and improvement of mental and physical health (holding mental seminar; reducing overwork/long-time work; 100% uptake rate for those who need reexamination)
 Enhancement of Contributions to Society and Communication	<ul style="list-style-type: none"> Enrichment of social contribution activities Harmonious coexistence with local communities 	 	<ul style="list-style-type: none"> Charitable donations and gifts beneficial to society Participation in and support for nature conservation, beautification and greening activities, and culture and sports activities Participation in the Human Resources Fostering Program in Chemistry, diversity promotion, and other projects Thorough aesthetic maintenance activities in the vicinity of business sites Expansion of community dialogues Dissemination of company information Holding plant and research laboratory tours and other events

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 2018	C Achievement	A Targets for 2019	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 	★★★	<ul style="list-style-type: none"> Execution of measures to strengthen corporate governance in accordance with the revised version of the Toagosei Group Basic Policy on Corporate Governance <ol style="list-style-type: none"> Efficient self-inspection Periodic check of Group companies 	P41
<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. 	★★★	<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 	P46
<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. Continuous monitoring by the Compliance Committee Each overseas subsidiary provided compliance education by using the handbook, etc. 	★★	<ul style="list-style-type: none"> Offering of education to fully disseminate the new Corporate Philosophy and the new Guidelines for Conduct of the Toagosei Group Continuous compliance education Periodic delivery of information regarding compliance 	P47
<ul style="list-style-type: none"> No major violation 	★★★	<ul style="list-style-type: none"> No major violation, including administrative guidance 	
<ul style="list-style-type: none"> CO₂ emissions: 367k tons 	★★★	<ul style="list-style-type: none"> CO₂ emissions: 350k tons or less Energy consumption per unit of output: 99% or less from the previous year 	P49
<ul style="list-style-type: none"> Volume of waste discharged externally: 11,997 tons Final landfill volume: 1,181 tons (1.7%) 	★	<ul style="list-style-type: none"> Final landfill rate: 0.5% or less Understanding of the details of produced waste, recycling, promotion of waste reduction and understanding of waste unit 	P53
<ul style="list-style-type: none"> Emissions of substances subject to PRTR: 47 tons 	★	<ul style="list-style-type: none"> Emissions of substances subject to PRTR: 44 tons or less 	
<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"> Zero explosion or fire accidents Zero serious leakage accidents of harmful substances or hazardous materials 	P54
<ul style="list-style-type: none"> Two lost-time injuries (plus four lost-time injuries in overseas offices) 	★	<ul style="list-style-type: none"> Zero lost-time injuries 	P55
<ul style="list-style-type: none"> Preparation of purchase specifications completed as planned Consistent response to legal revisions regarding poisonous and deleterious substances control 	★★★	<ul style="list-style-type: none"> Proper response to laws and regulations regarding chemical management Stable purchase of materials 	P56
<ul style="list-style-type: none"> 3% increase from the previous year 	★	<ul style="list-style-type: none"> Reduction in the number of complaints 	P57
<ul style="list-style-type: none"> The number of problems increased by 18% from the previous year No serious problems 	★	<ul style="list-style-type: none"> Reduction in the number of physical distribution problems 	P58
<ul style="list-style-type: none"> Achieved employment rate of persons with disabilities of 2.99% 	★★★	<ul style="list-style-type: none"> Maintenance of employment rate of persons with disabilities of 2.4% or higher 	P59
<ul style="list-style-type: none"> Targets not achieved as the average annual paid leave usage rate was 88.8% on a group-wide basis 	★★	<ul style="list-style-type: none"> Promotion of work-life balance (achievement of an average annual leave usage rate of 100%) 	P64
<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 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) 	
<ul style="list-style-type: none"> Held mental health training at two sites Began activities to reduce long-time work by analyzing the attendance data of IC card readers 67% uptake rate for those who need reexamination 	★	<ul style="list-style-type: none"> Promotion of health management (reduction of the number of persons who are on long-term absence due to mental problems; reducing overwork/long-time work; increasing the rate of persons who maintain appropriate weight; decrease of smoking rate; 100% uptake rate for those who need reexamination) 	
<ul style="list-style-type: none"> Donations made for victims of 2018 Japan Floods in Hiroshima Prefecture and Onomichi City 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 Participation in Japan Initiative for Marine Environment (JalME) Participation in and sponsorship for the Human Resources Fostering Program in Chemistry continued Donations to the "Tobitate! (Leap for Tomorrow) Young Ambassador Program" continued Donation to International Chemistry Olympiad business Co-sponsorship for Minato City Marathon and T league 	★★★	<ul style="list-style-type: none"> Contribution to the development of next-generation personnel through support for academic research, arts and culture, and sports Promotion of conservation activities for biodiversity 	P65
<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 	P66
<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 Holding plant and research laboratory tours and other events 	



Corporate Governance



P Targets for 2018	D Results in 2018	C Achievement	A Targets for 2019
<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 	★★★	<ul style="list-style-type: none"> Execution of measures to strengthen corporate governance in accordance with the revised version of the Toagosei Group Basic Policy on 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"> 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"> The head office and sites jointly conducted a crisis response drill. The Risk Management Committee performed periodic risk assessment about BCP, etc. 	★★★	<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	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)	Outside Director (Audit & Supervisory Committee Member)
Yasuo Kitamura	Yasuhiro Koike	Satoru Nakanishi	Akira Komine	Tsutomu Harada	Nobuhiko Takano	Kiyoko Ishiguro	Masahiko Yasuda
Director President and Representative Director, Aronkasei Co., Ltd	Director General Manager, Supply Chain Management Division and General Manager, Tokyo Sales Department	Director General Manager, Group Management Division	President and Representative Director	Vice President and Representative Director and General Manager, Corporate Strategy Division		Director General Manager, Group Administrative Division	Director General Manager, Technology & Production Administrative Division and General Manager, Research & Development Administrative Division
Shinichi Sugiura	Moriyuki Kenjou	Katsuyuki Ito	Mikishi Takamura	Nobuhiro Ishikawa	Yoshitaka Suzuki	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 "Through the endless possibilities of chemistry, we bring happiness created by highly functional materials," 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.

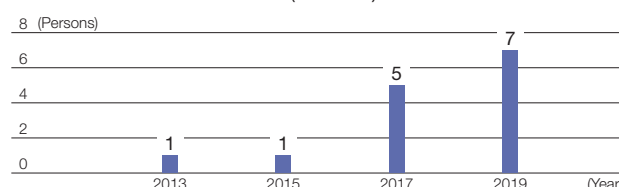
Measures for continuous strengthening of corporate governance

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
2018	The proportion of outside directors in the voluntary Nomination Committee/Remuneration Committee increased to a majority

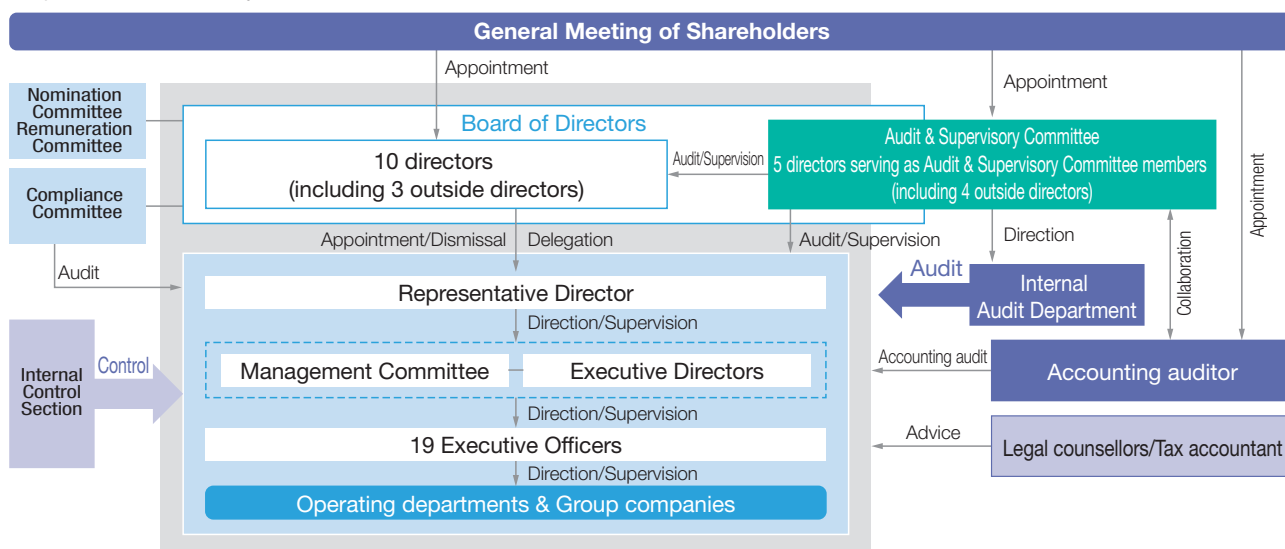
Proportion of Outside Directors in the Total Number of Directors



Number of Outside Directors (Persons)



Corporate Governance System



Management System

The Board of Directors consists of 15 directors, including ten directors who do not serve as Audit & Supervisory Committee members (of whom three are independent outside directors) and five directors who also serve as Audit & Supervisory Committee members (of whom four are independent outside directors). In March 2019, the number of independent outside directors increased from 5 to 7, further enhancing the management oversight function of the Board of Directors.

The Company selects a well-balanced mix of candidates for directors who possess extensive experience and abundant knowledge in various business fields including R&D, technology and production, sales, corporate administration, accounting and legal affairs. In addition, a new female director was appointed in 2019 to maintain the diverse structure of the Board of Directors.

With respect to business execution, the Management Committee composed of executive directors and meets every week, in principle, to deliberate in advance matters to be discussed at 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 in an aim to clarify their responsibilities for business execution.

Audit System

The Audit & Supervisory Committee consists of five directors (including four 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 the 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 accounting auditor and the Internal Control Section.

Messages from Outside Directors



Outside Director **Satoru Nakanishi**

In celebrating the Company's 75th anniversary of foundation, we renewed the corporate philosophy so that it leads to the 100th anniversary as well as the future mission, taking a new step towards contributing to the realization of an affluent society.

To achieve the Group's sustainable growth and to increase its corporate value over the medium- and long-term, it is indispensable to further develop our product lineup, which will be a new pillar of our business, and continually improve CSR management and corporate governance, which support growth.

As an outside director, I am committed to contributing to improve Toagosei Group's highly-effective corporate governance structure that ensures transparent, fair, swift and resolute decision-making by leveraging my experience at financial institutions and in the management of operating companies.



Outside Director (Audit & Supervisory Committee Member) **Nobuhiko Takano**

The Group strives to improve and strengthen corporate governance to fulfill its corporate social responsibility as well as audits and supervises business execution in an effective manner based on the understanding that extremely important responsibilities and duties are expected of outside directors and the Audit & Supervisory Committee. The Company's Audit & Supervisory Committee consists of five directors serving as Audit & Supervisory Committee members (including four outside directors) and exchange questions and answers at the Board of Directors, executive interviews and other important meetings. Furthermore, in cooperation with the Internal Control Section and accounting auditor, the Committee conducts on-site inspection of plants and interviews with each division while placing the Internal Audit Department under its command. To achieve the Group's sustainable growth and to increase its corporate value over the medium- and long-term, I make continuous efforts to perform highly-effective audits and supervision by utilizing my work experience at public offices as well as knowledge and experience cultivated as a certified tax accountant.

Internal Control

We have established the Basic Policy on Internal Control by the resolution of the Board of Directors in order to strengthen corporate governance. In accordance with said policy, the Internal Control Section confirms the operating status of internal control from an independent perspective, reports such results to the Board of Directors and 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).

In addition, the Internal Audit Department carries out internal audits of the Toagosei Group's compliance status and the appropriateness of business operations under the instructions of the Audit & Supervisory Committee.

The Internal Control Section and the Internal Audit Department 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.

Selection of Directors

The Company has prescribed the selection standards for the Company's directors (excluding directors who also serve as Audit & Supervisory Committee members and independent outside directors who do not serve as Audit & Supervisory Committee members) as follows to clarify the qualities expected of directors:

1. Persons who possess outstanding knowledge and abilities and extensive experience in regard to the business administration and operational management of the Group, or persons who possess sufficient understanding of the Group's business activities, along with the experience and knowledge needed to appropriately and fairly supervise the business execution of the Company's directors and other personnel, thereby contributing to the achievement of the Group's medium- to long-term management plans.
2. Persons who are fair-minded and possess excellent character, views, and job execution capabilities as well as have the ability to execute fair and appropriate supervision of business administration, operational management, and business execution based on high ethical standards.

To enhance the objectivity and transparency of the appointment, the Nomination Committee, in which the majority of the members are independent outside directors, has been established as an advisory body to the Board of Directors. The Committee deliberates matters such as appointment procedures, qualifications and reasons for appointment regarding proposals on candidates for director prepared by the representative director, and reports to the Board of Directors.

Remuneration for Directors

Considering that remuneration for directors (excluding directors who also serve as Audit & Supervisory Committee members and independent outside directors who do not serve as Audit &

Supervisory Committee members) will be one of the healthy incentives to generate sustainable growth, the Company has established a compensation standards linked to performance. The amounts of the performance-linked remuneration are determined based on corporate performance of each business year, duties of each director, performance of duties from both short-term and mid- to long-term perspectives, among other important factors.

In addition, to enhance the objectivity and transparency of the remuneration, the Remuneration Committee, in which the majority of the members are outside directors, has been established as an advisory body to the Board of Directors. The Committee deliberates proposals on directors' remuneration, which is prepared by the representative director, in view of the remuneration system and individual director's remuneration, and reports to the Board of Directors.

Assessment for the Effectiveness of the Board of Directors

The Company analyzes and assesses the effectiveness of the Board of Directors every year based on the self-assessment of each director. Issues recognized therein are discussed by the Board of Directors for improvement.

Assessment for the effectiveness of the Board of Directors performed in 2019

1. Assessment method

We conducted a survey for all directors regarding the effectiveness of directors, and the Board of Directors had discussions based on the compiled result and opinions received through the survey. We assigned a third party to review, compile and analyze survey items for the assessment for the effectiveness so as to enhance the objectivity and transparency of the assessment.

2. Questions asked to directors in the survey

- Structure and operation of the Board of Directors
- System supporting the Board of Directors
- Constructive dialogue with shareholders
- Contribution to the Board of Directors (self-assessment), etc.

3. Assessment results

The scale of the Board of Directors, the frequency of the Board meetings, the selection of matters to be deliberated, the securing of deliberation time and the provision of information necessary for audits and supervision were assessed appropriate, indicating that the effectiveness of the Board of Directors is secured in general.

Meanwhile, we confirmed and shared that further discussions would be required regarding the number of members of the Board of Directors and its diversity, the improvement of methods for providing information to outside directors, the appointment of directors, remuneration for directors, and the planning of their successors.

Support System for Outside Directors

We have taken various steps to establish the environment that enables outside directors to properly supervise that mid- and long-term management directions are deliberated in a multi-dimensional way and the Company's management strategies are executed appropriately. Specifically, we provide outside directors with opportunities to visit each business site of the Company periodically with a view to deepen their understanding of the Company's

business. Furthermore, they receive monthly explanation regarding the contents discussed by the Management Committee, and share their understanding on the Company's management issues and constructively exchange opinions as needed through attendance at important meetings regarding research and development, CSR policy, etc.

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 increase the effectiveness of risk management at the group-wide level, the Committee regularly identifies and assesses risks, formulates risk countermeasures, and checks the status of the countermeasures.

Potential risks

- Natural disaster/infectious disease (earthquake, infectious disease, etc.)
- Environmental and safety risk (ground pollution, fire, explosion, etc.)
- Product risk (product liability, intensified competition, etc.)
- Legal risk (violation of laws and regulations, lawsuits filed, etc.)
- Financial risk (fund shortage, bankruptcy of business associates, etc.)
- Personnel and labor risk (harassment, misdeed of employees, etc.)
- Public communications-related risk (error or delay in information disclosure)
- Geopolitical risk (civil war, easing or strengthening of regulations, etc.)
- Economic risk (fluctuation of currencies, stock price, interest rate, etc.)
- Social risk (damage by harmful rumors, cyber-terrorism, etc.)
- Other risks related to the external environment (suspension of power and other lifelines, etc.)

Business Continuity Plan (BCP) and Response in the Event of a Crisis

To continue business operations even in the event a risk is materialized, we have formulated the Business Continuity Plan (BCP) that determines the standards on businesses that should be prioritized to continue operation and the target recovery time according to the damage status.

The Toagosei Group has established the Toagosei Group Crisis Response Rules that specify the organizational framework and concrete measures in the event of a crisis. Moreover, the Emergency Action Manuals have been prepared according to respective phenomenon and office, and training is conducted regularly. In 2018, joint crisis training was held by Toagosei's Head Office and the Hirono Plant.

The issues identified by the training and risk management by department were reviewed and discussed at a meeting of the Risk Management Committee and actions for improvement are being implemented.

Information Leakage Risk Countermeasures

In accordance with the "Regulations for Management of Confidential Information," the Toagosei Group prepared a "list of confidential information" that specifies confidential information of respective department, and promoted countermeasures for the risk of information leakage. In addition to education for spreading awareness regarding information management and handling rules, we are continuously improving the information security system. In 2018, the Group conducted an investigation on the presence of unauthorized communication to external parties through the internal network and the leakage of confidential information to overseas websites, and discussed and implemented effective measures.

Dialogue with Shareholders and Investors, and Information Disclosure

Basic Policy and Framework

The Company clearly states in the Toagosei Group Basic Policy on Corporate Governance that it “engages in constructive dialogue with shareholders who have an investment policy that aligns with medium- to long-term shareholder profits,” and prescribes the policy on constructive dialogue with shareholders.

In terms of information disclosure, we strive to disclose information to all stakeholders in a timely, proper and fair manner in compliance with rules on the handling of important information (insider information) specified in the Financial Instruments and Exchange Act, etc., the Regulation on Fair Disclosure, and the Rules of Tokyo Stock Exchange and other related regulations, to obtain stakeholders' correct understanding on the Group.

Regarding investors and public relations, which is positioned as one of the important management themes, we have established Investors & Public Relations Department as a dedicated section, for which the director in charge of IR (director, General Manager of Group Management Division) exercises control. We have also established the “IR Committee,” which deliberates the basic policy and standards on information disclosure to improve the framework.

Dialogue with Stakeholders

We strive to disclose information proactively based on not only legal disclosure under applicable laws and regulations and timely disclosure under the Rules of Tokyo Stock Exchange, but also the voluntary disclosure of information that does not meet the above disclosure standards. We hold financial briefings (twice a year) and individual interviews for institutional investors and media organizations, and organize plant tours and other events for local residents and students. We also publish the Toagosei Group Report (this document) in Japanese and English as well as the “Shareholder Newsletter” for shareholders as materials (tools) of investors and public relations. These materials are also posted on our corporate website so that they will be widely accessible by all stakeholders.

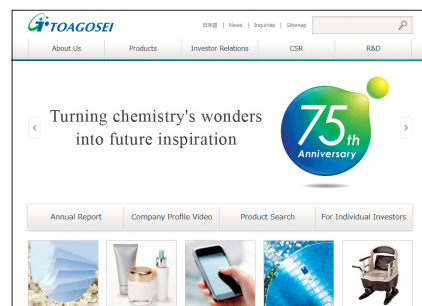
General Meeting of Shareholders

Considering that a general meeting of shareholders is a place for more productive dialogue, we disclose the notices of convocation on the Company's website and through the TSE, on the prior day of sending out the notices, for early information disclosure to our shareholders.

In addition, on the backdrop of increase in the number of foreign shareholders, a summary of the notice of convocation, reference documents and the notice of resolution are translated into English and disclosed on the Company's website and through the TSE concurrently with the Japanese version.



Financial briefing



Toagosei's Corporate Website

We are enriching information disclosure on the corporate website.

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



Compliance



P Targets for 2018	D Results in 2018	C Achievement	A Targets for 2019
<ul 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. ● Continuous monitoring by the Compliance Committee ● Each overseas subsidiary provided compliance education using the handbook 	★★	<ul style="list-style-type: none"> ● Offering of education to fully disseminate the new Corporate Philosophy and the new Guidelines for Conduct of the Toagosei Group ● Continuous compliance education ● Periodic delivery of information regarding compliance
<ul style="list-style-type: none"> ● No major violation, including administrative guidance 	<ul style="list-style-type: none"> ● No major violation 	★★★	<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 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, 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 2018, we conducted education for new employees and for managerial personnel according to position, education about the Subcontractor Act for Group companies, and education about insider trading regulations using Group Newsletters and e-learning tools, 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

Provision of Education about Insider Trading Regulations

In 2018, we focused on education about insider trading regulations as part of education about the management of confidential information. In the Group Newsletter, we created articles with which trainees can concretely learn about acts that are forbidden through manga and illustrations and disseminated the articles thoroughly among the Group. In the e-learning training, which offers a review test to check the trainees' level of understanding, efforts are being made to enhance the effectiveness of compliance education.



Education through Group Newsletter



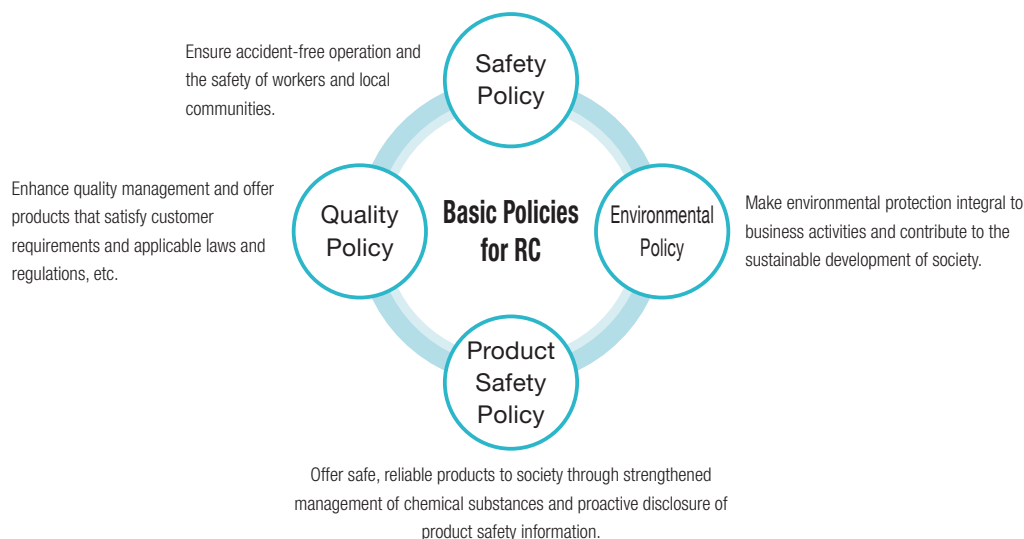
Responsible Care Management

Basic policies for RC

Mindful of its responsibilities as an enterprise engaged in the chemical business, the 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.



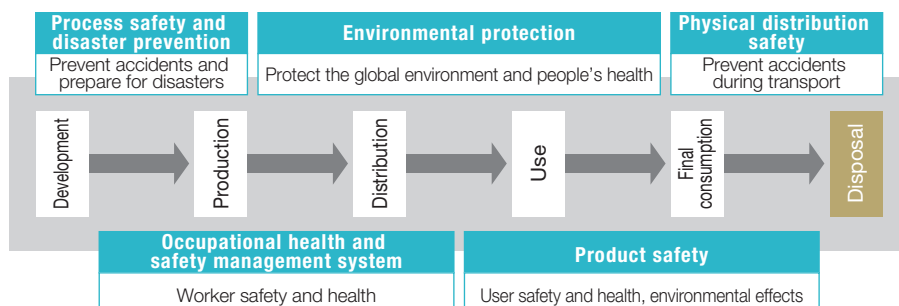
Toagosei Group and Responsible Care

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 2018	D Results in 2018	C Achievement	A Targets for 2019
<ul style="list-style-type: none"> CO₂ emissions: 386k tons or less 	<ul style="list-style-type: none"> CO₂ emissions: 367k tons 	★ ★ ★	<ul style="list-style-type: none"> CO₂ emissions: 350k tons or less Energy consumption per unit of output: 99% or less from the previous year
<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"> Volume of waste discharged externally: 11,997 tons Final landfill volume: 1,181 tons (1.7%) 	★	<ul style="list-style-type: none"> Final landfill rate: 0.5% or less Understanding of the details of produced waste, recycling, promotion of waste reduction and understanding of waste unit
<ul style="list-style-type: none"> Emissions of substances subject to PRTR: 44 tons or less 	<ul style="list-style-type: none"> Emissions of substances subject to PRTR: 47 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 Group engages in efficient production to reduce CO₂ emissions. While the overall production of the Group has been increasing since 2017, the production volume in 2018 was almost unchanged from the previous year, maintaining the same level of energy consumption volume and energy consumption per unit of output. The CO₂ emissions decreased thanks to the declining trend of CO₂ emission factors in Japan owing to the improvement in power configurations, contributing to the reduction of CO₂ emissions. For the overseas business, although Toagosei Thailand started its operation in 2018, CO₂ emissions were reduced at the group-wide level.

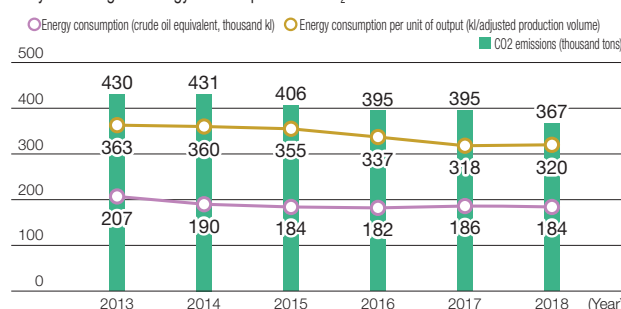
We have set a target to reduce CO₂ emissions by 26% compared with the emissions volume in 2013 in light of the global targets for 2030 adopted in the Paris Agreement (COP21). To achieve this goal, we consider it necessary to further enhance the group-wide structure for energy management in addition to recognition of above external factors, and work to address the issue.

Activities to Prevent Leakage of Fluorocarbons

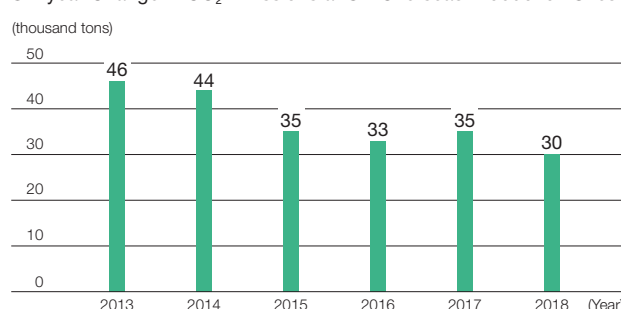
In line with the Law concerning the Recovery and Destruction of Fluorocarbons, we strive to identify the amount of leaked fluorocarbons and implement necessary measures to prevent the leakage. However, the results of the 2018 survey regarding the amount of leaked fluorocarbons indicated the leakage of 1,969 tons (converted to CO₂) among the entire Group in Japan due mainly to malfunction in equipment using fluorocarbons and the age-related deterioration of facilities. Being keenly aware of the importance of

more thorough measures against the leakage of fluorocarbons, we have added new target actions in the 2019 CSR targets.

Six-year Change in Energy Consumption and CO₂ Emissions at Domestic Production Sites



Six-year Change in CO₂ Emissions at Six Overseas Production Sites*



*Scope of reporting: six overseas production sites
There are currently six overseas production sites including Toagosei Thailand, which went into operation in June 2018.

Environmental Impact Reduction Measures

Protection of Water Quality

The Toagosei Group considers water a limited resource and strives to promote its efficient use. Owing to the same level of production volume compared with the previous year, the Group's water consumption in Japan in 2018 was 50 million m³, and total effluent volume was 42 million m³. 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 2018 was 0.32 million m³.

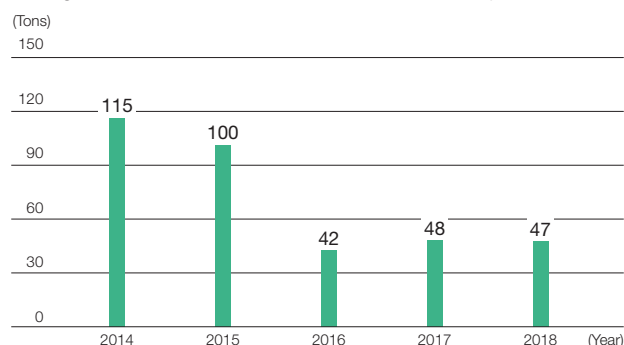
Protection of Air Quality

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, the respective overseas production sites control their exhaust in accordance with applicable regulations in their jurisdictions.

Chemical Substance Emissions Reduction

The Group's business sites properly manage chemical substance emissions in compliance with the Law concerning Pollutant Release and Transfer Register (PRTR Law). One of the substances that account for a large portion of PRTR-controlled substances is chloromethane (methyl chloride) discharged at the Sakaide Plant. We have introduced a facility that absorbs and excludes chloromethane at the end of 2015 and have been operating stably since; therefore in 2016 and onward, annual emissions of the substances decreased to less than half of the past level.

Change in Emissions of Chemical Substances Subject to PRTR



Emissions of Principal Substances Subject to PRTR (t)

Major emissions	2018
Chloromethane (methyl chloride)	21.9
Chloroethylene (vinyl chloride)	4.8
Methyl acrylate	3.6
Dichloromethane (methylene chloride)	2.5
Toluene	1.3

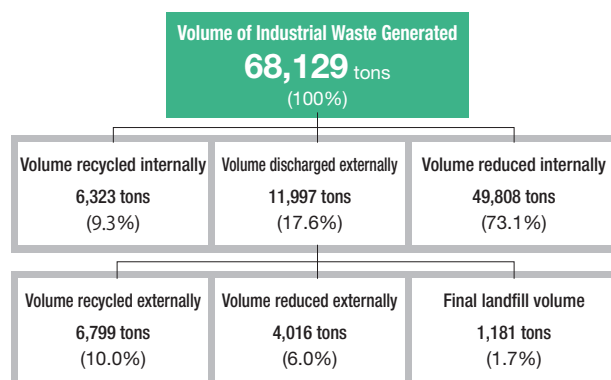
Initiatives to Realize a Recycling Society

Reduction in Final Landfill Volume and Waste Recycling Measures

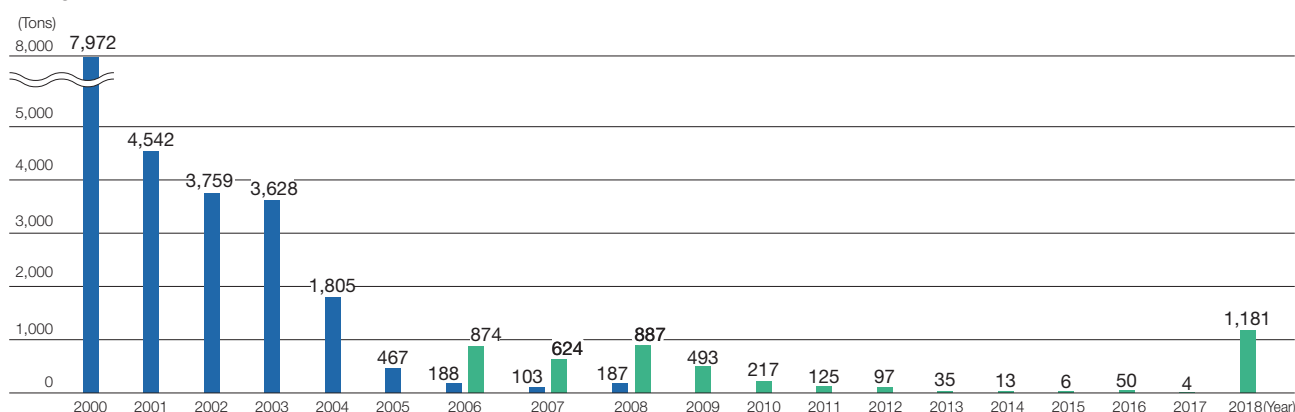
The Group focuses on promotion of initiatives to reduce final landfill volume. The Group's final landfill volume, which was around 8,000 tons in 2000 (non-consolidated basis), has been so far reduced to several hundreds of tons (consolidated basis). While the final landfill volume for 2018 temporarily increased owing to the disposal of waste that had been untouched and stored in a plant, the amount of waste that is produced from daily production activities and finally disposed of in landfill dropped drastically.

Going forward, we will continue to select industrial waste handling operators that make efforts toward recycling as destinations for discharged waste.

Industrial Waste Disposal Flow



Change in final landfill volume ■ Toagosei (-2008) ■ Toagosei Group (2006-)



Investment, etc., in Environmental Protection

The Group introduced environmental accounting in 2000 and has since been announcing its stance on environmental activities. Starting this year, we disclose the details of investment in order to facilitate understanding.

1. We focused on the transition to energy-saving equipment following 2016 and 2017.

Description	Investment (Millions of yen)
Renewal of electrolyte-related equipment to enhance energy efficiency (Nagoya Plant)	83
Transition to the use of energy-efficient extrusion-molding machines (Aronkasei)	71
Introduction of zero-gap electrolytic machine (Yokohama Plant)	24
Installation of LED lights (Aronkasei and others)	13
Other	60
Total	251

2. We are continuously and systematically investing in pollution control measures.

Description	Investment (Millions of yen)
Addition of condenser for prevention of air pollution and installation of removal facilities	25
Measures to prevent penetration of harmful substances into soil, inspection and purification of soil	34
Strengthened management of wastewater treatment facilities	34
Noise and vibration control measures	8
Total	101

3. We are making further efforts to develop and study environmentally-friendly products.

Description	Expenses (Millions of yen)	
	R&D	Capital investment
Development of materials for parts to be mounted on electric vehicles with low environmental load	138	181
Development of materials for soil improvement to prevent liquefaction caused by earthquakes*	35	—
Consideration on industrial use of plant-based materials	24	—
Consideration on reduction of environmental load by increasing the productivity of existing products	123	26
Consideration on further improvement in performance of environmentally-friendly products	62	—
Total	382	207

*Received the Excellent Presentation Award in the Paper Presentation at the 73rd Annual Meeting of the Japan Society of Civil Engineers in FY2018

4. Other

In addition to investment costs, we spend ordinary expenses for pollution prevention, prevention of the leakage of harmful substances, environment monitoring, green space management and environmental education, etc.

Scope of calculations: Toagosei Group listed on P.53

Period covered: January 1 to December 31, 2018

Calculation method: Obtained by multiplying the amounts actually paid by environment factors specified under internal rules

Topics

Received the Excellent Presentation Award at the JSCE Annual Meeting

Mr. Shun Nakano from the General Center of Research and Development won the Excellent Presentation Award in the Paper Presentation at the 73rd Annual Meeting of the Japan Society of Civil Engineers (JSCE), held at Hokkaido University Sapporo Campus in August 2018. His presentation under the theme of “properties of composite polymer-type soil improvement agent” focused on the gel-formation mechanism, liquefaction strength and safety of a new soil improvement agent containing magnesium acrylate as a main component.

● Message from Mr. Nakano

Engaging in civil engineering, I often feel that the power of chemistry can play a greater role in the field of civil engineering. It is a fact that, in recent disasters, buildings and infrastructure suffered serious damage even with the highly-developed construction technologies that exist today. With this in mind, it will become increasingly important to improve functions in not just construction techniques but also materials. I believe that such an approach is not yet sufficient. On the other hand, it is also true that “construction must be sound and dependable.” Continuously taking on the challenge of new materials while maintaining the soundness of construction is not an easy task. To reconcile these issues, it is essential that the civil engineering industry and the chemical industry work closely together to understand the properties before selecting new materials.

In this sense, I am honored to receive this award and contribute in building a bridge between industries of civil engineering and chemistry. It does not stop here. I will stay committed to producing satisfying materials.





Shun Nakano

General Center of Research and Development
New Product Research Laboratory

Environmentally Friendly Products and Technologies

The Group supplies environmentally-friendly products for diverse fields.

Environmentally-Friendly Products and Technologies

Business area	Product	Details	Pages
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.	P21-22
	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.	P23-24
	Acrylic polymers for lithium ion batteries (LIB)	This product is used for LIB plates. It contributes to the enhancement of capacity and power as well as improved battery life, properties which are in demand for automobile use.	
	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. 	P25-26
	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.	P27-28 P33-34
	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.  Chamber preventing rainwater backflow (with vent)	P29-30
	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.	

Business Activities and Environmental Impacts

Scope of calculations			Period covered
Toagosei	Plants	Nagoya Plant, Yokohama Plant, Takaoka Plant, Tokushima Plant, Sakaide Plant, Kawasaki Plant, Hirono Plant	One year from January 1, 2017 to December 31, 2018
	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

	2017	2018
Energy consumption (crude oil equivalent, thousand kl)	186	184
Per unit of output (kl/adjusted production volume, thousand tons)	318	320

Water Consumption

	2017	2018
Water resources (million m ³)	51	50

INPUT



Toagosei Group Production Sites in Japan

OUTPUT

Business Activities

	2017	2018
Production volume (thousand tons)	1,186	1,163

Environmental Impacts on Water Resources

	2017	2018
Total effluent volume (million m ³)	42	42
COD (tons)	116	109
Total nitrogen (tons)	33	27
Total phosphorus (tons)	1.4	1.2
Substances subject to PRTR (tons)	4	4

Industrial Waste

	2017	2018
Volume of industrial waste generated (tons)	34,304	68,129
Volume reduced internally (tons)	15,993	49,808
Volume discharged externally (tons)	11,627	11,997
Final landfill volume (tons)	4	1,181

In 2018, we reviewed the scopes of volume of industrial waste generated and volume reduced internally that are subject to calculation.

Environmental Impacts on Atmosphere

	2017	2018
CO ₂ (CO ₂ equivalent, thousand tons)	395	367
SO _x (tons)	40	37
NO _x (tons)	71	69
Soot and dust (tons)	7	5
Substances subject to PRTR (tons)	44	43

Safety and Disaster Prevention



P Targets for 2018	D Results in 2018	C Achievement	A Targets for 2019
<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"> Zero explosion or fire accidents Zero serious leakage accidents 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.

For example, the acrylic product manufacturing plant in Nagoya performed a “blind drill” in which the details of the drill were not notified to the self-defense disaster prevention team and the

firefighting team in advance of the drill. Starting with the sounding of an alarm for abnormal drainage, drill participants, without knowing what happened or where, had to identify the location of the disaster only with the help of “controllers,” which are panels, pictures and on-the-scene indicators shown by firefighters. Participants then performed various first aid measures, one after another, including for emergency facility shutdowns, leakage prevention, prevention of abnormal drainage and recovery operation. This unscripted drill, which simulated an actual disaster, was a meaningful training as responses learned through day-to-day drills were fully demonstrated.

Disaster Drills at the Nagoya Plant



On-site Command Headquarters



Response Headquarters

VOICE » For safety at operating sites

We, at the Tokushima Plant, handle hazardous substances that hold risks of explosions and fires as well as highly toxic substances. Our operations also may involve extremely high pressure. In the event of a leakage of such dangerous substances, not only will employees be exposed to danger, but so will residents in neighboring areas. To operate the plant safely and steadily, routine training is necessary.

The Tokushima Plant is now in the middle of a generation change as a number of employees will reach the mandatory retirement age by 2021. Improving the skills of mid-level and young employees is a future issue.

Important tasks in the Operation Group are (1) to understand the fundamentals and principles of facilities and mechanisms, and (2) to take appropriate action in case of emergency. More specifically, (1) is a measure to prevent problems and accidents from occurring and (2) is a measure to minimize damage in the case of a problem/accident.

Especially in 2019, we plan on holding regular internal seminars on the identification of cause, prediction and planning of actions to take, as well as response in case of emergency under the hypothesis of an abnormal process. We also give young operators opportunities to handle important operations and startup operations. Through such efforts, we aim to pass on our technologies to the next generation.

The Tokushima Plant has recorded zero accidents for three consecutive years. We will continue to maintain this record going forward.



Masatoshi Kato
Manager, Chlorine & Alkali
Products Section, Manufacturing
Department



Occupational Health and Safety



P Targets for 2018	D Results in 2018	C Achievement	A Targets for 2019
● Zero lost-time injuries	● Two lost-time injuries (plus four lost-time injuries in overseas offices)	★	● Zero lost-time injuries

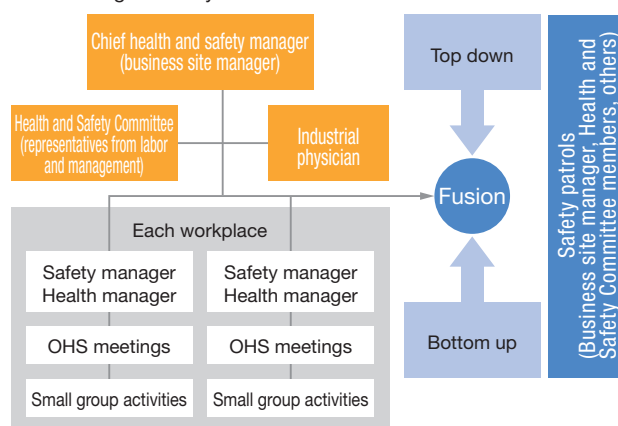
Occupational Health and Safety Initiatives

Occupational Health and Safety Management System

The Group determines priorities for occupational health and safety (OHS) promotion and key policies and measures at the All TOA CSR Committee and engages 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.

Occurrence of injuries

In 2018, two lost-time injuries occurred at domestic business sites and four lost-time injuries occurred at overseas business sites.

In 2019, we will boost the level of sensitivity to risks of both administrators and workers through the improvement of on-site patrol methods, etc.

We will also strengthen safety management at overseas production bases.

With regard to lost-time and no-lost-time injuries occurring during work, as well as commutation injuries, injuries resulting from falls increased.

We will encourage employees to understand their own physical condition and the risk of falling through cooperation with the environment and safety departments as well as the Health Management Promotion Section.

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
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
2018	2(4)	13	0(1)	5	2	18

*Numbers in parentheses indicate accidents at overseas business sites (excluded figures).

Topics

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

Mr. Akito Tsurumoto, Foreman at Oita Chemical, received the "Minister of Health, Labour and Welfare's Special Award for Outstanding Foremen in Occupational Safety" in fiscal year 2018, following the Foreman at the Kawasaki Plant in fiscal year 2016 as well as the Foreman at the Takaoka Plant and the Foreman at the Onomichi Plant of Aronkasei in fiscal year 2017. A "Foreman" is a "key person in on-site safety" and this award is granted in recognition of the continuous and concerted efforts of on-site workers to maintain zero-injury status. We are encouraged and motivated by winning this award for three consecutive years.

Foreman Tsurumoto expressed his determination in the winner's message that his mission is to create an accident-free and rewarding workplace, in the midst of drastic changes in the work environment where there is less senior workers and more new workers.



Akito Tsurumoto
Manufacturing Section



Product Safety



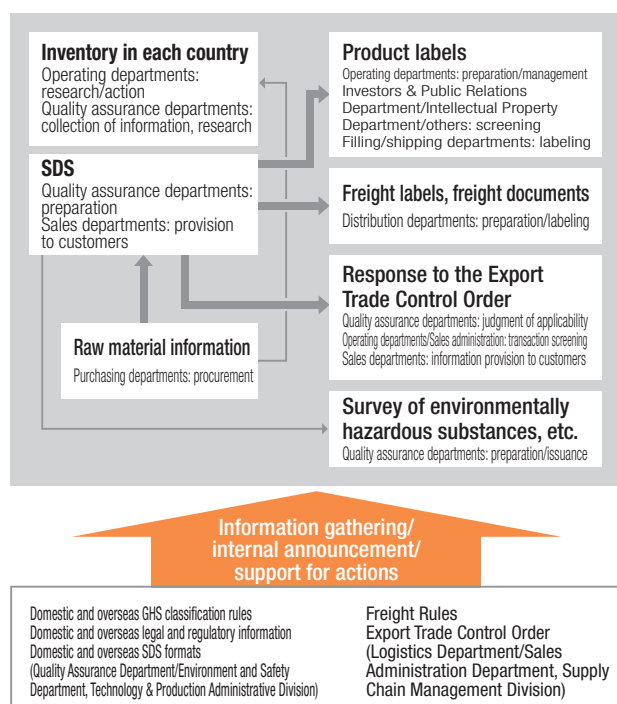
P Targets for 2018	D Results in 2018	C Achievement	A Targets for 2019
<ul style="list-style-type: none"> ● Preparation and registration of purchase specifications ● Consistent response to legal revisions regarding chemical management 	<ul style="list-style-type: none"> ● Preparation of purchase specifications completed as planned ● Consistent response to legal revisions regarding poisonous and deleterious substances control 	★ ★ ★	<ul style="list-style-type: none"> ● Proper response to laws and regulations regarding chemical management ● Stable purchase of materials

Appropriate Management of Chemical Substances

Chemicals Safety Management System

In the 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. We also make necessary responses to new substances in the inventory of each country.

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 spread in various countries around the world including Japan. We are updating SDS and 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 2018	D Results in 2018	C Achievement	A Targets for 2019
● Reduction in the total number of complaints	● 3% increase from the previous year	★	● Reduction in the number of complaints

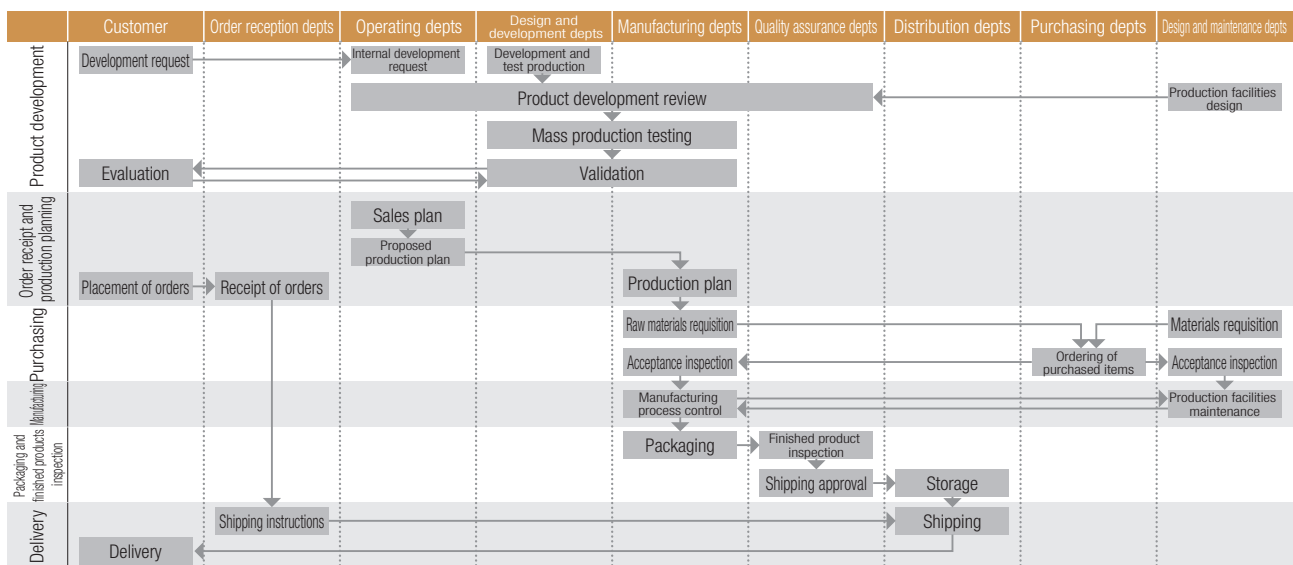
Quality Assurance System

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 management system. When claims are made, we offer a timely response based on the principle of three actuals (actual place, actual part, and actual situation). In addition to setting a target for the number of complaints, we have determined quality issues according to the actual status of the respective plants and departments

(strengthening of manufacturing process management and improvement of quality of analysis) to perform activities that align with the determined priority.

Moreover, we focused our efforts last year on on-site audits for products manufactured by subcontractors in addition to those manufactured by ourselves, and provided suggestions such as on process improvement measures, leading to an improvement in quality performance.

Quality Assurance System

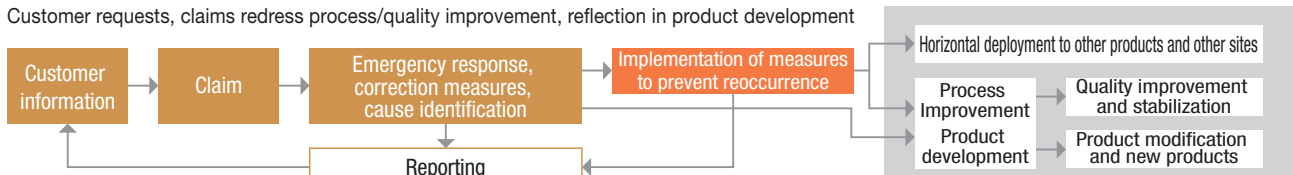


Initiatives in Response to the Voice of the Customer

In regard to opinions of our customers, we strive to actively respond to not only complaints and claims but also requests on product quality. Considering a customer request as an opportunity to make improvements such as product upgrade, process improvement, work renovation, and facility repair, we enhance the level of quality management from a broad perspective.

In recent years, customers are seeking a higher level of assurance and standards. To respond to their requests, we strive to reinforce the cooperative framework between relevant plants in performing various activities in an effort to further strengthen the quality assurance system.

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





Physical Distribution Safety



P Targets for 2018	D Results in 2018	C Achievement	A Targets for 2019
<ul style="list-style-type: none"> Reduction in the number of physical distribution problems 	<ul style="list-style-type: none"> The number of problems increased by 18% from the previous year No serious problems 	★	<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.



Conference with carriers

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. In these meetings, matters such as the cause of and countermeasures for the problems as well as any issue in the measures taken are discussed in an aim to prevent similar accidents.

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 respond to a case where there is a defect in a valve when receiving the delivered dangerous/poisonous products as well as to confirm emergency contact procedures and methods to secure safety and evacuate, etc. 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



Valve operation practice (in the case of a defect found in a valve)

In-house training sessions on transportation

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 October 2018, 92 people participated in the session titled "Briefing session on shipping/aerial transportation of hazardous materials," which was held by connecting the head office with each site. In addition, we strive 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 Group.

Details of in-house training session (held in October 2018)

1. Newspaper article on damage caused by a typhoon
2. Sample displays including nameplates
3. Invoice of dangerous goods (shipping transportation)
Declaration form of dangerous goods (aerial transportation)
4. Rules on shipping transportation and storage of dangerous goods (Appendix 1)
Rules on dangerous air cargo
5. Example classification of dangerous goods
6. Certificate of UN containers
7. Regulations on isolation
8. Conclusion



Human Resources



P Targets for 2018	D Results in 2018	C Achievement	A Targets for 2019
<ul style="list-style-type: none"> Employment rate of persons with disabilities of 2.4% 	<ul style="list-style-type: none"> Achieved employment rate of persons with disabilities of 2.99% 	★ ★ ★	<ul style="list-style-type: none"> Maintenance of employment rate of persons with disabilities of 2.4% or higher
<ul style="list-style-type: none"> Promotion of work-life balance (achievement of an average annual leave usage rate of 100%) 	<ul style="list-style-type: none"> Targets not achieved, as the average annual paid leave usage rate was 88.8% on a group-wide basis 	★ ★	<ul style="list-style-type: none"> Promotion of work-life balance (achievement of an average annual 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 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)
<ul style="list-style-type: none"> Maintenance and improvement of mental and physical health (holding mental seminar; reducing overwork/long-time work; 100% uptake rate for those who need reexamination) 	<ul style="list-style-type: none"> Held mental health training in two sites Began activities to reduce long-time work by analyzing the attendance data of IC card readers 67% uptake rate for those who need reexamination 	★	<ul style="list-style-type: none"> Promotion of health management (reduction of the number of persons who are on long-term absence due to mental problems; reducing overwork/long-time work; increasing the rate of persons who maintain appropriate weight; decrease of smoking rate; 100% uptake rate for those who need reexamination)

Respect for Human Rights

Human Rights Protection Initiatives

○ Respect for Human Rights and Harassment Countermeasures

The Group respects fundamental human rights and strives to establish an environment where the diversity of human resources, including seniors, child-rearing women, and employees with foreign citizenship is respected and where everyone can maximize their potential. 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.



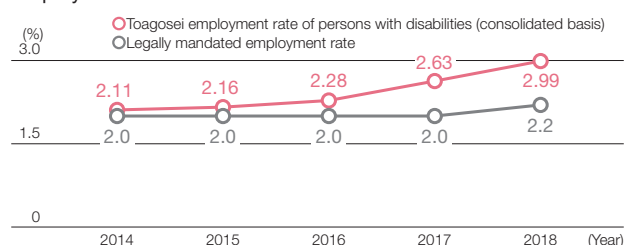
Human rights seminar (Tokushima Plant)

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 2018 was 3.04% for Toagosei Co., Ltd. and 2.99% for the Group as a whole. A total of 52 persons with disabilities work in the Group, 17 of whom have severe disabilities. In 2019 and beyond, we will continue to cultivate a workplace environment where persons with disabilities can work with peace of mind.

Employment Rate of Persons with Disabilities



○ Employment of Older Persons

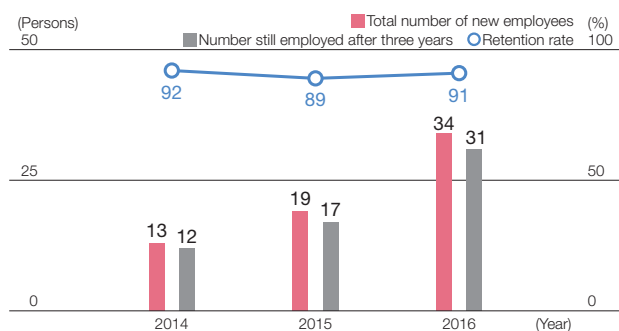
The Group is actively enhancing measures for the employment of older persons in light of revision of the pension system and other factors. We raised the mandatory retirement age from 60 to 65 in April 2013 to respond to a change in the age of eligibility for public pensions and are endeavoring to utilize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

Human Resources Development

Recruiting Activities

The 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 Group is strengthening its high-value-added businesses and implementing a growth strategy that includes overseas development. We consider that each individual employee is the source of power to achieve the Group Vision and aim to maximize and expand the latent potential of each individual.

To develop excellent, highly motivated human resources who will drive the Group's growth and support employees pursuing self-growth, we conduct 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.

Development of Young Employees

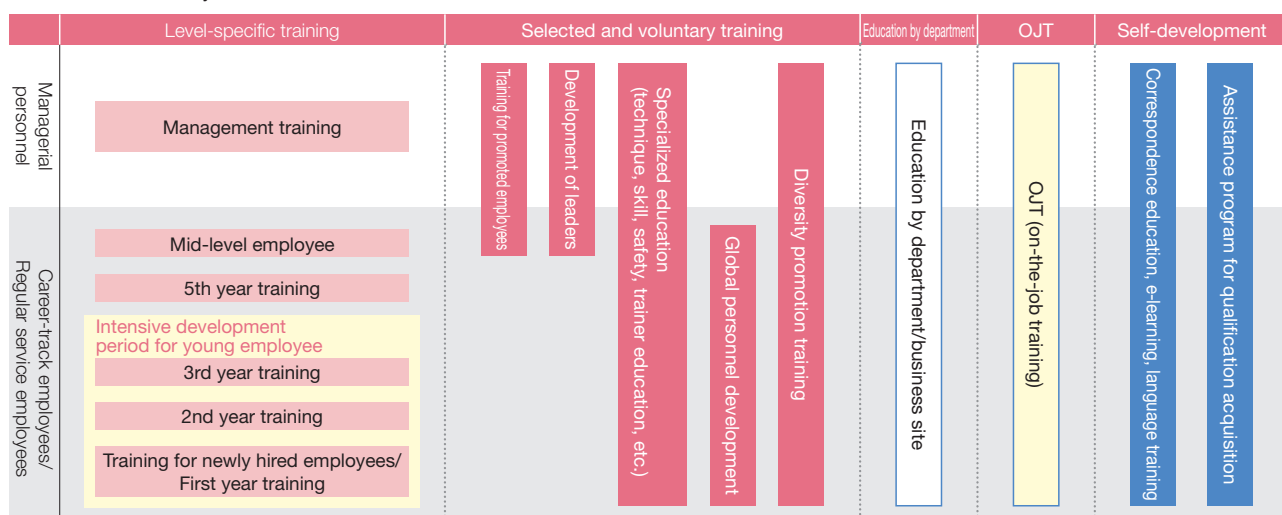
The Group focuses on developing young employees in the hope that they will become a substantial part of workforce at an early stage. Having positioned the first three years after joining Toagosei as the intensive development period, we offer them step-by-step and level-specific training until the third year to improve their basic abilities as a member of society and other skills necessary to perform their duties. In our programs, we encourage trainees to work closely with their colleagues who joined Toagosei at the same time so that their amicable rivalry leads to the improvement of future behaviors and self-growth.

We aim to develop young employees who can think independently and proactively make actions by involving other people.



Second year training for career-track employees

Chart of education system



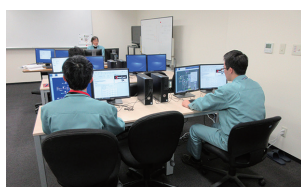
Technical Education

To further strengthen development of personnel equipped with skills that contribute to stable workplace and actively pass down our technologies and skills to the next generation, we have assigned employees responsible for technical education to the Nagoya Plant, enhancing specialized education in technical departments (operation, equipment, unit operation, safety, etc.).

Group training includes an interactive program that enables participants to not only acquire basic knowledge, but also deepen their understanding by exchanging views about the workplace equipment they choose to study.

In 2018, we introduced a simulator for process education and training in an aim to offer more practical education. Using this simulator, trainees can learn about not only operating methods but also process principles. By offering simulated operation similar to the behavior of an actual plant, this training increases a trainee's analytical ability and response capability, such as in detecting abnormal signs of plant operation, performing operation in abnormality and in detecting causes of the deformity.

We are also developing personnel who ensure safe and stable operation by enhancing safety education including experience-based training and hazard prediction training.



Training with a simulator



Safety awareness training

Self-development and Career Development Assistance

The Group has prepared distance education, e-learning courses and online video 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 complete such training by setting up an assistance program that covers training fees and establishing an environment that facilitates employee self-development. Furthermore, we conduct TOEIC tests and actively support acquisition of public qualifications, using them to support the career development of employees.

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.

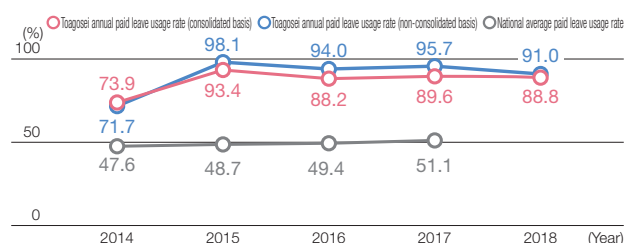
Creating an Employee-friendly Environment

Promotion of work-life balance

The Group aims to realize work-life balance for employees. We strive to reduce long working hours for our employees so that work and family life are well-balanced and even have positive effect on each other.

We stressed the importance of efficient working ahead of the general public. A no-overtime day was implemented in 2011, and in 2015, we promoted the use of annual paid leave and reduced designated work hours of full-time daytime workers by 15 minutes. In 2017, we also established a system to visualize the hours spent at the office by introducing an entry control system with an IC card reader. As a result of these initiatives, the Group's annual leave usage rate in and after 2015 drastically improved to around 90%.

Annual Paid Leave Usage



* National average paid leave usage rate: 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.

Promotion of Flexible Work Style

We 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.

We have also introduced a work-at-home system to encourage employees to reconcile a comfortable life and work by enhancing productivity. This system is applicable to not only employees who raise children and provide long-term care, but also to those whose work is expected to be more productive and efficient by working at home.

In addition, we have introduced a system allowing employees to retain up to 40 days of annual paid leave even after the expiry of the statutory period of validity. The retained leave can be used for non-work related injury or sickness, long-term care, childcare hours (employees who raise elementary school children in sixth grade or under), and volunteer work.

Leave System for Spouse Relocation and Reentry System

To assist employees in balancing work and family life, in January 2017 Toagosei introduced the leave system for spouse relocation, which allows leave of up to three years for employees accompanying their spouses on overseas assignment, as well as 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, half-day paid leave, and leave for refreshment
- Flextime work system, short-time work system
- Dormitory and company housing system
- Work-at-home system
- Long-term care leave for a period longer than the statutory number of days



Employee dormitory in Tokai City, Aichi Prefecture

VOICE » Use of the Leave System for Spouse Relocation and Reentry System

Because my husband was relocated to the U.S. for one and a half years, I used the Leave System for Spouse Relocation and Reentry System.

During the period of leave, I studied language and culture on weekdays by learning English, self-studying, and communicating with local people at events held in the neighborhood.

I was grateful to have an opportunity to concentrate on raising my children with my husband's cooperation even while he was assigned abroad. Moreover, it was a valuable experience to visit national parks and cities on the east coast, places we could not have visited easily if we were living in Japan.

I would like to utilize the language skills that I acquired during the period of leave in my future work.



Tomoka Yamada
Inorganic Products Technology
Development Section,
Technology Development
Department, Nagoya Plant

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 2016 and has started development of a structure to enable women to fully demonstrate their abilities and formulated an employer action plan in March 2016 for proactively promoting active participation by women. The essential points of this plan include objectives of achieving a female hiring ratio of 30% or higher each year and tripling the ratio of female managers by January 1, 2021 (compared to January 1, 2016).

Eruboshi Certification

In May 2016, Toagosei has obtained certification (Grade 2) 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

Since 2015 Toagosei has assigned women to workplaces operating under the shift working system at manufacturing sites, where no women had been appointed previously, and continues to expand the job categories available to women. This assignment has promoted reduction of workload and reviewing of the measures to improve the work environment from the unique perspective of women. The Company has introduced tools that can be operated even with a small amount of force and power assist apparatuses that can reduce the labor of transporting heavy items.

Tours for Female Junior and Senior High School Students

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, we held plant and research laboratory tours annually for female junior and senior high school students from 2016 to 2018.

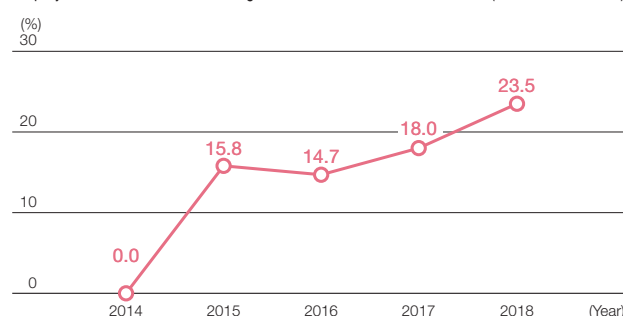
In 2018, we held plant and laboratory tours as part of "*likamo! Rikei*" Project for Promoting STEM Women," an initiative organized by the Gender Equality Division of the Bureau of Community and Cultural Affairs of Aichi Prefecture to fully familiarize female students with scientific fields through corporate press tours and festivals.

Through the tours, we conveyed 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.



Laboratory visit for female junior and senior high school students

Employment Rate of Women among New Graduates in Past Five Years (consolidated basis)



VOICE » Various career tracks enabling employees to make use of their abilities

I studied science and joined Toagosei as a mid-life hire, regular service employee to engage in clerical work. After serving as a job leader of regular service, I changed my job category to career track. I had never anticipated aiming to work in a managerial position, because I took childcare leave twice for a total of about three years. However, I took the promotion test with the support of my colleagues. Currently, I am mainly responsible for the Group's fund management as the General Manager of the Financial Department in the Group Administrative Division. Although my working time is limited as I also have to raise my children, I have made continuous efforts to produce output as much as possible within my working hours and build on even the smallest accomplishments. I am committed to establishing a track record that proves that anybody highly motivated can flourish at Toagosei.



Mika Hamano
Manager, Financial Department,
Group Administrative Division

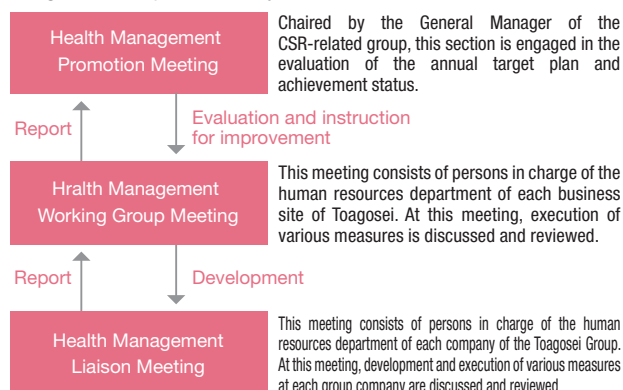
Approach to Health Management

Health Management Promotion System

Considering promotion of maintenance and improvement of employee health as an investment that leads to improved corporate profits in the medium term, the Group has established a standing and dedicated group, which has since been conducting and promoting healthcare administration in a strategic, systematic and continuous manner. We aim to enhance our corporate value by improving productivity and creativity, as well as by suppressing increased medical expenses and the risk of absences due to sickness through such initiatives.

Centering on the Health Management Promotion Section established in the Human Resources Department in 2018, we operate a PDCA cycle through various committee meetings. We strive to solve the problems of employees suffering from unhealthy conditions and take preventive measures in cooperation with the Health Insurance Society, aiming to realize zero employees on long-term leave due to lifestyle-related diseases and other illness by 2025.

Image chart of promotion system



Employee Health Promotion

Toagosei conducts comprehensive medical examinations and periodic medical examinations for the purpose of employee health management. Each business site engages in unique activities, such

as holding health guidance sessions given by hygiene staff and health seminars presented by a doctor, as well as offering recreational activities for health improvement to raise employee awareness of health management. In 2018, we started providing a subsidy that covers the cost of mass vaccination of influenza to members of the Health Insurance Society in support of the daily health improvement of our employees.



Mass influenza vaccination

Mental Healthcare

To enable employees to ascertain their own stress level, we conduct an annual stress check and strive to create workplaces where people do not develop mental health issues. To this end, based on the results of the stress check, we analyze the tendency and causes of stress in each workplace, provide feedback to supervisors of these workplaces, and take measures such as providing mental health training for managers who play a major role in the care of the workplace. Furthermore, we have set up a consultation counter to enable employees and their family members to anonymously receive counseling without any involvement of the Company. This system helps employees receive counseling services with ease.



Mental health training for managers

Topics

Certified as a 2019 Health and Productivity Management Organization (White 500)

In February 2019, Toagosei was certified as a 2019 Health and Productivity Management Organization (White 500). This program is organized by the Ministry of Economy, Trade and Industry (METI) in collaboration with Nippon Kenko Kaigi, which consists of leaders from economic circles, medical groups and local municipalities, for the purpose of honoring corporations that perform outstanding health management.

With the goal of promoting healthy management, the Group has implemented initiatives to further promote the maintenance and improvement of employees' health since 2018. Considering that the physical and mental health of each individual employee is an important asset, we continue to strengthen the practice of healthy management.





Enhancement of Contributions to Society and Communication



P Targets for 2018	D Results in 2018	C Achievement	A Targets for 2019
<ul style="list-style-type: none"> Charitable donations and gifts beneficial to society Participation in and support for nature conservation, beautification and greening, and culture and sports activities Participation in the Human Resources Fostering Program in Chemistry, diversity promotion, and other projects 	<ul style="list-style-type: none"> Donations made for victims of 2018 Japan Floods in Hiroshima Prefecture and Onomichi City 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 Participation in Japan Initiative for Marine Environment (JaiME) Participation in and sponsorship for the Human Resources Fostering Program in Chemistry continued Donations to the "Tobitate! (Leap for Tomorrow) Young Ambassador Program" continued Donation to International Chemistry Olympiad business Co-sponsorship for Minato City Marathon and T league 	★ ★ ★	<ul style="list-style-type: none"> Contribution to the development of next-generation personnel through support for academic research, culture & art, and sports Promotion of 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 	★ ★ ★	<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 Holding plant and research laboratory tours and other events 	<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 Holding plant and research laboratory tours and other events

Social Contribution Activities

Social Contribution Committee Activities

The 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.



Aichi Prefecture "Forest Growing Activities by Aichi-based Companies" (Nagoya Plant)



Tokushima Prefecture "Tokushima Forest Growing Collaboration Project" Ceremony for concluding the partnership agreement (Tokushima Plant)

Activities for aesthetic maintenance and conservation of biodiversity, etc.

Site	Activity
Each site of Toagosei Group	<ul style="list-style-type: none"> Garbage cleaning, planting tree activities, etc. Participating in the "CO₂ Reduction/Light Down Campaign" in support of "Cool Choice" initiative 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 Sennenmori (1,000-year Forest of Takamaru Mountain)" and "Tokushima Forest Growing Collaboration Project" volunteer activities for forest thinning and improvement
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"> Clean-up activities for Jiyang Lake Ecological Garden

Topics

Sponsor of T League

In November 2018, we became an official sponsor of T League with the aim of increasing recognition of the Toagosei Group by enhancing our CSR activities and sponsoring sports. Through our support for T League activities, we will help foster future athletes and contribute to the promotion of sports culture.

* T League: New table tennis league operated by T League (general incorporated association).

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Enhancement of Communication

Harmonious Coexistence with Local Communities

The 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.



An on-the-spot class offered to a primary school (Oita Chemical)



Plant tour of technical high school students (Sakaide 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.



Internships for local university and technical college students (Takaoka Plant)

○ 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

Awarded Medal with Dark Blue Ribbon

Since 2016, Toagosei has supported by donation the "Tobitate! (Leap for Tomorrow) Young Ambassador Program, a collaborative initiative between the government and the private sector that supports overseas study" (Community to Develop Global Human Resources), which was established by the Japan Student Services Organization (Independent Administrative Agency). In recognition of our support for the public interest, we received the Medal with Dark Blue Ribbon* at an award ceremony held on March 5, 2019. We will continue internal development of human resources to realize Toagosei's overseas expansion and other growth strategies, and actively cultivate global human resources that support Japan's future, while making a contribution to society.

*The Medal with Dark Blue Ribbon (konju hōshō) is an award of honor granted to individuals or parties who donate private funds for the public interest.





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