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CSR Report  
2017



Printed on paper made with wood from forest thinnings. "Morino Chonai-Kai" (Forest Neighborhood Association) — Supporting sound forest management.

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**Responsible Care**

At every stage of their operations, companies dealing with chemicals must ensure that the environment, safety and health are safeguarded. This starts with the development and manufacturing of chemicals, and goes all the way through to distribution, use and final disposal after consumption. It also involves publishing the results of those activities, being engaged and willing to communicate with society. The chemical industry refers to this conscientious activity as Responsible Care (RC).



**About This Report**

The purpose of the CSR Report 2017 is to provide stakeholders with information about Mitsubishi Gas Chemical Company, Inc. (MGC) and our corporate social responsibility (CSR) activities, to broaden understanding about MGC and its activities.

The following guidelines were referenced during the creation of this report to provide an easier to understand layout using clear and concise language. The MGC Group's Eco-friendly Products Permeating Our Daily Lives section features seven products and technologies that contribute to reducing environmental impact and creating a positive environment in such ways as cutting food waste and reducing substances that pollute the atmosphere. In addition, our vision for CSR activities based on our philosophy and initiatives and outcomes toward "Creating values to share with society" are highlighted in the MGC Group and CSR section. We openly welcome your honest opinions and feedback about the contents of this report.

MGC stands firmly committed to promoting further stakeholder engagement through the appropriate sharing of information.

**Scope of This Report**

**Organizations included**

All MGC offices in Japan. The activities of the entire MGC Group and individual subsidiaries are also covered in certain sections of the report.

**Reporting period**

April 1, 2016 through March 31, 2017 (includes some activities after April 2017). However, Responsible Care (RC) activities are included from January 1, 2016 – December 31, 2016 (includes some RC activities after January 2017).

**Reference Guidelines**

- Ministry of the Environment, "Environmental Reporting Guidelines (2012)"
- Ministry of the Environment "Environmental Accounting Guidelines 2005"
- ISO 26000

**Publication Information**

Date of publication: December 2017

**Disclaimer:**

This report contains past and present facts, in addition to information about expectations regarding social conditions, management plans and policies of the company together with anticipated results. These assertions or assumptions are based on the information available at the time of drafting, however unforeseen circumstances may lead to unexpected social conditions or result in changes to business activities which are different to those expressed here.

MGC will pursue the Group Vision of "Creating values to share with society" to fulfill the expectations of all of our stakeholders



**Toshikiyo Kurai**  
President and Representative Director

**Q1** First, could you provide an overview of MGC Group's business and tell us about its business performance in FY 2016?

**A1** We recorded all-time high profit due to an improvement in the revenue balance thanks to structural reform and other measures.

MGC Group supplies creative products and technologies, primarily in our four core business segments called the Natural Gas Chemicals Company, Aromatic Chemicals Company, Specialty Chemicals Company and Information & Advanced Materials Company under the MGC Philosophy for Being, which states "MGC contributes to societal growth and harmony by creating a wide range of value through chemistry."

In FY 2016, we experienced substantial profit growth as ordinary income and net income recorded all-time highs. While this was due in part to the blessing of an upturn in market conditions for commodityproducts, it can also be said that it is the outcome of continuous efforts to date, including the improvement in our revenue balance through the advancement of structural reform. Going forward, we will concentrate our efforts on building a resilient corporate structure that is not affected by the external environment with a desire to achieve stable growth.

**Q2** Could you tell us about the progress of the mid-term management plan MGC Advance2017?

**A2** We promoted a revision of our business portfolio aimed at stable growth.

Under MGC Advance2017, our mid-term management plan, we are aiming to achieve a balanced business portfolio (optimization of the business structure) by enhancing the profitability of existing businesses, especially core businesses, in addition to concentrating efforts on restructuring underperforming businesses and developing and creating new businesses. In FY 2016, with the aim of enhancing profitability, we expanded production capacity for special polycarbonates and decided to increase production capacity for glycidyl methacrylate. We also promoted the restructuring of underperforming businesses and concentrated efforts on establishing structures that will accelerate the creation of new businesses.

**Q3** | Could you tell us about progress in “creating new businesses” in more detail?

**A3** | **We have promoted organizational restructuring aimed at the speedy creation of new businesses, primarily in the “medical/food” field.**

MGC Group has established the five target fields of energy, information/communications, mobility, medical/food, and infrastructure as business areas to focus on.

Of these, we are concentrating in particular on the field of “medical/food,” which goes a little beyond an extension of our existing businesses. MGC Group has previously leveraged the culturing technology it has nurtured to develop businesses related to health food ingredients and monoclonal antibody pharmaceuticals. In order to further speed up business development in this field going forward, we established a new Life Science Division in the Natural Gas Chemicals Company in October 2016 (see page 16). We are also developing an array of “medical/food” related businesses such as oxygen absorbers, food packaging materials, and medical packaging materials at our other companies. Thus, we aspire to amass these technologies and products across the Group, without being restricted by organizational territories, thereby achieving synergies.

In order to promote the creation of new businesses, and not only in the “medical/food” field, it is important to adopt an approach of “learning about technology we do not have from others” rather than insisting on closed innovation. In FY 2016, we implemented alliances with external partners, including participation in an investment partnership run by Universal Materials Incubator Co., Ltd., establishment of a monoclonal antibody pharmaceuticals manufacturing company in a joint venture with Nippon Kayaku Co., Ltd., and investment in Veritas In Silico Inc., which conducts research into nucleic acid pharmaceuticals.

As for internal organization, meanwhile, we established the Business Strategy Division in April 2016 following the Advanced Business Development Division established in FY 2015. There are many cases of overlap in the fields of new businesses and existing businesses. Therefore, going forward, the Business Strategy Division will perform coordination from the perspective of total optimization, including determination of the department in charge and the allocation of management resources.

**Q4** | Could you tell us about Group management?

**A4** | **We are implementing measures aimed at achieving our vision in each of the areas of management streamlining, governance, and diversity of human resources.**

We have been working on the introduction of the Business Management Unit (BMU), which regards MGC divisions and Group companies that have closely related businesses as single units in order to ensure the Group’s best awareness and action based on shared values and objectives at Group companies, which are responsible for different businesses in different regions worldwide. Moreover, we have also established an integration study committee aimed at the integration of the three main trading companies. We will further strengthen and enhance the functions of the trading companies, positioning them on the frontline of the MGC Group, which translates the strength of chemicals into solutions for social challenges. Going beyond mere streamlining, we expect the trading companies to become MGC Group’s powerful partners, which will include gathering information from around the world.

In addition to strengthening MGC Group management in this way, we aim to be a corporate group that continues to gain a high level of trust from society due to highly transparent management through corporate governance.

We also value the diversity of human resources, which is the source of our capacity for growth. We would like to make use of “differences” such as nationality, language, culture, age, sex, expertise, and values in enhancing competitiveness and growth. For example, at present, for MGC alone about 80% of our employees are technical-related. While this can be a strength, a uniformity of ideas is also a weakness. Corporate development requires human resources that play a diversity of roles. We also need to have a broad perspective with multi-faceted viewpoints and ideas in order to continue producing technologies and products that are useful to society. Therefore, we promote human resource exchanges and technical collaboration between Group companies. At the same time, we have been increasing the opportunities for employees to encounter different ideas and cultures through such means as providing marketing training to technical-related human resources and having them take advantage of the program for short-term training overseas.

Through these initiatives, we will foster a corporate culture in which people working at MGC Group respect diversity and collaborate with partners inside and outside the Group that have diverse strengths, enabling the creation of synergies.

**Q5** | Could you tell us what kind of results there have been with regard to “Creating values to share with society”?

**A5** | **We have been able to provide society with new value in diverse areas, including technical innovation, solution of environmental challenges and contribution to local communities.**

It could be said that “Creating values to share with society,” stated in our Group Vision, is the essence of “MGC contributes to societal growth and harmony by creating a wide range of values through chemistry,” which is MGC Group’s Philosophy for Being. The flip side of this seems harsh, but we have a sense of crisis about whether society really needs products that keep losing money, and we have promoted structural reform.

Meanwhile, as an example of the value created through our products, in 2016 our special polycarbonate used for smart phone camera lenses and other applications received the Ichimura Prize in Industry for Outstanding Achievement, which is presented to products that have made outstanding and extensive contributions to society (see page 15). This product has a high share of the global market as a plastic that contributes to the miniaturization and high resolution of camera lenses, and it was an excellent boost for the entire company that the results of some ten years of persistent research and development have been highly rated by society. In addition to taking pride in this award, we are considering whether we can take any initiatives that utilize the prize money in some form for social contribution.

As for products that help solve social challenges, we have selected and published “MGC Group environmental contribution products” (pages 36-38). Achieving international targets under the Paris Agreement and the Sustainable Development Goals (SDGs) will require innovation, and chemicals have great potential for making a contribution to this innovation. We expect that presenting how MGC Group’s chemicals are helping to reduce environmental impact forms the first step in unlocking this potential.

Further, QOL Innovation Center Shirakawa commenced operations in Shirakawa City, Fukushima Prefecture in April 2017 (see page 16), raising expectations that it will generate local employment, not to mention developing and manufacturing products that will lead to QOL (quality of life) improvements. In Fukushima Prefecture, we are also taking part in a natural gas thermal power generating project in Soma City, and we hope that these projects overall will support reconstruction from the earthquake disaster which occurred in 2011.

**Q6** | Could you tell us about initiatives to ensure safety, including at Group companies outside Japan?

**A6** | **We will share our safety philosophy throughout the Group and continue working to be accident- and disaster-free.**

MGC has been promoting the Bridge safety project under the safety philosophy that the top priority of our business is ensuring safety. In conjunction with this, the MGC Group has been working together with the goal of achieving zero accidents and zero occupational injuries by sharing case studies of accidents and occupational injuries as well as best practices at individual companies through the MGC Group Environment and Safety Council.

Thanks to these efforts, all MGC plants were completely accident-free\* in 2016. This is certainly something to be proud of, but past safety is no guarantee of future safety. Going forward, it is important to strengthen our efforts to ensure safety and maintain our awareness of continuing to be accident- and disaster-free.

Furthermore, as the ratio of overseas production rises, it is essential to share our safety philosophy and put it into practice at overseas sites as well. We will expand the efforts at our domestic sites, which are the mother plants, overseas, too, to foster a Group-wide culture of prioritizing safety.

\*Zero accidents, both with and without lost working time.

MGC Group hopes to realize sustainable growth in prosperous coexistence with a wide range of stakeholders, including customers, shareholders and investors, employees, business partners such as suppliers and alliance partners, and local communities. We will continue to welcome honest feedback and requests from our stakeholders.



# Operating a Global Business in a Truly Wide Range of Segments, from Basic Chemicals to Fine Chemicals and Functional Materials

## Corporate Information (as of March 31, 2017)

**Company name** MITSUBISHI GAS CHEMICAL COMPANY, INC.  
**Head office address** Mitsubishi Building, 2-5-2 Marunouchi, Chiyoda-ku, Tokyo 100-8324  
**Established** January 15, 1918  
**Incorporated** April 21, 1951  
**Capital** ¥41.97 billion  
**Number of employees** 8,034 (consolidated), 2,323 (non-consolidated)  
**Number of consolidated subsidiaries** 71  
**Main business sites in Japan**  
**Branch** Osaka Branch  
**Overseas offices** Shanghai Office, Taiwan Office  
**Research institutes** Tokyo Techno Park (Tokyo Research Laboratory, MGC Chemical Analysis Center, Research and Development Center), Niigata Research Laboratory, and Hiratsuka Research Laboratory  
**Plants** Niigata Plant, Mizushima Plant, Kashima Plant, Yokkaichi Plant, Yamakita Plant, Naniwa Plant, and Saga Plant

## Domestic Network

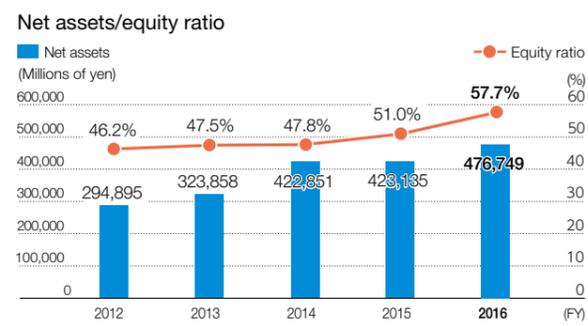
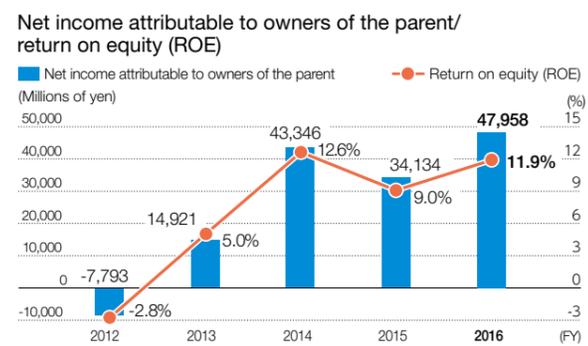
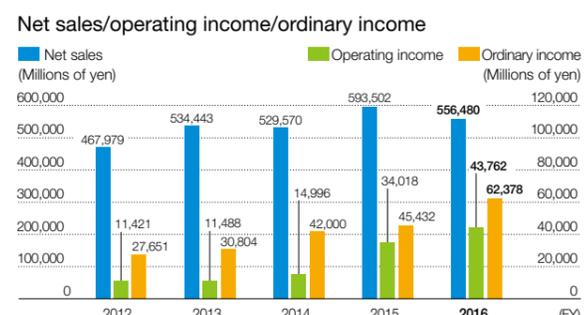
- Head Office
- Niigata Research Laboratory
- Niigata Plant
- Kashima Plant
- Tokyo Techno Park
- Hiratsuka Research Laboratory
- Yamakita Plant
- Yokkaichi Plant
- Osaka branch
- Naniwa Plant
- Mizushima Plant
- Saga Plant

## International Network

- AGELESS (THAILAND) CO., LTD.
- BRUNEI METHANOL COMPANY SDN. BHD.
- CARIBBEAN GAS CHEMICAL LTD.
- KOREA ENGINEERING PLASTICS CO., LTD.
- JSP INTERNATIONAL GROUP LTD.
- METANOL DE ORIENTE, METOR, S.A.
- MGC ADVANCED POLYMERS, INC.
- MGC ELECTROTECHNO (THAILAND) CO., LTD.
- MGC MONTNEY HOLDINGS LTD.
- MGC PURE CHEMICALS AMERICA, INC.
- MGC PURE CHEMICALS SINGAPORE PTE. LTD.
- MGC PURE CHEMICALS TAIWAN, INC.
- MGC TRADING (THAILAND) LTD.
- MITSUBISHI GAS CHEMICAL AMERICA, INC.
- MITSUBISHI GAS CHEMICAL ENGINEERING-PLASTICS (SHANGHAI) CO., LTD.
- MITSUBISHI GAS CHEMICAL EUROPE GMBH
- MITSUBISHI GAS CHEMICAL SHANGHAI COMMERCE LTD.
- MITSUBISHI GAS CHEMICAL SINGAPORE PTE. LTD.
- PT PEROKSIDA INDONESIA PRATAMA
- POLYXYLENOL SINGAPORE PTE. LTD.
- PTM ENGINEERING PLASTICS (NANTONG) CO., LTD.
- SAMYOUNG PURE CHEMICALS CO., LTD.
- SAUDI METHANOL COMPANY (AR-RAZI)
- SUZHOU MGC SUHUA PEROXIDE CO., LTD.
- TAI HONG CIRCUIT INDUSTRIAL CO., LTD.
- THAI POLYACETAL CO., LTD.
- THAI POLYCARBONATE CO., LTD.



## Financial Highlights (consolidated)



\* Some MGC affiliates outside of Japan have been using International Financial Reporting Standards (IFRS) since FY 2015.

## Businesses and Main Products – Operating Eight Businesses through Four Companies

### Natural Gas Chemicals Company

**Methanol and Organic Chemicals Business**

The Methanol and Organic Chemicals business has an extensive line up of products that are useful for people's lives ranging from methanol and ammonia and their various derivatives which are basic chemical raw materials through to functional materials that form the raw materials for plastics, coating compounds, synthetic fibers, adhesive agents, artificial leather, pharmaceuticals, and agricultural chemicals.

**Energy & Resources Business**

The Energy & Resources business promotes operations inside and outside of Japan in search of energy for chemical manufacturing, including exploration and development for natural gas and oil in Niigata Prefecture. The Energy & Resources business is conducting a development project for clean, renewable geothermal energy in Akita Prefecture as well as new geothermal energy developments in Hokkaido and the Tohoku region.

### Aromatic Chemicals Company

**Aromatic Chemicals Business**

Our highly original product portfolio, which includes aromatic aldehydes, primarily metaxylene chains, and aromatic polycarbonates are used in intermediate materials for pharmaceuticals, agricultural chemicals and aromatics, resin raw materials, and additives. MX-Nylon helps to retain the freshness of food and beverages and reduce the weight of packaging.

**Foamed Plastic Business**

Our foamed plastic provides a range of performance benefits such as shock absorption, thermal and sound insulation with structural strength, chemical resistance and recyclability and very low weight. It is widely used in daily life and typical uses are food containers, residential insulation materials, industrial packaging materials, and automotive components, contributing to energy and resource savings, and conservation of the environment.

### Specialty Chemicals Company

**Inorganic Chemicals Business**

Our Inorganic Chemicals Business supplies hydrogen peroxide for industrial use, chemicals for use in the electronics industry and environmental chemicals based on hydrogen peroxide which have low environmental impact and diverse functions such as bleaching, disinfecting, oxidizing, and metal etching. We also offers monomers for ultra-high refractive index lenses and photoresist monomers.

**Engineering Plastics Business**

Engineering plastics, such as polycarbonate and polyacetal, have contributed to reducing the weight of automobiles and machinery components. Our Engineering Plastics Business also offers special polycarbonates for optical applications and polycarbonate sheet (film) which has advantages for surface processing technologies.

### Information & Advanced Materials Company

**Electronics Materials Business**

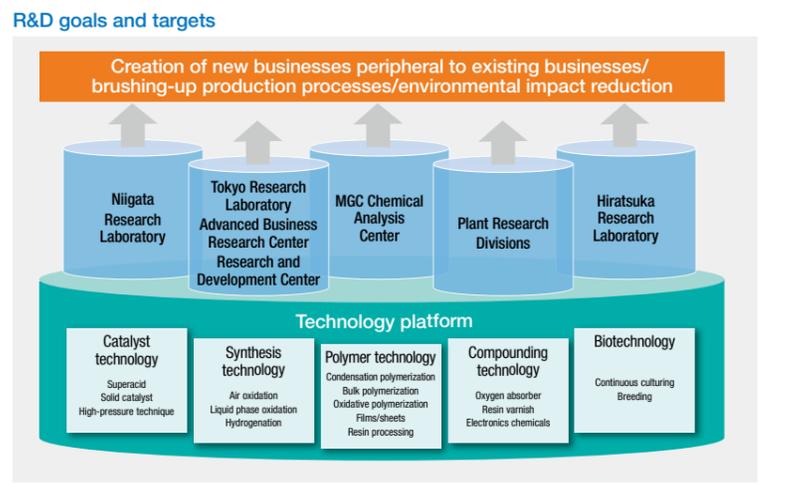
Our Electronics Material Business supplies materials for electronics including laminates for printed circuit boards (PCB) and support materials for drilling in the PCB manufacturing process. These products meet the stringent requirements of the PCB industry. In particular, BT laminates, which led to plastic semiconductor packages, have contributed to the evolution of semiconductor.

**Oxygen Absorbers Business**

The chemical principle of oxidation, where iron reacts with oxygen and rusts, has been put to use in a barrier film to absorb oxygen in a completely sealed container to protect foods against oxidation and deterioration. This product concept led to the development of AGELESS, the world's first oxygen absorber, which made MGC the pioneer of oxygen absorption technology.

## Research and Development Strategy and Structure

MGC's research and development activities are divided into Company R&D and Corporate R&D. Company R&D assesses changing market needs, and brings research laboratories and centers, plant research and technology divisions and marketing divisions together to undertake research and development in line with each company's business strategy. Corporate R&D aims to create new core businesses through the Advanced Business Development Division with a focus on research and development centered on Five Target Fields (See page 14) that leverage Group strengths from a medium- to long-term perspective.



## Profile of Mitsubishi Gas Chemical (MGC): MGC in Our Daily Lives

MGC is a chemical company engaged in a truly wide range of segments, from basic chemicals to fine chemicals and functional materials. In this section, we showcase MGC's products and technologies in energy, information/communications, mobility, medical/food, and infrastructure, which are the five target fields listed in the mid-term management plan MGC Advance2017.

## Energy/Infrastructure

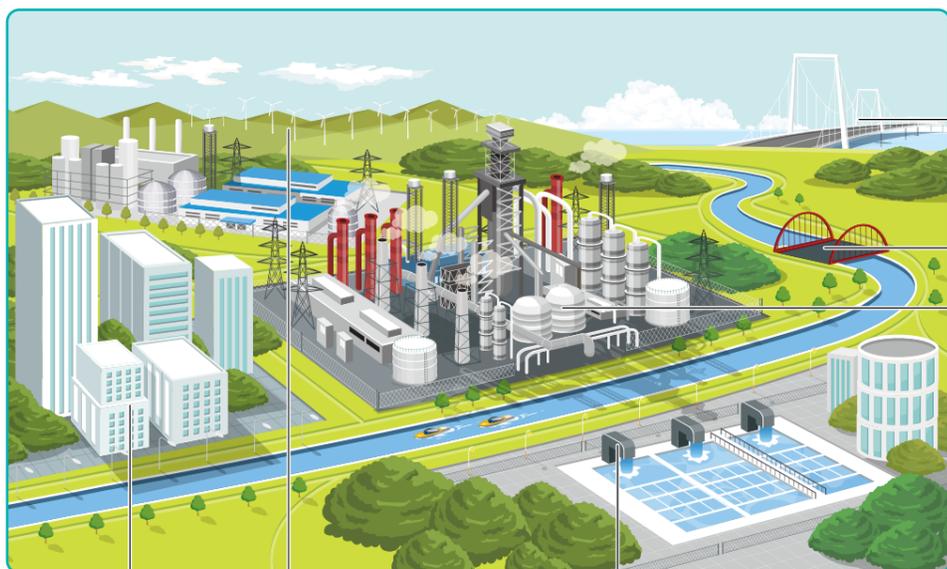
### Methanol

Used in plastics, coatings, and pharmaceuticals as a basic chemical, with diverse applications for derivatives too. MGC has methanol plants outside of Japan, supporting much of global demand.



### Geothermal power generation

MGC is developing clean geothermal energy with low CO<sub>2</sub> emissions during generation and promoting power generating projects (See page 38).



### Metaxylenediamine (MXDA)

Used in coatings for structures such as bridges, plant pipes, and tanks to prevent metal deterioration (See page 37).

### 1,3-Bis (Aminomethyl) cyclohexane

Outstanding weatherability, used in coatings and paints. Helps to extend the life of building walls and floors and wind turbine blades.

### Phthalic anhydride and Isophthalic acid

Used in plasticizing agents for softening PVC water pipes.

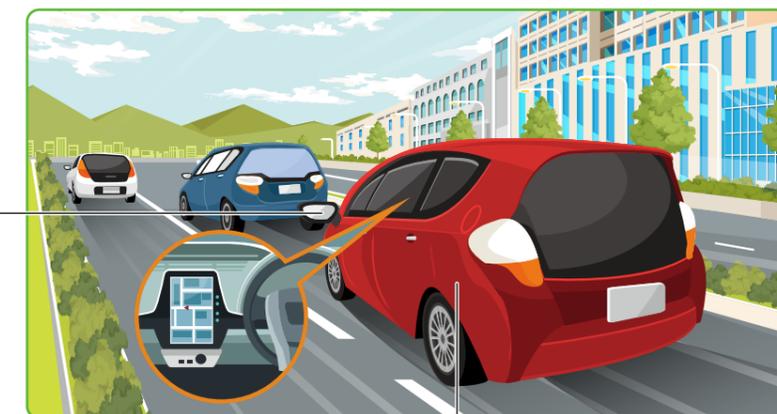
## Mobility

### Glycidyl methacrylate

Used in automotive topcoat paints.

### Foamed plastic

Widely used in automotive interiors and exteriors, including bumpers and seats. Light-weight foam with high shock absorbing properties has helped to enhance collision safety performance and improve fuel economy.



### Miscellaneous engineering plastics

Used as a component in door mirrors, headlights, car navigation systems, automotive interiors, and the camera lenses of drive recorders.

### Polyacetal

Used in interior components and fuel pump modules.

## Information/Communications



### BT materials for semiconductor packages

MGC was the first in Japan to develop this plastic PWB material that helps to make mobile devices more compact and high performance.

### Polycarbonate (Iupilon)

Used in touch panels and liquid crystal displays for mobile devices.

### EL chemicals

Used during the manufacture of semiconductors, flat panel displays, and printed wiring boards.

### Epoxy printed wiring board (PWB) material

Used in motherboards.



### Miscellaneous engineering plastics

Used in the outer casings, internal gears and photoreceptor drums of printers, copy machines, and other office automation equipment.



### Special Polycarbonate (Iupizeta EP)

Used in camera lenses. Features excellent optical properties, such as high transparency and a high refractive index, which contributes to higher resolution cameras (See page 15).

## Medical/Food

### Medical Sector



### Anaerobic culture system (AnaeroPack)

This system is used in microorganism testing at clinical labs to speed up diagnosis and contributing to research and development in the medical sector.

### Drying and de-oxydation agent (PharmaKeep)

Maintains low oxygen concentration levels and low humidity for pharmaceuticals, which ensures longer lasting quality.

### Peracetic acid (Diapower)

Used in the disinfectant and sterilization of medical devices and equipment.

### Food Sector

### Oxygen absorbers (AGELESS, AGELESS OMAC)

Absorbs oxygen in sealed containers to maintain a long shelf life, taste and freshness. Maintains the quality of food and helps reduce wastage (See page 36).

### Pyrroloquinoline quinone (PQQ)

A new food ingredient considered to be not only beneficial for the brain but also for beauty as well (See page 16).



### Heat-resistant polyester (ALTESTER)

Used for containers for jelly and the like because it is easily molded and is highly transparent.

### Hydrogen peroxide (Diapower HP)

Used to clean and disinfect food and beverage containers allowing longer shelf lives at room temperature.

### Aromatic aldehydes

Used as raw material for agricultural chemicals.



### Purified Isophthalic acid

Used in PET bottles.

### Polyamide (MX Nylon)

Used for hot tea and carbonated beverage bottles because of its excellent gas barrier properties.

### Neopentylglycol

Used in the outer film for PET bottles.

We work on CSR activities as a corporate group that “contributes to societal growth and harmony by creating a wide range of value.”

### MGC Philosophy

#### Philosophy for Being

MGC contributes to societal growth and harmony by creating a wide range of value through chemistry.

#### Management Concept

- MGC management is striving to create a place where there is job satisfaction and a dynamic group in which motivations and abilities are respected.
- Marketing that watches the world to ascertain needs, and expands/creates markets
- Creative research/development that deeply understands needs, and refines the seeds that will bring forth success
- Production activities that work toward improved technology, environmental preservation, ensure safety, and provide better products
- An open corporate culture in which each person can share their goals and actively participate

#### Principles of Conduct

##### As a Professional Group

1. Courage that does not shy away from change
2. Aim for lofty goals
3. Perseverance in achieving goals
4. Build team spirit with communication

#### Safety Philosophy

Ensuring safety is the top priority of our business activity.

### MGC Corporate Behavior Guidelines

Mitsubishi Gas Chemical Company, Inc. (“MGC” or “the Company”) aims to be a company that acts with sound judgment and maintains the trust and understanding of society. The Company operates under six behavioral principles, presented and explained below, and will share knowledge of these principles widely throughout Group companies.

Senior managers recognize that it is their role to embody the spirit of these principles, and while ensuring that they have a full understanding of the necessary information inside and outside the Company, they will take the initiative to promote a high level of corporate ethics, and strive to develop and operate an effective framework for this purpose through the internal control system. Furthermore, if an incident takes place in contravention of these guidelines, they will take command and fulfill their obligations for internal and external disclosure, strive to identify the cause of the incident and prevent its recurrence, and deal with the matter strictly and fairly in respect to all parties, including management itself.

- (1) MGC will ensure customer and consumer satisfaction and trust by providing high-quality products and services that are useful, safe and reliable.
- (2) MGC will voluntarily and proactively address environmental issues.
- (3) MGC will comply with laws, regulations and rules, and will conduct fair, transparent, appropriate and open business activities.
- (4) MGC will endeavor to ensure broad-ranging communication with society through appropriate disclosure of information.
- (5) MGC will engage in business activities that are useful for society, and actively contribute to society as a responsible corporate citizen.
- (6) MGC will provide comfortable and productive working conditions for employees, and will ensure a safe and rewarding working environment.

### Being a Corporate Group that Continues to Gain a High Level of Trust from Society

As members of society, corporations are supported by diverse stakeholders, including business partners, local communities, and employees. As a corporate group that continues to gain a high level of trust from society, MGC Group ensures the soundness of corporate activities through the implementation of compliance and exhaustive risk management in addition to actively promoting environmental and safety activities.

We formulated the MGC Philosophy and the MGC Corporate Behavior Guidelines as the guiding principles for putting these beliefs into action. Going forward, every single employee will strive to put corporate social responsibility (CSR) into practice in order to earn the trust and support of stakeholders.

### Innovative Technology and Research and Development

Environment-related expenses in R&D (FY 2016)

For environmentally friendly products

**2 billion yen**

For environmentally friendly production methods

**0.9 billion yen**

→ See page 6 for Research and Development Structure

### Product Development to Meet Social Needs

Product varieties

Approx. **150**

→ See pages 7-10 for MGC in Our Daily Lives

### Offering Highly Safe and Reliable Products and Services to Enhance Customer Satisfaction

Customer companies

Approx. **13,000** (domestically)

The number of manufacturers, domestically, who use and consume MGC products. Trading companies not included.

→ See page 17 for Together with Customers

### Promoting Fair and Appropriate Transactions

Suppliers

Approx. **2,500** (domestically)

→ See page 17 for Together with Our Business Partners

### Creating Safe and Comfortable Workplaces

Employees (consolidated)

**8,034**

→ See pages 17-20 for Together with Employees

### Appropriate Information Disclosure and Dialogue

Shareholders

**19,843**

→ See page 22 for Together with Shareholders and Investors

### Promoting Social Contribution Activities

Donations of chemistry experiment kits

Approx. **10,000**

→ See pages 21 and 22 for Together with the Community

### Contributing to Conservation of the Global Environment

CO<sub>2</sub> emissions reduction\*1

**26%** (over FY 1990 levels)

Chemical substance management and air pollutant emissions\*2

**14% reduction** (over FY 2014 levels)

\*1 GHG emissions intensity (CO<sub>2</sub> equivalent) \*2 PRTR substances

→ See pages 27-46 for Responsible Care and MGC

### Strengthening the CSR Management System

Employees receiving grade-specific training

**329** (MGC)

→ See page 23 for Corporate Governance

→ See pages 24-26 for Compliance and Risk Management

We are working on measures one by one based on the mid-term management plan aimed at “Creating values to share with society.”

**MGC Group's Strengths**

Unique proprietary technologies	Global marketing structure
Development structure to meet customer needs	Wide range of businesses
Strong relationships with leading clients	Production system consisting of multiple locations

**Mid-term Management Plan—Five Basic Strategies**

**1 Enhancing the profitability of existing businesses, especially core businesses**

Mainly invest management resources in core businesses to further enhance profitability.

	Core Businesses	Semi-Core Businesses
Natural Gas Chemicals Segment	Methanol/Natural resources and energy	
Aromatic Chemicals Segment	MXDA & MX Nylon/Foamed plastic	Aromatic aldehydes
Specialty Chemicals Segment	Hydrogen peroxide & electronic chemicals (EL chemicals)/ Polycarbonate & functional sheet film	Polyacetal
Information & Advanced Materials Segment	BT materials/AGELESS	

**2 Restructuring underperforming businesses**

We will find exit strategies for underperforming businesses.

**3 Developing and creating new businesses**

Create business in new areas meeting future market needs, in addition to surrounding areas of existing ones.

**New Business Development Measures**

- Establish Advanced Business Development division
- ¥50 billion for R&D investment
- Pursue M&A for growth
- Utilization of QOL Innovation Center Shirakawa

**4 Improving group-wide operational efficiency**

Maximize corporate value through group management action.

**5 Improving total enterprise quality in support of sustainable growth**

Achieve further improvement in quality that continuously enhances MGC Group's competitiveness.

**Main Themes**

- Minimizing losses using safe and stable operations
- Strengthening internal control and compliance systems
- Securing and training human resources for the future of the Group
- Realizing a healthy and strong financial position

We will create values to share with society and realize sustainable growth.

Based on our Philosophy for Being, which is “MGC contributes to societal growth and harmony by creating a wide range of value through chemistry,” we have constantly tried to create new technologies and value to grow in partnership with society.

In tandem with the globalization of recent years, the rapidly changing economic environment and social structures around us have become increasingly complex. While providing value to society based on our four companies, MGC aspires to continually create new businesses to solve social issues that arise in the future and deliver new value.

Based on these aspirations, MGC established “Creating values to share with society” as the Group Vision in FY 2015.

We will create not only economic but also social value, that is, value that is shared with society, and aim to realize sustainable growth.



**We achieved success in various projects aimed at realizing our vision for 2021.**

**Received the Chemical Industry's First Ichimura Prize in Industry for Outstanding Achievement for the Development of Special Polycarbonate**

In April 2017, we received the highest level Outstanding Achievement prize at The Ichimura Prize in Industry from the New Technology Development Foundation, which is presented to a technology developer or group that has made contributions and achievements toward progress in industry. The technology for which we

received the prize is the Development of High-refractive-index & Low-birefringence Special Polycarbonate Resin, and it is the first time the prize has been received by a chemical manufacturer which produces basic chemicals and derivatives.



Commemorative banquet for the Ichimura Industrial Prize



Commemorative trophy for the Ichimura Prize in Industry for Outstanding Achievement

**We also received the following awards for this technology.**

- 48th JCIA Technology Award: Grand Prize (Japan Chemical Industry Association)
- 65th Chemical Technology Award (The Chemical Society of Japan)

**What is High-refractive-index & Low-birefringence Special Polycarbonate Resin?**

Iupizeta EP series special polycarbonate developed by MGC is a material that combines optical performance, processability, and environmental performance which has a high market share as a resin that helps with miniaturization and high resolution, such as for camera lenses in smart phones and tablets. In addition to the Kashima Plant, it has been produced at the Niigata Plant since 2014.

Going forward, expansion is expected into diverse applications, including on-board automotive cameras, surveillance cameras, game consoles, medical devices, and drones, and we are increasing production capacity in line with demand, which includes boosting the production capacity of the Kashima Plant in 2016.



Pictures are images

**Main Features of Iupizeta EP Series**

<b>High refractive index</b>	High refractive index helps to thin the lens
<b>Low birefringence</b>	Low birefringence reduces optical distortion and helps to increase image clarity
<b>Excellent moldability and processability</b>	High fluidity and suitability for thin-wall molding process helps to thin the lens
<b>Reducing environmental impact</b>	Helps to reduce environmental impact using manufacturing method that does not require solvents and does not produce wastewater

**Established Manufacturing Company for Monoclonal Antibody Pharmaceuticals Aimed at Strengthening the Life Science Business**

In October 2016, MGC established a new Life Science Division in order to speed up business development in the "medical/food" field in which growth is expected going forward. The division engages in the integrated management of the life science business centered on monoclonal antibody pharmaceuticals and microorganism culturing system products, primarily pyrroloquinoline quinone (PQQ) and yeast containing S-adenosylmethionine (SAME).

In the area of monoclonal antibody pharmaceuticals, in advance of the establishment of our new Life Science Division, we set up Cultivecs Inc. for the contracted

manufacture of monoclonal antibody pharmaceuticals including biosimilars in a joint venture with Nippon Kayaku Co., Ltd in June 2016. Bio-pharmaceuticals, particularly monoclonal antibody pharmaceuticals, are growing significantly in the pharmaceutical market in and outside Japan. However, as manufacturing and development costs are high in comparison with conventional low molecular-weight drugs, the burden on patients themselves and medical insurance is an issue. Cultivecs Inc., will contribute to the proliferation of biosimilars in Japan by developing a contracting business for monoclonal antibody pharmaceuticals.



Monoclonal antibody pharmaceuticals research facility



PQQ

Yeast containing SAME

**Established QOL Innovation Center Shirakawa**

In April 2017, we established the QOL Innovation Center Shirakawa as a new manufacturing and research and development site for MGC Group. QOL is an acronym for Quality of Life, and MGC has positioned it as "the major site for realizing the Group Vision of 'Creating values to share with society' in innovating an array of differentiated products to improve the quality of life."

After the completion of the first phase of construction, we have begun operating a plant for AGELESS, an oxygen absorber that prevents the deterioration of food and medicines, and functional film sheet used in the information and electronics sectors.



QOL Innovation Center Shirakawa

**Launched Sales of Transparent Polyimide Varnish**

We launched sales of Neopulim, a transparent polyimide with outstanding heat resistance, low thermal expansion, and optical characteristics. We have already launched mass production for use in optical components.

We also promoted marketing of Neopulim for use in a variety of display substrates, including flexible organic EL displays. Neopulim, which offers an outstanding balance of heat resistance to over 400°C, low thermal expansion, and optical characteristics, is the subject of considerable expectation.



Transparent polyimide varnish

## Together with Stakeholders

As a member of society MGC contributes to the community, and by fulfilling its responsibilities to various stakeholders, the company will earn society's trust and sympathy.

### Together with Customers

We work hard to provide safe and highly reliable products and services to all of our customers, from direct business partners to the end consumer. As part of these efforts, all of our plants have acquired an ISO 9000 series of certification in quality management.

If problems related to the Product Liability Law (PL Law) occur, the designated staff person in charge of complaints at each Company will work with the business division in question, the production divisions, research divisions, or logistics divisions, to investigate the source of the problem and design countermeasures. At the same time, the Product Liability Committee, which received a report from the designated staff person in charge of complaints, formulates and implements company-wide preventive measures.

It should be noted that problems related to the Product Liability Law have not occurred at MGC so far.

In addition to these company-wide activities, we are also striving to raise customer satisfaction in each particular business division.

### Together with Our Business Partners

We carry out fair and open procurement activities in full compliance with applicable laws and we are building relationships of trust with our business partners to help build an environmentally-friendly and safety-minded supply chain.

### Compliance with the act against delay in payment of subcontract proceeds, etc. to subcontractors

All of our business transactions with business partners are in full compliance with the Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors. Every year we check the entire company for compliance with this important law. We have also created a check sheet to verify the applicability of this law during new business transactions and regularly hold in-house training sessions on the law to ensure complete compliance.

### Working with partner companies

We are working closely with the shipping providers of our partner companies to ensure safety during transportation, to enhance logistics quality, and to carry out a modal shift. Additionally, we also carry out audits of our partner companies from the standpoint of compliance and to build more positive, lasting relationships.



Safety education at the first delivery due to our modal shift.

### Together with Employees

#### Respect for human rights

At MGC, we strictly adhere to our Corporate Behavior Guidelines and MGC Code of Conduct, to respect individual personality and human rights, to not hurt anyone by discriminating against them based on their race, gender, nationality, age, religion or place of origin. We provide separate training courses on human rights for new employees and managers to raise awareness of human rights among all employees. Our Code of Conduct also articulates that sexual harassment and power harassment are prohibited. We are committed to preventing them within our company, and reinforce this principle through training sessions, internal communications and a special consultation desk.

These guidelines and code—along with the four fundamental principles\* of the International Labor Organization (ILO)—have been communicated to our Group companies overseas.

\* 1. Freedom of association and the effective recognition of the right to collective bargaining; 2. Elimination of all forms of forced or compulsory labour; 3. Effective abolition of child labour; and 4. Elimination of discrimination in respect of employment and occupation.

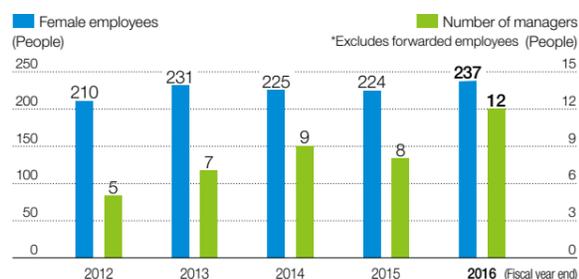
#### Promoting diversity

We are putting effort toward creating an environment that respects diversity and enables our employees, who themselves are diverse individuals, to display their unique capabilities and approach work with a sense of purpose and meaning.

#### More active role for women

We have prepared an action plan ending in FY 2021 that targets a four-fold increase in the percentage of female managers over FY 2015. Under the action plan, we are implementing measures to support career development and working to enhance systems that assist with balancing work and family life.

#### Number of female employees/managers (non-consolidated)



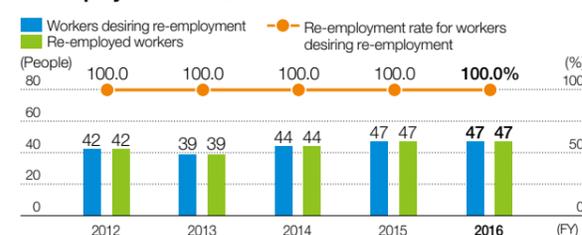
#### Number of employees/managers who are foreign nationals (non-consolidated)



#### Re-employment of retirees

The re-employment rate for retirees desiring re-employment has reached 100% for eight years in a row from FY 2009 to FY 2016 as a result of our re-employment opportunities for retirees. In FY 2016, 47 of the 69 workers who reached retirement age wanted re-employment, and all of them were re-employed. Providing mechanisms that enable employees to continue working actively regardless of age contributes to creating a vibrant workplace.

#### Re-employment of retirees



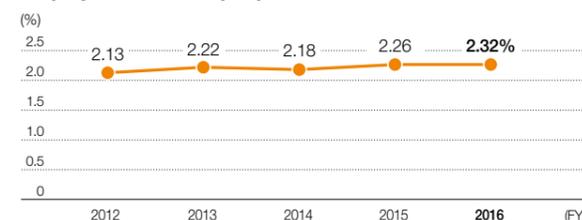
#### Employment of people with disabilities

MGC's employment rate for people with disabilities was 2.32% as of the end of FY 2016, which exceeded the legally mandated rate of 2.0%. We will continue working to create a workplace environment that allows people with various disabilities to display their capabilities.



Employee with a disability at work.

#### Employment rate for people with disabilities



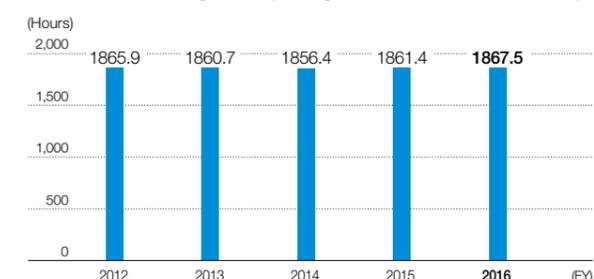
#### Work-life balance

We have introduced a flextime system with the aim of realizing work-life balance. We have also established a system for accumulating annual leave (up to 40 days) for effective utilization of otherwise expired annual leave as well as various types of special leave, including leave for marriage, bereavement, a spouse giving birth, work transfers, volunteering, donation, and self-care. In FY 2016, usage of annual leave was 86.5%. We have maintained a high rate of annual leave usage for many years, and a climate that makes it easy to take annual leave has been created.

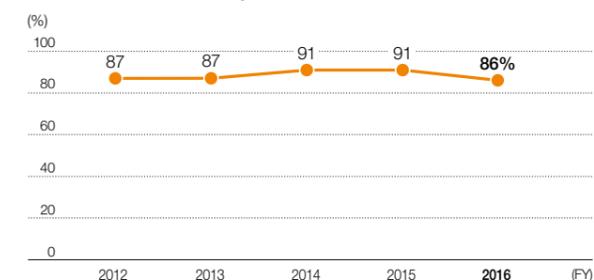
#### Efforts to reduce working hours

Total working hours were 1,867.5 hours per employee in FY 2016. In order to reduce working hours, we are making efforts that include establishing a no-overtime day and measures to encourage employees to take their annual leave through such groups as the Shorter Hours Committee established by labour and management.

#### Total annual working hours (average for labour union members)



#### Percentage of annual paid leave being taken (average for labour union members)



Together with Stakeholders

Childcare and nursing care

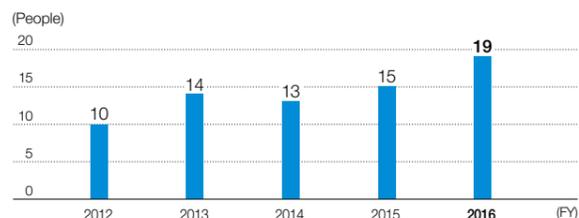
We have established a system for child care that exceeds the statutory requirements, including childcare leave until a child reaches two years and one month and a system of shorter working hours until a child enters elementary school.

We have achieved a 100% return to work after childcare leave for five years in a row. In FY 2016, we added fertility treatment to the intended uses of accumulated annual leave and prepared a pamphlet on our childcare systems.

We have established a system that exceeds the statutory requirements for nursing care leave. This includes allowing a maximum of one year, which can also be split.

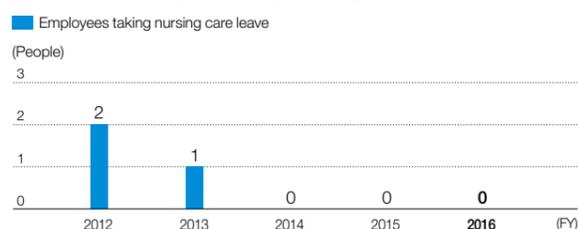


Number of employees using reduced working hours for childcare



\* Number of users during the FY

Number of employees taking nursing care leave



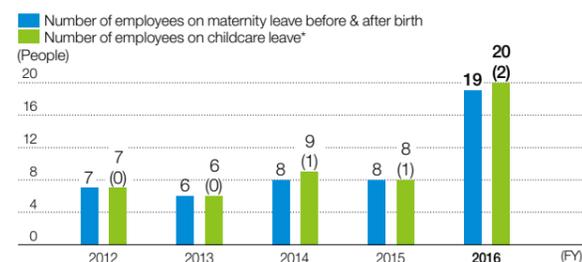
Acquisition of next-generation support certification logo "Kurumin"

In June 2016, MGC acquired the next-generation support certification logo "Kurumin" in recognition of systems and initiatives to support a balance between work and family.

Kurumin certification is a system for enterprises that formulate and implement an action plan based on the Act on Advancement of Measures to Support Raising Next-Generation Children and meet the standards for certification to receive recognition from the Minister of Health, Labor, and Welfare as a company that supports child raising.



Maternity leave



\* Parenthesis indicates the number of males who took childcare leave  
\* For women, the fiscal year of child care leave is determined by the first day of maternity leave.

Health management

We provide regular health checkups every year for all officers and employees, and the checkup rate is practically 100%. When the results of tests indicate the need for retesting or there are any findings, we work to promote employee health through health guidance provided by industrial physicians and public health nurses.

Care for mental health

It is important that our employees maintain their physical health, and at MGC we have implemented programs to ensure mental healthcare as well. The Employee Assistance Program (EAP) is one of these, in which employees can freely contact external professional institutes by e-mail, telephone or in person to discuss concerns. In addition, in order to effectively implement the stress checks stipulated under Japan's Industrial Safety and Health Act, we conduct an annual "mental health" diagnosis for self-evaluation of stress conditions in addition to striving to raise stress awareness through workshops and other means.

We also conduct mental health training during sessions designed for new employees and employees receiving a promotion.

MGC's human resource development

Our people are our greatest asset. Based on our human resource development philosophy, MGC strives to create mechanisms which enable individual employees to raise their personal knowledge and capabilities as a professional while furthering individuality, as well as a working environment that is invigorated with employees' self-fulfillment.

Personnel system

MGC's personnel system is a multi-stream vocational qualification grading system based on management by objectives. Up to the standard age of 28, employees belong to the same basic career path regardless of gender or educational background, and then move on to select courses that will help them in their career. We support all employees equally, providing them with a range of career opportunities in line with individual aspirations that meet their role, achievements and capabilities.

Development of human resource capabilities

In order to create an environment for each employee to work toward achieving individual goals, we are working to enhance systems that support career development and skill development based on grade-specific and department-specific training and distance education.

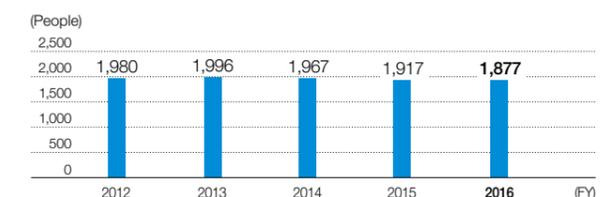
MGC company-wide education and training system

	Management-grade	Mid-level employees	Junior employees
<b>Grade-specific training</b>	<ul style="list-style-type: none"> <li>General Manager level</li> <li>Organizational management training</li> </ul>	<ul style="list-style-type: none"> <li>Manager level</li> <li>Beginner manager training</li> <li>Manager training</li> <li>Mid-level employee training</li> <li>Career development training</li> </ul>	<ul style="list-style-type: none"> <li>New recruit training</li> <li>New recruit follow up training</li> </ul>
<b>Occupation-specific training</b>	<ul style="list-style-type: none"> <li>Global human resource development training and overseas short-term training</li> <li>Logical communication and negotiation strategies</li> <li>Technology networking events (production, research and engineering departments)</li> <li>Patent study sessions (research promotion departments)</li> <li>Placements at research institutions, such as universities</li> <li>Safety and health, environmental management, quality control-related training</li> <li>Other specialized education and in-house seminars</li> </ul>		
<b>Self-education</b>	<ul style="list-style-type: none"> <li>Language qualifications and language training (includes English, other languages, and theme-specific training)</li> <li>Management and business skills</li> <li>Finance, accounting, tax, and law</li> <li>Basic chemistry and basic safety technology</li> <li>Other communications training</li> </ul>		
<b>OJT</b>	<ul style="list-style-type: none"> <li>Practical OJT training</li> </ul>		

Union/labor-management relations

Over the years MGC and the Mitsubishi Gas Chemical Workers Union have built up mutual trust and respect between each other based on positive labor-management relations, which allows them to work together to solve various issues. We regularly hold management council meetings with the aim of sharing awareness of issues related to management and the business environment, including such themes as the workstyle, welfare, and treatment of employees, and meetings of the Personnel System Review Committee and other committees for joint labor-management discussion of various systems. Together we have revised the personnel system, the re-employment system, and retirement plans. Other issues such as wages and bonuses are determined through yearly collective bargaining and other negotiations.

Number of labor union members (as of March 31, 2017)

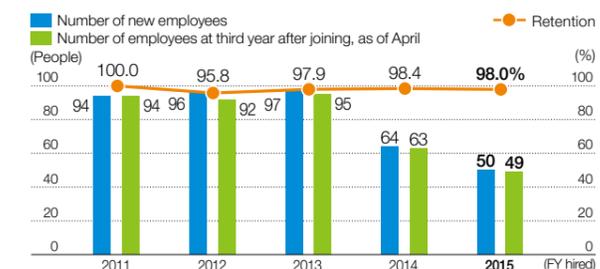


\* The participation rate is 100% due to the union-shop system.

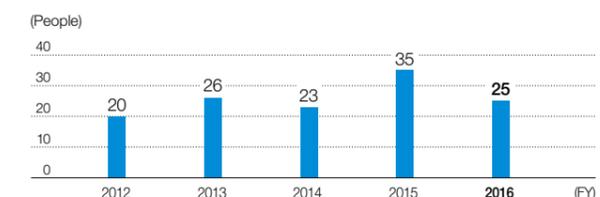
Employee tenure (as of March 31, 2017)

	Male	Female	Total
Average age	40.4	39.7	40.3
Number of years worked	18.3	16.5	18.2

Retention of new employees (third year after joining)



Turnover



\* Number of labor union members and managers retiring at their own accord (including completion of leave of absence period, support changing job type, and excluding job transfers)

Together with Stakeholders

Together with the Community

Interaction with local communities

Involvement in community activities

We participate in community festivals, blood donation drives, and traffic safety campaigns on local roads to encourage interaction with the local community.



Taking part in local traffic safety activities (Niigata Research Laboratory)



Taking part in a local festival (Yamakita Plant)

Supporting "Fukushima Sakura Project"

Together with the completion of the QOL Innovation Center Shirakawa in Shirakawa City, Fukushima Prefecture, we supported Fukushima Sakura Project's Haruka 2017 - Shirakawa Hana Kagari.



The project, which began in 2013 with the hope of recovery following the Great East Japan Earthquake, carries out activities that include sending seedlings of Haruka, a new variety of cherry tree, from Fukushima Prefecture to all parts of Japan. At the event, which was held in Nanko Park and attended by Kozo Yamamoto, then Minister of State for Regional Revitalization, Masao Uchibori, governor of Fukushima Prefecture, and Kazuo Suzuki, mayor of Shirakawa City, the coming of a new spring was presented through a performance of taiko drumming together with a water screen and projection mapping as well as a chorus of recovery support song *Hana wa Saku* (Flowers will Bloom), renewing the vision for reconstruction with the 6,500 people present.



Chorus of NHK's recovery support song *Hana wa Saku*

Beautification activities, etc. in the local community

At each of its sites, MGC participates in the preservation of nearby coastal forests and cleanup activities for roads, nearby riverbeds, and other activities.



Coastal forest preservation activities (Niigata Plant)



Site cleanup activities (Yokkaichi Plant)

Environmental and disaster preparedness activities in the local community

To deepen understanding of our environmental conservation and process safety activities by local communities, MGC has continued to participate in local dialogue meetings held by the Japan Chemical Industry Association (JCIA).

In addition, we are working together with local communities to promote safety and disaster preparedness through joint drills with fire departments and other means. All of MGC's plants have obtained ISO 14001 certification and continually strive to improve the quality of their environmental management systems.



Okayama District Responsible Care local dialogue meeting (Mizushima Plant)

Commendation from Virginia, U.S. in recognition of performance in reducing environmental impact

In August 2016, MGC Advanced Polymers, Inc., an overseas subsidiary, gained approval for E3 (Exemplary Environmental Enterprise) in an environmental program promoted by the state of Virginia, and received a commendation. Approval under the program has three stages from E2 to E4, and E3 approval requires excellent track record in environmental conservation, as well as implementation of the rigorous environmental management system specified by the E3 program and a pollution prevention program.



MGC Advanced Polymers, Inc.

Initiatives for the next generation

We host student visits and internships involving local junior high schools, high schools, technical junior colleges and universities. Through such initiatives, we are stimulating an interest in chemistry among children and students who are the next-generation.



A student tour (Hiratsuka Research Laboratory)

Ten years since starting to provide chemistry experiment kits

MGC has continued to provide chemistry experiment kits to junior high schools near our facilities since 2008 with the aim of helping students to realize that chemistry is useful in every-day life and preventing declining interest in science. To mark the 10th anniversary of the program, we received a commendation from the mayor of Hiratsuka City.



Commendation from mayor of Hiratsuka City

The kits help students understand the oxidation of iron by making pocket heating pads, and so far a total of more than 100,000 kits have been used in junior high school classes in 16 municipalities. We have received such comments as, "Students gained an understanding of the workings of an every-day item and we were able to deepen their interest" and "All the students carried out the experiment enthusiastically" from junior high school teachers that we have provided the kits to.

Together with Shareholders and Investors

To ensure shareholders and the investment community correctly understands MGC, we strive to disclose information in a fair and transparent manner through information disclosures in accordance with laws and the rules of stock exchanges, the announcement of information on our website or through media outlets, and through reports to shareholders.

Basic policy on profit distribution

MGC places the improvement of corporate value through business expansion and growth as a challenge of the greatest importance, takes into consideration investment and lending plans, financial health, and future business trends in order to realize future business growth, and works to achieve an optimal allotment of retained earnings and returns to shareholders.

Regarding dividends, the decision to continue steady dividends is made taking into account trends in business results.

In addition, MGC's basic policy on the repurchase of its own shares is to consider the market environment, etc. while conducting such purchases in a flexible manner in order to enhance returns to shareholders and improve capital efficiency.

The year-end dividend for FY 2016 was ¥22 per share. (Taking into account the 2 for 1 share consolidation conducted on October 1, 2016, this was an increase of ¥6 per share. With a dividend of ¥11 per share without taking the share consolidation into account, it is an increase of ¥3 per share.) Taking the share consolidation into account, the interim dividend for FY 2016 was ¥16 per share (¥8 per share without taking the share consolidation into account). Therefore, the annual dividend was ¥38 per share (¥19 per share without taking the share consolidation into account).

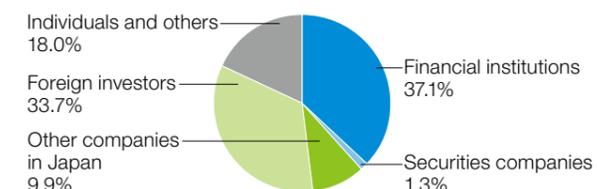
General meeting of shareholders

The annual shareholders meeting is held avoiding peak days so that as many shareholders can attend as possible. MGC is also endeavoring to send the convocation notice earlier as well as posting the information on the company website before sending the convocation notice to give shareholders more time to consider what to vote. We also translate the convocation notice and other documents into English and have adopted an electronic voting platform in order to improve convenience for shareholders.

Briefings for institutional investors and securities analysts

For institutional investors and securities analysts, we hold earnings briefings, as well as business briefings. In addition, we posted reference material from our earnings briefings, as well as business reports, on our website in an effort to share information about MGC in a timely fashion.

Composition of shareholders (as of March 31, 2017)



## Corporate Governance

We strive to operate an effective corporate governance system and to continually reinforce and enhance our system in order to fulfill the expectations of all stakeholders.

### Basic Approach to Corporate Governance

As a member of society, MGC strives to operate an effective corporate governance system and to continually reinforce and enhance our system in order to fulfill the expectations of all stakeholders, including shareholders.

#### Basic policy

- (1) We ensure the rights and equality of shareholders.
- (2) We cooperate properly with stakeholders other than shareholders.
- (3) We ensure appropriate information disclosure and transparency.
- (4) We fulfill the responsibilities of the Board of Directors, etc.
- (5) We engage in constructive dialogue with shareholders.

### Overview of Corporate Governance Structure

For the sake of appropriate management supervision and counsel from an external perspective, and to raise our management transparency and fairness, MGC appoints two outside directors. Our management structure as of June 30, 2017 consists of 12 directors, including two outside directors, and 24 executive officers (including people who concurrently serve as directors).

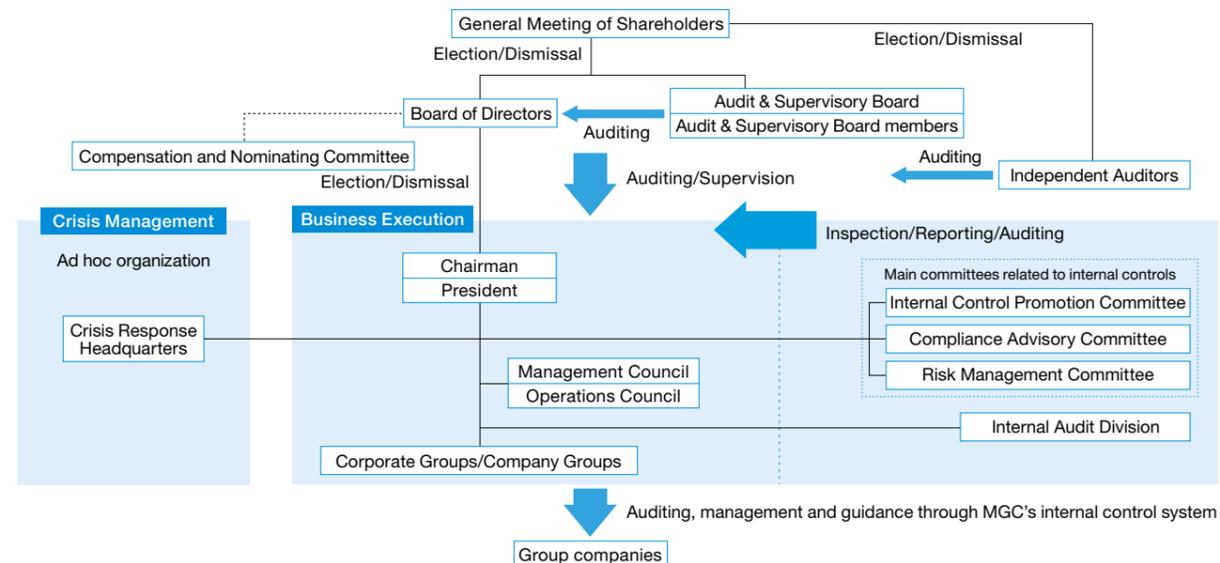
Any important matters affecting MGC are to be reviewed and decided with a broader perspective at the Management Council where management policy may be discussed, and at the Operations Council where definitive

action plans may be discussed. In addition, MGC draws upon the expertise of legal counsel and other experts when required in the decision-making process and the business execution of the company.

There are four Audit & Supervisory Board members, two of whom are external. They attend important meetings as well as board meetings, conduct audits of departments, inspect subsidiaries, and strive to understand the decision-making process and status of business execution. In addition to ensuring a rational decision-making process and compliance with the law and corporate ethics, the Audit & Supervisory Board members conduct inspections of our business operations. They regularly exchange opinions with directors and receive status reports on business execution from directors and employees on a regular basis, or immediately when involving material matters. Members request explanations as required and state their views. They also inspect important documents concerning business execution, and require information from directors and employees.

Moreover, in order to ensure transparency, objectivity and appropriateness in the processes for determining compensation for directors and executive officers and those for determining the nomination and election of directors, Audit & Supervisory Board members, and executive officers, proposals on compensation and the appointment of officers are reviewed by the Compensation and Nominating Committee composed of the Chairman, the President and the outside directors before submission to the Board of Directors.

#### Corporate governance framework



## Compliance and Risk Management

In our aim to earn the trust and understanding of the community, MGC practices compliance while readying and strengthening systems for responding to any manner of risk.

### MGC Group Compliance

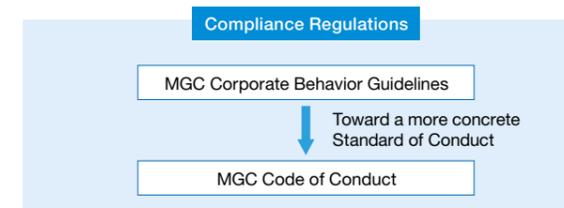
Compliance at MGC Group involves not only abiding by laws and company rules, but also widely upholding fair, transparent and free business activities based on its responsibilities to society as a group of companies. Based on this understanding, we have summarized the actions to be taken by executive officers and employees in the “MGC Corporate Behavior Guidelines” and the “MGC Code of Conduct” and we make revisions to these guidelines and code of conduct as necessary based on changes that take place in society.

To ensure thorough compliance across the entire MGC Group, we distribute the “MGC Compliance Handbook” to all of our employees in Japan. For overseas Group companies, we also created English, Chinese and Thai language versions of the “MGC Corporate Behavior Guidelines” and the “MGC Code of Conduct” to ensure the philosophy of MGC Group is made known to and practiced by all.



MGC compliance handbook

#### MGC compliance concepts

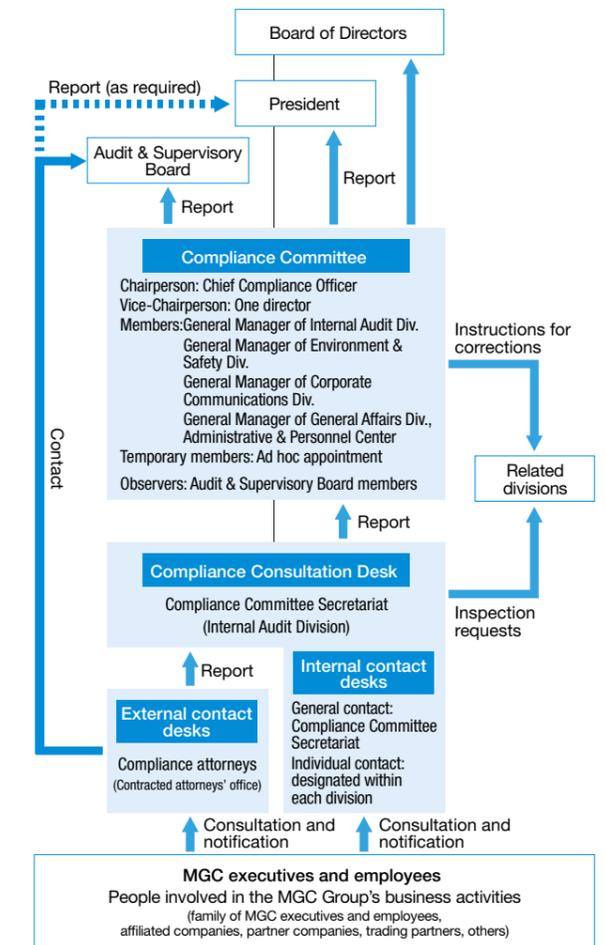


### Compliance System

MGC has established a Compliance Committee to supervise matters concerning the Group's compliance program, headed by the Chief Compliance Officer and reporting directly to the President. The Compliance Committee also includes a director (as vice-chairperson), heads of compliance-related departments, and others. The roles of the Committee are as follows:

1. Formulating and deliberating on the framework, policies, and implementation measures of MGC Group compliance.
2. Understanding the implementation status of MGC Group compliance, and providing necessary guidance and supervision.
3. Inspecting instances of noncompliance, and formulating and deliberating on measures for rectification and prevention of recurrence.

#### MGC compliance structure



Compliance implementation measures, guidance and supervision, and steps taken to rectify and prevent recurrence of noncompliance, which are formulated and deliberated on by the Compliance Committee, are reported to the MGC President and Audit & Supervisory Board, then implemented after following specified internal procedures.

In addition, MGC has set up a “Compliance Consultation Desk” to achieve early detection and undertake preventative steps against unethical practices. Our internal contact desks are staffed by internal audit departments, while external contact desks can be found at the offices of specialized attorneys, including access to female attorneys. These specialized attorneys also provide advice to the Compliance Committee and assist with the training of various related departments.

Reports and consultations brought to the attention of the Consultation Desk and deemed as potentially serious compliance violations are promptly reported to the

Corporate Governance

Compliance Committee chairperson. The Compliance Committee decides on necessary rectification or recurrence prevention measures after investigating the related facts. Investigation results and the details of said measures are also reported back to the party responsible for the consultation or report.

In FY 2016, we once again raised internal awareness about the Compliance Consultation Desk.

Compliance Education

MGC sets aside October each year as “Ethics Month” to conduct compliance training for employees. The president also sends out a circular to all business sites to raise awareness about compliance issues.

In FY 2016, we chose specific items of timely nature from among the 40 different types of legal compliance training materials contained on our intranet. These items were provided to employees, through our e-learning system.

Given rising need to respond to compliance issues, such as cartel involvement or illegal payoffs, at Group companies affiliated with our overseas businesses in emerging countries and other locations, MGC is also working to enhance the quality of its compliance training for staff that are dispatched as officers to overseas affiliates. In FY 2016, in addition to raising internal awareness about overseas bribery regulations once again, we distributed reference materials to business divisions.



Screenshot from the e-learning system

Risk Management in MGC Group

In response to the various risks related to our business activities, MGC launched company-wide, comprehensive risk management activities in 2006 with the establishment of a Risk Management Committee. To disseminate knowledge at the start of our activities, we conducted seminars for top management and for employees at all workplaces on the topics of the importance and practice of risk management.

Presently, we are reviewing measures for the highest priority risks out of those risks listed in the identification and assessment of latent risks and formulating a business continuity plan (BCP) when necessary. BCPs created by each department are centrally managed by the secretariat of the Risk Management Committee to ensure other departments have access for use as reference.

In addition, with regard to risks at Group companies, the MGC department that supervises each company shares information and responds when necessary. The risks with a major impact on MGC are reviewed by the Risk Management Committee.

Risk Management Framework

The four Companies conducting business activities and all corporate divisions actively assess and prioritize risk situations and devise risk reduction measures. The Risk Management Committee, headed by the Chief Risk Officer, provides direction and supervision for each department as well as deliberates on problems that require a company-wide response.

In terms of risks associated with project implementation, we have developed an action plan to identify and evaluate risks inherent in our operations or internal control systems. We then take the appropriate measures. In the event that a serious risk is identified, we set up a special group to cope with it according to internal rules.

Risk management promotion system



Risk Management Committee's Annual Plan for FY 2016

Among the risks that accompany our business activities, we have identified earthquakes, toxic or hazardous substance leaks, fire and explosion, and information leaks as four that must be handled with priority on a companywide basis. Our workplaces are also examining countermeasures related to these priorities.

In FY 2016, we actively pursued major annual policy points that included those listed below.

1. To confirm and ensure countermeasures for large-scale natural disasters
2. To study what function the Risk Management Committee should have
3. To continue subcommittee activities through independent setting of issues (including follow up of risk management at Group companies)

Major Initiatives in Risk Management Activities

Measures against large-scale natural disasters

MGC has deployed a company-wide safety confirmation system to cope with a large-scale natural disaster, such as a Nankai Trough earthquake or an earthquake directly below Tokyo, which is the subject of the Cabinet Office's Large-Scale Earthquake Disaster Prevention and Mitigation Measures. In addition, we have provided offices with emergency devices, such as wireless communication devices, so as to enable communication among workplaces even when regular telephone communications become disabled or restricted.

Furthermore, as part of our Business Continuity Plan (BCP), we conduct emergency training sessions using these systems and equipment each year, so that even if headquarters becomes paralyzed due to a large-scale natural disaster, each of our facilities, such as plants and research centers, may continue supporting customers and maintaining other services, supplementing the headquarters' function.

We also are pushing forward initiatives for first responder training at each workplace, as well as gathering stocks of reserve supplies. To cite examples of other initiatives, we have planned for scenarios in which working employees and guests visiting MGC face difficulties returning to their homes after a disaster. We have stocked food, drinking water, and other materials to allow persons in the company to remain in offices for at least three days.

In FY 2015, MGC progressively carried out seismic reinforcements, steadily moved forward with responses to buildings which are old and have a greater potential of

causing injuries should a large-scale earthquake occur, which were found as a result of the earthquake resistance assessments conducted up until last year. Additionally, we increased the plants covered in the examinations into improving plant-wide seismic performance, including manufacturing equipment, at the model plants which we conducted in the previous fiscal year.

In FY 2016, we re-assessed the MGC Head Office, MGC sites, and the main sites of Group companies for risk related to various disasters that included not only earthquakes but also eruptions and flooding with reference to hazard maps published by local governments and other resources to check on the implementation of countermeasures and verify their suitability.

Going forward, we will continue efforts to review the effectiveness of measures through exercises and drills related to disaster prevention and business continuity to strengthen our preparation for a large-scale natural disaster.



Wireless communication device for emergency use



Disaster reserve supplies

Measures against information leakages

Regarding the prevention of information leaks—one of the risk issues we have targeted for priority treatment—we examined ways to manage technical information and other measures.

Going forward, in addition to issuing warnings and strengthening our information management practices, we think it is important to minimize information leakage risks based on scenarios where secrets were leaked and to address the challenge of striking the right balance between the prevention of information leakages and effectively sharing this information within the company.

Risk management of group companies

As a risk management measure including Group companies, we are carrying out requests for enhanced risk management, while also exchanging information after investigating on each company's initiatives and practices. In FY 2016, we promoted a review into upgrading risk management at Group companies given the increasing need for internal control as a corporate group. As a result, we worked to further strengthen PDCA cycles through mutual collaboration between Group companies and the MGC department in charge that supervises the particular companies.

## Environment and Safety Management

We at MGC conduct business activities with sustainable development, building a recycling-based society, and safe operations as critical management issues, and promote Responsible Care (RC) throughout MGC as the means to assure environmental and safety activities.

### The MGC Group Policies on Environment and Safety

As an important member of the community, the MGC Group makes an effort to earn social trust by recognizing our responsibility to contribute to the community, to secure the environment and safety of the community, and to put our corporate activities in harmony with the protection of the global environment under the principle of sustainable development.



#### Environmental and Safety Targets Fundamental Policies

- Zero Accidents, Zero Occupational Injuries, and Environmental Preservation
- Ensuring health and safety in our operations
  - Ensuring process safety through the improvement of self-maintenance technologies and on-site competency
  - Reducing environmental impacts and contributing to sustainable social development
  - Ensuring safety in the handling, use, and disposal of chemical products
  - Ensuring environmental conservation and safety in the logistics of obtaining raw materials and storing and delivering our products
  - Strengthening relationships with stakeholders
  - Promoting the MGC Group's environmental and safety activities
  - Continuously improving environmental and safety management systems

### MGC's RC Medium-Term Plan 2017

\* The descriptions of distribution safety, dialogue with society, and RC in general have been omitted.

RC Code	RC Medium-Term Plan (2015-2017)
Occupational Health and Safety	<p><b>Working toward zero occupational injuries and accidents</b></p> <ul style="list-style-type: none"> <li>■ Enhance everyday safety activities (<i>Kiken Yochi</i>: hazard prediction; <i>Hiyari Hatto</i>: near-miss incident identification activities; the 5Ss; etc.)</li> <li>■ Enhance communications.</li> <li>■ Prevent the occurrence of similar occupational injuries and similar incidents.</li> <li>■ Prevent occupational injuries in partner companies.</li> <li>■ Perform risk assessments for handled chemicals.</li> </ul>
Process Safety and Disaster Prevention	<ul style="list-style-type: none"> <li>■ Establish a framework for activities (Bridge) to eliminate accidents, as the core constituent of safety activities at plants.</li> <li>■ Adopt and operate the safety competency assessment system of the Japan Society for Safety Engineering.                             <ul style="list-style-type: none"> <li>• Construct frameworks enabling plants themselves to practice PDCA.</li> </ul> </li> <li>■ Strengthen and deepen risk assessment (RA).                             <ul style="list-style-type: none"> <li>• Establish activities composed of identification, reduction, and periodical review of risks.</li> </ul> </li> <li>■ Establish PDCA in education at business sites, including OJT.</li> <li>■ Analysis and horizontal communication of case studies from other companies, past case studies, HH case studies, etc.</li> <li>■ Enhance disaster readiness framework.</li> <li>■ Enhance equipment management and improve self-maintenance technologies.</li> <li>■ Formulate "MGC Safety Standards" applicable to the entire MGC Group.</li> </ul>
Environmental Preservation	<ul style="list-style-type: none"> <li>■ Reduce energy consumption intensity to 85% or lower compared with FY 1990 levels.                             <ul style="list-style-type: none"> <li>• Implementation of energy saving measures and reduction of equipment problems.</li> </ul> </li> <li>■ Reduce greenhouse gas emissions intensity to 72% or lower compared with FY 1990 levels.</li> <li>■ Reduce emissions of PRTR substances by 10% compared with FY 2014.</li> <li>■ Maintain Zero Emissions of wastes (Zero Emissions at MGC: 0.3% or less final disposal of generated wastes, by weight).</li> <li>■ Reduce generated waste volume by 10% compared with FY 2014.</li> <li>■ Promote initiatives related to conservation of biodiversity.</li> <li>■ Formulate methods for evaluation of environmentally friendly products.</li> </ul>
Chemical and Product Safety	<ul style="list-style-type: none"> <li>■ Provide up-to-date safety information on handled chemical products and incorporate information into SDSs (safety data sheets).</li> <li>■ Risk management for handled chemical products.                             <ul style="list-style-type: none"> <li>• Participate in JIPS.*</li> <li>• Risk management for new products.</li> </ul> </li> <li>■ Adapt to EU REACH regulation and other overseas regulations.</li> </ul>

\* JIPS: Japan Initiative of Product Stewardship, a voluntary initiative advanced by the Japan Chemical Industry Association (JCIA) for strengthening chemical product management. JIPS is the Japanese version of the GPS (Global Product Strategy), international voluntary initiative for chemical product management.

### Message from the Director in Charge of Environment and Safety

This year, 2016, was the second year of our three-year RC Medium-Term Plan 2017. The key points of this plan are to eradicate accidents by strengthening and enhancing risk assessment, prevent the reoccurrence of similar accidents and occupational injuries, and to evaluate our contribution to preserving biodiversity and the contribution by MGC products to the environment. This year, MGC was able to carry out our activities with zero lost time injuries and zero serious injuries. Having overcome several incidents in the past, we have put effort into preventing the occurrence of similar incidents, and we have progressed with strengthening risk assessment as stipulated in the medium-term plan. I feel these numbers show a certain amount of success for our efforts. You could say that risk assessment is evidence of a shift regarding accident and disaster countermeasures in wider society from "preventing reoccurrences" of disasters that have already happened to "preventive measures" for disasters that could happen. Predicting and identifying disasters beyond the scope of normal reasoning challenges the abilities of companies and work places. Alongside the continued promotion of Bridge self-led safety activities at business sites in the medium-term plan, I also want to create safety guidelines that will lead to the assessment and improvement of safety-related abilities at the work sites that make up MGC's safety base.



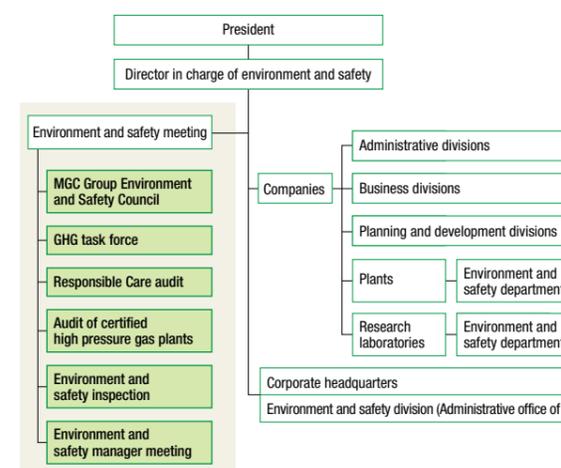
Kenji Inamasa  
Senior Managing Executive Officer

Regarding the environment, we have set numerical targets in areas such as energy, greenhouse gas emissions, and waste in accordance with the RC medium-term plan, and we are working to lighten our environmental footprint. Through these everyday efforts, MGC received an extremely positive A- (A minus) rating from the CDP\* following its 2016 climate change questionnaire. We will aim to increase our presence as "a superior and distinctive chemicals company" by steadily implementing the remaining year of the medium-term plan, and continue with initiatives to ensure safe and stable production.

\* CDP: Acronym for the former Carbon Disclosure Project, a project by institutional investors to encourage companies to form climate change strategies and disclose specific greenhouse gas discharge volumes.

### Responsible Care Promotion System

All of MGC's divisions, at both the segment and corporate level, follow fundamental environmental and safety principles that promote Responsible Care. Every December, MGC holds environment and safety meetings, which are chaired by the President and consist of all executive officers, division heads, and plant managers. MGC also takes steps to make continuous improvements in the PDCA cycle based on the RC medium-term plan targets and annual activity targets.



In 2016, we audited the status of 1) implementation of measures to prevent recurrence of similar accidents and injuries (including the prevention of falls), 2) partner companies' initiatives to prevent occupational injuries, 3) implementation of the safety competency assessment system (plants), and 4) the establishment of risk assessment related to chemical substances.

- **Audit period**  
August – October, 2016
- **Auditees**  
5 plants, 3 laboratories (including Tokyo Techno Park), business divisions of 4 segments, Purchasing & Logistics Center
- **Audit findings**  
Full conformity (32 cases) Non-conformity (no cases)  
Improvement orders (6 cases) Comments (29 cases)
- **Follow-up issues identified in previous year**  
We audited the handling of items identified at workplaces in the previous year to confirm that proper measures have been taken.



RC audits (Kashima Plant)

### RC Audits in 2016

The director in charge of environment and safety, together with an auditing team, conducts the RC audit. This audit assesses the implementation status of RC action plans at each of our sites while deciding upon and auditing high importance audit items for the year.

Results and Plans for RC Activities at MGC

★★★ : Achieved ★★ : Mostly achieved ★ : Further efforts required

	RC Medium-Term Plan 2015-2017	2016 RC Action Plan		2016 Achievements	Assessment	2017 RC Action Plan
Occupational Health and Safety	<ol style="list-style-type: none"> <li>Enhance everyday safety activities (<i>Kiken Yochi</i>: hazard prediction; <i>Hiyari Hatto</i>: near-miss incident identification activities; the 5Ss; etc.)</li> <li>Enhance communications.</li> <li>Prevent the occurrence of similar occupational injuries and similar incidents.</li> <li>Prevent occupational injuries in partner companies.</li> <li>Perform risk assessments for handled chemicals.</li> </ol>	<p>We will firmly establish the safety culture that was fostered through Accident Zero (AZ) activities, and will share this culture with partner companies to eliminate industrial accidents.</p> <ol style="list-style-type: none"> <li>Steadily continue daily safety activities (hazard prediction, <i>Hiyari Hatto</i> [near-miss] incident identification activities, 5Ss, etc.) to prevent these from becoming routine and stagnant.</li> <li>Enhance communication within business sites.</li> <li>Analysis of past case studies, case studies from other companies, HH case studies, etc. and horizontal communication of these to prevent the occurrence of similar incidents.</li> <li>Activities to prevent occupational injuries at partner companies                             <ul style="list-style-type: none"> <li>Improve equipment, support education, conduct risk assessment in work and construction, enhancement communication, etc.</li> </ul> </li> <li>Entrench the implementation of surveys of risks and hazards to workers from chemical substances (adapt to the Amendment of the Industrial Safety and Health Law).</li> </ol>		<ol style="list-style-type: none"> <li>Continued to energize daily safety activities (hazard prediction, <i>Hiyari Hatto</i> [near-miss] incident identification activities, 5Ss, etc.) through participation in training sessions, holding presentations, campaigns, and other measures.</li> <li>Enhanced communication by implementing regular patrols, holding exchange events both within and between departments, on-site traffic supervision, encouraging greetings, and other measures.</li> <li>Shared accident information both within the company and externally, and provided education by analyzing past accidents and near misses.</li> <li>Established committees, task forces, and the like with partner companies and practiced mutual interaction among Occupational Health and Safety Committee members to enhance communication. Held campaigns and supported partner companies in addition to daily activities.</li> <li>Adjusted chemical substance risk assessment rules in response to an amendment to the Industrial Safety and Health Act, and worked to promote risk assessment.</li> </ol>	★★★	<p>To achieve the targets of the RC Medium-Term Plan 2017, we will firmly establish the safety culture that was fostered through the AZ activity in which all employees took part, and will share this culture with partner companies to eliminate occupational injuries.</p> <ol style="list-style-type: none"> <li>Steadily continue daily safety activities (hazard prediction, <i>Hiyari Hatto</i> [near-miss] incident identification activities, 5Ss, etc.) to prevent these from becoming routine and stagnant.</li> <li>Enhance communication within business sites.</li> <li>Analysis of past case studies, case studies from other companies, HH case studies, etc. and horizontal communication of these to prevent the occurrence of similar incidents.</li> <li>Activities to prevent occupational injuries at partner companies                             <ul style="list-style-type: none"> <li>Improve equipment, support education, conduct risk assessment in work and construction, enhancement communication, etc.</li> </ul> </li> <li>Conduct surveys of risks and hazards to workers from chemical substances (adapt to the Amendment of the Industrial Safety and Health Law).</li> </ol>
Process Safety and Disaster Prevention	<ol style="list-style-type: none"> <li>Establish a framework for activities (Bridge) to eliminate accidents.</li> <li>Adopt and operate the safety competency assessment system of the Japan Society for Safety Engineering.                             <ul style="list-style-type: none"> <li>Construct frameworks enabling plants themselves to practice PDCA.</li> </ul> </li> <li>Strengthen and deepen risk assessment.                             <ul style="list-style-type: none"> <li>Firmly establish activities composed of identification, reduction, and periodical review of risks.</li> </ul> </li> <li>Establish PDCA in education at business sites, including in OJT.</li> <li>Analyze and horizontally communicate case studies from other companies, past case studies, <i>Hiyari Hatto</i> (near-miss) case studies, etc.</li> <li>Enhance our disaster readiness framework.</li> <li>Enhance equipment management and improve self-maintenance technologies.</li> <li>Formulate "MGC Safety Standards" applicable to the entire MGC Group.</li> </ol>	<p>Work toward the strengthening of on-site competency and safety competency, and the elimination of accidents and irregularities.</p> <ol style="list-style-type: none"> <li>Establish the Bridge framework.</li> <li>Adopt the safety competency assessment system of the Japan Safety Competency Center.</li> <li>Enforce risk assessments for non-steady-state situations (emergencies, startup, shutdown, operational errors, personnel changes, etc.)</li> <li>Steadily implement RC education and training according to education guidelines Enhance education and training (improve operational capability and emergency response capability)</li> <li>Prevent the occurrence of similar accidents through analysis of our and other companies' past case studies (use of the JCSA's Safety and Accident Prevention Guidelines, etc.)</li> <li>Enhance our disaster readiness framework.</li> <li>Enhance equipment management and prepare for the renewal of high pressure gas certification.</li> <li>Start formulation and application of MGC Safety Standards (Head Office).</li> </ol>		<ol style="list-style-type: none"> <li>We are establishing the Bridge framework and each task force is engaged in activities.</li> <li>Only a few plants still require the introduction of the safety competency assessment system. We have begun initiatives to counter weak spots identified through assessments at plants where the system has already been introduced.</li> <li>In accordance with the Safety and Accident Prevention Guidelines, we have completed non-steady-state risk assessment for risks similar to the three major accidents. Furthermore, we are advancing non-steady-state situation risk assessments to further enhance comprehensiveness. We are also introducing HAZOP*1 as a risk assessment method.</li> <li>We are providing education in line with the education plan and practicing the PDCA cycle. We are enhancing education and training by introducing driving simulators to improve driving skills and using external training courses, such as Sanyo Personnel Development courses and Keiyo Coastal Industrial Complex Personnel Development courses.</li> <li>We carried out surveys of understanding concerning troubles*2, analysis of trouble diaries, checks of the effectiveness of past measures, analysis and communication of major <i>Hiyari Hatto</i> (near-miss) incidents, and the like, and worked to communicate these horizontally across the company.</li> <li>We performed drills simulating what we call a "medium-scale" disaster, where multiple locations of a single site have emergency situations simultaneously.</li> <li>We are conducting equipment management according to MOSMS*3 priority.</li> <li>We are creating MGC Safety Standards.</li> </ol>	★★★	<p>Work toward the strengthening of on-site competency and safety competency, and the elimination of accidents and irregularities.</p> <ol style="list-style-type: none"> <li>Finish establishing the Bridge framework and continue operations under said framework.</li> <li>Adopt the safety competency assessment system of the Japan Safety Competency Center.</li> <li>Enforce risk assessments for non-steady-state situations (emergencies, startup, shutdown, operational errors, personnel changes, etc.)</li> <li>Steadily implement RC education and training according to education guidelines Enhance education and training (improve operational capability and emergency response capability)</li> <li>Prevent the occurrence of similar accidents through analysis of our and other companies' past case studies (use of the JCSA's Safety and Accident Prevention Guidelines, etc.)</li> <li>Enhance our disaster readiness framework.</li> <li>Enhance facility management.</li> <li>Formulate and start operation of MGC Safety Standards.</li> </ol>
Environmental Preservation	<ol style="list-style-type: none"> <li>Reduce energy consumption intensity to 85% or lower compared with FY 1990 levels. (Implementation of energy saving measures and reduction of equipment problems)</li> <li>Reduce greenhouse gas emissions intensity to 72% or lower compared with FY 1990 levels.</li> <li>Reduce emissions of PRTR substances by 10% compared with FY 2014.</li> <li>Maintain Zero Emissions of wastes (Zero Emissions at MGC: 0.3% or less final disposal of generated wastes, by weight).</li> <li>Reduce generated waste volume by 10% compared with FY 2014.</li> <li>Promote initiatives related to conservation of biodiversity.</li> <li>Formulate methods for evaluation of environmentally friendly products.</li> </ol>	<p>Undertake social contribution through the environment, while continuing to reduce environmental impacts.</p> <ol style="list-style-type: none"> <li>Further improve our energy consumption intensity and greenhouse gas emissions intensity.</li> <li>Continue notifications in accordance with the PRTR Law and reduce emissions</li> <li>Continue Zero Emissions initiatives.</li> <li>Encourage initiatives toward the preservation of biodiversity.</li> <li>Consider methods for evaluation of environmentally friendly products.</li> </ol>		<ol style="list-style-type: none"> <li>As the result of initiatives to reduce energy consumption and GHG emissions, the Plant Manufacturing Division was able to reduce energy consumption by 3% and GHG emissions by 7% in FY 2016. Energy consumption intensity improved 0.4 points on the previous year to 91% of 1990 levels, while GHG emission intensity improved 0.5 points to 74% of 1990 levels. We implemented around 50 energy saving measures, including changing the source of energy for compressors, and changing heating methods.</li> <li>The PRTR substance emissions volume for MGC alone in FY 2016 was 256 tons, a reduction of approximately 14% from FY 2014.</li> <li>The Zero Emissions Rate for MGC alone in FY 2016 was 1.34%, meaning we have not achieved the Zero Emissions since FY 2014. Final disposal increased in FY 2016 due to a one-off surplus soil disposal at Mizushima Plant, and MGC as a whole failed to achieve Zero Emissions criteria.</li> <li>Waste generated by MGC alone in FY 2016 amounted to about 78,600 tons, a 3% reduction on FY 2014.</li> <li>We carried out activities such as planting and maintaining trees at plants and participating in cleaning activities in the areas surrounding these plants.</li> <li>In FY 2016, seven MGC Group products and businesses that contribute to reducing environmental impact were selected as "MGC Group Eco-friendly Products" and we designed an introductory panel for them.</li> </ol>	★★	<p>Undertake social contribution through the environment, while continuing to reduce environmental impacts.</p> <ol style="list-style-type: none"> <li>Improve our energy consumption intensity and greenhouse gas emissions intensity.</li> <li>Continue notifications in accordance with the PRTR Law and reduction of emissions.</li> <li>Continue measures to reduce wastes.</li> <li>Promote initiatives toward the preservation of biodiversity.</li> <li>Publicly announce the eco-friendly products, select second round of products and create an introductory panel</li> <li>Identify apparatus with high-concentrations of PCB</li> </ol>
Chemical and Product Safety	<ol style="list-style-type: none"> <li>Provide safety information for chemical products handled (reflecting the latest safety information in SDSs, etc.)</li> <li>Risk management for handled chemical products.                             <ul style="list-style-type: none"> <li>Participate in JIPS.</li> <li>Risk management for new products.</li> </ul> </li> <li>Adapt to EU REACH regulation and other overseas regulations.</li> </ol>	<p>We will carry out risk management of products.</p> <ol style="list-style-type: none"> <li>Provide up-to-date information through SDSs.</li> <li>Risk management of handled chemical products.                             <ul style="list-style-type: none"> <li>Participate in the JIPS initiative of the JCSA and creation of Safety Summaries.</li> <li>Promote risk assessment for new products.</li> </ul> </li> <li>Adapt to overseas regulation.                             <ul style="list-style-type: none"> <li>Adapt to EU REACH regulation.</li> <li>Collect information regarding regulations in non-EU countries.</li> </ul> </li> </ol>		<ol style="list-style-type: none"> <li>We created a list of SDSs that needed reviewing due to an amendment to the Industrial Safety and Health Act and are carrying out these reviews (248 of 320 reviews completed). We obtained the latest SDSs for chemical substances handled such as raw materials.</li> <li>We submitted one Safety Summary. Internal safety studies for new products conducted in 2016 consisted of 3 acute toxicity studies, 7 Ames mutagenicity studies, 6 primary skin irritation studies, and 1 pathogenicity study, for 17 in total (compared with a respective 11, 12, 14, and 1 studies, for a total of 28, in 2015).</li> <li>In preparation for REACH registration, we created the analysis reports for 6 substances scheduled for registration in 2018 (analysis reports for 20 substances have been created in total). With regard to non-EU foreign regulations, we provided by email, information obtained from industry associations, etc.</li> <li>Korea REACH We carried out a survey of substances to be registered in September, and started registration preparations from October.</li> </ol>	★★★	<p>We will carry out risk management of products.</p> <ol style="list-style-type: none"> <li>Provide up-to-date information through SDSs.</li> <li>Manage risks in handled chemical products.                             <ul style="list-style-type: none"> <li>Participate in the JIPS initiative of the JCSA and creation of Safety Summaries.</li> <li>Promote risk assessment for new products.</li> </ul> </li> <li>Adapt to foreign regulations.                             <ul style="list-style-type: none"> <li>Adapt to EU REACH regulation.</li> <li>Collect information regarding regulations in non-EU countries.</li> </ul> </li> </ol>

\*1 HAZOP: Abbreviation of Hazard and Operability Studies. A method of conducting risk assessment on processes.

\*2 Surveys of understanding concerning troubles: A tool for educating and preventing negligence that uses troubles that have occurred in the past to survey an individual's understanding of safety.

\*3 MOSMS: Maintenance Optimum Strategic Management System. A plan-led mechanism for facility maintenance, advocated by the Japan Institute of Plant Maintenance.

# Occupational Health and Safety, Process Safety, and Disaster Prevention

MGC's top priority is to ensure safety, and we have a proactive approach aimed at zero accidents and zero occupational injuries.

## Safety Philosophy

Ensuring safety is the top priority of our business activity.  
Safety is the basis of our business activity and ensuring safety is our duty to society.

### Occupational Health and Safety Initiatives

To achieve our objective of no occupational injuries, our workplaces continuously engage in everyday safety activities such as 5S activities, hazard prediction, and proposals to address *Hiyari Hatto* (near-miss) incidents. Our worksites also advance various safety activities such as safety related education and drills, and occupational health and safety risk assessments.



*Hiyari Hatto* (near-miss) activity report (Yokkaichi Plant)



5S patrol (Saga Plant)



Education using younger employees as instructors (Niigata Research Laboratory)



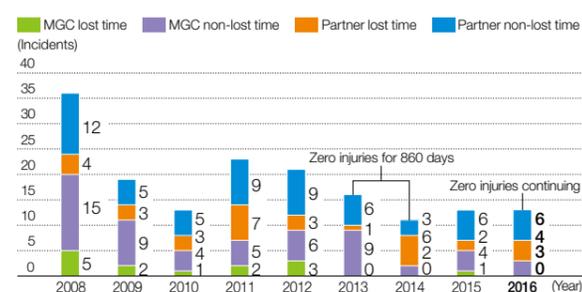
Education on handling high-pressure gas canisters (Hiratsuka Research Laboratory)

### Safety Performance

With no serious accidents last year, we have managed to maintain an excellent track record of zero occupational injuries for over two years running. Although there were no lost time injuries at MGC, there were five occurrences at partner companies.

MGC realizes that we have a serious responsibility to ensure the safety of people at our partner companies and we will provide even further support and assistance in multiple areas going forward.

### Safety Record (MGC and partner companies)



### Lost time injury frequency rate\*1

	2012	2013	2014	2015	2016
MGC	0.80	0	0	0.27	0
Chemical industry	0.85	0.82	0.76	0.81	0.88
Manufacturing industry	1.00	0.94	1.06	1.06	1.15

\*1 **Frequency rate:** Number of occupational injury casualties per one million working hours

### Lost time injury severity rate\*2

	2012	2013	2014	2015	2016
MGC	0.03	0	0	0	0
Chemical industry	0.12	0.12	0.17	0.04	0.03
Manufacturing industry	0.10	0.10	0.09	0.06	0.07

\*2 **Severity rate:** Number of lost working days per 1,000 working hours

### Preventing Occupational Injuries at Partner Companies

We share information on occupational injuries, perform risk assessments, provide safety education, and carry out joint disaster reduction training aimed at industrial accident prevention in partner companies, while we work to enhance our cooperative frameworks. In some plants, we also conduct audits and safety inspections of partner companies.



Protective tool training for partner companies (Mizushima Plant)



Danger experience training for partner companies (Niigata Plant)



KY (hazard prediction) training for partner companies (Niigata Plant)



Emergency drill with partner companies (Yokkaichi Plant)

### Process Safety and Disaster Prevention Activities

To prevent the occurrence of accidents and injuries, it is important to continue stable operation by ensuring safety of production processes and soundness of equipment. In each plant, we utilize equipment maintenance (M3) and other systems to conduct checks and make renewal plans, and perform checks, repairs, and renewals with priority set according to risk and the importance of facilities.

We are also using case studies of past accidents to verify the effectiveness of countermeasures and engaging in initiatives aimed at preventing the occurrence of similar accidents. We are also carrying out facility risk assessments that simulate non-steady-state operations, such as emergency shutdowns.

Furthermore, in addition to converting standards manuals to "Know Why," we are also introducing operation simulation training.



Regular maintenance patrol (Mizushima Plant)



Lecture by former employees on improving safety competency (Kashima Plant)



HAZOP training (Kashima Plant)



Operation simulation training (Niigata Plant)

### Responding to emergencies

In preparation for accidents, we establish a self disaster readiness framework at each business site and carry out various disaster reduction drills according to sites' annual plans.



Fire hose drill (Tokyo Techno Park)

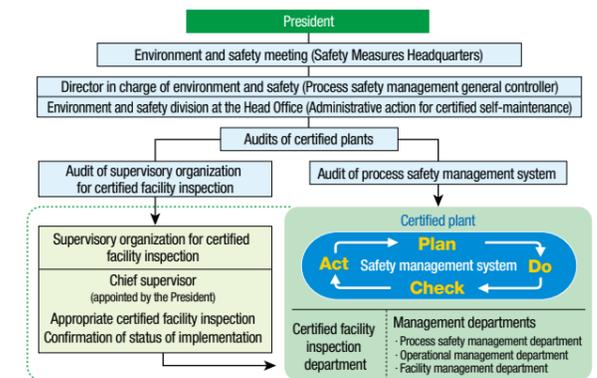


Disaster preparedness drill (Yamakita Plant)

### Certified high pressure gas plants

Niigata Plant and Mizushima Plant, which are high pressure gas safety management code certified plants, are audited by the Director in charge of environment and safety (Process Safety Management General Controller) under the company rules for "High pressure gas certification safety management". The aim of our audits is to objectively evaluate the high pressure gas safety management system and the certified inspection management framework to ensure that they are working effectively.

### Certified process safety management system for high pressure gas

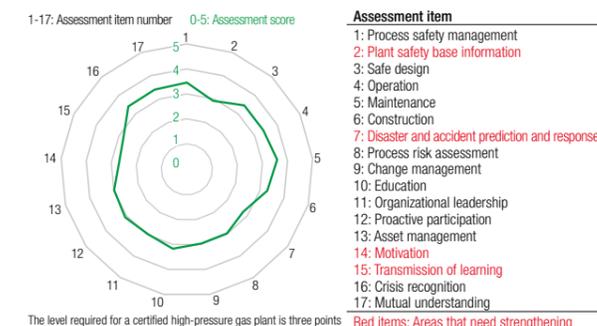


### Accident Elimination (Bridge) Activities

Following on from six years of Accident Zero (AZ) activities, we are now in the third year of Bridge activities and self-led safety activities are being carried out under the frameworks established at each plant.

Assessments using the Japan Society for Safety Engineering's safety competency assessment system are progressing smoothly, and once weak spots are identified, improvements are being made. We are also holding company-wide improvement presentation meetings where excellent reports are commended, and promoted to share information on environment and safety, such as case studies of successful improvements.

### Safety Competency Assessment Results (Mizushima Plant)



## Environmental Impacts Accompanying Business Activities

### (Domestic MGC Group)

Member companies of the MGC Group Environment and Safety Council in Japan make efforts to contribute to the reduction of environmental impacts and the sustainable development of society, in accordance with the MGC Group's fundamental environmental and safety principles.

The table below displays the environmental impact of the MGC Group's operations in Japan in FY 2016.

#### Total for the Domestic MGC Group\*1

FY 2015*2	FY 2016
Sites tabulated: 66	Sites tabulated: 66

INPUTS	Units	2015	2016
Energy consumption (crude oil equivalent)	1,000 kL	567	548
<b>Water usage</b>			
Tap water	1,000 m <sup>3</sup>	1,070	646
Industrial water	1,000 m <sup>3</sup>	22,060	22,235
Groundwater	1,000 m <sup>3</sup>	1,358	1,224
River water	1,000 m <sup>3</sup>	9,131	9,978
Others	1,000 m <sup>3</sup>	1,240	1,154
Total water intake	1,000 m <sup>3</sup>	34,860	35,237

OUTPUTS	Units	2015	2016
<b>Emissions to atmosphere</b>			
Greenhouse gas emissions (CO <sub>2</sub> equivalent)	1,000 tons	1,280	1,191
SO <sub>x</sub>	tons	72	71
NO <sub>x</sub>	tons	628	536
Soot and dust emissions	tons	19	24
<b>Released to water area</b>			
Drainage volume	1,000 m <sup>3</sup>	30,928	32,321
COD emissions	tons	196	234
Total nitrogen emissions	tons	282	207
Total phosphorus emissions	tons	46	69
<b>Generation of waste</b>			
Amount generated	tons	126,358	120,311
Amount recycled (including amount sold)	tons	37,884	42,208
Transfer to off-site	tons	34,188	26,641
Final disposal	tons	1,968	2,239
<b>Notified substances under PRTR Law</b>			
Emissions (air)	tons	1,242	827
Emissions (water)	tons	20	15
Emissions (soil)	tons	0	0
Total amount emitted	tons	1,262	842
Total amount transferred	tons	628	1,100

\*1 The total for the domestic MGC Group is the sum of environmental impact data for the MGC Group's main domestic manufacturing and processing businesses (member companies of the MGC Group Environment and Safety Council; see pages 45 to 48) and MGC itself (production sites such as plants and non-production sites such as laboratories and sales offices, with MGC training centers and company-owned recreation facilities together treated as the equivalent of one site. Furthermore, aggregation of MGC Ageless Co., Ltd., is planned from FY 2017 results onwards). The environmental impact values shown in the table for the Group as a whole capture over 90% of the scope of consolidated accounting for the MGC Group in Japan.

\*2 FY 2015 data may appear differently in CSR Report 2016 because it has been revised.

#### MGC Alone

FY 2015*2	FY 2016
Sites tabulated: 13	Sites tabulated: 13

INPUTS	Units	2015	2016
Energy consumption (crude oil equivalent)	1,000 kL	472	455
<b>Water usage</b>			
Tap water	1,000 m <sup>3</sup>	397	413
Industrial water	1,000 m <sup>3</sup>	19,022	18,975
Groundwater	1,000 m <sup>3</sup>	452	427
River water	1,000 m <sup>3</sup>	9,131	9,978
Others	1,000 m <sup>3</sup>	898	1,018
Total water intake	1,000 m <sup>3</sup>	29,900	30,811

OUTPUTS	Units	2015	2016
<b>Emissions to atmosphere</b>			
Greenhouse gas emissions (CO <sub>2</sub> equivalent)	1,000 tons	1,052	975
SO <sub>x</sub>	tons	54	58
NO <sub>x</sub>	tons	576	488
Soot and dust emissions	tons	8	13
<b>Released to water area</b>			
Drainage volume	1,000 m <sup>3</sup>	27,585	28,852
COD emissions	tons	174	182
Total nitrogen emissions	tons	263	191
Total phosphorus emissions	tons	45	68
<b>Generation of waste</b>			
Amount generated	tons	78,496	78,607
Amount recycled (including amount sold)	tons	20,675	20,909
Transfer to off-site	tons	8,472	8,305
Final disposal	tons	700	1,054
<b>Notified substances under PRTR Law</b>			
Emissions (air)	tons	257	241
Emissions (water)	tons	20	15
Emissions (soil)	tons	0	0
Total amount emitted	tons	278	256
Total amount transferred	tons	237	352

## Environmental Impacts Accompanying Business Activities

### (Overseas MGC Group)

MGC surveys and compiles environmental impact data for group companies sited overseas that engage in manufacturing.

#### Overseas MGC Group Companies\*3

2015*2	2016
Sites tabulated: 16*4	Sites tabulated: 15*4

INPUTS	Units	2015	2016
Energy consumption (crude oil equivalent)	1,000 kL	260	249
<b>Water usage</b>			
Tap water	1,000 m <sup>3</sup>	317	302
Industrial water	1,000 m <sup>3</sup>	4,757	5,013
Groundwater	1,000 m <sup>3</sup>	10	9
River water	1,000 m <sup>3</sup>	0	0
Others	1,000 m <sup>3</sup>	2,117	2,315
Total water intake	1,000 m <sup>3</sup>	7,200	7,638

OUTPUTS	Units	2015	2016
<b>Emissions to atmosphere</b>			
Greenhouse gas emissions (CO <sub>2</sub> equivalent)	1,000 tons	2,430	2,277
<b>Released to water area</b>			
Drainage volume	1,000 m <sup>3</sup>	4,115	3,922
<b>Generation of waste</b>			
Amount generated	tons	10,190	9,883
Amount recycled (including amount sold)	tons	7,236	7,779
Final disposal	tons	1,039	1,132
<b>Notified substances under PRTR (TRI) Law</b>			
Emissions (air)	tons	93	108
Emissions (water)	tons	27	43
Emissions (soil)	tons	0	0
Total amount emitted	tons	120	151
Total amount transferred	tons	797	910

\*3 Targeted companies: Ageless (Thailand) Co., Ltd.; Korea Engineering Plastics Co., Ltd.; MGC Advanced Polymers, Inc.; MGC Electrotechno (Thailand) Co., Ltd.; MGC Pure Chemicals America, Inc.; MGC Pure Chemicals Taiwan, Inc.; Mitsubishi Gas Chemical Engineering-Plastics (Shanghai) Co., Ltd.; MGC Pure Chemicals Singapore Pte. Ltd.; P.T. Peroksida Indonesia Pratama; Samyoung Pure Chemicals Co., Ltd.; Suzhou MGC Suhua Peroxide Co., Ltd.; Te an Ling Tian (Nanjing) Fine Chemical Co., Ltd. (excluded in 2016); Thai Polyacetal Co., Ltd.; Thai Polycarbonate Co., Ltd.

\*4 As some data is not collected for some companies, data may not be available for all locations.

## Preservation of Biodiversity (MGC Alone)

Endorsing the aims of the Keidanren (Japan Business Federation) Declaration of Biodiversity, MGC signed on as a promotional partner of the Declaration in 2009.

In 2014, MGC became a member of the Keidanren Nature Conservation Committee with the aim of engaging in activities to protect the natural environment and conserve biodiversity.

The chemical industry handles a large volume and variety of chemical substances and among these are many which may have a severe impact on human health and ecosystems if unintentionally released into nature.

Carrying out its business activities with a keen awareness of this, MGC will strive to maintain a rich natural environment and preserve biodiversity through measures such as chemical management founded on responsible care, environmental preservation, conservation of resources and energy. Furthermore, we will contribute to sustainable development through the development of technology that can be assessed as eco-friendly products, and the proliferation of these products.

We are undertaking activities related to biodiversity through close-at-hand activities at each plant, such as flower campaigns within the plants and maintenance of forest preserves in surrounding areas.

## Initiatives for the Prevention of Global Warming (MGC Alone)

MGC is aware of the major risks to its business associated with global warming and, is making efforts to prevent it.

### Greenhouse Gas Reduction Targets

The Plant Manufacturing Division accounts for 97% of MGC greenhouse gas (GHG) emissions and is engaged in initiatives to reduce these emissions. It has set the following targets.

Energy consumption intensity\*1:

Reduce to 85% or lower compared with FY 1990 levels by FY 2017 (89.5% or lower compared with FY 2014 levels)

GHG emissions intensity\*2:

Reduce to 72% or lower compared with FY 1990 levels by FY 2017 (88.7% or lower compared with FY 2014 levels)

\*1 Energy consumption intensity: The amount of energy consumption per unit of production volume

\*2 Greenhouse gas emissions intensity: The amount of GHG emissions per unit of production volume

### GHG emissions in FY 2016

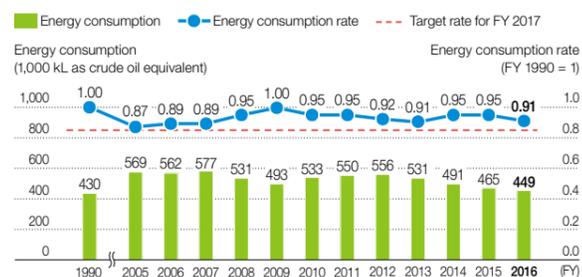
	Energy consumption (1,000 kL crude oil equivalent)	Greenhouse gas emissions (1,000 tons CO <sub>2</sub> equivalent)
Plant Manufacturing Division	449.3	963.5
Transportation Sector (shipper)	10.7	28.4
Office Area	6.0	11.7
<b>Business activities overall</b>	<b>466.0</b>	<b>1003.6</b>

### Initiatives in Plant Manufacturing Division

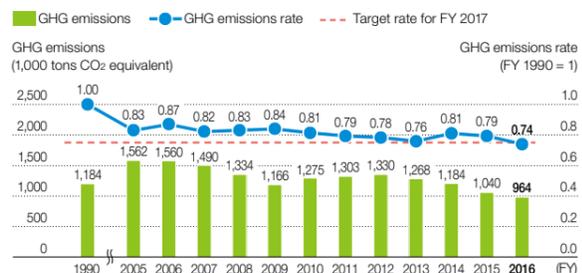
In FY 2016, we implemented around 50 measures including changing the source of energy for our compressors, changing heating methods, reviewing refining methods, strengthening heat recovery, and efficiently using by-products as fuel. The energy conserved by these measures is equivalent to around 6,000 kL of crude oil and the reduction in GHG emissions was equivalent to around 6,000 tons of CO<sub>2</sub>. Total cost reductions were equivalent to about 600 million yen.

Looking ahead, we are planning measures including the adoption of new-model co-generation systems, and reviews of refining methods.

### Energy consumption and consumption rate



### GHG emissions and GHG emissions rate

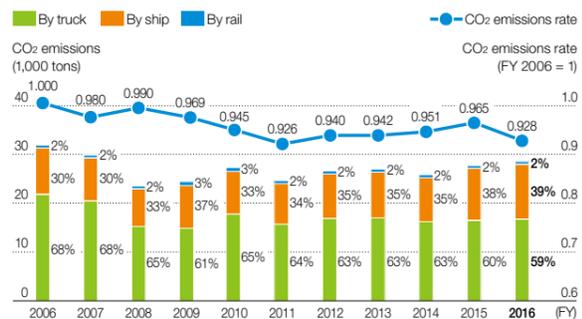


### Initiatives in the Transportation Sector

In our transportation sector, we have undertaken energy saving initiatives focused on enlarging the volume that can be transported in a single shipment, and making a modal shift to environmentally-friendly transportation methods such as rail.

As an example of this modal shift, in FY 2016 we reduced energy consumption by 17% and GHG emissions by 10% by shifting from truck transportation to rail transportation.

### CO<sub>2</sub> emissions



## MGC Group Eco-friendly Products Becoming Widespread

MGC products can be useful in reducing environmental impact in various areas of society. These kinds of products are being designated by MGC as "MGC Group Eco-friendly Products."

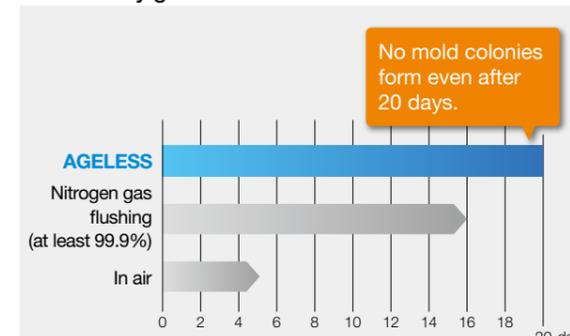
### Oxygen absorbers (AGELESS) | Prolonged preservation of food freshness and taste

#### Reduction of food waste

Disposal of food due to mold, discoloration, and change in taste is reduced. Furthermore, maintaining deliciousness and freshness for long periods can reduce CO<sub>2</sub> emissions in distribution by reducing the frequency of production and transport.

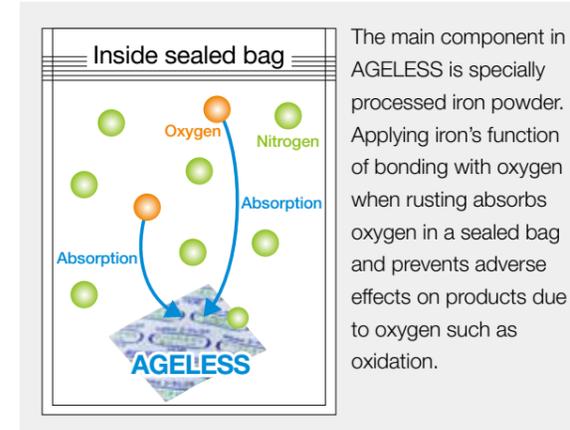


#### Mold colony generation test



Test method: Inoculate *castella* sponge cake with blue mold and compare effect on growth suppression of AGELESS pack and nitrogen gas flushing packaging

#### Oxygen absorption mechanism



#### Effect of AGELESS



MGC Group Eco-friendly Products Becoming Widespread

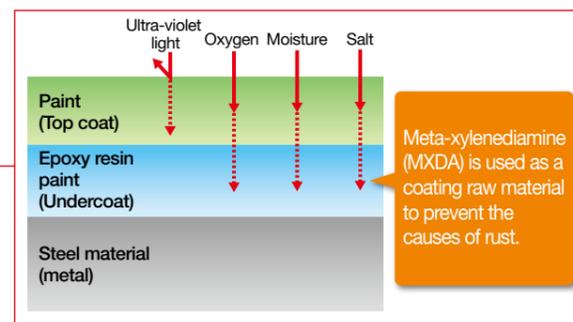
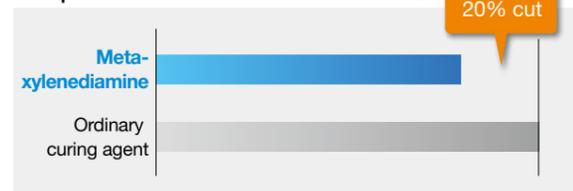
**Meta-xylenediamine (MXDA)** | An environmentally- and health-friendly paint component

**Reduces organic solvent emissions to zero!**



Used as a health- and environmentally-friendly water-based epoxy coating, it reduces emissions of organic solvents that cause atmospheric pollution to zero. Using meta-xylenediamine allows a 20% reduction in the volume of epoxy hardener used, so it also helps to conserve oil resources.

Comparison of hardener content in formula



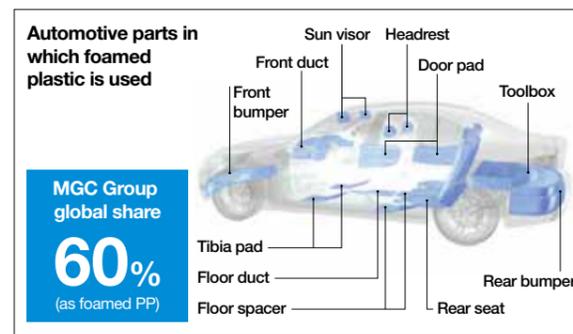
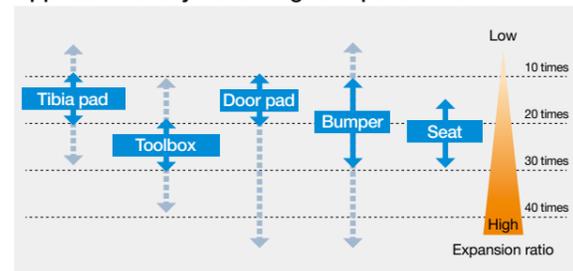
**Foamed plastic** | A resin that contributes significantly to reducing weight and increasing fuel economy of automobiles

**20-30% reduction in weight Rear seat example (comparison with previous products)**



Foamed plastic, which is very lightweight and rigid, is widely used in automotive parts, playing a role in improving fuel economy and reducing CO<sub>2</sub>. In addition, it is an environmentally-friendly material that can be recycled.

Applications vary according to expansion ratio



MGC Group global share  
**60%**  
(as foamed PP)

\*Products of JSP, a member of the MGC Group.

**Dimethyl ether (DME)** | A clean fuel

**Reduced NOx emissions and zero SOx and PM emissions during combustion**



MGC makes methanol and DME from natural gas that is produced as a by-product during the extraction of oil, so it has advantages in terms of efficient utilization of resources and the environment. Moreover, its practical use is being promoted due to the fact that it is a clean fuel that avoids generating the sulfur oxide (SO<sub>x</sub>) and particulate matter (PM) emitted when burning light oil and kerosene.

DME is used as a propellant in sprays replacing CFCs.

DME is being investigated for commercialization as a fuel for boilers in plastic greenhouses and a plant growth auxiliary.

\*Warming while also supplying CO<sub>2</sub> required for growth.

DME can be used as a clean diesel fuel.

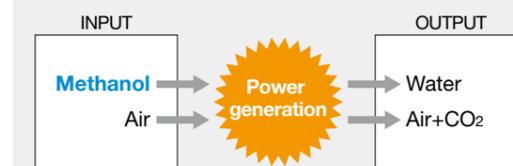
**Direct methanol fuel cell (DMFC)** | A quiet clean generator

**Zero atmospheric pollutant emissions (NOx, SOx, and particulates)**



Because it generates electricity through a chemical reaction, it is quiet and does not pollute the air. It can provide electricity continuously for at least several days and is becoming increasingly common as an emergency power source.

DMFC power generation mechanism



The DMFC uses methanol and air to make electricity through a chemical reaction. Electricity can be produced for as long as the supply of methanol is maintained.

**Geothermal power generation** | Renewable clean energy

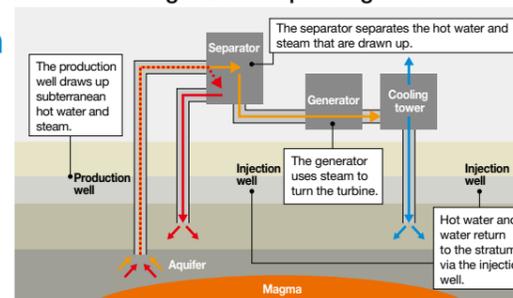
**Lifecycle CO<sub>2</sub> emissions\* Less than 1/50 Compared with Coal fired power generation**

\*Refers to CO<sub>2</sub> emissions over the life of a power station.



Geothermal power is a renewable energy utilizing subterranean steam that can generate power in a stable manner that is not dependent on changes in the seasons and weather. It reduces CO<sub>2</sub> emissions during generation to a great extent.

Mechanism of geothermal power generation



**Hydrogen peroxide** | An environmentally-friendly bleaching agent



Hydrogen peroxide is a chemical that has been used as a bleaching agent and an oxidizer for many years. As it does not create harmful by-products forming water and oxygen even when it decomposes, it is in demand in diverse areas as an environmentally-friendly chemical.

Chlorine-free bleaching process

MGC's hydrogen peroxide is used as a bleaching agent for paper.

## Reducing Chemical Substance Emissions (MGC Group)

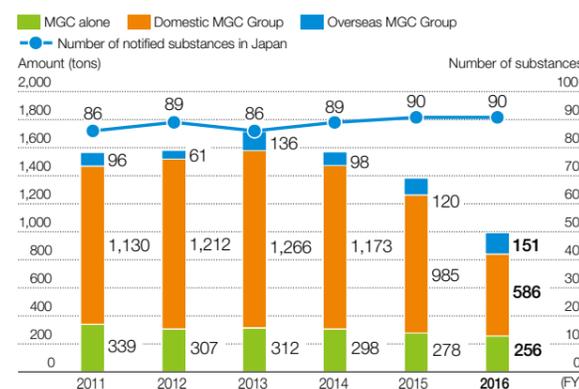
Each MGC Group company assesses and issues notifications on substances subject to the chemical substance emission notification system of the country in which it is based (PRTR in Japan), while working to reduce the amounts released and transferred.

### Substances Subject to Notification under the PRTR Law

Many countries have systems that require notifications regarding chemical substance emission in a similar way to Japan's PRTR Law (TRI in the US, etc.) We have aggregated substance emissions reported by overseas group companies that also fall under Japan's PRTR system into our totals.

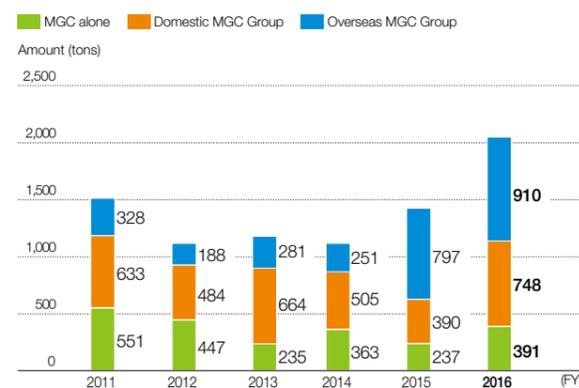
Our annual emission of these substances totaled 993 tons, a decrease of about 28% from 1,382 tons in the previous year. The primary reason for the reduction was the plan undertaken by JSP Corporation, a Group company, to replace a PRTR-targeted blowing agent used in the manufacture of a portion of its products with a non-PRTR-targeted blowing agent.

### Substance emissions (in accordance with the PRTR Law)



Overseas totals for each calendar year have been added to the corresponding fiscal year on the graph.

### Substance transfers (in accordance with the PRTR Law)



### Substance emissions and transfer intensity (in accordance with the PRTR Law) over consolidated net sales



### PRTR Law Substances with High Levels of Emissions (Domestic MGC Group)

Among the substances registered under the PRTR Law, those listed below are emitted by the domestic MGC Group in amounts of 10 tons or more.

- Chloromethane\* (534 tons)
- 1,2,4-Trimethylbenzene (75 tons)
- Dichloromethane (58 tons)
- Xylene (18 tons)
- Toluene (13 tons)

\* There was an error in the figure listed for chloromethane in CSR Report 2016. The correct figure was 923 tons

### Japan Chemical Industry Association PRTR-Targeted Substances (MGC Alone)

The Japan Chemical Industry Association (JCIA), of which MGC is a member, has specified 328 Class I Designated Chemical Substances stipulated by the PRTR Law, and a JCIA specified 90 substance plus 1 substance group as voluntary PRTR-targeted substances (with only atmospheric emissions calculated for the JCIA-specified substances). The entire chemical industry is working toward the reduction of emissions of these PRTR substances.

The amount of the substances emitted by MGC in FY 2016 totaled 75 substances and 336 tons, a decrease of about 9% from 371 tons in the previous fiscal year.

\* Past emissions and transfer figures have been reviewed and corrected.

## Reduction of Waste (MGC Group)

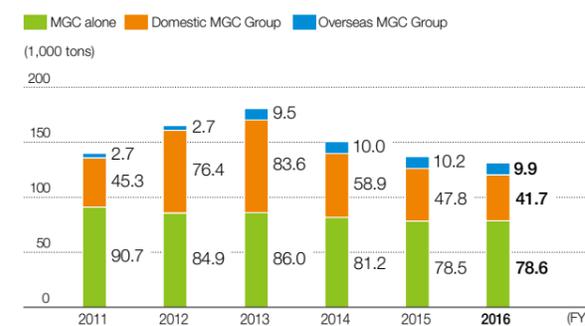
Each MGC Group company is striving to reduce waste by promoting the 3Rs of waste (Reduce, Reuse, Recycle), and to undertake the proper disposal of wastes in accordance with law.

### Waste Reduction Achievement

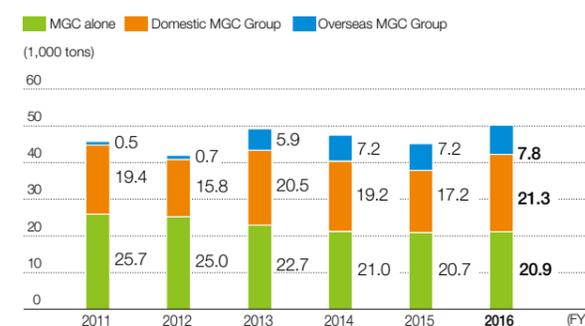
FY 2016 waste amounts totaled about 130,200 tons Group-wide, a decrease of about 6,300 tons, or about 5%, from the previous year.

Final disposal for the Group totaled 3,370 tons, an increase of about 400 tons from the previous year. The increase in final disposal amounts since FY 2014 for MGC alone was due to one-off increases associated with review of business and surplus soil disposal.

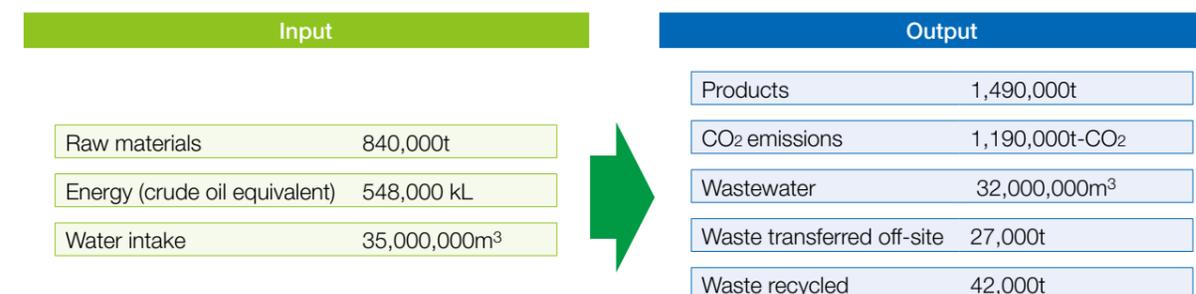
### Amount of waste generated



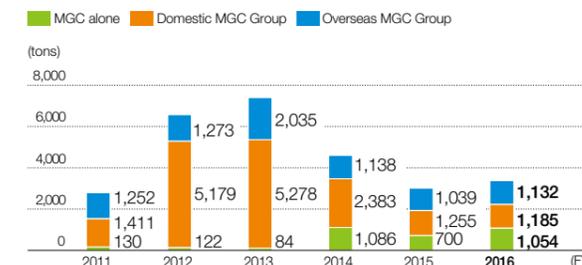
### Recycled amount



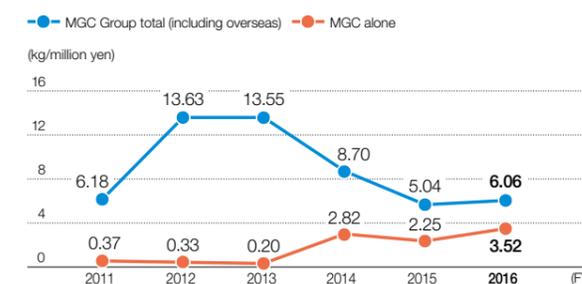
### Input and Output Related to Production in FY 2016 (Domestic MGC Group)



### Final disposal amount

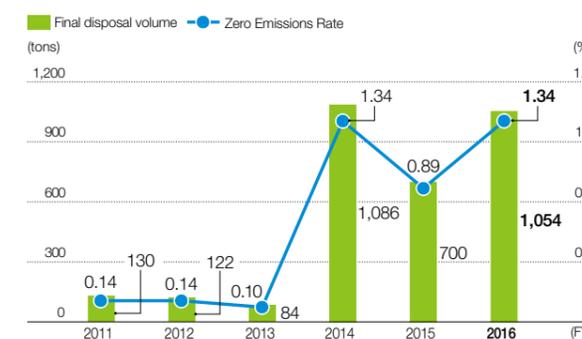


### Final disposal intensity compared to net sales



### Zero Emissions (MGC Alone)

#### Final disposal volume and Zero Emissions Rate (MGC alone)



\* Past data regarding waste has been reviewed and corrected.

## Conservation of Water and Atmospheric Environments

### (MGC Group)

To preserve the soundness of the water and air resources so vital to the Earth and to use them sustainably, MGC Group companies monitor water intake and wastewater volumes, as well as the volume of substances within this wastewater that impact the environment.

### Water Intake / Wastewater Volume

The increase in wastewater in FY 2012 and FY 2013 in our domestic Group was a one-off event due to the intensive processing of wastewater stored in tanks associated with the decommissioning of facilities.

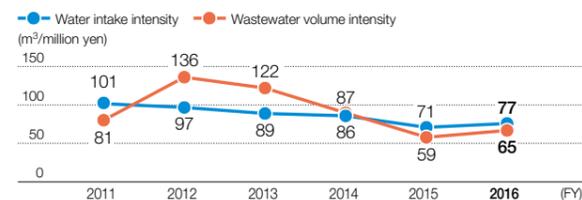
#### Water intake



#### Wastewater



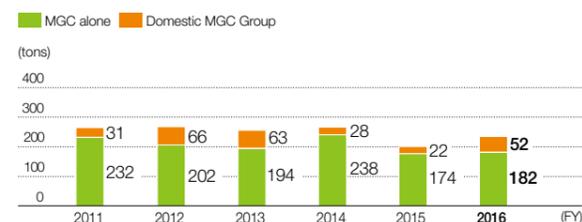
### Global water intake / wastewater volume intensity compared to consolidated net sales



### Preservation of the Water Environment (Domestic MGC Group)

The increase in nitrogen seen during FY 2013 and FY 2014 was a one-off increase due to processing of wastewater associated with the decommissioning of facilities.

#### Emission of COD



#### Emission of total nitrogen



#### Emission of total phosphorous



### Preservation of Atmospheric Environment (Domestic MGC Group)

#### Emission of SOx



#### Emission of NOx



#### Emission of soot and dust



\* Past data has been reviewed and corrected.

## Environmental Accounting (MGC Alone)

Through environmental accounting in accordance with guidelines by the Ministry of the Environment, MGC has quantitatively calculated and released the investment amount and costs of environmental preservation required for the business activities of MGC (alone), as well as the real economic benefits obtained.

### Environmental Preservation Cost and Economic Benefits

#### Investment amount

The total amount of investment related to environmental preservation activities in FY 2016 was approximately 800 million yen. Major investments include converting the power supply for compressors at the Mizushima Plant.

#### Expenses

Total expenses related to environmental conservation activities in FY2016 were 7.8 billion yen. Of these, the highest expense was 2.7 billion yen for research and development, accounting for 34% of the total.

#### Economic benefits

The reduction of expenses through energy saving measures and the income from the sale of unneeded items generated in our business activities were recorded as real economic benefit.

#### Economic benefit

Title	Item	Amount (millions of yen)
Income	Profit on sale of valuable waste, etc.	25.9
Reduction of expenses	Effects due to energy saving	355.7

#### Environmental preservation cost

Breakdown	Main areas of activity	(millions of yen)	
		Investment	Expenses
Onsite cost	Air pollution prevention	212.9	736.1
	Water pollution prevention	102.6	1,627.4
	Soil, Noise	8.4	0.3
Global environmental preservation cost		114.7	1,323.4
Resources recycling cost		7.1	873.5
Up or down stream cost		0.0	52.3
Management activity cost		33.9	516.5
R&D cost		283.6	2,899.8
Social contribution cost		0.0	11.1
Environmental damage cost		0.0	75.4
Total		763.1	8,115.9

Compliance with the Ministry of the Environment's Environmental Accounting Guidelines 2005

Period: From April 1, 2016 to March 31, 2017

Scope: MGC alone

Methods: Investments were proportionally related to the approved or enforced amount of capital expenditure to environmental preservation. Expenses were proportionally related to the ratio of environmental preservation and include depreciation allowance.

### Environmental Preservation Investments (MGC Alone)

MGC has been undertaking environmental preservation investments since FY 2015.

Environmental preservation investments are those investments which are difficult to adopt in conventional investment projects for reasons including long return on investment periods, but for which we are internally soliciting projects with large environmental burden reduction effects, and projects connected to the conservation of biodiversity, aiming for execution on a total scale of about 100 million yen.

As an example, investment to replace air conditioning equipment with new energy-saving, fluorocarbon-free types has the dual effects of energy conservation and preventing damage to the ozone layer. Moreover, replacing mercury-vapor lamps and fluorescent lights with LED lighting is a promising step to conserve energy and reduce equipment containing mercury.

In FY 2016, we switched mercury-vapor lamps in our plants and surrounding street lights to LED lighting, upgraded air conditioning equipment, and switched the fuel used in our boilers. This had an effect of reducing electric power consumption by approximately 200,000 kWh over the year.

## Safety Management of Chemicals and Products

As a responsible provider of chemical products, MGC clearly explains properties, safety, and handling of its chemical products, as well as deploying various activities to protect the environment and to ensure the health and safety of all who use our products.

### Safety Assessment of Chemical Substances and Products

At the development stage of products, MGC first conducts basic surveys and safety assessments. When products correspond to new chemical substances, we submit the notifications required by law and conduct necessary safety testing. We then classify products according to whether they do or do not come under each legal regulation, as well as according to their degree of hazard under standards such as GHS,\* and create safety information such as safety data sheets (SDSs). Based on these, we perform risk assessments (based on hazards of the substances themselves and exposure) for all product processes, from manufacture to disposal, and offer the products after appraisal.

\* GHS: The Globally Harmonized System of Classification and Labeling of Chemicals. Chemical hazards are classified under fixed standards and are indicated clearly with pictograms on labels and SDS documentation. Ultimately, the information contributes to accident prevention, human health, and environmental preservation.

### Providing Safety Information

MGC provides safety information on chemicals through means including submission of product SDSs, placement of product warning labels on containers, and distribution of Yellow Cards.

#### Safety data sheets (SDSs)

SDSs are documents that convey detailed information about the handling and safety of chemicals, and are submitted to companies that handle MGC's chemicals, such as customers, sales agents, and shipping companies. SDSs that conform to GHS-compliant JIS (JIS Z 7253) are available for all of our products; we are now working to further enhance the listed safety information.



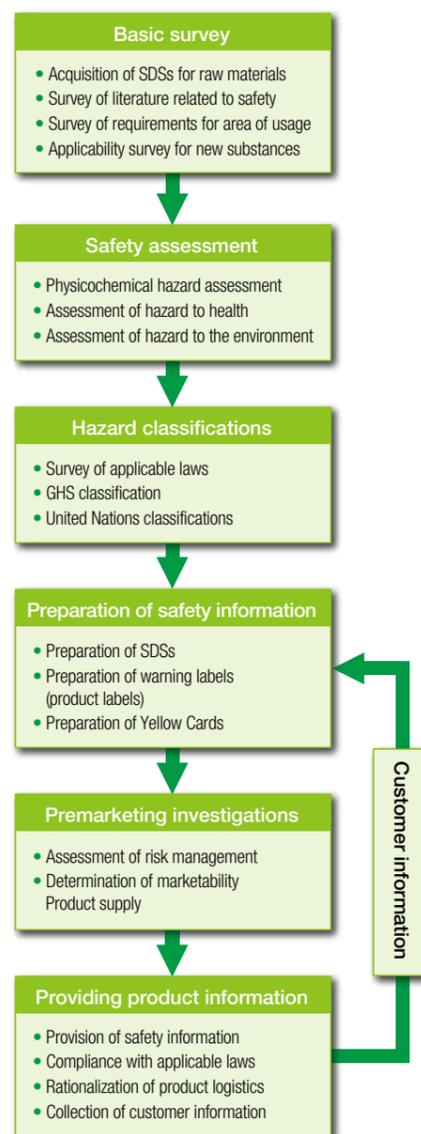
#### Labels

Easy-to-understand GHS-compliant warnings and safety information for users are printed on labels affixed to our chemical products. We are revising the SDSs by reviewing the safety information, and are revising labels as well.



#### Yellow Cards

A Yellow Card is a card readied in preparation for an accident during domestic shipment. It briefly lists a product's properties, laws that apply to the product, and emergency response measures, as well as contact information including fire departments, police departments, and MGC. We distribute these cards to shippers of chemicals, and ensure that they are carried during product shipments.



### Chemical and Product Safety Education

MGC conducts chemical and product safety education within its product liability (PL) training at each business site. In FY 2016, we conducted education on companies' stances toward and handling of PL.

The scope of chemical substances that became subject to mandatory risk assessments grew under the June 1, 2016 amendment to the Industrial Safety and Health Act, and substances continue to be added. We conducted education on risk assessment methods for use in the handling of various chemical substances to ensure safety within the company and deepen knowledge regarding the handling of products.



Chemical substance risk assessment (Kashima Plant)

### Compliance with EU REACH Regulation and Extending it to JIPS

As one adaption to the EU's REACH regulation for chemical product management, we are registering chemical substances that are exported to Europe. Since a portion of this registered information meshes with the activities of the Japan Initiative of Product Stewardship (JIPS) initiative of the JCIA, we are taking the hazard information and risk (exposure) information used for REACH registration and extending it to JIPS as well, while also making active use of it in our management of chemical substances.



GPS/JIPS Safety Summary

### Emergency Responses in Distribution

At MGC workplaces, we have set up a wide-area support system that includes supplying emergency goods and apparatus to production sites and establishing communication between sites to facilitate emergency responses to accidents that occur during transportation. Because of our preparation of response systems and supplies, we cooperate with local police or fire departments upon request, should an accident occur during another company's transport of product in the vicinity of our workplaces.

We conduct training for scenarios that include terrorism, logistics accidents, and shipping accidents with marine spills that require oil barrier deployment.



Logistics disaster prevention drill (Niigata Plant)



Marine hose drill (Mizushima Plant)

### GLP certified testing facility

The MGC Niigata Research Laboratory is recognized by the Japanese government as conforming to GLP\* test facilities for Ames mutagenicity study. GLP test reports command high confidence internationally. In addition, as GLP test reports can be used in notifications under the Industrial Safety and Health Law and the Law concerning the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., we conduct GLP tests when notifications are necessary for new chemical substances that are part of our product development.

We conduct testing to assess the safety of the chemicals handled by the MGC Group, including acute oral toxicity studies, primary skin irritation tests studies, and pathogenicity studies.

\* GLP (Good Laboratory Practice): GLP is a system which ensures the reliability of test results, through government recognition of excellent testing facilities that demonstrate GLP-based management, testing equipment, test planning, internal auditing systems, reliability assurance systems, and compliance with test result standards.

## The MGC Group Environment and Safety Council

MGC Group manufacturing companies in Japan are promoting environmental and safety initiatives within the MGC Group Environment and Safety Council. MGC Ageless Co., Ltd. joined in May 2017, making a total of 13 domestic affiliates.

RC Medium-Term Plan	2017 RC Action Plan
<ul style="list-style-type: none"> <li>Strengthening of communication with domestic and overseas Group companies (conferences, audits, liaison meetings)</li> <li>Group-wide practice of process safety and disaster prevention activities and labor safety activities</li> <li>Group-wide practice of environmental management</li> </ul>	<ul style="list-style-type: none"> <li>Sharing and horizontal communication of information on abnormal occurrences and occupational injuries</li> <li>Audit of domestic and overseas affiliates</li> <li>Support for the environmental and safety activities of domestic and overseas affiliates</li> <li>Setting of environmental impact reduction plans by the domestic MGC Group</li> </ul>

### MGC Group Environment and Safety Council Meeting

The Council meets twice a year to exchange ideas and to report on topics including MGC's and member companies' annual plans for environmental and safety activities, the results of the activities, and the status of accidents and occupational injuries.

Since 2012, the Council meets not only at the MGC headquarters, but also at MGC business sites and the business sites of Group companies, which provides an opportunity to raise the bar of environmental and safety activities by visiting the business sites of each company firsthand.



A meeting at JSP Kanuma Plant      JSP Kanuma Plant observation tour

### Sharing Safety Information across the MGC Group

If an accident or occupational injuries occur at an MGC Group company, information is immediately distributed across the Group using the safety information conveyance system to help prevent similar incidents from occurring. Furthermore, excellent examples of environmental and safety initiatives at MGC Group companies are introduced and shared across the Group as good practices.

### Environmental and Safety Audits

We oversee audits at domestic and overseas affiliates with the environment and safety director as team leader. We conduct 4 or 5 domestic and 5 or 6 overseas audits each year in support of the Group companies' environment and safety activities.

In 2016, the 12 companies below were audited.

- Fudow Company Limited
- Japan Finechem Company, Inc.
- Japan U-PiCA Company, Ltd.
- Toyo Kagaku Co.Ltd.
- MGC Electrotechno Co., Ltd.
- MGC Pure Chemicals Taiwan, INC. (MPCT/Taiwan)
- MGC Electrotechno (Thailand) Co., Ltd. (ETT/Thailand)
- Thai Polyacetal Co., Ltd. (TPAC/Thailand)
- Thai Polycarbonate Co., Ltd. (TPCC/Thailand)
- AGELESS (THAILAND) CO., LTD. (AGT/Thailand)
- MGC Advanced Polymers, Inc. (MAP/US)
- MGC Pure Chemicals America, Inc. (MPCA/US)

### Eiwa Chemical Industry Co., Ltd.

Manufacture and sale of blowing agents

Address: Daido Seimei Co. Kyoto Bldg. 9F, 595-3 Manjuya-Cho, Sanjo-sagaru, Karasuma-dori, Nakagyo-ku, Kyoto-shi, Kyoto 604-8161, Japan  
Tel: +81-75-256-5131  
URL: <http://www.eiwa-chem.co.jp/en/>



Kuniaki Jinnai  
President & CEO

Eiwa Chemical Industry's blowing agents have a wide range of applications in automobiles, construction materials, electronics, and other industries. Our strength is our technical ability to realize required attributes, which contribute to society by adding characteristics that lead to reduced environmental impact, such as weight reduction, heat insulation, and damping. Regarding safety, we are steadily engaging in activities such as KYT and risk assessment with an eye to breaking records for zero accidents and zero injuries, and will continue to stably supply products.



Firefighting drill using powder-based extinguishers

### MGC Advanced Chemical Inc.

Manufacturing of chemical products and life science-related materials

Address: 4061-2, Tayuhama, Kita-ku, Niigata-shi, Niigata 950-3112, Japan  
Tel: +81-25-259-7187  
URL: <http://mgc-ac.jp/> (Japanese only)



Takafumi Abe  
President & CEO

As a member of the MGC Group, we have the manufacture of life sciences-related materials and organic chemicals as our primary business. Through the practice we term "Safety assurance takes priority over all business activities," we endeavor daily to take environmental preservation into account and maintain safe and secure operations, so that we may be a presence trusted by the market and the community.



AED course

### MGC Electrotechno Co., Ltd.

Manufacture of copper-clad laminates

Address: 9-41, Aza-Sugiyama, Oaza-Yone, Nishigo-mura, Nishishirakawa-gun, Fukushima 961-8031, Japan  
Tel: +81-248-25-5000  
URL: <http://www.mgcet.jp/> (Japanese only)



Nobuhisa Ariyoshi  
President & CEO

MGC Electrotechno aims to become the world's leading copper-clad laminate supplier, trusted by customers. We possess equipment that spans prototype research to mass production, and are improving our competencies in manufacturing technology, quality control, quality assurance, maintenance, procurement, and other areas.

While giving consideration to the environment, we are also taking action to become a safe and accident-free company that is trusted in the community.



Switching fuel to LNG to conserve energy and reduce environmental impact

### MGC Ageless Co., Ltd.

Ageless manufacturing and technology services

Address: Ryowa Building, 3-6-1 Kanda Surugadai, Chiyoda-ku, Tokyo, 101-0062, Japan  
Tel: +81-3-3251-0761  
URL: <http://home.mgc-ageless.co.jp/>



Yoshihisa Sakakibara  
President & CEO

MGC Ageless engages in customer service at our Tokyo business site, and Ageless manufacturing at our Shirakawa business site, thereby playing a role in MGC's oxygen absorber business. Ageless extends the best-before date and expiration date of customers' products, contributing to the safety and stability of food and medical products, and reducing waste and the use of additives.

We are also committed to compliance-conscious management, environmentally-friendly manufacturing, working closely with communities, and ensuring safe and stable operations.



Firefighting drill

### MGC Filsheet Co., Ltd.

Manufacture of polycarbonate film and sheet

Address: 4-2242, Mikajima, Tokorozawa-shi, Saitama 359-1164, Japan  
Tel: +81-4-2948-2151  
URL: <http://www.mgcs.jp/en/>



Tsuneaki Iwakiri  
President

MGC Filsheet operates functional film and sheet production plants in Tokorozawa, Shirakawa, and Osaka, three locations blessed with abundant nature. Our products have a wide range of applications, particularly in the fields of information devices and automobiles.

In addition to regular safety and industrial and environmental accident prevention activities, we engage in environmentally-friendly product development, reducing environmental impact, conserving energy and resources, reducing emissions, preventing environmental pollution, and other measures. We will continue striving to harmonize with nature, cooperate with local communities, and contribute to the creation of an abundant society and sustainable global future.



(Left) Shirakawa Plant  
(Right) Basic life-saving training

### JSP Corporation

Manufacture and sale of foamed plastics

Address: Shin-Nisseki Bldg., 4-2 Marunouchi 3-chome, Chiyoda-ku, Tokyo 100-0005, Japan  
Tel: +81-3-6212-6300  
URL: <http://www.jsp.com/en/>



**Yukio Sakai**  
President & CEO

As a dedicated manufacturer of foamed plastics, we supply the world with products that meet the needs of the times with respect to energy conservation, resource conservation, and environmental preservation. As an internationally competitive company that prioritizes safety and adaption to the environment, we engage in business activities that earn the trust and satisfaction of stakeholders as stipulated in our responsible care (RC) policies on environment and safety.



Kyushu Plant volunteers participating in activities for conserving forests that protect water sources

### Shin Sanso Kagaku Co.

Manufacture of hydrogen peroxide

Address: 148-58 Yufutsu, Tomakomai-shi, Hokkaido 059-1372, Japan  
Tel: +81-144-55-7337  
URL: <http://www.sskc.co.jp/> (Japanese only)



**Yasushi Hiramatsu**  
President & CEO

Shin Sanso Kagaku is the only manufacturer of hydrogen peroxide in Hokkaido. We have been operating our production site in Tomakomai, an area surrounded by abundant nature, for 30 years. Since the end of FY 2016, we have been producing AdBlue, a high-quality urea solution that suppresses the amount of nitrogen oxide discharged in diesel vehicle exhaust fumes, further enhancing our line-up of environmentally-friendly products. We are strengthening the environmental awareness of each individual employee and working toward stable production with zero accidents and zero occupational injuries.



Participating in commuter road cleaning as part of an association of coastal companies

### Japan Finechem Co., Inc.

Manufacture and sale of fine chemicals, for industrial use, and electronic products

Address: Uchisaiwaicho Tokyu Bldg. 9F, 3-2 Uchisaiwaicho 1-chome, Chiyoda-Ku, Tokyo 100-0011, Japan  
Tel: +81-3-5511-4600  
URL: <http://www.jfine.co.jp/eng/>



**Shigenobu Ono**  
President & CEO

Japan Finechem continuously works on safety activities under the slogan that safety comes before all else. Our goal is more than just preventing accidents from happening. We are endeavoring to ensure safe and stable operations by implementing facility and work process improvements identified through self-led activities, risk assessments and Hiyari-KY (hazard prediction) proposals, in order to establish a presence trusted by the markets and society for our strengths in safety practices.



Fire extinguisher training led by the Kita fire department as part of integrated disaster preparation training at the Niigata Plant

### Japan U-PiCA Co., Ltd.

Manufacture and sale of unsaturated polyester resin and coating resins

Address: Madre Matsuda Bldg., 4-13 Kioi-cho, Chiyoda-ku, Tokyo 102-0094, Japan  
Tel: +81-3-6850-0241  
URL: <http://www.u-pica.co.jp/en/>



**Yoshihiro Yamane**  
President & CEO

Japan U-PiCA is aiming for further improvement in the areas of environment, safety, and health under our philosophy of "aiming to be a materials manufacturer that contributes to realizing an abundant society." Regarding safety, we are strengthening our ability to identify and handle potential causes of danger and are working to achieve zero accidents and injuries. In regard to environmentally-friendly products, we are developing materials for CFRP that will contribute to lower weight and energy conservation, and expanding production of bioplastics.



U-PiCA safety convention

### Toyo Kagaku Co., Ltd.

Resinous molding processing

Address: 51-497 Aza-Doudou, Oaza-Morowa, Togo-cho, Aichi-gun, Aichi 470-0151, Japan  
Tel: +81-561-39-0531  
URL: <http://www.toyo-kagaku.co.jp/> (Japanese only)



**Masanori Shimuta**  
President & CEO

Toyo Kagaku manufactures plastic molded products under the basic policies of "safety first, environmental conservation, and stable production."

We engage in safety activities including identification and improvement of hazardous locations and on-site traffic supervision.

Regarding the environment, we take energy conservation and other factors into consideration by adopting energy saving equipment and reducing waste through the improvement of material yields.



Drill for hazard prediction during transport by hand truck.

### Japan Pionics Co., Ltd.

Manufacture and sale of gas purifiers and abatement system

Address: 3-32 Tamura 3-chome, Hiratsuka-shi, Kanagawa 254-0013, Japan  
Tel: +81-463-53-8300  
URL: <http://www.japan-pionics.co.jp/en/>



**Masaaki Iijima**  
President & CEO

We believe that safety assurance and environmental preservation are our social responsibilities and that they are fundamental to our business activities. While working continuously toward zero accidents and zero occupational injuries, product quality assurance, and strengthening of risk management, we participate actively in community activities as we aim to become a company trusted by the community.

We hope to strengthen these activities and, as a member of the MGC Group, contribute to the improvement of the Group's corporate value.



Participation in community activities (greening and cleaning activities around the Sagami River together with local elementary school students)

### Fudow Co., Ltd.

Manufacture and sale of molding resin

Address: NOF Shin-Yokohama Bldg. 5F, 15-16 Shin-Yokohama 2-chome, Kouhoku-ku, Yokohama-shi, Kanagawa 222-0033, Japan  
Tel: +81-45-548-4210  
URL: <http://www.fudow.co.jp/en/>



**Hideaki Matsumoto**  
President & CEO

Fudow has managed to maintain a record of no injuries at our Gamagori Plant for 13 years and we also received a good evaluation during our environment and safety audit by MGC.

We submitted a team consisting primarily of new employees into the Fujinomiya City Firefighting Skills Competition and recaptured the grand prize after conceding it two years ago.

We are aware that safety needs to be sustained as a long-term investment, and we will continue to advance environmental and safety activities centered on the workplace and involve participation by all employees.



Fudow employees work to recapture the grand prize at the Fujinomiya City Firefighting Skills Competition

### Yonezawa Dia Electronics Co., Inc.

Manufacture of printed circuit boards, auxiliary materials for processing

Address: 446-3 Hachimanbara 3-chome, Yonezawa-shi, Yamagata 992-1128, Japan  
Tel: +81-238-28-1345



**Nobuhisa Ariyoshi**  
President & CEO

YDE manufactures, and carries out R&D for, printed circuit boards and auxiliary sheets for drilling. We use a variety of chemicals in these activities.

Making preservation of the rich nature of Yonezawa our top priority, we perform risk assessments and planned maintenance of facilities to prevent leaks and other accidents that impact the environment. We also engage in KYT, Hiyari Hatto (near-miss) incident identification, and 5S activities, with the aim of achieving zero accidents.



Ongoing median strip greening activity