

# RC Report 2022



## Nippon Shokubai Group Mission

# TechnoAmenity

Providing Prosperity and Comfort to People and Society,  
with Our Unique Technology

## Values

### > Respect Diversity

We will create new value by respecting the unique traits of each person.

### > Pioneer New Possibilities

We will courageously provide solutions to customer challenges and social issues.

### > Contribute to Global Environmental Preservation

We will work to ensure a better global environment is passed down to the next generation.

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## On publishing the RC Report 2022

Nippon Shokubai's reports on Responsible Care (RC) initiatives began with the issuance of the "Environmental Report" in fiscal 2002. Along with the improvement of the initiatives, the report name and contents have been changed as required. Starting from fiscal 2019, in line with the publication of the TechnoAmenity Report to cover management strategies and financial data, in view of the importance of RC activities, we have issued a separate RC Report, which compiles information exclusively on our RC activities.

Under the principle of sustainable development, the Nippon Shokubai Group has designated environmental protection; process safety and disaster prevention; occupational safety and health; chemical safety; quality; and communication with society as the six priority areas of its RC activities, in which we are endeavoring to ensure the implementation of the activities. We enhance our activities based on our Safety Philosophy "Safety takes priority over production" and RC Policy, as well as the needs of society.

In March 2022, we formulated our Group's new Medium-term Business Plan "TechnoAmenity for the future-I," in which we set new goals that aim to expand the development and sales of environmental



## Safety Philosophy

# Safety takes priority over production.

## Code of Conduct

Every person working at the Nippon Shokubai Group will carry out business activities with commitment to the guiding principles below.

- ① We will contribute to the realization of a sustainable society by putting the Group Mission into practice.
- ② We will execute our business activities by always ensuring both internal and external safety.
- ③ We will enforce thorough-going compliance in every area.
- ④ We will support international human rights standards and respect the human rights of all people touched by our business activities.
- ⑤ We will engage in fair and sincere business activities with all of our stakeholders.
- ⑥ We will provide materials and solutions needed by customers.
- ⑦ We will help reduce our environmental impact and help tackle environmental issues through technology.
- ⑧ We will actively disseminate information and dialogue with stakeholders.
- ⑨ We will recognize and respect diversity so that every person and organization reaches their full potential.
- ⑩ We will contribute to the development of local communities as a member of those communities.

contribution products to contribute to reducing the impact on the environment throughout the product lifecycle. Moreover, in line with the Medium-term Business Plan, we have formulated the 11th Medium-term RC Basic Plan and implemented this three-year plan since April 2022.

Furthermore, in November 2021, in response to increasingly apparent global climate change issues and Japan's revision of its greenhouse gas (GHG) emissions reduction goal, we set our Group's goal of reducing GHG emissions from our business activities in Japan by fiscal 2030 to 30% from the fiscal 2014 level. We also evaluated the impact of climate change in line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), and we reported the evaluation results in the TCFD Report, which was issued in April 2022 separately from this RC Report. Climate change issues are a major challenge that we need to tackle on a company-wide basis, and we will actively address them from various perspectives, including RC.

I hope this Report will help deepen your understanding of the RC initiatives of our Group. We appreciate your support and candid opinions.

**Gun Saito**

Executive Officer, Director of RC Division



# RC Initiatives

Nippon Shokubai actively promotes RC initiatives in the priority areas of environmental protection, process safety and disaster prevention, occupational safety and health, chemical safety, quality and communication with society.

## RC Initiatives

All companies in the chemical industry responsible for handling chemical substances voluntarily agree to protect the environment, safety and health in all processes ranging from the development of chemical substances to their manufacture, transportation, use, end consumption, disposal and recycling. By disclosing the results of these activities to the public, the companies hold dialogue and communicate with society. These efforts are known as Responsible Care (RC). The RC Global Charter was released in 2006 and revised in 2014 by the International Council of Chemical Associations (ICCA), which promotes Responsible Care worldwide.

Nippon Shokubai has participated in the Japan Responsible Care Council (currently known as the Japan Chemical Industry Association [JCIA]'s Responsible Care Committee) since it was established in 1995, and has been advancing various initiatives by introducing relevant systems, such as the environmental management system under ISO 14001, the quality management system under ISO 9001, and the occupational safety and health management system (OSHMS).

We are determined to continue contributing to society while fulfilling our corporate social responsibility through our group-wide commitment to Responsible Care.



President's signature on the RC Global Charter (Revised 2014 version)

## RC Policy

In conformity with the Nippon Shokubai Group Mission, values, Safety Philosophy, and code of conduct, we rank the provision of products and technologies that contribute to environmental protection in order to serve society as an important management measure.

In addition, while paying due respect to the principle of Sustainable Development, we are determined to conduct all activities in accordance with the following policy related to environmental protection, safety, and quality that will bring our business operations into harmony with the global environment.

We will implement this RC Policy in all our business operations by ensuring all employees have a thorough understanding and awareness of its importance. The president shall be the person with the ultimate responsibility for implementing this policy.

- 1** Aim at environmental protection and reduction of negative environmental impact throughout the entire life cycle of a product, from development to disposal.
- 2** Ensure the safety of our employees and our communities by targeting zero accidents and zero injuries with a commitment to the Safety Philosophy, "Safety takes priority over production."
- 3** Confirm the safety of chemical materials, intermediates and products, and consider the health of our customers, employees of our logistics subcontractors, our employees, and others.
- 4** Stably supply products and associated services that meet customer satisfaction and inspire their trust.
- 5** Publicly announce the results of these activities and make an effort to communicate for proper understanding.

## RC Promotion Organization

The president is chairman of the RC Promotion Committee, which covers all of the following activities: environmental protection, process safety and disaster prevention, occupational safety and health, chemical safety, quality management, and communication with society. The Committee discusses general and basic matters to tangibly promote each of the guidelines set forth in the RC Policy and separately prescribed company regulations. Under the RC Promotion Committee, specialized subcommittees are established, to promote companywide RC activities.

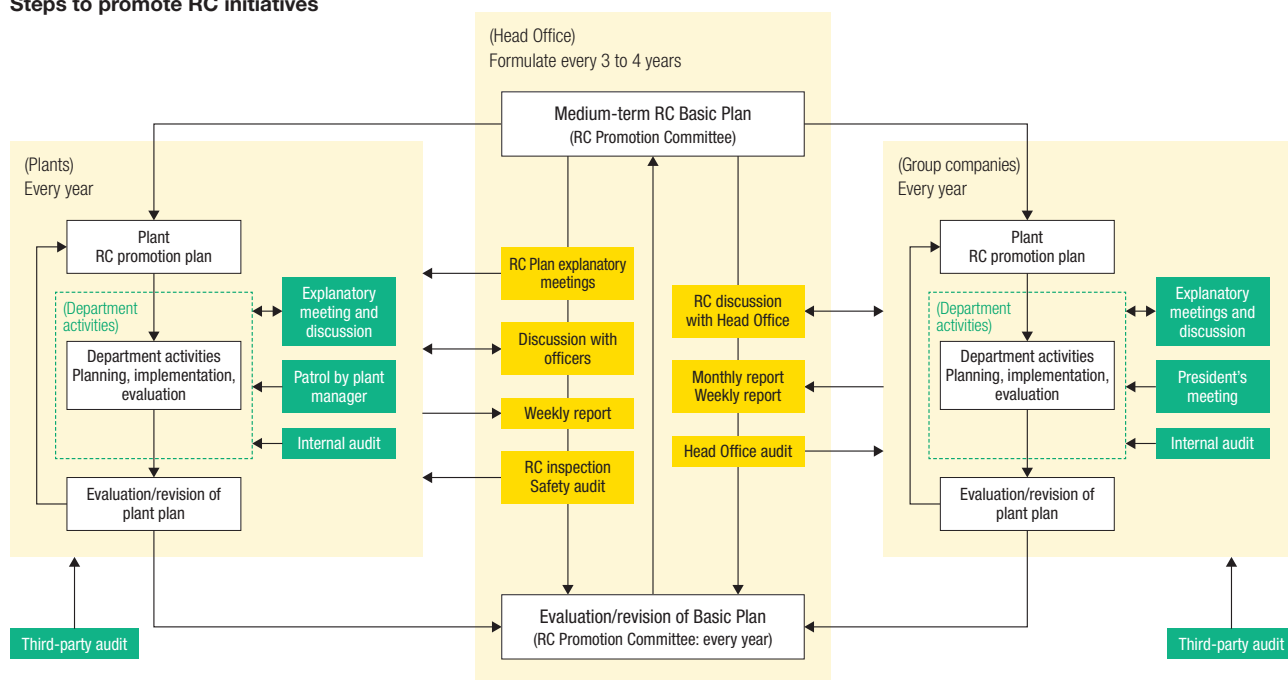
**RC Promotion Committee**  
● Chairman: President

Specialized subcommittees

## Cycle of RC Initiatives Promotion

To implement the RC Policy, the Nippon Shokubai Group promotes RC initiatives by following the PDCA cycle below each year, thereby contributing to society and fulfilling its corporate social responsibility.

### Steps to promote RC initiatives



### Steps in RC Initiatives Promotion

#### [Head Office]

The RC Promotion Committee, chaired by the President, formulates the Medium-term RC Basic Plan every three to four years in line with the period of the medium-term management plan. RC inspections and safety audits are conducted every year based on the themes for inspections determined each year in order to check and evaluate the status of implementation of activities at each plant, and revise the plan if necessary.

#### [Plants]

Each year, the RC committee of each plant chaired by the plant manager formulates its new plant RC promotion plan, based on the company-wide Medium-term RC Basic Plan and the evaluation results of the plant RC promotion plan of the previous year. Based on this plan and in view of the issues specific to the department, each department formulates the department activities plan as its specific action plan.

The progress of the activities is checked through patrol by the plant manager, department discussion, and internal audits under ISO and various other management systems, as well as through

discussion with the Head Office officers, RC inspections, and third-party audits. Based on the results of these checks, the department activities plan is revised as necessary. Thus, following this PDCA cycle, the plant works to continuously improve its initiatives.

#### [Group companies]

Similar to the case of plants, Group companies plan their activities each year based on the Medium-term RC Basic Plan. Each company formulates its own plant RC promotion plan taking into account its activities and local laws and regulations.

The progress of the activities is shared with the Head Office by means of periodic reports, including weekly reports, and online meetings, and is checked through regular discussion and audits by the Head Office. Based on the results of these checks, Group companies revise their activities as necessary. By following this PDCA cycle, Group companies work to continuously improve their initiatives.

Moreover, the Head Office encourages exchanges among Group companies, thereby mutually improving the level of their RC activities.

### Definitions

#### PDCA cycle: Plan-do-check-act cycle

An approach for continuous process improvement in the quality management in production. It is designed to continuously improve business processes by iteratively repeating four steps: Plan, Do, Check, and Act.

# RC Initiatives

## RC Inspection

Nippon Shokubai conducts RC inspections every year to ensure continuous improvement of RC initiatives at Himeji and Kawasaki Plants by organizing the RC Inspection Committee chaired by the Member of the Board in charge of production and technology, which consists mainly of officers.

### RC Inspection

We have conducted RC inspections for 47 years since they started in February 1974 (initially named “safety inspections”), to implement our Safety Philosophy “Safety takes priority over production,” which was established in 1973.

The RC inspection, which was renamed in fiscal 2003 (previously known as a safety inspection), is currently conducted on the progress of each RC initiative at the plants and their priority theme set for each fiscal year. The priority themes of recent years are as shown below.

Medium-term Plan*	Fiscal year	Priority theme
9th FY 2014 to FY 2016	FY 2014 (42nd)	Progress in measures to prevent recurrence
	FY 2015 (43rd)	Measures to prevent recurrence and development of a safety culture
	FY 2016 (44th)	Summary of measures to prevent recurrence
10th FY 2017 to FY 2020	FY 2017 (45th)	Initiatives for environmental protection
	FY 2018 (46th)	Prevention of quality issues and ensuring quality governance
	FY 2019 (47th)	Prevention of recurrence of similar industrial injuries
	FY 2020 (48th)	Prevention of process safety accidents
FY 2021	FY 2021 (49th)	Chemical substance management

\* The FY 2021 plan is a single-year plan.

### Fiscal 2021 RC inspection

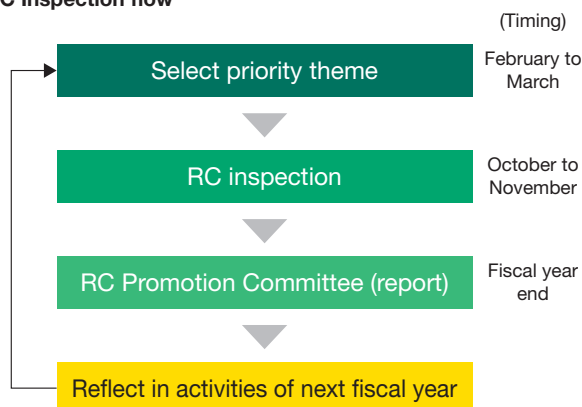
The RC inspection for fiscal 2021 was conducted partly on site and partly online, in consideration of the spread of COVID-19, on October 22 at the Kawasaki Plant and on November 11 at the Himeji Plant, to check the progress of each of their RC initiatives and under the priority theme of “chemical substance management.”

### RC Inspection flow

The priority theme of the RC inspection for a fiscal year is determined between February and March of the previous fiscal year based on information on issues inside and outside the Company and the results of internal RC initiatives. Then the RC Inspection Committee conducts the inspection between October and November. The inspection results of both plants are reported to the RC Promotion Committee, which is chaired by the President, and reflected in activities of the next fiscal year.

The flow of an RC inspection is as shown below.

#### RC Inspection flow



A written report indicating the problems found, proposals for improvement and other matters is issued for the both Plants, with the aim of ensuring continuous improvement of their RC initiatives.



RC inspection conducted partly on site and partly online

# RC Basic Plan for Fiscal 2021 and Its Results

The Medium-term Business Plan (TechnoAmenity for the future-I) was put into action in April 2022, and we have decided to formulate the 11th Medium-term RC Basic Plan in time with that. Therefore, the RC Basic Plan for fiscal 2021 is a single-year plan formulated as an extension of the 10th Medium-term RC Basic Plan.

The RC Basic Plan for fiscal 2021 was formulated by reflecting the following in each item of the RC initiatives: initiatives continued from the 10th Plan, corrective actions taken against the issues encountered, and requests from both inside and outside the company. Although we have steadily promoted the initiatives in each RC field to “attain more trust from customers,” many of the targets have not been reached.

Evaluation  Achieved  Almost achieved  Not achieved

## Environmental Protection

### Objectives for Fiscal 2021

- To reduce energy consumption by an amount equivalent to 2,000 kL of crude oil at the Himeji and Kawasaki Plants and 67.5 kL at Suita Research Center
- To reduce energy consumption intensity by 6% from fiscal 2015 levels (1% reduction annually to 102.1 L/t-production)
- To reduce CO<sub>2</sub> intensity by 6% from fiscal 2015 levels (energy source, 1% reduction annually to 0.206 t-CO<sub>2</sub>/t-production)
- To reduce fuel consumption intensity for road transportation by 6% from fiscal 2015 levels (1% reduction annually to 33.1 L/1,000 t-km)
- To promote modal shift
- To maintain zero emissions<sup>1</sup>  
(Quantity of final off-site landfill) ≤ (Total amount of waste generated × 0.1%)
- To reduce emissions of substances subject to the PRTR Law by 25% from fiscal 2015 levels (81 t/y)

### Results for Fiscal 2021

- Energy consumption reduced by 6,058 kL at the Himeji and Kawasaki Plants and 127 kL at Suita Research Center
- Energy consumption intensity: 10.2% reduction • CO<sub>2</sub> intensity: 16.9% reduction
- Fuel consumption intensity for road transportation: 1.7% reduction
- Modal shift promotion continues • Zero emissions maintained
- Emissions of substances subject to the PRTR Law: 20.0% reduction

### Priority Initiatives

- 1) Promoted energy conservation initiatives and advanced technical reviews to reduce waste and the release of PRTR-controlled chemical substances.
- 2) Continued examining the utilization of renewable energy.
- 3) Evaluated contributions to CO<sub>2</sub> emissions reduction related of our products through cLCA.<sup>2</sup>
- 4) Conducted inspections of equipment that uses fluorocarbons as planned.

## Process Safety and Disaster Prevention

### Objectives for Fiscal 2021

- To achieve zero accidents of Class A<sup>3</sup> and Class B<sup>4</sup> (zero severe process safety accidents)

### Results for Fiscal 2021

- Class A process safety accidents: 0 • Class B process safety accidents: 0

### Priority Initiatives

- 1) Implemented systematic risk assessments and other initiatives to prevent accidents and malfunctions.
- 2) Systematically implemented measures against deterioration and for earthquake response, for example.
- 3) Continuously improved our process safety management system.
- 4) Systematically implemented and sought to enhance external education and workplace education and training.
- 5) Sought to strengthen a safety first mindset through efforts that included Safe Operation Month activities and safe behavior checks.

## Occupational Safety and Health

### Objectives for Fiscal 2021

- Zero injuries with loss of workdays<sup>5</sup> • Zero injuries without loss of workdays<sup>6</sup> (including contractors)

### Results for Fiscal 2021

- Five injuries with loss of workdays • Eight injuries without loss of workdays

### Priority Initiatives

- 1) Advanced basic safety activities and undertook other efforts to prevent injuries.
- 2) Implemented systematic safety measures by, for example, steadily undertaking the organization-wide introduction of industrial injury examples.
- 3) Checked the status of every safety activity and sought to continuously improve them.
- 4) Systematically implemented workplace safety education and sought to enhance workplace education and training.
- 5) Sought to strengthen a safety first mindset through efforts that included safe behavior checks.
- 6) Supported the safety initiatives of our contractors through safety education and patrols, for example.

#### Definitions

- <sup>1</sup> Zero emissions: Reducing the quantity of waste subject to final disposal at off-site landfills to 0.1% or less of the total amount of waste generated
- <sup>2</sup> cLCA (carbon Life Cycle Analysis): A method of assessing greenhouse gas emissions throughout the life cycle of a finished product incorporating chemical products and a comparison product containing no such chemical products when used by consumers and in other industries. The evaluation method calculates a chemical product's net contribution to GHG emissions reduction by determining the increased emissions when no such chemical product is used
- <sup>3</sup> Class A: Level 9 or higher according to the Nippon Shokubai method on the Japan Petrochemical Industry Association chart
- <sup>4</sup> Class B: Level 3 to 8 according to the Nippon Shokubai method on the Japan Petrochemical Industry Association chart
- <sup>5</sup> Injury with loss of workdays: Injury requiring at least one lost workday for medical treatment
- <sup>6</sup> Injury without loss of workdays: Injury requiring no loss of workdays for medical treatment
- <sup>7</sup> Refers to Group companies inside and outside Japan, unless otherwise specified

## Chemical Safety

### Objectives for Fiscal 2021

- To achieve zero problems related to chemical safety (legal or social problems)

### Results for Fiscal 2021

- Zero problems related to chemical safety

### Priority Initiatives

- 1) Gathered information about the hazardous properties and the legal requirements for chemical substances. In addition to making this information known within the company, also appropriately provided information to customers, including through SDS.
- 2) Implemented functional improvements to our chemical substance management system and ensured information granularity based on our plans.
- 3) Properly provided various reports and submitted information within specified time periods in accordance with the legal obligations of Japanese and foreign laws and regulations as well as other requests from authorities.

## Quality

### Objectives for Fiscal 2021

- To promote customer satisfaction • To attain more trust from customers
- To achieve zero serious quality complaints

### Results for Fiscal 2021

- To promote customer satisfaction: Almost achieved.
- To attain more trust from customers: Achieved.
- No serious quality complaints

### Priority Initiatives

- 1) Promoted efforts to prevent quality issues.
- 2) Implemented product safety assessment, product entrustment assessment and screening by the gate system for fine and specialty chemicals and new businesses.
- 3) Strengthened support for the quality assurance initiatives of Group companies.<sup>7</sup>
- 4) Implemented quality audits at both our plants and Group companies.
- 5) Continuously implemented quality education and quality awareness-raising activities.

## Communication with Society

### Objectives for Fiscal 2021

- To maintain dialogue with stakeholders and implement information disclosure

### Results for Fiscal 2021

- Participated in dialogue with local communities
- Published TechnoAmenity Report and RC Report

## Developing RC among Our Group Companies (Measures Common to Our Group Companies)

### Objectives for Fiscal 2021

- (1) Environmental Protection:
  - To reduce energy intensity
  - To reduce final disposal at off-site landfills (Group companies in Japan)
  - To reduce the amount of waste (Group companies outside Japan)
  - To reduce emissions of substances subject to the PRTR Law
- (2) Process Safety and Disaster Prevention:
  - To achieve zero disasters and zero accidents (equivalent to Class A and Class B severe process safety accidents on the Nippon Shokubai scale)
- (3) Occupational Safety and Health: To achieve zero injuries with loss of workdays
- (4) Chemical Safety: To achieve zero problems related to chemical safety (legal or social problems)
- (5) Quality: To achieve zero serious quality complaints
- (6) Communication with Society:
  - To maintain a dialogue with stakeholders and implement reasonable information disclosure

### Results for Fiscal 2021

- Seven of the 12 Group companies reduced their energy intensity year-on-year.
- Waste subject to final disposal at off-site landfills increased by 8.9% compared to the level of the previous fiscal year.
- The amount of waste generated increased by 0.2% compared to the level of the previous fiscal year.
- Emissions of substances subject to the PRTR Law increased by 1.4% compared to the level of the previous fiscal year.
- Zero facility disasters • Zero facility accidents • One injury with loss of workdays
- Zero problems related to chemical safety • No serious quality complaints
- Published an Environmental Report and participated in community events

### Priority Initiatives

- Conducted RC discussions and audits, and sought to improve the RC level of the entire Group.



## The 11th (Fiscal 2022–2024) Medium-term RC Basic Plan

We have formulated the 11th Medium-term RC Basic Plan as a three-year plan for April 1, 2022 to March 31, 2025 in time with the period of the Medium-term Business Plan (TechnoAmenity for the future-I). We have set objectives and priority initiatives for the 11th Medium-term RC Basic Plan by extracting initiatives that should be continuously conducted from the 10th Medium-term RC Basic Plan and the RC Basic Plan for fiscal 2021; examining the results of analyzing the issues encountered; and responding to external needs, including law amendments made in response to technological progress and for other purposes.

By steadily implementing the 11th Medium-term RC Basic Plan and continuously making improvements, we will continue our safe and stable production activities and move toward the Goals for 2030, which are set in our long-term vision “TechnoAmenity for the future.”

Furthermore, regarding the setting of numeric objectives (KPIs, or Key Performance Indicators), which we started in the 10th Medium-term RC Basic Plan, we will continue to set them to regularly evaluate the progress and direction of our daily activities.



### Environmental Protection

#### Objectives for Fiscal 2022–2024

- To reduce energy consumption by an amount equivalent to 6,000 kL of crude oil (over three years)
- To reduce energy consumption intensity by 5% from fiscal 2019 levels (1% reduction annually to 96.9 L/t-production)
- To reduce CO<sub>2</sub><sup>1</sup> emissions for fiscal 2030 by at least 30% from fiscal 2014 levels (including Group companies in Japan)
- To reduce fuel consumption intensity for road transport by 4% from fiscal 2020 levels (1% reduction annually to 33.7 L/1,000 t-km)
- To promote modal shift
- To reduce water use intensity to at least fiscal 2020 levels (to 8.45 m<sup>3</sup>/t-production)
- To maintain zero emissions<sup>2</sup>  
(Quantity of waste subject to final disposal at off-site landfills) ≤ (Total amount of waste generated × 0.1%)
- To reduce emissions of substances subject to the PRTR Law by 25% from fiscal 2015 levels (81 t/y)<sup>3</sup>

#### Priority Initiatives

- 1) To promote energy conservation initiatives and advanced technical reviews to reduce waste and the release of PRTR Law-controlled chemical substances
- 2) To promote CO<sub>2</sub> emissions reduction toward the achievement of carbon neutrality
- 3) To build a system that totals up product-specific CO<sub>2</sub> emissions
- 4) To ensure appropriate management of equipment that uses fluorocarbons and strive to control fluorocarbon emissions
- 5) To promote certification of Environmental Contribution Products, including those manufactured by Group companies



### Process Safety and Disaster Prevention

#### Objectives for Fiscal 2022–2024

- To have zero Class A<sup>4</sup> and Class B<sup>5</sup> process safety accidents (zero severe process safety accidents)

#### Priority Initiatives

- 1) To cultivate a culture of safety prioritization
- 2) To implement initiatives to prevent issues
- 3) To take systematic safety measures
- 4) To maintain and improve systems
- 5) To enhance education and training



### Occupational Safety and Health

#### Objectives for Fiscal 2022–2024

- Zero injuries with loss of workdays<sup>6</sup>
- Zero injuries without loss of workdays<sup>7</sup> (zero at contractors, too)

#### Priority Initiatives

- 1) To implement initiatives to prevent issues
- 2) To take systematic safety measures
- 3) To maintain and improve systems
- 4) To enhance education and training
- 5) To give more support to the safety initiatives of our contractors

#### Definitions

- <sup>1</sup> The emissions reduction objective is in fact for GHG, but most GHG is actually carbon dioxide (CO<sub>2</sub>). Therefore, this objective mentions “CO<sub>2</sub>” instead.
- <sup>2</sup> Zero emissions: Reducing the quantity of waste subject to final disposal at off-site landfills to 0.1% or less of the total amount of waste generated
- <sup>3</sup> Due to amendment of the PRTR Law, this objective is scheduled to be reviewed within the period of the 11th Medium-term RC Basic Plan.
- <sup>4</sup> Class A: Level 9 or higher according to the Nippon Shokubai method on the Japan Petrochemical Industry Association chart
- <sup>5</sup> Class B: Level 3 to 8 according to the Nippon Shokubai method on the Japan Petrochemical Industry Association chart
- <sup>6</sup> Injury with loss of workdays: Injury requiring at least one lost workday for medical treatment
- <sup>7</sup> Injury without loss of workdays: Injury requiring no loss of workdays for medical treatment



### Chemical Safety

#### Objectives for Fiscal 2022–2024

- To have zero problems (legal or social) related to chemical safety

#### Priority Initiatives

- 1) To effectively make information on the safety of chemical materials and related laws and regulations known and familiar throughout the company
- 2) To ensure dissemination of information on product safety and applicable laws and regulations to stakeholders
- 3) To maintain legal compliance and adequately respond to new laws and regulations of Japan and other nations
- 4) To promote systematization of chemical material management tasks



### Quality

#### Objectives for Fiscal 2022–2024

- To receive zero serious quality complaints
- To improve customer satisfaction by strictly complying with quality-related laws and promoting priority initiatives regarding quality

#### Priority Initiatives

- 1) To effectively use quality management systems and continuously improve them
- 2) To prevent quality complaints and issues by promoting initiatives to prevent them
- 3) To continuously implement quality education and awareness-raising activities to cultivate a quality-first mindset



### Communication with Society

#### Objectives for Fiscal 2022–2024

- To maintain dialogue with stakeholders and implement reasonable information disclosure



### Developing RC among Our Group Companies (Measures Common to Our Group Companies)

#### Objectives for Fiscal 2022–2024

- 1) Environmental Protection:
  - To reduce energy intensity
  - To set a CO<sub>2</sub><sup>1</sup> emissions reduction objective (Group companies outside Japan)
  - To reduce the quantity of waste subject to final disposal in off-site landfills (Group companies inside Japan)
  - To reduce the total amount of waste generated (Group companies outside Japan)
  - To reduce emissions of substances subject to the PRTR Law (Group companies inside Japan)
- 2) Process Safety and Disaster Prevention:
  - To have zero injuries and zero accidents (equivalent to Class A and Class B process safety accidents on the Nippon Shokubai scale)
- 3) Occupational Safety and Health:
  - To have zero injuries with loss of workdays
- 4) Quality:
  - To have zero problems (legal or social) related to chemical safety
- 5) Chemical Safety:
  - To receive zero serious quality complaints
- 6) Communication with Society:
  - To maintain dialogue with stakeholders and implement reasonable information disclosure

#### Priority Initiatives

- To strengthen support to improve the RC level of the entire Group



# Environmental Protection Initiatives

Nippon Shokubai promotes initiatives to reduce the environmental impact of our business operations, including tackling climate change and reducing waste through our product supply chains.

## Overview of Fiscal 2021

In response to the Japanese government's substantial raising of its GHG emissions reduction goal in April 2021, we have reviewed our target values and scope. Energy consumption intensity improved thanks to our efforts to conserve about 6,000 kL of energy (crude oil equivalent) through enhanced efficiency of manufacturing equipment and because of an increase in the production volume of our major products, and the target for energy consumption intensity was achieved. As for the reduction of emissions of substances subject to the PRTR Law, we made efforts for the reduction as planned, but we were not able to achieve the target due to an increase in emissions caused by an increase in production volume.

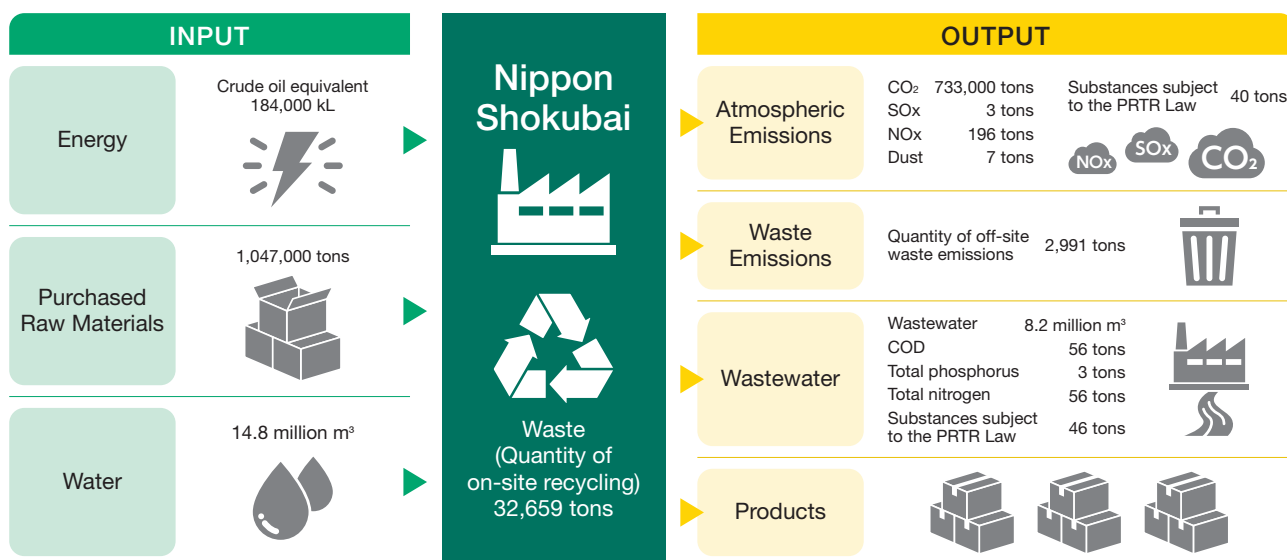
## Environmental Protection Policy

Based on our Group Mission “**TechnoAmenity** —Providing Prosperity and Comfort to People and Society, with Our Unique Technology,” we have established the following policies:

- We will work to reduce greenhouse gas emissions by actively promoting the use of renewable energy and biomass feedstock, as well as improving energy efficiency.
- We will contribute to the achievement of a recycling-oriented society by reducing waste and chemical substance emissions and promoting recycling and the effective use of resources.
- We will actively develop and provide products and technologies that contribute to the reduction of environmental burdens.
- We will work to minimize the negative impact of our business activities on ecosystems and strive to preserve biodiversity.
- We will proactively disclose information on environmental protection and deepen mutual understanding with stakeholders through communication.

## Environmental Impacts of Our Business Operations

We are engaged in various efforts to not only provide better products and services, but also to reduce the environmental impacts of our business operations, including in our supply chains. We make efforts to conserve energy and tackle climate change of course. We are also managing the water used in our manufacturing sites in order to use water resources effectively, conducting advanced recycling and thoroughly treating water before it is released into the natural environment. Moreover, we also commission odor monitoring as well as conduct odor patrols and regular noise measurements so that neighboring residents can live in peace. In fiscal 2021, we received no reports of environmental pollution incidents or environmental complaints.



Note: This fiscal 2021 data is for only Nippon Shokubai (including our head offices, research centers and other sites).

# Environmental Protection Initiatives

## Initiatives for Tackling Climate Change

### Promoting Greenhouse Gas (GHG) reduction

#### ► Formulating a roadmap for reducing GHG emissions

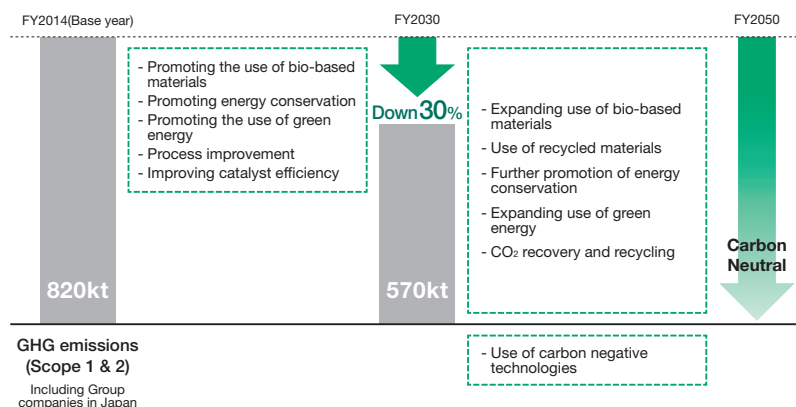
We have formulated a roadmap for reducing GHG emissions by 2050 based on “TechnoAmenity for the Future,” our long-term vision announced in April 2021. This roadmap concerns our “Strategic Transformation for Environmental Initiatives,” which is one of our “Three Transformations.”

In March 2019, the JCIA set a new CO<sub>2</sub> emissions reduction goal for fiscal 2030 (10.7% reduction from the fiscal 2013 level). With reference to this goal, we set a goal, in 2020, of reducing GHG emissions by at least 10% from fiscal 2014 levels by 2030, the final year of our long-term vision. We had made efforts toward the

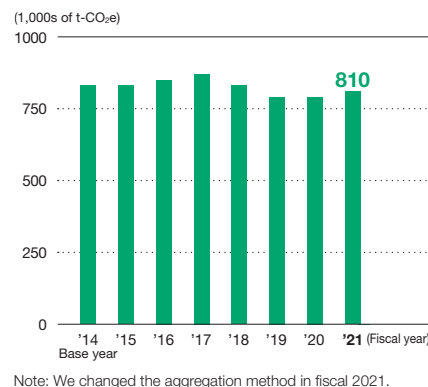
reduction, but in April 2021, the Japanese government substantially raised its GHG emissions reduction goal for fiscal 2030 to 46% from fiscal 2013 levels. In response to this upgrade, we revised our goal for reducing our GHG emissions in Japan, to begin with, which accounted for about 70% of our Group's total GHG emissions, to 30%.

In fiscal 2021, our GHG emissions in Japan amounted to 810,000 t-CO<sub>2</sub>e, 2% reduction from the fiscal 2014 level. Going forward, we will review our goals for reducing our GHG emissions outside Japan, too.

#### Roadmap for Reducing GHG Emissions by 2050 (Announced in November 2021)



#### Trend in GHG Emissions (in Japan)



### Employee's Voice

#### Saving effort and reducing the input amount of steam by 20%

Waste water generated during product manufacturing is concentrated and then incinerated. In the concentration process, evaporated gas is conducted to a light-component removal tower, into which steam is blown to prevent organic constituents from falling onto the tower bottom and to distill them at the tower top. This distillate is then cooled to liquefy, causing the water to separate from the organic constituents. The organic constituents contain dioxane, a restricted substance. So, the supernatant liquid is extracted and incinerated.

In the supernatant liquid extraction process, it used to be necessary to regularly make measurements and adjust the extraction amounts, because no monitoring instruments were installed and the amounts extracted with an air pump varied greatly. Installation of new pumps and flowmeters for constant monitoring of extraction amounts has saved the effort and stably kept the amount of the constituents contained in the waste water at the tower bottom from exceeding the target level. Also, it has become possible to determine how much steam we should blow into the tower bottom, leading to a 20% reduction in the input amount of steam.

We will continue to further optimize operation conditions to streamline the process.



Takahiro Sakoguchi

Production No. 3 Section, Kawasaki Plant

## ► Reducing energy use/CO<sub>2</sub> emissions

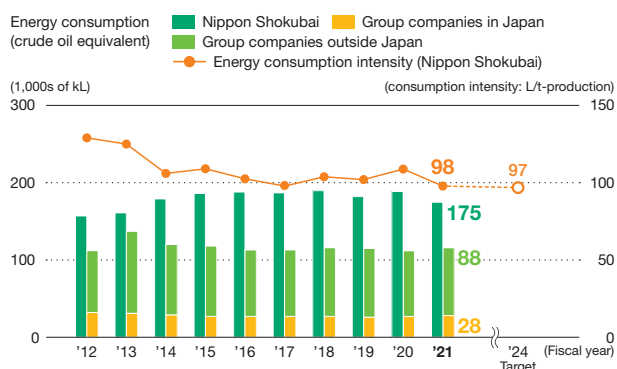
At Nippon Shokubai, in line with the targets set in the commitment to a low carbon society by the JCIA, the RC Promotion Committee, chaired by the President, has formulated the Medium-term RC Basic Plan. Based on this Plan, each plant, under the initiative of the energy management committee, implements activities to help mitigate climate change, including reducing energy consumption and CO<sub>2</sub> emission intensity.

In fiscal 2021, our efforts to reduce energy consumption resulted in an energy consumption intensity of 98 L/t-production and a CO<sub>2</sub>

emission intensity of 0.401 t-CO<sub>2</sub>/t-production.

The Osaka and Tokyo head offices utilized the Green Power Certification System to use green power (generated from biomass). In fiscal 2021, the Himeji Plant started solar power generation (on-site PPA). We promote energy conservation activities through the collection of waste heat and the introduction of a co-generation system. We also collect part of the CO<sub>2</sub> generated in the manufacturing process and sell it as liquefied carbon dioxide to reduce CO<sub>2</sub> emissions.

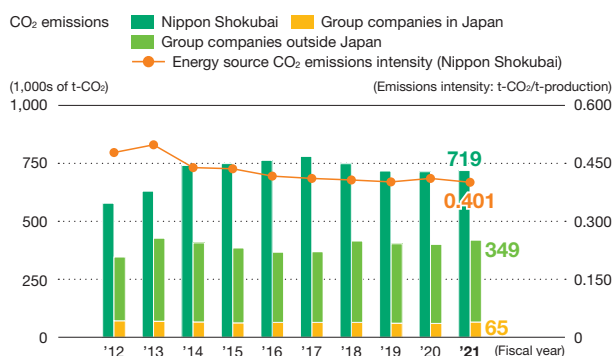
### Trends in Energy Consumption and Energy Consumption Intensity



Note: The amount of energy consumed and CO<sub>2</sub> emissions do not include our head offices, research centers, plant administration buildings or employee welfare facilities.

Note: The amount of energy consumed and CO<sub>2</sub> emissions in fiscal 2021 totaled 9,000 kL and 14,000 t-CO<sub>2</sub>, respectively, for our head offices, research centers, plant administration buildings, and employee welfare facilities of Nippon Shokubai.

### Trends in CO<sub>2</sub> Emissions and Intensity



Note: CO<sub>2</sub> emissions are totals of energy source and non-energy source CO<sub>2</sub> emissions.

Note: We changed the aggregation method in fiscal 2021.

## ► Suppression of fluorocarbon emissions

The Act on Rational Use and Proper Management of Fluorocarbons was fully implemented in April 2015 and covers the entire lifecycle of fluorocarbons from production to disposal. In April 2020, regulations for the disposal of specified devices were tightened.

As a “user of specified products,” we carry out scheduled simple inspections and periodic inspections as required by law. The amount of fluorocarbon leakage calculated in fiscal 2021 totaled 7,069 t-CO<sub>2</sub>e for the entire company, with 2,838 t-CO<sub>2</sub>e from the Himeji Plant and 4,194 t-CO<sub>2</sub>e from the Kawasaki Plant.

We will continue to strive to reduce the amount of fluorocarbon leakage through initiatives such as strengthening inspections and maintenance, introducing devices that use coolants with a low global warming potential and ozone depletion potential, and implementing proper treatment at the time of disposal of devices, which will help alleviate global warming.

### Calculated Leakage of Fluorocarbons in Fiscal 2021

	(t-CO <sub>2</sub> e)
Himeji Plant	2,838
Kawasaki Plant	4,194
Others	37
<b>Entire company</b>	<b>7,069</b>

## Topics Issued TCFD Report

In line with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD), we evaluated the impact of climate change risks and opportunities on our business and reported the evaluation results in the TCFD Report, which was issued in April 2022. This Report describes our Group's response, featuring the impact of climate change on our business and scenario analysis of the impact.

To read the report, click the link below to access the Sustainability Library on our website.

### Sustainability Library

<https://www.shokubai.co.jp/en/sustainability/library/>

## Definitions

### Green Power Certification System

Refers to a system that enables the environmental added value of electricity generated from natural energy to be traded in the form of “green power certificates” by business operators that issue the certificates with the approval of an authorized third-party organization.

# Environmental Protection Initiatives

## Calculating the GHG emissions resulting from our entire supply chain

### ► Calculation of Scope 3 emissions

In Scope 3, the amount of GHG emissions associated with corporate activities in the supply chain is calculated for each category, and the amounts of all categories are aggregated. The GHG protocol classifies GHG emissions into Scopes 1, 2 and 3 as shown below.

#### Scope 1 Direct emissions:

Direct GHG emissions by the reporting entity itself (by burning fuel and through industrial processes)

#### Scope 2 Indirect emissions:

Indirect GHG emissions as a consequence of the use of electricity, heat, or steam supplied by other companies

#### Scope 3 Other indirect emissions:

Indirect GHG emissions not covered in Scope 2 (emissions by other companies in relation to the reporting entity's activities)

We will continue to calculate Scope 3 emissions in the future as we investigate the possibility of reducing CO<sub>2</sub> emissions resulting from all corporate activities.

### Trend in Scope 3 Emissions Calculation extent: Nippon Shokubai only

No.	Category	Emissions (1,000 t-CO <sub>2</sub> e)		
		FY2019	FY2020	FY2021
1	Purchased goods and services	1,510	1,445	1,522
2	Capital goods	37	55	44
3	Fuel- and energy-related activities (not included in Scope 1 or Scope 2)	63	85	83
4	Upstream transportation and distribution	14	14	15
5	Waste generated in operations	7	7	8
6	Business travel	0.3	0.3	0.3
7	Employee commuting	0.9	0.9	0.9
12	End-of-life treatment of sold products	2,068	1,961	2,111
15	Investments	73	70	79
Total		3,774	3,637	3,862

## Initiatives for Eco-friendly Distribution

### Promoting White Logistics, which will lead to reducing environmental impact

As a way of tackling climate change through our logistics operations, we are taking steps to reduce our CO<sub>2</sub> emission intensity and implement exhaust gas countermeasures to control air pollution.

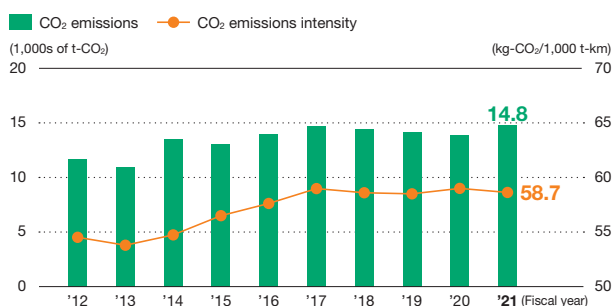
Although changing economic conditions can affect the amount of goods we transport and our CO<sub>2</sub> emissions, we are advancing initiatives to reduce our CO<sub>2</sub> emission intensity. These include an enhanced modal shift rate, improved transport efficiency, the introduction of digital tachometers interlocked with GPS and drive recorders, energy efficient vehicle operation such as minimal idling and the installation of energy-efficient tires, and the promotion of container round use.

We adopted the Kawasaki eco-transportation system as an air pollution control measure (effective April 1, 2010) and introduced three initiatives: eco-friendly driving and display of "eco-drive" stickers, elimination of vehicles that do not comply with laws regulating NO<sub>x</sub> and PM emissions, and widespread adoption of low emission and energy-efficient vehicles.

In response to the increasingly severe shortage of truck drivers in the logistics industry, Nippon Shokubai supports the "White Logistics" promotion campaign, a movement aiming to realize sustainable logistics. For the purpose of improving productivity and efficiency of transportation and realizing a "whiter" working environment that is friendly to women and drivers in their 60s, we are advancing various initiatives, including improving efficiency of transportation by promoting a shift from long-distance transportation by trucks to transportation using roll-on/roll-off ships or railroad or by introducing joint transportation with other companies in the same business field, and improving loading and unloading operations.

We believe that these initiatives will contribute also to reducing the impact on the environment.

### Trends in CO<sub>2</sub> Emissions and Intensity Attributable to Domestic Logistics



An example of modal shift (railway tank containers and loading and filling equipment)

### Definitions

#### Modal shift

Changing the mode of transportation to a mass transportation method, such as using railways or ships, thereby improving the efficiency of transportation while also reducing energy consumption and environmental impact.

#### Kawasaki eco-transportation system

An environmentally friendly transportation system established by a partial amendment to the "Kawasaki City Ordinance for Conservation of Life Environment, including Pollution Prevention."

#### Roll-on/roll-off ship

A ship designed to transport wheeled cargo on trucks or chassis cabs.

#### Ton-kilometer

Transport ton-kilometer is a unit of transportation measurement referring to the freight transport volume. As an index for precisely expressing transport as an economic activity, it is the product of the freight haul distance (in kilometers) and the transported freight weight (tons).



## Environmental Protection through Our Products

### Environmental Contribution Products

Chemical products have an impact on the environment because they are produced using the Earth's resources and involve the discharge of CO<sub>2</sub> and other waste. However, looking at the entire product life cycle from raw material procurement to product disposal, in some stages chemical products contribute to a reduction in environmental impact.

We evaluate how our Group's products contribute to reducing

environmental impact by being used through the supply chain in everyday products, for equipment that produces such everyday products, and in social infrastructure.

Our internal certification committee certifies the Environmental Contribution Products after examining them based on their checklist items and numerical data. In fiscal 2021, two Environmental Contribution Products were newly certified.

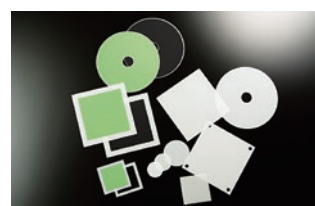
Applications in parentheses



IONEL™ (Lithium-ion battery materials)



AQUALOC™ (Concrete admixtures)



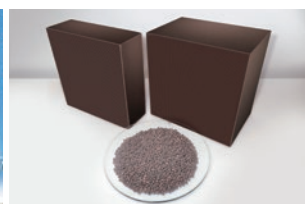
Electrolyte sheets for solid oxide fuel cells



VEEA™ (UV-curable reactive diluent)



Waste gas treatment catalyst



### Environmental Contribution Products

Types of contribution		Product life stage	Applications	Accredited products
Global warming prevention Energy conservation	GHG reduction	Manufacturing	Aquaculture feed binders	AQUALIC™ H (for feed)
			Concrete admixtures	AQUALOC™
		Use	Lithium-ion battery materials	IONEL™
			Solid-state battery materials	ICPDAP™, ICPSEB™
			CO <sub>2</sub> absorbents	Aminoalcohol (Nippon Nyukazai Co., Ltd.)*
		Disposal	Paint and adhesive raw materials, reactive diluents	Isobornyl acrylate
			Paint and adhesive raw materials	Ethyl acrylate
	Energy conservation	Manufacturing	UV-curable reactive diluents	VEEA™
		Use	Solid oxide fuel cell materials	Electrolyte sheets for solid oxide fuel cells
			Automotive damping materials	ACRYSET™ (for damping materials)
			Optical and electronic materials	ZIRCOSTAR™
Chemical emission reduction Air quality preservation	Chemical emission reduction	Use	Water-based paints	UWR™, ACRYSET™ (for water-based paints)
			Water-based adhesives	EPOCROS™
			UV curing paints	AOMA™
	Air pollution prevention	Use	Removal of HC (hydrocarbon), NOx, dioxin and other pollutants from exhaust gas	Automotive catalysts Waste gas treatment catalysts Denitrification catalysts and equipment Dioxin decomposition catalysts and equipment
			Oxidation and decomposition of harmful substances in wastewater	Wastewater treatment catalysts for catalytic wet air oxidation
			Water treatment additives	EPOMIN™
Water resource conservation Water quality preservation Biodiversity preservation	Water contamination prevention	Use	Detergent builders	AQUALIC™ L (for detergent)
		Disposal	Detergent ingredients	SOFTANOL™ HIDS™
	Biodegradability	Disposal	Hollow fiber membranes	Polyvinylpyrrolidone
			Concrete admixtures	AQUAGUARD™
Resources use reduction	Resources use reduction	Use	Hollow fiber membranes	Polyvinylpyrrolidone
Waste reduction	Waste reduction	Disposal	Concrete admixtures	AQUAGUARD™

\* A product of our Group company

# Environmental Protection Initiatives

## Promoting CO<sub>2</sub> emissions reductions throughout the product lifecycle

We employ the cLCA method to assess the degree to which our products contribute to reducing CO<sub>2</sub> emissions.

The cLCA method assesses CO<sub>2</sub> emissions throughout the lifecycle of a finished product incorporating a specific chemical

product compared with a product when assuming that the chemical products are not available. The difference in the volume of emissions is calculated as the net volume of emissions that would be avoided as a result of using that chemical product.

Nippon Shokubai's products that are expected to contribute to the avoidance of CO <sub>2</sub> emissions			Assessment prerequisites
<b>AQUAGUARD™</b>	Calculation of CO <sub>2</sub> emissions avoided in one year when all apartments are built as long-lasting structures <b>4.05 million tons<sup>1</sup></b>	AQUAGUARD™ was developed to reduce cracking and spalling in concrete. The combination of AQUAGUARD™ with a high-range water reducer for concrete is expected to contribute to much longer-lasting concrete structures.	Service period: The lifecycle assessment assumes that a long-life apartment has a 100-year service life and a conventional apartment has a 50-year service life. CO <sub>2</sub> emissions associated with the building, use and demolition of apartments are evaluated with reference to the "Guidelines for LCA for Buildings" published by the Architectural Institute of Japan.
<b>ACRYSET™</b> (for damping materials)	Calculation of CO <sub>2</sub> emissions avoided when an application-type vibration-damping material is installed in all automobiles manufactured in one year <b>310,000 tons</b>	We developed an emulsion for application-type vibration-damping materials for mounting on the lower surface of a vehicle body to reduce the noise and vibration from the engine and road surface. Using such material, it is possible to make the vehicle light and energy-efficient.	The annual travel distance is assumed to be 10,000 km with a 10-year service life. Automobiles using asphalt sheeting as a vibration-damping material are compared and evaluated.
<b>ZIRCOSTAR™</b>	Calculation of CO <sub>2</sub> emissions avoided when ZIRCOSTAR™ is incorporated in all smartphones manufactured in one year <b>220,000 tons</b>	This product has outstanding optical properties, and using it for plastic lenses, displays, and other optical materials increases the energy efficiency of displays on mobile phones, smartphones, and other handheld devices, contributing to a longer battery life.	According to the usage time described in the Carbon Footprint Product Category Rules, the product was evaluated as being in use for two years. A smartphone incorporating ZIRCOSTAR in the optical material was evaluated as achieving a 3.6% reduction in power consumption as an energy-efficiency benefit.
<b>VEEA™</b>	Calculation of CO <sub>2</sub> emissions avoided by reduction expected from all the UV curable inks produced in one year <b>330,000 tons</b>	Use of VEEA™ as UV-curable reactive diluents for inks that are better for the environment makes volatile solvents, as well as related equipment, unnecessary, saves energy and increases productivity.	Printed materials were assumed to be printed in four colors on full A-sized sheets with 3.2 g/m <sup>2</sup> of ink. Commercial offset and commercial UV printing presses were compared for evaluation.
<b>IONEL™</b> <b>ICPDAP™</b> <b>ICPSEB™</b> Electrolyte sheets for solid oxide fuel cells	(1) Calculation of CO <sub>2</sub> emissions avoided when solid batteries are utilized as a regulated power supply for the use of renewable-energy-derived electricity supplied in one year (Use for electric vehicles is not included.) (2) Calculation of CO <sub>2</sub> emissions avoided from the use of fuel cells <b>5.96 million tons</b>	IONEL™, ICPDAP™ and ICPSEB™ are used for storage batteries. Storage batteries are expected to be utilized as a regulated power supply in order to enhance solar power and wind power, which are major sources of renewable energy subject to significant output fluctuations. Use of solid oxide fuel cells will also contribute to reducing CO <sub>2</sub> emissions as they can generate electricity and hot water with high efficiency.	For calculation of CO <sub>2</sub> emissions avoided from the use of storage batteries, fluctuations in electricity and regulated power supply were assumed so that the supply and demand of electricity are balanced at the most economically efficient point. For calculation of CO <sub>2</sub> emissions avoided from the use of fuel cells, because the amount of hydrogen supply cannot be predicted, evaluation was conducted based on fuel cells for houses, which generate power by modifying "city gas." The comparison target was thermal power generation.
<b>Aminoalcohol</b> (Nippon Nyukazai Co., Ltd.) <sup>2</sup>	Calculation of CO <sub>2</sub> emissions avoided in one year when the CO <sub>2</sub> emitted from thermal power plants is collected and stored using a chemical absorption technique <b>5.5 million tons</b>	While renewable energy is increasingly being used, thermal power plants continue to operate to achieve stable power supply. Aminoalcohol contributes to CO <sub>2</sub> emissions reduction because this product is used when these power plants trap CO <sub>2</sub> from waste gas through a chemical absorption technique.	Aminoalcohol was used as an absorbing solution when CO <sub>2</sub> was separated and collected, and the amount of energy required mainly for the separation and collection was evaluated. The comparison target was CO <sub>2</sub> emissions without the separation or collection.

Note: The assumptions above are expected values and do not guarantee actual service lives or performance.

<sup>1</sup> The prediction value used for this evaluation was recalculated based on conditions in recent years. <sup>2</sup> A product of our Group company

## Chemical Substances Control Initiative

### Reducing chemical emissions

In fiscal 1995, we participated in a voluntary PRTR survey undertaken by the JCIA and have set out to reduce our emissions of chemical substances into the environment.

In fiscal 2021, we released 86 tons of substances subject to

the PRTR Law, which represents a 20.0% decrease in emissions compared to fiscal 2015 levels. However, we were not able to achieve our target of 25% reduction from fiscal 2015 levels.

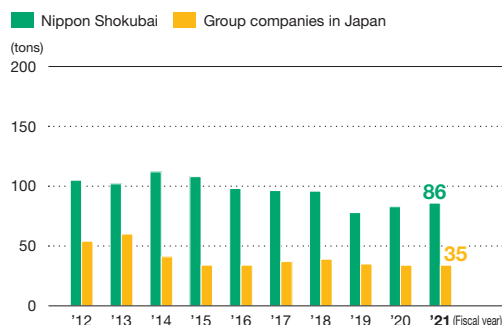
#### Top 10 Substances Subject to the PRTR Law Released in Fiscal 2021

Calculation extent: Nippon Shokubai only

(tons)

No.	Government Designation No.	Substance Subject to the PRTR Law	Released into Atmosphere	Released into Water	Total Emissions	Amount Transferred
1	405	Boron compounds	0.0	32.4	32.4	0.3
2	321	Vanadium compounds	0.0	9.2	9.2	0.0
3	4	Acrylic acid and its water-soluble salts	8.5	0.0	8.5	0.0
4	80	Xylene	6.6	0.0	6.6	0.0
5	58	Ethylene glycol monomethyl ether	3.1	0.0	3.1	0.0
6	56	Ethylene oxide	2.9	0.0	2.9	0.0
7	300	Toluene	2.9	0.0	2.9	388.2
8	104	Chlorodifluoromethane	2.2	0.0	2.2	0.0
9	12	Acetaldehyde	2.2	0.0	2.2	0.0
10	7	Butyl acrylate	2.1	0.0	2.1	0.0

#### Trends in Emissions of Substances Subject to the PRTR Law



#### Definitions

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

A regulatory system that requires the reporting of emissions of designated chemical substances into the air, water and soil as well as the volume of waste transferred. Data compiled and submitted to governmental agencies are disclosed to the public.

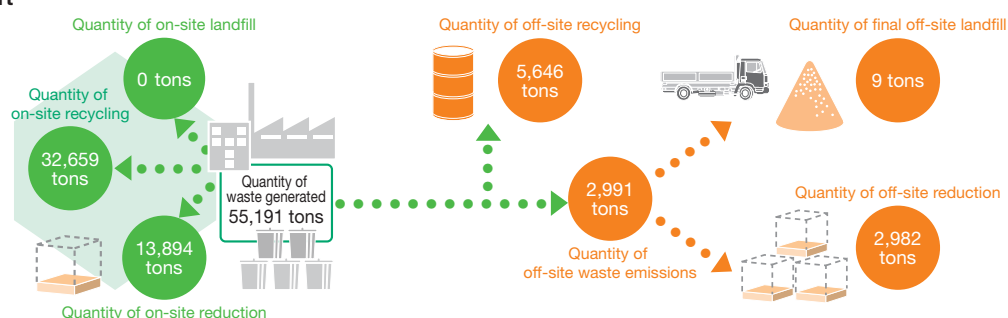
## Waste Reduction Initiatives

### Reducing the amount of waste subject to final disposal at off-site landfills

Reducing waste is a necessary initiative to support the creation of a society committed to recycling. Toward the goal of achieving and maintaining “zero emissions” (defined as “reducing the quantity of waste subject to final disposal at off-site landfills to less than 0.1% of the total amount of waste generated”), we are introducing sorting for the recovery and recycling of our waste.

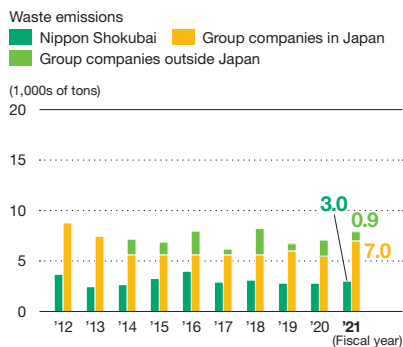
In fiscal 2021, we are continuing to implement our zero emissions policy by reducing the amount of waste subject to final disposal at off-site landfills. In addition to implementing comprehensive sorting for recovery and recycling, we are achieving this by redesigning our processes to reduce waste, reusing byproducts and processing product leftovers on site.

#### Waste Flowchart

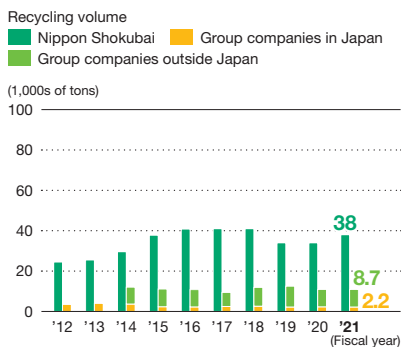


Note: We partly changed the aggregation method in fiscal 2021.

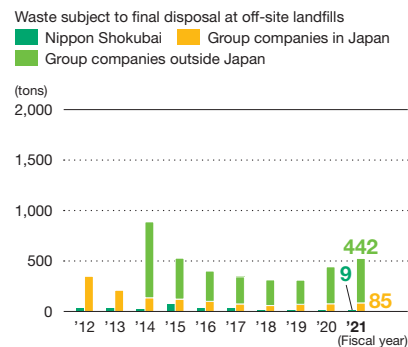
#### Trends in Waste Emissions



#### Trends in Recycling Volume



#### Trends in Amount of Waste Subject to Final Disposal at Off-site Landfills



### Employee's Voice

#### Reducing emissions of methyl cellosolve by 1.3 tons a year

In the series of activities related to reducing emissions of substances of concern into the air, my department worked on reducing emissions of methyl cellosolve into the air because the department uses this substance as a reaction solvent to manufacture fine chemical products.

When the reaction is completed, pressure is applied to the reaction tank to discharge the solution. Then, vaporized methyl cellosolve (the “reaction solvent vapor”) remains in the reaction tank. When the pressure is released, the reaction solvent vapor is condensed by a heat exchanger to collect it, but some of it is emitted into the air, and reducing such emissions was an issue. So, my department worked on the issue and took the following measures to reduce it:

- To change the coolant for the heat exchanger
- To extend the time it takes for the reaction solvent vapor to pass through the heat exchanger

These measures have enhanced the efficiency of collecting the reaction solvent vapor, reducing emissions by 1.3 tons a year. My department will continue to work on the reduction of environmental impacts, as early as the product development phase.



Yukio Shiotsuki

Fine Chemicals Manufacturing Department,  
Himeji Plant

## Environmental Protection Initiatives

### Pollution Control Initiatives Targeting Air

#### Working to reduce environmental impact by introducing waste gas treatment catalysts

To prevent air pollution, we monitor our SO<sub>x</sub>, NO<sub>x</sub> and dust emissions. We have installed denitrification equipment for NO<sub>x</sub> emissions reduction, which we developed in-house, and scrubbers for dust emissions reduction. For SO<sub>x</sub> emissions reduction, we are reducing our heavy-oil consumption and converting the fuel to natural gas. For purification of unreacted raw materials from production processes, we use the waste gas treatment catalysts we have developed in-house.

None of these emissions exceed the levels agreed with the local cities or prefectures.

#### Trends in Emissions

(tons)

		'16	'17	'18	'19	'20	'21
SO <sub>x</sub> emissions	Nippon Shokubai	3.4	2.8	3.5	3.5	3.7	3.1
	Group Companies in Japan	1.9	1.5	1.6	1.4	1.6	1.4
NO <sub>x</sub> emissions	Nippon Shokubai	205	204	198	203	198	196
	Group Companies in Japan	44	48	45	43	48	72
Dust emissions	Nippon Shokubai	6.1	6.4	6.3	6.5	5.7	7.4
	Group Companies in Japan	2.7	2.3	2.2	3.3	2.1	2.1

### Water Resource Conservation

Our Group manufactures a wide variety of chemical products, and water is indispensable in their manufacturing process. For example, water is used to prepare water solution products, heat or cool materials in the manufacturing process, clean products, and operate detoxifying facilities that remove chemicals generated in the manufacturing process as well as drainage facilities. Therefore, we believe that ensuring the sustainability of water is an essential prerequisite to the continuity of our business and a mission we should take up for the sake of society. For water resource conservation, we work on efficient use of water and water pollution control, and we also aim to contribute to the resolution of water issues through our products and technologies (see “Environmental Contribution Products” on page 12).

We have confirmed with the Aqueduct Water Risk Atlas, developed by the World Resources Institute (WRI), that none of our business locations are in the “Water Stress” area. We will continue to check on this matter and work on reducing water-related risks.

#### Pollution control initiatives targeting water

For water pollution prevention, we adopt high-performance activated sludge treatment equipment that can stably process even high-impact substances to purify waste liquid in a sophisticated manner, striving to reduce the environmental impact of the discharge.

None of the emissions of chemical oxygen demand (COD), total phosphorus, or total nitrogen in the waste water exceed the levels agreed with the local cities or prefectures.

#### Trends in Emissions

(tons)

		'16	'17	'18	'19	'20	'21
COD of wastewater	Nippon Shokubai	51	54	55	50	50	56
	Group Companies in Japan	34	45	53	60	61	55
Total phosphorus emissions	Nippon Shokubai	2.8	2.8	2.9	2.7	2.5	2.6
Total nitrogen emissions	Nippon Shokubai	54	47	58	55	52	56

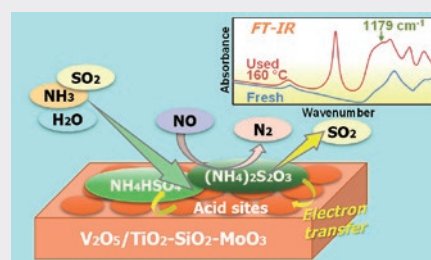
### Topics Nippon Shokubai Receives the Technology Award from the Catalyst Manufacturers Association, Japan – Identified an exhaust-gas detoxification mechanism of De-NO<sub>x</sub> catalyst –

In June 2021, we received the Technology Award 2021 from the Catalyst Manufacturers Association, Japan for our research on “the development of highly active and resistant De-NO<sub>x</sub> catalyst and the identification of its performance enhancement mechanism.”

The Association presents the Technology Award to creative inventions or improvements that have made significant contributions in the catalyst industry, or to catalyst-related technical papers recognized for their academic value. We have received this award after our paper on practical catalyst research was published in prestigious academic journals in the catalyst research field *ChemCatChem*, *Applied Catalysis A: General*, and *Industrial & Engineering Chemistry Research* and the significance of its academic achievement was recognized.

For an overview of the awarded technology, click the link below to read a new release on our website.

<https://www.shokubai.co.jp/en/news/news0275.html>



Model of ammonium sulfate decomposition on a catalyst



## Biodiversity Preservation

With the awareness that all of our business activities benefit from biodiversity and have an impact on it, we consider biodiversity preservation as one of the key issues to address in relation to sustainability. Our Environmental Protection Policy states that “We will work to minimize the negative impact of our business activities on ecosystems and strive to preserve biodiversity.” We believe that we can contribute to biodiversity preservation through our continuous activities to tackle climate change, protect the environment through our products, control chemicals, reduce waste, control air pollution, and conserve water resources.

With cooperation from local governments, NPOs, and other organizations, our employees participate as volunteers in activities to protect and restore the natural environment both inside and outside Japan. These activities are aimed at learning the importance of biodiversity preservation and training individuals to think about the environment and act for themselves.

### Forest development initiatives

#### ► Contributing to Our Forests and Water Resources

Location: Akasai Valley, Hara, Haga-cho, Shiso-shi, Hyogo prefecture  
Start of activity: November 2008

We have been, for example, undertaking management of the headwater forest in the Akasai Valley where originates the Ibo River that passes by our Himeji Plant.



Research on creatures in Akasai River

#### ► Contributing to the “Yugawara Myriad Leaves Forest”

Location: Kajiya, Yugawara-machi, Ashigarashimo-gun, Kanagawa prefecture  
Start of activity: November 2013

In the headwater forest of upper reaches of the Shinzaki River in Yugawaramachi, we conduct forest improvement and nature observation tours.



Yugawara Myriad Leaves Forest

#### ► Japan-Indonesia Friendship Forests of Banten Bay for Biodiversity Preservation

Location: Serang, Banten Province, Republic of Indonesia  
Start of activity: September 2018

Nippon Shokubai has launched an initiative aimed at restoring mangrove forests in Banten Province in the Republic of Indonesia, where PT. NIPPON SHOKUBAI INDONESIA is located.



Planting saplings

#### ► Japan-China Friendship Forest Development and Global Warming Prevention

Location: Ejina Horo Banner, Inner Mongolia Autonomous Region, China  
Start of activity: October 2008

In order to prevent desertification in inland China and regenerate the vast forests that were once there, we have been undertaking tree planting in this area, and observing the growth of the trees.



Trees firmly rooted and grown in the desert area

In fiscal 2021, to prevent the spread of COVID-19, the volunteer activities by our employees were canceled, and the secretariats and NPOs made on-site visits to inspect maintenance and management conditions.

Note: The forest development initiatives in Japan and China are undertaken in cooperation with NPOs through the Green Fund of the National Land Afforestation Promotion Organization. The forest development initiative in Indonesia is undertaken in cooperation with local NPOs.

### Preserving and popularizing the *Nojigiku* chrysanthemum

To save, preserve, and popularize the endangered *nojigiku* chrysanthemum, the prefectural flower of Hyogo, our Himeji Plant has cultivated 160 varieties of this flower, including foundation stock, in a 2,000-square-meter green yard by the plant. Cultivation began in 1972 and by 1974 the Himeji Plant began distributing seedlings annually in cooperation with the Hyogo prefectural government.



*Nojigiku* in a preservation garden

# Environmental Protection Initiatives

## Environmental Accounting

The values determined in our environmental accounting were aggregated according to the *Environmental Accounting Guidelines for the Chemical Industry* published in 2003 by the JCIA and the Japan Responsible Care Council. We also made reference to the Environmental Accounting Guidelines 2005 published by the Ministry of the Environment of Japan.

### Environmental Protection Costs & Environmental Protection Benefits

Applicable period: April 1, 2021–March 31, 2022 Calculation extent: Nippon Shokubai only

(millions of yen)

Classification		Main Initiatives	Amount Invested	Expenses	Effects
Business area cost	1. Pollution Control Cost	Preventing air and water pollution, controlling hazardous substances	56	1,168	No pollution problems occurred.
	2. Global Environmental Protection Cost	Initiatives to reduce energy consumption and to tackle climate change	49	3,733	We conducted energy efficiency efforts equivalent to 6,185 kL (crude oil) annually.
	3. Resource Recycling Cost	Appropriate treatment and disposal of industrial waste	0	698	We maintained zero emissions by sorting and recycling our solid waste.
Upstream/downstream cost		Reuse of resources	0	63	Some of drum containers are reused.
Environmental management cost		Operation of environmental management structure; acquisition and maintenance of ISO 14001 registration	0	595	All our plants successfully acquired certifications, and we are seeking to enhance our environmental management systems.
R&D cost		Reduction of the environmental impact through development and manufacturing of green products	0	3,227	Conducting R&D of products that contribute to the environment.
Social activity cost		Environmental-related contributions	0	20	Implementing forest development initiatives.
Environmental damage cost		—	0	4	—
Total			105	9,508	

### Economic Effects (Monetary Benefits) Resulting from Environmental Protection Initiatives

(millions of yen)

Effect		Amount
Income	Operating revenue from recycling used products and waste generated by principal business activities	30
Cost saving	Reduction in expenses associated with energy conservation	3,865
	Reduction in waste disposal cost accruing from resource conservation and recycling	2,826
Total		6,722

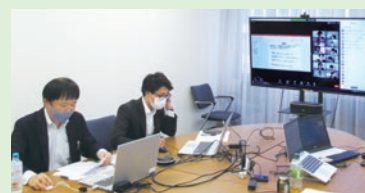
**Reference** Total investment for the period: 8,101 million yen  
Total R&D expenses for the period: 13,638 million yen

## Close Up

### Rank-based RC Training

We provide ongoing employee training in RC for the purpose of improving their knowledge, skill, and understanding of overall RC initiatives.

In keeping with our training curriculum for fiscal 2021, we have been providing this training to new employees entering our company, to employees being promoted to the position of subsection chief and to employees being promoted to managerial positions. We will continue improving our RC training capabilities in the future.



Training for new employees

### Definitions

#### Environmental Accounting

This system collects and analyzes the costs and effectiveness of environmental protection in business activities, quantitatively and to the maximum extent, and makes the data available to the public. It is focused on sustainable development for companies with the goal of efficiently and effectively promoting environmental protection initiatives while maintaining a good relationship with society.

# Process Safety and Disaster Prevention Initiatives

Under the Safety Philosophy “Safety takes priority over production,” all our employees take part in various activities to ensure safety.

## Overview of Fiscal 2021

We had zero class A or B process safety accidents. In fiscal 2021, while maintaining our basic approach to safety issues, we continued to promote our voluntary safety initiatives according to the priority initiatives of the RC Basic Plan for Fiscal 2021, a single-year plan formulated as an extension of the 10th Medium-term RC Basic Plan.

## Basic Approach to Safety Issues

We have incorporated the lessons learned from the accident at the Himeji Plant in 2012 to reinforce our basic approach to safety issues. We have clarified our Safety Philosophy, Safety Oath, and the safety management principles presented below, as well as the roles of the company at each organizational level, and are ensuring that all employees stay fully informed.

### Safety management principles

We are putting into practice the fundamental principles for safety management, behavior principles during production activities and other guidelines that are established in the Safety Management Regulations of our company.

<Fundamental principle of safety management (excerpt)>

- (1) Assure safety based on our Safety Philosophy, “Safety takes priority over production.”

<Behavior principle during production activities>

- (1) Stop operation immediately if you discover something abnormal in the functioning of equipment. No one will ask who was responsible.



Safety Oath



Safety Philosophy, “Safety takes priority over production”



Inspection of Kawasaki Plant by President

### Message from the President on Safety

On Safety Oath Day in fiscal 2021, our President said in his speech that each employee should keep in mind our Safety Philosophy, “Safety takes priority over production,” in steadily implementing basic safety activities and measures against the recurrence of accidents every day with a sense of ownership, and that the accumulation of such step-by-step efforts would lead to the attainment of more trust from customers. He also requested that we hold safety discussions in every workplace during our Safe Operation Month (September 16 to October 15), in which everyone should discuss and reconfirm their individual roles, in other words, what they should do in their workplace to strengthen a culture of safety prioritization.

In addition, the President visited the Himeji and Kawasaki Plants to conduct safety inspections. He had a lively dialog with the employees and reemphasized that we should continue to pursue safe and stable production activities with our Safety Philosophy “Safety takes priority over production” deeply in mind, as well as to keep taking thorough measures against COVID-19.



Inspection of Himeji Plant by President



# Process Safety and Disaster Prevention Initiatives

## Promotion of Voluntary Safety Initiatives

Since its foundation, Nippon Shokubai has ensured safe production with the technologies we developed in-house, and the voluntary safety initiatives we have introduced are aimed at zero Class A and Class B severe process safety accidents.

### Efforts to prevent accidents and malfunctions

We employ HAZOP to identify latent risks in a plant. We are working to prevent incidents by systematically implementing HAZOP for both routine and non-routine work, and also by conducting Management of Change and non-routine work management.

As small group initiatives, we are promoting HMI activities at the Himeji Plant and TPM activities at the Kawasaki Plant to identify problems and implement improvements.

We will continue with our multi-faceted approach to prevent accidents and malfunctions.

### Systematic implementation of safety measures

When an accident happens, we investigate the cause in stages and introduce measures to prevent any recurrence. Long-term maintenance of facilities is incorporated in our maintenance plans and implemented according to the plans. We are also systematically dealing with the aging degradation of our facilities.

### Earthquake preparedness

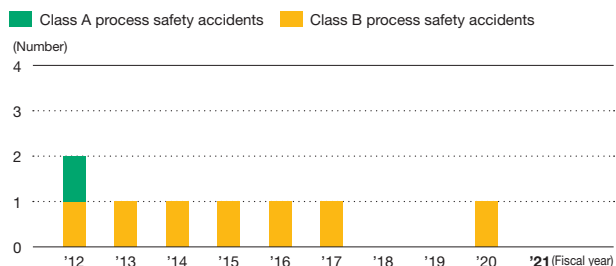
Following the Great East Japan Earthquake of 2011, we reviewed our earthquake preparedness in the event of a future major earthquake and tsunami from both the tangible and intangible aspects and are adopting the necessary measures, which are periodically reviewed and reinforced.

Regarding the existing measures that are in place to improve the seismic resistance of high-pressure gas facilities, we confirmed that all spherical reservoirs with steel tube bracing and those towers and tanks that are important high-pressure gas facilities have seismic designs that meet the seismic standards for reporting to the relevant authorities. We continue to implement seismic resistance measures for our piping facilities in fiscal 2022.

### Results of process safety accidents

In fiscal 2021, we had zero class A or B process safety accidents. We will continue our efforts to prevent process safety accidents while constantly improving safety activities.

#### Trends in the Number of Process Safety Accidents



#### Definitions

##### HAZOP (Hazard and Operability Study)

A safety evaluation method for systematically evaluating the adequacy of safeguards in plants and eliminating latent risks in plants through comprehensive detection.

##### HMI (Himeji Manufacturing Innovation) activities

These activities advance improvement and innovation at the Himeji Plant.

##### TPM (Total Productive Maintenance) activities

These improvement activities seek to realize production methods that pursue the highest overall efficiency in production systems.

### Enhancing education and training

To upgrade the skills and expertise required to maintain safe operations, we are fulfilling the requirements for training-related risk management at our chemical plants.

Courses on risk management and other related themes were given by instructors from Sanyo Association for the Advancement of Science & Technology, online in fiscal 2021, in due consideration for the prevention of COVID-19 infection. A total of 54 people participated.

To increase the competency of the employees who implement HAZOP and to train the next generation, we invited outside lecturers to both plants and held HAZOP trainings again in fiscal 2019.

At both plants, we have collected "know-why" information so that people can understand the origins of our procedures and rules and to enable skills to be passed on. We are using this information for teaching.

The opinions voiced by our employees have encouraged us to continue conducting training both inside and outside the company to improve knowledge of safe operations and to increase safety awareness.



"Chemical plant accident prevention based on actual case study" class

### Maintenance and improvement of safety management efforts

Each year, RC inspections are conducted by executive management at both Himeji and Kawasaki plants. In fiscal 2021, as usual, the management verified safety management activities at both plants.

The Executive Officer of the RC Division at our Head Office conducted safety audits as the head of the auditing committee, to ensure continuous improvements to our safety management.

### High-pressure gas safety accredited plants

The Ministry of Economy, Trade and Industry accredited the Chidori Plant and the Ukishima Plant located at our Kawasaki Plant as Accredited Completion Inspection and Safety Inspection Executors for high-pressure gas in 1989 and 1991, respectively. Reaccreditation inspections are conducted every five years.

This accreditation permits continuous operation of high-pressure gas production facilities and autonomous safety inspections by plants with competent self-managed safety systems.



## Improving emergency drills

We have established disaster prevention arrangements at every plant, and we systematically conduct a variety of emergency drills every year.

In fiscal 2021, we had to take extra care to prevent COVID-19 infection in the emergency drills as in the previous year, but we exercised our ingenuity in conducting them.

By feeding back issues that were made apparent in the emergency drills in the future trainings, we will continue to review and strengthen our disaster prevention, including related arrangements, education and training.



Comprehensive Emergency drill at the Kawasaki Plant



Comprehensive emergency drill at the Himeji Plant



Comprehensive Emergency drill at the Suita Research Center

## Strengthening a culture of “safety prioritization”

Safety is not what someone ensures for you but what you need to consider and secure for yourself. We believe that in order to strengthen a culture of safety prioritization, it is vital that we be aware of the above and reflect this awareness in our organizational and individual behavior.

Both of our plants are undertaking unique efforts to strengthen a culture of safety prioritization. For example, employees at our Himeji Plant conducted self checks of fundamental safety behavior, and employees at our Kawasaki Plant undertook safety behavior check activities.

## Preventing accidents caused by a loss of collective memory

To show our determination never to forget the accident in 2012 and our resolve never to let such an accident happen again, we held a Safety Oath Ceremony in front of the Safety Oath Monument at the Himeji Plant in fiscal 2021, renewing our commitment to continually improving our safety competency.



Safety Oath Ceremony

## Commendations

At the Hyogo High-Pressure Gas Safety Managers' Convention of the Hyogo High-Pressure Gas Safety Organization, an employee of our Himeji Plant received the Chairman's commendation as an excellent high-pressure gas safety manager.

The Osaka Association for Safety of Hazardous Materials commended the Suita Research Center for its safety management and accident prevention at hazardous material facilities.



Receiving award at the Hyogo High-Pressure Gas Safety Managers' Convention



Commendation certificate from the Osaka Association for Safety of Hazardous Materials

## Responsible Care Activities

# Logistics Safety Initiatives

We have commissioned Nisshoku Butsuryu Co., Ltd. to handle all our logistics operations. To ensure the safety and quality of our logistics tasks, they cooperate closely with the Environmental Safety and Quality divisions of both our Himeji and Kawasaki Plants, where we work diligently to prevent logistics accidents.

With the aim of minimizing damage should an accident occur during product shipment, we periodically conduct drills to respond to accidents on transportation routes.

Moreover, in support of the White Logistics movement promoted mainly by the Ministry of Land, Infrastructure, Transport and Tourism toward the realization of sustainable logistics, we made a White Logistics declaration in April 2020, and we have been continuously implementing relevant activities.



Training for accidents during product transportation

# Occupational Safety and Health Initiatives

Toward achieving the target of zero industrial injuries (including those at our contractors), we implement activities to ensure occupational safety and health, including improving the working environment, reducing risk factors, and creating pleasant workplaces.

## Overview of Fiscal 2021

We experienced four injuries with loss of workdays and four injuries without loss of workdays. Our contractors experienced one injury with loss of workdays and four injuries without loss of workdays. In fiscal 2021, we continued to promote our occupational safety and health initiatives for industrial injury prevention according to the priority initiatives of the RC Basic Plan for Fiscal 2021, a single-year plan formulated as an extension of the 10th Medium-term RC Basic Plan.

## Basic Approach to Occupational Safety and Health

We promote our occupational safety and health initiatives in order to prevent industrial injuries and health impairment in workplaces, ensure employee safety and health, and create a comfortable working environment.

### Ensuring Continuous Improvement of Occupational Safety and Health

We have been continuously improving our occupational safety and health based mainly on our Occupational Safety and Health Management System (OSHMS). In addition, we are striving to reduce industrial injuries by systematically implementing various basic safety initiatives, including "kiken yochi (KY)" risk prediction, "hiyari hatto" near miss and "5S" campaigns, as well as by conducting a variety of education and training courses. In the event of an industrial injury, the workplace digs deep into the causes of the injury and plans countermeasures, and the Safety and Health Committee reviews them from both the management's and the labor's perspectives, thereby preventing recurrence or similar injuries.

### Risk assessment

In accordance with the Occupational Safety and Health Management System, we have been undertaking task risk assessment to reduce or eliminate the sources of risks. Moreover, we are systematically implementing risk assessments for chemicals handled at each worksite and working to decrease risks.

### Basic safety initiatives

In an effort to prevent industrial injuries, we are committed to daily safety initiatives targeting work-related risks. Specifically, we remain focused on our kiken yochi (KY) or "risk prediction" campaign before work, our hiyari hatto practice of collecting reports on "close-call" incidents, and our "5S" campaign in the workplace. To maintain and enhance sensitivity to danger, we conduct KY training and KY workshops on a periodic basis, with the aim of improving the level of our daily safety activities. We are also working to familiarize ourselves with basic safety behavior: (1) Think before you act; (2) Pointing and calling; and (3) Hold the handrail when stepping on stairs, by putting up posters and providing related education, thereby helping to prevent industrial injuries.



### On-site training sessions

Aiming to improve sensitivity to risks hidden in plant operations, we offer experiential training in hanging in a full harness safety belt and ascending and descending rope ladders, and hands-on training in removing hose couplers and sampling.



Hands-on training in sampling

### Definitions

#### KY Campaign (risk prediction campaign)

This campaign is intended to prevent injuries by highlighting, at meetings before work, the risk factors (unsafe behaviors and unsafe conditions) that remain hidden in work practices and by implementing measures to address them.

#### Near miss (hiyari hatto, HH)

Even where no accidents and injuries have occurred in day-to-day operations, we monitor workers' experiences of "near misses" or "scares" in order to clarify why such events occur and how we can avoid them. From the results, we can adopt safety measures applicable to both facilities and actions.

#### 5S Campaign

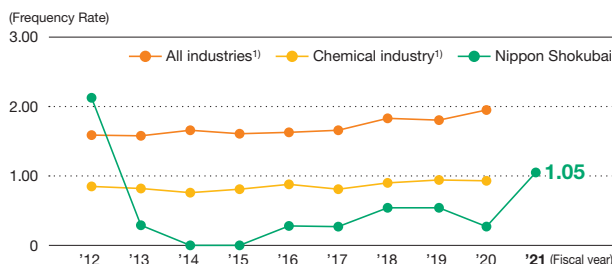
This campaign promotes the 5 "S" practices, which can be translated as sort, set in order, shine, standardize and sustain.

### Occurrence of industrial injuries

In fiscal 2021, we experienced four injuries with loss of workdays and four injuries without loss of workdays. Our contractors experienced one injury with loss of workdays and four injuries without loss of workdays.

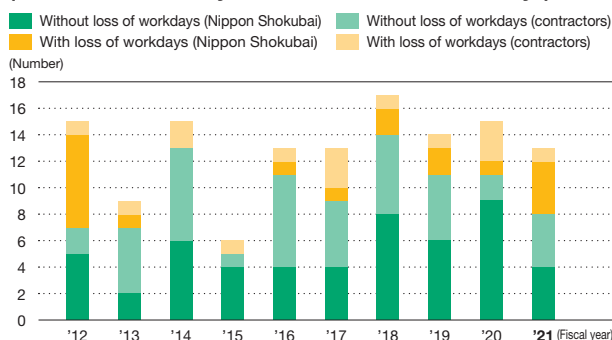
In recent years, industrial injuries have occurred frequently among young workers at Nippon Shokubai, while they have occurred frequently among less-experienced workers at our contractors. We are therefore enhancing safety education for young or less experienced workers to raise their safety awareness.

#### Trends in Frequency Rate of Injuries with Loss of Workdays



Note: Frequency rate: The number of casualties in industrial injuries per million working hours  
1) Source: "Survey on Industrial Accidents" by the Ministry of Health, Labour and Welfare

#### Trends in Total Number of Industrial Injuries (with Loss of Workdays and without Loss of Workdays)



### Addressing the health issues of company retirees

Since our company was established, we have never manufactured products containing asbestos; however, we have used insulation and sealing materials that contained asbestos.

For this reason, we support our retirees by offering consultations on health issues and providing health check-ups to those who request them. Information regarding these services is posted on our website.

# Chemical Safety Initiatives

Toward achieving the goal of zero legal and social problems related to chemical substances throughout the lifecycle of products, we are committed to the proper management of chemicals through initiatives including complying with laws and regulations and providing related information.

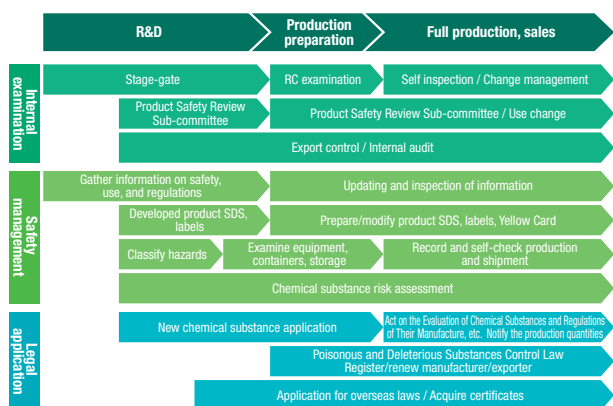
## Overview of Fiscal 2021

Faced by the tightening of laws and regulations, and industry standards for management of chemical substances, as a result of efforts to collect information related to product safety and applicable laws and regulations, and to disseminate the information throughout the company, we were able to achieve zero legal and social problems in fiscal 2021. We also advanced the development of a system for automatic production of warning labels and other measures for work improvement, thereby enhancing the chemical management system. We will continue to develop a system for the management of chemical substances capable of adapting to diverse laws and regulations, as well as social situations.

## Comprehensive Management of Chemical Substances throughout the Product Lifecycle

Toward achieving the goal of zero legal and social problems related to chemical substances throughout the lifecycle of products, Nippon Shokubai is committed to the proper management of chemicals and implements a variety of initiatives, including upgrading our internal systems to comply with laws and regulations related to chemical products, and providing customers with information on relevant laws and regulations as well as product safety information.

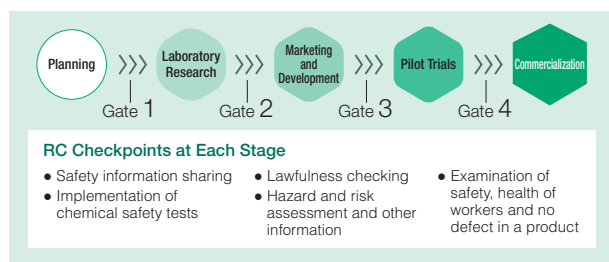
### Chemical Management System



### Ensuring the safety of new products

We have introduced a gate system at each stage from R&D to commercialization. We apply our technical expertise to examine the safety of chemical products throughout the product lifecycle and determine at each stage whether to proceed to the next stage.

#### Gate System



### Product safety initiatives

We prepare GHS-compliant SDSs, warning labels, and Yellow Cards and provide information to customers while providing training sessions for our employees. Regarding application-specific products used in pharmaceutical raw materials, pesticides, cosmetics and food additives, our Product Safety Review Sub-committee conducts strict checks while ensuring compliance with the Product Liability Act.

### Establishment of a chemical substance management system

We have created a comprehensive chemical substance management system that provides centralized management of various types of information such as hazard and regulation for chemicals, raw materials, and products, and we are operating this system for broad applications, such as risk assessments, the issuance of SDS, and responding to customers' requests for the survey of chemical substances contained in our products. We are also continuously committed to developing new functions, including automatic production of GHS labels, as well as maintaining and improving the system functions with updated information.

### Accommodating chemical registration requirements within and outside Japan

In collaboration with specialized institutions and our Group companies outside Japan, we are responding appropriately to laws and regulations, including the Act on the Evaluation of Chemical Substances and Regulations of their Manufacture, etc. and the Industrial Safety and Health Act in Japan, as well as TSCA in the United States and REACH in Europe.

To enhance the employees' legal knowledge regarding chemical management regulations and awareness of compliance with laws, we hold regular education programs on laws and meetings to explain new systems.

Moreover, in cooperation with an organization in which we are a member, we actively respond to risk assessments by governmental agencies inside and outside Japan, including information provision to the agencies.

### Addressing import/export controls

To ensure legal compliance regarding imports and exports, we have streamlined our process for strengthening company regulations, keeping our employees informed about whether a product has been subject to import/export restrictions and improving our shipping management system for coordination with our enterprise resource planning (ERP) backbone accounting system. We also conduct regular internal training. In the internal audit we conduct every year, it was confirmed that there were no problems with exports between January and December 2021.

#### Definitions

##### Yellow Card

Carriers who transport hazardous products must carry a yellow card for reporting information about their cargo to fire squads in the event of an accident. The yellow card lists a product's hazards, first aid procedures in an accident, and emergency contact information. As part of its promotion of RC, the JCIA prepares and manages guidelines on the procedures for preparing a yellow card in order to strengthen first aid measures in the event of an accident.



# Quality Initiatives

Nippon Shokubai's basic policy related to quality is to provide products and services that fully satisfy our customers while earning their trust. We also work to maintain or improve our quality levels.

## Overview of Fiscal 2021

We achieved our target of zero serious quality complaints. Quality audits for Nippon Shokubai plants and Group companies both inside and outside Japan were conducted to confirm that compliance is ensured for the entire Group.

## Ensuring Continuous Improvement of Quality

### Customer satisfaction initiatives

All our plants and all the Group companies both inside and outside of Japan engaged in manufacturing have introduced quality management systems. We implement our quality assurance initiatives from the customer's perspective from the product development stage through manufacturing and delivery.

We are dedicated to the continuous improvement of our quality management system to ensure our customers are satisfied with the stable high quality of our products and services.



Quality control convention

### Promoting initiatives to address quality issues

We respond quickly to any complaints or inquiries from customers concerning our products. At the same time, we prevent quality issues from occurring through company-wide distribution of case studies.

Cases of complaints and issues that occurred in fiscal 2021 were shared at meetings of the department managers, where permanent measures were taken. The information on quality complaints and issues are also distributed to our Group companies in Japan, with the aim of preventing similar quality problems.

### Initiatives toward gaining greater public trust

We have established quality management systems that ensure the safety and reliability of our products. The quality assurance department of our Head Office has conducted quality audits of our plants and Group companies to check the quality assurance systems and the status of quality management at all production sites.

In quality audits for fiscal 2021, a Lot traceability exercise was used to check whether countermeasures against past quality issues were taken on an ongoing basis.

These audits did not reveal any problems that were considered to constitute non-conformance. We will conduct quality audits on a continual basis to check that measures to meet customer requests and countermeasures against past quality issues are taken properly.

### Supply chain initiatives

Nippon Shokubai promotes initiatives to ensure supplies of safe and reliable products throughout the entire supply chain, from procurement of raw materials to manufacture and sales of products. In accordance with our regulations for green procurement management, we have independently assigned substances that are regulated or highly hazardous to two categories: "prohibited substances" and "restricted substances." We are promoting the development of green products and the procurement of raw materials with low environmental impact while controlling the inclusion of such substances in our products. For information transmission sheets, we have introduced chemSHERPA.

### Introducing products with halal certification

Parts of Southeast Asia, most notably Malaysia and Indonesia, are home to many Muslims, and demand for halal-certified ingredients and production processes from food-related businesses has been increasing. In response to this situation, we have acquired halal certification for products for which acquisition of the certification is strongly urged by customers. Specifically, in 2014, the Himeji Plant acquired halal certification for organic acids (maleic anhydride, succinic acid, and disodium succinate), and Sino-Japan Chemical Co., Ltd. acquired halal certification for some products. In 2015, the Himeji Plant acquired halal certification for sodium polyacrylate (AQUALIC™ H series), too. Furthermore, PT. Nippon Shokubai Indonesia (NSI) acquired halal certification for all products in 2019. With these certifications, we can expect further expansion of demand for these products in Southeast Asia. We will make continuous efforts to provide prosperity and comfort to people and society by responding to the needs of society.

**Note: Examples of products for which our Group has acquired halal certification (as of April 1, 2022)**

Succinic acid, Disodium succinate, Maleic anhydride, AQUALIC™ FH (Food additive), AQUALIC™ MH (Feeding stuff additive), and AQUALIC™ IH (Industry), and All products produced at NSI (Acrylic acid (AA), Acrylates (AES), Superabsorbent polymers (SAP))



NSI Halal certification

## Definitions

### chemSHERPA

This shared system for transmitting information about chemicals contained in products to supply chains was developed under the leadership of the Ministry of Economy, Trade and Industry in Japan. Full-scale utilization began in April 2018.

### Halal Certification

A certification with religious relevance, granted by the relevant organizations when certain standards are satisfied, for products and services targeted at Muslim customers.



# Communication with Society

Guided by our Group Mission of “**TechnoAmenity**—Providing Prosperity and Comfort to People and Society, with Our Unique Technology,” we have adopted a number of social initiatives. These include maintaining clear and open communication with society as a good corporate citizen that works in harmony with local communities and trains next-generation human resources.

## Working in Harmony with Local Communities

Believing that establishing a relationship of trust with local community residents is crucial for stable business operation at each plant, we take various opportunities to communicate with them.

### ▶ Cleanup campaign

We conduct periodic cleanups of the environs around all our plants as a local beautification initiative.



Cleanup activity

### ▶ Sweet potato harvest party

We grow sweet potatoes in the potato fields we have created in the green yard of the Himeji Plant. Every year, we invite neighborhood kindergartners and nursery school children to enjoy harvesting our crop of sweet potatoes. We have been holding this activity since 1971, as it has helped us forge strong ties in the community. In fact, some of the children who harvested potatoes in the past are now employed with us.

In fiscal 2021, to prevent the spread of COVID-19, we canceled an invitation to neighborhood kindergartners to harvest sweet potatoes, and instead delivered harvested sweet potatoes to neighborhood nursery schools.



Children harvest potatoes

### ▶ Dialogue with local communities

Nippon Shokubai participates in the community dialogue undertaken by the JCIA's Responsible Care Committee and introduces the corporate RC initiatives to the participants from neighborhood associations, local governments, NPOs, industry organizations and companies in areas in which our plants are located. Through such communication, we aim to enhance mutual understanding.

In fiscal 2021, to prevent the spread of COVID-19, the dialogue was held in the Kawasaki area in writing.



Dialogue with local communities  
Proceedings of the dialogue held in writing (cover)

## Training the Next Generation

We host and participate in various events to help people become familiar with chemical technologies. We also provide internship opportunities to have work experience through hands-on training. Through initiatives that take advantage of our unique business characteristics, we are contributing to developing the abilities of children who will form the next generation.

### ▶ Children's Chemistry Experiment Show

We have been presenting an Experiment Show titled “Superabsorbent Polymer, the Mysterious Powder.” The children enjoy experimenting with chemistry and show great interest.

In fiscal 2021, we canceled the show due to the spread of COVID-19.



Experiment Show

### ▶ Hosting internship trainees

We provide internship opportunities for students from technical colleges.



Internship

### ▶ Delivery class for junior high schools

We offer a “delivery class” to teach the attractions of our work to junior high school students. To interest students in chemistry and work, the lecturer talked about the pleasure of work and the sense of satisfaction from work.



Delivery class at a junior high school

# Production/R&D Site Reports

## Himeji Plant

### Plant Outline

Plant Manager Tokihiro Yokoi, Executive Officer  
 Location 992-1 Aza-Nishioki, Okinohama, Aboshi-ku, Himeji, Hyogo  
 Number of employees 1,241 (including research center)  
 Products Acrylic acid, acrylates, maleic anhydride, superabsorbent polymers, resin modifiers, electronic information materials, De-NOx catalysts, dioxins decomposition catalysts, and other products  
 TEL +81-79-273-1131  
 FAX +81-79-274-3723



Tokihiro Yokoi,  
Plant Manager

### Fiscal 2021 Results of RC Activities

- Occupational safety and health
- Process safety and disaster prevention
- Environmental protection

Three injuries with loss of workdays, five injuries without loss of workdays (including contractors)  
 Zero Class A and Class B process safety accidents  
 Energy consumption intensity: reduced by 11% from the FY2020 level

For occupational safety and health, the Himeji Plant has always strived to establish the practice of basic safety behavior (thinking before action, pointing and calling, and holding the handrail when walking up or down stairs). Aiming to further ingrain the behavior, the plant has been taking an ergonomic approach lately.

Regarding process safety and disaster prevention, a Hyogo Prefecture petrochemical complex comprehensive emergency drill took place at the Himeji Plant, assuming it to be the accident site. Due to the spread of COVID-19, this was conducted as a virtual drill, but it afforded an opportunity to confirm cooperation with the fire department, the Japan

Coast Guard, and companies in the neighborhood.

For environmental protection, full-scale introduction of a plant-wide activity to recycle plastic pallets, which used to be disposed of as waste, into regenerated pallets considerably reduced the amount of pallet waste.

The Himeji Plant is striving to constantly provide maximum value for customers under its policy, "Let us make a plant with high safety and productivity by enhancing the resilience of each member of the plant, and making constant ambitious efforts to implement three transformations (business transformation, strategic transformation for environment initiatives and organizational transformation)!"

### Hands-on safety experience in pointing and calling

Many human errors are caused by careless mistakes and preconceptions due to lack of confirmation. Using a newly introduced "pointing and calling safety check simulator," the Himeji Plant provides workers with an opportunity to experience simulated human errors caused by a lack of confirmation and understand through their own experience the importance of pointing and calling before action.

You simply press buttons as directed on the screen. That is very easy, but you can realize that you would make more mistakes without the pointing and calling practice. We believe that we can make a troubleless, injury-free, safe and stable plant where our employees can work with ease of mind if they stick to the basic safety behavior and make action for self-protection a habit. We will continue to promote safety education and training, aiming to raise the safety awareness of all workers and contractor employees, from young to experienced.

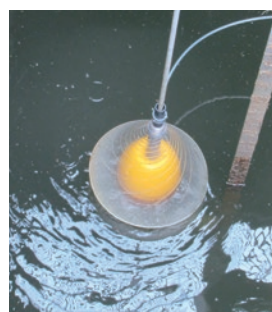


Hands-on experience

### Introduction of an organic pollution monitor (drainage monitoring system)

To strengthen monitoring of the drainage path at the plant site, the Himeji Plant has attached an organic pollution monitor to a drainage-oil separator.

This organic pollution monitor applies the mechanism of a gas detector. It vaporizes any trace of organic substances in drainage and detects the generated vapor in real time. Before the installation of the monitor, its effectiveness was confirmed with an on-site test conducted with a demo unit. The reinforced monitoring system has made it possible to react more quickly than before in the event of a leak of a hazardous material. We will continue to strive for environmental protection by promoting activities to prepare for emergencies.



Sampling float



Main unit (with a sensor)

## Kawasaki Plant

### Plant Outline

Plant Manager	Yoshihisa Oka, Executive Officer
Location	Chidori Plant 14-1 Chidori-cho, Kawasaki-ku, Kawasaki, Kanagawa Ukishima Plant 10-12 Ukishima-cho, Kawasaki-ku, Kawasaki, Kanagawa
Number of employees	367
Products	Ethylene oxide, ethylene glycol, ethanolamine, secondary alcohol ethoxylates, polymers for concrete admixture, acrylic acid special ester, and other products
TEL	+81-44-288-7366
FAX	+81-44-288-8492



Yoshihisa Oka,  
Plant Manager

#### Fiscal 2021 Results of RC Activities

- Occupational safety and health
- Process safety and disaster prevention
- Environmental protection

One injury with loss of workdays, two injuries without loss of workdays (including contractors)  
Zero Class A and Class B process safety accidents  
Energy consumption intensity: reduced by 8% from the FY2020 level

Regarding occupational safety and health, the Kawasaki Plant had one injury with loss of workdays (fracture) and two injuries without loss of workdays (chemical burns and cut wounds). To thoroughly prevent similar issues, we reviewed the work environment and delivered re-education in work procedures.

For process safety and disaster prevention, we ensured safety management. As a result, the Chidori Plant achieved continuous operation of its ethylene oxide manufacturing facility for 619 days (two years) and maintained the accreditation of Safety Inspection and Completion Inspection Executors for high-pressure gas granted by the Ministry of Economy, Trade

and Industry.

For environmental protection, we took energy conservation measures, including steam reduction through equipment modification. Regarding substances subject to the PRTR Law, its amendment will add more substances to the list of those subject to the law, and we promoted the identification of sources of emissions of such additional substances, while continuing to strive for the recovery of boron.

We will continue to promote RC activities to ensure safety and even higher reliability.

### Utilization of an operator training simulator

At the Kawasaki Plant, we have introduced an operator training simulator and utilized it to educate and train young operators who will take a lead in plant operation in the future.

This simulator aims at the acquisition of plant operation skills. Targeted at ethylene oxide manufacturing equipment, which is the main plant in the Kawasaki Plant, the simulator provides training in non-routine starting and stopping of the equipment, condition alterations during steady operation, and operation in the event of an emergency. A trainee's superior serves as the instructor to give one-on-one training and evaluates training results to make sure that every trainee can acquire operation skills. Since a single erroneous operation may lead to a serious accident, workers attend the training with a sense of tension, believing that they cannot do better in the manufacturing setting than in training.



Training

### Replacement of absorption columns in the ethylene oxide manufacturing facility

The manufacturing process of ethylene oxide, a flagship product of the Kawasaki Plant, requires continuous operation, and its manufacturing facility consists of many dedicated pieces of equipment. One such piece of equipment is columns that absorb the gas generated. Old-model columns, which had been used for almost 50 years, were removed, and regular packed columns, which were expected to increase the absorption capacity, were installed. This large-scale construction was intended to maintain stable operation by replacing the aged equipment and reduce the energy load due to a smaller amount of absorbing solution. Combined with regular maintenance, the construction took a long time, but it was completed without process safety accidents because of safety measurements taken, including risk identification through management of change as well as thorough prearrangements.



Absorption columns replacement at the Chidori Plant



# Production/R&D Site Reports

## Suita Research Center

### Suita District Outline

Representative	Yasutaka Sumida, Director of Innovation & Business Development Division, Member of the Board, Managing Executive Officer
Location	5-8 Nishi Otabi-cho, Suita, Osaka
Number of employees	411
R&D organizations	Innovation & Business Development Division, Corporate Research Division, Industrial & Household Chemicals Research Department, New Energy Materials Research Department, Electronics & Imaging Materials Research Department, Process Technology Center, Health & Medical Business Division, Cosmetics Materials Research Group, IONEL Construction Team, R&D Management Department, General Affairs Suita Department, Responsible Care Suita Department
TEL	+81-6-6317-2202
FAX	+81-6-6317-1578



**Yasutaka Sumida,**  
Director of Innovation &  
Business Development Division



### Fiscal 2021 Results of RC Activities

- Occupational safety and health
- Process safety and disaster prevention
- Environmental protection

One injury with loss of workdays, one injury without loss of workdays\*  
Zero Class A and Class B process safety accidents  
Recycling 100% of waste

\* Total number for Suita Research Center and Himeji Research Center

Regarding occupational safety and health, we had one injury with loss of workdays and one injury without loss of workdays. Both of the injuries seemed partly attributable to lack of risk prediction, and we have been striving to prevent similar injuries through continued and enhanced safety activities.

For process safety and disaster prevention, training in risk management in process development was given by an external organization, and various emergency drills were conducted with their programs rearranged in

consideration of the prevention of COVID-19 infection.

Regarding environmental protection, we continued to achieve 100% recycling of waste in fiscal 2021. We set up a committee for promotion of energy conservation in fiscal 2020, and we have been striving for even more efficient energy management.

Aiming at safe research activities with no injuries, we will continue to promote RC activities in good balance with the promotion of research.

### Commitment to education

Continued from 2020, RC education in the research and development segments was conducted partly in person with thorough measures taken against the spread of COVID-19 infection and partly online with a conferencing tool, although one of the planned education programs was forced to be postponed.

In fiscal 2021, an environmental education program was newly added. Moreover, efforts were made to promote the trainees' understanding, including the implementation of a comprehension test after each program and the adoption of a two-part program structure, which consists of a classroom lecture on applicable laws and regulations and instruction in practical tasks. The introduction of the comprehension tests generally received favorable comments from the trainees, some of whom mentioned that the tests helped them grasp key points of the education.

We will strive for the optimization of program contents and the style of education provision, so that we can respond to trainees' needs and changes of the circumstances that surround chemicals, including increasingly stringent laws and regulations.



Education

### Disaster prevention and energy conservation activities

The Suita Research Center operates two nitrogen generators, including a backup. Nitrogen supplied by them has a role in preventing chemicals from causing fire, in addition to being used in various experiments.

To prepare for power failures and other unexpected situations, the center has newly introduced nitrogen cylinder bundles. Recently, addressing energy issues has become an important part of the SDGs. The cylinder bundles ensure a supply of nitrogen in the event of a shutdown of the operating nitrogen generator, which has allowed the center to turn off the backup nitrogen generator at night, when nitrogen usage is low. In this way, the cylinder bundles contribute to energy conservation while preventing accidents.



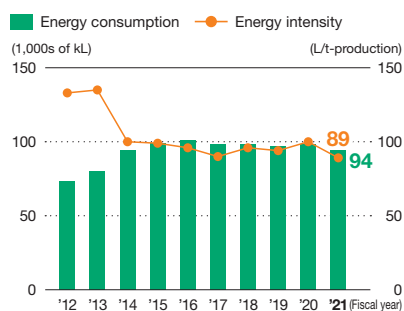
Cylinder bundles



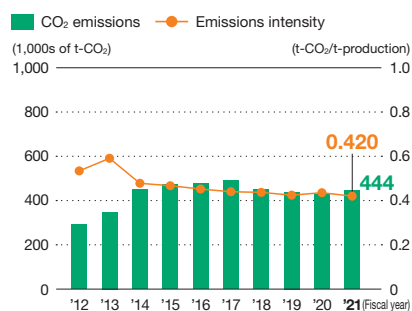
## Plant Data

### Himeji Plant

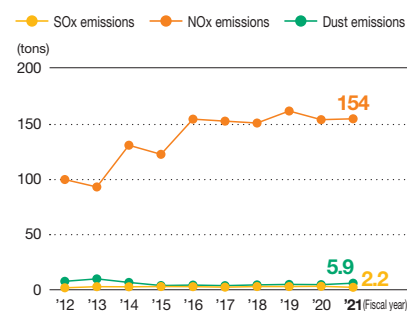
#### Trends in Energy Consumption and Intensity



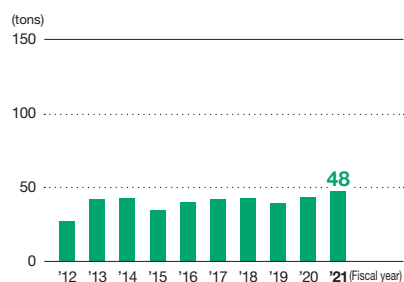
#### Trends in CO<sub>2</sub> Emissions and Intensity



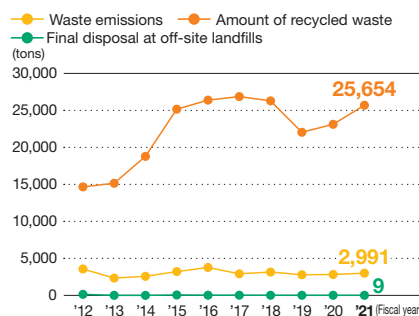
#### Trends in Emissions of SO<sub>x</sub>, NO<sub>x</sub>, and Dust



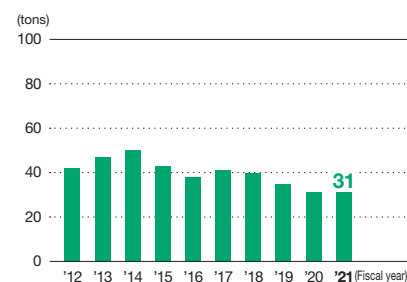
#### Trend in COD of Wastewater



#### Trends in Amount of Waste, Recycled Waste, and Waste for Final Off-site Landfill Disposal

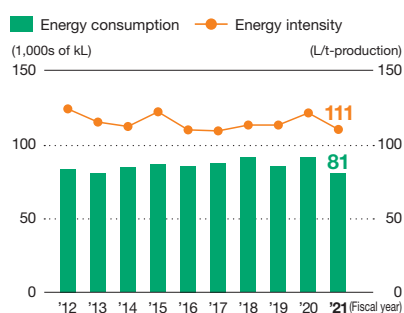


#### Trend in Emissions of Substances Subject to the PRTR Law

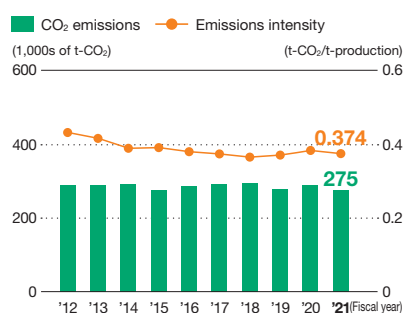


### Kawasaki Plant

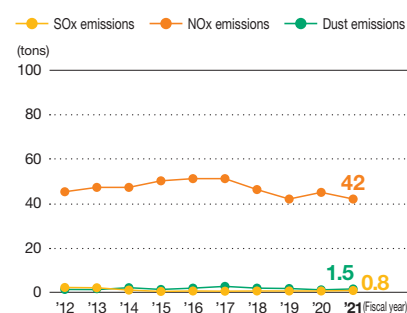
#### Trends in Energy Consumption and Intensity



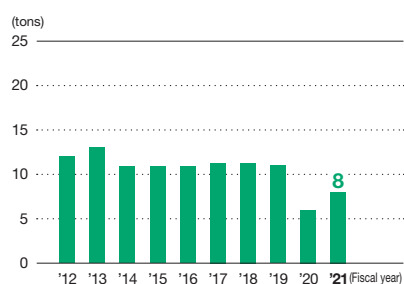
#### Trends in CO<sub>2</sub> Emissions and Intensity



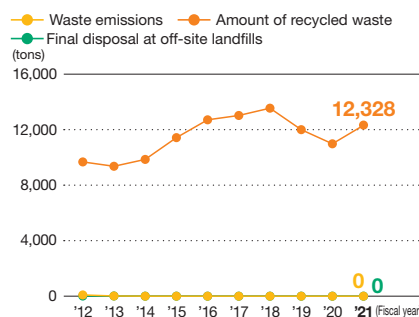
#### Trends in Emissions of SO<sub>x</sub>, NO<sub>x</sub>, and Dust



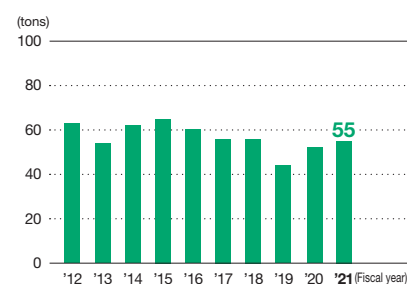
#### Trend in COD of Wastewater



#### Trends in Amount of Waste, Recycled Waste, and Waste for Final Off-site Landfill Disposal



#### Trend in Emissions of Substances Subject to the PRTR Law



# Providing Support for Group Companies

In the interests of strengthening group management, we are providing active support for the RC initiatives of our Group companies.

## Support for Environment and Safety Activities

### RC discussions

The RC Division holds RC discussions to promote and improve RC initiatives for Group companies both inside and outside Japan. In fiscal 2021, because the RC Division could not visit the Group companies due to the COVID-19 pandemic as in the previous year, discussions were held online with six Group companies in Japan and one Group company outside Japan.

In these discussions, the companies in Japan reported on the planning and achievements of their RC initiatives. And the company outside Japan reported on the planning and achievements of its RC initiatives, as well as the status of operation of its management systems.

We provided them with advice and support.



RC discussion with Nippon Polymer Industries Co., Ltd.



RC discussion with Sino-Japan Chemical Co., Ltd.

### Environmental and safety audits

We conduct environmental and safety audits at our Group companies in Japan every year to strengthen our environmental safety management structure and promote continuous system improvements.

In fiscal 2021, the audits were conducted online, as in the previous year. We were able to confirm compliance with legal requirements as well as the status of the establishment and operation of necessary standards related to safety and the environment. We also confirmed that their environment and safety management systems are properly implemented.



Environmental and safety audit of the Kashima Plant of Nippon Nyukazai Co., Ltd.



Environmental and safety audit of Chugoku Kako Co., Ltd.

### Environment and safety exchange meeting

Every year, environment and safety personnel of our Group companies inside Japan gather at one of the companies to hold an environment and safety exchange meeting. At the meeting, the company that serves as the venue introduces its RC initiatives, and the participants share information with each other to improve the level of their initiatives.

In fiscal 2021, the meeting was held online due to the spread of COVID-19, but the participating companies shared their basic safety activities (a *hiyari hatto* (near miss) campaign and task risk assessment), basic safety behavior (thinking before you act, pointing and calling, and holding the handrail when stepping on stairs), and problems, and exchanged views.

## Support for Quality Activities

### Support for quality assurance initiatives

For Group companies inside Japan, in fiscal 2021, we continued to provide advice and support on their quality activities and quality issues through quality roundtable meetings.

For SAP manufacturing sites of Group companies outside Japan, to ensure high quality at the same level at our all sites for our core businesses, we have a quality meeting every year with the members in charge of quality of each site.

In fiscal 2021, the meeting was held online in two separate groups in consideration of the time difference, as in the previous year. As usual, we also held a periodic meeting with each site, including Sino-Japan Chemical Co., Ltd.

We continue to provide even closer support to the Group companies, including the enhancement of the quality-related database for work sites outside Japan.



Quality meeting at Nisshoku Chemical Industry (Zhangjiagang) Co., Ltd. (in 2018)

### Quality audits

Quality audits for the Group companies inside Japan for fiscal 2021 were conducted online, as in the previous year, focusing on products that had caused issues in the past. Through a Lot traceability exercise, the auditors checked how countermeasures against the recurrence of the issues had been taken on an ongoing basis. Opportunities for improvement found in the audits were shared within the Group companies to raise the level of their initiatives.

For Group companies outside Japan, too, internal audits of SAP manufacturing sites were conducted online in fiscal 2021. Quality personnel of these companies were asked to take photos of the manufacturing sites in advance, and the photos were used to inspect the sites. For manufacturing sites of products other than SAPs, quality audits are conducted every other year, and they were conducted in fiscal 2021, focusing on a Lot traceability exercise, as with quality audits for the Group companies inside Japan. None of the manufacturing sites revealed serious non-conformance.



Quality audit of Nisshoku Techno Fine Chemical Co., Ltd.

### Quality exchange meeting

Every year, quality personnel from us and the Group companies inside Japan hold a quality exchange meeting, taking turns to lead it. In fiscal 2021, due to the spread of COVID-19, the meeting was conducted online on the theme of management of change and customer notification. Lately, unavailability of materials and raw materials sometimes forces abrupt changes in schedule. The participants exchanged views and ideas about how their companies coped with the situation.

# Initiatives of Group Companies

## Group Companies in Japan

### CHUGOKU KAKO CO., LTD.

#### Principal business

Manufacture and sale of adhesive-processed products and fine sphere particles

In fiscal 2021, for environmental protection, Chugoku Kako replaced aged boilers. Along with the replacement, the fuel was changed from bunker A to city gas, and this upgrade to high-efficiency boilers reduced CO<sub>2</sub> emissions by 30% and electricity usage by 50%.

Regarding occupational safety, the Production Department had three injuries without loss of workdays. These comprised pinch injuries, injuries from being caught in machinery, cuts, and scratches, which are major types of injuries that occur at the factory. We will steadily take countermeasures against the recurrence of these injuries, and apply these countermeasures to similar tasks and equipment while raising workers' safety awareness for injury prevention.

"Chugoku Kako Improvement ACTION," our improvement and proposal activity that started in 2020, entered its second year and is gradually getting results, including less workload and more information shared. We will continue to make constant improvements and promote RC initiatives.



High-efficiency boilers

#### Interview

#### Toward the continued achievement of zero injuries

Having had zero injuries since October 2015, my workplace set "zero injuries with or without loss of workdays" as the occupational safety target for the fiscal 2021 RC promotion plan, and worked to achieve it.

Last injuries that occurred in the workplace were mostly caused by workers with a longer career history. I suspected that their familiarity with tasks and the work environment lowered their guard against hazards and decreased their awareness.

Therefore, in addition to "KY" risk prediction and *hiyari hatto* (near miss) campaigns, which we have long conducted, we patrol around the section as a "5S" promotion activity to identify dangerous spots and share information on them, as well as check how clean each workspace is. Furthermore, workers in my section share information with each other about how they handle raw materials. Through this information sharing based on the SDSs of these raw materials, my section ensures thorough understanding and reacknowledgement of hazards.

Through these activities, my workplace will continue to aim at realizing a safe and pleasant work environment.



Shoji Kawamura

Manager  
Production No. 3 Section  
Chugoku Kako Co., Ltd.

### TOKYO FINE CHEMICAL CO., LTD.

#### Principal business

Manufacture and sale of disinfectants for industrial use, brine, antifouling agents, stabilizers of vinyl chloride resins, etc.

In fiscal 2021, Tokyo Fine Chemical worked on safety and health initiatives under Nippon Shokubai's Safety Philosophy "Safety takes priority over production," as it did in the previous fiscal year, but regrettably it had one injury without loss of workdays. The worker fell due to heatstroke and broke a bone. We will identify risk factors again and strive for zero injuries. Regarding the other elements of occupational safety and health, for prevention of group infection in the factory amid the ongoing spread of COVID-19, workers take their temperature every morning when entering the factory, and acrylic plates have been installed in each workplace for social distancing, thereby strengthening hygiene management.

As for process safety and disaster prevention, we focus on new-employee education, including repeated study of past accident cases, comprehensive fire drills, and drills assuming accidents on transportation routes. We will continue to make company-wide efforts in promoting RC initiatives, and strive for stable factory operations while preventing COVID-19 infection.



Comprehensive fire drill



Temperature check when arriving at work

### NIPPON CHEMICALS CO., LTD.

#### Principal business

Manufacture and sale of iodine, iodine compounds, raw materials for pharmaceuticals and pesticides and natural gas

In fiscal 2021, Nippon Chemicals strived to foster safety culture through RC initiatives with full participation, but regrettably it had an injury without loss of workdays, in which a worker's fingers were pinched by a stepladder. Although safety patrols have been eliminating unsafe spots, current activities have not sufficiently reduced unsafe behaviors. We are striving to ensure basic safety behavior by putting up awareness-building posters and conducting many other activities, in addition to "KY" risk prediction and *hiyari hatto* (near miss) campaigns and risk assessment.

For process safety and disaster prevention, in fiscal 2021, in addition to an annual factory-wide emergency drill, we conducted a night-time emergency call drill for its emergency response team. The drill carried out an actual procedure, from night-time emergency calls to preparation for first response, which clarified various issues. This drill will be conducted on a regular basis to prepare for emergency.

Regarding logistics safety, for the prevention of falls from a tanker during cargo handling, we installed equipment to hang fall prevention gear. After developing a procedure for using the equipment, we started using it in April 2022.

In fiscal 2022, we will formulate a new (three-year) RC plan and strive to achieve the targets through RC initiatives with full participation.



Poster displaying all employees' safety and health declarations



Measure to prevent falls from vehicles



# Initiatives of Group Companies

## Group Companies in Japan

### NIPPON POLYMER INDUSTRIES CO., LTD.

**Principal business** Manufacture and sale of acrylic resins

In fiscal 2021, Nippon Polymer Industries conducted the following RC initiatives. For process safety and disaster prevention, we increased emergency supplies and equipment to control and respond to disaster, including the additional purchase of emergency radio sets to enhance information sharing and communication among self-defense disaster response team members and the purchase of portable generators and lithium-ion batteries to respond to disaster during night time and power failure.

For environmental protection, we settled a pending matter: a new dike was constructed in the No. 2 production tank yard, which stored non-hazardous materials. Moreover, tanks of caustic soda for cleaning were relocated to the yard, which raised leak and pollution control levels.

Regarding safety and health, regrettably, we had one injury without loss of workdays early in fiscal 2021. The injury was caused by exposure to acrylic acid, due to insufficient management of its container and lack of confirmation caused by carelessness stemming from familiarity with the daily task. Taking these issues seriously, we are making renewed efforts to prevent industrial injuries, including review of the risk assessment of similar tasks and thorough implementation of pointing and calling. Although the spread of COVID-19 has been limiting various activities, we will continue to work on RC initiatives with full participation whenever possible, aiming for zero accidents and zero injuries.



Joint emergency drill (self-defense disaster response station)



Tanks of caustic soda for cleaning and the dike

### NIPPON NYUKAZAI CO., LTD.

**Principal business** Manufacture and sale of surfactant and other chemicals

In fiscal 2021, Nippon Nyukazai promoted RC initiatives based on a single-year plan formulated as an extension of the 4th Medium-term RC Promotion Plan (fiscal 2017–2020).

Regarding occupational safety and health, analysis of near miss incidents revealed that the most common cause was unawareness of the risk. In the next fiscal year, we will promote activities to improve sensitivity to risks.

For environmental protection, a working team created a theme for energy consumption reduction activities. From now on, the team will discuss how to act on the theme and make ideas more specific actions for energy consumption reduction, thereby promoting CO<sub>2</sub> emissions reduction.

For process safety and disaster prevention, we introduced a workflow system into management of change, visualizing progress and strengthening management. Also, enlightenment education was delivered using cases of accidents that occurred at our company or other companies.

Regarding communication with society, to enhance the quality of RC initiatives, we underwent third-party verification by the JCIA. We will apply the advice received through the verification to our activities.

We will continue to strive for safe operations and further promote the enhancement of our RC initiatives.



RC inspection of the plant by the management



Third-party verification report by the JCIA

### NISSHOKU TECHNO FINE CHEMICAL CO., LTD.

**Principal business** Manufacture and sale of (meth)acrylic acid derivatives and photo/electro chemicals

Regrettably in fiscal 2021, Nisshoku Techno Fine Chemical had two injuries without loss of workdays, and it immediately took countermeasures against the recurrence of such injuries. To prevent industrial injuries, we will continue “KY” risk prediction and *hiyari hatto* (near miss) campaigns and proactively implement risk assessment of tasks, including infrequent ones.

To work on environmental protection, we set the target of reducing the following compared to fiscal 2020 levels: waste intensity, emissions intensity of substances subject to the PRTR Law, and energy use intensity. The operation of new equipment reduced the energy use intensity. The medium-term plan includes conversion of fuel for once-through boilers from heavy oil to city gas, which will reduce environmental impact.

For process safety and disaster prevention, amid the spread of COVID-19, we conducted disciplinary and water discharge drills under the guidance of the Ichikawa Collaborative Disaster Control Center, as well as a comprehensive emergency drill.

In fiscal 2022, we will continue to conduct safety and disaster control activities while taking measures against COVID-19.



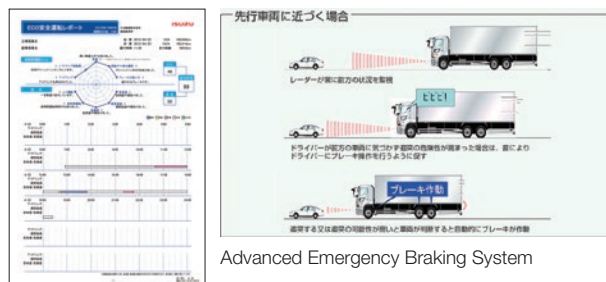
Disciplinary and water discharge drills under the guidance of the Ichikawa Collaborative Disaster Control Center

### Nisshoku Butsuryu Co., Ltd.

**Principal business** Logistics of chemicals

The Nisshoku Butsuryu Group positions “providing environment-friendly, safe, and high-quality logistics services for chemicals and contributing to society through its RC initiatives” as its key management policy. Under this policy, we have been working on the reduction of GHG emissions as an initiative to reduce environmental impacts and promoting risk prediction as an initiative to achieve zero accidents and injuries. We also promote proper operation of advanced operation information systems and the introduction of vehicles equipped with Advanced Emergency Braking System as priority tasks.

We also worked on the following priority issues: prevention of environmental disasters and accidents, promotion of energy consumption reduction and resource conservation, prevention of accidents with vehicle equipment, prevention of chemical transportation/handling issues, and promotion of white logistics.



Advanced Emergency Braking System

“Mimamori-kun” advanced operation information system



## Group Companies outside Japan

### NISSHOKU CHEMICAL INDUSTRY (ZHANGJIAGANG) CO., LTD. (China)

#### Principal business

Development, manufacture and sale of superabsorbent polymers and polymers for concrete admixture

All employees of Nisshoku Chemical Industry (Zhangjiagang) were divided into 13 teams to join "Near Miss—Kaizen Activity 2021," and submitted a total of 160 suggestions (including 40 safety-related ones). In this activity, held twice a year, teams that made the most and the second most suggestions per capita are rewarded.

We also conduct emergency drills twice a year in collaboration with the local fire department and emergency response center to improve employees' emergency response capabilities.

In November 2021, we held first-aid training by an external specialist to enhance employees' first-aid skills.



"Near Miss—Kaizen Activity 2021" awarding ceremony



Emergency drill

#### Interview

#### Introduction of a new wastewater recovery system

Nisshoku Chemical Industry (Zhangjiagang) introduced a new wastewater recovery system in December 2021 and put it into use in January 2022. Since it started being used, the system has run well, and product quality has been maintained.

This system allows the company to decrease wastewater by about 1,800 tons per year, reducing its environmental impact and cutting the cost of wastewater treatment. The system also enables acrylic acid and water contained in the wastewater to be recovered for reuse. About 80 tons of acrylic acid can be recovered every year, which saves resources and production costs.

We hope to conduct similar excellent improvement activities in the future to help achieve the goals of environmental protection and cost reduction.



Zhang Yao

Assistant to production manager  
Nisshoku Chemical Industry  
(Zhangjiagang) Co., Ltd.

### NIPPON SHOKUBAI EUROPE N.V. (Belgium)

#### Principal business

Manufacture and sale of acrylic acid and superabsorbent polymers

Global warming (climate change) due to excessive GHG emissions is the biggest challenge of our times. In order to save our planet, Europe has the ambition to become the first "climate neutral continent" in the world. The EU has set an ambitious goal of reducing GHG emissions to at least 55% below 1990 levels by 2030, which is very challenging. The Nippon Shokubai Group strives to protect the environment. Nippon Shokubai Europe, its Group company, has subscribed to the SBT (science-based target) with a goal set in alignment with a maximum 1.5°C global warming up scenario.

The process started with the use of a carbon accounting method to calculate CO<sub>2</sub> emissions linked to three scopes that covered all our processes. This has led to a report on our CO<sub>2</sub> footprint. On this base report, our reduction roadmap is now being made. We will also share the progress towards net zero to all our stakeholders yearly. We will clearly show our environmental engagement, for, as we all know, climate change will not wait...



CO<sub>2</sub> emissions report

### SINO-JAPAN CHEMICAL CO., LTD. (Taiwan)

#### Principal business

Manufacture and sale of surfactant and other chemicals

Sino-Japan Chemical's disaster response teams are divided into five squads (reporting, firefighting, evacuation guidance, safety protection, and emergency first aid) in the daytime. In the night time, the teams are split into three squads (reporting, firefighting, and evacuation guidance) based on the belief that rescue is the most important duty during the night hours, when staff are scarce and visibility is low.

Early in 2021, in Linyuan Industrial Park, where our plant is located, more than one serious accident occurred, with most of them occurring at night. Therefore, in fiscal 2021, we conducted drills at night time. Moreover, explosion-proof lighting fixtures were added to existing equipment, and emergency lights were installed. Thanks to the employees' rich experience built up through past drills as well as good lighting equipment, the disaster response teams acted swiftly and reliably in the night-time drills, proving their capability of responding to a disaster at the same level as in day-time drills.

We will continue to conduct night-time drills on an ongoing basis to maintain and reinforce our night-time disaster rescue capabilities.



Night-time drill

# Initiatives of Group Companies

## Group Companies outside Japan

### Nippon Shokubai America Industries, Inc.

#### Principal business

Manufacture and sale of superabsorbent polymers, polymers for concrete admixture, water soluble polymers and acrylic emulsions

In 2021, Nippon Shokubai America Industries continued to promote RC-focused initiatives at its two facilities: Chattanooga and Houston.

The Chattanooga facility has historically had ground settlement and sinkhole issues. To reduce the risk of groundwater contamination, all process and wastewater pipes that used to be located below ground were moved to overhead pipe racks. Additional proactive environmental protection measures were taken, including the rehabilitation of the plant's stormwater outfall area.

At the Houston facility, there were two large-scale planned maintenance events with no injuries. Before a planned maintenance, a safety slogan contest is held to foster a safety culture. The winning slogan for 2021 was: "No Safety, Know Pain. Know Safety, No Pain." This slogan was used on hardhat stickers and a large banner to remind employees of the importance of ensuring their safety at work.

Additionally, an emergency response training that focused on plant fire prevention and rescue operations was held jointly with American Acryl L.P. Through its environmental initiatives, the facility had zero air permit or stormwater deviations.

Both facilities have obtained ISO 45001, 14001 and 9001 certifications. Aiming to continue to accomplish their goal of zero accidents and/or injuries, the facilities will remain fully committed to achieving this in the future.



Emergency response training



Winning slogan for the safety slogan contest



### SINGAPORE ACRYLIC PTE LTD

#### Principal business

Manufacture and sale of crude acrylic acid

In 2021, Singapore revised the standards for the safety and health management system for the chemical industry (SS 651:2019) to achieve closer alignment with the new ISO 45001:2018. Therefore, employees of Singapore Acrylic attended trainings and made other efforts to meet the new requirements with the help of a consultant.

We also conducted the energy efficiency opportunities assessment mandated by the government as part of energy reporting requirements, with help of a consultant to identify areas of energy consumption improvement. We will study the feasibility of the suggested improvement ideas.

SMAG (a conglomerate of four Japanese companies in the same complex), to which we belong, launched a safety campaign of slip, trip and fall prevention in response to recent incidents, including falling off a bicycle and slipping on a wet or uneven road surface. Video clips and slides were displayed on TV monitors, and environmental safety bulletins were put up on notice boards to raise awareness. A banner for slip, trip and fall prevention was also displayed at the entrance to SMAG plants.



Banner for slip, trip and fall prevention



Environmental safety bulletin

### PT. NIPPON SHOKUBAI INDONESIA

#### Principal business

Manufacture and sale of acrylic acid, acrylic esters, and superabsorbent polymers

In 2021, Nippon Shokubai Indonesia had several opportunities to be verified or assessed by governmental and public agents.

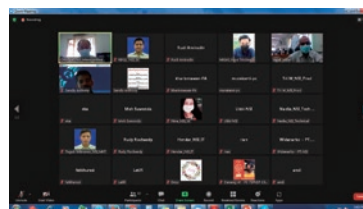
We are a member of Responsible Care Indonesia (RCI) and need to undergo verification for seven RC Codes of Management Practices every two years. RCI verification in 2021 awarded Gold Level to the company.

We have implemented SMK3 (Occupational Health and Safety Management System) based on Government Regulation No. 50, which was issued in 2012. We had an audit by a government certification body for certification renewal and obtained the certification of Advanced Category with a score of 90.96% across 166 criteria.

Furthermore, we received the "Blue" rating (full compliance with the regulations) of PROPER (Indonesia's Program for Pollution Control, Evaluation and Rating) in the 2020–2021 period. For further development, we are striving to obtain the "Green" rating (exceeding the compliance level).



RCI verification (online)



SMK3 audit (online)

# About this RC Report 2022

This RC Report 2022 was prepared to go into more detail about our RC initiatives reported in the TechnoAmenity Report, which we began to publish in 2019.

In preparing this Report, we focused on increasing both simplicity and readability for ease of understanding by a wide variety of stakeholders.

Along with this RC Report 2022, we would recommend that you read the TechnoAmenity Report 2022. This integrated report covers our materialities, value creation process, business strategies, governance, and financial information to explain our Group's medium- and long-term value creation efforts to all of our stakeholders, including shareholders and investors, in an easy-to-understand manner.

## Scope of This Report

### Organization

(Unless otherwise stated, all provided data refers solely to Nippon Shokubai Co., Ltd.)

#### NIPPON SHOKUBAI CO., LTD.

Osaka Office  
Tokyo Office  
Himeji Plant  
Kawasaki Plant  
Suita Research Center  
Himeji Research Center

#### Group Companies in Japan

NIPPOH CHEMICALS CO., LTD.  
TOKYO FINE CHEMICAL CO., LTD.  
CHUGOKU KAKO CO., LTD.  
NIPPON POLYMER INDUSTRIES CO., LTD.  
NISSHOKU TECHNO FINE CHEMICAL CO., LTD.  
NIPPON NYUKAZAI CO., LTD.  
Nisshoku Butsuryu Co., Ltd.

#### Group Companies outside Japan

Nippon Shokubai America Industries, Inc.  
PT. NIPPON SHOKUBAI INDONESIA  
NIPPON SHOKUBAI EUROPE N.V.  
SINGAPORE ACRYLIC PTE LTD  
NISSHOKU CHEMICAL INDUSTRY  
(ZHANGJIAGANG) CO., LTD.  
SINO-JAPAN CHEMICAL CO., LTD.

### Reporting period:


April 1, 2021–March 31, 2022

Some topics in and after April 2022 are also contained in the report.

### Publication date:

November 2022

# Third-party Verification Report on Greenhouse Gas Emissions



No.1811004363

## Greenhouse Gas Emissions Verification Report

To: NIPPON SHOKUBAI CO., LTD.

### 1. Objective and Scope

JQA conducted verification in accordance with "ISO 14064-3" for GHG emissions, and with "ISAE3000" for energy consumption. The scope of this verification assignment covers Scope 1, 2 as GHG (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CFC, HCFC, HFCs and PFCs) emissions and energy consumption. The verification was conducted to a limited level of assurance and quantitative materiality was set at 5 percent of the total emissions in the Report. The organizational boundaries of this verification include ten production sites and four non-production sites of the Company and its group companies in Japan. Our verification procedures included:

- Performing validation of integrated functions to check the Rule prior to the on-site assessment.
- Holding on-site verification at the Company's two domestic sites. The location of sampling sites for on-site assessment was selected by the Company.
- On-site assessment to check the Report's boundaries, source of GHG, monitoring points, monitoring and calculation system and its controls.
- Vouching: Cross-checking the GHG emissions and energy consumption data against evidence for all sampling sites.

### 2. Procedures Performed

JQA conducted verification in accordance with "ISO 14064-3" for GHG emissions, and with "ISAE3000" for energy consumption. The scope of this verification assignment covers Scope 1, 2 as GHG (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CFC, HCFC, HFCs and PFCs) emissions and energy consumption. The verification was conducted to a limited level of assurance and quantitative materiality was set at 5 percent of the total emissions in the Report. The organizational boundaries of this verification include ten production sites and four non-production sites of the Company and its group companies in Japan. Our verification procedures included:

- Performing validation of integrated functions to check the Rule prior to the on-site assessment.
- Holding on-site verification at the Company's two domestic sites. The location of sampling sites for on-site assessment was selected by the Company.
- On-site assessment to check the Report's boundaries, source of GHG, monitoring points, monitoring and calculation system and its controls.
- Vouching: Cross-checking the GHG emissions and energy consumption data against evidence for all sampling sites.


### 3. Conclusion

Based on the procedures described above, nothing has come to our attention that caused us to believe that the statement of the information regarding the Company's FY2021 GHG emissions and energy consumption in the Report, is not materially correct, or has not been prepared in accordance with the Rule.

GHG Emissions	Scope1	Scope2	Total
	657 thousand t-CO <sub>2</sub> e	153 thousand t-CO <sub>2</sub> e	810 thousand t-CO <sub>2</sub> e

### 4. Consideration

The Company was responsible for preparing the Report, and JQA's responsibility was to conduct verification of GHG emissions and energy consumption in the Report only. There is no conflict of interest between the Company and JQA.

  
Sumio Asada, Board Director  
For and on behalf of Japan Quality Assurance Organization  
1-25, Kandassudacho, Chiyoda-ku, Tokyo, Japan  
September 5, 2022

## Contact Information

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Responsible Care Division

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Tel: +81-70-8714-3591

Website: <https://www.shokubai.co.jp/en/>

# TechnoAmenity

Providing Prosperity and Comfort to People and Society,  
with Our Unique Technology

## NIPPON SHOKUBAI CO.,LTD.

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541-0043, Japan  
TEL : +81-6-6223-9111 FAX : +81-6-6201-3716

### Tokyo Office

Hibiya Dai Bldg., 1-2-2 Uchisaiwai-cho, Chiyoda-ku, Tokyo  
100-0011, Japan  
TEL : +81-3-3506-7475 FAX : +81-3-3506-7598

Website: <https://www.shokubai.co.jp/en/>



Our company logo  
represents the spirit of  
**TechnoAmenity**

Hexagon

Cosmo yellow

Earth green

Horizon between  
two colors

► One of the fundamental symbols used in chemistry

► Represents the hidden energy of the sun

► Represents the life-supporting nature of the earth

► Represents the future we always seek