

# DIC REPORT 2018

The DIC Group Integrated Report

# Color & Comfort



**DIC** Corporation

# The DIC WAY

## Mission

Through constant innovation, the DIC Group strives to create enhanced value and to contribute to sustainable development for its customers and society.

## Vision

Color & Comfort by Chemistry

## Spirit

Drive, Integrity, Dedication, Collaboration, Harmony

## Making it Colorful DIC helps make life colorful





Mission

Vision

Spirit

## **Specialty Solutions**

DIC draws on its expertise and comprehensive strengths to offer solutions

## **Innovation through Compounding**

DIC brings innovation to society through its core compounding technologies

# Color & Comfort

## Connecting the DIC Group and its Stakeholders

## **DIC Group Communications Tools**

The DIC Group uses a variety of tools to promote communication with its many stakeholders to encourage greater awareness of the Group's activities. More detailed sustainability-related information and data can be found on the DIC website.



#### DIC Global Website

#### Real-time information

WEB http://www.dic-global.com/en/ Umbrella website providing information to the global public about the DIC Group and reports on its various activities; updated as necessary



## Contents

- 3 The DIC Group: A Global Powerhouse
- **5** A Message from the President
- 9 Financial and Nonfinancial Information
- 11 The DIC Group's Approach to Value Creation
- 13 The DIC Group's Business Portfolio
- 13 Printing Inks
- 15 Fine Chemicals
- 17 Polymers
- 19 Compounds
- 21 Application Materials
- 23 Fiscal Year 2017 DIC Group Topics
- 25 Special Feature Product Development Designed to Create New Value
- 26 Pigments for Color Filters Used in LCDs and OLED Displays (Functional Pigments)
- 30 Adhesive Primers for Optical and Packaging Films
- 35 ТОРІС

Efforts to Reduce Environmental Impact by Using Water-Based Biomass Ink Made with Plant-Based Packaging Resin

- 36 Corporate Governance
- 41 Directors, Corporate Auditors and Executive Officers

## About this Report

In previous years, the DIC Group has published a combined corporate profile and sustainability report with the aim of presenting a clear, easy-to-understand picture of the Group and its sustainability initiatives. Beginning in 2018, the Group has transformed the DIC Report into an integrated report, which combines financial information, encompassing consolidated operating results and corporate strategies, and nonfinancial (sustainability) information. The Group has published a simplified summary version of the report (printed), which focuses on key highlights, and a more detailed complete version (PDF), which contains extensive quantitative data.

## DIC Report (Complete version) (PDF-form publication)

Note: A used herein, the term 'Asia-Pacific region'—a geographic designation that, like "Europe and the Americas" and "Greater China," represents a grouping of companies overseen by a regional headquarters—refers to Asia (excluding Japan and Greater China) and Cecaria. The term 'Asia and Ocearia'r refers to Asia (excluding Japan) and Ocearia.

## Link with the DIC Website

The (WEE) mark indicates that more detailed information and/or data can be found on the indicated page of the DIC global website. DIC global website WEE http://www.dic-global.com/en/

#### Scope of Reporting

In principle, this report provides information on DIC Corporation and consolidated DIC Group companies worldwide. For information on the scope of reporting for ESH-related initiatives, please visit the pertinent page of the DIC website.

#### **Reporting Period**

Fiscal year 2017 (January 1–December 31, 2017)

#### **Date of Publication**

June 2018 (The next report is scheduled for publication in June 2019.)

#### Guidelines Referen

Guidelines referenced in the preparation of this report were ISO 26000, the International Organization for Standardization's standard for social responsibility, released in 2010; Japan's Responsible Care Code; and the Global Reporting Initiative (GRI)'s GRI Standards.

## 43 > Overview of Materiality and Sustainability

- Compliance 48 50 **Risk Management** 58 Information Security 60 Environment, Safety and Health (ESH) 109 Quality Human Resources Management 112 125 Sustainable Procurement 128 Business Models that Respond to Social Imperatives 130 New Technology Development and Value Creation Harmony with the Community and Social Contributions 134 Communication with Stakeholders 137 142 DIC Report 2018 and the GRI Standards 147 **Third-Party Verification**
- 148 Third-Party Opinion Regarding DIC Report 2018
- 149 DIC Group Milestones
- 151 Corporate Data

## Financial Section





## **Cover Design**

The cover of this year's DIC Report derives its inspiration from the DIC Group's "Color & Comfort" brand slogan, employing bright colors that evoke the efforts of the Group, a global powerhouse, to enrich and add vibrancy to society and the lives of people everywhere.

## The DIC Group: A Global Powerhouse

## **Corporate Data**

Registered name: Corporate headquarters:

Date of foundation: Date of incorporation: Paid-in capital: Number of employees:

Number of subsidiaries and affiliates:

**DIC** Corporation

DIC Building, 7-20, Nihonbashi 3-chome, Chuo-ku, Tokyo 103-8233, Japan February 15, 1908 March 15, 1937 ¥96.6 billion 20,628 (Nonconsolidated: 3,273)

(Domestic: 32 171 Overseas: 139/









Corporate headquarters (Tokyo)

- Notes: 1. The consolidated results for fiscal year 2013 comprise the accounts for the nine months ended December 31, 2013, of DIC and all but one of its domestic subsidiaries and all but one or its comestic subsidiaries and the 12 months ended December 31, 2013, of its overseas subsidiaries and one domestic subsidiary.
  2. Corporate data is as of December 31, 2017. Net sales and operating income are for fiscal year 2017.

Net Sales (Billions of yen) 10,000 8,000 6,000 4 000 2,000 0 '13 '14 '15 '16 '17 (FY) **Operating Income** (Billions of yen)



## **Global Network**

DIC has 171 companies in 64 countries and territories around the world.





Sun Chemical Corporation headquarters (United States)



Breakdown of Fiscal Year 2017 Net Sales by Segment



Note: Fiscal year 2017 net sales and operating income as used here include intersegment transactions. For this reason, and because of the existence of transactions classified as "others," which are not attributable to reportable segments, these figures differ from reported net sales and operating income.

#### Breakdown of Fiscal Year 2017 Net Sales by Region



Note: Operating income as used here includes eliminations (approximately ¥5.8 billion). Accordingly, these percentages do not represent shares of reported operating income.

## **Principal Global R&D Sites**

Breakdown of Fiscal Year 2017 Operating Income by Segment



#### Breakdown of Fiscal Year 2017 Operating Income by Region





## A Message from the President

Representative Director, President and CEO DIC Corporation

## Kaoru Ino

## Vision:

# A unique global organization that is trusted by society

- Contribute to global society guided
   by our Color & Comfort brand slogan
- Realize corporate value to which people can
  relate through the promotion of diversity
- Work with DIC Group employees, customers and shareholders to create value and build an appealing brand

## Building on Our 110-Year History to Drive New Growth and Evolution

# *Ensuring that DIC remains a unique global organization that is trusted by society*

In the period under review, I assumed the reins as representative director, president and CEO of DIC. Having accepted the appointment, I believe that my mandate is to do my utmost to carry out my duties, the most important of which is to build on the foundation established by my predecessors to drive new growth and evolution.

In fiscal year 2018, we are celebrating the 110th anniversary of DIC's establishment. Printing inks, a key business since the start, continue to account for the bulk of our sales. While marveling at the fact that we have inherited a 110-year-old business from our founders, I recognize that today we operate in an environment characterized by changes that differ in nature from anything we have ever faced before. For example, the telephone took more than 50 years to come into widespread use. In contrast, Facebook took only a year to gain worldwide popularity. Social structures continue to change drastically, owing primarily to three key factors, namely the next wave of advanced digital technologies, falling birth rates and issues related to financial resources to support the social safety net. The pace of change is astonishing. In a sense, I see this as the new normal. Amid such rapid and drastic changes, how do materials manufacturers contribute to society going forward? As we work to adapt resilient businesses passed on to us by our founders to this new normal, we must also look at how to handle change. I see responding effectively to these issues as an important mission.

In fiscal year 2017, the second year of our current threeyear medium-term management plan, DIC108, we succeeded in achieving record consolidated income results. Net sales for the period amounted to ¥789.4 billion. Operating income and ordinary income were ¥56.5 billion and ¥57.0 billion, respectively. Net income attributable to owners of the parent was ¥38.6 billion. During the period, businesses that we expect to drive growth—notably functional pigments, polyphenylene sulfide (PPS) compounds and packaging materials, in which we are concentrating our allocation of management resources on a global basis—continued to expand steadily, as we laid the groundwork for future growth, including through advance investments. Despite some of our businesses feeling the impact of rising raw materials prices and other external factors, we responded effectively by focusing our attention on launching products that meet market need and expanding sales of environment-friendly high-value-added offerings. Thanks to these and other efforts, we made solid progress toward achieving the objective of a key strategic initiative spearheaded by my predecessor, Yoshiyuki Nakanishi, namely, the realization of a robust earnings structure that is impervious to fluctuations in external factors such as raw materials prices and exchange rates.

In fiscal year 2019, we will embark on a new medium-term management plan. In considering the content of this plan and our mission, which defines what we ultimately aspire to be, we will endeavor to address increasingly varied and compelling social imperatives and contribute to the realization of a sustainable society. To this end, we must cultivate new businesses, in addition to printing inks, pigments and compounds, in which we have the potential to earn global market-leading positions.

## Formulating a new medium-term management plan

In preparation for the launch of our new medium-term management plan, in fiscal year 2018 we are promoting extensive debate and discussion to determine critical changes needed for us to fulfill our mission, based on which we will formulate strategies from a medium- to long-term perspective. Our determination to respond to

<b>^</b>	11.1.	Tanada
Quar	ntitative	e largets

	2015 Actual	2016 Target	2016 Actual	2017 Target	2017 Actual	2018 Forecast	
Net sales	¥820.0	¥870.0	¥751.4	¥920.0	¥789.4	¥820.0	
Operating income	¥51.1	¥54.0	¥54.2	¥58.0	¥56.5	¥58.0	
Net income	¥37.4	¥25.0	¥34.8	¥30.0	¥38.6	¥40.0	
ROE (return on equity)	15.0%	9.0%	12.9%	10.0%	13.0%	12.2%	
Ordinary investments	¥34.0						
Strategic investments (M&As, etc.)	—						
D/C ratio*	47%						
Dividend payout ratio	21%						

\* Debt-to-capital (D/C) ratio: Interest-bearing debt / (Interest-bearing debt + Net assets)

the dramatic changes taking place in society—to the new normal—remains firm.

In pondering our image of the DIC Group in the future, the key will be our Color & Comfort brand slogan. This unique slogan really conveys DIC's DNA. It encapsulates our desire to leverage the power of chemistry, drawing on our wealth of core technologies, to bring color and comfort to people's lives and, in so doing, to contribute to the realization of a richer, more vibrant society. This slogan is of course based on our management vision, Color & Comfort by Chemistry.

I have narrowed my focus for achieving these goals to areas that offer potential synergies with base technologies in our printing inks, pigments, polymers and other core businesses, implementing measures designed to bolster corporate value and build new businesses. Taking a distinctively DIC approach, we will focus on environmentfriendly printing inks and polymers, packaging and healthcare businesses that contribute to food safety, and on liquid crystals (LCs), jet inks and pigments that enable us to provide a rich array of color materials. Such efforts would position us to resolutely fulfill our role in helping to address social imperatives and deliver value to society while concurrently adding muscle to our high-value-added businesses. Examples include packaging inks, which are unquestionably printing inks but unlike other printing inks are expected to see market growth in the future, as well as conductive and insulating inks, which from a technology perspective are completely different from conventional printing inks. For us, the challenge is as big as cultivating businesses in brand new domains. We intend to look at areas peripheral to businesses in which we have base technologies. At the same time, we will seek to further expand our business portfolio, and to improve its efficiency and soundness.

We will discuss ideas and encourage debate internally while at the same time envisioning what we aspire to 10 years down the road. From there, we will use backcasting to formulate our next medium-term management plan, which will kick off in fiscal year 2019. We will publish details of the plan—tentatively called DIC111—as soon as they are available.

## Emphasizing innovation to drive further evolution

In January 2017, DIC announced a capital and business alliance with Taiyo Holdings Co., Ltd. Partnering with Taiyo Holdings, which commands a top-class share of the global market for solder resist, will position DIC well to develop products for the electronics sector, notably for printed wiring boards (PWBs). Under DIC108, we have identified electronics as a key next-generation theme, alongside carbon reduction, packaging and life sciences.

In the area of business development, Mr. Nakanishi was the first to demonstrate the importance of breaking free from our reliance on independent efforts and actively encouraging open innovation to capitalize on external resources. We are also promoting participation in global venture networks. Through such efforts, we are working to, among others, identify and promote new next-generation development themes and swiftly secure cutting-edge technologies to accelerate the creation of new businesses. We are also making flexible use of strategic investments, having budgeted ¥150.0 billion for this purpose over the three years of DIC108, to outline a new growth trajectory to internal and external stakeholders. By the final year of our next mediumterm management plan, we aim to achieve a stable return on equity (ROE) of 10%-plus, underpinned by the value created through such new innovation, as well as consolidated net sales of around ¥1,000 billion and consolidated operating income in the area of ¥100 billion, thereby meeting the longterm targets set forth in DIC108.

#### Global value creation: The essence of the DIC Group

In considering our image of the DIC Group in the future, it is impossible to gloss over the importance of a global perspective. We conduct our operations through a network of 171 companies in 64 countries and territories. We are the world's leading manufacturer of printing inks; organic pigments, the principal raw material used in printing inks;



and PPS compounds—key engineering plastics—with global market shares of around 30%, 20% and 27%, respectively. Approximately 60% of consolidated net sales are outside Japan. In other words, a global perspective is critical for many reasons. One of these is the need to manage exchange rates that go hand in hand with our business activities, which is not one on one with the U.S. dollar, but involves multiple currencies, including the euro, the Turkish lira and the Indian rupee. It is all extremely complicated, but we have established a mechanism that enables us to effectively manage factors that cause exchange rate fluctuations.

I see our global character as a vital growth driver. We have established printing inks, polymer and PPS technical centers in key locations in Asia, Europe and elsewhere, enabling us to accurately grasp and swiftly address local needs. We are currently taking steps to reinforce our global management structure, including appointing a local executive to head up a key product division, as well as our regional headquarters, to ensure we remain abreast of rapid market changes. These moves have positioned us to maximize our unique strengths as a multinational group with R&D facilities and diverse human resources around the world. Since fiscal year 2016, we have been promoting ambitious global branding initiatives to bolster awareness of the value that we provide to stakeholders and encouraging employees to apply that awareness to their everyday work, and in doing so to help instill a greater sense of solidarity across the Group.

#### ESG as a central element of management

The DIC Group launched its corporate social responsibility (CSR) program in fiscal year 2007, later changing the designation used across this program from "CSR" to "sustainability." Since then, we have steadily implemented initiatives in line with 11 key themes, ranging from "Compliance" to "Business models that respond to social imperatives." In light of increasing awareness of social imperatives pertaining to environmental, social and governance (ESG)-related issues, effective from fiscal year 2018 we established the ESG Unit.

As a leading chemicals manufacturer, we are working to secure safety, reduce environmental impact and ensure the stringent management of chemical substances, which we view as fundamental to our operations and an essential responsibility. We are also taking steps to combat climate change—a universal challenge—including setting medium-to long-term targets for reducing our global emissions of CO<sub>2</sub> worldwide and focusing on the development of products that contribute to a low-carbon economy. In addition, we are deepening awareness of and redoubling efforts to address other critical issues, including minimizing industrial waste by recycling and reusing materials and addressing water risks.

In the area of global human resources, we acknowledge the importance of advancing diversity, including by valuing different philosophies and values. We have spelled out a goal of marshaling the diversity of the individuals that make up our labor force, recognizing the fact that we are in an age today where individuals can change society. In other words, we understand the absolute importance of promoting diversity



in management. A key component of this is to advance opportunities for female employees, a theme for which we have set a key performance initiative (KPI). As a group with roughly 20,000 employees in 64 countries and territories around the world, it is important to remain aware that we have a vast range of exceptional human resources that we must manage in a way that maximizes latent capabilities. To marshal the diversity of individuals, we will also work to ensure that employees feel like active participants.

Finally, on the subject of governance, we have established a structure based on Japan's Corporate Governance Code and in fiscal year 2017 increased the number of independent outside directors on our Board of Directors with the aim of further reinforcing governance functions. We are also working to fortify our foundation as a global organization through measures ranging from reinforcing the governance capabilities of our subsidiaries, thereby strengthening the overall framework that underpins Group management, to strengthening our quality management system and ensuring compliance with new laws and regulations.

In Japan, you sometimes hear the phrase "a company is a public entity of society." In the future, companies will be evaluated not only for their success in responding to change but also for their ability to be agents of change. From this perspective, as a distinctive global manufacturer of fine chemicals, we will continue to be guided by our Color & Comfort brand slogan as we actively take on the challenge of creating value for society.

#### Note: The consolidated results for fiscal year 2013 comprise the accounts for the nine months ended December 31, 2013, of DIC and all but one of its domestic consolidated subsidiaries and the 12 months ended December 31, 2013, of its overseas subsidiaries and one domestic subsidiary.

Cash Provided by Operating Activities and Free Cash Flow



## Net Sales, Operating Income and Operating Margin

#### Net Income Attributable to Owners of the Parent and ROE



#### Net Assets, Interest-Bearing Debt and D/C Ratio\*





activities increased in fiscal year 2017.

Capital Expenditure and Investment



#### Returns to Shareholders\* (Dividends per Share and Payout Ratio)



DIC Report 2018 **9** 

## Global CO $_2$ Emissions and CO $_2$ Emissions per Unit of Production (DIC Group)



 CO2 emissions per unit of production is calculated using adjusted production volume (parent company in Japan only). (Notification submitted to Japan's Ministry of Economy, Trade and Industry)





## Average Years of Employment (DIC Corporation)



## Global Energy Consumption and Energy Consumption per Unit of Production (DIC Group)



\* Base year: Fiscal year 2013

Energy consumption per unit of production is calculated using adjusted production volume (parent company in Japan only). (Notification submitted to Japan's Ministry of Economy, Trade and Industry)

#### Occupational Accident Frequency Rate (DIC Corporation)



Note: The frequency rate expresses the frequency of accidents resulting in lost workdays in a fiscal year, calculated as the number of deaths or injuries per million work hours.

Frequency rate = <u>
Number of deaths or injuries due to occupational accidents</u>
×1,000,000 <u>
Total work hours</u>
×1,000,000

A frequency rate of 1.0 means one occupational accident resulting in workdays lost in one year at a site with 500 employees.



## Female Employees in Management Positions (DIC Corporation)

DIC Report 2018

# Achieving Sustainable Growth The DIC Group's Approach to Value Creation

**Diverse** 

With the aim of ensuring a sustainable society, the DIC Group strives to provide products and solutions that respond to the needs of markets and its customers and add color and comfort to life.



## Color & Comfort



DIC Report 2018 **12** 

## **Printing Inks**

## A Stable Business Since the Start



President, Printing Inks Business Unit Hideo Ishii





#### Printing Inks Product Division

Offset inks; gravure inks; flexo inks; can coatings; news inks; packaging adhesives; printing supplies



#### Outstanding color reproduction and reduced energy consumption

DAICURE HR series

(High-sensitivity UV-curable offset inks) As well as suitability for use with low-power UV printers, DIC's innovative DAICURE HR high-sensitivity UV-curable offset inks deliver outstanding color reproduction.



#### Ensuring safety for food and the environment FINART series

(Gravure inks for food packaging)

FINART gravure inks combine superb image quality and suitability for high-speed printing. They also respond to demand for the reduction of solvents in food packaging and for compliance with safety regulations in different markets, thereby contributing to safety for food and the environment.

## Segment Operating Results



## Rationalize operations in mature markets and shift focus to packaging inks

Recent years have seen a tapering of demand for publishing inks, news inks and other inks for paper-based print media, particularly in mature markets such as Japan, North America and Europe, owing to the burgeoning popularity of digital media. Since its previous medium-term management plan, which ran from fiscal year 2013 through fiscal year 2015, the DIC Group has sought to strengthen the printing inks business by advancing three core strategies, which are to further rationalize operations in mature markets, to augment operations in promising emerging economies and to shift its business focus to packaging inks, for which demand is rising worldwide. Under DIC108, the Group is taking decisive steps to reinforce its presence in emerging economies, keeping a close eye on demand trends. At the same time, the Group is working to optimize its regional production configurations and elevate sales of segment products, particularly environment-friendly inks, functional coatings and adhesives.

## *Expand operations by focusing on promising markets and products*

The DIC Group is reinforcing its production capabilities, placing an emphasis on the Middle East, South America and key Asian markets such as the Philippines and Vietnam. In both emerging and developed economies, the Group is focusing its allocation of resources on environment-friendly products for food packaging applications, including packaging inks, functional coatings and adhesives. Through these efforts, together with those in related businesses such as films, the Group will continue striving to provide total packaging materials solutions that respond to the needs of both consumers and brand owners.

## Progress of Major Initiatives in Fiscal Year 2017

In the area of packaging inks, demand continued to increase in Japan, North America and Europe, underpinned by increasingly sophisticated consumer lifestyles. Demand in emerging economies also continued to expand, owing to population growth and rising living standards.

Evocative of the DIC Group's commitment to promoting recycling and reuse, in Japan the period brought the launch of a rice ink, an innovative environment-friendly printing ink made with recyclable materials derived from biomass, namely, rice bran. In addition to being included in the list of rice inks approved by Japan's Rice Ink Consortium, the new ink has gained Biomass Mark certification from the Japan Organic Recycling Association (JORA). The Group was also active in emerging economies, establishing a joint venture in Saudi Arabia. Packaging inks account for more than 70% of the printing inks market on the Arabian Peninsula, where the annual market for such inks is projected to continue growing at between 5% and 10% for the foreseeable future. With the aim of expanding the Group's presence in this strategically important market, Sun Chemical Corporation formed a joint venture with the region's leading printing inks manufacturer in terms of market share. Sun Chemical has long had operations on the Arabian Peninsula. The Group will move swiftly to maximize synergies between the local partner's marketing capabilities, which reflect its familiarity with the market, and Sun Chemicals' technologies to provide top-quality products and superior services.



# DIC Launches the *PASLIM VM* Series of Dry Laminating Adhesives that Enhance the Oxygen-Barrier Properties of Vapor Deposition Films

HIGHLIGHT

In fiscal year 2017, DIC developed the *PASLIM VM* series of dry laminating adhesives, which improve the oxygen-barrier properties of food packaging materials made with vapor deposition films. This groundbreaking product compensates for scratches and cracks in the vapor-deposited layers to which it is applied, enhancing such layers' inherent oxygen-barrier properties to achieve a performance level close to that of aluminum foil, thereby helping to reduce food loss and simplify packaging. In addition, although DIC's new dry laminating adhesive exhibits excellent handling properties equivalent to those of conventional products, the high solid design means that its emissions of volatile organic compounds (VOCs) are 50% lower than those of existing DIC adhesives. As well as complying with codes and standards for packaging based on Article 18 of Japan's Food Sanitation Act (Ministry of Health, Labour and Welfare Ordinance No. 370), the product has met the U.S. Food and Drug Administration (FDA)'s 175.105 regulation for adhesives used in food packaging.





and are free of defects arising from pinholes, creases and scrapes, which occur during manufacturing, allow gases to pass through.



Coating with *PASLIM VM* essentially eliminates gas leakage and, because it compensates for defects, prevents them from allowing gases to seep out.

## **Fine Chemicals**

Optronics Materials and Other High-Value-Added Products



President, Fine Chemicals Business Unit Kazuo Hatakenaka





## Pigments Product Division

Organic pigments; special effect pigments; Thi metal carboxylates; sulphur chemicals (lubricant additives)



(Green pigments for color filters) In developing the G58 series of green pigments, DIC defied conventional wisdom by using zinc, rather than copper, as the central metal, which achieves a marked increase in brightness and reduces energy consumed by the liquid crystal display (LCD).



Thin-film transistor (TFT LC) materials; Supertwisted nematic (STN) LCs

For more information, please see Segment Results on pages 2-4 of the attached Financial Section.



## Responding to the evolution of LCDs

TFT LC materials

The production of TFT LCs demands advanced technological expertise. DIC is one of only a few companies in the world with such expertise. DIC's technologies ensure it is able to provide products that respond to demands for faster response times and greater long-term reliability.

## Segment Operating Results



## Business Strategies Under DIC108

The DIC Group is powering growth in this segment by increasing value added. To this end, the Group is capitalizing on its continuous product development and solid supply configuration to bolster its share of the markets for the segment's two key strategic products: functional pigments and TFT LCs.

#### **Pigments**

With the market for organic pigments for publishing inks—the principal source of demand for these products—shrinking, the DIC Group is working to increase sales of functional pigments for niche and high-growth applications, including pigments for color filters, pigments for cosmetics and special effect pigments. In the area of pigments for color filters, the Group will broaden its lineup of products that help improve color and functions. The Group is also striving to augment its recently acquired special effect pigments business in Europe by bolstering sales of high-value-added products and reinforcing its production capacity for pigments used in building materials. To expand its pigments for cosmetics business, the Group has broadened its focus to include pigments for skincare products and is taking steps to increase its production and sales of red pigments, demand for which continues to rise, as well as to boost sales in Japan.

#### LCs

With an emphasis on n-type TFT LCs, the principal type of LCs used in largescale displays in LCD televisions and other devices, DIC is actively bringing new products to market by allocating resources to development. The Group is also maximizing its technical and production base in Qingdao to augment its operations in the People's Republic of China (PRC), which is expected to be a major center of LCD manufacturing going forward.



TFT LCs used in LCD televisions

## Progress of Major Initiatives in Fiscal Year 2017

#### **Pigments**

Owing to the strengthening of laws and regulations pertaining to color materials for cosmetics, demand for the DIC Group's pigments for cosmetics—which comply with laws enforced by the U.S. FDA and its counterparts in other countries—grew rapidly, particularly in Asian markets. Demand for special effect pigments continued to expand steadily in Eastern Europe, the Middle East and Asia, underpinned by the Group's technologies for controlling density, compression strength and thermoconductivity, which are expected to support sustainable growth for this business in the years ahead.

#### LCs

Fiscal year 2017 brought the development of groundbreaking nanophase separated (NPS) LCs that boost LCD response speed, which is critical to picture quality for sports and other content involving high-speed action. Because they allow control of response speed, applied voltage and

transmissivity, the new NPS LCs facilitate the design of new LCDs that respond to advanced performance requirements. The launch of this and other high-performance products is expected to bolster sales of LCs.



## Sun Chemical Pigments for Cosmetics Receive Approval Under Europe's COSMOS Standard for Natural and Organic Cosmetics

HIGHLIGHT

Sun Chemical's SunPURO® Oxides ECOCERT\*-certified series of organic pigments for cosmetics recently received approval under Europe's unified COSMOS (COSMetic Organic Standard) for natural and organic cosmetics. A premium line of pigments for cosmetics, SunPURO® pigments boast an extremely low heavy metal (naturally occurring inorganic material) content and are used in foundation, base makeup and mascara, among others. COSMOS approval was earned by the four pigments comprising the SunPURO® Oxides series: Red iron oxide, yellow iron oxide, titanium dioxide (white) and black iron oxide.

COSMOS was developed by an independent nongovernmental organization established in 2010 by five organizations, including ECOCERT, based in four European countries (France, Germany, Italy and the United Kingdom), with the aim of creating a unified global standard. Owing to the lack of a standard for natural cosmetics at the time, COSMOS was later adopted as a unified standard for Europe. COSMOS is currently attracting attention as a promising candidate to become a single global standard.

\* ECOCERT is an independent organic certification organization that provides assessment and certification for compliance with European standards for designating products "organic."



Attestation of conformity with COSMOS

## Polymers

## DIC's Second Core Business



President, Polymers Business Unit Toshio Hasumi





#### **Polymers Product Division**

Waterborne resins; ultraviolet (UV)-curable resins; acrylic resins; methacrylate resins; epoxy resins; phenolic resins; fluorochemicals; polyurethane resins; polyester resins; plasticizers; unsaturated polyester resins; polystyrene; alkylphenols



#### Environment-friendly nextgeneration adhesives that respond to diverse needs TYFORCE series

(Moisture-curing hot melt adhesives) This series of solvent-free adhesives delivers superb production efficiency and bonding strength. These resins have been adopted for a wide range of applications, including building materials, apparel and electronic components.



Technologies that facilitate the control of light for applications ranging from display cases to optical fibers DEFENSA OP series

(Low-refractive index UV-curable resins) Used for optical fiber cladding and optical coatings, the *DEFENSA OP* series of lowrefractive index UV-curable resins helps improve the performance of optical fibers and the brightness of display cases.

## I Segment Operating Results



## **Business Strategies Under DIC108**

#### Product strategy

The DIC Group is concentrating management resources on strategic products, namely, waterborne, UV-curable, acrylic, polyurethane and polyester resins, and accelerating global development with a focus on promising markets, notably those for coatings and adhesives in Asia.

## Regional strategy

Capitalizing on technical centers established in Thailand and the PRC, the Group is responding to increasingly stringent environmental regulations by offering waterborne, solventfree and other environment-friendly products, as well as by advancing the development and sale of offerings that respond to needs for general-purpose products and boosting overseas sales as a percentage of overall segment sales. With demand on the decline in Japan, the Group is integrating and closing production lines while at the same time pursuing markets for polyurethane and UV-curable resins for niche and high-performance applications, thereby lifting the weighting of high-value-added products in its portfolio.

TT HUMAN I -10 IT BEARD TIT 

Demand for environment-friendly products for use in coatings is increasing overseas

## Progress of Major Initiatives in Fiscal Year 2017

#### Environmental initiatives

In Japan, a new series of polyester resins for use on precoated metal was developed and launched. In addition to reducing emissions of VOCs when forming coatings, this new global-standard series complies with the world's most stringent regulations governing chemical substances. Overseas, a polymers subsidiary in Thailand installed and began using solar panels, thereby reducing its emissions of CO<sub>2</sub>, a move designed to combat global warming.

#### Regional trends

In Japan, shipments of high-value-added products rose. With sales of polystyrene robust against a backdrop of rising demand for use in packaging for ready-made foods, domestic production capacity was expanded by approximately 20%. In overseas markets, overall shipments of waterborne resins and other environment-friendly products increased.



# DIC Increases Production Capacity for Polystyrene Used in Packaging for Prepared Foods

HIGHLIGHT

By reinforcing facilities and optimizing production processes, DIC increased the annual production capacity of the Yokkaichi Plant, located in Yokkaichi, Mie Prefecture, from 171,000 metric tonnes to 208,000 metric tonnes. In addition to general-purpose *DICSTYRENE*, which boasts excellent transparency and impact resistance, and *HYBRANCH* hyperbranched polystyrene, a high-performance product that offers both strength and superb moldability, DIC's polystyrene lineup includes *RYULEX* transparent heatresistant styrene-based resins. Valued for its transparency, foamability and moldability, polystyrene is odorless, making it a popular choice for use in food trays for lunch boxes and prepared foods sold at, for example, convenience stores and supermarkets. DIC will further strengthen its polystyrene production configuration to ensure stable supplies.



Yokkaichi Plan

## Compounds

New Value Created through Dispersion and Compounding Technologies



President, Compounds Business Unit Masanobu Mizukoshi





#### Liquid Compounds Product Division

Jet inks; fiber and textile colorants and artificial leather colorants; high-performance coatings and adhesive materials; coatings for optical films



Advanced DIC Group pigment dispersion technologies ensure excellent color development and a glossy finish. With a reputation for reliability, the *SunJet* series of jet inks enjoy popularity in markets around the world.



## Solid Compounds Product Division

PPS compounds; high-performance compounds; plastic colorants; high-performance optical materials



DIC.PPS series (PPS compounds) The DIC Group's PPS compounds boast excellent heat and chemical resistance, rigidity, strength and electrical insulating properties, as a result of which they have found application in components for hybrid, electric and other environment-friendly vehicles as an alternative to metal materials, which helps reduce vehicle weight.

## Segment Operating Results



## Business Strategies Under DIC108

The DIC Group is leveraging its growth-driving basic and composite technologies to continuously bring new products that satisfy the needs of users to market in the strategically important areas of jet inks and PPS compounds. Through such efforts, the Group is striving to realize a higher growth rate than the market.

#### Jet inks

To date, the DIC Group has sought to augment this business by focusing on high-value-added water-based and UV-curable jet inks, primarily for industrial and office-related applications. In addition to boosting sales in these markets, the Group is expanding efforts to market products for new applications such as textiles and ceramics, demand for which is expected to rise.

#### **PPS** compounds

Valued for their excellent heat and chemical resistance, PPS compounds are used widely as an alternative to metal materials in components for automotive engines and electronics equipment. To maintain its leading share of the global market, the DIC Group is promoting the expansion of production facilities with the aim of stabilizing its global supply configuration. The Group is also increasing the number of employees in sales and technical services for key automobile and automotive component manufacturers to enhance the accuracy and speed with which DIC Group products obtain approval from manufacturers.

## Progress of Major Initiatives in Fiscal Year 2017

## Jet inks

Capitalizing on its competitive advantages, the DIC Group took steps to enhance cooperation with printer and printer head manufacturers to expand its sales channels. The Group also pressed ahead with ongoing development efforts with the goal of building new businesses, including products for office-use multifunction printers (MFPs), textiles and ceramics.

#### **PPS** compounds

The reduction of fuel consumption is a principal focus of efforts across the automobile industry. To this end, manufacturers are stepping up efforts to use alternatives to metal materials in a bid to lower vehicle weight. Reflecting this trend, the year saw steadily expanding shipments of PPS compounds for use in fuel-efficient vehicles, notably hybrids, in Japan. In India, the Group responded to voracious demand by adding three new sites to its local sales network. The Group also added people to its sales force in North America, thereby fortifying its local sales configuration.



PPS compounds production facility in the PRC

## Solid Compound Technical Center Asia Pacific is Established

HIGHLIGHT

With the aim of developing and improving products suitable for markets in Southeast and South Asia, and to strengthen its technical service structure in the PPS compounds and resin colorants businesses, DIC established the Solid Compound Technical Center Asia Pacific on the premises of DIC Compounds (Malaysia) Sdn. Bhd. In addition, injection molding machines and equipment for use in evaluating material properties that are compatible with engineering plastics were installed, thereby creating a system that can respond in a timely manner to the needs of regional customers. In addition to PPS compounds production facilities in Japan, the PRC, Australia and Malaysia, the DIC Group now has technical centers in Japan, the PRC and Europe. The new facility in Malaysia further strengthens the Group's integrated global product development, improvement and technical service configuration.



Solid Compound Technical Center Asia Pacific

## **Application Materials**

A Variety of Products Made Possible by the Integration and Application of DIC Technologies



President, Application Materials Business Unit Shinsuke Toshima





#### Application Materials Product Division

Industrial adhesive tapes; magnetic tapes and coated sheets; hollow-fiber membranes and modules; coextruded multilayer films; health foods and natural colorants; decorative boards, interior housing products and coatings for building materials; decorative sheets and decorative films; processed sheet molding compounds (SMCs), bulk molding compounds (BMCs) and other products; molded plastic products



#### Enhancing waterproof smartphone construction DAITAC WS#84 series

(Double-sided adhesive tapes for waterproof mobile communications devices)

One of the first series of waterproof tapes to be developed and marketed for waterproof smartphone construction, the *DAITAC WS#84* series continues to support efforts to enhance the ability of smartphones to resist water ingress.



# A superfood that provides a balanced wealth of nutrients DIC Spirulina

Spirulina is an edible blue-green algae rich in vitamins, minerals and B-Carotene that boasts an excellent amino acid balance. Spirulina's nutritional value and popularity as an ingredient not only in health foods but also for culinary applications has earned it a reputation as a superfood.

## Segment Operating Results



## Business Strategies Under DIC108

Having devised a new growth model, the DIC Group is stepping up the expansion of its electronics and life sciences business. At the same time, the Group is promoting decisive rationalization of its housing products business.

#### Electronics and life sciences

In industrial adhesive tapes, the DIC Group is accelerating specin initiatives with global brand owners, as well as with nascent local brand owners in the PRC, with the goal of bolstering adoption for use in smartphones and tablets. The Group is also promoting development efforts with a view to entering the market for vehiclemounted displays in the future. In hollow-fiber membranes and modules, the Group is working to sustain high growth for degassing modules used in inkjet printers, for which it holds the leading global market share, and to make a full-scale entry into the market for large degassing modules for water treatment applications. The Group's aims in the area of health foods are to maintain high sales of Spirulina, a highly rated superfood, and to expand sales of Spirulina-derived natural blue food coloring *Linablue*<sup>®</sup> in North America and Europe, taking advantage of a shift in market preferences from synthetic to natural food colorings.

#### Housing products

In the area of unsaturated polyester resin molded products, the DIC Group continues working to improve profitability through restructuring measures and decisive cost reductions. In laminated products, the Group is revamping its business model for *DIC200*, a key strategic building material, and implementing dramatic structural reforms. The Group is also working to enhance the accuracy and accelerate the process of gaining certification for segment products.

## Progress of Major Initiatives in Fiscal Year 2017

#### Electronics and life sciences

Shipments of industrial adhesive tapes increased, led by products for automobiles and smartphones. In the area of hollow-fiber membranes and modules, the DIC Group augmented its lineup of products for the degassing of jet inks and the production of ultrapure water for use in semiconductor fabrication processes, by introducing a new decarbonizing module and, in anticipation of healthy demand, introduced a new model with a high flow rate. In health foods, the DIC Group expanded its production capacity for its natural blue food coloring.

#### Housing products

Newly developed products included a sheet-form passive heat storage material that effectively harnesses solar heat to maintain comfortable room temperatures. Created by dispersing a phase change material (PCM) in resin, this innovative material can be processed at construction sites, something not possible with conventional materials, for easy use in housing construction. Because it can also be used as a cold storage material, the DIC Group is also marketing it for use in the constant-temperature transportation of pharmaceuticals, as well as for horticultural applications.



Hollow-fiber membrane module for degassing and aerating liquids

## DIC Builds New Production Facility for Hollow-Fiber Membrane Modules Used for Degasifying Jet Inks



DIC built a new plant for manufacturing small hollow-fiber membrane modules for degassing and aerating liquids in the *SEPAREL*<sup>®</sup> series, which are used in the degassing of inks for industrial inkjet printers, on the site of its Chiba Plant. DIC, which entered the hollow-fiber membrane business in 1989, manufactures proprietary membranes comprising 200–250  $\mu$ m-diameter hollow fibers and a nonporous surface skin layer with a thickness of 1  $\mu$ m. Hailed for significantly reducing the negative consequences of degasification, these products currently command a 70% share of the global market for membrane modules used in inkjet printers. Going forward, the Company will work to further grow its leading global market share.



New production facility

## Fiscal Year 2017 DIC Group Topics

topic 1

## Strategies for Sustainable Growth: Progress Report

DIC has included a specific quantitative target of ¥150.0 billion for strategic investments, including in mergers and acquisitions (M&As), over the three years of its current medium-term management plan, DIC108. In fiscal year 2017, the Company made a number of investments with the aim of making use of external resources in a manner that aligns with the fundamental goals of DIC108, which are to stabilize the earnings of its core businesses, expand businesses that will drive growth and create next-generation businesses.

## Capital and Business Alliance with Taiyo Holdings and Other Strategic Investments

On January 25, 2017, DIC announced a capital and business alliance with Taiyo Holdings, as a result of which Taiyo Holdings became an equity-method affiliate of DIC. Total investment by DIC, which amounted to ¥24.9 billion, was subsequently completed. The alliance brings together the DIC Group's materials development capabilities, which draw on its core technologies, and Taiyo Holdings' extensive supply chain, which encompasses solder resist and PWBs, to promote the swift and efficient development of molded interconnect devices (MIDs) and other next-generation materials. In September 2017, DIC signed a global, multiyear cooperative agreement with Fermentalg of France, a leader in the production of algae for nutrition and health applications. This partnership will bring together Fermentalg's unique microalgae strain bank and integrated biotechnology platform with DIC's significant applied research, mass production capabilities and global sales network.

Group company Sun Chemical, operations of which are centered in North America and Europe, also continued to promote key strategic investments aimed at reinforcing its sales configuration in high-growth markets and regions. In July 2017, Sun Chemical acquired Joules Angstrom U.V. Printing Inks Corp., a specialized manufacturer of UV-curable printing inks, while in November it formed a joint venture with Alliance Holdings Company Ltd., combining its printing inks business on the Arabian Peninsula with the operations of Alliance Holdings' subsidiary Ink Products Company, Ltd., the region's top printing inks manufacturer in terms of market share. Sun Chemical's stake in the new company is 51%.



## 2 Collaboration with U.S. Firm Nanosys to Develop Inks for Inkjet-Printed QDCFs

DIC is currently working with Nanosys, Inc., of the United States, to develop inks for use in the production of inkjet-printed quantum dot color filters (QDCFs). Quantum dots (QDs) are light-emitting inorganic semiconductor nanoparticles. Because the color emitted can be controlled freely by changing dot size, QDs are garnering considerable attention as materials for next-generation displays.

Realizing mass commercialization for QDCFs presents two key challenges. The first is that fabrication costs for QDs are high, constituting a major hurdle to growth in demand and making it imperative for QDCF manufacturers to minimize production losses. The use of inkjet printing to place QDs is seen as an ideal solution that will make the low-cost production of QDCFs a reality. QDCFs facilitate the manufacture of LCDs and organic electroluminescence displays that are more power efficient and deliver a wider color gamut and viewing angle than existing units, underpinning hopes for their use in next-generation displays going forward.



Colloidal QD dispersions irradiated with a UV light

## 

## Employment Practices Based on the Incorporation of Diversity into Management

The DIC Group actively pursues diversity by employing a broad spectrum of individuals without regard to considerations such as gender, nationality, physical limitation or age. The Group works to foster a corporate culture that encourages understanding and respect for individual differences and actively draws on these differences to ensure an organization that is capable of responding promptly to rapid changes in the business environment and in customer needs.



Myron Petruch General Manager, Pigments Product Division President, Performance Pigments, Sun Chemical Corporation

## MESSAGE

## Diversity at Work: The First Foreign National Appointed General Manager of a Product Division

With the aim of maximizing its outstanding human resources and deepening human interaction within the DIC Group, in 2018 DIC appointed a foreign national to the position of product division general manager for the first time in its history. Three of the Company's current executive officers are foreign nationals. Under its next medium-term management plan, DIC will aim to increase this number by 20%–30%, thereby creating a management framework that ensures responsiveness to global needs. I am honored to have been appointed general manager of the Fine Chemicals Business Unit's Pigments Product Division. At Sun Chemical, I am currently president of Performance Pigments, but effective from January 1, 2018, I am serving concurrently as general manager of DIC's Pigments Product Division. I am the first foreign national to be named general manager of a product division. I recognize the tremendous responsibilities that come with this appointment and pledge to perform my duties to the very best of my ability.

My experience leading specialty chemicals businesses, especially in pigments, led me to join Sun Chemical in 2008. Since then, I have traveled extensively around the world to many DIC and Sun Chemical locations and to many of our global customers to help reinforce one of our operating foundations, which is that we are one of the top global names and leaders in organic pigments and specialty effect pigments used in a broad range of applications. My personal motto is "Think globally, but act locally." Accordingly, I will work to maintain both a broad overview to ensure an accurate grasp of global conditions and a narrow focus to ensure a thorough understanding of local needs with the goal of further sharpening the DIC Group's competitive edge.

## **Expanding Businesses that Will Drive Growth**

In fiscal year 2017, shipments of pigments for color filters, pigments for cosmetics and special effect pigments and other functional pigments were up.

## Pigments for Color Filters

The quality expectations of customers for the pigments that determine the performance of color filters are extraordinarily high. DIC's green pigments for color filters satisfy the rigorous standards of manufacturers of next-generation high-definition displays, delivering more lifelike colors. As a consequence, sales of these pigments continue to expand steadily. We are the world's largest manufacturer of these filters with a global market share of approximately 85%. Our share of the global market for blue pigments for this application also continues to rise, and we are in the process of expanding our global production capacity to 1.5 times the current level.

#### Pigments for Cosmetics

Owing to the strengthening of laws and regulations pertaining to color materials for cosmetics, we are seeing rising awareness of health and safety issues and an increasing preference for natural products. Against this backdrop, demand

for pigments for cosmetics is growing rapidly, particularly in Asian markets. The DIC Group's pigments for cosmetics comply with laws enforced by the U.S. FDA and its counterparts in other countries, as well as with the most rigorous standards for purity, giving us a key competitive advantage. We continue to capitalize on our position as the leading global manufacturer of pigments for cosmetics to drive technical innovation.

## High-Performance Special Effect Pigments

Thanks to its lightness, as well as its excellent thermal and acoustic insulating properties, fire resistance and workability, autoclaved aerated concrete (AAC) is a building material that is expected to continue seeing demand growth. The production of high-performance aluminum pigments for AAC demands advanced technical capabilities. Aluminum pastes and powders manufactured by DIC Group company Benda-Lutz Corporation are used to ensure the stability of product quality for the world's top AAC products. By leveraging its industry-leading technologies to facilitate precise control of density, compression strength and thermoconductivity, the DIC Group has established itself as the leading global manufacturer of these pigments.



Pigments for color filters



Pigments for cosmetics



High-performance special effect pigments

Special Feature

Product Development Designed to Create New Value

# The DIC Group is leveraging the power of chemistry to deliver color and comfort to people's lives.

Established 110 years ago as a manufacturer of printing inks, DIC has worked continuously to apply and improve its core organic pigments and synthetic resins technologies to develop an extensive range of high-value-added products. Many of these products are helping to address critical challenges facing the world, including issues related to the environment, as well as to safety and peace of mind for people, and in so doing help to guide us toward the realization of a sustainable global society that is rich with color and comfort.



**Fine Chemicals** 

## **Fine Chemicals**

Pigments for Color Filters Used in LCDs and OLED Displays (Functional Pigments)





Securing the top share of the global market for pigments for color filters by offering products with unrivaled optical properties



## Value Creation

## Global market-leading pigments that deliver outstanding brightness and picture quality

Color images on LCDs used in televisions, computers and smartphones are produced using the three primary colors of light—red (R), green (G) and blue (B). These colors are created using pigments. LCDs produce images by transmitting light emitted from a backlight lamp through a color filter to which an RGB pattern has been applied. As a consequence, the pigments used in the color filter are crucial to picture quality.

With Japan's shift to digital terrestrial television driving up demand for flatpanel LCD televisions and the popularity of smartphones increasing, in 2007 DIC launched the *G58* series of green pigments, which achieved a remarkable increase in brightness. The series includes *FASTOGEN GREEN A350*, a green pigment characterized by outstanding brightness and contrast that ensures excellent picture quality even with little light from the backlight. In fiscal year 2014, DIC developed the *G59* series of green pigments for wide color gamut color filters, which deliver superior brightness and color reproduction, making them suitable for use in filters for next-generation high-definition displays, including those for ultra-high-definition (UHD) televisions. DIC currently enjoys an 85%plus share of the global market for green pigments for color filters, making its products the de facto standard. DIC also manufactures blue pigments for color filters. In 2012, the Company developed the *A* series, which boasts a superb balance between brightness and contrast. The optical properties of pigments in this series have earned high marks from smartphone manufacturers and boosted DIC's share of the global market for blue pigments to approximately 50%.

DIC's pigments for color filters, which satisfy the diverse performance requirements of displays used in LCD televisions, smartphones, tablets and notebook computers while at the same time adding value, have been adopted for use by many display manufacturers for use in color filters. In addition to improving picture quality, these pigments reduce energy consumption and, by extension, lower emissions of CO<sub>2</sub>. Having positioned pigments for color filters as a business that it expects to drive growth, DIC continues working to reinforce its development and product supply capabilities.





## Composition of an LCD and the Role of Pigments



#### A Distinctively DIC Response

Applying technologies amassed through the production of printing inks to the development and expansion of functional pigments that have become the de facto standard worldwide

DIC first succeeded in developing offset printing inks in-house in 1915 and 10 years later began production of organic pigments for its own use. Over subsequent years, the Company amassed development and design capabilities, as well as production technologies, crucial to the manufacture of fine chemicals and in 1973 commercialized revolutionary high-performance, long-lasting nematic LCs, which were adopted by Sharp Corporation for use in the world's first pocket calculator incorporating an LCD. DIC's passion and development prowess are also evident in its pigments for color filters.

Large-screen LCD televisions are expected to deliver superbly realistic and accurate color reproduction. The small LCDs used in smartphones and other devices must be clear, easy to read and bright enough to ensure legibility even with less light. This is because reduced light requirements results in longer battery life. Increasing brightness requires making color filters thinner and more transparent, but this alone will not deliver vivid colors and resolution. With the question of how best to realize both high brightness and vivid colors an ongoing challenge for display manufacturers, DIC has responded by developing innovative pigments for this application.

Copper has traditionally been the central material used in green pigments. In developing its green pigments for color filters, DIC defied conventional wisdom by exploring the use of a different central material with the goal of further enhancing performance characteristics. Through a process of trial and error, the Company narrowed down the list of suitable materials from a wide range of candidates, eventually choosing zinc. DIC also significantly improved transparency by reducing the size of pigment particles, thereby achieving a dramatic increase in contrast, which ensures a bright, clear picture quality even with less light. The outcome of these efforts was the groundbreaking *G58* series.



Picture quality is influenced significantly by the brightness and contrast of the pigment used in the color filter. (Left: High brightness and high contrast; Right: Low brightness and low contrast)



In the area of blue pigments for color filters, DIC also leveraged its superior molecular design capabilities to achieve outstanding tinting strength and precise particle size control. To develop the *A* series of blue pigments for color filters, the Company also employed specialty particle surface processing to ensure highly stable dispersion, realizing an excellent balance between brightness and contrast. Products in the *A* series currently dominate the market for blue pigments for color filters, delivering excellent optical properties that continue to earn solid marks from smartphone manufacturers.

DIC's success in developing a steady stream of pioneering functional pigments is supported by the seamless integration of basic technologies amassed in various fields as a manufacturer of color materials, the crossbusiness R&D configuration of its Central Research Laboratories and production technologies that facilitate the mass production of products with performance characteristics realized in the laboratory.



Chemical structure of green pigments in the G59 series, which are particularly popular among smartphone manufacturers

#### **Key Person from DIC**

## We are making full use of the DIC Group's global network at all stages, from the promotion of product strategies through to the expansion of sales channels.

The value chain extending from functional pigments through to color filters for LCDs encompasses manufacturers of pigments, pigment dispersions, resist inks, color filters and LCDs. In developing pigments for color filters, we gather information on the latest trends from LCD manufacturers, which we apply to the formulation of next-generation product strategies.

Production of pigment dispersions, color filters and LCDs is concentrated primarily in East Asia. Recent years have seen a particularly sharp increase in the PRC, which is on the verge of overtaking the Republic of Korea (ROK) as No. 1 in terms of volume produced. We are making full use of the DIC Group's global network by working closely with local Group companies to bolster the adoption of DIC pigments for color filters for use in LCDs.

Manager, Pigments Sales Group 2, Pigments Product Division Naoto Akiyama



#### **Key Person from DIC**

## We are capitalizing on the substantial growth potential of pigments for color filters by realizing new optical properties.

Since joining DIC, I have been involved in the development of green pigments. The chemical structure of our market-leading *G58* and *G59* pigments is extremely complex, but with both series it is possible to dramatically transform optical properties simply by making minor adjustments. The growth potential of this business is all the more significant for this reason and our ability to make continuous improvements and modifications means that the sky really is the limit.

The evolution of display backlight technology from light-emitting diodes (LEDs) to organic light-emitting diodes (OLEDs) to QDs (light-emitting semiconductor nanoparticles) is also a key factor underscoring changes in the performance requirements of pigment customers. At the Central Research Laboratories, dedicated molecular design, analysis, simulation and other technical groups promote cross-collaboration with the goal of accelerating all stages of the development of products with new optical properties, from planning through to commercialization.

Fine Synthesis Technical Group 5, Fine Synthesis Technical Division 1, Central Research Laboratories Keisuke Sakamoto



## DIC aims to boost sales of blue pigments for color filters to 1.5 times the fiscal year 2016 level by fiscal year 2021

In June 2017, DIC announce that it plans to expand the production capacity for blue pigments for color filters of its Kashima Plant, in Ibaraki Prefecture, to 1.5 times the fiscal year 2016 level by fiscal year 2021. In light of growing demand—underpinned by growth in emerging economies—and an increase in the volume of pigments used attributable to the trend toward larger displays, DIC estimates that the global display market will continue to expand at a rate of approximately 3.5% annually between now and fiscal year 2025. Demand for A series blue pigments for color filters has risen sharply since launch, reflecting a steady increase in the number of customers adopting these pigments for use. DIC will capitalize on the expansion of its production capacity to boost sales of these pigments to 1.5 times the fiscal year 2016 level by fiscal year 2021, to solidify its top share of the global market for this application, which are currently recognized as the de facto standard worldwide.



DIC is expanding the Kashima Plant's production capacity for blue pigments for color filters.

## Polymers

Adhesive Primers for Optical and Packaging Films

SDGs Goals 9 and 12



## Outstanding adhesion improves the reliability of LCDs and the safety of food products

## Value Creation

Ultrathin (less than 1/10,000 millimeter) waterborne polyurethane resin adhesive primers

DIC's ultrathin high-performance films are used extensively for optical applications, including LCDs for televisions, computers and smartphones, and food product packaging applications, such as retortable pouches and snack food packets. While such films appear to be a single layer, they actually comprise multiple layers that are laminated together. The multilayer structure makes it possible to impart critical performance features, including transparency, electroconductivity, antireflectivity and brightness in the case of films for optical applications and heat resistance as well as oxygen-barrier properties and moisture resistance in the case of films for food packaging applications.

Film layers are generally laminated using adhesives. However, in situations where the surface attributes of polyethylene terephthalate (PET) film discourage adhesion, an adhesive primer (aqueous polyurethane surface modifier; also called an anchor coat or an adhesion promoter) is applied prior to the laminating adhesive. While less than 0.1 micron (1/10,000 millimeter) thick, DIC's new primers ensure a powerful bond between the PET film substrate and coating layer, thereby playing a key role in enhancing the properties of high-performance films.



DIC's HYDRAN resin adhesive primers for films

## Primers Help Increase LCD Brightness



## DIC's popular HYDRAN resins: Reliable, easy-to-use and environment-friendly

Polyurethane resins are copolymers that boast excellent adhesion to a variety of substrates. Polymer design can be leveraged to impart various desired characteristics, facilitating a broad range of applications, including bonding fibers, films and metals. Waterborne polyurethane resins, in particular, deliver outstanding adhesion, while cross-linking agents can be used to enhance strength, adhesion and resistance to water, heat and moisture.

DIC has more than 40 years of experience as a manufacturer of polyurethane resins. One of its best-known products is the *HYDRAN* series of waterborne adhesive polyurethane resins, which are rated highly for increasing the adhesion, transparency, abrasion resistance and durability of substrate and

coating materials, and for enhancing the workability—including superb surface slip, windability and blocking resistance<sup>\*1</sup>—of *HYDRAN*-coated films.

Because they are solvent-free, *HYDRAN* resins also eliminate concerns regarding emissions of VOCs, making it an ideal choice from the perspectives of reducing the negative environmental impact of food packaging and protecting the safety and health of production workers. In addition, in the production of aluminum food trays, the use of aluminum vapor deposition\*<sup>2</sup> on *HYDRAN*-coated PET film uses significantly less energy than the conventional process, which involves laminating together layers of PET film and aluminum foil with an adhesive, and reduces tray weight.

\*1 Blocking is the undesired adhesion of adjacent layers of film when winding. Blocking causes various issues, including hindering surface slip and preventing peeling off.

\*2 Minute particles of aluminum are evaporated in a vacuum using, for example, an electron beam or high-frequency induction. The vaporized aluminum is deposited on the film substrate, where it condenses.



## The PET Film Value Chain

#### A Distinctively DIC Response

# Maximizing top-class polymer technologies and an extensive global network to establish a strong brand image and a proven track record as a supplier

Building on its pigment and resin dispersion and formulating technologies realized through the production of printing inks, DIC is promoting the development of high-value-added products that leverage its basic and core technologies. The former category includes technologies in the area of optics and color, organic molecular design, polymer design and dispersion technologies, while the latter includes those in the area of synthesis, compounding formulation and surface treatment. DIC's efforts in this area are underpinned by its ability to integrate technological resources originating across

the DIC Group to combine materials with diverse properties and performance characteristics.

DIC's success in commercializing waterborne polyurethane resin adhesive primers for optical and food packaging applications is attributable to its know-how in peripheral areas such as high-performance films, coatings and adhesives. The Company makes use of its vast store of development and production know-how to realize distinctively DIC responses to market needs.



## Promoting business diversification through information gathering and global marketing

Polymers is one of five business segments into which the DIC Group classifies its global operations. The remaining four are Printing Inks, Fine Chemicals, Compounds and Application Materials. These four segments overlap with the Polymers segment not only on the technology front but also because they frequently manufacture and sell products for common applications and operate in the same geographic markets. As a consequence, all five segments inevitably share customers and suppliers. The Group's adhesive primer business thus works with Group companies in each country and territory, enabling it to efficiently gather information on markets and customers and to modify its sales strategies accordingly.

Because primers are intermediate materials, the handling methods and coating technologies employed in their use impact the quality of finished products. Accordingly, DIC recognizes the importance of a sales approach that encompasses consulting on everything from formulation to process management. Here, too, DIC thus capitalizes on its extensive experience to provide tailored production support, as well as to sell products, to film manufacturers and other customers. This approach has earned the Company a solid reputation for reliability.



Collaboration between DIC Asia Pacific and DIC India Ltd. is bolstering results in India's flexible packaging market

## Having inherited DIC's DNA, we are promoting the development of businesses that respond to social imperatives.

While potential applications for adhesive primers are numerous, we have narrowed our focus to optical and food packaging films. We have succeeded in expanding our shares of both markets by promoting the development of formulations and products that comply with the selection criteria and required performance characteristics of leading customers in each of the countries and territories in which we operate.

At all stages, I find myself impressed by our wealth of technological and human resources, as well as by our meticulously crafted global network, which is attributable to the fact that we were early to turn our attention to overseas markets. Our ability to effectively combine such assets results in a dynamic force that I liken to a chemical reaction. These assets, amassed over 100 years in business, are the building blocks of DIC's DNA. They are also the driving force behind our efforts to develop products and global businesses that respond accurately to rapidly evolving social imperatives.

Manager, Dispersion Sales Group, Polymers Product Division Kenji Ikeda



#### Key Person from DIC

#### We are leveraging synergies between our development capabilities and informationgathering prowess in the rapidly evolving LCD market.

PET film adhesive primers for optical applications used in LCDs must enhance brightness and outstanding adhesion to film substrates cured using UV light to impart hard coat properties. DIC's primers deliver excellent adhesion to a wide variety of UV-cured resins and do not impede either the length of usability after mixing or the transparency of the film after coating, userfriendly features that have earned high marks from customers. I see our development capabilities in this area as representing the technological depth of departments responsible for producing polyurethane raw materials and for using these materials in products. The synergies between these capabilities and our information-gathering prowess enables us to provide a broad range of intermediate materials that anticipate the needs of LCD manufacturers. In the LCD market, models change with astonishing rapidity. To grow our share of this market, we must treat our distinctive development and information-gathering capabilities like the wheels on a vehicle, synchronizing movement while at the same time increasing speed.

DIC (Shanghai) Co., Ltd. Sou Kanegae

#### Key Person from DIC

## As the performance of food packaging continues to rise, we continue working to communicate the value of DIC's adhesive primers to an ever-greater number of customers.

I am in charge of sales of primers for use in food packaging to customers in the Asia–Pacific region, Europe and the Americas. With living standards in emerging economies improving visibly, expectations vis-à-vis the performance of packaging films for food products are increasing, spurring demand for multilayer films that extend the shelf life of food and can withstand heating. DIC's primers have established a solid brand image among market-leading packaging film manufacturers with outstanding technological capabilities. For mid-tier mass producers, knowledge regarding primers and production support are critical. Accordingly, with an approach that focuses on resolving the issues faced by customers uppermost in our minds, which we have dubbed "DIC Special Solutions," we are participating in an initiative led by DIC Asia Pacific to collaborate closely with Group companies in countries and territories across the region to cultivate a greater variety of customers.

Dispersion Sales Group, Polymers Product Division Daisuke Nagaoka



#### Key Person from DIC

#### Our efforts focus on developing products for off-line film producers.

Customers for adhesive primers fall into two categories. The first category, which consists primarily of major manufacturers, uses the in-line method, which involves coating primer onto film before the termination of crystal orientation<sup>+</sup>, after which the manufacturing is completed with drying, stretching and heat treatment. The second category, mainly mid-tier producers, uses the off-line method, which involves coating film in a separate process after the termination of crystal alignment, stretching and heat treatment. DIC's primer enjoys a solid reputation and a strong track record among manufacturers in the first category, but we recognize that expanding this business depends on increasing sales to manufacturers in the second category. Off-line coating is challenging from both technological and cost perspectives, so we will need to provide carefully tailored support services. Nonetheless, securing customers in as-yet untapped areas is the key to the next phase of growth for this business, so teams across the DIC Group will work as one to promote the development of new products and to further improve sales results.

\* Biaxially oriented PET film is a crystalline polymer, while "crystal orientation" represents the degree of alignment of crystal axes. Stretching and heat treatment improves film's resistance to, among others, heat, impact and chemicals.

Polymer Technical Group 2, Polymer Technical Division 2 Kazuhiko Chiyonobu



## Efforts to accelerate development and supply capabilities in a key growth market proceed

DIC primarily produces *HYDRAN* resin adhesive primer at the Hokuriku Plant in Japan. Against a backdrop of rising demand in other Asian markets, the Company has sought to accelerate the development of products tailored to regional needs and reinforce its supply configuration by establishing the Polymer Technical Center–Asia Pacific within the site occupied by DIC Group company Siam Chemical Industry Co., Ltd.

In fiscal year 2017, DIC's technical team and Siam Chemical Industry collaborated to complete trial production of the primers using actual equipment at the Polymer



The Polymer Technical Center Asia Pacific positions DIC to swiftly and accurately grasp local needs and to supply products in a timely manner.

Technical Center–Asia Pacific. In fiscal year 2018, steps will be taken to further perfect production lines and obtain customer evaluations with a view to commencing full-scale production in fiscal year 2019. In addition to establishing two production sites for the primers, in Japan and in Thailand, DIC will take steps to localize sales capabilities, thereby positioning it better to supply products in a more timely manner, in line with its global strategy of promoting local production and consumption.



#### Key Person from DIC

## We will continue to leverage DIC's management resources to drive the expansion of the DIC Group's operations in Asia.

Siam Chemical Industry was established in 1974, making it one of the oldest Japanese-affiliated companies in Thailand, and is primarily engaged in the manufacture and sale of synthetic resins for coatings, molding and industrial applications. Our integrated management of production, sales and technological functions, which enables us to guarantee the same level of quality as DIC in Japan, is our principal competitive advantage, underpinning steady growth to date. In a move aimed at reinforcing our operating foundation to further support sustainable growth and responding to environmental issues in Thailand, we recently started up newly installed solar panels. In response to environmental needs across Asia, we also plan to invest decisively to facilitate production of *HYDRAN* waterborne polyurethane resins. We will continue to leverage DIC's management resources to effectively grasp regional needs and drive the expansion of the Group's operations in Asia.

President, Siam Chemical Industry Co., Ltd. Sumiko Mochizuki



#### **Key Person from DIC**

#### We are working to respond swiftly to market needs in Southeast Asia.

The Polymer Technical Center–Asia Pacific was established in fiscal year 2015 within the site occupied by Siam Chemical Industry with the goal of responding swiftly to changing needs in fast-growing Southeast Asian markets. In fiscal year 2017, we launched a similar team in Indonesia. Our efforts focus on not only polyurethane resins but also acrylic resins, polyester and other resins for a broad range of applications. In addition to hiring experts in various areas to facilitate advanced R&D and the provision of superior technical services, specialists in analysis technologies have been posted to the Polymer Technical Center–Asia Pacific to work with local technical staff. We are currently capitalizing on the newly developed *HYDRAN* resin adhesive primers, which draws on DIC's expertise in the area of materials for printing, to provide distinctively DIC solutions that address local needs.

General Manager, Polymer Technical Center-Asia Pacific Akifumi Yamamoto



## TOPIC

**Social Imperative** 

## Efforts to Reduce Environmental Impact by Using Water-Based Biomass Ink Made with Plant-Based Packaging Resin

## Sun Chemical Promotes Initiatives Aimed at Addressing an Important Social Imperative

Sun Chemical, which oversees the DIC Group's operations in Europe and the Americas, is one of the world's leading manufacturers of printing inks. The company develops and supplies a broad range of products that address diverse social imperatives.

Brands today are under a lot of pressure to be environment-friendly. Studies have shown that consumers want more sustainable packaging and global retailers have made it clear that they prefer to work with brands that integrate environment-friendly practices in their packaging.

Recognizing these trends, brands are taking dedicated steps to vet and study the environmental practices implemented by their suppliers and partners. In fact, some brands in the fast/quick food service industry have gone so far as to push forward initiatives that focus on using all-natural packaging.

This has led to a push for greener inks with a higher level of bio-renewable content. A bio-renewable ink can be derived from tree, plant, insect and/or animal materials, according to the U.S.-based National Association of Printing Ink Manufacturers (NAPIM). These can include resins, gums, oils, waxes, solvents, and other polymer building blocks.

Brand owners want these bio-renewable inks to maintain the same guality and performance requirements of a non-renewable ink, keep to a cost that is competitive with non-renewable inks and comply with the standards outlined by the brand and a variety of regulations, including California's Proposition 65 and the European Union's Toy Safety Directive, among others.

#### Sun Chemical's Response

Sun Chemical has responded to the industry challenges by rolling out a line of inks that meet environment-friendly, bio-renewable and biodegradable standards that the industry, brand owners, retailers and consumers are looking for. Formulated with significantly higher levels of bio-renewable resin content compared to other previous market

offerings from Sun Chemical, the new SunVisto® AquaGreen water-based inks deliver the required critical performance attributes needed across a range of paper packaging applications.

The inks can be blendable using varnishes and standard water-based pigment dispersions, and do not compromise end-use or on-press performance. They also offer outstanding print fidelity and ink resolubility on press, quick setting for in-line converting and high levels of resistance properties to rub, abrasion, water and grease.

Sun Chemical's R&D and compliance teams from Europe, North America and South America spent a year and a half replacing chemicals with natural products to ultimately provide an ink solution that was comparable in cost, delivered the required performance attributes and met all the standards and regulatory compliance requirements.



## VOICE Sun Chemical is fulfilling its responsibilities to ensure sustainable business practices.

Sun Chemical is a recognized leader in compliance and R&D, with a strong commitment to sustainable practices. Those attributes were why a customer in North America approached us with a project to see if we could create a series of natural bio-renewable inks that would meet the sustainability needs and standards of major fast/quick food service brands. It was a major undertaking with a lot of testing and trial runs. It was inspiring to see our team's determination to find the right raw materials needed to accomplish the goals and requirements of our customer and global regulations.



Vice President, Marketing Penny Holland
## Corporate Governance

### Basic Approach to Corporate Governance

The DIC Group identifies the purpose of corporate governance as being to ensure effective decision making pertaining to its management policy of achieving sustainable corporate growth and expansion through sound and efficient management, while at the same time guaranteeing the appropriate monitoring and assessment of and motivation for management's execution of business activities. With the aim of achieving a higher level of trust on the part of shareholders, customers and other stakeholders and enhancing corporate value, the DIC Group also promotes ongoing measures to reinforce its management system and ensure effective monitoring thereof.

## Policy on Corporate Governance

DIC has prepared a Policy on Corporate Governance, which it has published on its corporate website. Policy on Corporate Governance International Internation

## Corporate Governance Organization

A company with internal auditors, DIC maintains a Board of Directors and a Board of Corporate Auditors. DIC has also instituted an executive officer system and has established a Nomination Committee, a Remuneration Committee, an Executive Committee and a Sustainability Committee.



#### Board of Directors

To accelerate decision making and reinforce corporate governance, nine directors have been elected to the Board of Directors. Of the nine, three are outside directors. In principle, the Board meets once monthly. The Board of Directors is responsible for making decisions on matters stipulated in the Companies Act of Japan, and in DIC's own regulations, as requiring Board-level approval, as well as for monitoring the execution of business activities, as reported by the executive officers.

#### Nomination Committee

The Nomination Committee was established as an internal committee of the Board of Directors with the aim of ensuring objectivity in the nomination of candidates for the position of director, corporate auditor or executive officer, and the dismissal of serving directors, corporate auditors and executive officers. The committee, which submits proposals to the Board of Directors, meets as necessary. At present, three of the committee's five members are outside, while the position of committee chairman is filled by an outside director.

#### 8 Remuneration Committee

The Remuneration Committee was established as an internal committee of the Board of Directors with the aim of enhancing the objectivity of procedures for determining executives' remuneration. The committee, which has been entrusted with responsibility for determining the salaries and bonuses of directors and executive officers, meets as necessary. At present, three of the committee's five members are outside, while the position of committee chairman is filled by an outside director.

#### 4 Executive Committee

The Executive Committee deliberates and resolves issues related to the execution of business activities. In principle, the committee meets twice monthly. Committee members are directors and executive officers designated by the Board of Directors. Meetings are also attended by one corporate auditor as part of the auditing process. Details of deliberations and resolutions are reported to the Board of Directors.

#### Sustainability Committee

The Sustainability Committee, which functions as an advisory body, meets several times annually to formulate sustainability policies and activity plans, as well as to evaluate and promote initiatives. Committee members are directors and executive officers designated by the Board of Directors. As part of audit activities, one corporate auditor also attends Sustainability Committee meetings. The committee reports the matters upon which it deliberates and the results of its deliberations to the Board of Directors.

#### 6 Board of Corporate Auditors

The Board of Corporate Auditors comprises four members, including two outside corporate auditors. In principle, the Board of Corporate Auditors meets once monthly. Board activities include debating and determining auditing policies and auditing plans. Board members also report on the results of audits conducted, as well as attend important meetings, including those of the Board of Directors, the Executive Committee and the Sustainability Committee, meet with representative directors on a periodic basis to exchange information and opinions, and collect business reports from directors, executive officers and employees. In addition, DIC has established an Office of Corporate Auditors, to which it assigns dedicated personnel to assist the corporate auditors in their duties.

DIC's three outside directors have extensive experience in and knowledge of corporate management, which they are able to leverage in the performance of their duties as outside directors of DIC. Corporate auditor Yoshiyuki Mase is a qualified certified public tax accountant and has overseen corporate accounting at DIC for many years. Outside auditor Katsunori Takechi provides tax accounting services pursuant to Article 51 of the Certified Public Tax Accountant Act and has broad experience in the field of corporate law. Outside auditor Cindy Yoshiko Shirata is an academic expert in the field of accounting involved in research and education in financial accounting and corporate management.

#### Internal Auditing Department

The internal auditing department is charged with internal auditing, which includes monitoring the effectiveness of internal controls at DIC and domestic DIC Group companies. For DIC Group companies in Asia, Oceania, the PRC, the Americas and Europe, internal auditing is the responsibility of local internal auditing teams.

#### 8 Accounting Auditors

DIC has engaged Deloitte Touche Tohmatsu LLC as its independent auditors. DIC strives to ensure an environment that facilitates the accurate disclosure of information and fair auditing. The corporate auditors, accounting auditors and the internal auditing department conduct audits from their respective independent positions, but also liaise periodically to facilitate close cooperation, thereby ensuring the effectiveness of auditing activities.

#### Rationale Behind Current Corporate Governance Organization

DIC has instituted an executive officer system, a move aimed at separating decision making and implementation and thereby accelerating business execution and clarifying responsibilities. As well as appointing three highly independent outside individuals to its Board of Directors, the Company has taken steps to reinforce its monitoring of business execution. DIC also has a Nomination Committee and a Remuneration Committee, which include the three outside directors, to ensure objectivity in the nomination of, and in determining remuneration for, directors and executive officers. The four-member Board of Corporate Auditors, which includes one attorney and one university professor as outside corporate auditors, liaises with the accounting auditors and the internal auditing department. This structure ensures the effective functioning of DIC's corporate governance system.

## System of Internal Controls

#### **1** Status of the System of Internal Controls

The DIC Group maintains a keen awareness of four key objectives, which are to ensure the effectiveness and efficiency of its businesses, uphold the reliability of its financial reporting, comply with laws and regulations relevant to its business activities, and safeguard its assets. To this end, DIC has prepared and operates a system of internal controls, key components of which are summarized below, to ensure proper business activities, based upon the Companies Act of Japan and the Financial Instruments and Exchange Act of Japan. The Board of Directors hears annual reports on measures on the status of the system of internal controls, a summary of which is included in the Company's report on its business activities.

- The Company shall work to set forth the DIC Group Code of Business Conduct as the standard regarding compliance, which directors and employees of the DIC Group shall comply with, and to disseminate the same.
- The Company shall establish an internal notification system as a channel available for the employees of the DIC Group and set up multiple notification channels independent from channels for communication used in the conduct of business. DIC shall prepare a structure that can quickly respond to domestic and international notifications.
- In order to ensure a system in which the duties of directors are performed properly and efficiently within the DIC Group, the Company shall establish regulations regarding company organization and authority.
- 4 The Company shall formulate medium-term management plans and the annual budget based upon management policies and management strategies, and, through dissemination of the same, the DIC Group shares common goals. Reports shall be made to the Board of Directors outlining the status of the progress.
- Information pertaining to the performance of duties by directors shall be recorded, retained and managed appropriately based upon the regulations for document management. The Company shall establish regulations for systems of information management and shall prepare a system for preventing leakage of confidential information of the DIC Group.
- 6 The Company shall formulate a risk management policy and shall identify, assess, prioritize and address properly any risks that may have a significant impact on management of the DIC Group.
- The Company shall determine an administrative department for each subsidiary from the standpoints of the conduct of business and business management, and shall supervise business affairs by dispatching a director to each subsidiary.
- 8 The Company shall clarify important matters pertaining to subsidiaries that require approval of or reporting to the Company.

#### Basic Policy Toward Eliminating Demands by Antisocial Elements

DIC's basic policy, as outlined in the DIC Group Code of Business Conduct, is to stand firmly against antisocial elements and in no way to acquiesce to demands presented by such elements. The General Affairs and HR Department is responsible for coordinating efforts to respond to extortion or other demand presented by antisocial elements, while individuals have been put in charge of efforts at each site and within each Group company. These individuals work in close collaboration with lawyers and the police to ensure the Company's responses are resolute. DIC has also prepared and distributed a manual on appropriate responses to such demands, with the aim of raising awareness among employees.

### Outside Directors and Outside Corporate Auditors

#### 1 Number and Role of Outside Directors and Outside Corporate Auditors

DIC currently has three outside directors and two outside corporate auditors. In addition to attending meetings of the Board of Directors, the outside directors serve as members of the Nomination Committee and the Remuneration Committee, enabling them to provide supervision with an independent point of view, thereby helping to reinforce DIC's corporate governance. The two outside auditors—one an attorney specializing in corporate law and the other an academic expert in the field of accounting whose specialties are financial accounting and corporate management—advise management of the DIC Group from an expert, multifaceted and independent perspective, thereby helping to reinforce the auditing function.

#### **2** Standards Used to Evaluate the Independence of Outside Directors and Outside Corporate Auditors

DIC has established standards for evaluating the independence of individuals appointed to the position of outside director or outside corporate auditor. DIC's outside directors and outside corporate auditors are individuals who, based on these standards, are unlikely to have conflicts of interests with ordinary shareholders and who comply with criteria for the independence of directors/auditors set by the Tokyo Stock Exchange.

## Independence Standards for Outside Officers

DIC does not recognize individuals with the connections listed below as being independent in the appointment of outside officers.

- Individuals who are executive officers of DIC or of one of its consolidated subsidiaries at present or have been in the preceding 10 years.
   Individuals to whom any of the following items have applied in the preceding three years:
- A principal business partner of the DIC Group (a business partner with which transactions in a single fiscal year exceed 3% of the DIC Group's consolidated net sales in that year) or an executive officer of a company to which this description applies
- An individual for which the DIC Group is a principal business partner (a company with which the DIC Group's transactions in a single fiscal year exceed 3.0% of the company's consolidated net sales in that year) or an executive officer of a company to which this description applies
- S A shareholder who holds 5% or more of voting rights in DIC or an executive officer of a company to which this description applies
- 4 A principal lender to the DIC Group (a lender from which loans in a single fiscal year exceeds 3% of the DIC Group's total loans in that year) or an executive officer of a company to which this description applies
- S An individual who has received contributions in a single fiscal year that exceeds ¥10 million or belongs to a group to which this description applies
- 6 An accounting auditor, an accountant who has served as an accounting auditor for the DIC Group or an individual who is an employee, partner or associate of an audit firm to which this description applies
- An individual to whom ③ above does not apply but who has received remuneration from the DIC Group in excess of ¥10 million in a single fiscal year as a provider or professional services, such as consulting, accounting or legal services, or an individual who belongs to a group that has received remuneration in excess of 3% of its consolidated net sales in that year as compensation for professional services, such as consulting, accounting or legal services
- Output A corporate executive of another company in the event that an executive officer of DIC is appointed to an outside officer position at that company
- 3. A spouse or relative within two degrees of kinship of individuals listed in section 1 or 2 above
- 4. An individual whose term in office as an outside officer of DIC has exceeded eight years

#### 3 Framework for Supporting the Efforts of Outside Directors and Outside Corporate Auditors

Prior to meetings of the Board of Directors, relevant materials are distributed to all directors, full-time auditors, outside directors and outside corporate auditors. In addition, directors bringing matters before the Board provide explanations in advance to outside directors, while full-time corporate auditors provide explanations as necessary to outside corporate auditors.

#### Other Initiatives to Enhance the Corporate Governance Organization

#### Composition of the Board of Directors

To enable the Board of Directors to resolve major operations-related issues, as well as to facilitate the effective oversight of management, the Board of Directors comprises outside directors, who maintain independence, and other individuals having a thorough knowledge of the businesses of the DIC Group, with consideration given to ensuring a balance among necessary knowledge, experience and capabilities. In light of the DIC Group's global operations, DIC also strives to ensure diversity in the Board's composition.

One member of the Board of Directors is female, as is one member of the Board of Corporate Auditors.

#### Composition of the Board of Directors and the Board of Corporate Auditors

	In-house	Outside	Total	Percentage of outside members
Directors	6	3	9	33.3%
Corporate auditors	2	2	4	50.0%
Total	8	5	13	38.5%





#### 2 Remuneration for Executives

Remuneration for directors is determined by the Remuneration Committee, which takes into account prevailing market rates, and consists of basic remuneration; bonuses, which are linked to consolidated operating results and the degree of achievement of individual targets; and stock compensation, which is based on medium- to long-term operating results. Directors who serve concurrently as executive officers are eligible for bonuses and stock compensation. Other directors and outside directors are eligible for basic remuneration only. Remuneration for corporate auditors consists of basic remuneration only and is determined through discussion involving all corporate auditors, in accordance with internal rules established by the Board of Corporate Auditors, with consideration given to ensuring a balance with remuneration for directors and to prevailing market rates.

Remuneration for Directors and	Corporate Auditors in Fiscal Year 2017
--------------------------------	--

	Composition of remu Total remuneration (Millions of ye			eration	Number of directory and comparets auditory
	(Millions of yen)	Basic salary	Bonus	Stock Compensation	
Directors (excluding outside directors)	322	209	65	48	6
Corporate auditors (excluding outside corporate auditors)	59	59	—	_	2
Outside officers	57	57		_	5

Note: The total amount of stock compensation is in accordance with the performance-based stock compensation plan that was approved at the 119th Annual General Meeting of Shareholders.

#### Evaluation of the Board of Directors' Effectiveness

DIC conducts an analysis and evaluation of the effectiveness of the Board of Directors annually via a self-evaluation conducted by the directors and corporate auditors. In fiscal year 2017, the Company conducted a survey of all directors and corporate auditors regarding, among others, self-evaluation and Board administration, responses to which were analyzed and evaluated by the Board of Directors. As a result, the effectiveness of the Board of Directors was confirmed.

DIC recognizes enhancing debate regarding the direction of corporate strategies and promoting deeper deliberations in the Nomination Committee and Remuneration Committee, among others, as key challenges and will continue working to promote improvements.

## Directors, Corporate Auditors and Executive Officers

#### Directors



1 Chairman of the Board of Directors Yoshiyuki Nakanishi

2 President and CEO

Kaoru Ino

3 Representative Director Masayuki Saito

Yoshihisa Kawamura

4 Director

5 Director

Hideo Ishii

6 Director Toshifumi Tamaki 7 Director\* Yukako Uchinaga 8 Director\*

Kazuo Tsukahara

9 Director\*

Yoshiaki Tamura

\* Outside



## Corporate Auditors



1 Corporate Auditor Jiro Mizutani

2 Corporate Auditor

Yoshiyuki Mase 3 Corporate Auditor\*

Katsunori Takechi

4 Corporate Auditor\* Cindy Yoshiko Shirata

\* Outside



#### Outside Director Profiles

#### Yukako Uchinaga

 April
 2004
 Director and Senior Executive Officer, IBM Japan, Ltd.

 October
 2009
 Director and Executive Vice President, Benesse Holdings, Inc.

 April
 2013
 Honorary Chairman, Berlitz Corporation

#### Kazuo Tsukahara

April 2008 Director and Managing Executive Officer, IHI Corporation April 2012 Representative Director and Executive Vice President, IHI Corporation June 2014 Adviser, IHI Corporation

#### Yoshiaki Tamura

January 2007 Executive Officer, Asahi Glass Co., Ltd. March 2013 Representative Director and Executive Vice President, Asahi Glass Co., Ltd. March 2017 Executive Fellow, Asahi Glass Co., Ltd.

#### | Outside Corporate Auditor Profiles

#### Katsunori Takechi

 April
 2000
 Public Prosecutor, Civil Affairs Bureau, Ministry of Justice

 October
 2003
 Joins Anderson Mõri & Tomolsune

 July
 2011
 Managing Partner, Takechi & Partners

#### Cindy Yoshiko Shirata

 Chi Log
 Professor, Nihon University College of Economics

 February 2010
 Visiting Professor, University of Munich

 October
 2014

 Professor, Faculty of Business Administration, Bunkyo University

## Executive Officers



President and CEO Kaoru Ino



Executive Vice President Masayuki Saito Assistant to President and CEO CFO Chairman of the Soard, Sun Chemical Corporation Chairman of the Supervisory Board, Sun Chemical Group Cooperatief U.A.



Managing Executive Officer Toshio Hasumi President, Polymers Business Unit General Manager, Polymers Product Div.



Managing Executive Officer Kazunari Sakai Technical Segment (Technical Management Unit and R&D Management Unit) General Manager, Technical Management Unit



Managing Executive Officer Naoyoshi Furuta General Manager, Production Management Unit



Managing Executive Officer Hideo Ishii President, Printing Inks Business Unit General Manager, Printing Inks Product Div. and Printing Inks Production Div.



Managing Executive Officer Masaya Nakafuji Head of General Affairs and Legal Unit and ESG Unit Diversity



Managing Executive Officer

General Manager, Marketing Management Unit

Masami Hatao

Managing Executive Officer Kazuo Hatakenaka President, Fine Chemicals Business Unit General Manager, Liquid Crystal Materials Product Div.



Managing Executive Officer

Head of Corporate Strategy Unit In charge of Kawamura Memorial DIC Museum of Art Chairman, DIC (China) Co., Ltd.

Toshifumi Tamaki

Executive Officer Rudi Lenz President and CEO, Sun Chemical Corporation



Executive Officer Koji Tanigami President and CEO, DIC Graphics Corporation Deputy General Manager, Printing Inks Product Div.



Executive Officer Shinsuke Toshima President, Application Materials Business Unit General Manager, Application Materials Product Div.



Executive Officer Taihei Mukose Head of Purchasing and Logistics & Information Systems Unit



Executive Officer Kiyotaka Kawashima General Manager, R&D Management Unit and Central Research Laboratories



Executive Officer Masanobu Mizukoshi President, Compounds Business Unit General Manager, Liquid Compounds Product Div. and Solid Compounds Product Div.



Executive Officer Hiroyuki Ninomiya Head of Finance and Accounting Unit



Executive Officer Paul Koek Managing Director, DIC Asia Pacific Pte Ltd



Executive Officer Myron Petruch General Manager, Pigments Product Div. President, Performance Pigments, Sun Chemical Corporation



Executive Officer Takeshi Asai General Manager, Corporate Planning Dept. Osaka Branch and Nagoya Branch

# **Overview of Materiality and Sustainability**

Amid rising environmental concerns, including climate change, and increasingly urgent social imperatives, companies today face an ever-more diverse array of challenges. In line with its basic sustainability policy, the DIC Group promotes a variety of sustainability initiatives worldwide and works to maintain an accurate grasp of social imperatives pertaining to ESG-related issues.

## Sustainability Report

Amid rising environmental concerns, including climate change, and increasingly urgent social imperatives, companies today face an ever-more diverse array of challenges, including rising awareness of the need to achieve sustainability in a manner that takes into account the environment, ecosystems and socioeconomic issues. The DIC Group launched its corporate social responsibility (CSR) program in fiscal year 2007. Having further clarified the overall direction of related initiatives as "sustainable growth," effective from fiscal year 2014 the Group changed the designation used across its program from "CSR" to "sustainability." In line with its basic sustainability policy, the DIC Group promotes a variety of sustainability initiatives worldwide and works to maintain an accurate grasp of social imperatives pertaining to ESG-related issues.

#### Basic Sustainability Policy (Formulated in January 2014)

The DIC Group is dedicated to conducting its business while retaining a strong commitment to five key concepts: preserving safety and health, ensuring fair business practices and respect for diversity and human rights, maintaining harmony with the environment and advancing its protection, managing risks, and creating value for society through innovation. DIC Group employees will continue working to deliver the value that its stakeholders—including its customers, suppliers, local communities, shareholders and investors, and employees—expect, showing ingenuity and a sense of responsibility. The Group itself will strive to remain an organization that contributes to sustainability for society and the global environment by capitalizing on its businesses to achieve unfaltering growth, thereby enhancing its own sustainability.

## Sustainability Framework and Themes

#### Themes

To foster concrete measure, in fiscal year 2007 the DIC Group's identified 12 key themes as a framework for implementing its CSR framework. Subsequently, the Group partially revised these themes in response to changes in the external environment and the progress of its efforts. Today, the Group's sustainability framework comprises 11 key themes, which are categorized as basic themes, themes that demonstrate unique capabilities and themes that combine elements of the previous two classifications. The Group implements a broad range of global initiatives that take into account its responsibility to ensure proper product stewardship, as well as its position as a leading manufacturer of fine chemicals.

Themes that demonstrate unique capabilities (A)	Business models that respond to social imperatives ······P128 New technology development and value creation ·····P130 Harmony with the community and social contributions ····P134 Communication with stakeholders ····P137
Core and category-specific themes (Themes that combine elements of (A) and (B))	Environment, safety and health P60 QualityP109 Human resources managementP112 Sustainable procurementP125
Basic themes (B)	Compliance P48 Risk management P50 Information security P58

#### Deployment

In line with its basic sustainability policy, the DIC Group has formulated medium-term (fiscal years 2016–2018) policies and creates annual activity plans for each of these themes. The Group makes use of the plan–do–check–act (PDCA) cycle in promoting initiatives and reports on its achievements annually in the DIC Report. The Marketing Management Unit and individual product and other divisions, sites and overseas and domestic DIC Group companies are charged with pursuing effective sustainability programs by formulating their own activity plans, ensuring that the Group's policies permeate their organizations and labor forces and linking sustainability initiatives to business targets.

## System for Promoting Sustainability Initiatives

The DIC Group's system for promoting sustainability initiatives centers on the Sustainability Committee, which answers directly to the president and CEO. The committee is tasked with reporting on the status of sustainability themes, as well as with proposing policies and programs for advancing sustainability and deliberating on critical related matters.

## Members of the Sustainability Committee

Executive vice president, Executive officer in charge of the Finance and Accounting Unit, Executive officer in charge of the Corporate Strategy Division, Executive officer in charge of the General Affairs and Legal Unit, General managers of the business units, General Manager of the Marketing Management Unit, General Manager of the Production Management Unit, General Manager of the Technical Management Unit, Executive officer in charge of the Purchasing and Logistics & Information Systems Unit, CEOs of regional headquarters, Corporate auditors



## Ensuring DIC Remains a Globally Trusted Corporate Citizen with a Proud Reputation

#### Leveraging its Position as a Global Manufacturer of Fine Chemicals to Support the UNGC

Seeking to fulfill its responsibilities as a member of the international community in a more proactive manner, in December 2010 the DIC Group pledged its support for the 10 principles put forth by the United Nations (UN) and became a signatory to the United Nations Global Compact (UNGC).

Inaugurated in 2000, the UNGC is a voluntary initiative for companies that seek to achieve global sustainable development. Companies and organizations worldwide have pledged their support for the UNGC in the belief that global sustainable development is possible if companies align their business practices with, and fulfill their social responsibilities in, 10 globally accepted principles in the areas of human rights, labor, the environment and the prevention of corruption.



#### Applying the 10 Principles of the UNGC

The DIC Group Code of Business Conduct conforms with the 10 principles of the UNGC. The Group is capitalizing on its participation in this program to advance its operations around the world, while at the same time giving evergreater consideration to the environment and human rights, with the aim of ensuring sustainability for global society.

#### 10 Principles of the UNGC (Official Version)

Humon rights	Principle 1	Businesses should support and respect the protection of internationally proclaimed human rights; and	
numan rights	Principle 2	make sure that they are not complicit in human rights abuses.	
	Principle 3	Businesses should uphold the freedom of association and effective recognition of the right to collective bargaining;	
Labour	Principle 4	the elimination of all forms of forced and compulsory labour;	
Labour	Principle 5	the effective abolition of child labour; and	
	Principle 6	the elimination of discrimination in respect of employment and occupation.	
	Principle 7	Businesses should support a precautionary approach to environmental challenges;	
Environment	Principle 8	undertake initiatives to promote greater environmental responsibility; and	
	Principle 9	encourage the development and diffusion of environmentally-friendly technologies.	
Anti-corruption	Principle 10	Businesses should work against corruption in all its forms, including extortion and bribery.	

#### Complying with ISO 26000

The DIC Group operates in a manner that is consistent with ISO 26000, released in November 2010, which provides businesses and organizations guidelines for operating in a socially responsible manner.

## The 2030 Agenda for Sustainable Development

At the UN Sustainable Development Summit in September 2015, a proposal titled "Transforming our world: the 2030 Agenda for Sustainable Development," later summarized as the Sustainable Development Goals (SDGs), was adopted with the participation of more than 150 UN member states. The agenda, which succeeded the Millennium Development Goals (MDGs), encompasses 17 goals and 169 targets. All UN member states are expected to mobilize efforts to attain the 17 goals, essential to sustainable development for the planet, by 2030. The DIC Group pledges to contribute through its business activities to the success of the SDGs.



Note: These SDG icons are used in this report (pages 25–34 and 48–134) to identify pertinent DIC initiatives. For more information on the SDGs, please see: we http://www.un.org/sustainabledevelopment/sustainable-development-goals/

## Materiality Analysis

The DIC Group has abstracted and analyzed material issues, that is, issues with the potential to affect its performance, and has identified those of particular significance, which it is taking steps to effectively and efficiently address. Guided by its DIC108 medium-term management plan, and by its longterm growth scenario, the Group will continue working to ensure that these efforts are beneficial to the management of its businesses.

## Materiality Analysis Process

#### 1 Abstraction of Issues

DIC abstracted 91 issues of particular significance to the Group based on the GRI's G4 Sustainability Reporting Guidelines\*; its own 11 sustainability themes; and issues delineated in DIC108 or The DIC WAY or added by Sustainability Committee members. The Group has divided these issues into three groupings: Environmental (E), social (S) and governance (including economic issues) (G), which it has combined into 22 general materiality issues.

\* Global guidelines for sustainability reporting published by the GRI, a leading international standards organization

#### 2 Materiality Analysis

Sustainability Committee members, heads of departments that spearhead the implementation of initiatives related to sustainability themes, and senior management from DIC Group companies in the United States, Asia and elsewhere assessed abstracted issues from the twin perspectives of importance to DIC Group businesses and importance to stakeholders. Based on the results of this process, and having comprehensively reviewed issues identified by external assessment organizations, the Company determined materiality to the DIC Group.

#### (a) Material importance to DIC Group businesses

DIC assessed issues with the potential to have an impact on the DIC Group, giving consideration to both potential risks and business opportunities.

#### (b) Material importance to stakeholders

- (i) The DIC Group recognizes five key stakeholder groups (customers, suppliers, local communities and society, employees and investors). Assessments looked at level of interest on the part of stakeholders and potential impact.
- (ii) To reinforce the role of objective external criteria, materiality issues identified by the DIC Group were analyzed by key independent ESG investment assessment programs, namely, the Dow Jones Sustainability Indices (DJSI), FTSE, MCSI, the Sustainability Accounting Standards Board (SASB) of the United States and Sustainalytics.

#### Key DIC Group Materiality Issues

- Promotion of products and services that contribute to environmental protection
- Contribution to the realization of a low-carbon society
- Contribution to colorful and comfortable lifestyles
- Provision of solutions
- Innovation through compounding
- Efforts to strengthen global technology development capabilities
- Creation of next-generation businesses
- Promotion of open innovation
- Harmony with and contribution to society
- Enhancement of brand strength/reputation (evaluation)
- Practical application of measures to reduce environmental impact
- Contribution to the realization of a low-carbon society
- Promotion of occupational health and safety
- Improvement of quality management capabilities
- Ability to foster and strengthen global human resources
- Promotion of diversity
- Efforts to address needs engendered by an aging society and falling birth rates
- Respect for human rights
- Promotion of supply chain management
- Response to economic globalization/efforts to reinforce governance
- Response to the growth of digital businesses

#### The DIC Group's Materiality Matrix



Themes	DIC Sustainability Themes	Relevant UN Sustainable Development Goal (SDG) Icons
	Business models that respond to social imperativesP128	8 EERAN EERAN 9 MARTINEERE 11 EERANUUTEE SDGS Goals 8, 9 and 11
Themes that demonstrate unique capabilities (A)	New technology development and value creationP130	9 Matrix Meeting       12 Reservation         Image: Constraint of the second secon
	Harmony with the community and social contributionsP134 Communication with stakeholdersP137	3 MONETARE 
		З дооналатия В влажится 7 антиваетов 12 везмарта 13 семат 14 иг. 15 иг.
Core and	Environment, safety and health	-// 🟹 🤅 CO 🐼 🗯 🖆
category-specific themes (Themes that combine	Human resources managementP112	3 advances
elements of (A) and (B))	Sustainable procurementP125	12 BOORT S, 4, 5, 8 and 10 12 BOORT STORE
	ComplianceP48	16 MARTING ANDRE
Basic themes (B)	Risk management P50	SDGS Goal 16
	moniation security	•

## Compliance

## Towards Fair and Transparent Corporate Activities





#### Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs

Objective of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
	Achieve target for percentage of employees participating in the e-learning program (90%).	<ul> <li>Participation in e-learning aimed at eliminating bribery and corruption reached 91%.</li> <li>Steps were taken to respond promptly to reports received via the whistle-blowing hotline. No reports of significant violations were received.</li> </ul>	**	Achieve target for percentage of employees participating in the e-learning program
Enhance awareness of compliance.	Encourage use of the whistle-blowing system to promptly identify and correct compliance violations.			(95%). • Implement compliance- and governance- related legal training in Japan, the Asia– Pacific region and Greater China.
Conduct business fairly.	Continue working to eliminate violations of antitrust and anticorruption laws.	Succeeded in eliminating violations of antitrust and anticorruption laws.	**	Eliminate violations of antitrust and anticorruption laws.

### Basic Approach to Compliance

Compliance in the DIC Group encompasses not only obeying laws but also acting in a manner that is in keeping with social norms and the expectations of customers, communities and other stakeholders. With the aim of ensuring sustainable growth for businesses that are both fair and transparent, DIC formulated the DIC Group Code of Business Conduct, a unified set of guidelines the adherence to which it considers to be the foundation of compliance. DIC compels all DIC Group employees to conduct themselves in accordance with the code.

## The DIC Group Code of Business Conduct

The DIC Group completed the DIC Group Code of Business Conduct in July 2014. The code not only mandates compliance with national laws and international rules but also presents 10 principles essential to the professional conduct of DIC Group employees. The DIC Group Code of Business Conduct has since been translated into 25 different languages to ensure that DIC Group employees worldwide share the Group's values and commit themselves to doing what is right, as well as to acting with common sense and an understanding of individual responsibilities, in all aspects of their work.

DIC Group Code of Business Conduct Vee http://www.dic-global.com/en/csr/pdf/code\_of\_business\_conduct\_en.pdf

## 10 Principles Essential to Professional Conduct

- 1 Your Rights as an Employee: Respect, Dignity, Privacy
- 2 Environment, Safety and Health
- Sour Responsibility to Avoid Potential Conflicts of Interest and to Protect Group Property
  Forced Labor, Child Labor, Conflict Minerals
- 4 Anti-Corruption and Anti-Bribery Policy
- **5** Your Relationship with Governments and Government Officials
- 6 Your Relationship with Customers, Suppliers, and External Third Parties
- Ø Money Laundering and Anti-Terrorism
- Insider Trading
- 1 Proper Accounting and Internal Controls Relating to Financial Reporting

## Initiatives to Promote Compliance

In addition to the DIC Group Code of Business Conduct, the Group promotes compliance through the following initiatives:

- Training focused on legal issues to improve compliance awareness is provided for employees at point of hire, when promoted and before overseas transfers. In addition, with the aim of promoting awareness of the DIC Group Code of Business Conduct, in fiscal year 2017 e-learning on the prevention of bribery and corruption was provided in Japan, the Asia-Pacific region and Greater China. Participation in all three regions averaged 91%-plus of eligible employees.
- Ocmpliance officers are appointed at all regional headquarters—DIC (Japan), Sun Chemical (the Americas and Europe), DIC (China) (the PRC), and DIC Asia Pacific (Asia and Oceania)-to spearhead global compliance efforts.

The DIC Group vows that it will not violate the principles of the DIC Group Code of Business Conduct, even if such a violation would appear to profit the Group. As a corporate citizen, the Group also pledges to respect social norms and act in a sound and socially acceptable manner. In fiscal year 2017, there were no serious violations of compliance laws.

## Establishing and Operating a Whistle-Blowing System

The DIC Group has established a whistle-blowing system through which one can directly report an issue or question regarding compliance to the division responsible for compliance. Since fiscal year 2014, the Group has maintained whistle-blowing hotlines that can handle reports in the languages of more than 160 countries. The Group has also devised strict rules under this system to protect whistle-blowers from retaliation, and is working to ensure the system functions in a proper manner.

When a report is received, the Group responds swiftly and appropriately, giving due consideration for pertinent laws while also incorporating internal and external opinions, to promptly identify and correct misconduct and other compliance violations as quickly as possible.



## Antitrust and Anti-Corruption Legislation

The DIC Group has formulated a basic policy to comply with antitrust legislation and made Groupwide efforts to ensure fair business practices. The DIC Group Code of Business Conduct includes rules for complying with antitrust legislation and prohibits involvement in corruption. Since fiscal year 2014, the Group has held more than 160 presentations regarding antitrust and anti-corruption legislation for relevant employees to ensure strict compliance with the laws of the countries in which it operates. In fiscal year 2017, compliance study sessions were held for directors and for the CEOs of DIC Group companies in Japan.

#### Promoting Compliance with Legislation Regarding the Timely Payment of Subcontractors

With the aim of enhancing understanding of the importance of appropriate and fair transactions with subcontractors, the Legal Division held presentations on legislation regarding the timely payment of subcontractors for the purchasing departments of domestic DIC Group companies that incorporated case studies. In January 2016, DIC prepared the Manual for Internal Auditing of the DIC Group's Compliance with Japan's Act against Delay in Payment of Subcontract Proceeds, Etc. to Subcontractors and standardized audit procedures, thereby creating a framework for conducting audits in a more efficient manner. The Group also encouraged employees in related positions to participate in programs sponsored by external organizations, including a workshop on promoting adherence to the Act sponsored by the Japan Fair Trade Commission and the Small and Medium Enterprise Agency.

## Taxation Compliance

In November 2017, the DIC Group formulated an official approach to tax. As an organization with global operations, the Group engages in fair and appropriate tax planning that reflects the nature of its businesses. The Group is also aware of risks associated with transfer price taxation and the use of tax havens and of its obligation to pay appropriate taxes in the proper jurisdictions as appropriate for its operations. The chart to the right shows a geographic breakdown of taxes paid by the Group in fiscal year 2017.

The DIC Group's Approach to Tax web http://www.dic-global.com/en/csr/philosophy/management/tax.html

#### Amount of Accrued Tax in Fiscal Year 2017



# VOICE We provide legal services that are essential to the DIC Group's global operations.

I am currently on assignment at DIC (China) as an overseas trainee, overseeing legal matters in collaboration with the staff of DIC (China)'s legal department. To ensure legal compliance when operating in a country or territory with different laws and regulations it is essential to consult local legal experts. This can be difficult if you don't have a basic knowledge of the country or territory's laws. As a trainee, I have come to realize that Legal Department staff members are expected to communicate with legal experts as well as serve as intermediaries between experts and business units. Looking ahead, I will continue working to gain a firmer grasp of needs associated with global operations with the goal of providing effective legal services.

Legal Department Shunji Tashiro

## **Risk Management**

## Reducing Business Risks and Preventing the Recurrence of Incidents

Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objective of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
Ensure business continuity for the DIC Group.	<ul> <li>Deploy a risk management system that conforms with the risk management policy and reinforce global awareness of the system.</li> <li>Promote ongoing Risk Management Subcommittee–led efforts to systematically implement response measures for critical risks, including governance at subsidiaries.</li> <li>Promote the ongoing improvement of product division BCPs and encourage communica- tion between product divisions and plants.</li> <li>Advance efforts to reinforce the corporate headquarters' crisis management configura- tion and promote safety measures overseas.</li> </ul>	<ul> <li>A risk management system was deployed and steps were taken to reinforce awareness at Group companies in the Asia–Pacific region and the PRC.</li> <li>Efforts were made to encourage the sharing of information and to reinforce cooperation between corporate headquarters in Japan and the Sun Chemical Group, which oversees operations in the Americas and Europe.</li> <li>Progress was made in the promotion of Risk Management Subcommittee–led efforts to systematically implement response measures for priority risks, including governance at subsidiaries.</li> <li>DIC promoted the ongoing improvement of product division BCPs and encouraged communication between product divisions and sites through visiting BCP lectures, among others.</li> <li>The corporate headquarters' crisis management configuration and safety measures overseas were reinforced.</li> </ul>	***	<ul> <li>Deploy a risk management system that conforms with the risk management policy and reinforce global awareness of the system.</li> <li>Promote ongoing Risk Management Subcommittee-led efforts to systematically implement response measures for critical risks, including governance a at subsidiaries.</li> <li>Encourage the ongoing improvement of product division BCPs and fortify communication between product divisions and sites.</li> <li>Advance efforts to reinforce the corporate headquarters' crisis management configuration and promote safety measures overseas.</li> </ul>

## Basic Approach to Risk Management

The DIC Group undertakes risk management initiatives with the aim of appropriately and flexibly addressing changes in its operating environment and the diversification of risks, and of swiftly mitigating damage. The Group recognizes risks in three principal categories: externally caused risks that are beyond its control, corporate risks that can be prevented and business risks that should be handled by the relevant divisions/departments. The Risk Management Subcommittee, which is a subordinate committee of the Sustainability Committee, oversees management of these risk responses.

## Risk Management Policy

The DIC Group first introduced risk management initiatives in 2001 by creating the Compliance Committee and setting up reporting channels. Following the inauguration of the Risk Management Subcommittee in May 2012, the Group undertook initiatives aimed at responding to serious natural disasters and promoting business continuity management (BCM). Since fiscal year 2014, the Risk Management Subcommittee has focused on establishing a risk management policy and a risk management system, efforts that are designed to further enhance corporate value Groupwide. In a bid to ensure the effective and sustainable implementation of initiatives, in January 2015 the Group introduced a newly formulated risk management policy.

## **Risk Management Policy**

Risk management objectives The DIC Group undertakes risk management initiatives with the aim of appropriately and flexibly addressing changes in the operating environment and the diversification of risks, and of swiftly mitigating damage.

- Definition of risks and risk management
  - The DIC Group's definition of risk and risk management is as follows:
  - 1. Risk: All uncertainties that threaten the DIC Group's sustainability and business goals.
  - 2. Risk management: Initiatives to enhance corporate value by managing all risks to the DIC Group from a Groupwide perspective.

## 8 Risk management initiatives

- 1. The DIC Group comprehensively evaluates all risks based on their potential impact on operations and likelihood of occurring, among others, and prioritizes systematic and effective responses.
- 2. The DIC Group constructs and validates risk management systems by repeating the PDCA cycle.
- 3. The Risk Management Subcommittee shares responsibilities with the risk management teams of individual businesses to properly deploy risk measures within the DIC Group. The conference regularly reports on its activities to the Sustainability Committee.

DIC Corporation

Meeting of the Risk Management Subcommittee

Since fiscal year 2016, DIC has encouraged awareness of its risk management policy across the global DIC Group by publishing information on the policy, as well as on risk management initiatives, on its in-house electronic notice board and through the Group's newsletter, *DIC Plaza*. In Japan, the Company also seeks to promote and raise awareness through the provision of training to plant general managers and senior executives of domestic Group companies.

## Risk Management Overview



## Risk Definition and Risk Owners

The DIC Group recognizes risks in three principal categories. The Group manages these risks by clarifying specific risk owners, which are the divisions/departments responsible for implementing responses.

	Risk categories	Main risk owners
Business activities	Risks that should be dealt with by relevant departments These are risks to be considered in the course of conducting business, including those that affect production, development, investment and procurement.	<ul> <li>Product divisions</li> <li>Production, marketing and technical management units</li> <li>Purchasing departments</li> </ul>
Corporate risk	Risks that should be dealt with by specialized departments Unlike risks that should be dealt with by relevant departments, these are risks that affect all Group business activities and can be addressed at the corporate level. Examples include risks related to information management and legal and regulatory compliance.	<ul> <li>Headquarters' administrative units</li> <li>Corporate planning departments</li> </ul>
activities	Risks beyond control These are risks arising from natural events and social circumstances.	<ul> <li>Risk Management Subcommittee</li> <li>Headquarters' administrative units</li> <li>Sites</li> </ul>

**Risk Map** 





- Intellectual property
- 3 Governance at subsidiaries 4 Product liability
- G Pandemics
- 6 Economic fluctuations
- Decline in debt ratings
- 8 Information security
- Operations of overseas business units Major natural disasters
- (Including those attributable to climate change)

- 2 Ability to foster human resources
- B Product quality complaints
- Management of chemical substances
- Optimized global production configuration
- 6 Establishment of global R&D network
- **D** BCM
- B Promotion of supply chain management
- (19) Promotion of occupational health and safety and consumer health (including mental health)

#### Risk Management System

In the process of formulating the risk management policy, the Risk Management Subcommittee established the DIC Group risk management system. This system begins with the distribution to directors of survey questionnaires regarding risks with the potential to interrupt the Group's businesses. Based on survey results, the subcommittee determines priority risks. Risk management plans are produced and risk response measures implemented, improved and reviewed by executives, thereby completing the PDCA cycle, with the aim of facilitating ongoing risk reduction.

DIC positioned fiscal years 2014-2016 as the inaugural phase of risk management predicated on the new system, with subsequent steps to be repeated annually, leveraging knowledge and experience gained. Based on survey results, the subcommittee determines priority risks. The administrative groups that comprise the subcommittee spearhead the assignment of an owner to each risk and work with related departments to implement response measures. A total of 16 priority risks, including "earthquakes, tsunami, volcanic eruptions" and "currency and interest rate fluctuations," were identified as risks to be addressed during this phase.

Looking ahead, DIC will continue to promote awareness and dissemination of the risk management policy and the risk management system. To enhance BCM, corporate headquarters will spearhead the preparation of Business Continuity Planning (BCP) Guidelines for lateral deployment across the DIC Group, which will be optimized to account for the situation on the ground in various countries and territories.



## Progress of Response Measures as of the End of Fiscal Year 2017

The Risk Management Subcommittee has completed the implementation of risk management plan measures to address 15 of the 16 priority risks, that is, all but "governance at subsidiaries," which is particularly broad in scale and will thus be carried over. (For details on this risk, please see page 53.) The effectiveness of measures was assessed and an executive review conducted, based on which the designation for all 15 was shifted from "priority" to "routine." The subcommittee will continue to apply the PDCA cycle, taking decisive steps to further enhance DIC's ability to manage these risks.

In fiscal year 2017, DIC incorporated materiality into the risk identification process. As a result, the Company identified seven new priority risks to be addressed during the period, all of which have the potential to negatively impact business opportunities and DIC's growth. Measures were judged to have been completed for three of these risks, which were redesignated "routine." The Company is currently taking decisive steps to address the remaining four.

A particular focus in fiscal year 2017 was reinforcing measures to promote awareness as a component of efforts to ensure DIC's ability to fulfill its supply responsibilities in the event of a major natural disaster. To clarify the roles of its corporate headquarters and individual sites and appropriate procedures, as well as to encourage the sharing of information, visiting BCP lectures were held at major sites in Japan. By encouraging the exchange of views between participating product division general managers and general managers/group leaders from production sites, the Company sought to advance understanding of BCPs, as well as to elucidate issues and reinforce responses to ensure business continuity in the aftermath of a disaster.

#### Examples of Response Measures for Selected Priority Risks (Fiscal Year 2017)

	Risk category	Possible negative impacts	Principle response measures
	Creation of next-generation businesses (Relevant pages: 128–129)	Dramatic changes in the external environment of existing businesses and insufficient ability to create new businesses; downsizing/financial difficulties attributable to insufficient management of business portfolio	<ul> <li>Analyze current state of business portfolio; assess growth potential and core competencies</li> <li>Next-generation businesses: Assess relevance to core competencies, hypothetical markets vs. existing markets and growth expectations, among others</li> <li>Create framework; establish system for implementation/program, obtain external assessment and secure human resources</li> </ul>
:	Management of chemical substances (Relevant pages: 101–105)	Production stoppages; suspension of exports; recall of products; payment of damages; decline in reputation due to legal/regulatory violations; weakening of brand image; damage to employee health and resulting litigation	Improve information system: Automate identification of substances subject to regulation; add to regulations considered in identification     Increase accuracy of information on chemical substances: Integrate management of information on toxicity and properties, secure information processing experts and promote the use of pertinent systems     Increase accuracy of information on raw materials     Grasp risks associated with handling: Conduct chemical substance risk assessments
:	Ability to foster and strengthen global human resources (Relevant pages: 115–118)	Delay in global expansion of businesses; breakdown of efforts to build relationships with customers; decrease in quality, volume and efficiency of work; weakening of cooperation among Group companies; decline in retention rate for young employees	Promote the implementation of measures designed to facilitate the smooth global expansion of businesses outlined in the current medium-term management plan Ensure that individuals traveling overseas on business/posted overseas fulfill their assigned missions Promote systematic efforts to foster individuals targeted for overseas assignment • Pool global human resources
4	Optimized global production configuration	Significant decline in sales/profits in global markets due to erosion of price competitiveness	Formulate grand design for the optimization of production at domestic facilities     Design optimal overall production configuration encompassing domestic and overseas     facilities     Reflect measures in the new medium-term management plan
:	Efforts to strengthen global technology development capabilities (Relevant pages: 130–133)	Loss of opportunities/critical delays in and withdrawal from overseas businesses; decrease in global competitiveness, capacity for business expansion and brand strength	Establish policy for the fostering and deployment of global technical personnel     Expand the exchange of technologies with the Sun Chemical Group; begin building     the technical foundation necessary for the promotion of medium- to long-term business     collaboration themes and promoting initiatives     Commence global management of intanglible technical assets     Promote education on and awareness of the information security policy     Create technology framework that leverages IT capabilities
	BCM (Relevant pages: 54–56)	Loss of commercial opportunities/withdrawal from businesses/decrease in profits of businesses due to ineffective post-disaster execution of BCPs; payment of damages due to failure to fulfill supply obligations; decline in reputation; casualties and negligence in regard to safety	<ul> <li>Promote awareness of the DIC Group's approach to BCM and its BCM manual</li> <li>Continue to update product division BCPs annually and provide direction for BCP formulation</li> <li>Continue to conduct BCP drills; promote collaboration between product divisions and sites and confirm the effectiveness of individual product division BCPs</li> </ul>
	Governance at subsidiaries (Relevant page: 53–54)	Arbitrary management and internal entanglements, inability to address issues properly, and expansion of concerns/losses out of public view attributable to the appointment of incompetent executives, and to insufficient monitoring by the boards of directors, at subsidiaries, frequent problems, difficulties in achieving results targets, and the discovery of scandals and legal violations resulting from insufficient management and operational capabilities	Enhance the visibility of Group governance systems     Ensure appropriate behavior by subsidiaries' executives     Ensure appropriate behavior by subsidiaries' boards of directors     Help subsidiaries ensure rational front-line operations

#### Efforts to Reinforce Safety Measures Overseas

Owing to the expansion of its global operations, the DIC Group is establishing new overseas bases and increasing the number of employees being assigned to overseas posts or traveling overseas on business. With the rising frequency of terrorism, uprisings, kidnappings and other such incidents in various locations, the Group is reinforcing safety measures designed to help employees evade danger. These include taking steps to advance awareness among related individuals and reinforce the corporate headquarters' ability to respond effectively in an emergency situation by establishing an emergency contact network, providing risk information to overseas bases, distributing safety handbooks, providing safety training to employees prior to taking up new overseas posts or embarking on overseas business trips, and conducting drills based on hypothetical scenarios set forth in crisis management manuals.



Safety training for employees prior to taking up overseas posts



Safety training for individuals prior to embarking on overseas business trips



Safety training handbook for employees traveling overseas on business



representatives residing overseas

#### Initiatives to Strengthen Governance at Subsidiaries

The DIC Group comprises 171 companies in 64 countries and territories. Two-thirds of the Group's employees are located at, and 60% of its consolidated net sales are generated by, bases outside of Japan. DIC recognizes that ensuring subsidiaries share the same values and vision—despite differences in culture, systems and customs— and maximizing management resources, while at the same time complying with local laws, regulations and rules, is critical to sustainable growth for the Group.

It goes almost without saying that in the event of a transgression, an incident of noncompliance or an unforeseen contingency at an overseas DIC Group base, there is a risk that the DIC brand image could be negatively affected, causing damage to the Group as a whole. DIC has thus positioned the management of this risk as a crucial challenge requiring immediate and ongoing initiatives and will continue to promote efforts to strengthen its framework for supporting risk-avoidance worldwide.

#### Framework for Supporting the Management of Subsidiaries

As an organization with global operations, DIC has worked continuously to create internal controls systems and establish governance configurations for its subsidiaries around the world. With the aim of ensuring that subsidiaries' risk management systems function and of reinforcing and increasing the efficiency of their management, in fiscal year 2016 DIC outlined four key themes to guide these efforts. This move was made in line with the Company's belief in the importance of establishing robust frameworks for the appointment of directors, the organization of corporate auditors, the operating structures underpinning subsidiaries' management and the provision of support by the parent company.

- Enhance the visibility of Group governance systems: The DIC Group's matrix-like governance organization positions products on one axis and regions on the other. Steps are being taken to clarify and set down standards for the segregation of duties and the delegation of authority to assist overseas subsidiaries in determining which of the two aspects should be given priority in making business decisions.
- Ensure appropriate behavior by subsidiaries' boards of directors: Prerequisites for the appointment of directors to subsidiaries' boards of directors, which are responsible for supervising executives' performance of their duties, are being established, as are guidelines for board administration.
- Sensure appropriate behavior by subsidiaries' executives: Prerequisites for the appointment of executives, including leadership skills, managerial competence and awareness of compliance, are being established.
- Implement measures that help subsidiaries ensure rational front-line operations: Such measures include setting KPIs for subsidiaries that align with DIC targets, establishing criteria for the provision of support and management assistance by the parent company's functional departments and determining acceptable operating levels.

#### Responding to New Laws and Regulations

Transfer price taxation is one of the principal challenges facing the DIC Group's subsidiaries. With transfer pricing, companies risk double taxation on transactions within the Group, that is, on being taxed on profits in the country of domicile and the country to which it transfers, i.e., sells, its products. As a consequence of the Base Erosion and Profit Shifting (BEPS) Project\*, effective from fiscal year 2018 DIC will be obliged to provide uniform information to local tax authorities in all of the countries in which it has operations. In response, the Company will work with the Group's overseas regional headquarters (DIC (China) and DIC Asia Pacific) and Sun Chemical to confirm and organize transaction information.

\* BEPS is the artificial reduction of taxable income through the shifting of profits to low-tax jurisdictions or other locations where there is little or no economic activity. The BEPS Project is an initiative undertaken in response to demands by G20 member countries seeking to prevent the erosion of their tax bases to plug gaps in tax rules that make BEPS possible.

## Themes Guiding Efforts to Strengthen Governance at Subsidiaries



# BCM

Drawing on lessons from the Great East Japan Earthquake, the DIC Group now accounts for all risks with the potential to interrupt business continuity through BCM. These risks include natural disasters such as large earthquakes and floods; influenza and other pandemics; explosions, fires, leaks and other facility accidents; and major corporate scandals. The Group comprehensively estimates the probability of each risk and its impact on management, prioritizing response measures for more significant risks.

In Japan, which is currently experiencing an active period in terms of volcanic and seismic activity, the Group deploys ongoing natural disaster response measures. These include maintaining headquarters' functions and task force framework, support measures for disasterstricken areas, and producing and renewing BCPs for each key product. The Group facilitates and maintains a system to maintain business continuity through training drills. These encompass drills for safety confirmation, emergency radio warnings, comprehensive disasters, disaster map exercises and BCP.

Having launched a review of BCPs based on social responsibility and customer imperatives in fiscal year 2015, we subsequently proceeded with the formulation of BCPs for all product divisions and related sites. As of fiscal year 2017, we had completed this process for all product divisions. We aim to complete the formulation of BCPs for 80% of core sites by fiscal year 2019.

#### BCM in Fiscal Year 2017

Initiatives in fiscal year 2017 focused on encouraging awareness among and providing training for all product division and Group production site BCP officers in Japan. To ensure that BCP officers share the same understanding of business risks and reinforce recognition of the need to address business continuity as an inherent aspect of everyday operations by encouraging the formulation of highly effective methods for countering various hypothetical crises—thereby enabling DIC to leverage limited resources to secure supply chains and restore sites to operability in the aftermath of a major disaster—the Group conducted visiting BCP lectures at 20 domestic sites. Participating product division general managers and general managers/group leaders from production sites exchanged views on issues and solutions.

## Complementary Production Capabilities

The DIC Group recognizes the need to ensure it can fulfill its supply responsibilities even in the event of damage to facilities from a major natural disaster and thus incorporates this perspective into its BCPs. One way it seeks to do so is through complementary production capabilities. For example, the Group's LC production facilities in Japan and the PRC collaborate on the implementation of BCPs, using a common emergency response manual and holding regular response simulation sessions. Group pigment production facilities have developed a framework that involves continuous cooperation to plan emergency response measures.



## **TOPICS** Visiting BCP Lectures Conducted at 20 Domestic Group Sites

#### Supplying Products in a Socially Responsible Manner

With the aim of facilitating collaboration between sites and corporate headquarters to ensure effective responses in the immediate aftermath of a hypothetical natural disaster, pandemic or serious accident, in fiscal year 2016 product divisions renewed their BCPs. As part of efforts to promote familiarity with new product division BCPs, in fiscal year 2017 DIC conducted visiting BCP lectures at 20 key DIC Group sites in Japan.

The DIC Group produces a wide range of materials and components that can have a significant impact on society if supplies are delayed. For this reason, in the event a production facility suffers damage due to a disaster or other event, it is critical that other sites are able to temporarily take over production or provide backup and that supply chain functions are secured to facilitate procurement of raw materials. Accordingly, the Group recognizes the need to ensure a common crisis awareness among product divisions, as well as among business units and other divisions and departments, clarify roles and individuals in charge, create an effective emergency contact network, and conduct ongoing drills aimed at improving responsiveness.

#### Formulating More Effective BCPs

Visiting BCP lectures were held from February through December 2017. An aggregate total of 300 individuals, including product division staff, Group company executives and group leaders, participated. Lectures included talks given by consultants and theme-specific working groups, which discussed key BCP issues at length, extracting those needing to be addressed over the medium to long term, with the goal of formulating more effective BCPs. DIC will capitalize on insights gained in the conducting of these lectures to promote horizontal deployment at overseas DIC Group companies to create a more robust framework for preventing and mitigating disasters and accidents.







Visiting BCP lecture (Osaka Branch Office)



Comment Our goal is to help facilitate the formulation of effective and genuinely practical BCPs.

Our organization has provided assistance to DIC in its efforts to promote awareness of and revise its BCPs since October 2016. What makes DIC's BCP and risk management efforts different from the more standard undertakings of many other companies is their focus on ascertaining the essence of issues. In 2017, we assisted with visiting BCP lectures at domestic Group sites, the objective of which was to promote awareness by focusing on the people actually responsible for formulation while confirming the basics of BCP and examining the state of related initiatives to clarify where issues exist. During 2018, we will help arrange joint drills for sites—primarily plants—and product divisions and continue advancing initiatives designed to fortify the framework for collaboration between sites and product divisions. Our efforts are designed to avoid turning this process into mere formality, but rather to facilitate the formulation of effective and genuinely practical BCPs. Expect good things from DIC's BCP and risk management initiatives in the years ahead.



President, Legal & Risk Management Institute Ken Mori

# Emergency Response Exercises and Drills

The DIC Group has developed and maintains a system designed to ensure its ability to minimize damage in the event of a disaster, as well as to ensure the smooth restoration of operations. This system includes a wide range of exercises and drills, including safety confirmation drills, emergency radio warning drills, comprehensive disaster drills, map-based simulation exercises and BCP drills.



Comprehensive disaster drill at the corporate headquarters

Task force map-based simulation exercise

BCP drill and training

## First-Ever Emergency Drill Simulating Ballistic Missile Launch

Amid rising political tensions on the Korean Peninsula, in September 2017 DIC conducted its first-ever emergency drill simulating the launch of a ballistic missile in the direction of Japan. The drill played out a scenario in which information has been received via Japan's J-Alert emergency warning system that a missile has been launched, sounds a siren and broadcasts instructions for people to take appropriate actions to avert danger. On each floor, members of the Company's in-house firefighting squad issued instructions for employees to move away from windows and take cover under or behind solid objects. In the event of an unforeseen emergency, it is critical to remain calm and resist the urge to panic. The Risk Management Subcommittee assesses the effectiveness of various drills immediately afterward and incorporates its findings into subsequent disaster prevention planning.

A STATE ANTICAL ANCHE, STORESS

ANTARCORD



Drill in progress

Government-prepared awareness poster in the corporate headquarters cafeteria

た 詳細にサイル落下的の

かな過剰行動 つき建立時期間間 BROM#-++++

#### DIC Corporate Headquarters *Emergency Pocket Books*

Approximately 1,300 employees of the parent company and various domestic Group companies work at the corporate headquarters in Tokyo. DIC has prepared Emergency Pocket Books, pocket-sized booklets that provide instructions on appropriate actions-both autonomous and in cooperation with others-in the event of a disaster for distribution to these employees and their families. The booklets also detail corporate headquarters' overall emergency response framework and the responsibilities of individual floors and departments in an emergency situation, as well as provide space for employees and their families to provide contact information. The compact size of the booklets ensures portability.



Emergency Pocket Books

### TOPIC

#### Training for Taking In Stranded Commuters in the Event of a Major Disaster

One of the most earthquake-prone countries in the world, Japan has been struck multiple times by devastating seismic activity. As a consequence, ensuring earthquake readiness, that is, the ability to prevent and mitigate the impact of earthquakes, is recognized as a critical challenge for society as a whole.

Tokyo's Nihonbashi district, home of DIC's corporate headquarters, is an area noted for its tightly clustered large commercial complexes and office buildings. Every year, a comprehensive neighborhood disaster drill is conducted on an empty lot near the DIC Building. Approximately 300 people took part in the 2017 drill, held on September 22, 2017, the scenario for which was an earthquake of close to 6.0 on the Japanese scale with an epicenter directly below a major urban area, which is something that is predicted to happen in Tokyo at some time in the future. Guided by personnel from the Nihonbashi Fire Station, participants received training in first aid (AED use and hemostasis); practiced using fire hydrants to extinguish fires; and toured facilities designated as temporary shelters for those stranded and an exhibition of relief tents set up by the Japanese Red Cross Society.

The DIC Building, designed with state-of-the-art earthquake-resistant technologies, has been designated as a temporary shelter for stranded commuters in Chuo Ward, where Nihonbashi is located. Accordingly, an exercise was conducted the scenario for which involved the opening of the first-floor main entrance area and taking in shoppers stranded in Nihonbashi when public transportation is suspended in the wake of a disaster. Approximately 60 DIC employees took part in the exercise, which also included instruction in procedures for, among others, receiving and guiding shelter users, distributing rations, blankets, multipurpose plastic thermal sheets and other emergency supplies, and providing first aid and information.

DIC will continue to play an active role in community-based efforts to reinforce local disaster preparations. In doing so, the Company aims to help ensure Tokyo's readiness to handle a major disaster.





Explanation to drill participants Emergency training in the use of by Nihonbashi Fire Station AEDs and hemostasis personnel



Training in the use of fire hydrants to extinguish fires



for stranded commuters set up in the DIC Building



Exhibition of temporary shelters Japanese Red Cross Society exhibition of relief tents

## **Information Security**

### Initiatives to Ensure Information Security

#### Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objective of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
Establish a global information security framework.	<ul> <li>Deploy common ICT-related usage and management guidelines in Japan, the Asia-Pacific region and Greater China.</li> <li>Commence the implementation of measures to reinforce information security in the Asia-Pacific region.</li> <li>Create a framework for the implementation of measures to strengthen BCPs.</li> </ul>	<ul> <li>Common ICT-related usage and management guidelines were deployed and related training provided in Japan, the Asia–Pacific region and Greater China.</li> <li>An Asia–Pacific region information infrastructure/ secure environment creation project was promoted.</li> <li>Steps were taken to reinforce information security based on a risk assessment conducted by a third-party organization.</li> </ul>	**	<ul> <li>Reinforce network infrastructure based on information infrastructure/BCPs designed to ensure preparedness for natural disasters and other issues.</li> <li>Complete Asia–Pacific region information infrastructure/secure environment creation project.</li> <li>Reinforce end-point security.</li> </ul>

## **Basic Approach to Information Security**

The DIC Group has positioned information security as a key management priority and established a Basic Policy on Information Security, which is founded on its recognition that protecting information assets that belong to or are managed by the Group is essential to its ability to conduct business. In line with this policy, DIC has formulated and implemented confidential information management regulations and information management guidelines. (The regulations and guidelines were created in Japan in fiscal year 2010. Deployment in Asia and Oceania commenced in fiscal year 2015.)

The DIC Group works to ensure that directors and employees use the Group's information assets appropriately in the course of business and appropriately handle confidential information. The Group also pursues continuous improvements by conducting internal audits to confirm current issues and identify risks.

## Globally Maintaining and Enhancing Information Security



DIC has continuously taken steps to fortify its system for responding to targeted cyber attacks and other critical risks to its information security. In fiscal year 2017, the Company also took steps to update its information security policy and rules to accommodate the Internet of Things (IoT), the integration of information and operational systems and the expansion of cloud computing and other new technologies. DIC also invited a third-party organization to assess its information security initiatives, which served to illuminate issues requiring attention from an expert, objective and multifaceted perspective, and has begun taking steps to address these issues in order or priority.

The DIC Group periodically employs an e-learning program to encourage awareness of information security and provide training to all employees in dealing with targeted cyber attacks. In fiscal year 2018, the Group will update and reinforce this program with a view to its continued use.

#### Initiatives in the Asia–Pacific Region and in Greater China

In fiscal year 2017, the DIC Group formulated information and communications technology (ICT) usage and management guidelines for the Asia–Pacific region and for Greater China. By promoting the deployment and firm establishment of these rules, the Group will continue working to reinforce the information security measures of DIC Group companies in these regions.

#### Initiatives in the Americas and Europe

Having recognized information security as a challenge of vital importance, the Sun Chemical Group, which oversees operations in the Americas and Europe, works to ensure business continuity and mitigate risks to its information systems and the confidentiality, integrity and accessibility of its data. The Sun Chemical Group also promotes continuous, systematic efforts, based on ISO 27001, designed to reinforce its information security countermeasures, thereby ensuring that it earns and maintains the trust of its stakeholders.



## Safeguarding Information Security Environments in Asia and Oceania

The DIC Group has developed an overall plan for adopting a security system in Asia and Oceania based on a unified infrastructure and in fiscal year 2017 began building country-specific management systems with the aim of combating, among others, computer viruses and software vulnerabilities. In fiscal year 2018, the Group will develop a framework that will enable local IT staff to maintain information security and operate related systems.

#### Initiatives Aimed at Resolving System Failures

The DIC Group backs up its business systems, which are crucial to its ability to ensure global business continuity, by maintaining duplicate systems at a secondary data center. The Group also promotes ongoing, systematic initiatives to ensure preparedness in the event of a natural disaster, pandemic of other unforeseen event, including ensuring mobile connection system redundancy and reinforcing backup centers.

### Common ICT Usage and Management Guidelines for Asia: Formulation, Education and Enforcement

With opportunities for using ICT tools expected to continue increasing, the ability of individual employees to use related tools effectively, with a proper understanding of precautions and rules, will benefit the DIC Group. In fiscal year 2017, the Group formulated common ICT usage and management guidelines for Japan, the Asia–Pacific region and Greater China. These guidelines are based on rules for the use of ICT-related hardware and software previously used in Japan.



At Sun Chemical, we see firsthand the increase and complexity of cyber threats on a daily basis and understand the potential impacts on business. To ensure business continuity, we are focused on protecting our systems and data assets through people, process and technology. Our information security program's foundation is based on the globally recognized ISO 27001 information security framework, and our strategy entails a multilayer security approach and continuous improvements based on threat intelligence and incident response. We have invested in diversified technologies such as data loss prevention solutions, the latest anti-virus software, network security solutions and so on. In addition to technology investments, we are focusing efforts on establishing a global user security awareness program to build a security-minded culture within Sun Chemical by training users how to protect themselves and the organization from cyber threats.



Sun Chemical

(From left) Manager, Infrastructure Chimdi Ifeakanwa Specialist, Security Infrastructure Larry Withrow Global Process Lead Ryan Vasquez

6

## Environment, Safety and Health (ESH)

Toward the Achievement of a Sustainable Society

## Promoting Responsible Care

## **Basic Philosophy**

As a company that manufactures and sells chemical substances, DIC sets standardized safety regulations for ESH initiatives. The Company is working to exceed regulatory standards and fully disclose results. Annual measures augment its core policy.

## Initiatives to Date

Having established its Principle and Policy for the Environment, Safety and Health in 1992, in 1995 DIC pledged to implement the precepts of Responsible Care. Since reaffirming its support for Responsible Care management in January 2006 by signing the CEO's Declaration of Support for the Responsible Care Global Charter, the Company has promoted constant improvements. In 2014, DIC amended its Principle and Policy for the Environment, Safety and Health and renamed it the Policy for the Environment, Safety and Health. The name was subsequently revised to the Environment, Safety and Health Policy.



SDGs Goals 3, 6, 7, 12, 13, 14 and 15

DIC is a signatory to the International Council of Chemical Associations' Responsible Care Global Charter

## Environment, Safety and Health Policy

As a responsible corporate citizen and as a company that manufactures and sells chemical substances, DIC recognizes that care for the environment, safety and health is fundamental to the management of the Company. DIC is committed to the concept of sustainable development in all aspects of its businesses and contributes to the global environment, including biodiversity, by creating environmentally sound products and technologies.

- We take responsibility for the environmental, safety and health implications of products throughout their life cycles.
- We continuously set goals and targets for environmental, safety and health improvements.
- S We comply strictly with laws, regulations and agreements relative to the environment, safety and health. For countries lacking such laws, we prioritize safe operations and protection of the environment.
- We systematically provide education and training on the environment, safety and health.
- S We prepare systems and audit internally to benefit the environment, safety and health.

We disclose these policies internally and externally and ask that all DIC Group companies observe them. The abovementioned "safety" also encompasses security and disaster prevention.

## Focus on Product Stewardship

The DIC Group views product stewardship as essential to the promotion of Responsible Care. Product stewardship is a philosophy that emphasizes assessing product-specific ESH risks and sharing findings, together with information on appropriate handling, with stakeholders, with the aim of reducing the ESH impact of products over their entire life cycle—i.e., from the development of chemical substances through to procurement, production, transport, sale, use and disposal or recycling.

## Applying the PDCA Cycle to Seven Responsible Care Codes

The DIC Group manages its Responsible Care initiatives in a uniform manner using a system comprising seven codes, six of which are mandated by the Japan Responsible Care Council (the first six codes listed) and a management code that was devised internally. In undertaking these initiatives, DIC and DIC Group companies leverage the Group's ISO 14001-certified environmental management system. In addition to these systems, certain overseas Group companies are working to secure the ISO's Occupational Safety and Health Management System (OSHMS) certification through ongoing efforts to enhance their Responsible Care capabilities.





#### Annual Activity Plans

The DIC Group formulates annual Responsible Care activity plans, translating them into English and Chinese. Based on its activity plans for fiscal year 2017, the Group sought to ensure that Group companies operating in each region developed their own specific plans, encouraging them to promote Responsible Care initiatives and contribute to an environment-friendly society through its manufacturing activities.

#### Fiscal Year 2017 Activity Plans

In fiscal year 2017, the DIC Group engaged in Responsible Care initiatives based on the following activity plans.

The DIC Group's Responsible Care Activity Plans	for Fiscal Year 2017	
<ol> <li>Occupational safety and health/disaster prevention In line with the DIC Group's fundamental objective, which rer targets for reducing the incidence of occupational accidents ir</li> <li>Environmental preservation</li> </ol>	nains the achievement of an acciden I fiscal year 2017.	-free workplace, set regional
In line with the DIC Group's goal of reducing its impact on impact and implement measures to facilitate the achievemen reduce carbon, including through the use of energy from re target for reducing the DIC Group's absolute emissions of Co annual average decrease of 1.0%.	the environment, set regional target t thereof. Of particular note, promote newable sources, maintaining an aw $O_2$ by 7.0% from the fiscal year 2013	s for lowering environmental energy-saving initiatives and areness of the medium-term level by fiscal year 2020, an
Cogistics safety		:
Promote the provision of information pertinent to the safe tran	sportation of chemical substances.	
Product stewardship		
Promote the provision of information to stakeholders regarding	g the appropriate handling of products	over their entire life cycles.
Communication with society		
Report on the results of the DIC Group's Responsible Care ac	tivities via the DIC Report.	
6 Management system		
Promote compliance with laws, regulations and agreement	s pertaining to ESH. Make use of the	e PDCA cycle in promoting
Responsible Care activities. Foster human resources in areas	pertinent to ESH.	
	•	
Message from the CEO	\$	4
NC's president and CEO property a massage for ampleuses	2017年度 全国安全通関社長メッセージ	環境月間メッセージ
	限を10月20日企会通知は、ホス141から4月20日本学編期間、7月1日から7月	6月5日は環境の日です。1922年6月5日にストッチウムと2回席 された「国連人国際地会議」を記念して定められた世界相側の記念日 です。また、4月は国際川間と定められています。
or Environment Month and National Safety Week.	「日本単規して、 「組織で直める安全管理 みんなで取り組む安全活動 ままっつかげとへやっつか。」	地球以今、経済・社会・環境の後で大きな課題に推測しています。 そこで、国連は2015年に移植可能な関連目標(SDG) 生材定しまし
	のスローボンのもとに、2000年に10月またでいます。	こ、MAA では利用用用から専用用用まではのラーマが向けられ、それらに対して、2000年に付けた支払用用の換合用用や利用のある・6 を気明らかにしました。その内、約年数が開始に指するテーマであり、
	10日、17月、日本、地球で加マンロタンスなシング、生活活動的などご登込的 数を機能にない、空却に準定した構成を見なしてございとした、しんしながら、20 16年間から間に登め、お波型を作用は、3年ぶつに活躍する場点に起来となってい ます。	中国同都の意思性が引えます。 このような社会的な要認に対して、企業がどのように取り組んでい さったを、時間でかったのか、したびつかった時について、
	2日1日号数公党为5元是梁虹,「金字物资点公理制、公正各等限、国制、公正各 管理部分号的合约者下,局部这些产业一方各方数元之公式的公式的上述是正式的工 与与我们可提示式。一局、期料等部的公共和公会分发展的《美产环境的合作人类 发展器合字中等部项公式会计工业式。	◦の予考、専用(Environment) の数かで倒する数かが損用になってます。この名のことしてまた。これ に取り扱いでいたないが走出け利能が発展の明的生まないと対象され、ス テークホルダーからの反射を欠う時代になってきました。
	免労物質による足損を利点すべく、毎年で良ら良いている名学物類のリスクプセス メントを引い、毎月のたツスク考えたまたこれで、リスクの使品は原告を構成してきま い、毎月の日本の日ムールであるとなど基本時代等が多年の日マイニンで、またき通	■結構開催への花り組みは、結果からの活動である環境自然の乱滅に 加え、学ばつや報告、希情開質用ないった地域構成問題に対して会 塗えしてどのように認道性を発展出来るかが聞われています。

中西義之

5組んで予まい。 で行きましょう。

2017 9 6 /1 1 1

DIC Report 2018 61

北国の後京ムームひとりが、安全軍権の優先に取り組み、詳りを持てる職業と許正 を作り未来につなげて行きましょう。

DESTRIBUTE

中面義之

#### Framework for Promoting Responsible Care

Each year, the DIC Group defines priority issues to address and uses the PDCA cycle in voluntary initiatives at the Group company, plant and research laboratory levels. The Responsible Care Department provides support for these initiatives to advance their progress and conducts regular audits to ensure compliance and improve safety and environmental performance.

#### Support for Group Company Responsible Care Initiatives

The Responsible Care Department provides wide-ranging support to domestic and overseas Group companies (a total of 51 sites), regardless of size, with the goal of enhancing Responsible Care initiatives Groupwide.

#### Principal Initiatives in Fiscal Year 2017

#### Support for Overseas Group Companies

In fiscal year 2016, the DIC Group rebuilt its framework for supporting the efforts of Group companies overseas to promote ESH initiatives in a flexible, autonomous manner appropriate for each country and territory. Once annually, executives from Group companies and site general managers in the PRC and the Asia–Pacific region, executives in charge and Responsible Care officers from corporate headquarters and other individuals hold annual ESH and energy conservation conferences, during which they exchange views on the progress of initiatives, as well as on challenges and future directions.

In a new undertaking, in February 2017 a trilateral Japan–Asia–Pacific–Greater China conference was held at DIC's corporate headquarters. In addition to discussing expanding and enhancing targets and data management, conference participants toured production facilities in Japan that are currently promoting advance initiatives. On another front, Responsible Care officers used the SharePoint intranet platform to share data and conference materials, among others.

#### Asia–Pacific Region

In the Asia–Pacific region, the DIC Group has established ESH country heads (individuals in charge of Responsible Care in individual countries) under the supervision of the regional ESH manager. Country heads hold periodic country-specific conferences, which are also attended by representatives from regional companies and production facilities and the regional ESH manager, to discuss the region's ESH policies, targets and challenges. In addition, a regional country heads from Indonesia, Thailand and Malaysia, the regional ESH manager, the executive in charge of regional operations, and Responsible Care officers, who meet to discuss ESH policies, targets and challenges for the subsequent year. A total of 15 people took part in the 2017 meeting, which was held in November.

#### Framework for Promoting Responsible Care





Greater China and Asia–Pacific region ESH and energy conservation conference (Asia–Pacific region)



Framework for promoting ESH in the Asia-Pacific region

#### [Regional Initiatives]

The DIC Group in the Asia–Pacific region comprises 16 companies in 11 countries. In addition to diverse customs and languages, a key challenge from an operations perspective is differences in awareness regarding occupational safety. To resolve such differences, it was crucial for the Group to establish common occupational safety standards and work to ensure the effective implementation thereof at all regional Group companies. DIC Asia Pacific, which overseas regional Group operations, has acquired certification under OHSAS 18001, the internationally accepted standard for occupational health and safety management systems, and has begun providing encouragement and support for companies in the region seeking to obtain certification, which 12 have done so to date. In fiscal year 2017, the company assisted the efforts of DIC (Vietnam) Co., Ltd., and DIC Philippines, Inc., which will seek certification in fiscal year 2018. At present, 88% of regional production facilities are OHSAS 18001 certified.

## VOICE What we learned through occupational safety training at the Kashima and Saitama plants.

In line with the DIC Group's "Safety First" philosophy, the Kashima Plant provides safety training and equipment to all employees, which we both found impressive. As participants in DIC's Global Capability Development (GCD) Program, we took part in a variety of safety drills, including fire drills, personal protection drills and tsunami evacuation drills at the Kashima Plant and practical safety drills at the Saitama Plant. Individual sections at the Kashima Plant also held regular safety conferences to discuss production floor safety and risk assessments checks. The advantage of these initiatives is that they ensure employees learn what is necessary to prevent accidents and ensure a safe workplace, including proper operational procedures and how to handle chemical substances. A workplace that consistently targets zero occupational accidents is a good workplace. We look forward to sharing these drills with the safety team at our workplace in Indonesia after we return home.



Beta Production Supervisor, Karawang Plant, PT. DIC Graphics Bachtiar Nugroho Amarullah (left) R&D Staff Sugianto (right)

#### Greater China

Steps taken to strengthen the ESH framework in Greater China included dispatching an ESH manager from corporate headquarters to serve as regional ESH director and assigning ESH coordinators to oversee efforts in the southern and eastern parts of the PRC. Teleconferences involving pertinent headquarters and local staff were also held regularly to facilitate the prompt resolution of issues.

#### [Regional Initiatives]

Steps have been taken recently to tighten the PRC's environmental laws, regulations and standards. Some of the country's standards are now even stricter than Japan's. Increasingly stringent safety standards have also been applied since the explosions that occurred at the Port of Tianjin in 2015. DIC is working to rebuild the DIC Group's framework for promoting safety and environmental measures in the PRC by appointing chemical substance managers to DIC (China)'s ESH team and assigning ESH coordinators to oversee efforts in the southern and eastern parts of the PRC. In addition, DIC provides training to site ESH officers on the handling of hazardous chemical substances and organizes lectures given by outside instructors to ensure awareness of current laws and regulations. The Company has also produced and distributed a Chinese-language version of *Principles of Safe Conduct* for workplace reading circles and provides support to employees in a variety of ways until these principles become second nature.

### TOPIC

#### DIC (China) Holds ESH Management Lecture Series

On June 7–8, 2017, DIC (China)'s ESH team held a lecture series on ESH management for general managers and other senior executives of local Group companies in Nanjing. The company invited Yi Fu Liu, general technical advisor for the State Administration of Work Safety's Process Safety Management (PSM) Project, to conduct lectures on, among others, advanced international safety management principles and the creation of a safety-oriented corporate culture, risk control, and the strengthening of laws governing safety management for chemicals companies. Participants commented that the lectures had given them a renewed appreciation of the importance of prioritizing safe operations. DIC (China) will continue to organize opportunities such as this with the aim of building a safety-oriented corporate culture.



#### Comment My impressions of DIC (China)'s ESH education

In June 2017, I was honored to be asked to assist with training for DIC (China) employees on advanced international safety management principles and the creation of a safety-oriented corporate culture in Nanjing. Training provided by DIC was meticulous, while the venue was laid out purposefully and participants actively exchanged opinions. The event was highly satisfactory from an educational perspective and highly rated by both management and employees. Through this experience, I learned that the company's executives are truly concerned about safety management and places a high priority on caring for employees. The event also showed the company's confidence in and resolve to maintain its solid safety management performance.



I also commend DIC (China)'s decisive Kaizen initiatives. I am grateful for the company's full support of my organization's educational efforts and hope that the information I was able to import regarding advanced international safety management principles, techniques and tools will prove useful. I also look forward to great things from the company in the years ahead.

General Technical Advisor, PSM Project, State Administration of Work Safety Yi Fu Liu

#### Europe, the Americas and Africa

The Sun Chemical Group oversees all Responsible Care initiatives by Group companies in Europe, the Americas and Africa. With the aim of sharing the overall DIC Group Responsible Care policies and values and facilitating close cooperation with the Sun Chemical Group, ESH officers at corporate headquarters in Tokyo hold periodic ESH conferences. In May, September and November 2017, officers met to exchange views on, among others, the status of initiatives, management of chemical substances and systems in place to facilitate contact in the event of an emergency.

#### Support for Group Companies in Japan

Calls are increasing for companies to further reinforce their frameworks for managing employee health and preventing occupational accidents. In fiscal year 2016, DIC and DIC Graphics introduced GL conferences, gatherings of ESH officers from principal production facilities across the country who have been appointed group leaders (GLs) and who oversee site ESH initiatives. GL conferences were held five times in fiscal year 2017, with Responsible Care officers also in attendance, with the aim of crafting standards, among others, and exploring improvements to address shared challenges.

#### Information Disclosure and Engaging with Society

The DIC Group strives to increase the transparency of its activities through the active disclosure of information and at the same time promotes dialogue with stakeholders by, among others, providing safety- and environment-related data through Group websites, the DIC Report and other media, as well as by holding environmental presentations for local residents at production facilities.

The DIC Group also promotes a variety of efforts to deepen its engagement with society. In Japan, such efforts include preparing site reports, inviting junior and senior high school students in for hands-on lab lessons, participating in community disaster drills, and providing assistance for local festivals and other local events. Overseas Group sites seek to advance dialogue and interaction with local communities by participating in tree plantings and other activities aimed at helping prevent global warming and preserve biodiversity.



Environmental presentation for the local community (Saitama Plant)



Site report (Saitama Plant)



Community event (bon odori) participation (Tokyo Plant)

#### Tree Planting Efforts (DIC (Guangzhou)) (PRC)

In April 2017, 33 employees of DIC (Guangzhou) Co., Ltd., which handles sales of DIC products, planted trees on the most renowned mountain in Guangzhou, Mt. Baiyun Shan, a 28 km<sup>2</sup> area of scenic beauty and popular tourist attraction that welcomes thousands of visitors every year. For planting, employees chose sweet olive trees (*guihua* in Chinese), which are well suited to the climate of Guangzhou and have fragrant flowers that are often used in Chinese teas and confections.



#### Testing of Firefighting Foam (Hokuriku Plant, DIC) (Japan)

In June 2017, the Hokuriku Plant invited pertinent individuals to view a testing of *Megafoam* alcohol-resistant firefighting foam. *Megafoam* can be used to put out fires involving watersoluble flammable liquid materials such as alcohol and ketones, because it does not dissolve when it comes into contact with water, thus maintaining excellent extinguishing capability. This has made it a popular choice among fire departments, electric power stations and the Japan Coast Guard, among others. With the aim of increasing awareness of this product and its performance, and in so doing to help prevent and minimize damage from fires, the plant intends to continue planning and implementing such tests going forward.



### TOPIC

## Siam Chemical Industry Wins Award for Balancing Industrial Development with Environmental Conservation

In September 2017, Siam Chemical Industry was awarded a Level 4 Green Industry Award by Thailand's Ministry of Industry. The Green Industry Award is an award system established by the Ministry in 2011 for the purpose of enabling compatibility between the cultivation of domestic industries and environmental conservation. The award comprises five levels, and companies achieving the criteria for each level are awarded a Green Industry Mark for that level. Siam Chemical Industry, which has earned certification under ISO 14001 and ISO 9001, had previously earned Level 3 and this year was awarded Level 4 (Level 5 is the highest). Level 4 has been awarded to 189 companies. To date, Siam Chemical Industry is the first chemicals company in Samut Prakan Province to receive this level.



DIC Report 2018 **65** 

## **ESH** Auditing

### **Basic Approach**

Responsible Care Department specialists with expertise, experience and auditing capabilities regularly collaborate with executive officers to audit Responsible Care initiatives at Group companies. Top DIC executives also take part in ESH audits at numerous sites each year to enhance Responsible Care performance across the DIC Group.

Overseas, Responsible Care Department specialists and regional headquarters' ESH officers assess the progress of efforts at production sites and work together to enhance the effectiveness of Responsible Care initiatives.



EHS audit conducted by DIC's Chairman and CEO

#### Audits in Fiscal Year 2017

In Japan, Responsible Care Department specialists have audited the Responsible Care efforts of domestic consolidated subsidiaries since fiscal year 2014 to verify efforts and support improvement activities. In fiscal year 2017, audits were conducted at DIC's nine principle sites and four DIC Graphics' sites. The Company also conducted audits using self-assessment checklists of 13 sites belonging to nine other domestic Group companies with the aim of enhancing safety and environmental management. ESH officers from DIC's principal sites took part in the audits of domestic Group company sites and also provided directions regarding the administration thereof.

Similar efforts are also promoted overseas, with audits becoming more stringent every year. In fiscal year 2017, the Group conducted inspections to determine the status of management systems, as well as Responsible Care audits in three areas (environment, safety and health) at 17 sites belonging to 17 companies in Greater China, three sites belonging to three companies in the ROK and 21 sites belonging to 16 companies in the Asia–Pacific region to determine the status of management systems and follow up on ESH initiatives. These audits used self-assessment checklists to confirm that each unit is progressing steadily through application of the PCDA cycle. Audits in Greater China were improved to include a revised self-assessment checklist comprising approximately 200 questions. Audits were also conducted at 39 sites by the Sun Chemical Group, which oversees DIC Group operations in Europe, the Americas and Africa, and at seven sites by subsidiary Seiko PMC Corporation, which manufactures chemicals for paper production and resins for printing inks and reprographic products, with DIC fully aware of audit results and the progress of subsequent improvements.

In fiscal year 2017, the Group reported one violation of environmental regulations overseas\*. Prompt steps were taken to make improvements to prevent recurrence. \* Violation with a penalty exceeding \$10,000



More detailed self-assessment checklist (Greater China)







Initiative at DIC Graphics Chia Lung Corp. (Taiwan)

## Audits Conducted at Subsidiaries' Sites (Fiscal Year 2017)



## Occupational Safety and Health and Disaster Prevention

Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objective of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018	
Ensure occupational safety and health.	Reduce frequency of occupational accidents resulting in workdays lost.DIC Group in Japan:1.8Asia-Pacific region:2.2Greater China:2.0Americas/Europe:8.0(Global DIC Group:4.57)	Reductions achieved: DIC Group in Japan: 2.65 Asia–Pacific region: 1.98 Greater China: 1.46 Americas/Europe: 6.46 (Global DIC Group: 3.98)	* *** ***	Reduce frequency of occupational accidents resulting in workdays lost.DIC Group in Japan:1.8Asia-Pacific region:2.2Greater China:2.0Americas/Europe:8.0(Global DIC Group:4.56)	

#### Occupational Safety and Health

#### **Basic Approach**

The DIC Group recognizes that operational safety is both fundamental to its businesses and the core component of Responsible Care. Accordingly, the Company undertakes occupational safety and health, security and disaster prevention measures to foster a "Safety First" philosophy Groupwide and in the mind of every employee.

Because its manufacturing operations span diverse fields, the DIC Group has numerous production processes that use hazardous and toxic materials and rotating devices, including ones that do not involve chemical reactions. Any accident involving such materials or devices has the potential to significantly impact society in general and damage the health of the Group and partner company employees and local residents.

With the aim of preventing such accidents, the DIC Group places a high priority on reducing risks in the workplace by enhancing awareness of *Principles of Safe Conduct* and training highly perceptive safety personnel. The Group strives to enhance safety through efforts to reinforce its safety infrastructure and create a safety-oriented corporate culture.

#### Framework for Promotion

The DIC Group sets individual regional occupational safety and health targets. The Responsible Care Department and regional headquarters work together to conduct Group company-specific risk assessments, analyze occupational accidents and promote remedial measures.

#### Principal Initiatives in Fiscal Year 2017

#### Making Regional Data Visible through Monthly Reports

The DIC Group conducts its diverse businesses in accordance with a wide range of national and regional legal systems, working environments and practices. The risk of accidents and disasters varies from one industry to another because of differences in the facilities, machinery and raw materials used. For Group companies to work as one to improve occupational safety and health, it is therefore crucial to establish appropriate benchmarks for each region (Japan, Greater China, the Asia–Pacific region, and the Americas and Europe).

DIC promotes the sharing of information on accidents, disasters and reporting procedures for each region, as well as gathered and shared statistical information related to occupational safety, including employee numbers, working hours, number of accidents leading to workdays lost, number of accidents involving fires/explosions, workdays lost, workdays lost before restart of operations, occupational accident frequency rate, occupational accident severity rate, workdays lost per thousand employees and workdays lost per million work hours. This approach makes it possible to objectively compare the operational safety of individual Group companies, establish more precise targets and facilitate improvement programs.

In fiscal year 2015, DIC established a system for aggregating monthly occupational safety and health data for each company in Greater China and the Asia–Pacific region as a monthly report. Domestic Group companies already had such a setup in place. This made it easier to more swiftly identify and compare working hours, the numbers of accidents leading to workdays lost, occupational accident frequency rates and other monthly data for these regions, thereby further streamlining Groupwide management.



Monthly report

#### 2 Reducing Risks

By understanding potential risks in production processes, facilities and devices, and the hazards of chemical substances, the DIC Group systematically prepares initiatives to prevent accidents and occupational injuries. In Japan, the Group has formulated guidelines for conducting risk assessments when deploying new or modified equipment or changing production processes and promotes ongoing efforts to reduce risks associated with chemical substances.

With the aim of reducing risks associated with chemical substances in Japan, since fiscal year 2015 the DIC Group has created a framework to facilitate the methodical implementation of risk assessments in line with the policy set forth by the Ministry of Health, Labour and Welfare. Of particular note, in fiscal year 2016 the Group formulated proprietary assessment guidelines, including for assessment procedures, and is considering measures to evaluate hazards and toxicity and lower risks associated with chemicals set forth in Japan's Poisonous and Deleterious Substances Control Act, such as modifying and improving practices for handling such substances. Individual sites have created risk assessment frameworks and developed three-year plans to govern initiatives. The progress of these risk assessments is confirmed through ESH audits.

#### Promoting E-Learning–Based Training for Employees

To enhance its ESH and disaster prevention capabilities, the DIC Group recognizes the importance of ensuring that all of its employees gain a broad understanding of chemical substances, production processes, and pertinent laws and regulations. In fiscal year 2016, the Group introduced an e-learning program on a trial basis, structuring training around laws and regulations pertinent to the operation of production facilities, including the Fire Service Act, the Air Pollution Control Law and the High Pressure Gas Safety Act, and verifying the appropriateness of education materials from the perspective of Responsible Care Department specialists, ESH officers and production departments, among others. In fiscal year 2017, the program was introduced formally for DIC Group companies in Japan, with 137 employees registering to take part. Participants can take up to 16 classes and must score above 80 points to earn certification.

In the PRC, the Group began an e-learning program on safety management for ESH officers in fiscal year 2016, capitalizing on a highly developed smartphone-based e-learning environment and active national and regional government endorsement, and intends to gradually introduce and expand availability. To date, 52 courses have been provided to ESH officers and facility specialists at 13 production facilities across the country. Going forward, the Group will continue to adopt tailored e-learning programs with the goal of supporting efforts to enhance employee know-how and skills.

03.02.044		BARRIEL-	216- B B
1000	100	-	N.CO.
18 E			derer.
184894	A+8195	0.0000	windows:
1000 C			
100	125	150	<b>2</b>
a. man	1.3	124	
Contraction and a	Concession of the second secon	ACTOR OFFICE	Contract of the second s
		1923114 -	<b>参与人族</b> い
an Tairtes		NURALIA Stratuczy	<b>申</b> り人数 に
B TARTAN MANDAN Mana		NENIH - Pristanti 2016arti 2016arti	95A8 10 12
8 744785 94.4845 8445 8445 8445 8445 8445 8445 844		888418 - 20156413 20156413 20156413 20156413	95A8 10 12 10
10 7122701 9242015 924201 924202 915000		88810 - 216000 216000 216000	9%AB 12 52 12 12
10 7122741 74275 2272 2272 2272 2272 2272 2272 227		82817 - 2156270 2156270 2156270 2156270 2156270	한사료 10 52 10 10 10 10 10 10 10 10 10 10 10
.0 74.82.94 74.75.75 74.75.75 28.55.75 29.55.75 29.55 20.55		025017 - 205007 2050000000000	000 AB 100 100 100 100 100 100 100 100 100 10
ы 74.8284 98.9845 28.9278 28.9278 28.9275 28.9275 28.9275 28.9275 28.9275 29.9275 29.9275 20.		00010	9%A8 10 12 10 10 11 11 10 12
18 (74278) 42592 (19272 (19272) (1927) (1928) (1929) (1929) (1929)		808414	01 AB 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
		998404	65A8 67 87 87 87 87 87 87 87 87 87 87 87 87 87
ын (тайхта) (тайхта) (тайхта) (тайхта) (тайхта) (тайхта) (тайхта) (тайхта) (тайхта) (тайхта) (тайхта) (тайхта)		88848 - 2016/01 2016/01 2016/01 2016/01 2016/01 2016/01 2016/01 2016/01	95AR 10 10 10 10 10 10 10 10 10 10 10 10 10

Portion of e-learning program

#### Training Skilled Safety Personnel to Predict Risks

To foster skilled safety personnel, the DIC Group provides regular safety education and training on how to handle chemical substances, using materials such as *Principles of Safe Conduct, Environment and Safety Guidelines for the R&D Department*, safety data sheets (SDSs) and its Occupational Accident Case Studies database. In recent years, the Group has focused especially on a technique called Kiken Yochi Training (KYT) ("hazard prediction training") and on hands-on safety training for employees of Group companies worldwide. The Group also undertakes similar initiatives at production sites. *Principles of Safe Conduct* has been translated into several languages, with local employees in the ROK and Malaysia translating the document for their own use after corporate headquarters produced Chinese- and English-language versions for use throughout Greater China and elsewhere in the Asia–Pacific region. KYT is a constructive way to further increase safety awareness. Domestic DIC Group companies use the techniques extensively and the Group is working to accelerate deployment across Greater China and the Asia–Pacific region.

#### 5 Promoting Hands-On Safety Training

The DIC Group's full-fledged hands-on safety training program began in 2012 with the introduction of a mobile initiative using equipment transported from site to site. Since fiscal year 2013, the Group has installed permanent training equipment in Japan (six sites), the PRC (three sites), Taiwan, Malaysia and Indonesia. Over the past few years, these and other initiatives have helped to almost halve the frequency rate of occupational accidents\* resulting in workdays lost at DIC Group sites in Japan. The Group's hands-on safety training simulates common workplace accidents— including those involving entanglement in rotating devices, falls from high places and incised wounds caused by cutting equipment—based on actual previous examples with the aim of reducing employees' willingness to accept risks and fostering their ability to recognize danger. In doing so, the Group seeks to transform the mindset of employees by encouraging them to think and act on their own to protect themselves and each other from latent risks.

\* The "occupational accident frequency rate" expresses the frequency of accidents resulting in workdays lost, calculated as the number of deaths or injuries per million work hours.

#### Initiatives in Japan

In 2014, the Group opened the Saitama Hands-On Safety Training Center, a facility boasting equipment that allows the simulation of an array of accidents, with the goal of fostering skilled safety personnel by incorporating training in new employee and rank-specific training programs. DIC's Chiba, Sakai, Hokuriku, Saitama, Kashima and other plants have also established their own hands-on safety training equipment and curricula to further embed safety into the DIC Group culture. With the aim of reducing accidents among inexperienced employees, Group companies, led by DIC and DIC Graphics, have included safety training and KYT in the training curricula for new employees. In fiscal year 2015, the Group downsized six types of hands-on equipment for the mobile initiative and raised the standards of lecturers.



KYT for new employees

#### Hands-on safety training: Simulating being caught in a chucking apparatus

#### Initiatives at Overseas Group Companies

Group companies overseas are also deploying hands-on safety training. In Greater China, hands-on safety training equipment has been installed at Nantong DIC Color Co., Ltd., a manufacturer of printing inks and organic pigments; DIC Graphics (Guangzhou) Ltd., a manufacturer of printing inks; and Changzhou Huari New Material Co., Ltd., which manufactures synthetic resins, in the PRC, and printing inks manufacturer DIC Graphics Chia Lung Corp., in Taiwan. In the Asia–Pacific region, equipment has been installed at DIC Compounds (Malaysia) and Indonesia's PT DIC ASTRA Chemicals, both of which manufacturer DIC India. These companies provide hands-on safety training for employees across their respective regions, as well as education for safety instructors. In fiscal year 2016, the cumulative number of participants in hands-on safety training across the global DIC Group surpassed 10,000.

#### TOPIC

#### Hands-On Safety Training Facilities Established in Thailand and India

In August 2017, hands-on safety training equipment for simulating entanglement in rotating devices, tumbles, falls from high places and other common workplace accidents were installed at Siam Chemical Industry's plant in Samut Prakan Province and DIC India's plant in Noida. The global deployment of hands-on safety training equipment, including the installation of equipment, has proceeded under the direction of DIC in Tokyo. These facilities also provide training to qualify ESH officers assigned to Group companies across the Asia–Pacific region as hands-on safety instructors to oversee training to local employees, which has underpinned a steady increase in awareness of safety. The installation of equipment at Siam Chemical Industry and DIC India facilities marks the first time local Group companies and employees have spearheaded such a move.



Employees participating in hands-on safety training at Siam Chemical Industry (left) and DIC India (center) and view of a training room

#### Number of Hands-On Safety Training Participants (Fiscal Year 2017)

	DIC Group (Japan)	DIC Group (overseas) (Greater China: 4 companies; Asia-Pacific region: 2 companies)	Total
FY2017	452	786	1,238
Cumulative total (FY2012–2017)	8,442	3,138	11,580

#### Status of Occupational Accidents

The DIC Group promotes a variety of initiatives aimed at eliminating occupational accidents. In fiscal year 2017, the number of occupational accidents resulting in workdays lost across the DIC Group was down from the fiscal year 2016 level. Looking ahead, the Group will continue working to analyze the causes of occupational accidents resulting in workdays lost that have occurred to date and to reflect its findings in concrete improvements with the goal of preventing the occurrence of such accidents in the future.

#### Workdays Lost Due to Occupational Accidents (FY2015-2017)

	DIC			DIC Group (Japan)		DIC Group (Global)			
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Number of workdays lost	1	3	2	5	5	3	88	71	70
Frequency rate	0.181	0.541	0.360	0.556	0.548	0.331	2.375	1.893	1.752
Severity rate	0.005	0.012	0.054	0.018	0.026	0.028	-	-	-
TRIR	1.27	2.35	2.16	2.11	3.07	2.65	4.32	3.84	3.98

\*Total recordable injury rate (TRIR): Number of occupational accidents resulting in lost workdays + Number of occupational accidents not resulting in lost workdays / Million work hours

#### **Severity Rate**



Severity rate = Total number of workdays lost × 1,000 Total work hours

A severity rate of 0.1 means 100 workdays lost in one year at a site with 500 people.

#### **Frequency Rate**



calculated as the number of deaths or injuries per million work hours.

Frequency rate = <u>
Number of occupational deaths or injuries</u> × 1,000,000 Total work hours × 1,000,000

A frequency rate of 1.0 means one occupational accident resulting in workdays lost in one year at a site with 500 people.

#### Safe Corporate Climate Cultivation Working Groups

Safe Corporate Climate Cultivation working groups comprise personnel in charge of safety at plants belonging to DIC and subsidiary DIC Graphics. These groups have been active since fiscal year 2011. Members meet regularly to discuss and exchange proposals regarding safety policies and measures.

- Fiscal year 2012: Working groups presented recommendations on safety policies and produced warning stickers to enhance awareness of workplace hazards.
- Fiscal year 2013: Working groups prepared safety posters featuring the president and CEO and started reading out key passages from *Principles of Safe* Conduct in workplaces with the aim of making the practices therein routine.
- Fiscal year 2014: Working groups prepared an illustrated version of Principles of Safe Conduct for reading out in workplaces.
- Fiscal year 2015: Working groups edited *Principles of Safe Conduct* into a tear-off calendar version for distribution at all workplaces. The calendar version was translated into English and Chinese.
- Fiscal year 2016: Working groups in the PRC began reading out key passages from Principles of Safe Conduct to further strengthen the DIC Group's culture of safety.
- Fiscal year 2017: Working groups updated *Principles of Safe Conduct* and prepared safety posters featuring the president and CEO to be put up at Group companies in fiscal year 2018.

安全基本动作

#### ■■■■ 安全基本動作





Pages from the illustrated version of *Principles of Safe Conduct* for workplace reading circles (available in Japanese, English and Chinese)



Qingdao DIC Finechemicals' employees reading out key passages

#### Occupational Health

The DIC Group handles a broad range of chemicals, including specified chemical substances and organic solvents. To safeguard the health of employees handling these chemicals, the Group regularly conducts health checkups and environmental measurements, and modifies and improves working conditions as needed. Industrial physicians, health supervisors and other experts inspect workplaces to manage employee health.

#### Electronic Storage of Employee Work and Health Records

Japanese laws and regulations mandate that companies handling specified chemical substances with the potential to cause serious health problems as a result of long-term exposure must maintain appropriate working environments as well as store work and health check records for 30 years. Companies must also maintain storage space for these records to minimize the risk of paper-based documents going astray or becoming lost.

In fiscal year 2014, the DIC Group in Japan built a centralized data management system comprising an information network linking each work site, facilitating the electronic recording and storage of data for each employee and the review of information by supervisors and administrators. The system ensures consistent recording formats at each site and helps eliminate the risk of records going astray while resolving the issue of storage space.

#### Occupational Health and Safety for Employees of Partner Companies and Subcontractors

In Japan, the DIC Group signs outsourcing agreements with partner companies and subcontractors that have offices on its sites and contracts work out to construction and logistics firms. All such firms are obliged to observe the DIC Group's Environment, Safety and Health Policy, as well as with pertinent occupational safety and health-related laws and regulations. The Group has established a DIC Safety Council at each principal domestic site, enabling site safety and health personnel and partner companies/subcontractors to cooperate in implementing safety patrols, conducting training and drills related to the handling of chemical substances, and staging safety rallies that feature lectures, presentations on best practices and other awareness-promoting initiatives during National Safety Week (July) and National Environment Month (June) and on site-specific safety days.



Safety rally (Kashima Plant)

#### Process Safety Management

DIC calculates process safety accidents at DIC Group sites in Japan in accordance with International Council of Chemical Associations guidelines. In fiscal year 2017, the Group reported 12 process safety accidents. The process safety accident frequency rate, that is, the number of such accidents per million work hours, was 1.32.
TOPICS

#### Sakai Plant Wins Certificate of Appreciation from JISHA

In November 2017, DIC's Sakai Plant, located in Osaka, received a certificate of appreciation from the Japan Industrial Safety and Health Association (JISHA) at the National Industrial Safety and Health Convention in Kobe. The organization gave high marks to the plant's efforts to achieve zero occupational accidents by conducting risk assessments to identify and eliminate or minimize risk, as well as to foster human resources, including through the provision of training for new and mid-career hires. The certificate was accepted by Takatoshi Ogawa, manager in charge of the Sakai Plant's Safety and Environment Group, who has worked over many years to enhance the plant's occupational safety and health initiatives.

#### Yokkaichi Plant Wins FDMA Commissioner's Award

In June 2017, the Yokkaichi Plant, in Mie Prefecture, received a fiscal year 2017 Fire and Disaster Management Agency (FDMA) Commissioner's Award as an excellent hazardous materials-related site. Located in the Yokkaichi Industrial Complex, the plant, which commenced operations in 1974, manufactures polystyrene for use in food containers and a variety of items for daily life. The facility has for many years implemented initiatives aimed at ensuring the safe management of hazardous materials and proper safety training. These include formulating rules based on pertinent laws, conducting facility risk assessments and implementing drills to guarantee preparedness in the event of a plant accident or major earthquake. Thanks to these and other efforts, the plant has not had an accident resulting in workdays lost since July 2004, reporting 4,649 consecutive accident-free days as of March 1, 2017. The FDMA also praised the facility as a hazardous materials-related site that has made notable contribution to ensuring the safety of people's lives.

#### Seiko PMC's Chiba Plant Receives JCIA Safety Award Special Prize

DIC Group company Seiko PMC's Chiba Plant was presented with a JCIA Safety Award Special Prize for 2017 at the annual convention of the Japan Chemical Industry Association (JCIA) in May 2017. JCIA recognizes companies that have conducted outstanding safety initiatives that serve as an example. The reward was in recognition of the plant's 44 consecutive years of accident-free operation, dating back to February 1973, which have been guided by four key priorities: compliance with laws and rules, KYT and pointing and calling prior to starting work, the wearing of proper protective equipment, and the assessment of chemical substance risks.

## **Disaster Prevention**

#### Basic Approach and Organization

Any fire, explosion or leak of hazardous substances from a chemicals plant could have a tremendous impact on local residents and the rest of the community and damage the health of employees, including those of partner companies. In addition to establishing a security management system to prevent such accidents, the DIC Group operates and maintains its facilities in line with pertinent laws and regulations. The Group regularly conducts emergency drills and has earthquake and other response measures in place.

DIC also undertakes risk assessments to ensure its ability to construct safe production facilities. In 2013, the DIC Group formulated the DIC Process Risk Management (PRM) Guidelines\*, which consist of four assessment techniques and implementation timetables for each. The Group uses these tools to conduct regular risk assessments at each of its sites. To aid in effective BCP, an essential component of risk management, in fiscal year 2016 the Group identified priority risks and implemented emergency response drills.

\* The DIC PRM Guidelines outline timetables and implementation frameworks for assessing the handling of chemical substances, production processes, production formulas, machinery and work practices with the aim of comprehensively identifying and steadily reducing risks associated with production and R&D processes.





平成2

## TOPIC

#### Drones Used for the Inspection of Elevated Facilities

In fiscal year 2017, DIC commenced the use of drones for the inspection of structures and elevated facilities on a trial basis at its Tatebayashi Plant, in Gunma Prefecture, which manufactures products such as plastic colorants (masterbatches). Inspections conducted for the purpose of facility maintenance include elevated facilities, roofs and rooftop pipes and usually involve erecting scaffolding for visual inspections by workers to identify areas where repairs are required. Since it is not possible to predetermine specific locations in need of repair, scaffolding must be erected over a wide area for the duration of the inspection, requiring substantial investments in terms of both time and expense.

Using aerial images captured by drones makes it possible to narrow down the locations requiring repair and assess the level of damage in advance, increasing the efficiency of inspections carried out in high places. The use of drones is governed by a wide array of laws and regulations, but there are few impediments to drone use at the Tatebayashi Plant because it is not situated in a densely populated area or an industrial complex. Accordingly, DIC is considering deployment for a broad range of applications. Observations using drones proved extremely effective in a disaster prevention drill held at the plant in April 2017. Aerial photography made it possible to monitor the status of employee evacuation procedures and the progress of fire drills simultaneously from the self-defense and disaster prevention headquarters, which was situated at a remote location.



Phantom 4 Pro+ drone



Aerial image captured by a drone confirming the presence of rust on the upper section of a facility



Drone photography of a disaster prevention drill

#### Facility Safety Assessment

#### Assessment Procedures

DIC Group production facilities have an array of equipment, ranging from units where chemical reactions are conducted to machine presses and other processing equipment. When modifying processes or upgrading/replacing equipment, the Group assesses safety at every stage, from process design and construction through to operation, maintenance and final disposal, in line with risk assessment guidelines for reaction processes and facilities, to ensure higher safety levels for new processes and facilities. In fiscal year 2015, DIC revised risk assessment guidelines for machinery and equipment and prepared educational materials to prevent static electricity accidents.

#### Accident and Disaster Analysis and Timely Information

DIC collects and compiles information on internal and external accidents, disasters and problems into its Occupational Accident Case Studies and Accident Case Studies databases. After identifying the causes of accidents or problems and establishing points to be checked, the Company incorporates database information into safety education for DIC and DIC Group companies in Japan and overseas.

#### **3** Initiatives to Enhance Safety Competency

A company's safety competency can be defined as its ability to maintain safety levels at its various sites. As a means of objectively evaluating and enhancing its safety competency, in fiscal year 2013 DIC introduced an assessment system that encompasses questions about safety infrastructure (technical considerations) and the Company's culture of safety (operation and management of organizational culture). This system was developed by the Japan Society for Safety Engineering (JSSE) as a common benchmark for engineers in the chemicals industry and is currently used by companies in Japan that are members of the Safety Competency Enhancement Center.

In fiscal year 2015 the Safety Competency Enhancement Center formulated a system for evaluating processing sites and a prioritized version of the system to streamline evaluations. In fiscal year 2016, the center reviewed and revamped criteria for assessing safety infrastructure and culture of safety, as a result of which application of the system has expanded to include non-chemicals industry companies. In fiscal year 2017, Safety Competency Enhancement Center inspections were conducted at the Yokkaichi and Saitama plants, the results of which the Company is using to implement further improvements.



Saitama Plant



Yokkaichi Plant

ESH

## Emergency Response Drills

DIC augments daily security patrols and periodic equipment checks with regular emergency response drills, especially at production sites in Japan and overseas.







Comprehensive fire drill at the Tokyo Plant



First aid drill at the Tokyo Plant

Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objectives of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
	DIC Group 1. Reduce CO <sub>2</sub> emissions 7.0% from the fiscal year 2013 layed by fiscal	<ol> <li>CO<sub>2</sub> emissions: 634,741 metric tonnes</li> <li>Down 3.7% from fiscal year 2016 (659,378 metric tonnes)</li> <li>Down 12.2% from fiscal year 2013 (722,955 metric tonnes)</li> </ol>	***	DIC Group 1. Reduce CO <sub>2</sub> emissions 7.0% from the fiscal
	year 2020 (average annual decrease of 1.0%).	Reference: CO <sub>2</sub> emissions per unit of production: 296 kg/metric tonne • Down 4.7% from fiscal year 2016 (311 kg/metric tonne) • Down 9.5% from fiscal year 2013 (327 kg/metric tonne)	***	year 2013 level by fiscal year 2020 (average annual decrease of 1.0%).
Reduce emissions of CO2 at sites (Scope 1 and 2).	<ul> <li>DIC Group (Japan)</li> <li>1. Reduce CO<sub>2</sub> emissions 7.0% from the fiscal year 2013 level by fiscal year 2020 (average annual decrease of 1.0%).</li> <li>2. Reduce energy consumption per unit of production 7.0% from the fiscal year 2013 level by fiscal year 2020 (average annual decrease of 1.0%). (Comply with Japan's Act on the Rational Use of Energy)</li> </ul>	<ol> <li>CO<sub>2</sub> emissions: 244,395 metric tonnes</li> <li>Up 0.9% from fiscal year 2016 (242,194 metric tonnes)</li> <li>Essentially level with fiscal year 2013 (244,377 metric tonnes)</li> <li>Energy consumption per unit of production: 3.914 GJ/metric tonne</li> <li>Down 2.4% from fiscal year 2016 (4.010 GJ/metric tonne)</li> <li>Down 6.1% from fiscal year 2013 (4.170 GJ/metric tonne)</li> <li>Reference: CO<sub>2</sub> emissions per unit of production: 222 kg/metric tonne</li> <li>Down 1.5% from fiscal year 2016 (225 kg/metric tonne)</li> <li>Down 4.3% from fiscal year 2013 (232 kg/metric tonne)</li> </ol>	* ***	<ul> <li>DIC Group (Japan)</li> <li>1. Reduce CO<sub>2</sub> emissions 7.0% from the fiscal year 2013 level by fiscal year 2020 (average annual decrease of 1.0%).</li> <li>2. Reduce energy consumption per unit of production 7.0% from the fiscal year 2013 level by fiscal year 2020 (average annual decrease of 1.0%). (Comply with Japan's Act on the Rational Use of Energy)</li> </ul>

## **Basic Approach**

Climate change, a principal cause of which is global warming, is an increasingly pressing issue for the entire world. The Intergovernmental Panel on Climate Change (IPCC), the leading scientific body dedicated to the assessment of climate change, continues to paint a dire picture for the future of the planet as a result of climate change. At the 2015 United Nations Climate Change Conference (the 21st annual session of the Conference of the Parties (COP 21) to the United Nations Framework Convention on Climate Change (UNFCCC)), participants adopted the Paris Agreement, a move aimed at accelerating efforts to tackle this urgent challenge.

As a manufacturer of fine chemicals, DIC recognizes that promoting efforts to curb global warming is a crucial management responsibility. The Company's medium-term sustainability policies thus include a pledge to reduce greenhouse gas emissions from its production facilities. To this end, DIC will continue taking steps to reduce energy consumption and promote low-carbon energy sources, as well as to actively disclose the results of initiatives and obtain third-party verification of its CO<sub>2</sub> emissions data. (At present, 16 of the DIC Group's 32 sites (and 20 offices and research facilities) in Japan have been accorded Designated Energy Management Factory status.)

- Undertake energy-saving initiatives Groupwide
- Deploy effective strategies through working group activities
- Operate energy-saving cogeneration systems (combined heat and power generating facilities)
- 4 Employ energy from renewable resources (biomass, wind power and solar power) at suitable sites
- Extend energy-saving initiatives to DIC Group companies overseas

## Framework for Promotion

DIC and DIC Group companies in Japan have established Energy-Saving Promotion committees at each production and R&D site. Committee activities include confirming the progress of initiatives, engaging in discussions and conducting patrols. DIC has also set up Energy-Saving working groups comprising members chosen from each production facility that fosters the exchange of information, research pertaining to new items and the Groupwide implementation of effective measures. This combination of site- and Group-level initiatives forms the framework under which the DIC Group endeavors to reduce its CO<sub>2</sub> emissions.

DIC Group companies overseas promote a wide range of independent energy-saving initiatives that align with the Group's policy. The Production Management Department provides support on multiple fronts, including the deployment of management systems and the training of employees. Critical initiatives are debated and the progress thereof is reported on by the Sustainability Committee, which answers directly to the president and CEO.

## Principal Initiatives in Fiscal Year 2017

## **1** Setting a Medium-Term Target for the Reduction of CO<sub>2</sub> Emissions

The DIC Group has declared "low carbonization" as a key theme of it sustainability program and is working to reduce energy consumed by its businesses, as well as to advance the use of energy from renewable sources by, among others, adopting biomass fuel, introducing solar and wind power, and purchasing low-carbon electric power.

In October 2016, the Sustainability Committee set a medium-term target for reducing the DIC Group's absolute emissions of CO<sub>2</sub> by 7.0% from the fiscal year 2013 level by fiscal year 2020. To this end, the Group has added promoting the use of electric power generated from renewable energy, including by biomass boilers and solar power systems, as well as the purchase of low-carbon electric power, to core initiatives implemented in line with this target. In its next medium-term management plan, formulation of which is currently in progress, the Group will set a target for beyond fiscal year 2020.

#### Global CO<sub>2</sub> Emissions: Results, Forecasts and Target for Fiscal Year 2020



# Forecast for Global CO<sub>2</sub> Emissions in Fiscal Year 2020 and Anticipated Contributing Factors

(Metric tonnes of CO<sub>2</sub>)



#### Energy Consumption and CO<sub>2</sub> Emissions by the Global DIC Group

Despite a 1.1% increase in production volume in fiscal year 2017, energy consumption by DIC Group companies worldwide decreased 2.9%, to 11,054,000 GJ, from 11,379,000 GJ in fiscal year 2016, while global CO<sub>2</sub> emissions declined 3.7%, to 634,741 metric tonnes, from 659,378 metric tonnes. The DIC Group's diverse product portfolio encompasses printing inks, polymers, pigments, LCs, engineering plastics and compounds. Recent years have seen an uptrend in the output of energy-intensive fine chemicals and a downtrend in the output of items the production of which is comparatively energy efficient. Against this backdrop, the Group's success in achieving a reduction in the volume of CO<sub>2</sub> emitted worldwide that exceeded its target for the year was due in large part to the decisive implementation of energysaving and carbon-reduction initiatives.

Principal factors in Japan	Principal factors overseas
Increased output of biomass boiler at the Kashima Plant (benefit of optimum energy mix)	Fuel conversion at the Karawang Plant (replacement of 10.0% of coal with PKS)
586 energy-saving initiatives	Start-up of biomass boiler at Nantong DIC Color
Reduction in CO <sub>2</sub> emissions attributable to the purchase of low-carbon electric power	Fuel conversion at DIC India (switch from diesel to LNG and LPG)
Replacement of cogeneration system at the Chiba Plant	Implementation of energy-saving and carbon- reduction initiatives by the Sun Chemical Group
Start-up of solar power generation system at the DIC Decor, Inc. (20 kW)	Start-up of solar panels at Siam Chemical Industry (generating capacity: approx. 700 kW) (August 2017)
	Start-up of solar panels at Qingdao DIC Finechemicals (generating capacity: approx. 400 kw) (October 2017)

CO<sub>2</sub> emissions per unit of production in fiscal year 2017, expressed in terms of kilograms of CO<sub>2</sub> per metric tonne of production, fell 4.7%, to 296.0 kg CO<sub>2</sub>/metric tonne, from 311.0 kg CO<sub>2</sub>/metric tonne in the previous period, a decline of 9.5% from fiscal year 2013, the Group's current base year. Going forward, the Group will continue to take steps to reduce energy consumption, including promoting the installation of energy-efficient equipment, improving production processes and increasing facility operating rates, as well as to further advance the use of renewable energy by shifting to clean fuels and furthering its use of solar power.

	Production	volume	Energy consumption	CO <sub>2</sub> emissions	CO <sub>2</sub> emissions per unit of production
	Change from fiscal year 2016	+1.1%	-2.9%	-3.7%	-4.7%
Global	Change from base year (fiscal year 2013)	-5.9%	-11.5%	-12.2%	-9.5%
	Change from fiscal year 2016	+2.9%	No change	+0.9%	-1.5%
Japan	Change from base year (fiscal year 2013)	-1.0%	-1.9%	No change	-4.3%
	Change from fiscal year 2016	-0.5%	-4.6%	-6.4%	-6.0%
Overseas	Change from base year (fiscal year 2013)	<b>-9.9</b> %	-16.7%	-18.4%	-9.5%

#### Changes in Fiscal Year 2017

Change from fiscal year 2013

Self-assessment of performance

 $\bigcirc$ 

Ο

% change

- 6%

- 12%

- 9%

Change from fiscal year 2016

Self-assessment of performance

0

% change

1%

- 4%

- 5%



#### CO<sub>2</sub> Emissions and CO<sub>2</sub> Emissions per Unit of Production



Clobal	CO. Em	liccione l	n Eiccol	Voar 2017
GIUDAI	CO2 EII	1122101121	II FISCAL	



### Global CO<sub>2</sub> Emissions and Change from Base Year (Fiscal Year 2013)



#### CO<sub>2</sub> Emissions in Fiscal Year 2017 by Region

Performance in fiscal year 2017 (Global)

Production volume

CO<sub>2</sub> emissions

CO2 emissions per unit of production

Self-evaluation: · Positive - NA × Poor

340

320

(anne)



#### Global CO<sub>2</sub> Emissions per Unit of Production and Change from Base Year (Fiscal Year 2013)



volume (parent company in Japan only). (Notification submitted to Japan's Ministry of Economy, Trade and Industry)

#### Factors Contributing to the Change in CO<sub>2</sub> Emissions by the Global DIC Group in Fiscal Year 2017

Factor	Change in CO <sub>2</sub> emissions from fiscal year 2016 (metric tonnes)	Change in weighting from fiscal year 2016	Notes
Increase in production volume	7,253	1.1%	Japan: +3.0%; Europe and the Americas: +2.0%; Asia–Pacific region: +3.0%; Greater China: +2.0%; Others: Down
Increase in incineration of waste oil and waste plastics in Japan	6,850	1.0%	Volume of waste incinerated was up from fiscal year 2016 (volume of waste generated declined)
Changes in product mix	5,595	0.8%	Products with high energy consumption per unit of production increased and products with low energy consumption per unit of production (including paper strengthening agents) decreased
Increase in energy consumption in Japan owing to construction of new technical buildings	1,640	0.2%	No. 3 building at the Chiba Plant and No. 8 building at the Central Research Laboratories
Change in CO_2 emissions factor of purchased electric power overseas (from 0.555 to 0.53 metric tonne of CO_2/thousand kWh )	-10,812	-1.6%	Adopted published target in "CO <sub>2</sub> Emissions from Fuel Combustion 2015" (average of fiscal year 2013 global results as emissions factor)
Impact of initiatives in Europe and the Americas to reduce energy consumption and improve productivity	-8,507	-1.3%	Production volume rose 2.0%, while energy consumption declined 1.0%
Impact of the introduction of renewable energy by Group companies overseas (1) Fuel conversion in Indonesia (replacement of 10.0% of coal with PKS) (2) Start-up of biomass boiler at subsidiary in the PRC (otput 2.0 metric tonnes/hour) (January 2017) (3) Installation of solar panels at subsidiary in Thailand (August 2017) (4) Installation of solar panels at subsidiary in PRC (generating capacity: 400 kW) (October 2017)	-6,437	-1.0%	<ol> <li>Full-scale operation commenced in fiscal year 2017 (impact: - 5,150 metric tonnes)</li> <li>Pantong DIC Color installed wood chip-fired biomass boiler (impact: - 999 metric tonnes)</li> <li>Siam Chemical installed solar panels (generating capacity: approx 700 kW) (impact: -226 metric tonnes)</li> <li>Qingdao DIC Liquid Crystal installed solar panels (generating capacity: approx. 400 kW) (impact: -61 metric tonnes)</li> </ol>
Impact of energy-saving and productivity-improvement initiatives in the Asia–Pacific region and Greater China	-5,165	-0.8%	Principal initiatives: • DIC Group company in India shifted to natural gas and implemented energy- saving initiatives DIC Group companies in Thailand, Australia and Indonesia implemented energy- saving initiatives
Increase in power generated using renewable energy at the Kashima Plant	-4,844	-0.7%	Increase in operation of biomass boiler and efforts to achieve an optimum energy mix yielded benefits
Implementation of energy-saving initiatives in Japan	-4,165	-0.6%	586 energy-saving initiatives were implemented
Purchase of low-carbon electric power in Japan (including from existing electric power companies with improved CO <sub>2</sub> emissions factor)	-2,718	-0.4%	Switched to low-carbon electric power for portion of electric power purchased
Changes in reporting boundaries and other factors	-1,796	-0.3%	Did not apply to DIC Pakistan Ltd. (impact: -858 metric tonnes) and certain other companies (impact: -938 metric tonnes)
Replacement cogeneration facilities at the Chiba Plant	-1,531	-0.2%	Commenced operation in January 2017 (resulted in 5.0% increase in efficiency)
Total	-24,637	-3.7%	

#### Energy Consumption and CO<sub>2</sub> Emissions by the DIC Group in Japan

In fiscal year 2017, production volume by the DIC Group in Japan—the 52 sites operated by DIC and domestic Group companies—rose 2.9%. Although energy consumption remained level at 4,314,000 GJ, energy consumption per unit of production—the indicator specified in Japan's Act on the Rational Use of Energy—declined 2.4%, to 3.914 GJ/metric tonne, from 4.010 GJ/metric tonne in the previous fiscal year. Similarly, while CO<sub>2</sub> emissions rose 0.9%, to 244,395 metric tonnes, from 242,194 metric tonnes in fiscal year 2016, CO<sub>2</sub> emissions per unit of production declined 1.5%, to 222.0 kg CO<sub>2</sub>/metric tonne, from 225.0 kg CO<sub>2</sub>/metric tonne in fiscal year 2016. CO<sub>2</sub> emissions were pushed up by increases in the output of energy-intensive fine chemicals and the volume of waste incinerated. These factors were countered by higher operating rates for renewable energy facilities (biomass boiler and wind and solar power facilities) and the positive impact of an appropriate balance of renewable energy sources, including a 1,700 kW–capacity cogeneration system, at the Kashima Plant. Other causes included the replacement of the Chiba Plant's cogeneration system with a new system with a generating capacity of 3,375 kW and 8.0 metric tonnes of steam/hour and the implementation of 586 energy-saving initiatives at production sites, which underpinned improvements in both energy consumption per unit of production and CO<sub>2</sub> emissions per unit of production.

Regarding CO<sub>2</sub> emissions in the supply chain, DIC reports data for six of the 15 categories of Scope 3<sup>\*</sup>, including "capital goods," "waste generated in operations" and "business travel." Third-party verification is obtained for "waste generated in operations."

\* Scope 3 emissions are indirect emissions from production, transport, shipment, commuting and other activities in the supply chain.



## Changes in CO<sub>2</sub> Emissions in the Supply Chain



## Capital goods Fuel and energy activities not included in Scope 1 and 2 Upstream transportation and distribution Waste from businesses Business travel Employee commutes

#### Factors Contributing to the Change in CO<sub>2</sub> Emissions by the DIC Group in Japan in Fiscal Year 2017

Factor	Change in CO <sub>2</sub> emissions from fiscal year 2016 (metric tonnes)	Change in weighting from fiscal year 2016	Notes
Increase in incineration of waste oil and waste plastics	6,850	2.8%	Volume of waste incinerated was up from fiscal year 2016 (volume of waste generated declined)
Increase in production volume	4,917	2.0%	Japan: +2.9% (DIC: +4.7%, DIC Group companies: +0.8%)
Changes in product mix	1,865	0.8%	Products with high energy consumption per unit of production increased and products with low energy consumption per unit of production (including paper strengthening agents) decreased
Increase in energy consumption in Japan owing to construction of new technical building	1,640	0.7%	$\ensuremath{\text{No.3}}$ building at the Chiba Plant and $\ensuremath{\text{No.8}}$ building at the Central Research Laboratories
Increase in power generated using renewable energy at the Kashima Plant	-4,844	-2.0%	Operation of biomass boiler increased and an optimum mix with other energy sources was achieved
Implementation of energy-saving initiatives in Japan	-4,165	-1.7%	586 energy-saving initiatives were implemented
Purchase of low-carbon electric power (including from existing electric power companies with improved CO <sub>2</sub> emissions factor)	-2,118	-0.9%	Switched to low-carbon electric power for portion of electric power purchased
Replacement cogeneration facilities at the Chiba Plant	-1,531	-0.6%	Commenced operation in January 2017 (resulted in 5.0% increase in efficiency)
Other factors	-412	-0.2%	
Total	2,201	0.9%	

## Energy-Saving Initiatives by the DIC Group in Japan

DIC Group sites (plants and R&D facilities) in Japan endeavor to conserve energy by promoting the following initiatives, which target the reduction of base load energy consumption, and by applying the PDCA cycle to improve the efficiency of production methods-thereby reducing energy used—and shorten process times. In fiscal year 2017, sites also began promoting carbon-reduction initiatives.

- Introduced energy-saving controls on pumps and blowers
- Used more efficient compressors and implemented measures to reduce pressure losses
- · Implemented measures to improve the power factors of electric equipment
- Adopted high coefficient of performance (COP) chillers and promoted measures to prevent cold and hot water supply waste
- Reduced use of boiler fuel, among others, through the recovery of waste heat
- Ensured appropriate warming times and temperatures for raw materials

In fiscal year 2017, these initiatives reduced energy consumption by approximately 233,000 GJ. This corresponds to approximately 30,000 200-liter drums of crude oil, or 5.4% of total energy consumed by the DIC Group in Japan during the period. Going forward, the Group will continue working to reduce its consumption of energy, and also share best practices among sites with the aim of discovering new themes. In addition, the Group will reinforce operating manuals for key energy-consuming equipment, including boilers, chillers and compressors, to optimize performance, as well as expand the deployment of initiatives developed in Japan at overseas sites.

- Employed highly efficient lighting and air conditioning measures to eliminate waste Actively promoted the use of energy from renewable sources, including solar power and power generated by biomass boilers, at suitable sites
  - Actively promoted the use of energy from low-carbon sources at suitable sites
  - Increased power generated using renewable energy at the Kashima Plant
  - Implemented 586 energy-saving initiatives at domestic production sites
  - Purchased low-carbon power (including from existing electric power companies with improved CO<sub>2</sub> emissions factors)
  - · Replaced cogeneration facilities at the Chiba Plant

586 energy-saving initiatives accounted for a reduction in energy consumption equivalent to approx. 30,000 200-liter drums of crude oil



Ke	y DIC Grou	up Energy-Saving	g Initiatives in Japar	n in Fiscal Year 2017	(Total Number of Initiat	ives Implemented: 586)

Production facility	Energy-saving initiative	Reduction in annual energy consumption (GJ)	Reduction in CO2 emissions (metric tonnes)
Chiba Plant	Reduced amount of steam used by improving base load of polymer production line	883	53
Chiba Plant	Changed heating method for glycerin (raw material) tanks	670	40
Chiba Plant	Reduced energy used by replacing substandard steam traps (after analysis of traps)	798	48
Chiba Plant	Replaced water and heating medium pumps; new pumps stop when reaction ceases	3,172	155
Chiba Plant	Switched to LED lighting	1,126	55
Chiba Plant	Other energy-saving initiatives at the Chiba Plant	10,744	548
Kashima Plant	Implemented initiatives aimed at reducing energy intensity of production processes for pigments	1,535	78
Kashima Plant	Implemented initiatives aimed at reducing energy intensity of production processes for functional products/additives	695	35
Kashima Plant	Reduced heat used by improving dehydration, washing and heat treatment processes for engineering plastics	6,488	327
Kashima Plant	Reduced power and steam losses, improved operation of mixer used in wastewater treatment and switched to LED lighting	772	39
Kashima Plant	Other energy-saving initiatives at the Kashima Plant	186	10
Sakai Plant	Installed heater box	699	37
Sakai Plant	Adjusted amount of water used in hot water washing	467	24
Sakai Plant	Reduced electric power consumption by installing systems for improving the efficiency of power use on B and D substations	1,240	65
Sakai Plant	Reduced fuel consumption by improving dryness of steam in flue boiler	1,194	63
Sakai Plant	Upgraded from gas turbine to EHP air conditioning system in technical building	4,908	257
Sakai Plant	Other energy-saving initiatives at the Sakai Plant	3,833	200
Hokuriku Plant	Reduced base load during production on SH production floor	941	52
Hokuriku Plant	Modified operation of circulation pumps and steam traps, and implemented other initiatives on J production floor	1,482	91
Hokuriku Plant	Shortened production processes, improved heating chamber and implemented other initiatives on E production floor	511	31
Hokuriku Plant	Improved steam traps, and switched to LED lighting, among others, on GLM production floor	504	32
Hokuriku Plant	Improved operation of wastewater mixer and well pump, and replaced transformer on utility floor	991	63
Yokkaichi Plant	Switched to E-series FCP centrifugal pump	397	20
Yokkaichi Plant	Switched to use of a single brining refrigerator	1,159	59
Yokkaichi Plant	Standardized waste heat recovery method	278	14
Yokkaichi Plant	Reduced steam loss, among others, by installing line valves	504	25
Komaki Plant	Reduced energy consumption, among others, by revamping work schedules for DIC Graphics' employees	580	28
Komaki Plant	Revised maintenance of heater temperatures for extruders and drying conditions, among others, for SC production	3,161	155
Komaki Plant	Reduced electric power consumption by switching to LED lighting, among others	476	23
Komaki Plant	Other energy-saving initiatives at the Komaki Plant	705	34
Tatebayashi Plant	Reduced base load, among others, by replacing compressors	661	34
Tatebayashi Plant	Reduced electric power consumption by switching to LED lighting, among others	355	18
Tatebayashi Plant	Implemented initiatives to reduce energy consumed by SC production processes	870	45
Tatebayashi Plant	Other energy-saving initiatives at the Tatebayashi Plant	680	35
Tokyo Plant	Reduced electric power consumption by switching to LED lighting, among others	875	45
Tokyo Plant	Other energy-saving initiatives at the Tokyo Plant	385	20
Gunma Plant	Disconnected unneeded power source for control panels (E plant)	3,061	154
Gunma Plant	Modified procedures for operation of nitrogen generator (D plant)	308	16
Gunma Plant	Replaced compressors (D plant)	951	48
Utsunomiya Plant	Shortened operating times for air compressors and introduced inverters	1,025	55
Utsunomiya Plant	Shortened operating times for cooling water, cold water and hot water pumps	3,501	193
Utsunomiya Plant	Replaced chillers, turned of air fans for outdoor warehouses and implemented other measures to rationalize production	2,469	141
Utsunomiya Plant	Rationalized production by introducing roll-less forming	1,210	70
Utsunomiya Plant	Switched from non-explosion proof mercury lighting to LED lighting in printing inks production areas	1,395	72
Kansai Plant	Reduced electric power consumption by switching to LED lighting, among others	522	27
Kansai Plant	Promoted energy-saving measures at the Kansai Plant and elsewhere	489	25
Others	Modified production processes, switched to LED lighting and replaced obsolete equipment with energy-efficient models	8,912	506
	Total for 586 initiatives	78,768	4.165

### Improving Yields by Expanding Use of System to Enhance the Visibility of Energy Consumption

With the aim of optimizing energy use on an individual facility basis, DIC developed a system that measures, monitors and verifies waste and irregularities in use in real-time, thereby enhancing the visibility of energy consumption. The system—which won the ECCJ Chairman's Prize at Japan's 2012 Energy Conservation Grand Prize awards, sponsored by the Energy Conservation Center, Japan (ECCJ)—has been rolled out at DIC sites across Japan. In fiscal year 2014, the system was installed at the Komaki Plant. In addition, a system to enhance visibility that also analyzes energy consumption during different production processes was installed on the V, C and B production floors of the Chiba, Kashima and Sakai plants, respectively, to reproduce optimum yields for materials inputs. In fiscal year 2016, DIC installed a more advanced version of the system at the Yokkaichi Plant.



## Reducing Energy Consumption and Enhancing Product Quality through Kaizen Skill Improvement Training

Having recognized that enhancing the awareness of employees in production and providing them with the tools to continuously improve their work are crucial to strengthening front-line capabilities, in 2008 DIC began offering the Kaizen Skill Improvement Training Program. This program—which is structured around four themes, namely, reducing energy consumption, increasing yields, enhancing product quality and rationalizing operations—seeks to foster professionals who can identify and resolve issues on their own initiative. Participants spend one year participating in initiatives aimed at improving quality control methods and the following year putting their findings into practice. Each December, achievements are presented at a briefing attended by pertinent plant general managers and executives.

Since 2012, DIC has also offered the Kaizen Initiative Instructor Training program, designed to equip employees who have completed the Kaizen Skill Improvement Training program with the leadership and educational skills necessary to serve as instructors for the program. As of the end of fiscal year 2017, a cumulative total of 450 employees from pertinent DIC sites in Japan had completed Kaizen training, with approximately 15%, or one in seven, subsequently going on to earn accreditation as program instructors, adding momentum to energy-saving and other initiatives.



Number of Employees Completing Kaizen Training

## TOPIC

#### Horizontal Deployment and Further Strengthening of Energy-Saving Promotion Working Groups

In Japan, leaders of domestic site Utility Control Groups, which oversee energy and water supplies and wastewater treatment, hold quarterly Utility Control Liaison Working Group conferences. A central focus of conferences is Energy-Saving Promotion working groups. Here, Utility Control Group managers are joined by representatives of the Production Management Department, who are currently assisting with efforts to prepare a manual outlining key energy-saving measures, compile best practice case studies, discover and test new methods for reducing energy consumption, consider the use of renewable energy as a way to reduce carbon, and conduct energy-saving analyses at sites nationwide.

The Energy-Saving Promotion Manual sets forth measures for, among others, enhancing the visibility of energy consumption, the framework for promoting energy-saving initiatives, procedures for formulating energy-saving plans, creating energy management standards, approaches to benchmarks for gauging energy performance and to investments in energy-saving initiatives, and use of the PDCA cycle to measure the progress of initiatives. The manual is distributed for use across the domestic DIC Group. Energy-saving analysis begins with comparing initiatives against the manual, creating a numerical expression of findings and plotting the results on a radar chart. Subsequent steps are to formulate proposals for addressing weaknesses identified through this process, implement remedial measures and follow up on results. Efforts to formulate proposals are not limited to individuals directly responsible, but also include pertinent department and plant general managers. For the foreseeable future, DIC will continue to use these energy-saving analysis activities to raise the level of efforts at sites nationwide, in addition to which it will add risk management–based BCP to the list of assessment criteria used and begin deployment at overseas Group production facilities.

Responses to global warming	Promote energy-saving initiatives and low carbonization	Energy-Saving Promotion working groups
Maintenance of power facilities	Reduce problems with power facilities and increase investment efficiency Reduce problems with electric equipment and foster a new generation of experts Implement measures to increase the stability of wastewater treatment	Power Facility Working Group Electric Technology Working Group Wastewater Treatment Working Group
Responses to environmental risks	Ensure accurate grasp of air and water quality Create framework for ensuring the swift start-up of utilities (BCP)	Environmental Risk Project
Cost reductions	Lower utilities costs and the cost of consumables and intermediate materials	Cost Reduction Project

#### Utility Control Liaison Working Group Initiatives for Fiscal Year 2018



#### Framework for Promoting Energy-Saving and Carbon-Reduction Initiatives (Japan)



Energy-Saving Promotion Working Group

	エネルギー	管理に関する	実用マニュア	アル
2012	=7.542. 全性境	A.621 2451	(	
B) 6, 1	●第1年で適切に用き	WL、ガラ積極的	に進行するための	具身的方法をお
全社マニ	*アルてある。	11111111		
SHITE	BONDIC 9A-	-768事業用に	わしゃて第2種実現	文書として文書
MEG- 181	47.9.			
• •	1982 · az · 4	**		
• •	*********	1. #8512848-8 \$15.		***->>>+
****	201793103			
		****		
	2.8 (1.000 + 03)			10128.6/
* *	2017 +11+1+	2017 10,000,010	24-17 R-12 (194-18	3+17 +10+15
	1	3	۵.	
***	8001075-7			
	the state	e-men intint		464.

**Energy-Saving Promotion Manual** 

#### [Energy-Saving Analysis and Response]

## Thermal Imaging Leak Detection and Elimination of Heat Loss

Boiler steam valves and other fittings are often not insulated, as a consequence of which heat escapes. DIC used infrared energy (thermal) imaging to accurately locate leaks and made use of removable insulating jackets to prevent the loss of heat energy.



#### [Energy-Saving Analysis]

## Enhancing the Visibility of Strengths/Weaknesses and Formulating Proposals for Remedial Measures

Working group teams were dispatched to sites to conduct energy-saving analyses and findings were plotted on radar charts to enhance visibility and provide hints for remedial measures. Working group members formulate proposals tailored to site needs, based on which remedial measures are implemented, many of which are later selected as best practice case studies and deployed Groupwide.



Analysis results



Proposal for remedial measures

# VOICE Actions that are a matter of course at one facility can be advanced techniques suitable for deployment at another.

In visiting various production facilities to conduct energy-saving analyses, I have found that actions that are a matter of course at one site may be unheard of at other facilities. The purpose of energy-saving analysis activities is not to find fault, but rather to discover new ideas and gather hints. I view them as treasure hunts. The horizontal deployment of such actions can help reduce energy consumption, costs and risks, so the motivation for working group members is high. Each of our production facilities has a Utility Control Group, which is responsible for energy management. While influential, these entities have traditionally been somewhat underappreciated. However, thanks to the efforts of the Energy-Saving Promotion working groups the presence of Utility Control groups has increased across the Group. I am confident that their efforts will also contribute to efforts to curb global warming at overseas production facilities in the years ahead.



Energy Manager, Production Management Department Satoshi Abe

#### 5 Reducing Fossil Fuel Use By Promoting the Introduction of Renewable Energy

Most of the energy from renewable sources used by DIC Group companies in Japan is natural energy generated using a biomass boiler and wind and solar power facilities at the Kashima Plant. In fiscal year 2017, such energy represented 10.3% of total energy (steam and electric power) consumption by these companies, amounting to 497,000 GJ (equivalent to 12,818 kl of crude oil), an increase of 21.0% from fiscal year 2016. The increase in renewable energy from the previous year was attributable to the stable operation of the Kashima Plant's biomass boiler and the success of efforts to achieve an optimal mix of power sources (biomass boiler, wind power, solar power, a cogeneration system and purchased electric power). Going forward, the Group will continue to actively promote the use of renewable energy as an effective way to reduce its CO<sub>2</sub> emissions.

DIC Group in Japan	Up to and including fiscal year 2017	Started up in fiscal year 2018
Biomass boiler (wood chip–fired)	Kashima Plant • Steam generated: maximum 30 metric tonnes/hour • Approximately half of steam generated used in production processes • Remainder of steam generated used to power turbine generating electric power for internal use • Electric power produced: 4,000 kW	Hokuriku Plant - Steam generated: Maximum 2.5 metric tonnes/hour - All steam generated used in production processes - No electric power generating function - Commenced operation in January 2018
Wind power	Kashima Plant • Generating capacity: 4,600 kW • Facility: Two 2,300 kW-capacity wind turbines	-
Solar power	Kashima Plant • Generating capacity: 100 kW DIC Decor, Inc. • Generating capacity: 20 kW	Kashima Plant • Generating capacity: 1,600 kW • Number of panels: 5,588 (each 278 W) • Commenced operation in January 2018

#### Energy Used by the DIC Group (Japan)





### Boosting Renewable Energy to 10.3% of Total Energy Consumption in Japan

In Japan, the DIC Group actively promotes the use of energy from renewable sources at suitable sites. The biomass boiler at the Kashima Plant (generating capacity: 4,000 kW and 30.0 metric tonnes of steam/hour) contributes significantly to this effort. DIC focuses on improving the quality of wood chips used as boiler fuel, which influences operating rates, as well as on enhancing maintenance procedures. By combining this boiler with two wind power generation facilities (each with a generating capacity of 2,300 kW) and a solar power generation system (100 kW), the Group aims to achieve an optimal power mix of purchased electric power, electric power produced through cogeneration systems and electric power generated using renewable energy. Thanks to these and other efforts, in fiscal year 2017 DIC Group companies in Japan used 497,000 GJ of energy from renewable sources, accounting for 10.3% of total energy consumption by these companies. As a consequence, the positive impact of the use of renewable energy was 30,791 metric tonnes.

At the Kashima Plant, DIC commenced operation of a newly installed megasolar power system with a generating capacity of 1,600 kW (comprising 5,588 278-watt solar panels with a surface area of 13,772 m<sup>2</sup>) in January 2018. The same month, certain liquefied natural gas (LNG) boilers at the Hokuriku Plant, which produces synthetic resins, were replaced with a wood chip biomass boiler. As a consequence, the plant's  $CO_2$  emissions in fiscal year 2017 were down approximately 12% from the previous period.

In fiscal year 2017, electric power generated in Japan using cogeneration systems and other independent means amounted to 70,140,000 kW, an increase of 9.0% from fiscal year 2016, representing 25.6% of total energy consumed by the DIC Group in Japan. The Group also embarked on a review of the electric power companies from which it purchases electric power and is taking steps to promote the procurement of green energy by prioritizing companies that supply power with a low CO<sub>2</sub> emissions factor.

## CO<sub>2</sub> Emission Reductions at the Kashima Plant (January–December 2017)







Megasolar and wind power systems at the Kashima Plant

Biomass boiler

## Independent Electric Power Generation through Cogeneration and the Use of Renewable Energy Increased to 23.0% of Total Energy Consumption in Japan

With the aim of increasing energy efficiency, and as a precaution against natural disasters, the DIC Group in Japan is advancing the systematic adoption of cogeneration and the use of renewable energy, that is, energy from sources that are naturally replenished. Cogeneration systems burn fuel to drive turbines, facilitating the production of electric power and the recovery and reuse of waste heat (steam and hot water), thereby improving energy efficiency.

With cogeneration systems already in operation at three domestic plants (Chiba, Saitama and Gunma), in 2015 DIC installed a natural gas turbine–powered cogeneration system with a generating capacity of 1,700 kW at its Kashima Plant. In April 2017, DIC replaced the existing cogeneration system at the Chiba Plant, which had a generating capacity of 5,300 kW, with a new high-efficiency 3,375 kW– capacity system, thereby realizing a volume of independently generated power ideally suited to current needs and reducing energy consumption thanks to an estimated 5.0% increase in efficiency. As a consequence, the maximum generating capacity of the Group's cogeneration systems in Japan was 14,000 kW. Electric power generated using cogeneration systems in fiscal year 2017 amounted to 44,270,000 kW and represented 16.0% of energy consumed by the Group in Japan during the period, while total independently generated electric power, including that from renewable sources, accounted for 23.0%.



Cogeneration system at the Chiba Plant





#### Electric Power Used by the DIC Group in Japan by Energy Source

#### Energy Consumption and CO<sub>2</sub> Emissions by the DIC Group Overseas

While production volume by overseas DIC Group companies edged down 0.5% in fiscal year 2017, energy consumption by these companies declined 4.6%, to 6,740,000 GJ, from 7,065,000 GJ in fiscal year 2016 and energy consumption per unit of production slipped 4.1%, to 6.469 GJ/metric tonne, from 6.746 GJ/metric tonne. CO<sub>2</sub> emissions decreased 6.4%, to 390,346 metric tonnes, from 417,184 metric tonnes in the previous period, and CO<sub>2</sub> emissions per unit of production declined 6.0%, to 374.6 kg CO<sub>2</sub>/metric tonne, from 398.4 kg CO<sub>2</sub>/metric tonne. Factors contributing to the decline in CO<sub>2</sub> emissions in fiscal year 2017 include efforts by individual Group companies to break down the Group's emissions reduction targets and promote energy conservation and carbon-reduction initiatives, the installation of a biomass boiler at Hainan DIC Microalgae Co., Ltd., and a solar power system at Qingdao DIC Finechemicals Co., Ltd., in the PRC; in the Asia–Pacific region, the replacement of a portion of the coal used to fire boilers with palm kernel shells (PKS) at the Karawang Plant of PT. DIC Graphics; and in Europe and the Americas, the installation of additional solar power systems and further initiatives aimed at improving production efficiency.



# CO<sub>2</sub> Emissions by the DIC Group Overseas and Change from Base Year (Fiscal Year 2013)





## CO<sub>2</sub> Emissions per Unit of Production by the DIC Group Overseas and Change from Base Year (Fiscal Year 2013)



#### Promoting Energy Savings Overseas

Laws and regulations, as well as infrastructure, differ between countries and regions. The DIC Group strives to promote energy savings and efficient operations wherever it is active and in so doing sets precedents for the global chemicals industry.

DIC Group companies overseas continue to implement a broad range of energy-saving initiatives, including improving production efficiency, reducing base load energy consumption, choosing high-efficiency models when replacing equipment and switching to LED lighting. As previously described, the Group is also promoting the use of energy from renewable sources and has several new projects currently under consideration for implementation in fiscal year 2018 and beyond. Efforts in fiscal year 2018 will center on installing solar power systems in regions with high-efficiency electric power generation and increasing the portion of coal it replaces with PKS. Looking ahead, DIC and DIC Group companies overseas will step up cooperation with the aim of contributing further to efforts to curb global warming.

#### **Energy-Saving Initiatives at Overseas Group Companies**

#### Asia–Pacific Region

The DIC Group has 23 sites in the Asia–Pacific region, which account for around 19.0% of the Group's total global CO<sub>2</sub> emissions. Despite a 3.0% increase in production volume by Group companies in the region, CO<sub>2</sub> emissions in the region declined 6.0% in fiscal year 2017. Principal factors behind this decrease included an increase in the fuel conversion rate (replacement of 10.0% of coal used with biomass) and the implementation of an energy-saving project at a pigments production facility in Indonesia, the promotion of fuel conversion (transition from diesel to natural gas) and energy-saving initiatives at a printing inks production facility in Indonesia and a printing inks production facility in Australia. While production volume in the region in fiscal year 2017 was up 16.0% from the fiscal year 2013 base year, CO<sub>2</sub> emissions were held to a 6.0% increase.

A regional ESH country head meeting is held annually at the office of DIC Asia Pacific in Singapore, with participants including country heads, the executive in charge of regional operations and pertinent individuals from the Responsible Care Department and the Production Management Department. The principal purpose of the meeting is to explain safety and environmental policies and discuss and agree on concrete action plans for the region in the subsequent fiscal year. In fiscal year 2017, this included providing an explanation of the Group's policies for combating global warming (reducing energy consumption and carbon) in fiscal year 2018 and determining action plans. As part of its efforts to ensure achievement of the CO<sub>2</sub> emissions reduction target set for the global DIC Group, corporate headquarters assists local Group companies by formulating and implementing energy-saving plans; promoting ongoing energy-saving analysis activities to support the identification of energy-saving themes and the implementation of remedial measures; deploying a practical energy management manual and best practice case study materials (establishing management practices and promoting horizontal deployment will remain targets for the foreseeable future); and launching and providing support for energy-saving and carbon-reduction projects at suitable sites.



Asia-Pacific region ESH country head meeting (Singapore)



Energy-saving analysis (DIC Compounds (Malaysia))

## CO<sub>2</sub> Emissions and CO<sub>2</sub> Emissions per Unit of Production (Asia–Pacific Region)



Performance in fiscal year 2017	Change from fiscal year 2016		Change from fiscal year 2013	
(Asia-Pacific region)	% change	Self-assessment of performance	% change	Self-assessmen of performance
Production volume	3%	—	16%	—
CO <sub>2</sub> emissions	- 6%	0	6%	×
CO <sub>2</sub> emissions per unit of production	- 9%	0	- 9%	0

#### Greater China

The DIC Group's 18 sites in Greater China, which include R&D facilities, account for approximately 10% of the Group's total CO<sub>2</sub> emissions. While production volume in fiscal year 2017 was up 2.0%, CO<sub>2</sub> emissions across the region were down 3.0%. Among factors contributing to this decline were the installation of a biomass boiler at Hainan DIC Microalgae, which produces Spirulina, and a solar power system with a generating capacity of 400 kW at Qingdao DIC Finechemicals, and the implementation of energy-saving initiatives at Zhongshan DIC Colour Co., Ltd. Compared with the fiscal year 2013 base year, production volume in Greater China in fiscal year 2017 was up 1.0%, while CO<sub>2</sub> emissions rose 16.0%. The increase in CO<sub>2</sub> emissions primarily reflected expanded production of energy-intensive products, including LCs, in recent years; an increase in base load energy rates for clean rooms and other factors not related to production, as well as to the start of operations at a new production facility for engineering plastics.

Once annually, regional energy officers and ESH officers hold a joint ESH conference that is also attended by the executive in charge of regional operations and pertinent individuals from the Responsible Care Department and the Production Management Department. In fiscal year 2017, the conference was held in November in Taipei. The environmental portion of the event included providing an explanation of the Group's policies for combating global warming (reducing energy consumption and carbon) in fiscal year 2018, setting a target for reducing regional CO<sub>2</sub> emissions and determining action plans. Participating companies also gave presentations introducing case studies and plans for future initiatives. The objective of the conference is to provide information on successful energy management and other energy-saving efforts to help companies enhance their performance. Gatherings have thus had a positive ripple effect, which includes encouraging the deployment measures based on the experiences of other companies.

Other regional efforts include promoting energy-saving analysis activities to gauge the status of energy management and the performance of energy-related equipment. As part of these efforts, local employees known as energy-saving masters assess energy-saving promotion frameworks, actual energy consumption, efforts to formulate policies and manage goals, and the performances of key equipment. Findings are plotted on a radar chart to identify strengths and weaknesses and encourage remedial measures.



#### CO<sub>2</sub> Emissions and CO<sub>2</sub> Emissions per Unit of Production (Greater China)

Change from fiscal year 2016 Change from fiscal year 2013 Performance in fiscal year 2017 (Greater China) % change Self-assessmer % change Self-assessmeni of performance Production volume 2% 1% CO<sub>2</sub> emissions 3% 0 16% × CO<sub>2</sub> emissions per unit of production 0 14% 4% ×

\* Self-evaluation: · Positive - NA × Poor



Energy-saving analysis (Qingdao DIC Finechemicals)





Greater China joint ESH conference (DIC Graphics Chia Lung)



Presentation of best practice case study (Lidye Chemical Co., Ltd., DIC Graphics Chia Lung)

## | Expansion of the Use of Renewable Energy at Sites in the Asia–Pacific Region and Greater China

Achieving a decarbonization of the global economy has become a central focus worldwide. Against this backdrop, the use of energy from renewable sources has increased across the Asia–Pacific region and Greater China, as elsewhere. DIC Group sites in these regions are making use of government subsidies and support to expand their use of renewable energy by, among others, installing biomass boilers and solar power systems.

## PT. DIC Graphics (Karawang Plant) (Indonesia)

### Project Launched to Reduce CO<sub>2</sub> Emissions by Switching from Coal to PKS

PT. DIC Graphics' Karawang Plant is a crucial facility for the production of pigments for inks and coatings for packaging applications, plastics and other applications, the production of which uses a significant amount of energy for boilers and water for washing. To date, the facility has primarily used coal, the combustion of which is extremely economical (approximately 1/5 the cost of heavy oil and 1/3 the cost of natural gas) and easy to obtain in Indonesia. Because the Karawang Plant accounts for a tenth of the DIC Group's global CO<sub>2</sub> emissions, and because its production volume continues to expand, reducing the facility's energy consumption and finding low-carbon energy sources is a critical challenge. To this end, the plant kicked off a CO<sub>2</sub> emissions reduction project focused on exploring low-carbon alternatives to coal that identified PKS. Because Indonesia is the world's second-largest producer of palm oil, PKS—which are left after the extraction of oil—are easy to secure in large quantities. Japan imports PKS for use as fuel for coal-fired electric power production facilities and biomass boilers.

Having determined that the calorific value of PKS, approximately 5,000 kCal/kg, is comparable to that of coal used at the plant, in December 2016 the project team began conducting combustion tests using a mixture of coal and pulverized PKS in various ratios, as a result of which it determined that approximately 20% of the coal could be replaced with PKS with no impact on boiler operation or combustion or on incinerated ash, which is used as an aggregate in cement.

In January 2017, the Karawang Plant began replacing approximately 10% of the coal it used with KPS. As a consequence, despite a 1.3% increase in production at the plant in fiscal year 2017, its CO<sub>2</sub> emissions declined 8.5%. In other words, thanks to introducing PKS on a trial basis, the plant realized a decrease of 5,000 metric tonnes in its annual CO<sub>2</sub> emissions. This reduction was equivalent to 0.8% of CO<sub>2</sub> emissions by the global DIC Group in fiscal year 2016. Beginning in fiscal year 2018, the plant will increase the proportion of PKS in its fuel mix to around 20%.



PKS to be used as fuel



Karawang Plant boiler

#### Siam Chemical Industry (Thailand)

#### Installation of Solar Panels Reduces CO<sub>2</sub> Emissions

Siam Chemical Industry, which manufactures a broad range of polymer products, including synthetic resins, continues to see rising demand for acrylic coating resins, underpinned by increases in automobile production. Thailand is seeking to diversify energy sources to reduce the country's dependence on natural gas to generate electric power. Energy from renewable sources is attracting considerable attention thanks to tax breaks offered by the Thai government. Against this backdrop, Siam Chemical Industry installed solar panels with a total generating capacity of 704 kW (annual output: 1,049 MWh) on the roofs of production buildings and warehouses at its plant in Samut Prakan Province. The solar panels commenced operation in July 2017. Electric power generated using these facilities is used on production lines and in offices. In fiscal year 2017, solar power accounted for 16.0% of the electric power used by the plant, lowering the plant's annual CO<sub>2</sub> emissions by 580 metric tonnes.



Siam Chemical Industry (Thailand)



Solar panels installed on the roof

#### Hainan DIC Microalgae (PRC)

#### **Biomass Boiler Replaces Diesel-Fired Unit**

Hainan DIC Microalgae, DIC Lifetec Co., Ltd.'s production base in the PRC, cultivates Spirulina, an edible blue–green algae that is attracting attention as a superfood, which it processes into nutritional supplements and natural food colorings. Until recently, the facility used a diesel-fired boiler to produce the steam necessary for its production processes, but in October 2016 it switched to a biomass boiler that uses waste rubber tree wood from the thinning of rubber forests as fuel. The new boiler was in operation for the duration of fiscal year 2017, resulting in a reduction of 1,000 metric tonnes in the facility's CO<sub>2</sub> emissions for the year, equivalent to 40.0% of its emissions in the previous year. This also accounted for 1.5% of the overall decrease in CO<sub>2</sub> emissions achieved by the DIC Group in Greater China in fiscal year 2017.

#### Qingdao DIC Finechemicals (PRC)





Biomass boiler

Hainan DIC Microalgae's general manager, Hideyuki Tsuda



440 kW-capacity solar power system at Qingdao DIC Finechemicals

## Solar Power System Installation Helps Reduce Energy Consumption and CO<sub>2</sub> Emissions Recognizing the monsoon climate, abundant sunshine and excellent atmospheric conditions of Qingdao as suited to solar power generation, subsidiary Qingdao DIC Finechemicals, a manufacturer of base materials for TFT LCs, which it supplies to local customers, installed a solar power system that features panels on the roof of the company's plant building. The new system, which has a generating capacity of 440 kW, began operating in September 2017. With this installation, Qingdao DIC Finechemicals' annual output of solar power is expected to reach 480 MWh, reducing its annual CO<sub>2</sub> emissions by approximately 8.5% from the fiscal year 2016 level.

## | Planned and Ongoing Efforts to Update Facilities and Modify Production Processes

#### Efforts to Optimize Equipment Contribute to a Significant Reduction of Refrigerator Power Consumption (DIC Synthetic Resins (Zhongshan))

Refrigerators account for a third of the electric power consumed by DIC Synthetic Resins (Zhongshan) Co., Ltd.'s metal carboxylates plant. This is primarily because cooling water is supplied by remote motors and water supply pumps, and the pumps operate at full capacity when refrigerators are running. To bolster efficiency, in May 2015 the company launched a project to review processes and equipment and explore potential improvements. This resulted in the installation of a cooling tower and water pump near refrigerators to recirculate cooling water. The company also identified a way to link refrigerator compressors with ice water pumps, facilitating the automatic adjustment of water temperature. Full-scale operations with the new setup commenced in January 2016. This has succeeded in reducing annual refrigerator power consumption to approximately 120,000 kWh, from around 320,000 kWh prior to optimization.



Upgraded cooling tower and water supply pump

#### Efforts Succeed in Harnessing Residual Heat from Incinerating Waste Resin Varnish Factory (Nantong DIC Color)

Nantong DIC Color Co., Ltd., incinerates waste resin varnish internally. The temperature of waste gas from this process reaches between 700° C and 800° C. The facility installed a heat exchanger to recycle this heat for showers and hot water in pigment manufacturing processes. This move has cut the facility's annual electric power bill by around Rmb168,000.



New hot water tank (left) and heat exchanger (right) to recycle waste heat

## VOICE A key theme is promoting investment in decarbonization with a view to future social change and risk.

The adoption of the Paris Agreement in 2015 further accelerated the efforts of developed economies to curb their CO<sub>2</sub> emissions. Efforts of particular note include the creation of preferential tax systems and subsidies with the aim of supporting efforts to make use of energy from renewable sources, encouraging companies to diversify energy sources by moving away from fossil fuels (thereby reducing carbon) and avoiding the risk of resource depletion. Indonesia has become the first country in Asia to sell green bonds to raise funds for investments in global warming countermeasures and environmental projects. Such moves will in no small way influence the plans of companies to update their facilities. For example, when looking to replace a key piece of equipment such as a boiler, companies must scrutinize not only performance and cost but also environmental considerations, investment recovery period and the availability of government subsidies, as well as anticipate changes that will take place in society over the useful life of the unit, in determining the timing of the change and selecting the most appropriate model.

When my colleagues and I visit production sites in Indonesia for energy-saving analysis activities or energy-saving promotion conferences, we discuss such issues with local executives. Today, the risk of not making environmental investments is rapidly becoming greater than the risk of being unable to recover such investments. Accordingly, taking steps to become a company that helps to advance decarbonization before regulations are tightened is crucial if we are to continue growing together with society. Going forward, we will step up efforts to share energy conservation and management expertise from Japan, as well as best practice case studies, with overseas Group companies.

Manager in Charge of Efficiency, Production Management Department Kazuo Kawaguchi

#### Europe and the Americas

The DIC Group has 113 sites in Europe and the Americas (this category also includes sites in Africa), which account for around 32.0% of the Group's total CO<sub>2</sub> emissions. Despite a 2.0% increase in production volume in fiscal year 2017, CO<sub>2</sub> emissions across the region were down 3.0%. This decline reflected multiple factors, notably the further integration of production facilities and execution of measures to raise production efficiency, the installation of solar panels and the implementation of other energy-saving and cost-cutting initiatives. Although regional production volume in fiscal year 2017 was essentially level with the fiscal year 2013 base year, CO<sub>2</sub> emissions were down 24.0%, with key contributing factors including a significant increase in production efficiency realized through a large-scale business reorganization, the use of outsourcing, including the contracting of energy-efficiency consultants to advance the reduction of energy consumption, and active efforts to promote the use of energy from renewable sources, including solar power, small hydroelectric power and landfill biogas.



#### Sun Chemical Group (United States)

#### Efforts to Promote the Use of Renewable Energy Stepped Up

Sun Chemical signed a solar power purchase agreement (PPA) with Onyx Renewable Partners and installed a solar power system comprising more than 2,500 panels on the roof of the parking structure at its research facility in Carlstadt, California. Under the 20-year PPA, Onyx will own and maintain the system, which has a generating capacity of 916 kW. Sun Chemical will purchase power generated by the system at approximately 50% of the market rate, thereby helping to reduce energy costs. Installation of the panels began in the fall of 2017 and was completed in January 2018. The system came on line in March 2018.



Solar panels at Sun Chemicals' research facility in Carlstadt, California



#### CO<sub>2</sub> Emissions and CO<sub>2</sub> Emissions per Unit of Production (Europe and the Americas)

Performance in fiscal year 2017	Change from fisc	al year 2016	Change from fiscal year 2013		
(Europe and the Americas)	% change	Self-assessment of performance	% change	Self-assessment of performance	
Production volume	2%	—	1%	—	
CO <sub>2</sub> emissions	- 3%	0	- 24%	0	
CO <sub>2</sub> emissions per unit of production	- 5%	0	- 24%	0	

\* Self-evaluation: 
o Positive — NA × Poor

#### Sun Chemical Group (Austria)

#### Site Wins the Energy Globe Award Lower Austria in the "Water" Category

Benda-Lutz Werke GmbH, the Sun Chemical Group's production site in Nussdorf, Austria, operates two small hydroelectric power facilities along the Traisen River. These two units are part of a consortium of 52 such riverside small hydroelectric power facilities operated with the aim of reducing the local community's consumption of energy. In 2017, the consortium received the Energy Globe Award Lower Austria in the "Water" category in recognition of its efforts to promote the sustainable use of hydroelectric power. At the award presentation ceremony, Sun Chemical and other consortium members gave a presentation titled "The Ecological, Compatible Usage of Hydrodynamic Power in the Lower Part of the Traisen." Receiving the Energy Globe Award Lower Austria increases the consortium's chances of being recommended for the national Energy Globe Award for Austria and the Energy Globe World Award in the Water category.



Winners of the Energy Globe Award Lower Austria in the "Water" category

Benda-Lutz Werke (Sun Chemical Group)

#### The DIC Group's Global Energy Mix



#### B Initiatives in Areas Other than Production

In fiscal year 2017, DIC once again promoted efforts in Japan in line with the country's Cool Biz and Warm Biz campaigns, official efforts to reduce electric power consumption by limiting the use of air conditioning in summer and winter through measures such as the introduction of more relaxed office dress codes. The Company also continued to promote initiatives aimed at reinforcing employees' awareness of the importance of lowering energy consumption, including replacing aging light fixtures and air conditioning equipment with newer, high-efficiency models that satisfy standards set by the ECCJ for its Top Runner program, turning off lights when not needed and implementing mandatory 22° C and 28° C summer air conditioning settings.

#### Reporting to the CDP

The CDP (formerly the Carbon Disclosure Project) is a global NPO that works on behalf of institutional investors worldwide to motivate companies to disclose information on initiatives to combat climate change and key environmental data. The CDP analyzes and evaluates information on strategies, greenhouse gas emissions, reduction targets and forecasts, and actual initiatives reported by approximately 6,200 leading global companies participating in its climate change assessment program, including 500 in Japan, and communicates its findings to said institutional investors. DIC has been reporting to the CDP since 2010.

In 2017, DIC was recognized by the organization for reaching the program's leadership level, receiving high marks for its efforts to reduce its greenhouse gas emissions and its disclosure and earning an overall score of A-, second only to the top score of A, for the second consecutive year. DIC received particularly high marks for its efforts to reduce greenhouse gases attributable to its expanding global production activities and for its disclosure. Cognizant of an increased awareness of risks to global water resources, in 2017 DIC also began participating in the CDP's water program, which evaluates companies' efforts to manage such resources.

A total of 73 Japanese companies reached the leadership level in the CDP's climate change assessment program in 2017, with 13 earning a score of A and 60 a score of A-. A total of six companies in the materials sector earned a score of A-.

#### Looking Ahead

With the goal of deepening understanding of the importance of energy efficiency across the Group, DIC has inaugurated a number of important new initiatives. In Japan, for example, the Company has created a forum for DIC Group energy officers at principal production facilities to meet regularly. In fiscal year 2018, the efforts of working groups will be guided by four central themes: advance and establish energy-saving initiatives based on the energy conservation manual; promote decarbonization by actively encouraging the use of renewable energy; search for and verify new methods of reducing energy consumption (e.g., small hydroelectric power, binary power and geothermal energy); and conduct energysaving analyses at sites to identify new measures of reducing energy consumption and support use of the PDCA cycle. The progress of these initiatives will be confirmed at quarterly working group meetings. Through initiatives implemented in line with these themes, the Group will probe deeper into issues of concern to society and foster experts in key areas to further reinforce responsiveness Groupwide.



## VOICE To reduce carbon, we will expand from a Group-specific to a region-focused and global-scale approach.

Overseas sites account for approximately 60% of the DIC Group's global CO2 emissions. With production in the Asia-Pacific region and Greater China continuing to expand, we face increasing calls to further improve production efficiency and realize an optimum energy balance. Against this backdrop, our ability to reduce carbon increasingly depends on taking a strategic perspective to investment in facilities and energy-saving initiatives. Going forward, we will continue to promote the horizontal deployment of best practice case studies. We will also expand to a region-focused and global-scale approach by stepping up collaboration with other departments and making full use of available human, organizational and administrative resources, including government subsidies and external experts, with the aim of ensuring a solid reputation as a leading global manufacturer of fine chemicals.



General Manager, Production Management Department Yuuichi Kougo

## Reducing Discharge of Chemical Substances

Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\* \* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objective of initiatives	Goals for fiscal year 2017 Achievement in fiscal year 2017		Evaluation	Goals for fiscal year 2018
Reduce VOC emissions into the air.	<ul> <li>Reduce VOC emissions into the air.</li> <li>Establish reduction targets for individual domestic sites and promote related initiatives (cumulative total of targets for domestic production facilities: 376 metric tonnes (-2.3% from fiscal year 2016)).</li> </ul>	DIC Group (Japan): Total emissions of 371 metric tonnes (-3.6% from fiscal year 2016).	***	<ul> <li>Reduce VOC emissions into the air.</li> <li>Establish reduction targets for individual domestic sites and promote related initiatives (cumulative total of targets for domestic production facilities: 357 metric tonnes (-3.7% from fiscal year 2017)).</li> </ul>

#### **Basic Approach**

As chemicals companies handle a considerably greater volume and more diverse range of chemical substances than companies in other industries, they must be extremely vigilant to prevent discharges of such substances into the environment. DIC has worked to reduce emissions into the air, water and soil of substances designated under the Pollutant Release and Transfer Register (PRTR) and of substances targeted under a voluntary scheme created by the JCIA since fiscal year 2000, while other DIC Group companies in Japan have done so since fiscal year 2005.

\* The JCIA is a general incorporated association. As one of Japan's major industry organizations, JCIA is a member of the International Council of Chemical Associations and pursues the healthy development of the chemical industry with other chemical-industrial organizations around the world.

## Principal Initiatives in Fiscal Year 2017

#### Reducing Emissions of VOCs

Having succeeded in achieving a voluntary target—set in fiscal year 2007—for reducing emissions of VOCs into the air of 30% by fiscal year 2010 (using fiscal year 2000 as the base year) for the DIC Group in Japan, domestic Group companies continue to pursue steady annual reductions through facility improvements and emissions management.

In fiscal year 2017, emissions of VOCs into the air by DIC totaled 177 metric tonnes, a decrease of 6.3% from fiscal year 2016, while those by the DIC Group in Japan, at 371 metric tonnes, were down 3.6%. The principal factor behind these results was the fact that reduction initiatives at the Saitama Plant have become firmly ingrained in everyday operations.

Overseas, Group companies in Greater China and the Asia–Pacific region continued to promote ongoing emissions reductions. In the PRC, in particular, the Group is updating facilities and stepping up management practices in response to the tightening of local regulations governing the emissions of VOCs.

Emissions of Targeted Chemical Substances into the Air (551 Substances, Including those Designated by the PRTR, and One Substance Group) Emissions of VOCs into the Air in Fiscal Year 2017





In fiscal year 2017, the DIC Group monitored discharges of 462 class-1 chemical substances designated under the PRTR and of 89 PRTRdesignated chemical substances (other than class-1 substances) and one substance group (chain hydrocarbons with up to 4–8 carbon atoms) targeted by the JCIA\*. During the period, DIC and DIC Group companies in Japan produced or used 110 and 123 of these substances, respectively, in units exceeding 1.0 metric tonne.

\* In 2014, the JCIA reviewed PRTR-designated chemical substances and revised the number of substances on its target list from 105 to 89.

Number of Targeted Chemical Substances Used and/or Produced in Amounts Exceeding 1.0 Metric Tonne in Fiscal Year 2017



Environmental Emissions of Targeted Chemical Substances (551 Substances, Including those Designated by the PRTR, and One Substance Group) in Fiscal Year 2017

DIC	Emissions into the air	177 metric tonnes
	Emissions into water	25 metric tonnes
	Emissions into soil	0 metric tonnes
DIC Group (Japan)	Emissions into the air	371 metric tonnes
	Emissions into water	25 metric tonnes
	Emissions into soil	0 metric tonnes

Targeted Chemical Substances for Which Emissions Exceeded 10.0 Metric Tonnes in Fiscal Year 2017

Substance	DIC	DIC Group (Japan)
oubstance	Emissions into the environment	Emissions into the environment
Ethyl acetate	68 metric tonnes	125 metric tonnes
Methyl ethyl ketone	24 metric tonnes	<b>48</b> metric tonnes
Toluene	<b>39</b> metric tonnes	<b>46</b> metric tonnes
Styrene	7 metric tonnes	<b>39</b> metric tonnes
Acetone	6 metric tonnes	<b>35</b> metric tonnes
Propyl alcohol	4 metric tonnes	21 metric tonnes
<i>N</i> -methylpyrrolidone	13 metric tonnes	13 metric tonnes
Butyl acetate	O metric tonnes	<b>11</b> metric tonnes

#### **2** Managing Water Resources

Usable fresh water on the earth's surface is said to account for only around 0.01% of the planet's total fresh water resources. Accordingly, finding effective ways to conserve and manage water resources is a crucial global challenge. The DIC Group withdraws fresh water (tap water and industrial water) for use in production processes and air conditioning and for drinking, among others. The Group also discharges wastewater—after purifying it in line with internal standards that exceed official standards in the countries and territories where it has operations—into rivers and other fresh water bodies. In Japan, the Central Research Laboratories, in Chiba Prefecture, recovers purified wastewater (graywater) and reuses it on-site in research, as a result of which it currently discharges no wastewater. The Group also promotes the recycling and reuse of water to reduce its impact on water resources.

In fiscal year 2017, the Group continued to promote efforts to improve production processes, share information and centralize data on fresh water withdrawn, water used and wastewater discharged. Fresh water withdrawn by the global DIC Group in the period edged down 0.5% from the fiscal year

2016 level, to 41,308,000 m<sup>3</sup>, comprising withdrawals by the Group in Japan (including the parent company) of 32,327,000 m<sup>3</sup>, up 5.9%, and by Group companies overseas of 8,981,000 m<sup>3</sup>, down 18.5%. Wastewater discharged by the global DIC Group in fiscal year 2017 rose 3.3%, to 38,822,000 m<sup>3</sup>.

Effective from fiscal year 2017, the Group adopted the GRI's guideline for collecting data on water withdrawn\* and used its water risk assessment tool to analyze initial water risk at 38 sites worldwide, which account for 75.0% of its global production. With the aim of enhancing its ability to manage water resources, the Group also commenced a review of the status of water recycling efforts. Looking ahead, the Group will continue working to enhance initiatives designed to help protect and ensure the effective use of precious water resources.

Water risk map

\* Included in the GRI's G4 Sustainability Reporting Guidelines.

## Siam Chemical Industry Promotes the Recycling of Wastewater

Siam Chemical Industry uses approximately 243 m<sup>3</sup> of water resources per day, with 45%around 109 m<sup>3</sup>—used in manufacturing and 55%—approximately 135 m<sup>3</sup>—discharged as wastewater. Using a water recycling facility, the company has endeavored to treat and reuse this wastewater. In fiscal year 2016, the company installed a cleaning tower capable of recycling 20 m<sup>3</sup> per hour, as a result of which it currently recycles 40-50 m<sup>3</sup> of wastewater daily. Looking ahead, the company will continue promoting initiatives aimed at advancing the recycling of water resources.

#### Scope of Reporting for the Withdrawal of Fresh Water and the Discharge of Wastewater

Beginning in fiscal year 2017, the DIC Group has adopted a new format that calls for gathering data on the withdrawal of fresh water by source and the discharge of wastewater by destination. With this change, the Group also started calculating water recycled, but difficulties with measurement and data collection prevented a calculation of the total volume. Going forward, the Group will take steps to ensure the accuracy of this calculation.

Fresh water withdrawn (1,000 m <sup>3</sup> )				
	Japan	Global DIC Group		
Surface water	17,166	19,695		
Groundwater	7,327	8,835		
Rainwater	0	0		
Wastewater generated by other organizations	2,061	2,062		
Tap water/industrial water	5,724	10,362		
Others	48	354		
Total	32,327	41,308		
Total in fiscal year 2016	30,513	41,528		
Change from previous year	5.9%	-0.5%		



DIC Group in Fiscal Year 2017
38,822,000 m
+ <b>3.3%</b> from fiscal year 2016

Wastewater discharged (1,000 m <sup>3</sup> )				
	Japan	Global DIC Group		
Rivers	20,372	20,644		
Oceans	7,121	7,122		
External treatment facilities	3,511	4,394		
Below ground	0	3		
Third parties	0	192		
Others	0	6,467		
Total	31,005	38,822		
Total in fiscal year 2016	28,168	37,593		
Change from previous year	10.1%	3.3%		

#### Soil and Groundwater Pollution Studies

Japan's Water Pollution Control Act was revised in 2012 to tighten structural standards governing equipment installed to prevent groundwater contamination by chemical substances. In addition to complying strictly with this Act and with the Soil Contamination Countermeasures Act, the DIC Group in Japan implements soil and groundwater surveys and countermeasures as necessary and assesses related environmental and safety risks.



#### 4 Reducing SOx, NOx and COD

Taking fiscal year 1990 as the base year, DIC Group companies in Japan have worked to reduce sulfur oxide (SOx) and nitrogen oxide (NOx) emissions—key causes of acid rain—from boilers. The Group is also working to reduce chemical oxygen demand (COD), an indicator of water quality deterioration in wastewater, thereby enhancing its water quality management.

Overseas, Group companies are also switching fuel from diesel to natural gas and replacing diesel-fired and heavy oil-fired boilers with waste wood-fired biomass boilers at sites with appropriate infrastructure. To reduce COD, the Group is promoting the reuse of water and installing environment-friendly closed-loop recycling and wastewater treatment systems at its sites that purify water to a level that exceeds the legally mandated level.



#### **SOx and NOx Emissions Volumes**

#### **5** Complying with Regulations Governing Emissions of Dioxins

In Japan, the DIC Group monitors emissions of dioxins from waste incinerators that produce these byproducts, a group of compounds with varying toxicities. At present, the Group has six such facilities. Continuous efforts to reduce emissions levels have enabled the Group to achieve results that greatly surpass standards specified in the Law Concerning Special Measures Against Dioxins.

#### **Dioxin Emissions from DIC Group Incinerators in Japan**

	Scale of facility	N	Waste gas		Wastewater		
Site	capacity)	Standard (ng-TEC/Nm³)	Emissions reported in fiscal year 2016 (ng-TEC/Nm³)	Standard (ng-TEC/Nm³)	Emissions reported in fiscal year 2016 (ng-TEC/Nm³)		
Chiba Plant (DIC)	Approx. <b>3</b> metric tonnes/hr	5	0.019	10	0.030		
Hokuriku Plant (DIC)	0.28 metric tonnes/hr	5	0.00016	10	0.0030		
DIC Interior Co., Ltd.	Approx. <b>0.1</b> metric tonnes/hr	10	0.21	NA	-		
Hokkaido Plant (DIC Kitanihon Polymer Co., Ltd.)	Approx. <b>0.2</b> metric tonnes/hr	10	0.05	NA	-		
Tohoku Plant (DIC Kitanihon Polymer Co., Ltd.)	Approx. <b>0.2</b> metric tonnes/hr	10	0.030	NA	-		
Harima Plant (Seiko PMC Corporation)	Approx. <b>0.2</b> metric tonnes/hr	10	0.75	NA	-		

ESH

## Reducing Industrial Waste

Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\* \* = Excellent: \*\* = Satisfactory: \* = Still needs work

Objectives of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
Reduce industrial waste disposed of as landfill ("zero emissions"). Reduce industrial waste generated by production facilities.	Implement measures at each site with the following goal: • Reduce industrial waste disposed of as landfill (for sites that have achieved "zero emissions," maintain that status) (cumulative total of targets for domestic production facilities: 69.9 metric tonnes (-62.0% from fiscal year 2016)).	<ul> <li>Industrial waste disposed of as landfill DIC Group (Japan): 148 metric tonnes (.19.0% from fiscal year 2016)</li> <li>Industrial waste generated by production facilities DIC Group (Japan): 32,336 metric tonnes (+3.0% from fiscal year 2016)</li> </ul>	*	Implement measures at each site with the following goal: • Reduce industrial waste disposed of as landfill (for sites that have achieved 'zero emissions," maintain that status) (cumulative total of targets for domestic production facilities: 147 metric tonnes (-1% from fiscal year 2017)).
Promote recycling.	Promote recycling at DIC Group compa- nies and set a target for resource recycling rate.	DIC Group (Japan) resource recycling rate: 93.0% (-7.0 percentage points from fiscal year 2016)	**	Promote recycling at DIC Group compa- nies and set a target for resource recycling rate.

### **Basic Approach**

The DIC Group aims to minimize industrial waste and promote the recycling and reuse of materials. Since fiscal year 2001, DIC has promoted zero emissions initiatives\* aimed at reducing industrial waste disposed of as landfill. DIC has deployed zero emissions initiatives at DIC Group companies in Japan since fiscal year 2008. With the aim of expanding efforts across the global DIC Group, in fiscal year 2013 DIC began to introduce management by objectives (MBO) at overseas Group companies. DIC subcontracts the treatment of industrial waste to be disposed of as landfill, and ensures that waste is properly treated by promoting strict compliance and on-site confirmation by designated departments at each of its production facilities.

\* Zero emissions initiatives: DIC is promoting initiatives aimed at reducing the volume of waste disposed of as landfill by 95% from the fiscal year 2000 level.

## Principal Initiatives in Fiscal Year 2017

#### Reducing Industrial Waste Disposed of as Landfill

The DIC Group works actively to reduce its disposal of industrial waste as landfill by recycling cinders, dust and sludge into, among others, roadbed materials and raw materials for cement, using thermal recycling to recover waste heat and reducing production losses by increasing yields.

#### Initiatives by the DIC Group in Japan

In fiscal year 2017, the total volume of industrial waste disposed of as landfill by the DIC Group in Japan amounted to 148 metric tonnes, down 19.0% from fiscal year 2016. This result was attributable primarily to the updating of equipment at production facilities, which led to a one-time decline in the amount of sludge and other waste generated, as well as to efforts to bolster recycling at the Kashima Plant. In fiscal year 2018, all DIC Group companies in Japan will step up the implementation initiatives aimed at achieving zero emissions.

DIC and DIC Group companies in Japan also continued working to ensure the appropriate disposal of polychlorinated biphenyls (PCBs). In addition, these companies promoted the strict management of unprocessed waste, including transformers, capacitors and stabilizers, through proper collection and storage in dedicated warehouses.

ESH

## Industrial Waste Generated in Fiscal Year 2017

DIC Group (Japan)



### Industrial Waste Disposed of as Landfill



## Deployment of Comprehensive Industrial Waste Management System

In fiscal year 2016, the DIC Group in Japan explored the introduction and conducted tests of a comprehensive industrial waste management system for use with the country's Electronic Manifest (e-Manifest) system. The e-Manifest system manages the movement of industrial waste by facilitating the electronic transmission of manifest information and tracking of the flow of waste from generation to final disposal. Unlike paper manifests, the e-Manifest system offers easy data input and eliminates the need for administrative reporting and storage by generators.

With anticipated revisions to Japan's Waste Management Law expected to increase demand for greater manifest data transparency, DIC resolved to introduce an industrial waste management system that would facilitate the efficient collection of data while also ensuring legal and regulatory compliance. The Group currently uses the system at 13 sites in Japan and intends to gradually expand deployment in the years ahead.

#### Differences Between the e-Manifest System and Paper Manifests



#### Comprehensive Industrial Waste Management System



GENESYS-ECO is much more than a tool for managing industrial waste. The most important-and most difficult-part of industrial waste management is the issuing of manifests. GENESYS-ECO balances reducing the risk of accidental legal violations with minimizing the burden on the individuals in charge. Linking it to the industry association-administered e-Manifest system will make it possible to automatically generate the annual reports we are required to submit to the authorities, greatly improving work efficiency. Moreover, using information on industrial waste stored in the cloud will enable us to make the entire process-from generation through to final disposal-visible, thereby positioning us to implement initiatives that will reduce our environmental impact. We are confident that this will help us further improve the effectiveness of our industrial waste management and contribute to society. Going forward, our goals are to standardize procedures and ensure that GENESYS-ECO is easy to use for everyone involved in industrial waste management, from beginners to veterans.

Manager, Safety and Environment Group, Saitama Plant Norio Tsunematsu

## Initiatives by the DIC Group Overseas

In addition to ensuring the disposal of industrial waste in a manner that complies with national and regional legal and regulatory requirements, the DIC Group's overseas production facilities work to minimize industrial waste through the voluntary recycling and reuse of materials.

In fiscal year 2017, DIC Group companies in the Americas and Europe, Greater China and the Asia-Pacific region introduced new waste treatment facilities and promoted the horizontal deployment of best practices, including those aimed at improving production processes, with the aim of achieving reductions in industrial waste generated that exceeded nationally and regionally mandated levels. Nonetheless, the total volume of industrial waste generated by DIC Group production facilities overseas rose 5.7%. Looking ahead, regional headquarters in these areas will focus on further reinforcing compliance with local laws and regulations while at the same time cooperating with DIC's Responsible Care and Production Management departments to analyze the reasons for this increase with the aim of curbing the generation of industrial waste and reducing the volume of industrial waste disposed of as landfill.

## TOPICS

## Newly Installed Thermal Combustion System at DIC Graphics (Guangzhou) Facilitates the Efficient Treatment of VOCs

In August 2017, DIC Graphics (Guangzhou) installed a new system for thermally decomposing and deodorizing VOCs in exhaust gas from production processes. The new system fills the combustion chamber with a ceramic material that absorbs heat, making it possible to spontaneously combust VOC gas streams and at a high temperature using only a small amount of auxiliary fuel. In the past, activated carbon adsorption was used to destroy VOCs. Because it facilitates the efficient thermal decomposition and deodorization of medium- and low-density VOCs, the system has contributed to a significant reduction in energy consumption and maintenance requirements.

## DIC (Malaysia) Reduces Environmental Impact by Renovating its Wastewater Treatment System

With the instability of treatment using its existing wastewater treatment system an issue from an environmental compliance perspective, printing inks manufacturer DIC (Malaysia) suspended operation of the system, opting instead to dispose of all wastewater from production processes externally as waste. In fiscal year 2017, DIC's Production Management Department worked with the company to develop a stable wastewater treatment process and made necessary renovations to its treatment system, obtaining approval and the appropriate license from Malaysia's Department of Environment. The improved system, which resumed full-scale operation in December 2017, has enabled the company to ensure that its treated wastewater meets local standards, as well as to reduce its total waste disposal volume.

## DIC's Komaki Plant Separates Plant Wastewater and Rainwater **Discharge Routes in Line with ESH Audit Suggestion**

The Komaki Plant, which produces PPS compounds, among others, uses an on-site treatment system to purify wastewater from production processes, which it then releases into a channel that flows into the nearby Oyama River. The system is also used to remove oil and particulates from rainwater collected from plant road surfaces, which is then discharged into the river. However, with this configuration there is a risk that a leak or other issue within the plant could result in the two types of water being mixed together and released into the river. In fiscal year 2016, this issue was raised with the plant during an ESH audit. The plant immediately implemented remedial measures, completely separating the discharge routes for wastewater from production processes and rainwater discharge routes, with the aim of reducing risk.

New system for thermally decomposing and deodorizing VOCs

Renovated wastewater treatment system



Separate discharge routes for plant wastewater and rainwater



## Environmental Impact of the DIC Group's Operating Activities

The DIC Group quantifies the environmental inputs (consumption of energy and other resources) and outputs (emissions into the environment) of its operating activities, and uses its findings to formulate comprehensive and efficient strategies for reducing its environmental footprint.

The chart below is a comprehensive illustration of the environmental impact of the DIC Group's domestic operating activities in fiscal year 2017. The chart shows environmental impact for two input items (total energy consumption and total water consumption) and six output items (emissions of 551 chemical substances (including those designated under the PRTR<sup>\*1</sup>) and one substance group<sup>\*2</sup>, emissions of CO<sub>2</sub>, emissions of NOx, emissions of SOx, COD in wastewater and industrial waste disposed of as landfill.)



\*1 The PRTR is a scheme in Japan for assessing, aggregating and disseminating data on the sources of hazardous chemicals, amounts released into the environment and amounts transferred off-site from industrial establishments via waste products.

\*2 The \*551 substances and one substance group' comprises 462 chemical substances designated by the PRTR and 89 substances and one substance group targeted for study by the JCIA.

## Managing Chemical Substances in Products

Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory: \* = Still needs work

Objectives of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
Respond to requirements relating to chemical product information.	Rebuild comprehensive system for managing chemical substances.	<ul> <li>Comprehensive system for manag- ing chemical substances was completed and alignment with its SAP system was reinforced.</li> </ul>	***	<ul> <li>Enhance functions of the compre- hensive system for managing chemical substances.</li> </ul>
	<ul> <li>Steps were taken to fortify support for overseas Group companies through full-time managers assigned to regional headquarters.</li> </ul>	**	Continue to expand deployment of the Wercs at overseas DIC Group companies.	
<ul> <li>Promote compliance with regulations in Japan and overseas (e.g., Japan's Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., and Poisonous and Deleterious Substances Control Act; the EU's REACH legislation; and the U.S.' TSCA.</li> <li>Promote compliance with the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., and Poisonous and Deleterious Substances Control Act; the EU's REACH legislation; and the U.S.' TSCA.</li> <li>Promote compliance with the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., and Poisonous and Deleterious Substances Control Act; the EU's REACH legislation; and the U.S.' TSCA.</li> <li>Promote compliance with the Evaluation of Their Complete compliance with the Evaluation of Their Statement in the Statement in the Evaluation of Their Statement in the transmission of the interval in the transmission of th</li></ul>	Promote compliance with the Act on the Evaluation of Chemical Substanc- es and Regulation of Their Manufac- ture, etc.	<ul> <li>Information was gathered on the revised Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., and negotiations were conducted through work with industry associations.</li> <li>A GHS-compliant label creation system linked to the Wercs was introduced at four Group companies in Thailand and Malaysia.</li> <li>Efforts to promote the registration of chemical substances to which REACH applies continued.</li> <li>Compliance with reporting requirements imposed by the TSCA Inventory Reset were completed.</li> </ul>	**	<ul> <li>Promote compliance with the revised Act on the Evaluation of Chemical Substances and Regula- tion of Their Manufacture, etc.</li> <li>Promote compliance with the ROK's revised K-PEACH</li> </ul>
	<ul> <li>Expand deployment of the Wercs at overseas DIC Group companies.</li> <li>Promote the registration of chemical</li> </ul>		**	
	substances to which REACH applies. • Complete compliance with reporting		Complete registration of chemical substances to which REACH applies.	
	Inventory Reset.		**	

#### **Basic Approach**

As a comprehensive global chemicals manufacturer, DIC approaches compliance with laws and regulations and the effective management of risks as essential to its survival. The Group works to maintain a solid grasp of laws and regulations in different countries and territories, and of trends relevant thereto, thereby ensuring its ability to design products that comply with regulations governing the use of chemical substances in products. The Group also strives to respond to requirements relating to the disclosure of information on chemical substances, thereby ensuring the safety of chemicals and products.

In 2002, participants in the World Summit on Sustainable Development (WSSD) in Johannesburg, South Africa, agreed on a goal for the management of chemical substances to minimize the significant adverse effects thereof on human health and the environment by 2020. Since then, DIC has promoted efforts to eliminate substances of high concern specified in the Montreal Protocol on Substances that Deplete the Ozone Layer, the Stockholm Convention on Persistent Organic Pollutants and the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, as well as to develop alternatives to products containing substances scheduled to be newly included in such agreements, as well as to actively provide information on chemical substances, with the aim of reducing risks to society.

As an expert in the management of chemical substances, DIC plays an active role in considering issues pertaining to chemical safety and regulations and developing responses through its participation in industry associations.

## Managing Chemical Substances

#### Ensuring the Swift Provision of Reliable SDSs

In 2003, the UN Economic Commission for Europe issued the first edition of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), the idea being to reduce chemical risks through an internationally harmonized approach to classification of chemicals by type and toxicity, the clear display of information on labels for better understanding and the provision of SDSs.

As a part of its efforts to ensure effective product stewardship, the foundation of Responsible Care, of which emphasize the management of chemicals across its entire supply chain, DIC has sought to respond swiftly to this development, as well as to provide customers with crucial hazard-related information. As such, in 2009 DIC established CIRIUS (Chemical Substance Information Comprehensive Management System) for domestic products. In addition to complying with GHS, CIRIUS enables DIC to provide customers with complete information on hazards associated with chemical substances, thereby helping to reduce related risks. CIRIUS centralizes the management of information about raw materials and chemicals, as well as automatically checks various laws and regulations—including the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., the Industrial Health and Safety Act; and the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture the provision of reliable SDSs.

#### Promoting the Global Deployment of the Wercs Label Creation System

In 2013, DIC began using the Wercs (a global SDS and label creation system developed with know-how from DIC) for products for export. As a result, DIC now has a structure that enables it to compile GHS-compliant SDSs for all exported products that comply with national and regional laws and regulations and is accessible in relevant local languages. In April 2014, DIC began using the Wercs to issue SDSs and labels for all exported products. In fiscal year 2015, DIC also began deploying the Wercs at overseas Group companies.

As specialized knowledge about chemical substance management is essential, DIC focuses on training in the manufacture, import and handling of chemicals in accordance with applicable laws and regulations and draws on its proprietary licensing system to enhance the skills of employees.

#### Framework for Promoting the Safety of Chemical Substances and Products



#### Risk Management Across the Supply Chain

In line with the DIC Group Universal Purchasing Policy, DIC formulated the DIC Group Green Procurement Guidelines, which prohibit the procurement of materials containing hazardous substances in seven categories. The guidelines mandate the submission of a DIC Raw Materials Survey, an SDS and a chemSHERPA\*, as well as a DIC Group Green Procurement Guidelines Survey, when purchasing raw materials, thereby creating a system for eliminating substances of concern. Submission of a Conflict Minerals Survey is also required.

1 Substances the production of which is prohibited, as outlined in Article 55 of Japan's Industrial Health and Safety Act;

- Substances designated as class 1 specified chemical substances in Japan's Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.;
- Substances designated for monitoring under Japan's Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.;
- Chemical substances the production of which is already prohibited, as detailed in Japan's Act on the Protection of the Ozone Layer Through the Control of Specified Substances and Other Measures (ozone-depleting substances listed in the Montreal Protocol);
- Specified particulates denoted in Japan's Air Pollution Control Act;
- Specified poisonous substances indicated in Japan's Poisonous and Deleterious Substances Control Act; and
- Specified substances detailed in the Stockholm Convention on Persistent Organic Pollutants.
- \* chemSHERPA is a scheme designed to facilitate the accurate and efficient sharing of information on chemical substances in products across the entire supply chain. DIC began using chemSHERPA in late fiscal year 2017.

### Position on the Use of Animals in Testing

In line with the 3Rs of animal use in research ("Replacement, Reduction, Refinement"), which are guidelines designed to ensure the more ethical use of animals in testing, the DIC Group actively promotes safe evaluation using quantitative structure–activity relationship (QSAR) models, which do not employ animals, and alternatives to animal testing.

## Reducing Risks through the Global Provision of Information

#### Information on Raw Materials and Chemical Substances in Imported Products in Japan

In April 2013, DIC consolidated the management of information on the composition of chemical substances in exported products and on chemical substance legislation in various countries and regions, introducing the Wercs, a new system that automatically creates product SDSs in the language-and in compliance with the laws and regulations-of individual export destinations, creating a foundation for its global information system and helping reduce risks for customers.

For products manufactured in Japan, DIC uses CIRIUS to centralize the management of information on raw materials and chemical substances. To facilitate the provision of reliable SDSs, CIRIUS automatically checks Foreign Exchange and Foreign Trade Act-based secure trade control rules, as well as the Act on the Evaluation of Chemical Substances and Regulation of Their



DIC provides information on chemical substances using CIRIUS in Japan and the Wercs overseas

Manufacture, etc., the Chemical Substances Control Law, and the Industrial Safety and Health Act and the Poisonous and Deleterious Substances Control Act.

The Wercs, which incorporates know-how accumulated by DIC in the creation and use of CIRIUS, was developed with the aim of expediting the provision of such information for products for export. The Wercs facilitates the translation of data into 46 different languages—including the languages of the 19 countries and territories to which DIC currently exports products—and the preparation of SDSs and labels in local languages that comply with laws and regulations in the Americas, Europe, Asia and elsewhere.

Since switching to the Wercs for creating SDSs and issuing labels for exported products, DIC has expanded the number of countries for which it can prepare local-language, legally compliant SDSs and labels to include the ROK, Europe, the United States, the PRC and Taiwan. Since April 2014, all SDSs and labels for products for export have been prepared using the Wercs. DIC is also promoting deployment of the system to Group companies in Japan, which are using the Wercs in tandem with CIRIUS to ensure the effective management of chemical substances across its domestic Group supply chain.

#### Expanding Deployment of the Wercs at Overseas Group Companies

In fiscal year 2015, DIC began deploying the Wercs at Group companies overseas. In fiscal year 2017, the Wercs was introduced at an additional five overseas companies, bringing to 21 the number of companies using the system. With the aim of promptly updating its labels to comply with GHS hazard labeling standards in the event of revisions to laws and regulations or the identification of new hazards, in fiscal year 2016 the Company set up an on-demand label printing system that links the Wercs with its SAP system. In fiscal year 2017, the Company began deploying this system at companies that have already introduced the Wercs. Through these and other efforts, DIC aims to prevent human error and increase business efficiency, as well as to facilitate globally consistent management based on a common system.

#### **Global Deployment of the Wercs**

Fiscal year 2013	Japan (four companies): DIC, DIC Graphics, DIC Kitanihon Polymer Co., Ltd. and Seiko PMC Corporation
Fiscal year 2014	-
Fiscal year 2015	Indonesia (Three companies)* Malaysia (Two companies)* Thailand (Two companies)* PRC (Five companies) Taiwan (Two companies)* Singapore (One company)
Fiscal year 2016	Taiwan (One company)*
Fiscal year 2017	Singapore (One company) Philippines (One company) Vietnam (One company) Sri Lanka (One company) Pakistan (One company)
Fiscal year 2018 (Scheduled)	India (One company) PRC (One company)

\* Deployment is complete.



## Complying with Laws and Regulations

#### Ensuring Prompt Responses to Regulatory Changes Worldwide

The principal goal governing the management of chemical substances worldwide is that implied in the agreement, reached at the WSSD in 2002, to ensure, by 2020, that chemicals are used and produced in ways that lead to the minimization of significant adverse effect. Recent years have seen the European Union enact Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) legislation, and the ROK, the PRC and Taiwan introduce legislation aimed at strengthening chemical substances risk management. As well, countries in Southeast Asia have deployed the GHS.

DIC collects the latest information on chemical substances in overseas markets through international consultants and experts, news wire services and chemicals industry associations to ensure that it can respond swiftly and effectively to revisions in laws. In 2009, the Company began using CIRIUS to manage chemical substance information for products manufactured in Japan. In fiscal year 2013, DIC switched to the Wercs for creating SDSs and issuing labels for existing exported products, accelerating its ability to provide information to customers.

In fiscal years 2016 and 2017, steps were taken across Asia to reinforce the management of chemical substances. Of particular note, the PRC announced a new assessment agency as part of its system for registering hazardous chemicals, while the ROK dramatically revised the Act on the Registration and Evaluation of Chemicals (K–REACH) and Thailand and Vietnam proceeded with preparation to introduce a new system for registering chemical substances.

#### Groupwide Efforts to Create a Stronger Compliance Framework

To ensure an accurate grasp of trends, DIC has worked steadily to strengthen communication with local Group companies and in fiscal year 2016 reinforced its management framework by assigning dedicated full-time managers to regional headquarters for Greater China and the Asia–Pacific region. Recently, DIC held discussions with legal and regulatory experts from Sun Chemical that resulted in an agreement to cooperate closely in a manner that capitalizes on the strengths of both companies.

In the United States, substantial revisions were made to the Toxic Substances Control Act (TSCA)<sup>\*1</sup> in fiscal year 2016, requiring a comprehensive inventory reset (review of existing chemicals on the TSCA list). DIC and Sun Chemical completed compliance with reporting requirements imposed by this reset. In advance of the May 2018 deadline for registering existing chemical substances under REACH<sup>\*2</sup>, DIC is registering existing exported low-volume chemical substances, i.e., those produced in volumes up to 100 metric tonnes per year, as well as promoting ongoing efforts to respond to substance evaluations by the European Chemicals Agency (ECHA) and ECHA member countries and collecting information on REACH substances of very high concern (SVHCs).

\*1 The TSCA is a law administered by the U.S. Environmental Protection Agency (EPA) that regulates chemical substances produced in or imported into the United States. \*2 Under REACH, businesses bear full responsibility for evaluating the safety of chemical substances they produce and/or use with no distinction made between "existing" and "new" substances. REACH also prohibits the use of specified chemical substances that pose unacceptable risks to human health.

# VOICE DIC and Sun Chemical are collaborating to promote a chemical substance management project.

DIC and Sun Chemical are engaged in a project to identify the criteria needed, and the framework required, for an undertaking to support a global chemical communication management system. This project seeks to define specific chemical criteria that must be utilized to assure compliance with regulations anywhere in the world. The project will involve developing an SAP integration IT platform that is seamlessly accessible by global beneficiaries. This will require an IT investment platform designed to uniformly characterize the chemical composition and safety risk of purchased materials and manufactured commercial products; a system, process, tools and discipline to continuously identify and maintain material characteristic consistencies with both chemical data and system deliverables, such as SDSs and labels; and robust support for new and onerous chemical control regulations (i.e., the U.S. EPA TSCA reset, K-REACH and Global GHS) and to accommodate international language requirements. Our objective is to provide leverage to help establish material fitness guidance with global customers and brand owners and, ultimately, to create a platform to support technological innovation and assist in the coordination of global procurement activities.



Global Regulatory Director, Sun Chemical Corporation Robert Kendrick

## Training in Chemical Substance Management

## Specialized Training Under DIC's Licensing System

As a comprehensive global chemicals manufacturer, DIC recognizes legal and regulatory compliance as central to risk management and endeavors to improve employees' awareness and knowledge of chemical substance regulations in Japan and overseas by holding workshops and maintaining a proprietary internal licensing system. Efforts include providing specialized training for individuals in Japan involved in exporting chemical substances in line with the Foreign Exchange and Foreign Trade Act and for individuals involved in importing chemical substances in line with the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc., as well as issuing licenses, valid for two or three years, to employees who have passed in-house examinations. As of fiscal year 2017, 1,473 employees held a Class A license, which requires specialized knowledge, and 194 held a Class B license, which pertains to ancillary operations, while a further 98 individuals had completed an advanced course demanding superior capabilities that was introduced in fiscal year 2015. In addition, 304 individuals held import licenses.





Seminar on laws and regulations governing chemical substance management for Group companies in the PRC held in Hangzhou

### Dispatching Officers to Provide Training in Use of the Wercs

With the full-fledged deployment of the Wercs, since fiscal year 2014 DIC has dispatched Responsible Care Department officers to hold seminars at principal Group companies in Greater China and the Asia–Pacific region. In fiscal year 2017, the Group began providing training tailored to local laws and regulations governing chemical substances. Owing to a major overhaul of the Wercs in fiscal year 2017, two officers in charge of pertinent laws and regulations in Singapore and the PRC also provided retraining to approximately 60 users from overseas companies. Going forward, corporate headquarters and regulations will collaborate to promote initiatives aimed at reinforcing the ability of overseas Group companies to respond effectively to these laws and regulations.

Training seminars for the Wercs go beyond explaining the system's operations and advantages. It is important for participants to understand the background and intent of legal revisions and to steadily amass basic data and update information. Constantly inputting such information into the system maximizes the potential of the Wercs, making it possible to provide valuable and timely information to customers and reduce overall risks to society as a whole. Taking the opinions and impressions of participants into consideration, DIC will continue to promote efforts to improve operability and data transmission speed with the aim of making the Wercs easier to use.

# VOICE We are working to improve responsiveness to laws and regulations governing chemical substances.

I am in charge of responses to chemicals-related laws and regulations in the PRC. Operating in an increasingly harsh environment, we work continuously to improve compliance across all chemicals-related operations by promoting efforts aimed at reinforcing the chemical substance management capabilities of individual Group companies. We have also added content related to the management of hazardous chemicals to ESH audits to assess the chemical substance management capabilities. I oversee training in the use of the Wercs and the BarTender labeling software, which we are using to ensure compliance in the area of materials safety data sheets (MSDS) and label production.



By auditing the efforts of trading companies in the PRC to handle hazardous chemicals, and by providing training on laws pertinent to chemical substances, we will continue working to raise employees' awareness of laws and regulations governing chemical substances.

Corporate ESH Specialist, DIC (China) Co., Ltd. Wenjing Zhang

## **Responsible Logistics**

Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objective of initiatives	Goal for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goal for fiscal year 2018
Reduce CO <sub>2</sub> emissions attributable to the transport of products (Scope 3).	Reduce CO <sub>2</sub> emissions by 1.0% by promoting modal shift and improving transport efficiency.	<ol> <li>Energy consumed per unit of production declined 3.0%.</li> <li>CO<sub>2</sub> emissions attributable to the transport of products declined 2.0%.</li> </ol>	** **	Reduce CO <sub>2</sub> emissions by 1.0% by promoting modal shift and improving transport efficiency.

#### Basic Policy and Framework for Promoting Initiatives

DIC's commitment to promoting Responsible Care encompasses initiatives aimed at ensuring safety in logistics, that is, at lowering chemical risks associated with the distribution of chemicals, and at reducing CO<sub>2</sub> emissions attributable to the transport of its products. The DIC Group's logistics configuration— components of which include transport between production facilities, the transport of products to customers and international logistics—previously centered on a dedicated subsidiary, established in 1999, that operated under the direct supervision of DIC. In a bid to rationalize and increase the efficiency of logistics, in 2011 DIC transferred ownership of the subsidiary to a partner firm and began to outsource its logistics. Since then, the Group has worked closely with this and other partner firms to improve the safety of and reduce CO<sub>2</sub> emissions attributable to logistics.

With the aim of better responding to social imperatives associated with the transport of chemicals over the medium to long term, in January 2016 DIC combined the logistics components of its various departments to create an independent Logistics Department. As a consignor, the new department, which comprises three sections—domestic planning, overseas planning and the global trading group—is charged with formulating logistics policies and promoting efforts to enhance efficiency, as well as with coordinating with logistics partners, that is, third-party logistics (3PL\*) firms providing complete outsourced logistics services, to further enhance safety and reduce environmental impact.

\* 3PLs are firms that provide partial or complete outsourced logistics services.



#### Safety Management in Logistics

The firms to which the DIC Group outsources logistics use containers that comply with the Fire Service Act and other transportation laws, as well as with related UN standards. The Group supplies information needed to display labels complying with the GHS as well as provides SDSs and other documentation to ensure safe shipping in Japan and overseas.

In Japan, the Logistics Department cooperates with its logistics partner firms, meeting regularly to discuss measures for improving the safety of both loading and transport work. Of particular note, logistics quality issues that cause trouble for customers—including leaks, undelivered cargo and delivery errors—are designated as incidents for priority attention. Targets, number of incidents, causes and countermeasures are confirmed at monthly meetings to ensure steady improvement. In fiscal year 2017, the incident rate was 44 ppm, down approximately 30% from the previous period. Members of plant health and safety committees attend each others' meetings to exchange information and promote on-site safety improvement initiatives.

The Logistics Department also inspects the offices of logistics partners located on-site at its 20 main domestic production facilities. In fiscal year 2017, inspections were conducted at nine of these offices, during which issues were pointed out and improvements confirmed. In addition, DIC endeavors to maintain and enhance safety by requiring transport personnel to carry Yellow Cards\*.



Regular meeting with logistics partners



Yellow Card carried by transport personnel

<sup>\*</sup> Yellow Cards are part of activities recommended by the JCIA. These cards contain information about the correct actions to take if an accident occurs. They provide contact details to ensure proper responses by transportation companies, firefighters and police officers if an accident occurs during the transport of chemical substances. Transport personnel must carry these cards at all times.

## TOPIC

#### **DIC Uses Container Vibration Data to Improve Transport Quality**

As part of its effort to improve transport quality, in fiscal year 2017 DIC's Logistics Department conducted tests to verify the degree of damage to 18-liter oil cans and other cargo containers from vibration during transport. When DIC products are transported in oil cans, the cans are generally secured with cable ties and packed onto pallets, which are then loaded onto transport trucks. Tests verified that even on extremely rough roads, cans suffered no major damage, with impact limited to minor scratches. As a result, the department concluded that damage to cans was occurring when pallets were loaded and unloaded from trucks using forklifts, as a result of which it inferred that the risk of damage to cans increases the more times they must be unloaded and reloaded at transfer points. The department shared test data with logistics partners to serve as a yardstick for joint efforts to formulate remedial measures. As a company that manufactures and transports chemical substances, DIC will continue working to ensure the safety of its logistics practices.

#### Reducing Greenhouse Gas Emissions Attributable to Logistics

While the volume of products shipped edged down 1.0%, energy consumption declined 3.0% and  $CO_2$  emissions attributable to logistics decreased 4.0%. Energy consumption per unit of production attributable to logistics improved 1.0%. These results were attributable primarily to ongoing efforts to combine lots and to shift from truck transport to transport using purchased containers, as a result of which the Group's modal shift rate rose 3.0 percentage points to 12.0%, from 9.0% in fiscal year 2016, with transport by ship rising 16.0% and transport by rail up 41.0%.

In Japan, a critical shortage of qualified drivers has become a serious issue for the logistics industry. To improve the effectiveness of measures taken to address this issue, the Logistics Department worked with the DIC Group's logistics partner firms to conduct a survey of drivers. Based on the findings of this survey, steps will be taken to reduce drivers' working hours, including verifying standby times—i.e., time waiting for cargo to be loaded—at production facilities and improving the efficiency of order picking and inspection procedures.

In a new initiative, DIC commenced shared logistics on a trial basis. This involves collaborating with other chemicals manufacturers to ship products on one truck using a milk run format, thereby reducing the number of trucks needed, increasing load efficiency and minimizing emissions of CO<sub>2</sub>. DIC's Logistics Department is currently analyzing the benefits and risks of this approach and will incorporate its findings into action plans for subsequent fiscal years.

In an effort to assist overseas Group companies, in the period under review a logistics manager was assigned to DIC Asia Pacific, which oversees Group operations in the Asia–Pacific region. DIC also studied workflows at individual overseas Group companies with the goal of rationalizing and enhancing the efficiency of logistics. Looking ahead, DIC will continue to support the efforts of Group companies overseas while at the same time shifting its focus from optimizing logistics for the DIC Group alone to realizing practices that are optimally suited to regional conditions.



#### CO<sub>2</sub> Emissions and Energy Consumption per Unit of Production Attributable to Logistics

# VOICE We are addressing the shortening of transport flow lines as a common challenge and developing multifaceted remedial measures.

A common challenge in logistics, whether we are looking at our operations in Japan or overseas, is to shorten transport flow lines. By promoting related initiatives, we will also help reduce energy consumption, CO<sub>2</sub> emissions and transport costs. Accordingly, we will continue to put our heads together to determine effective approaches and develop and test promising new measures. For example, in Japan DIC currently leases a considerable number of warehouses, which it uses for inventory adjustment and to ship products. We are currently investigating whether the length of related flow lines is appropriate. This is just one of a number of efforts to reexamine aspects of logistics that were previously ignored. The operating environment for logistics services is increasingly harsh. We have opted to view this as an opportunity for an overhaul with the aim of further rationalizing and increasing the efficiency of our logistics practices.



General Manager, Logistics Department Kazuhiko Yamada
## **Report on Other Initiatives**

Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objectives of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
Report on Responsible Care initiatives and prepare site reports.	<ul> <li>Reinforce and expand efforts to enhance the DIC Group's performance.</li> <li>Promote ongoing Responsible Care initiatives tailored to local markets.</li> </ul>	<ul> <li>Steps were taken to create a founda- tion for unifying performance data while ensuring legal and regulatory compliance in different countries and territories.</li> <li>Ongoing Responsible Care initiatives tailored to local markets were promoted.</li> </ul>	***	<ul> <li>Reinforce and expand efforts to enhance the DIC Group's performance.</li> <li>Promote ongoing Responsible Care initiatives tailored to local markets.</li> </ul>
Implement measures for PCBs.	<ul> <li>Maintain a system for storing and managing PCBs.</li> <li>Promote the proper disposal of equipment containing PCBs.</li> </ul>	PCB waste was collected and stored in an appropriate manner and disposed of in accordance with the practices of the Japan Environmental Storage & Safety Corporation (JESCO).	***	<ul> <li>Maintain a system for storing and managing PCBs.</li> <li>Promote the proper disposal of equip- ment containing PCBs.</li> </ul>
Protect the ozone layer.	<ul> <li>Reinforce framework for managing equipment containing chlorofluorocarbons (CFCs).</li> <li>Continue promoting efforts to avoid the adoption of new raw materials containing specified CFCs.</li> <li>Continue to ascertain the amount of CFCs leaked at domestic DIC Group companies and promote measures to prevent leakage.</li> </ul>	<ul> <li>The adoption of new raw materials containing specified CFCs was avoided.</li> <li>Measures to ascertain the amount of CFCs leaked at domestic DIC Group companies proceeded.</li> </ul>	***	<ul> <li>Reinforce framework for managing equipment containing CFCs.</li> <li>Continue promoting efforts to avoid the adoption of new raw materials containing specified CFCs.</li> <li>Continue to ascertain the amount of CFCs leaked at domestic DIC Group companies and promote measures to prevent leakage.</li> </ul>
Asbestos	Ensure awareness of potential risks associated with the discovery of asbestos during demolition or when retrofitting equipment and of appropri- ate responses.	Materials containing asbestos, includ- ing insulation, were discovered during the removal of equipment and were removed and disposed of in a legally appropriate manner.	***	Ensure awareness of potential risks associated with the discovery of asbes- tos during demolition or when retrofitting equipment and of appropriate responses.

## Quality

#### Enhancing Product Quality and Customer Satisfaction

#### Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objective of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018	
	Promote efforts to foster employees who will shoulder responsibility for product quality and customer satisfaction.	Measures to revitalize the efforts of depart- ments and individuals responsible for quality assurance on the front lines were launched. These included holding meetings to facilitate the exchange of information and opinions.	**	Reinforce the quality assurance frame- work by, among others, modifying the corporate culture and improving employee ethics, thereby making it possible to prevent quality issues from arising.	
Secure product quality.	Encourage relevant divisions and departments to cooperate at all stages, from product planning through to shipment, with the goal of providing the products and services that customers and markets seek.	A design review system was created whereby the relevant product division quality assurance group participates from the initial stage of development.	**	Ensure a level of quality that fulfills the DIC Group's corporate social responsibility. Collect and organize information on raw materials pertinent to safety, compliance with laws and regulations, and environmental protection and provide appropriate product information.	

#### **Basic Approach**

Along with its Environment, Safety and Health Policy, the DIC Group views the improvement of product quality as a theme that is essential to upholding a sound operating foundation. Accordingly, the Group seeks to ensure every employee shares the sentiment conveyed in its Quality Policy and works continuously to enhance quality and ensure customer satisfaction.

**DIC's Quality Policy** 

"Contribute to the prosperity of customers and society by consistently providing reliable products" (Updated in May 2015)

#### Framework for Implementation

To better leverage its agility and comprehensive capabilities, DIC has established a matrix-like quality management configuration that positions product divisions on the vertical axis and the Technical Management Unit and Production Management Unit on the horizontal axis. DIC has also introduced a quality management system (QMS) based on ISO 9001—the International Organization for Standardization's benchmark for such systems—in product divisions and subsequently earned ISO 9001 certification for all of its production facilities. The Company capitalizes on this QMS, as well as on two other management systems, to promote ongoing efforts to enhance quality.

In fiscal year 2015, DIC revamped its quality assurance configuration with the aim of building a stronger consensus between top management and people on the front lines, establishing a framework that enables swift and effective responses to quality issues. The Company is also taking steps to enhance internal quality audits and product quality-related educational initiatives to create a corporate culture that emphasizes initiatives aimed at improving the quality of its products. The Company's current configuration divides product quality into two functions: Product quality across the entire DIC Group, which is the responsibility of the Quality Assurance Department, and product-specific quality management, which is overseen by product division quality assurance groups and facilitates prompt and appropriate quality management. By thus dividing Groupwide and product-specific quality management, DIC has positioned itself to advance close communication among these departments and to secure product quality.

The Quality Assurance Department implements regular product quality audits of DIC Group companies in Japan to ensure that quality management is functioning effectively, as well as to lift product quality levels, thereby ensuring customer satisfaction. Overseas, DIC Group companies continue to promote a variety of efforts directed at further reinforcing product quality.



Quality

#### Initiatives Aimed at Increasing Customer Satisfaction

To ensure its ability to provide high-quality products that customers feel secure using, DIC promotes a variety of quality improvement initiatives during product planning, design and development, the procurement of raw materials, production and sales, giving consideration to the need for effective product stewardship. Relevant product division quality assurance groups participate in design reviews from the initial stages of development, conducting rigorous evaluations at each stage, with the goal of providing the products and services that customers and markets seek. After products are sold, customer and market assessments are gathered and fed back to development departments to facilitate further quality improvements. In collaboration with technical and purchasing departments, the Quality Assurance Department collects and organizes information on raw materials pertinent to safety, compliance with laws and regulations, and environmental protection, enabling it to provide appropriate product information.



#### 2 New Efforts to Enhance Product Quality–Related Educational Initiatives

Committed to providing safe, secure products that satisfy its customers, DIC recognizes the importance of ensuring that employees maintain a high awareness of quality, as well as a constant commitment to achieving further quality improvements and upholding high quality standards. To this end, the Company provides education regarding product quality to all DIC Group employees at specific times, including through training for newly hired and newly promoted employees.

Since fiscal year 2016, DIC has also offered training led by external experts in the field for employees involved in quality management. Approximately 40 individuals participate in such training annually. In fiscal year 2017, the Company began holding meetings for employees responsible for quality assurance on the front lines to revitalize the efforts of employees and departments by facilitating the exchange of information and opinions. Going forward, DIC will continue working to establish and promote further awareness of product quality as essential to upholding a sound operating foundation.



#### Global Product Quality Initiatives

All domestic and overseas DIC Group companies with production capabilities (excluding those belonging to the Sun Chemical Group) have earned certification under ISO 9001, based on which they have established product quality assurance frameworks. In the years ahead, DIC will advance efforts to further reinforce quality frameworks to better suit product divisions and Group companies.

#### Percentage of DIC Group Companies with Production Capabilities Certified Under ISO 9001



Quality

Quality News (Issue No. 92, published in September 2017)

品質ニュース No. 92

仕組みを変える

因は補助ロク

ラブルが発生する度に対策を行いますが、直接原因4

同じような種類

"管理の問題"や

いませんか。 隠れている かロケットに使われていた O リ 「。 製造メーカーは、O リングか

-5日 :2017/9/7 5日7:本社 日務保証部 日期報理部

打ち上げまし

#### Preventing the Recurrence of Problems

The DIC Group is promoting the creation of a system to ensure that information received regarding quality problems (complaints and criticisms) is collated, analyzed and shared efficiently across the Group. Once launched, this system will be used to prevent the recurrence of such problems.

To discover the causes of quality problems, the Group employs "why-why analysis" ("*naze-naze bunseki*"). Using why-why analysis in an effort to eliminate product rejects at the production stage, in fiscal year 2016 the Hokuriku Plant achieved an 80% reduction from the fiscal year 2010 level. DIC also applies why-why analysis in determining the cause of accidents, an approach that continues to yield solid results.

Through meetings held to facilitate the exchange of information and opinions among individuals responsible for quality assurance on the front lines, the Group also continues to promote bottom-up quality improvement initiatives that reflect front-line perspectives. DIC also publishes *Quality News*, which provides useful information on quality management and ways to enhance work quality. In addition to being published regularly on DIC's portal site and distributed directly to relevant parties, *Quality News* is used in employee training.



```
Why-why analysis (naze-naze bunseki)
```

#### Change in the Number of Quality Problems

Change in the Number of Product Returns



Change in the Number of Complaints Received (Base year: Fiscal year 2011)



### VOICE Laying the groundwork for IATF 16949 certification for the DIC.PPS series of PPS compounds

PPS compounds are the principal product of the Solid Compounds Product Division. Thanks to polymers with excellent heat-resistance and robust compounding technologies that match customer needs, 70% of these compounds are used in automotive components. Because the quality of components and the materials used therein significantly affect the safety of vehicles, International Automotive Task Force (IATF) 16949 was created as a quality management standard specifically for the automobile industry with the aim of preventing defects and minimizing quality anomalies.

Recent years have seen an increase in the number of major automakers based in Europe and the Americas that demand IATF 16949 certification for components and materials suppliers as a condition for doing business. Accordingly, we are currently working to create systems necessary to obtain certification for four key global PPS compounds production facilities (Komaki, Vienna, Penang and Zhangjiagang) by early fiscal year 2020.

General Manager, Solid Compounds Quality Assurance Group, Solid Compounds Product Division, Komaki Plant Takumi Hirosawa



## Human Resources Management

#### Working to Enhance Job Satisfaction

SDGs Goals 3, 4, 5, 8 and 10



#### Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objectives of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
	<ul> <li>Conduct seminars for Group executives at DIC's corporate headquarters based on the results of voluntary human rights and labor practices inspections. Formulate a human rights policy.</li> <li>Conduct voluntary human rights inspections of Group companies in Japan and overseas.</li> </ul>	<ul> <li>An external speaker was engaged to conduct a seminar on work-life balance for Group executives.</li> <li>A draft version of the Group's human rights policy remained under consideration.</li> <li>Individual human rights cases involving Group companies in Japan and overseas were investigated.</li> <li>Sun Chemical participated in the Responsible Mica Initiative.</li> </ul>	**	<ul> <li>Formulate a human rights policy.</li> <li>Use human rights training to encourage awareness of the policy.</li> <li>Implement voluntary human rights inspections at Group companies in Japan and overseas.</li> </ul>
Foster and endorse the advancement of local staff overseas with the aim of advancing global management.	Introduce a unified policy regarding remuneration for management-level employ- ees at DIC and DIC Graphics.	On January 1, 2018, the Group introduced unified role-based standards to determine remuneration for 1,300 management-level (i.e., manager and above) employees. As a consequence, unified standards are now used for the majority of such employees in Europe and the Americas, the Asia–Pacific region, the PRC and Japan.	***	Consider the creation of a global personnel system that includes evaluation with the goal of ensuring rational and efficient human resources management.
	Continue to offer training programs for employees and candidates for executive positions at DIC Group companies in Japan and overseas and to implement measures aimed at fostering global human resources.	<ul> <li>A total of five employees of overseas Group companies were sent to work at Group compa- nies in Japan under the GCD Program.</li> <li>Practical training aimed at fostering global human resources was introduced.</li> </ul>	***	Continue offering the GCD Program.     Continue providing practical training aimed at fostering global human resources.
Encourage women in the work- place with the aim of securing a diverse labor force and support- ing diverse working styles.	Enhance measures for advancing the careers of female employees and increase the percentage of new female graduates recruited to 30%-plus.	<ul> <li>A diversity seminar was held for directors and supervisors.</li> <li>Executive-led lunch seminars were held for female employees.</li> <li>A panel discussion was held with women in management positions at other companies as panelists.</li> <li>Telecommuting arrangements were introduced in January 2018.</li> </ul>	***	Continue to advance efforts to, among others, change mindsets, create a framework and actively encourage the hiring of female job candidates.
Promote the hiring of individuals with disabilities with the aim of securing a diverse labor force and supporting diverse working styles.	Increase the number of employees with disabilities to 2.2% of DIC's total labor force.	As of December 31, 2017, individuals with disabili- ties accounted for 1.94% of DIC's total labor force.	*	Increase the number of employees with disabilities to 2.2% of DIC's total labor force.

#### **Basic Approach to Human Resources Management**

With the aim of being an organization that empowers all employees to reach their full potential, the DIC Group is committed to respecting human rights and eliminating all forms of discrimination and to creating a work environment that embraces diversity. The Group also strives to support a healthy work–life balance for each employee and create a work environment conducive to job satisfaction, as well as to foster local human resources in markets around the world, which it recognizes as essential to ensuring sustainable corporate growth under its current medium-term management plan.

#### Respect for Human Rights

The DIC Group actively supports global codes governing human rights<sup>\*1</sup>, in line with which it is currently formulating the DIC Group Human Rights Policy, and promotes related initiatives. The DIC Group Code of Business Conduct, which outlines standards that DIC Group employees are expected to observe, lays down provisions prohibiting human rights violations and requiring respect for diversity, two philosophies that are the foundation of the Group's corporate activities. DIC Group employees are obliged to understand and provide written pledges to abide by the Code. Domestic and overseas Group companies implement voluntary human rights and labor practices inspections as part of ongoing efforts to prevent issues from arising, assess the results of these inspections and confirm the absence of violations.

In fiscal year 2010, DIC became a signatory to the United Nations Global Compact (UNGC), pledging its support for the UNGC's 10 principles, which include tenets regarding human rights and labor. The Company continues to implement related initiatives in all areas of its corporate activities to reinforce respect for human rights in the human resources management practices of all Group companies and prevent the occurrence of violations.

In response to the Modern Slavery Act 2015<sup>\*2</sup>, DIC is reinforcing training regarding human rights due diligence<sup>\*3</sup>, cognizant of the issue of human trafficking and the risks it poses to companies with operations in the United Kingdom. The Company also promotes awareness among DIC Group company executives and enhances corporate headquarters' inspection and monitoring structure as part of an ongoing effort to bolster Group management capabilities.

\*3 Human rights due diligence is an ongoing risk management process that a company needs to follow in order to identify, prevent, mitigate and account for how it addresses its adverse human rights impacts.

<sup>\*1</sup> The International Bill of Human Rights, comprising the Universal Declaration of Human Rights and the International Covenants on Human Rights (the International Covenant on Economic, Social and Cultural Rights and the International Covenant on Civil

and Political Rights; the International Labour Organization's Declaration on Fundamental Principles and Rights at Work; the United Nations' Guiding Principles on Business and Human Rights at the Global Compact (UNGC).
 2 Under the Modern Slavery Act 2015, an Act of the Parliament of the United Kingdom, companies with operations in the United Kingdom must report on the existence/nonexistence of slavery, human trafficking or other critical violations of human rights in their supply chains, related risks and steps they are taking to address such practices. "Modern slavery" encompasses debt bondage, forced labor and servitude; human trafficking; and the Endour Compact (UNGC).

#### The DIC Group Human Rights Policy

As a member of society that recognizes the importance of respect for human rights and respects the basic human rights of all stakeholders, including its customers, suppliers and employees, the DIC Group is currently formulating a human rights policy, a draft of which is provided below. Based on this policy, DIC will work to increase the human rights awareness of its executives and employees and to conduct its business activities in a manner that shows respect for human rights.

#### 1. Positioning

This policy, which is in accordance with global human rights codes, articulates DIC's fundamental stance on respect for human rights.

#### 2. Scope of application

This policy applies to all executives and employees of the DIC Group. The Company shall also encourage its business partners and suppliers to adhere to this policy and cooperate with them to advance respect for human rights.

#### 3. Responsibility to respect human rights

The Company shall strive to fulfill its responsibility to respect human rights by ensuring that its business activities do not result in violations of the human rights of stakeholders, as well as by preventing human rights abuses in the course of its business. In the event that its business partners or suppliers cause adverse human rights impacts through their businesses, products and services, the Company—while not directly complicit—shall use its influence to encourage the responsible parties to cease the practices responsible for such impacts.

#### 4. Human rights due diligence

To fulfill its responsibility in regard to respect for human rights, the Company has created a human rights due diligence system, which it shall employ on an ongoing basis to identify and address human rights risks.

#### 5. Corrective/remedial actions

Should the Company cause adverse human rights impacts or should it become evident that it has been complicit in causing such impacts, the Company shall take appropriate corrective/remedial actions in response.

#### 6. Compliance with applicable laws

The Company shall comply with applicable laws in the countries and territories in which it operates. The Company shall also respect international human rights principles and work actively to promote these principles.

#### 7. Disclosure and education/training

The Company shall periodically report publicly on the progress of initiatives implemented in line with this policy. To ensure the effectiveness of this policy, the Company shall also provide appropriate training to its executives and employees.

#### 8. Dialogue and discussion

The Company shall engage with stakeholders regarding initiatives implemented in line with this policy by creating opportunities for dialogue and promoting discussion in good faith.

#### 9. Identifying principal human rights challenges

The Company has separately identified principal human rights challenges. In line with this policy, the Company shall use due diligence as appropriate. Recognizing this as an ongoing process, the Company shall also continue to revise and amend these challenges to reflect social change, business trends and other factors.

### **DIC** Corporation

#### Principal Human Rights Challenges Facing the DIC Group

Based on key global standards regarding human rights, the DIC Group has identified the following as the principal human rights challenges it faces and promotes appropriate due diligence in accordance with its draft human rights policy. The Group will review these challenges on a regular basis, taking into consideration factors such as social change and business trends.

#### (1) Eliminate discrimination The DIC Group prohibits all types of discrimination, harassment and other practices that undermine the dignity of any individual. (2) Prevent child labor and forced labor The DIC Group prohibits the use of child labor, forced labor, slave labor and labor resulting from any form of human trafficking. (3) Respect basic labor rights

The DIC Group respects basic labor rights, including freedom of association and employees' rights to organize and to engage in collective bargaining.

#### (4) Address the issue of conflict minerals

The DIC Group prohibits the use of conflict minerals. Should any raw materials purchased from third-party suppliers be found to contain conflict minerals, the Group will respond by, among others, immediately terminating the procurement thereof.

#### The DIC Group's Human Rights Due Diligence System

The DIC Group has created a human rights due diligence system, which it employs on an ongoing basis.

Identify and evaluate human rights risks in the

1)	Commit
1)	Commu

Demonstrate the Group's

• Formulate a human rights policy.

• Reinforce awareness of the policy.

human rights policy and views.

Introduce section on human rights into the

DIC Group CSR Procurement Guidelines.

2) Identify and evaluate impacts

3) Implement corrective/remedial measures, provide training and gauge effectiveness

#### Implement measures and gauge effectiveness.

- Group's business and across its supply chain. • Encourage voluntary human rights inspections • Implement corrective/remedial measures.
  - Plan and provide human rights training. Gauge the effectiveness of measures.

4) Disclose information

#### Report periodically on human rights initiatives.

- · Provide information via the DIC global website.
- Include information in the DIC Report.
- · Publicize using conventional mass media.

### Due Diligence Initiatives to Address Principal Human Rights Challenges

Identify and evaluate the impact

1. Promotion of supply chain due diligence by the Purchasing Department

at Group companies.

of human rights risks.

To ensure that its extended supply chain functions in a socially responsible manner, the Company established the DIC Group Universal Purchasing Policy in 2008, based on which it also formulated purchasing management regulations, and the DIC Group CSR Procurement Guidelines, which clarify issues it expects suppliers to address, in 2009. Using the policy and guidelines, the Company promotes CSR procurement by ensuring that all suppliers implement improvements and initiatives necessary to ensure sustainable procurement, as well as advances respect for human rights and takes comprehensive steps to address human rights risks such as conflict minerals, across its supply chain.

#### 2. Responses to a questionnaire issued by coatings industry organizations

DIC completed a questionnaire designed to confirm its awareness of the issue of child labor in the mining of mica in India and the presence or absence of mica procured from mines using child labor, as well as to ensure that it has corrective measures in place. The Company's responses confirmed that the DIC Group procures no mica from mines using child labor and communicated its approach to human rights, including its vow to immediately terminate procurement in the event an issue should arise.

#### 3. Establishment of whistle-blowing hotlines and corrective measures by the compliance team

The Company's compliance team has created a channel for Group employees to report to whistle-blowing hotlines. In fiscal year 2017, the Company received 24 human rights-related reports through this system. However, internal investigations revealed no serious violations. Appropriate corrective measures were implemented in the receipt of reports.

#### 4. Contact procedures and responses to comments and complaints

The Company has established procedures for suppliers, customers, local communities and other stakeholders to report issues by telephone or through its corporate website and strives to respond swiftly when comments or complaints are received. No complaints pertaining to human rights issues were received in fiscal year 2017.

#### TOPIC

#### Sun Chemical Participates in the Responsible Mica Initiative

The Responsible Mica Initiative is a unique collaboration established in February 2017 to eradicate child labor in the mining of mica in India. DIC Group company Sun Chemical, which oversees the Group's printing inks, resins and pigments for cosmetics operations in Europe and the Americas, is a founding member and one of many materials and cosmetics manufacturers taking part in this initiative.

Mica has a broad range of industrial applications, including coatings, cosmetics, electronics materials and cutting fluids and is mined around the world. The use of children in the mica mines of India, a leading producer, has been identified as an issue that needs to be addressed. Through participation in the Responsible Mica Initiative, Sun Chemical will work to contribute through its operations to the realization of a sound, viable mica mining industry in India.

Responsible Mica Initiative was http://www.responsible-mica-initiative.com/index.html

Mica

#### Building Trust with the DIC Employees' Union

DIC's management and representatives of its employees' union meet regularly with the goal of ensuring healthy industrial relations based on mutual trust. In addition, through labor-management councils and casual management conferences, DIC shares management information and its vision for the future with union representatives and encourages the frank exchange of opinions. A total of 67.8% of parent company employees belong to the DIC Employees' Union. (100% of non-managerial employees are union members.)

#### Global Human Resources Management

In line with The DIC WAY, which represents its fundamental management philosophy, and its DIC108 medium-term management plan, the DIC Group has established a global human resources management framework under which Group companies in Japan, the PRC and the Asia–Pacific region are overseen by DIC, while those in North America, Europe, Central and South America, and Africa are overseen by Sun Chemical of the United States.

With the rapid expansion of its global operations, DIC recognizes that fostering human resources and creating an environment that encourages cross-border career advancement and mobility is essential to increasing corporate value. To these ends, since fiscal year 2015 the Company has sought to develop harmonized promotion, personnel evaluation and remuneration systems, the cornerstone of its global human resources management framework for DIC Group companies under its jurisdiction.

Having unified personnel evaluation systems for executives in Japan, the PRC and the Asia–Pacific region, as well as created a management resources database, DIC is promoting systematic efforts to cultivate executives, including introducing specialized management training and systematic training programs. Through such efforts, the Company is striving to create a structure that allows it to cultivate executives that best suit its needs without regard for nationality.

In fiscal year 2017, DIC and DIC Graphics unified the qualification standards for 1,300 management-level (i.e., manager and above) employees. These changes came into effect in January 2018. As a consequence, unified duty- and role-based standards are now used for the majority of such employees in Europe and the Americas, the Asia–Pacific region, the PRC and Japan.

DIC is striving to realize a framework that creates a broader playing field, allowing employees with diverse values and skills to exercise their capabilities and using the same yardstick to evaluate their achievements. By so doing, the Company aims to create work environments that enhance job satisfaction and contribute to the expansion of DIC Group businesses.

		Fiscal year 2015	Fiscal year 2016	Fiscal year 2017
Number of	Male Female	2,898 683	2,653 660	2,618 655
employees	Total	3,581	3,313	3,273
	Male	42.2	41.9	42.2
Average age	Female	40.3	40.6	41.3
	Total	41.8	41.6	42.0
Average	Male	18.2	17.8	18.2
years of employment	Female	17.7	18.5	19.2
	Total	18.1	18.2	18.4
New	Male	75	38	39
graduates	Female	20	14	11
hired	Total	95	52	50

#### Fiscal year 2015 Fiscal year 2016 Fiscal year 2017 (Fiscal year 2013 hires) (Fiscal year 2014 hires) (Fiscal year 2012 hires) Male 95.7% 91.3% 79.2% (after three 100% Female 91.7% 100% 83 Total 91.4% 96.5% 35 32 37 Male oluntary 11 8 8 Female number o 45 40 Total 1.3% 0.3% 1.3% Male Separation rate (voluntary) 0.2% 1.7% 1.2% Female 1.3% 0.3% Total 1\_4

#### **Basic Personnel Statistics (DIC)**

#### Integrating DIC Group Executive Evaluation Systems

The DIC Group has integrated its evaluation systems for Group company presidents and other executives in Japan and overseas with the goal of encouraging these individuals not only to pursue near-term results for their business units but also to choose management approaches that are optimal for the Group as a whole from both a medium- and long-term perspective. The Group also integrated its global personnel policies to ensure that remuneration is in keeping with local market levels and individual job responsibilities.

#### Securing and Fostering Human Resources

#### Ensuring Fair and Consistent Treatment

Having recognized fortifying its Group

organizational capabilities and enhancing

the skills of its people as important

challenges, DIC has declared the mediumterm focus of its human resources development program as being to nurture human resources capable of reinforcing front-line capabilities and accelerating

change. This program, which is divided

into six categories, is based on curricula

that emphasize a systematic approach

to helping each employee acquire critical

skills. Since fiscal year 2016, training has

emphasized the concepts of "global" and "diversity," with areas emphasized including training to improve English-language skills and Japanese-language training for

non-native speakers.

To ensure that the efforts and achievements of all employees are reflected appropriately in their treatment, DIC has consolidated its numerous employee qualification systems irrespective of job classification and educational credentials. The selection of employees to recommend for qualification is done through screening based on objective standards, thereby guaranteeing equal opportunities for promotion to all motivated, capable employees.

Remuneration and personnel evaluation systems designed to enhance job satisfaction ensure that individual employees' abilities and achievements are assessed appropriately and reflected in a timely manner. Of note, the Company has introduced MBO, a goal-setting management tool that promotes both corporate growth and employee development, into its personnel evaluation system. Results of individual evaluations are fed back in full to employees, including reasoning behind determinations—a transparent process that ensures employees are largely satisfied with evaluation results.



#### Postering Human Resources to Reinforce Front-Line Capabilities and Accelerate Change

Medium-Term Focus of DIC's Human Resources **Development Program** 

Nurture human resources with the aim of realizing sustainability and achieving the targets of DIC108



DIC Report 2018 116

#### Reinforce front-line Foster human resources with the skills

necessary to promote the steady growth of businesses, maintaining awareness of the importance of sustainability

 Reinforce leadership skills Strengthen management capabilities
 Enhance department- and job-specific skills

#### Accelerate change

Foster human resources with the skills necessary to drive change in businesses to ensure DIC is always ahead of the times Propose solutions that respond to changing business styles

 Develop products that leverage compounding technologi
 Give full play to comprehensive skills Accelerate globalization

#### **DIC Training Programs**

Management- level training	Promote globalization, strengthen/foster the ability of management-level employees to deal with risks	DIC Management School, media training
Global human resources development	Systematic efforts to foster managers and employees of overseas Group companies, enhance the skills of Japanese employees assigned to overseas posts, improve the Japanese-language abilities of employees who are not native speakers	Next Global Human Resources Development Program, Global Management (preparatory training for employees assigned to overseas posts), Global Leader Candidates Development Program, Global Challenge Program, Target Global Program (training to enhance English-language communication skills), Effective E-Mailing (training in how to compose e-mails in English), Japanese-language training for employees who are not native speakers
Level-specific training	Education and training to equip employees with the skills to fulfill responsibilities at each level	Qualification-specific training (J, M, S, senior); training tailored to different management ranks
Department- and job-specific training	Education and training to enhance capabilities required by different departments and jobs	Human resources development programs tailored to production departments (Kaizen Skill Improvement Training Program, others), technical departments (training to support the ability to propose R&D themes, others), sales departments (training to cultivate proposal development capabilities, others) and support departments ("why-why analysis" training, others)
On-the-job training	Hands-on training in the workplace to foster employees and cultivate skills	Workplace-specific on-the-job training, domestic technical department trainee program, Overseas Trainee Program, Global Capability Development (GCD) Program
Self-development	Support for employees seeking to enhance their skills	Correspondence courses, e-learning courses, in-house seminar courses, Skype-based English conversation courses, preparatory courses for the TOEIC Institutional Program (IP) Test

#### Training to Enhance Proposal Development Capabilities

Since fiscal year 2013, DIC has offered a series of courses that focus on cultivating prowess in the area of proposal development, in line with its goal of reinforcing front-line capabilities. In the advanced course, which primarily targets senior manager–level employees, groups of five or six individuals from sales and technical departments form cross-department project teams, which select practical customer-centered themes, and work to formulate solutions to pertinent hypothetical issues and further hone their ability to prepare and present proposals. The course, which lasts nine months, encompasses approaches to development of innovative proposal themes and angles, problem solving and persuasive presentations, among others, with professional business consultants offering advice and guidance at each stage.

Course work is in addition to participants' regular responsibilities, so participants have a lot on their plates, but they find that they are able to apply newly acquired skills almost immediately, greatly improving front-line capabilities. Participants have also used their selected themes to make proposals to actual customers, many of which have reached the verification stage.

#### 3 Fostering Global Human Resources

#### Offering the Overseas Trainee and GCD Programs

The goal of DIC's Overseas Trainee Program is to foster global human resources by dispatching selected employees from Japan to work at a DIC Group company in another country for a specified period, thereby helping them develop a more international mindset, improve their skills and build networks with their colleagues overseas. As of the fiscal year 2017 year-end, 19 individuals were participating in this program.

Under the GCD Program, employees from overseas Group companies are sent to work at DIC Group companies in Japan. Positioned as part of the Group's effort to foster global human resources and promote diversity, this program gives future business leaders a chance to learn new skills and Japanese

business techniques and to network with Group colleagues, as well as to deepen their understanding of Japan's culture and commercial practices. This program also brings domestic employees in contact with other cultures and provides an opportunity for them to polish their English-language skills and acquire a global perspective. In fiscal year 2017, Group companies in four countries sent one or two GCD Program Participants to spend between three months and one year at sites in Japan.

Through the Overseas Trainee and GCD programs, DIC seeks to advance the globalization of the overall DIC Group, as well as to encourage smooth cooperation between Group companies in Japan and their counterparts overseas.

#### Initiating Practical Training for Global Human Resources

Overseas Trainee Program Destination and Number of Employees Dispatched in Fiscal Year 2017

United States	4
Malaysia	3
Indonesia	3
Germany	2
India	2
PRC	2
United Kingdom	2
Vietnam	1

on ed	Country of Origin and Number of Participants in the GCD Progran in Fiscal Year 2017

Indonesia	2
PRC	1
ROK	1
Thailand	1

In fiscal year 2017, the Company initiated a training program for mid-tier employees designed to enhance global business skills, selecting 24 individuals in their 30s and 40s to take part. Participants attended classes conducted by native English speakers that focused on improving presentation, negotiation, debate and other skills. The Company also provides individual training designed to improve English-language capabilities, including one-on-one Skype-based training focused on improving conversational skills and TED talk\* listening and dictation classes.

\* TED (Technology, Entertainment, Design) talks are conferences conducted by U.S. media NPO TED, LLC, that are posted online for free distribution. The talks address a wide range of topics and are given by front-line leaders in various fields invited to serve as speakers.

#### TOPIC

#### Lecture Provided to Promote Understanding of Islamic Culture

Prior to the arrival of GCD Program participants from Indonesia, in February 2017 managers and assistant managers at the Kashima Plant, in Ibaraki Prefecture, attended a lecture designed to give them a basic knowledge of Islamic culture. Lecture participants learned about practices that have developed around the religion of Islam, which is practiced by 80% of Indonesians, including the obligatory duty to pray five times a day, halal food, and fasting during the holy month of Ramadan. The lecture helped the plant make necessary preparations, including setting aside a space for daily prayer, and to give consideration to working hours, food choices and other factors after the two individuals arrived. Despite a certain amount of initial bewilderment on the part of both plant employees and program participants, earnest efforts to communicate helped enhance understanding of each others' cultures and customs. In March 2018, the Indonesian program participants is correct as a welcoming environment for participants from Malaysia who arrived earlier this year.

### VOICE Taking part in this program expanded my horizons and reinforced my professional drive.

As a participant in the Overseas Trainee Program, I spent fiscal year 2017 at DIC (Guangzhou). While I had been to the PRC numerous times on business, taking up a post there gave me a better understanding of how Chinese people think, as well as an appreciation of historical and cultural context, which has enabled me to communicate on a deeper level in business situations.



Strength through

Diversity

One thing I did while I was in Guangzhou was to plan a variety of cross-department recreational activities involving both local staff and staff from Japan. This activity helped me build strong professional and personal relationships with my colleagues, as a result of which I really enjoyed working together. On my days off, I also

participated in get-togethers organized to help Japanese expats in Guangzhou get to know each other. There are a lot of us in the area under similar circumstances and I found the opportunity to socialize with compatriots in various businesses, industries and positions—people I would likely never have met if we were all in Japan—extremely valuable, and it encouraged me to reflect again on myself and on the Company I represent.

I really believe in the value of the Overseas Trainee Program as an initiative that expands one's horizons. I hope that many employees are able to take advantage of this challenging and rewarding opportunity in the years ahead.
High Performance Chemicals Sales Department 1, Polymers Product Division Keisuke Saji

#### Promoting Diversity

The DIC Group actively pursues diversity by employing a broad spectrum of individuals without regard to considerations such as gender, nationality, physical limitation or age. The Group works to foster a corporate culture that draws on its understanding and respect for diversity to produce creative ideas and to incorporate the concept of diversity into management, thereby

creating workplaces that enhance job satisfaction for employees. DIC's new president and CEO, Kaoru Ino, who took office in January 2018, has said, "It is important to recognize that marshaling the diversity of the individuals that make up our labor force will enable us to respond to social imperatives or even to change DIC itself." The Group will continue working to draw out the distinctive capabilities of its employees by creating work environments that empower a richly diverse global team of true individuals to fully exercise their abilities.

#### 1 Hiring Diverse Human Resources

With the objective of securing talented individuals with advanced specialized capabilities, global perspectives and language capabilities, DIC actively promotes the hiring of international students completing undergraduate or graduate studies at Japanese universities; Japanese and foreign nationals completing undergraduate or graduate studies at overseas universities; and experienced mid-career candidates with extensive experience and expertise. At present, approximately 40 foreign nationals are employed in various capacities at DIC.

#### Number of Foreign Nationals Currently Employed by DIC

Sales positions	Technical positions	Department/ division administration	Posted overseas	Production	Total
4	25	8	4	1	42

#### Nationalities of Foreign Employees



#### VOICE Thanks to the support of my supervisors and colleagues, I learned to really love my work.

I met a number of DIC employees at an academic conference when I was in graduate school and was really impressed by their positive attitude and broad expertise, so when I started looking for a job after graduation DIC was my first choice. My first assignment was in a department involved in developing LC products, which is completely different from my area of specialization in university and something I really did not know much about. Thanks to the support of my supervisors and colleagues, I was able to overcome any difficulties I faced and play a key role in developing products and learned to really love my work. To me, DIC's true appeal is its willingness to entrust important tasks to young employees and the fact that I have so many colleagues I can talk to about anything, whether work-related or personal. In April of this year, I was transferred to a department involved in gravure inks development, so I am once again working hard to learn new things with the aim of quickly becoming a useful part of my new team.



Dispersion Technical Group 1, Tokyo Plant Keumhee Jang

#### 2 Expanding Career Opportunities for Women

In line with its commitment to promoting diversity, DIC implements a variety of initiatives to expand career opportunities for female employees. Having established a full-scale program to support employees in balancing the demands of a career and childcare in 2007, since fiscal year 2016 the Company has pushed ahead with measures to transform employee mindsets and its corporate culture, as well as to provide training designed to encourage the drive and determination of female employees and broaden the range of jobs open to women.

#### Creating a Framework for Initiatives

In fiscal year 2017, DIC established the position of diversity officer in each of its business units to create a framework for initiatives in each business unit that reflect the actual situation on the ground. The individual in charge of diversity for the Group and the business unit diversity officers meet periodically to exchange information, among others, with the aim of raising the standard of initiatives implemented Companywide.

#### Transforming Employee Mindsets and the DIC Corporate Culture

In October 2016, DIC held the Women in DIC Forum, which addressed the issue of career opportunities for female employees and welcomed female executives from multiple Group companies, at its corporate headquarters in Tokyo. Approximately 800 employees—split evenly between female employees and male management-level employees—participated in the conference on-site and via live relay. In the first session, four female executives from overseas Group companies gave presentations, while in the second session three female employees

in senior positions in Japan joined the four speakers for a panel discussion on pursuing a rewarding career as a way to enrich one's life. The discussion was broadcast to 14 DIC Group sites across Japan. As part of its effort to change the mindsets of management-level employees, in May 2017 DIC held a conference for approximately 300 line supervisors on the meaning of diversity. The following month, the

conference for approximately 300 line supervisors on the meaning of diversity. The following month, the Company held a round-table discussion that included an outside director who is board chair of an NPO and is well versed in diversity management. All executive officers participated in the discussion, which included debate on the direction and substance of future efforts to promote career opportunities for female employees.



Women in DIC Forum

#### Enhancing Management Skills

In a move designed to help enhance the management skills of female employees, in fiscal year 2016 DIC became a member of the Japan Women's Innovative Network (J-Win), registering two employees as individual members. An NPO that assists efforts to promote and firmly establish diversity management in the workplace, J-Win engages in a broad range of activities, including advising and serving as a consultant for companies seeking to advance career opportunities for female employees, organizing seminars and lectures, and conducting surveys. DIC employees participate in a variety of J-Win programs with the goal varying from improving project management capabilities and self-improvement to conducting research using diversity case studies and expanding networking efforts.

Thanks to these and other efforts to improve work environments, in fiscal year 2017 the voluntary separation rate for female employees of the parent company remained in the area of 1%, while the average years of service for female employees once again exceeded that for male employees.

DIC continues taking decisive steps to expand its recruitment of new female graduates from technical schools and bachelor's and master's degree programs, conduct awareness seminars for employees qualified for executive and managerial positions, and expand its telecommuting system. Through such efforts, the Company aims to boost the percentage of management positions occupied by female employees to 8.0% by January 1, 2021. DIC has also formulated an action plan based on Japan's Act on Promotion of Women's Participation and Advancement in the Workplace.



Regular meeting of J-Win members (July 2017, Tokyo)

## VOICE What I learned through participation in a J-Win program designed to advance career opportunities for women.

I participated in a 23-person working group organized on the theme of collaboration among companies with the goal of group members fortifying knowledge and experience through a variety of activities, including document studies, visits to various companies and the examination of case studies. To me, the most exhausting part was the discussing of matters until every member was satisfied. As individuals with nothing in common other than the fact that we are female and businesspeople, I think we all found team building and the alignment of goals difficult. The opportunity to share information with people from different companies and systems was stimulating and provided an opportunity to reflect on one's own company. Participation in this working group also enabled me to build a network of contacts that I will always value. Going forward, the challenge will be to transform this important experience and the connections I made into something that effectively benefits DIC.



Publicity Manager, PR Group, Corporate Communications Department Yukie Yano

#### Initiatives Aimed at Expanding Career Opportunities for Women

	Transform corporate culture and the mindset of management-level employees	<ul> <li>Message from the President</li> <li>Seminars to promote awareness</li> <li>Identical uniforms for male and female employees</li> <li>Training for employees in administrative positions</li> </ul>
2007	Encourage the drive and determination of female employees	<ul> <li>Seminars to promote awareness among female employees</li> <li>Introduction of role models</li> </ul>
2007 1 2015	Expand opportunities for female employees	<ul> <li>Assignment of female employees to production and sales positions</li> <li>Inclusion of female employees in regular system of transfers, reassignments and job rotations</li> <li>Increase in number of women hired</li> </ul>
	Establish systems to support a healthy work–life balance for female employees and encourage the use thereof	<ul> <li>Establishment of systems to support a healthy work–life balance</li> <li>Publication of the Libra work–life balance support guide and introduction of e-learning program for employees taking leave</li> <li>Introduction of system allowing management-level employees to limit the locations to which they will accept transfers</li> </ul>
2016 and beyond	Further expand support to measures and promote awareness	<ul> <li>Women in DIC Forum</li> <li>Diversity seminars for executives and supervisors</li> <li>Lunchtime seminars for female employees conducted by executives</li> <li>Awareness seminars for female employee</li> <li>Career support seminars for female employees</li> </ul>

## Policy for Advancing the Careers of Female Employees

DIC is committed to creating a work environment in which all employees can fully exercise their abilities. To this end, the Company pledges that female employees shall enjoy equal access to career opportunities as their male counterparts and that no gender-based restrictions or barriers shall be applied.



#### 3 Advancing the Employment of Individuals with Disabilities

DIC is committed to creating inclusive work environments that help individuals with disabilities enjoy active and fulfilling careers. One initiative, which began in fiscal year 2015, is an internship program, organized in collaboration with a facility providing support for individuals with intellectual disabilities, designed to transition into full-time employment. In fiscal year 2017, three program participants were offered full-time clerical positions.

As of December 31, 2017, individuals with disabilities accounted for 1.94% of DIC's total labor force, falling slightly short of Japan's legally mandated quota of 2.0%. Going forward, DIC will continue striving to enhance work environments and increase workplace accessibility with the aim of lifting this figure to 2.2% by fiscal year 2018.

Percentage of DIC's Labor Force Accounted for by Individuals with Disabilities



#### 4 Reemployment after Retirement and Support for Retirement Planning

DIC has deployed a system that facilitates the reemployment until age 65 of individuals reaching retirement age (60) and wishing to remain with the organization. With available options including fulltime work, short-time work and work sharing, this system enables reemployed individuals to maximize their experience and make full use of their accumulated technological capabilities and specialized expertise, thereby contributing to sustainable growth for the DIC Group and the training of subsequent generations.

DIC also offers classes for employees within a year of retirement that helps them prepare for life after their careers. These classes provide assistance with retirement planning and education regarding the national pension system, as well as offer retirement lifestyle simulations.

#### Number of Reemployed Individuals

	Fiscal year 2015	Fiscal year 2016	Fiscal year 2017
Number of retirees (A)	126	108	69
Individuals seeking reemployment	104	92	55
Number of individuals reemployed (B)	97	91	55
Reemployment rate (B) / (A)	<b>77.0</b> %	<b>84.3</b> %	<b>79.7</b> %

#### Initiatives that Support a Healthy Work–Life Balance

DIC views a healthy work-life balance as essential to both self-realization and sustainable corporate growth. Accordingly, from the standpoint of corporate health management\*, the Company continues to expand systems intended to facilitate such a balance.

In response to falling birth rates and lengthening life spans, the Japanese government has launched a drive to promote work style reforms, in line with its belief that positive workplaces lead to higher productivity, with the aim of helping individuals balance the demands of a career and childcare or nursing care and improving productivity. Since well before this, DIC has promoted initiatives aimed at enabling all employees to realize both a satisfying work life and a fulfilling life outside work.

\* An approach to employee health management that emphasizes a corporate management perspective and the implementation of strategic measures

#### Enhancing Programs that Help Employees Balance the Demands of Work and Home

In 1986, DIC blazed a trail for chemicals manufacturers in Japan by implementing a childcare leave program. Since establishing a program to support employees in balancing the demands of a career and childcare in 2007, the Company has continued promoting measures that make it easier for employees to make use thereof. In fiscal year 2008, DIC acquired the Kurumin Mark, which recognizes companies that promote initiatives designed to assist employees in raising children. The Company also deployed a system that gives regular employees the option to accept or refuse transfers requiring relocation and, since 2012, a system that allows management-level employees to limit the locations to which they will accept transfers, making it easier for individuals who are unable to accept transfers that involve relocation because of childbirth, childcare, nursing care or other responsibilities.

#### Promoting Measures to Retain Employees with Nursing Care Responsibilities

In Japan, one of the social ramifications of falling birth rates and lengthening life spans is an increase in the number of people requiring nursing care, as a result of which more people find themselves having to leave their jobs to take care of family members. Steps taken by the government to help address these issues include revising the Child Care and Family Care Law in 2016 to make it easier for individuals to take leave or time off and increasing benefits for temporary absences from work. To encourage use and promote knowledge of its related leave programs, in June 2017 DIC began distributing the *Childcare and Nursing Care Handbook*. DIC has also revised the rules of these programs, including making it possible to break up nursing care leave, as well as to shorten

# Toos # Bar #

**Kurumin Mark Certification** 

In 2008, DIC was accorded the Kurumin Mark, which recognizes companies that actively promote initiatives designed to assist with child rearing, by Japan's Ministry of Health, Labour and Welfare.



#### Promoting Telecommuting

workdays, thereby making it easier for employees to use them.

In fiscal year 2016, DIC began exploring the potential of telecommuting, which enables employees to work at home or another remote location using ICT, eliminating the time and location constraints of traditional work arrangements. The following year, employees and management conducted extensive talks to iron out details. After analyzing and evaluating the results of a trial involving 57 employees, in January 2018 the Company launched the DIC Telecommuting System, which is available to all employees at all sites in Japan.

By creating systems that make it possible for each employee to choose a working style that suits the type of work he or she does, as well as his or her personal needs, DIC will continue working to help employees achieve a healthy work-life balance. The Company will also continue to promote the independent execution of duties with the aim of reinforcing employees' self-management capabilities, thereby accelerating efforts to galvanize employees and encouraging them to give full play to their creativity.

#### Major Expansion of the Flextime System

To facilitate flexible working styles, in fiscal year 2017 DIC resolved to significantly expand its flextime system and in April 2018 made the system applicable to all areas of operations other than production floors. The system makes it possible for employees to determine the time at which they end their working day to the extent that it does not hinder business efficiency, as well as to simultaneously make use of telecommuting, with the goal of promoting the independent execution of duties and enhancing self-management capabilities.

#### Work and Childcare Balance Support Programs

Childcare Leave Program	The maximum length of leave is until the child reaches the age of 2 years and 6 months, which is one year longer than the legally mandated leave period.
Leave to Assist with Parenting Program	Male employees can take five days' paid leave during the eight weeks following their child's birth to assist with parenting.
Childcare While Working Program	Employees can shorten their workday by up to three hours until the end of a child's third year of elementary school. Employees can also stagger their working hours to accommodate childcare schedules.
Economic support system	This system enables employees on unpaid childcare leave to borrow a portion of their bonuses in advance to pay for, among others, fertility treatment or infant care facility fees.
Return to previous (or equivalent) position	Employees returning from childcare leave must be allowed to return to their previous position or to a position equivalent thereto.
Information sharing to promote program participation	DIC's views on support for work and childcare balance, as well as a guide to its various available systems and how to make use of them, are posted on the Company's website and intranet.
Nursing care leave system	Employees can take such leave for up to one year, exceeding the statutory maximum of 93 days. As of January 2018, employees may also break up leave without restriction.
Nursing Care While Working Program	Employees not wishing to take leave while providing nursing care can shorten their workday by up to two hours or opt for a system in which they shorten their days by two hours before or after prescribed working hours. As of January 2018, employees may also request to be excused from doing overtime without restriction.
Relocation limitation system	Management-level employees may limit the locations to which they will accept transfers that involve relocating because of childbirth, childcare, nursing care or other responsibilities.

#### Use of the Childcare Leave and Leave to Assist with Parenting Programs

Thanks to the introduction of various programs to help employees in balancing the demands of work and home and the creation of an environment that encourages employees to take advantage of such thereof, the percentage of DIC employees who return to work after using DIC's Childcare Leave Program is currently 100%. The number of individuals using the Leave to Assist with Parenting Program, available to the dependents of employees who have given birth, has risen. Underscored by efforts to enhance these systems, the average years of employment for female employees has increased, exceeding the average for male employees.

#### Number of Employees Using the Childcare Leave and Leave to Assist with Parenting Programs

	Fiscal year 2014	Fiscal year 2015	Fiscal year 2016	Fiscal year 2017
Number of employees using the Childcare Leave Program	28	29	35	35
Number of employees using the Leave to Assist with Parenting Program	63	64	<b>62</b>	77

#### Average Years of Employment (Including Individuals Seconded to Group Companies)



#### 2 Reducing Extreme Overwork and Encouraging Employees to Take Annual Paid Leave

DIC has deployed an electronic system to manage on-site hours, working hours and approved overtime hours. As a measure to prevent extreme overtime, if an employee exceeds the agreed-upon overtime limit (80 hours/month), his or her supervisor and the senior executive in charge are automatically notified so that steps can be taken to ameliorate the situation. The supervisor is required to submit a report outlining the employee's work and the reasons for the excessive hours while also presenting specific measures to ameliorate the situation, which is also shared with the DIC Employees' Union, a process designed to curb extreme overwork.

In addition, the Company has instituted a mandatory Groupwide "no overtime day" every Wednesday and on payday, which in Japan is once a month at month-end, in a bid to encourage efficient work practices and bolster productivity. (Sites can change these days as appropriate.) DIC also encourages employees to take annual paid leave, notably by recommending leave timing at each site and having employees plan dates for such leave.

#### Average Monthly Overtime Hours Worked and Annual Paid Leave Taken

	Fiscal year 2014	Fiscal year 2015	Fiscal year 2016	Fiscal year 2017
Average monthly overtime hours worked per employee	12.2 hours	<b>12.1</b> hours	12.3 hours	<b>12.2</b> hours
Average annual paid leave granted	<b>19.1</b> days	<b>18.8</b> days	<b>19.1</b> days	<b>18.8</b> days
Average annual paid leave used	<b>11.0</b> days	<b>11.2</b> days	<b>12</b> days	<b>12</b> days
Usage rate for annual paid leave	<b>57.6</b> %	<b>59.6</b> %	<b>62.8</b> %	<b>63.8</b> %

#### Caring for Mental Health

DIC takes steps to create environments in which employees feel physically and mentally supported and works to ensure that its labor management practices comply with relevant laws. The Company places a high priority on caring for psychological and emotional well-being and has established a comprehensive mental health program, highlights of which include engaging an in-house occupational psychologist, promoting initiatives aimed at warding off mental health problems and extending support to ensure a smooth return to work for employees taking leave. In particular, access to counseling provided by an occupational psychologist has had a considerably positive impact in terms of ensuring employees get treatment and are able to return to work as quickly as possible.

DIC has also offered voluntary stress checks since fiscal year 2013 and promotes active, systematic efforts with the aim of preventing mental health disorders in accordance with related legislation passed in Japan in fiscal year 2016. In fiscal year 2017, DIC conducted seminars led by an in-house physician at sites that have scored above a certain level in voluntary stress checks and provided counseling aimed at helping employees improve communications with supervisors, colleagues and family members. The Company will promote the ongoing, systematic implementation of these initiatives.

#### Mental Health Initiatives

- Guidance from an in-house occupational psychologist (engaged as an occupational physician since fiscal year 2012)
- Internal and external help desks
- Line-care training\* for supervisors
- · Mental health self-checks as a part of training for new employees
- Distribution of Kokoro no Kenko ("Psychological Health") self-check handbook to all employees
- · Flexible process to support employees returning to work after taking leave



Kokoro no Kenko self-check handbook

\* Line-care training: Training for supervisors to help them recognize promptly when an employee is unwell and respond appropriately by, for example, recommending guidance or counseling or making workplace improvements.

A new healthy cafeteria menu selection

**DIC Irodori Care<sup>+</sup>** 

#### Initiatives to Support Employee Health

DIC has always analyzed the results of employees' annual physicals and provided assistance to employees for whom lifestyle improvements have been recommended by providing introductions to hospitals and clinics. The Company has also sought to contribute to good health for employees by encouraging the use Spirulina-a noted superfood\* that is manufactured by a DIC Group company—as an ingredient in cooking.

In fiscal year 2016, DIC's Healthcare Office and the company responsible for the operation of the corporate headquarters' employee cafeteria collaborated to develop a new healthy cafeteria menu. The new menu, dubbed DIC Irodori Care+ ("DIC Colorful Care+") was launched in February 2017, beginning with the cafeteria at the Company's corporate headquarters in Tokyo, with distinctive signage used to promote recognition and a clear explanation provided of the benefits of menu selections, including reduced calories and low sodium content, to encourage use.



DIC will continue implementing measures designed to help ensure the physical and mental health of its employees as part of its commitment to creating a work environment in which all employees can fully exercise their abilities.

\* The term "superfood" is used to describe standard foods with an excellent balance of nutrients that provide health benefits and foods containing specific nutrients and/or ingredients good for human health

#### TOPIC

#### DIC Earns "White 500" Certification in the Health & Productivity Outstanding Entities Recognition Program

DIC was certified for the first time in the large enterprise category (dubbed the "White 500") of the 2018 Health & Productivity Outstanding Entities Recognition Program, which is organized by Japan's Ministry of Economy, Trade and Industry and Nippon Kenko Kaigi\*1. By shining a spotlight on outstanding enterprises working to advance health and productivity management, this program seeks to create an environment that ensures such enterprises gain enhanced public recognition-i.e., from employees, jobseekers, related companies and financial institutions-as organizations that approach employee health and productivity from a management perspective and promote strategic initiatives.

In addition to looking at whether enterprises have stipulated health management in their corporate mission and disclose pertinent information, the 2018 Health & Productivity Outstanding Entities Recognition Program assessed performance based on three criteria, namely, grasp of employee health-related issues and consideration of actions, establishment of a foundation for the practical implementation of health and productivity management measures and work engagement<sup>\*2</sup>, and promotion of efforts that help ensure the physical and mental health of employees. DIC received scores significantly above the industry average for all three of these criteria, finishing in the top 20% with a five-star rating.

Going forward, DIC will continue to implement measures designed to help ensure the physical and mental health of its employees as part of its commitment to creating a work environment in which all employees can fully exercise their abilities.



\*1 Nippon Kenko Kaigi ("Japan Health Council") is an organization that liaises with private companies, with the full backup of the government, to put effective measures in place to prolong the healthy life expectancy of citizens and to ensure sound medical services in Japan.
\*2 A concept used to measure employees' mental health, work engagement is described as a positive, fulfilling work-related state of mind that is characterized by vigor, dedication and absorption. "Vigor" is taking pride and experiencing a sense of satisfaction in one's work, "dedication" is feeling strongly involved in and focused on one's work and "absorption" is being actively engrossed in one's work.

## Sustainable Procurement

#### Promoting Socially Responsible Procurement Across the Supply Chain



12 RESPONSIBLE CONSUMPTION AND PRODUCTION

#### Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objective of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
Promote CSR procurement	<ul> <li>For raw materials used in core businesses, work with suppliers to minimize CSR procurement-related risks.</li> <li>Examine CSR procurement assessments of suppliers in the PRC more carefully with the goal of uncovering issues in the supply chain and implementing corrective measures together. Share information with the Sun Chemical Group.</li> <li>Based on CSR procurement questionnaire responses in Japan, discuss corrective measures with suppliers having low self-assessment scores.</li> </ul>	For raw materials procured in Greater China, to confirm suppliers' ability to respond to environmental regulations, measures focused on implementing on-site inquires at key suppliers of raw materials used in core businesses and requesting corrective measures. Information derived was shared with the Sun Chemical Group.	**	For raw materials procured in Greater China, minimize procurement-related risks by closely inspecting the responses to environmental regulations and implementing countermeasures to address issues.
	For companies overseen by DIC Asia Pacific and DIC (China), use version 2 of the <i>DIC Group Supply-chain CSR</i> <i>Deployment Guidebook</i> to once again advance awareness of CSR procurement, prioritizing key raw materials in core businesses.	DIC Asia Pacific and DIC (China) worked with local companies to conduct on-site inquiries at suppliers in their respective regions (two in the Asia–Pacific region and two in Greater China) with the aim of fostering awareness.	**	For suppliers of raw materials used in core businesses that are based in the Asia–Pacific region, implement detailed inquiries to gain a solid grasp of risks, thereby ensuring procurement stability, from the perspective of business continuity.

#### **Basic Approach to Sustainable Procurement**

Having recognized the increasing importance of addressing global issues related to human rights, climate change and water risk, among others, as social imperatives, the DIC Group promotes socially responsible procurement practices. To ensure its extended supply chain functions in a socially responsible manner, the DIC Group established the DIC Group Universal Purchasing Policy, based on which it also formulated purchasing management regulations, in 2008 and the DIC Group CSR Procurement Guidelines, which clarify issues it expects suppliers to address, in 2009. Using the policy and guidelines, the Group promotes CSR procurement across its supply chain by ensuring that all suppliers implement improvements and initiatives necessary to ensure the sustainability of Group procurement. Group companies in Japan, the Americas and Europe, Greater China and the Asia–Pacific region collaborate to ensure sustainable procurement on a global basis.

#### The DIC Group Universal Purchasing Policy

Guided by an action policy established to realize the DIC Group's basic sustainable procurement principles, the Purchasing Department adheres to the following guidelines in dealing with suppliers:

#### Fair and transparent business practices The DIC Group will implement fair and open purchasing activities with suppliers based on global perspectives, without the constraints of conventional commercial customs.

2 An appropriate purchasing process and the building of relationships of mutual trust

The DIC Group, as a good partner for suppliers, will build long-lasting, mutually trusted relationships with suppliers and work together with them for mutual harmony and benefit, while complying with relevant regulations/social norms, domestic and overseas, and pursuing adequate quality and prices.

#### Satisfying environmental/safety needs

The DIC Group will take responsibility as an exemplary corporate citizen for environmental affairs, occupational safety, human health and product quality, always take into account changes in society and implement environment-friendly purchasing activities

#### Challenge the creation of new value In order to respond at a high level to a new value sought by society, the DIC Group will proactively

challenge the creation of such value together with suppliers, with whom the same goal can be shared, and strive to grow together with them in a sustainable manner.

#### The DIC Group CSR Procurement Guidelines

- ••••••
- Compliance with laws and social norms
- Respect for human rights and consideration for work environments
- Safety and hygiene
- Promotion of sound business management
- Consideration for the environment
- Information security
- Appropriate quality and safety and improved technologies
- Flexible attitude to ensure stable supplies and respond to change
- Contribution to local communities and society
- Promoting CSR and deploying it in the supply chain

#### Encouraging CSR Procurement

Based on the DIC Group Universal Purchasing Policy, and incorporating requirements contained in guidebooks put out by external organizations including the Japan Electronics and Information Technology Industries Association (JEITA), DIC formulated the DIC Group CSR Procurement Guidelines, a series of requirements pertaining to ESG-related imperatives, including the management of chemical substances in and reduction of the environmental impact of raw materials, as well as respect for human rights across its entire supply chain. With the aim of compelling suppliers to observe these guidelines, the DIC Group conducts assessments and on-site inquiries in accordance with the DIC Group Supply-chain CSR Deployment Guidebook. (Version 2 of the guidebook was published in July 2013.) In addition to obliging suppliers to ensure the stringent management of chemical substances through the DIC Group Green Procurement Guidelines, the Group entreats suppliers to develop and release products that have less of an impact on the environment and promote green procurement themselves, as well as to lower the environmental impact of materials they procure, and of the packaging, transport, production and engineering thereof, by trimming resources and energy used in, decreasing the weight and expending the useful life span of, and reducing CO<sub>2</sub> emissions from such materials. Such measures have proven effective in strengthening the Group's relations with suppliers.

#### The DIC Group Green Procurement Guidelines

In line with the DIC Group Universal Purchasing Policy, DIC formulated the DIC Group Green Procurement Guidelines, which prohibit the procurement of materials containing hazardous substances in seven categories\*1. The guidelines mandate the submission of a DIC Raw Materials Survey, an SDS and a chemSHERPA\*2, as well as a DIC Group Green Procurement Guidelines Survey, when purchasing raw materials, thereby creating a system for eliminating substances of concern. Submission of a Conflict Minerals Survey is also required.

\*1 (1) Substances the production of which is prohibited, as outlined in Article 55 of Japan's Industrial Health and Safety Act; (2) Substances designated as class 1 specified chemical substances (1) Substances the production of which is prohibited, as obtined in Article 55 of Japan's industrial Health and Safety Act; (2) Substances designated as class 1 specified chemical substances in Japan's Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.; (3) Substances designated for monitoring under Japan's Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.; (4) Chemical substances the production of which is already prohibited, as detailed in Japan's Act on the Protection of the Ozone Layer Through the Control of Specified Substances and Other Measures (ozone-depleting substances listed in the Montreal Protocol); (5) Specified particulates denoted in Japan's Air Pollution Control Act; (6) Specified poisonous substances indicated in Japan's Poisonous and Deleterious Substances Control Act; and (7) Specified substances detailed in the Stockholm Convention on

Persistent Organic Pollutants. \*2 chemSHERPA is a scheme designed to facilitate the accurate and efficient sharing of information on chemical substances in products across the entire supply chain. DIC began using chemSHERPA in late fiscal year 2017

#### Supplier Self-Evaluations

In accordance with version 2\* of the DIC Group Supply-chain CSR Deployment Guidebook, the DIC Group asks suppliers to complete questionnaires, which it uses to ascertain the status of suppliers' CSR procurement practices. The questionnaire further segments the Group's 10 procurement guidelines into 46 issues, including green procurement, acquisition of ISO 14001, consideration for human rights and the work environments, and promoting CSR procurement to secondary suppliers.

\* Version 1 of the DIC Group Supply-chain CSR Deployment Guidebook was published in 2009 in Japanese, English and Chinese. Version 2, published in July 2013, includes new sections on conflict minerals and biodiversity, added in response to changing social imperatives

#### Analyzing the Results of Questionnaires

From November 2013 through December 2017, the DIC Group conducted assessments for 729 suppliers using version 2 of the DIC Group Supply-chain CSR Deployment Guidebook, accounting for 90%-plus of its procurement spending in Japan. The Group analyzed and assessed questionnaire responses, providing feedback to all 729 suppliers and requesting corrective measures for significant issues through on-site inquiries or written comments.









higher on the Group's 5.0-point scale.

#### Conducting On-Site Inquiries

From fiscal year 2011 through fiscal year 2017, the DIC Group conducted on-site inquiries for 70 suppliers. The objective of these inquiries is to help suppliers further their understanding of CSR. In an on-site inquiry, the Group and the supplier confirm the responses provided by the supplier in the assessment questionnaire. Other efforts include introducing examples of Group initiatives designed to advance CSR procurement and realize sustainability.

#### Global Procurement Initiatives

In fiscal year 2017, DIC and regional headquarters in the PRC and the Asia–Pacific region cooperated to conduct on-site inquiries for 12 suppliers in core businesses in the PRC based on the suppliers' CSR procurement assessment responses. DIC also worked with these suppliers to fortify understanding of issues related to local environmental regulations, and of environmental issues in the supply chain related to local legal and regulatory compliance, as well as to request corrective actions. Information on these on-site inquiries was shared at a global procurement conference with Sun Chemical.

#### **Conflict Minerals**

In compliance with the U.S. Securities and Exchange Commission's requirement for listed companies to report on their use of conflict minerals, the DIC Group published its Basic Policy concerning Conflict Minerals on its global website. This policy outlines the Group's pledge to refrain from using gold, tantalum, tungsten and tin, which are classified as conflict minerals, that is, minerals mined in conditions of armed conflict and abuse in the Democratic Republic of the Congo and its neighboring countries. The policy also states that should any raw materials purchased from third-party suppliers be found to contain conflict minerals, the DIC Group will immediately terminate the procurement thereof. The DIC Group uses the Conflict Minerals Reporting Template prepared by the Responsible Business Alliance (RBA) and the Conflict-Free Sourcing Initiative (CFSI), to conduct conflict minerals audits across its entire supply chain. As of December 2017, responses had been received for more than 90% of the items currently procured by Group purchasing departments.

## Business Models that Respond to Social Imperatives

#### **Cultivating Next-Generation Businesses**





Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objective of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
Propose solutions-oriented businesses that respond to social imperatives.	With the aim of creating next-generation businesses, strengthen cooperation with external organizations to accelerate business expansion on a global scale.	By reinforcing collaboration with other companies and organizations in the creation of such next-generation businesses as near infrared dyes, QD jet inks and cell culture substrates, the DIC Group made steady progress toward entering promising new markets.	***	Implement value chain-oriented marketing and emphasize two perspectives, namely, DIC Group products and customers/ regions, with the goal of expanding the Group's operating foundation and helping to increase consolidated net sales.
	Participate in trade shows for key customer industries in Japan and overseas to strengthen the DIC brand.	The DIC Group participated in major trade shows in Japan and overseas, including FINETECH JAPAN, Food Safety Japan, Wood Ecological Technology Fair 2017, Highway Techno' Fair 2017 and the 30th Annual Meeting of the Japan Society for Endoscopic Surgery (Japan) and interPack (Germany). Group companies in the PRC and the ROK also staged private exhibitions for customers.	***	Participate in trade shows for key customer industries in Japan and overseas to strengthen the DIC brand and promote digitization to improve efficiency.

#### Responding Accurately to the Changing Needs of Society

Given the economic impact of key social imperatives, expectations are growing that highly competent companies—including those able to make decisions and act quickly and those with the expertise and efficiency necessary to resolve issues—will help contribute to the resolution of related problems. The DIC Group's approach is to ensure an appropriate grasp of changes in the social structure to gain insights into concerns shared by its customers and to offer appropriate solutions. While the starting point of these efforts is listening to the voices of its customers—an approach known as "customer-in"—the Group also takes a "market-in" approach, paying heed to the importance of anticipating social imperatives.

#### Promoting Businesses that Anticipate Social Imperatives

One of the central strategies of the DIC Group's current medium-term management plan, DIC108, is to create next-generation businesses. The Group is responding to this challenge through the cultivation of business models that address social imperatives.

For example, one of the principal objectives behind efforts to expedite the widespread adoption of renewable energy is to address increasingly crucial issues such as global warming and the depletion of fossil fuels. However, this depends on, among others, installing large-capacity storage batteries to resolve issues related to the generation of surplus electric power. The DIC Group conducts tireless research aimed at addressing such challenges and is developing innovative materials and systems for storage batteries and sensors that will yield concrete, viable solutions, thereby contributing to sustainability. The Group also continues to promote business activities with roots in the needs of society with the aim of further evolving its business models.

#### Examples of Optimized Business Models that Respond to Social Imperatives

#### **1** Near Infrared–Based Food Contaminant Detection System that Will Improve Food Safety

DIC is currently developing a near infrared-based food contaminant detection system in collaboration with Mitsui Kinzoku Instrumentations Technology Corporation. The system combines dyes that emit infrared for plastics and a device that detects near infrared and is thus expected to be able to identify plastic contaminants, which has traditionally been considered difficult. Thanks to near infrared's safety—it has minimal impact on human health—and the ease with which it penetrates matter, the potential for application in the detection of contaminants in food products is seen as being high.



Near infrared-based food contaminant detection system

Inks for Use in the Production of Inkjet-Printed QDCFs for Power-Efficient Displays DIC is working with quantum dot (QD) manufacturer Nanosys to develop inks for use in the production of the world's first cadmium-free QD jet inks for use in inkjet-printed quantum dot color filters (QDCFs). Because they facilitate the manufacture of displays that are more power efficient and deliver a wider color gamut and viewing angle than existing units, QDCFs are garnering considerable attention for use in next-generation displays. Going forward, DIC will continue promoting development with the goal of marketing inks for use in the production of inkjet-printed QDCFs, which will join the Company's LC materials and organic pigments for color filters as key offerings in this area, in fiscal year 2020.



Colloidal QD dispersions irradiated with a UV light

Cell Culture Containers with Thermosensitive Polymer Coating for Use in Regenerative Medicine DIC recently developed the *Cepallet*<sup>™</sup> series of cell detachment–enhancing cell culture containers, which minimize damage to induced pluripotent stem (iPS) and embryonic stem (ES) cells during cell recovery. The containers represent a practical application of the results of research conducted in collaboration with Associate Professor Hirofumi Suemori of Kyoto University's Institute for Frontier Life and Medical Sciences and Masato Nakagawa, lecturer at Kyoto University's Center for iPS Research and Application (CiRA). The containers, which capitalize on DIC's exclusive synthesis and coating technologies, minimize damage to cultured cells during recovery, improving cell survival rates and the efficiency of recovery.

## Anticipating Trends and Promoting Efforts to Identify and Cultivate Promising New Markets

With the aim of realizing sustainable growth over the medium to long term, the DIC Group has identified promising new markets arising from social imperatives in six key areas resources, materials and energy; logistics and industrial equipment; electronic and electrical equipment; pharmaceuticals and medical devices; general consumer products; and construction infrastructure—and is striving to assess its ability to cultivate demand in each. The Group is also working to identify key technologies, as well as to discern technological issues that must be addressed, allowing it to accurately gauge growth and technology development potential and determine which of these markets it will enter.

#### AQUACEPTER®

Addressing the need to repair aging tunnels, roads, bridges and other infrastructure elements is an urgent priority. DIC and the Hanshin Expressway Group recently developed an innovative agent for stopping water ingress that employs *AQUACEPTER*\*—a new material developed exclusively by DIC—and are currently conducting field trials on Hanshin Expressway tunnels. In addition to excellent adhesive strength for sealing leaks, the new agent provides flexibility that accommodates later concrete structural movement, making it an effective choice for preventing leaks not sealable using conventional methods. This new low-odor, environment-friendly, water-based agent also improves conditions for workers. DIC and the Hanshin Expressway Group will continue to promote active development efforts with the aim of helping extend the life of infrastructure.





Cepallet™ cell culture containers



AQUACEPTER®

#### Global Efforts to Expand Business Domains and Cultivate Next-Generation Businesses

The DIC Group currently encompasses 171 companies in 64 countries and territories. The Group classifies its operations into four regional groupings: Japan, where the corporate headquarters is located; the PRC; the Asia–Pacific region; and the Americas and Europe.

Once it has resolved provisionally to enter a new market that offers promise from a global value chain perspective, the DIC Group sets about clarifying necessary technologies, systems and services, as well as key development themes. Technology and sales departments work together to verify theoretical value and ascertain the appropriate opportunity to enter the market and, bearing in mind the Group's position in the supply chain, aim to create an optimal business model that will enable it to provide innovative solutions to its customers and build a robust business.

Focusing particularly on core businesses, the DIC Group is currently taking active steps to reinforce and expand its presence in key Asian markets, which are expected to see significant growth going forward, while at the same time broadening its reach to include emerging economies in Eastern Europe, South America and the Middle East. The Group is also seeking to drive further growth by promoting active R&D initiatives, spearheaded by R&D units at its domestic sites, in collaboration with R&D bases in the PRC, the Asia–Pacific region, and the Americas and Europe (the Sun Chemical Group).

### Enhancing Brand Strength

Established as a manufacturer of printing inks, DIC has expanded its focus, capitalizing on its foundation in organic pigments and synthetic resins to develop a diverse portfolio of products that leverage its wealth of core technologies. Today, the Group supplies products that respond to the needs of customers in a variety of industries, including printing, automobile manufacturing and electronics. In line with its branding program, launched in fiscal year 2016, the Group seeks to enhance its brand strength through active participation in trade shows in Japan and overseas that convey the value it provides and the role it plays—which in fiscal year 2017 included interpack (Germany), FINETECH JAPAN and Food Safety Japan—and through communication with customers.



The DIC Group's booth at FINETECH JAPAN in fiscal year 2017

## New Technology Development and Value Creation

#### Proposing Solutions that Leverage Elemental Technologies





Goals and Achievements of Major Initiatives Evaluations are based on self-evaluations of current progress. Key: \*\*\* = Excellent; \*\* = Satisfactory; \* = Still needs work

Objectives of initiatives	Goals for fiscal year 2017	Achievements in fiscal year 2017	Evaluation	Goals for fiscal year 2018
Enhance ability to develop products and technologies that facilitate contribution to a sustainable society.	<ul> <li>Promote collaboration among DIC Group technical departments.</li> <li>Enhance global R&amp;D configuration.</li> <li>Encourage open innovation.</li> <li>Use IT to enhance the efficiency of R&amp;D.</li> </ul>	<ul> <li>The Solid Compound Technical Center-Asia Pacific, in Malaysia, and the Fine Chemical Technical Center-Korea were established. The former oversees solid compound-related R&amp;D in the Asia-Pacific region, while the latter focuses on LC-related technologies.</li> <li>Groupwide technical collaboration bolstered achievements in printing inks and polymers, including the development of water-based products, in the PRC, which conlinues to see a tightening of environmental regulations.</li> <li>Active use was made of open innovation and artificial intelligence (AI) to enhance the speed and efficiency of R&amp;D.</li> </ul>	**	<ul> <li>Promote collaboration among DIC Group technical departments.</li> <li>Strengthen global technological development.</li> <li>Make use of open innovation and Al to hasten R&amp;D.</li> </ul>
Promote the development of environment-friendly products and services.	Accelerate efforts to develop low-carbon and other products that reduce negative impact on the environment.	<ul> <li>Newly developed products included a rice bran oil-based gravure ink and a low-VOC coating resin for use in coated steel.</li> <li>Environment-friendly products accounted for 56.0% of overall product sales.</li> </ul>	**	Accelerate efforts to develop low-carbon and other products that reduce negative impact on the environment.

#### Achieving Sustainable Growth

In line with its Color & Comfort brand slogan, the DIC Group is leveraging its basic technologies, including those in the areas of optics and color, organic molecular design, polymer design and dispersion, as well as its core technologies in such areas as synthesis, compounding and formulation, and surface treatment, to develop high-value-added products that contribute to a sustainable society. The Group is also building a portfolio of next-generation products and new technologies by integrating technological resources originating across the Group, as well as actively promoting open innovation, to drive sustainable growth.

#### The DIC Group's Basic and Core Technologies and Target Markets



Developing Next-Generation Products with Compounding Technologies and through Open Innovation



#### Specific Initiatives and Achievements

The DIC Group is promoting the development and use of clean technologies. The Company is encouraging a shift toward materials with reduced environmental impact—notably energy-saving, water-based and solvent-free materials, as well as materials for the electronics, automotive, packaging and other industries—that improve the environmental performance of the products in which they are used, which it has positioned as environment-friendly products.

#### Products for Use in Electronics Equipment

The DIC Group is developing materials that contribute to the reduction of energy consumption by facilitating the downsizing of and the shortening of and reduction of waste in production processes for finished products. In products for LCDs, the Group worked to enhance the performance of its blue pigments for wide color filters, a move that helped bolster sales. The Group also promoted sample shipments of a highly responsive monomer that shortens production processes for polymer sustained alignment (PSA) LCs. In the area of NPS LCs, a proprietary technology, the Group succeeded in significantly improving response speed while at the same time maintaining transmittance comparable to that of PSA LCs. In addition, the Group began providing samples of a new n-type LC material that spontaneously adopts homeotropic alignment, eliminating the need for an alignment layer. In the area of next-generation display materials, DIC continued to promote development of inks for use in the production of inkjet-printed QDCFs for displays in collaboration with Nanosys of the United States. (For details, see "2. Inks for Use in the Production of Inkjet-Printed QDCFs for Power-Efficient Displays" on page 129.) In the area of products for use in electronics materials, the Group developed a naphthalene-based epoxy resin for use in semiconductor packages that has been adopted by fabricators, while in products for printed electronics–related applications the Group commercialized a nanosilver dispersion (particles of silver dispersed in a solution) for metallic foil bonding layers and a polymer adhesive layer material.

#### Products for Packaging Applications

Newly developed and launched products in Japan included a non-food (waste) rice bran oil-based gravure ink for printing on the surface of food packaging, a high-sensitivity UV ink that meets the requirements for Japan's Vegetable Oil Ink mark and a white lamination ink for use on refill pouch materials that delivers both high opacity and physical properties. In the area of adhesives for packaging, the Group developed a new product made with vegetable oil-derived materials.

Overseas, the Sun Chemical Group brought a number of new products to market, including a water-based ink system made with vegetable oil-derived raw materials and a series of UV LED inks for printing on films and other packaging materials. The group also proceeded with the development of a deseaming adhesive for shrink sleeves.

#### Products for Energy-Related Applications

In the area of battery-related products, the DIC Group launched adhesives for solar battery back sheets in the PRC and India and released a new binder for lithium-ion battery (LiB) separators. In building materials, a new sheet-form passive heat storage material that effectively harnesses solar heat to minimize changes in indoor temperatures was adopted for use by a housing company. The Group is also working to expand applications for this product, including as a heat/cold storage material for the low-temperature transport of pharmaceuticals and other products and in greenhouse agriculture.

#### A Global R&D Configuration that Underpins Product Development

The DIC Group's global R&D bases work as one to promote R&D of new technologies and products. DIC's Technical Management Unit and R&D Management Unit cooperate with the R&D components of DIC Group companies around the world. These include DIC Graphics; the Sun Chemical Group's research centers in the United States, the United Kingdom and Germany; Qingdao DIC Finechemicals, which conducts comprehensive R&D tailored to market needs in the PRC; printing inks technical centers (Asia–Pacific region and the PRC;) polymer technical centers (Asia–Pacific region and the PRC;) the Fine Chemical Technical Center–Korea and solid compound technical centers (Asia–Pacific region, the PRC and Germany). In addition, an algae research center in the United States capitalizes on the Group's accumulated expertise as a producer of Spirulina to conduct comprehensive algae-related research in areas ranging from cultivation to practical application.

#### The DIC Group's R&D Configuration



#### Promoting Environment-Friendly Products

The DIC Group is committed to effective stewardship of the products it provides. (For related information, please see pages 60, 101 and 110.) Conscious always of the importance of ensuring its products are environment-friendly, DIC promotes the development of products and new technologies that are useful to society and works to increase the weighting of environment-friendly products in its portfolio, by reducing the volume of hazardous substances it uses, focusing on products that are less hazardous and products that facilitate recycling, and realizing safer production processes that generate less waste and use less energy. The Group has established internal rules for designating products "environment-friendly" and

works to increase the weighting of products that have earned this designation in their portfolio. In fiscal year 2017, environment-friendly products accounted for 56.0% of all products put out by DIC and subsidiary DIC Graphics. The Group also strives to maintain a solid grasp of laws and regulations in different countries and territories, and of trends in environmental measures—thereby ensuring its ability to design products that comply with diverse regulations governing the use of chemical substances in different markets— and conducts environmental assessments on a continuous basis.

For printing inks, adhesives and other products used in food packaging, which the Group supplies to customers around the world, the DIC Group has established a global product stewardship team. The team shares information on regulations and relevant topics from different markets, as well as promotes awareness thereof and provides education. Knowledge thus gained is incorporated into product design and used to produce compliance certificates across the supply chain, which are essential for customers worldwide.

#### **Evaluation Sheet for Environment-Friendly Products**

Department:		Prepared by:		Prepared on:			
Product to be Evaluated:							
Evaluation Item	Certifying Standards	Description		Average of f	Coefficient α	Subtotal α·f	
Energy Consumption	Reduction of energy in production, transportation, etc.						
Materials to be Used	Reduction of use of non- renewable materials, non- recyclable materials, etc.						
Hazards	Product with lower toxicity, etc.						
Amount of Waste Generated	Reduction of environmentally concerned substances, etc.						
Remarks:	Remarks:						
			Evaluator				

DIC introduced its system for designating environment-friendly products in 2003 and uses a proprietary evaluation sheet to designate products as "environment-friendly."

#### Accelerating the Development of Natural Food Colorings through Open Innovation

Targeting the fast-growing market for natural alternatives to synthetic food colorings, DIC has commenced joint R&D with Fermentalg, France's leading producer of microalgae for use in food products, with the aim of developing a new generation of natural food colorings. The arrangement—which brings together Fermentalg's unique microalgae strain bank and biotechnology platform and DIC's significant R&D prowess, industrial production capabilities and global sales network—is expected to accelerate the development of groundbreaking new natural food colorings.

#### Products that Contribute to the Realization of Clean Technologies

The DIC Group develops materials that contribute to the realization of clean technologies designed to resolve critical global environmental issues. Product divisions promote the development of clean technology-related products for individual target markets that leverage distinctive DIC capabilities. Overall annual sales of such products currently amount to approximately ¥165.4 billion.

The DIC Group is conscious of the recycling of resources and is working on the 3Rs ("Reduce, Reuse, Recycle"). In the reduction area, we are working to reduce the amount of materials used by our customers by reducing the thickness and strength of our products in the fields of plasticizers, adhesives and adhesive tapes. In the area of recycling, we are developing and launching products that use recycle-conscious components and promoting businesses that lead to recycling. While considering social issues such as marine plastic pollution, we are working to preserve the environment through our business activities and explore business areas in which we can contribute.

#### Innovation through Compounding

Building on its fundamental pigment and resin dispersion and formulating technologies, realized through the production of printing inks, DIC has succeeded in combining materials with different properties and performance characteristics to develop groundbreaking products and create new value. Recent achievements in the area of PPS compounds include the development of a new compound that complies with U.S. FDA standards for packaging that comes into direct contact with food products, sample shipments of which have begun in Europe. The Group also commenced sales of a new high-strength, highly thermoresistant compound for use in plumbing-related applications, for which it is also promoting application in automotive cooling components. The DIC Group will continue to harness its distinctive compounding capabilities to transform its diverse technologies into competitive advantages with the aim of driving innovation.



#### Protecting Intellectual Property

Recognizing intellectual property as crucial to competitiveness, the DIC Group vows to respect the intellectual property of other companies. At the same time, guided by an open/closed strategy the Group works to secure intellectual property rights for its own technologies and make use of "black boxing."

DIC's efforts to reinforce protection of its intellectual property are also attracting notice outside of the Company. For example, in fiscal year 2017 DIC was sixth in a ranking of companies in the chemicals industry in Japan in terms of patent assets owned conducted by an independent firm\*. DIC registers an average of 400 new patents annually. While this is small compared to leading chemicals firms, the Company received a high score for the overall scale of its patent assets, reflecting the quality and high profile of the patents it holds. DIC will continue to actively protect its intellectual property portfolio with the aim of ensuring sustainable growth in the years ahead.

**VOICE** We are promoting the development of next-generation products that stabilize human thermal environments, thereby reducing energy consumption and enhancing comfort.

In the construction field, promoting far-reaching measures to reduce energy consumption is an urgent challenge. The impact of living environments on residents' health is also a subject of renewed scrutiny, further underscoring the importance of improving human thermal environments. With the aim of addressing this imperative, we developed and launched a new sheet-form passive heat storage material. Because the material itself absorbs and radiates heat, it helps to maintain comfortable indoor temperatures, reducing energy required for heating and cooling.



Conventional heat storage materials liquefy at a certain temperature, making their use in construction problematic. We leveraged proprietary technologies to create a material in sheet form that offers superb workability. To encourage widespread adoption of this product, we are currently promoting the creation of pertinent Japan Industrial Standards (JIS), among others. We have also begun submitting the material for use in projects to reduce energy consumption that are currently being supported by the Ministry of Land, Infrastructure, Transport and Tourism and the Ministry of Economy, Trade and Industry. In addition, we are cultivating applications in such areas as agriculture, civil engineering, constant-temperature transportation and automobiles, efforts that have begun to yield some very interesting data.

Manager, Coating & Applied Materials Technical Group 3, Coating & Applied Materials Technical Division Kenichi Fujisaki

## Harmony with the Community and Social Contributions

#### Adding Color & Comfort to Lifestyles



SDGs Goals 3 and 4

#### **Basic Approach to Social Contribution**

Based on its Guidelines for Social Contribution Activities, established in fiscal year 2009, the DIC Group works to ensure harmony with local communities and individuals through activities aimed at building a strong relationship with society.

#### The DIC Group's Guidelines for Social Contribution Activities

In line with its Color & Comfort by Chemistry management vision, the DIC Group will promote social contribution initiatives in three areas: business activities, culture and education, and communities and society.

#### **Business activities**

The DIC Group will offer products and services that contribute to the development of a sustainable society and protection of the global environment from the viewpoint of "CSR through business activities."

#### Culture and education

The DIC Group will engage in activities that will contribute to the development and promotion of culture, the arts, science and education, including fostering next-generation human resources in areas such as the culture of color and chemistry.

#### Communities and society

The DIC Group will strive to coexist harmoniously with local communities to develop a relationship of mutual trust. Moreover, the Group will provide an environment that enables employees to engage in voluntary contribution activities in their respective local communities.

.....

#### Examples of Recent Initiatives

#### *Publication of the* Guidebook for the Color Universal Design–Recommended Color Set

The DIC Group is actively involved in R&D in the area of color universal design (CUD), as well as in expanding public awareness and understanding of CUD's importance. Under the supervision of the University of Tokyo, the Group, in cooperation with the Japan Paint Manufacturers Association, the Industrial Research Institute of Ishikawa and the Color Universal Design Organization, created the Color Universal Design–Recommended Color Set and, in 2013, published the *Guidebook for the Color Universal Design–Recommended Color Set*. In developing the color set, the organizations capitalized on their particular expertise and verification by study participants with various types of color vision to adjust proposed colors, a process that facilitated the creation of a set of colors that are relatively easy to distinguish regardless of ability to see colors and can be reproduced using printing inks, coatings and digital imaging.

In 2015, Chiba University, the Central Research Laboratories and DIC Color Design, Inc., gave presentations on issues to consider in printing warnings and other important information on packaging and the results of joint research on the color appearance of red spot colors at two international academic conferences. The results of joint research in the use of color in an aging society were presented at a meeting of the Color Science Association of Japan in June 2017. Two color options were developed (a warm orangey yellow and a cool yellowish green) to give architects and others more choice.

In spring 2018, manufacturers began marketing new tactile paving to assist visually impaired pedestrians developed by DIC in collaboration with the University of Tokyo and architect Kengo Kuma in a project that began in 2011. Developed to ensure high visibility for visually impaired individuals and harmony with the landscape, the new paving was also designed with studs that do not pose a barrier to wheelchairs and strollers.

In April, DIC participated in the project to revise the Japan Industrial Standards (JIS) standard for safety colors (JIS Z 9103). With the goal of choosing colors that can be distinguished by people with diverse color vision, the project used the findings of an extensive survey to conduct a comprehensive review of safety colors from the perspective of CUD. The revised standard for safety colors is expected to increase safety and convenience for visitors to Japan and individuals with diverse color vision in advance of the Tokyo 2020 Olympic and Paralympic Games.

Looking ahead, DIC will continue to promote a variety of research initiatives that contribute to society and add color to lifestyles.



Press conference introducing the newly developed tactile paving



JIS safety colors (before and after revision of standard)

#### Visiting Science Lab Program

In line with the Japanese government's efforts to promote career education initiatives, as well as to help curb a decline in the popularity of science among children, DIC and DIC Graphics conduct visiting science labs at public elementary schools. Through this program, the Group seeks to spark children's interest in science and encourage them to realize the close relationship between science and their everyday lives. Since launching this initiative in 2010, the two companies have conducted visiting science labs at 35 schools for approximately 2,700 sixth-graders.

In fiscal year 2017, this program won silver in the 2017 Education Support Grand Prix, sponsored by Tokyo-based Leave a Nest Co., Ltd. The Education Support Grand Prix is the only awards program in Japan that evaluates and recognizes the educational initiatives of companies committed to helping children thrive from both a business and an educational perspective. In explaining its decision, the jury cited measures and systems in place to ensure that the DIC Group's program—the goal of which is purely to contribute to society—continues regardless of fluctuations in operating results. Jury members also gave high marks to the program's use of know-how and technologies unique to the DIC Group, as well as to its clear positioning as an initiative that enables the Group to contribute through its business activities to the success of the SDGs. DIC pledges to continue offering this program in the years ahead.



Visiting science lab



DIC's 2017 Education Support Grand Prix award certificate

#### Comment This is a program that is closely linked to children's everyday lives.

DIC and DIC Graphics began conducting science labs at our school in 2017. In addition to the employee who served as instructor, the lab included a number of other employees, each of who worked with four or five students. This ensured that experiments were both safe and fun, resulting in a science lab that was a truly valuable experience for all participants. In addition to helping children realize that studying science is useful in everyday life, the lab aligned with regular curriculum units, meaning that the school's burden for preparation was minimal. From the perspective of career education, the value of these science labs is enhanced by the fact that they are conducted by a well-known company with close ties to our community.



Principal, Itabashi Municipal Kami-Itabashi No. 2 Elementary School Yukio Ozawa

#### Initiatives Led by the Central Research Laboratories

The Central Research Laboratories offer a variety of programs in such uniquely DIC topics as synthesis and chromatics to the students of local schools. In December 2017, students from Chiba Prefectural Sakura High School—a Super Science High School\*— were invited to take part in a visiting lab lesson conducted by staff of the Central Research Laboratories on the themes of "colorant extraction using Spirulina" and "measuring rheologic behavior using mayonnaise and honey." The young researchers who serve as lab instructors also incorporated a career education component, taking time to talk to students about how they became interested in science, their choice of university and the challenges and rewards of being a researcher.

\* A designation awarded by Japan's Ministry of Education, Culture, Sports, Science and Technology (MEXT) to senior high schools that implement curricula focused on the sciences and mathematics that goes beyond MEXT's official guidelines with the aim of fostering the next generation of talented engineers and scientists.



Visiting lab lesson

#### Kawamura Memorial DIC Museum of Art

The Kawamura Memorial DIC Museum of Art, located adjacent to the Central Research Laboratories in Sakura, Chiba Prefecture, was established in 1990 to publicly exhibit works of art collected by DIC Corporation and its affiliates. In 2018, the museum is celebrating its 29th anniversary. As of December 2017, cumulative visitors to the museum had surpassed 2.4 million. DIC views operation of the museum, which assumed its current name in 2011, as a social contribution initiative that the DIC Group is uniquely positioned to undertake as an organization intrinsically involved in color.

The museum's extensive collection spans numerous genres, encompassing works by Rembrandt; Impressionists such as Monet and Renoir; modern European artists such as Picasso and Chagall; early modern, modern and postwar Japanese artists; and luminaries of late-20 century American art, including Mark Rothko, Cy Twombly and Frank Stella. In addition to a standing exhibit from its permanent collection of more than 1,000 major works, the museum stages special exhibitions several times a year that focus on pertinent literary works and other artifacts that evoke the cultural atmosphere at the time works were created to help visitors better understand the collection. The museum also offers free-of-charge guided tours every afternoon beginning at 2:00 pm.

Another appealing aspect of the museum is its location on a lushly forested 10-hectare site alive with seasonal flowers and foliage that has been open to the public since the museum's establishment. A total of 250 cherry trees—10 varieties in total—blossom every spring, while in summer wildflowers of all colors cover the site. Other highlights include the lotus pond at the back of the garden, which was expanded in 2015, and the wooded nature trail that traverses the site.

In a move aimed at promoting relations with the local community and fostering local cultural activities, the Kawamura Memorial DIC Museum of Art has established an annex gallery on the museum site that serves as an exhibition space for local amateur artists and is also made available to elementary and junior and senior high schools in the Sakura area for an exhibition of local students' works.

The museum was also the first in Japan to introduce interactive methods originated by the Museum of Modern Art in New York for teaching children about art. To date, a total of 150 schools and more than 10,000 children have taken part in the museum's educational programs, which are offered to entire classes led by elementary or junior high school teachers. This program has been certified every year since its establishment by the Association for Corporate Support for Arts under its This is MECENAT program.



Kawamura Memorial DIC Museum of Art



Museum entrance hall



Outdoor terrace

#### Matching Gift Program

DIC has a matching gift program whereby it matches the total amount collected through an annual year-end fundraising drive spearheaded by its employees' union. Funds raised through the 2017 drive and matching gift program were donated to 22 children's homes and facilities providing support for disabled individuals. In October 2017, the efforts of the team responsible for this program at the Sakai Plant over many years received a certificate of appreciation by the mayor of Osaka.



DIC employees present a donation to Amagasaki Gakuen, a children's home in Amagasaki, Hyogo Prefecture



A DIC employee presents a donation to Orion House, in Sakura, Chiba Prefecture, which provides support for disabled individuals

#### Support for Disaster-Hit Areas

DIC currently donates funds to assist reconstruction in areas devastated by the April 2016 Kumamoto Earthquake though participation in the IPPO IPPO NIPPON project, an initiative organized for this purpose Earthquake by Keizai Doyukai (Japan Association of Corporate Executives).

## Communication with Stakeholders

#### **Promoting Disclosure and Communication**

#### **Promoting Disclosure and Communication**

The DIC Group places a priority on disclosing information to its stakeholders worldwide, as outlined in Article 7 of its Policy on Corporate Governance.

## Article 7 (Ensuring Appropriate Information Disclosure and Transparency)

The Company shall ensure transparency and fairness; and in order to gain the correct understanding and trust from stakeholders, shall timely and appropriately disclose information relating to matters such as the DIC Group's management philosophy, management policies, business plans, financial condition and sustainability activities.

Guided by this policy, the DIC Group promotes communication with stakeholders through television advertisements, participation in exhibitions, websites and events. By communicating effectively with stakeholders, the Group strives to ensure an adequate understanding of stakeholder expectations and to reflect such expectations in its business activities. The Group is also expanding its awareness of the concept of stakeholder engagement, a key requirement under ISO 26000.

	Ties with customers	Ties with shareholders and investors	Ties with society	Ties with employees	Ties with the media
Basic approach	Build trusting relationships. By incorporating the demands of customers, seek to develop products that enhance customer satisfaction.	Ensure appropriate disclosure and build trusting relationships with shareholders and investors, encouraging both to evaluate DIC as an attractive investment.	Operate in harmony with the community and build positive relationships with local residents that will underpin the long-term sustainability of operations.	Provide workplaces that are conducive to job satisfaction and enable all employees to fulfill their potential. Over the long term, achieve true diversity.	Deepen mutual understanding through effective publicity, advertising and other communications efforts.
Communications tools	Websites     Product pamphlets     Corporate profile DVDs     DIC Report     Corporate PR film     News releases     Television advertisements	Websites     Press conferences     Ouarterly results     announcements     Vida Shoken Hokokusho     (financial disdisure document required     of listed comments in Japan)     Timely disclosure     Notice of Convocation of     the Annual General Meeting     of Shareholders     Shareholders     Shareholders     Dic Report     News releases     Television advertisements	Websites     Site reports     Corporate profile DVDs     DIC Report     News releases     Television advertisements	DIC Plaza (in-house newsletter) Intranet DIC Pocket Book (in-house Group data file) DIC Report Corporate PR film News releases Television advertisements Global linkage Branding questionnaire	<ul> <li>Press conferences</li> <li>Interviews with journalists</li> <li>DIC Report</li> <li>News releases</li> <li>Television advertisements</li> </ul>
Opportunities for communication	<ul> <li>Sales activities</li> <li>Participation in exhibitions</li> </ul>	General shareholders' meetings     Results presentations     IR conferences     IR meetings     DIC IR Day	<ul> <li>Production facility tours</li> <li>Participation in projects involving collaboration among industrial concerns, government bodies and academic institutions</li> <li>Participation in community events</li> <li>Environmental monitoring</li> </ul>	Labor-management councils     Results presentations     for employees     Presentations on the DIC     Group Code of     Business Conduct     Sustainability presentations	Newspapers     Economic publications     Industry publications

#### Ties with Customers

Guided by the basic policy of its medium-term management plan, which emphasizes the focused allocation of management resources in key business domains, in fiscal year 2017 the DIC Group took part in numerous trade shows in Japan and overseas. Such events provided valuable opportunities for the Group to communicate with its customers. In Japan, the Group participated in the Tokyo Health Industry Show 2017, held in March 2017, where it exhibited Spirulina, which continues to attract attention as a superfood. In April, the Group took part in FINETECH JAPAN, where it showed TFT LCs, highly thermoconductive insulating adhesive sheets and other products that leverage state-of-the-art technologies. At the JPCA Show—organized by the Japan Electronics Packaging and Circuits Association—in June, the Group exhibited nanosilver dispersions, ultrathin adhesive polymer materials and other products that leverage Cutting-edge DIC technologies. Overseas, the Group took part in CHINAPLAS 2017, which targets the rubber, plastics, automobile manufacturing, electronics and other industries. In addition to giving a presentation on trends in colors and materials from an Asian perspective during Seoul Design Week 2017, the Group participated in trade shows in various locations around the world for a broad range of industries. The Group also held a private show to introduce initiatives and propose solutions to which it invited customers, trading company representatives and brand owners, among others.

In November 2017, the Group invited customers to an exhibition of historical editions of the Asia Color Trend Book and works from the Kawamura Memorial DIC Museum of Art at DIC corporate headquarters in Tokyo. The goal of this exhibition, which was held in the newly established DIC Color & Comfort Lounge, was to promote communication and understanding. On another front, the Group modified the DIC global website, enhancing usability across multiple devices and reinforcing information on individual products.

Some of the Trade Shows in which Sun Chemical Participated in 2017
interPack 2017 (Germany)
in-cosmetics global 2017 (United Kingdom)
PACK EXPO 2017 (United States)

InPrint 2017 (Germany)

Aquatech Amsterdam (Netherlands)



CHINAPLAS 2017



interPack 2017 (Germany)

#### | Ties with Shareholders and Investors

The DIC Group has established a policy for promoting constructive dialogue with shareholders and strives to ensure fair, appropriate and timely disclosure and to communicate closely with shareholders and investors, as well as to raise awareness of its ESG initiatives. Views and concerns expressed are shared with management and incorporated into operations as appropriate.

In fiscal year 2017, the Group sought to enhance communication with the investment community in Japan by holding two results presentations for institutional investors and securities analysts, as well as by participating in investor relations (IR) conferences organized by securities companies and in various IR meetings. DIC also held DIC IR Day 2017 to encourage a deeper understanding of the business it expects to drive growth going forward. Overseas, the Group held IR meetings and participated in IR conferences organized by securities companies in North America, Europe and Asia to encourage familiarity with its business strategies. Active efforts to advance communication with overseas investors also included 178 one-on-one meetings conducted in person or by telephone.

To provide information to individual investors, the Group participated in an IR fair in Japan and company presentations, which were attended by approximately 800 individuals, to further understanding of its business activities and ESG initiatives. The Group also continued to actively provide information for individual investors via the DIC global website, as well as through conventional mass media.





President and CEO Kaoru Ino speaks to analysts at DIC's fiscal year 2017 results announcement (February 2018)



DIC IR Day 2017 (December 2017)

#### | Ties with Society

In addition to the business community, the DIC Group takes steps to enhance communications with ordinary consumers, including students. In fiscal year 2016, the Group deployed the *DIC Color Guide*<sup>®</sup> Event Pack, developed to encourage solo branding initiatives by employees, at sites across Japan.

In September 2017, the Group created a display introducing DIC at the Itabashi Public Library, in Tokyo, the third consecutive year it has done so. The display focused on the Group's efforts to develop environment-friendly products, one of its core sustainability initiatives, as well as on its social contribution efforts, including its visiting science lab program and the Kawamura Memorial DIC Museum of Art.

DIC's calendar for 2018 was honored with a silver award in the corporate calendars category of the 69th All Japan Calendar Competition, sponsored by the Japan Federation of Printing Industries and Japan Printing News Co., Ltd. This annual event recognizes the best calendars produced by general for-profit organizations, as well as publishers and printing companies, among others, in terms of printing technology, planning, design, functionality and creativity. DIC will continue working to plan, design and produce innovative original calendars that appeal to stakeholders.

At the Kawamura Memorial DIC Museum of Art, a violin concert centered on works by Bach was held concurrently with the exhibition "WOLS: From the Street to the Cosmos." Painter and photographer Wols—Alfred Otto Wolfgang Schulze—is said to have loved Bach and poetry.

In fiscal year 2016, DIC declared a new brand slogan, "Color & Comfort," and launched an ambitious branding program that included a brand advertisement for television. In fiscal year 2017, the Company kicked off the second installment of this advertisement, *Irodori no Uta* ("Poem of Colors"). The DIC global website's dedicated branding page introduces this and other branding initiatives, as well as a corporate PR film. The DIC global website ranked 36 in Japan's CSR Communications Association's 2018 ranking of corporate websites based on the quality of their CSR-related content, conducted from October through December 2017, after finishing outside the rankings in the previous year.





DIC's display at Tokyo's Itabashi Public Library

Award certificate from the All Japan Calendar Competition 2018

#### Communication in the Field of Education

In July 2017, the Central Research Laboratories sponsored a booth at the 7th Chiba Science School Festival, held at the Tsuda campus of the Chiba Institute of Technology. This event, which is sponsored by the Chiba Science School Net, seeks to support the scientific research efforts of high school students, as well as encourage elementary and junior high school students to take a greater interest in science. The Central Research Laboratories' booth in the 2017 festival, the theme of which was "The Mysteries of Color," offered students the chance to conduct experiments in the extraction of the natural blue colorant in Spirulina.

In August 2017, for the second consecutive year, the DIC Group hosted the Chiba Prefectural Dream Challenge Hands-On School, a program for elementary school-age children organized by the prefecture's Board of Education, at the Central Research Laboratories' convention hall and the Kawamura Memorial DIC Museum of Art. The event welcomed 10 children chosen from among 80 applicants, who conducted experiments in the extraction of colorants from Spirulina and paper chromatography using aqueous felt-tipped pens under the instruction of,

respectively, Mizuki Endo (Advanced Characterization Research Center) and Mari Shibata (Dispersion Technical Group 6). Participating children gave the experience top marks, with comments received including "I learned that DIC is a manufacturer of chemicals and that we see many of its products in everyday life," "I learned that people see and interpret colors in different ways" and "I enjoyed the experiment where we got to see colors changing." Companies with operations in Chiba collaborate in multiple ways with the Chiba Prefectural Dream Challenge Hands-On School program, which invites parents and children to visit corporate and university laboratories and other facilities in the prefecture to participate in experiments and tour facilities.



7th Chiba Science School Festival

#### | Ties with Employees

The DIC Group promotes a variety of initiatives to facilitate active communication with its employees around the world. In April 2017, the Group conducted an employee awareness survey in Japan, the PRC and the Asia–Pacific region. In February 2018, the Group's in-house newsletter, *DIC Plaza*, which is published in Japanese and English, produced a special edition to celebrate the Group's 110th anniversary. As well as introducing Group operations and colleagues from around the world, *DIC Plaza*—which is produced with the goal of enhancing in-house communication—features comments from a wide range of stakeholders.

In March 2018, *DIC Plaza* won an overall award for seasonal publications in the Fiscal Year 2017 Keidanren In-House Newsletter Awards. *DIC Plaza* received above-average scores for all judging criteria. In particular, high marks were given for planning and content, which aligns with management policies, the introduction of activities involving a variety of employees in Japan and overseas to highlight themes such as diversity and sustainability, and the showcasing of Kaizen and other steadfast production initiatives, as well as for attractive page layout.

The Group's intranet is another way for DIC to share information with employees worldwide and further understanding of its activities. In fiscal year 2017, a total of 72 items were posted on the intranet.

Senior management also promotes opportunities for direct communication with employees. These include quarterly results presentations for employees given by the president and CEO, executive vice president and executive officers in charge of individual businesses, the goal of which is to enhance understanding of the Group's management strategies and the Group's current operating and financial status.

In March 2017, the Kashima Plant organized a facility tour for employees' families, a component of the plant's 45th anniversary celebrations. Planned as part of DIC's ongoing branding program, the event was held as a first practical step toward achieving the plant's goal, which is to create a production site worthy of showcasing to the world, by enabling employees to show their families the plant where they work. A total of 90 family members participated in the tour, which included lunch at the employee cafeteria and a visit to the production floor.



Executive Vice President Masayuki Saito gives a results presentation to employees (February 2018)



110th anniversary issue of

DIC Plaza



Facility tour for families of employees (Kashima Plant)

#### Ties with the Media

DIC is reinforcing efforts to provide information with newspapers, magazines and other media as a means of enhancing its ability to communicate with its many stakeholders, who include its customers and shareholders, investors and local communities. This reflects a conviction that effective, independent publicity and advertising that facilitates objective media coverage is vital to securing stakeholders' understanding of the DIC Group and its operations. In fiscal year 2017, DIC provided the media with information on a variety of key subjects, including new products, capital investments, operating results, sustainability initiatives and personnel systems. Increased media coverage brought positive responses from stakeholders across the board.



#### **External Assessments**

In fiscal year 2017, DIC was selected for inclusion in the Dow Jones Sustainability Indices Asia Pacific Index, a leading benchmark for sustainability initiatives in the Asia-Pacific region and part of the Dow Jones Sustainability Indices (DJSI), a global family of indices for socially responsible investment (SRI). This was the third consecutive year DIC has been selected for inclusion.

DIC also reports to the CDP, which works on behalf of institutional investors to motivate companies to disclose information on initiatives to combat climate change and key environmental data. In fiscal year 2017, the Company received high marks for its efforts to reduce its greenhouse gas emissions and its disclosure, earning an overall score of A-, second only to the top score of A, for the second consecutive year. Also in the period under review, the Company was selected as a constituent of the MSCI Japan ESG Select Leaders Index, an ESG investment index of leading Japanese companies, and of the MSCI Japan Empowering Women Index (WIN), both developed by U.S.based MSCI Inc. Both MSCI indices have been selected as benchmarks for the ESG investment strategy of Japan's Government Pension Investment Fund (GPIF), which sought stock indices comprising companies with outstanding ESG performances.

ProNed Inc., which advises companies on ensuring effective corporate governance, ranked DIC's corporate governance program as Score 1 in fiscal year 2017, the top mark that it awards. With the aim of driving sustainable growth, the DIC Group also participates in a number of the UNGC's SRI/ESG, SDGs, Supply Chain, Human Rights Due Diligence and Disaster Risk Reduction working groups.

# MEMBER OF **Dow Jones Sustainability Indices**

In Collaboration with RobecoSAM (



2018 Constituent MSCI MSCI Japan ESG Select Leaders Index



2018 Constituent MSCI MSCI Japan Empower Women Index (WIN)



2018 Constituent MSCI ESG Leaders Indexes

## DIC Report 2018 and the GRI Standards

DIC Report 2018 was prepared in compliance with the GRI Standards' "Core" option.

Standard	Disclosures	Page(s), etc.	Related information / Reasons for omission	G4 standard	ISO 26000				
GRI 102:	02: General disclosures 2016								
1	Organizational profile								
102-1	Name or organization	3 (The DIC Group: A Global Powerhouse)		G4-3	-				
102-2	Activities, brands, products, and services	11–12 (The DIC Group's Approach to Value Creation), 13–14 (Printing Inks), 15– 16 (Fine Chemicals), 17–18 (Polymers), 19–20 (Compounds), 21–22 (Application Materials), 130–133 (New Technology Development and Value Creation)			-				
102-3	Location of headquarters	3 (The DIC Group: A Global Powerhouse)		G4-5	-				
102-4	Location of operations	3-4 (The DIC Group: A Global Powerhouse), 158 (Corporate Data)		G4-6	-				
102-5	Ownership and legal form	3 (The DIC Group: A Global Powerhouse)		G4-7	-				
102-6	Location of operations	3-4 (The DIC Group: A Global Powerhouse), 11–12 (The DIC Group's Approach to Value Creation), 13–14 (Printing Inks), 15–16 (Fine Chemicals), 17–18 (Polymers), 19–20 (Compounds), 21–22 (Application Materials), 130–133 (New Technology Development and Value Creation)		G4-8	-				
102-7	Scale of the organization	3–4 The DIC Group: A Global Powerhouse, 158 (Corporate Data), 6–9 of the Yuka Shoken Hokokusho ("Affiliated Companies")	13–14 (Printing Inks), 15–16 (Fine Chemicals), 17–18 (Polymers), 19–20 (Compounds), 21–22 (Application Materials)	G4-9	-				
102-8	Information on employees and other workers	115 (Global Human Resources Management)	10 of the Yuka Shoken Hokokusho ("Employees")	G4-10	6.4 6.4.3				
102-9	Supply chain		125–127 (Sustainable Procurement) Disclosure of supplier profiles is currently being coordinated.	G4-12					
102-10	Significant changes to the organization and its supply chain	No major changes		G4-13	-				
102-11	Precautionary principle or approach	50–57 (Risk Management), 60–65 (Promoting Responsible Care)		G4-14	6.2				
102-12	External initiatives	44-45 (Ensuring DIC Remains a Globally Trusted Corporate Citizen with a Proud Reputation), 60 (Promoting Responsible Care)	92 (Reporting to the CDP)	G4-15	6.2				
102-13	Membership of associations	UNGC, JCIA, Keidanren, Keizai Doyukai, Japan Printing Inks Makers Association		G4-16	6.2				
2	Strategy								
102-14	Statement from senior decision-maker	6-8 (A Message from the President)		G4-1	6.2				
102-15	Key impacts, risks, and opportunities	43-47 (Overview of Materiality and Sustainability, 50-57 (Risk Management)	13–14 (Printing Inks), 15–16 (Fine Chemicals), 17–18 (Polymers), 19–20 (Compounds), 21–22 (Application Materials)	G4-2	6.2				
3	Ethics and integrity		- 						
102-16	Values, principles, standards, and norms of behavior	1 (The DIC WAY), 48 (The DIC Group Code of Business Conduct)		G4-56	-				
102-17	Mechanisms for advice and concern about ethics	49 (Establishing and Operating a Whistle-Blowing System)		G4-57, G4-58	-				
4	Governance	-							
102-18	Governance structure	36 (Corporate Governance), 44 (System for Promoting Sustainability Initiatives)	41–42 (Directors, Corporate Auditors and Executive Officers)	G4-34	6.2				
102-19	Delegating authority	44 (System for Promoting Sustainability Initiatives)		G4-35	-				
102-20	Executive-level responsibility for economic, environmental and social tonics	44 (System for Promoting Sustainability Initiatives)		G4-36	_				
102-22	Composition of the highest governance body and its committees	41–42 (Directors, Corporate Auditors and Executive Officers), 36–40 (Corporate Governance) 36–41 of the Yuka Shoken Hokokusho ("Corporate Governance")		G4-38	6.2				
102-23	Chair of the highest governing body	The chair of the highest governing body is the chair of the Board of Directors.	41–42 (Directors, Corporate Auditors and Executive Officers), 36–39 of the Yuka Shoken Hokokusho ("Corporate Governance")	G4-39	6.2				
102-24	Nominating and selecting the highest governance body	36-40 (Corporate Governance), 36-41 of the Yuka Shoken Hokokusho ("Corporate Governance")		G4-40	6.2				
102-25	Conflicts of interest	36-40 (Corporate Governance), Yuka Shoken Hokokusho (*Major Shareholders")		G4-41	6.2				
102-26	Role of highest governance body in setting purpose, values, and strategy	44 (System for Promoting Sustainability Initiatives)		G4-42	-				
102-29	Identifying and managing economic, environmental, and social impacts	43-47 (Overview of Materiality and Sustainability), 50-57 (Risk Management)		G4-45	6.2				
102-30	Effectiveness of risk management processes	44 (System for Promoting Sustainability Initiatives, 50–57 Risk Management)		G4-46	-				
102-31	Review of economic, environmental, and social topics	50–57 (Risk Management) (Reviews are conducted three times annually under the framework shown on page 44.)	44 (System for Promoting Sustainability Initiatives)	G4-47	6.2				
102-32	Highest governance body's role in sustainability reporting	The Sustainability Committee formally reviews and approves the sustainability report.	44 (System for Promoting Sustainability Initiatives)	G4-48	-				
102-33	Communicating critical concerns	44 (System for Promoting Sustainability Initiatives), 50–57 Risk Management)		G4-49	6.2				
102-35	Remuneration policies	40 (Remuneration for Executives), 36–41 of the Yuka Shoken Hokokusho ("Corporate Governance")		G4-51	6.2				
102-36	Process for determining remuneration	40 (Remuneration for Executives), 116 (Securing and Fostering Human Resources)	116 (Integrating DIC Group Executive Evaluation Systems)	G4-52	-				
102-38	Annual total compensation ratio		10 of the Yuka Shoken Hokokusho ("Employees")	G4-54	-				

5	Stakeholder engagement				
102-40	List of stakeholder groups	137 (Communication with Stakeholders)		G4-24	6.2
102-41	Collective bargaining agreements	Japan: 100% of employees belong to a labor union.	Overseas: Coverage by collective bargaining agreements in each country/region complies with local laws and regulations	G4-11	6.3.10 6.4 6.4.3 6.4.4 6.4.5
102-42	Identifying and selecting stakeholders	137–141 (Communication with Stakeholders)		G4-25	6.2
102-43	Approach to stakeholder engagement	137–141 (Communication with Stakeholders)		G4-26, G4-PR5	6.2 6.7 6.7.4 6.7.5 6.7.6 6.7.8 6.7.9
102-44	Key topics and concerns raised		137–141 (Communication with Stakeholders)	G4-27, G4-PR5	6.2
6	Reporting practice	- 	- 	·	
102-45	Entities included in the consolidated	3 (The DIC Group: A Global Powerhouse), 158 (Corporate Data)		G4-17	6.2
102-46	Defining report content and topic boundaries	43-47 (Overview of Materiality and Sustainability)		G4-18	_
102-47	List of material topics	46 (Materiality Analysis)		G4-19	-
102-48	Restatements of information	NA		G4-22	-
102-49	Changes in reporting	NA		G4-23	-
102-50	Reporting period	2 (About this Report)		G4-28	-
102-51	Date of most recent report	2 (About this Report)		G4-29	-
102-52	Reporting cycle	2 (About this Report)		G4-30	-
102-53	Contact point for questions regarding the report	Back cover		G4-31	-
102-54	Claims of reporting in accordance with the GRI standards	2 (About this Report)		G4-32-a	-
102-55	GRI content index	(142–146) DIC Report 2018 and the GRI Standards (this table)		G4-32-b	
102-56	External assurance	60 (Promoting Responsible Care), 154 (Third-Party Verification)		G4-32-c, G4-33	7.5.3
103	Management approach				
GRI 102:	General disclosures 2016				
103-1	Explanation of the material topic and its boundary	46 (Materiality Analysis)		G4-DMA-a, G4-20, G4-21	-
103-2	The management approach and its components	<ul> <li>DIC's 22 general materiality issues</li> <li>Promotion of products and services that contribute to environmental protection, Contribution to the realization of a low-carbon society, Contribution to colorful and comfortable lifestyles</li> <li>128–129 (Business Models that Respond to Social Imperatives), 130–133 (New Technology Development and Value Creation)</li> <li>Provision of solutions, Innovation through compounding, Efforts to strengthen global technology development capabilities, Creation of next.generation businesses, Promotion of open innovation</li> <li>130–133 (New Technology Development and Value Creation)</li> <li>Harmony with and contribution to society, Enhancement of brand strength/reputation (evaluation)</li> <li>129 (Enhancing Brand Strength), 134–136 (Harmony with the Community and Social Contributions), 137–141 (Communication with Stakeholders)</li> <li>Practical application of measures to reduce environmental impact, Contribution to the realization of a low-carbon society, Promotion of occupational health</li> <li>60–108 (Environment, Safety and Health (ESH))</li> <li>Improvement of quality management capabilities</li> <li>109–111 (Quality)</li> <li>Ability to foster and strengthen global human resources, Promotion of diversity, Efforts to address needs engendered by an aging society and falling birth rates</li> <li>112–124 (Human Resources Management), 125–127 (Sustainable Procurement)</li> <li>Response to economic globalization/efforts to reinforce governance, Response to the growth of digital businesses</li> </ul>		G4-DMA-b, G4-EN34, G4-LA16, G4-HR12, G4-SO11	_
103-3	Evaluation of the management approach	As above, assessment results are indicated on various pages; 44 (System for Promoting Sustainability Initiatives)		G4-DMA-c	
200	Economic topics				
GRI 201:	Economic performance 2016				
201-1	Direct economic value generated and distributed	3–4 (The DIC Group: A Global Powerhouse)		G4-EC1	6.8 6.8.3 6.8.7 6.9.9
201-3	Defined benefit plan obligations and other retirement plans	75 of the Yuka Shoken Hokokusho		G4-EC3	_
GRI 202:	Market presence 2016				
----------	--	---	---	---------	--
202-1	Ratios of standard entry level wage by gender compared to local minimum wage		10 of the Yuka Shoken Hokokusho	G4-EC5	6.4.4 6.8
GRI 203:	Indirect economic impacts 20	16			
203-1	Infrastructure investments and services supported	134 (Harmony with the Community and Social Contributions)	Global corporate website (Home page > Sustainability > Harmony with the Community and Social Contributions)	G4-EC7	6.3.9 6.8 6.8.3 6.8.4 6.8.5 6.8.6 6.8.6 6.8.7 6.8.9
203-2	Significant indirect economic impacts	134–136 (Harmony with the Community and Social Contributions)	Global corporate website (Home page > Sustainability > Harmony with the Community and Social Contributions)	G4-EC8	6.3.9 6.6.6 6.6.7 6.7.8 6.8 6.8.5 6.8.5 6.8.6 6.8.7 6.8.9
GRI 205:	Anti-corruption 2016				
205-1	Operations assessed for risks related to corruption		48–49 (Compliance), Risks related to corruption at sites not assessed, but legal training provided in countries and territories where such risks are high	G4-SO3	6.6 6.6.3
205-2	Communication and training about anti- corruption policies and procedures	48-49 (Compliance)	125–127 (Sustainable Procurement)	G4-SO4	6.6 6.6.3
205-3	Confirmed incidents of corruption and actions taken	NA , 48 (Goals and Achievements of Major Initiatives)		G4-S05	6.6 6.6.3
GRI 206:	Anti-competitive behavior 201	6			
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices	NA, 48 (Goals and Achievements of Major Initiatives)		G4-SO7	6.6 6.6.5 6.6.7
300	Environmental topics			·	·
GRI 301:	Materials 2016				
301-1	Materials used by weight or volume	_	Disclosure is currently being coordinated.	G4-EN1	6.5.4
GRI 302:	Energy 2016				
302-1	Energy consumption within the organization	75–92 (Preventing Global Warming), 100 (Environmental Impact of the DIC Group's Operating Activities) (All electric power generated independently using renewable energy is consumed internally.)		G4-EN3	6.5.4
302-2	Energy consumption outside the organization	_		G4-EN4	6.5.4
302-3	Energy intensity	75–92 (Preventing Global Warming), 100 (Environmental Impact of the DIC Group's Operating Activities)	Disclosure by type of energy and by boundary is currently being coordinated	G4-EN5	6.5.4
302-4	Reduction of energy consumption	75–92 (Preventing Global Warming)		G4-EN6	6.5.4 6.5.5
302-5	Reductions in energy requirements of products and services	_	128–129 (Business Models that Respond to Social Imperatives), 130–133 (New Technology Development and Value Creation)	G4-EN7	6.5.4 6.5.5
GRI 303:	Water 2016	-			
303-1	Water withdrawal by source	94-95 (Managing Water Resources), 100 (Environmental Impact of the DIC Group's Operating Activities)		G4-EN8	6.5.4
303-2	Water sources significantly affected by withdrawal of water		94 (Managing Water Resources)	G4-EN9	6.5.4
GRI 305:	Emissions 2016			1	
305-1	Direct (Scope 1) GHG emissions	75–92 (Preventing Global Warming)		G4-EN15	6.5.5
305-2	Energy indirect (Scope 2) GHG emissions		Disclosure is currently being coordinated.	G4-EN16	6.5.5
305-3	Other indirect (Scope 3) GHG emissions	79 (Changes in CO <sub>2</sub> Emissions in the Supply Chain), 106–107 (Responsible Logistics)		G4-EN17	6.5.5
305-4	GHG emissions intensity	75–92 (Preventing Global Warming)		G4-EN18	6.5.5
305-5	Reduction of GHG emissions	75–92 (Preventing Global Warming)		G4-EN19	6.5.5
305-6	Emissions of ozone-depleting substances (ODS)	108 (Report on Other Initiatives)		G4-EN20	6.5.3 6.5.5
305-7	Nitrogen oxide (NOx), sulfur oxide (SOx), and other significant air emissions	93–94 (Reducing Discharge of Chemical Substances), 96 (Reducing SOx, NOx and COD)		G4-EN21	6.5.3
GRI 306:	Effluents and waste 2016			1	
306-1	Water discharge by quality and destination	93–94 (Reducing Discharge of Chemical Substances), 100 (Environmental Impact of the DIC Group's Operating Activities)		G4-EN22	6.5.3 6.5.4
306-2	Waste by type and disposal method	97–100 (Reducing Industrial Waste), 100 (Environmental Impact of the DIC Group's Operating Activities)		G4-EN23	6.5.3
306-3	Significant spills	NA		G4-EN24	6.5.3
306-4	Transport of hazardous waste	NA		G4-EN25	6.5.3
306-5	Water bodies affected by water discharges and/or runoff	_	94 (Managing Water Resources)	G4-EN26	0.5.3 6.5.4 6.5.6
GRI 307:	Environmental compliance 20	16	Γ		
307-1	Non-compliance with environmental laws and regulations	66 (ESH Auditing)		G4-EN29	4.6

GRI 308:	308: Supplier environmental assessment 2016				
308-1	New suppliers that were screened using environmental criteria		125-127 (Sustainable Procurement) Disclosure currently being coordinated.	G4-EN32	6.3.5 6.6.6 7.3.1
308-2	Negative environmental impacts in the supply chain and actions taken	125–127 (Sustainable Procurement)		G4-EN33	6.3.5 6.6.6 7.3.1
400	Social topics				
GRI 401:	Employment 2016				
401-1	New employee hires and employee turnover	115 (Basic Personnel Statistics)	118 (Promoting Diversity)	G4-LA1	6.4 6.4.3
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	112 (Human Resources Management)		G4-LA2	6.4 6.4.3 6.4.4
401-3	Parental leave	121 (Enhancing Programs that Help Employees Balance the Demands of Work and Home)		G4-LA3	6.4 6.4.3
GRI 402:	Labor/management relations	2016		1	1
402-1	Minimum notice periods regarding operational changes	A minimum notice period is provided as specified in labor agreements.		G4-LA4	6.4 6.4.3 6.4.4, 6.4.5
GRI 403:	Occupational health and safet	y 2016			
403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work- related fatalities	70 (Status of Occupational Accidents)		G4-LA6	6.4 6.4.6
403-4	Health and safety topics covered in formal agreements with trade unions	Health and safety topics are covered in formal agreements with trade unions.	123 (Reducing Extreme Overwork and Encouraging Employees to Take Annual Paid Leave)	G4-LA8	6.4 6.4.6
GRI 404:	Training and education 2016				
404-2	Programs for upgrading employee skills and transition assistance programs	60–74 (Environment, Safety and Health (ESH)), 81 (Reducing Energy Consumption and Enhancing Product Quality through Kaizen Skill Improvement Training), 110 (New Efforts to Enhance Product Quality–Related Educational Initiatives), 112–124 (Human Resources Management)		G4-LA10	6.4 6.4.7 6.8.5
404-3	Percentage of employees receiving regular performance and career development reviews	116 (Ensuring Fair and Consistent Treatment) All DIC employees, regardless of gender, job or rank, receive performance and career development reviews twice annually.	115 (Global Human Resources Management), 116 (Securing and Fostering Human Resources)	G4-LA11	6.4 6.4.7
GRI 405:	Diversity and equal opportuni	ty 2016			
405-1	Diversity of governance bodies and employees	41–42 (Directors, Corporate Auditors and Executive Officers), 115 (Global Human Resources Management), 120 (Advancing the Employment of Individuals with Disabilities)		G4-LA12	6.3.7, 6.3.10 6.4 6.4.3
GRI 406:	Non-discrimination 2016				
406-1	Incidents of discrimination and corrective actions taken	NA		G4-HR3	6.3 6.3.6 6.3.7 6.3.10, 6.4.3
GRI 407:	Freedom of association and c	ollective bargaining 2016			
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk	112 (Human Resources Management)	44 (Ensuring DIC Remains a Globally Trusted Corporate Citizen with a Proud Reputation), 125 (Sustainable Procurement)	G4-HR4	6.3 6.3.3 6.3.4 6.3.5 6.3.8 6.3.10 6.4.3 6.4.5
GRI 408:	Child labor 216				_
408-1	Operations and suppliers at significant risk for incidents of child labor	112 (Human Resources Management)	125 (Sustainable Procurement)	G4-HR5	6.3 6.3.3 6.3.4 6.3.5 6.3.7 6.3.10
GRI 409:	Forced or compulsory labor 2	016			
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	112 (Human Resources Management)	125 (Sustainable Procurement)	G4-HR6	6.3 6.3.3 6.3.4 6.3.5 6.3.7 6.3.10
GRI 410:	Security practices 2016	,	1	1	
410-1	Security personnel trained in human rights policies or procedures		112 (Human Resources Management)	G4-HR7	6.3 6.3.5 6.4.3 6.6.6
GRI 411:	Rights of indigenous peoples				
411-1	Incidents of violations involving rights of indigenous peoples	NA		G4-HR8	6.3 6.3.6 6.3.7 6.3.8 6.6.7

GRI 412:	Human rights assessment 201	6			
412-1	Operations that have been subject to human rights reviews or impact assessments	112 (Human Resources Management)		G4-HR9	6.3 6.3.3 6.3.4 6.3.5
412-2	Employee training on human rights policies or procedures		112 (Human Resources Management)	G4-HR2	6.3 6.3.5
GRI 413:	Local communities 2016				
413-1	Operations with local community engagement, impact assessments, and development programs		137 (Communication with Stakeholders)	G4-SO1	6.3.9 6.6.7 6.8 6.8.5 6.8.7
GRI 414:	Supplier social assessment 20	016			
414-1	New suppliers that were screened using social criteria		125–127 (Sustainable Procurement); Disclosure is currently being coordinated.	G4-LA14, G4-HR10, G4-S09	-
414-2	Negative social impacts in the supply chain and actions taken	125–127 (Sustainable Procurement)	Disclosure regarding negative social impacts in the supply chain is currently being coordinated.	G4-LA15, G4-HR11, G4-SO10	
GRI 415:	Public policy 2016				
415-1	Political contributions	_		G4-S06	
GRI 416:	Customer health and safety 20	016			
416-1	Assessment of the health and safety impacts of product and service categories		60 (Focus on Product Stewardship), 109 (Quality)	G4-PR1	6.3.9 6.6.6 6.7 6.7.4 6.7.5
416-2	Incidents of non-compliance concerning the health and safety impacts of products and services	There were no incidents resulting in fines or penalties.	111 (Preventing the Recurrence of Problems)	G4-PR2	6.3.9 6.6.6 6.7 6.7.4 6.7.5
GRI 417:	Marketing and labeling 2016		·		
417-1	Requirements for product and service information and labeling	101–105 (Managing Chemical Substances in Products)	110 (Initiatives Aimed at Increasing Customer Satisfaction)	G4-PR3	6.7 6.7.3 6.7.4 6.7.5 6.7.6 6.7.9
417-2	Incidents of non-compliance concerning product and service information and labeling	NA		G4-PR4	6.7 6.7.3 6.7.4 6.7.5 6.7.6 6.7.9
417-3	Incidents of non-compliance concerning marketing communications	NA		G4-PR7	6.7 6.7.3 6.7.6 6.7.9
GRI 418:	Customer privacy 2016				
418-1	Substantial complaints concerning breaches of customer privacy and losses of customer data	NA		G4-PR8	6.7 6.7.7
GRI 419:	Socioeconomic compliance 20	016			
419-1	Non-compliance with laws and regulations in the social and economic area	NA		G4-SO8, G4-PR9	6.6 6.6.3 6.6.7 6.8.7

# **Third-Party Verification**





### Mr. Kaoru Ino

Representative Director, President and CEO DIC Corporation

#### Objective

SGS Japan Inc. (hereinafter referred to as "SGS") was commissioned by DIC Corporation (hereinafter referred to as "the Organization") to conduct independent verification based on criteria of verification (ISO 14064-3: 2006 and the SGS verification protocol) regarding the data prepared by the Organization on the scope of verification (hereinafter referred to as "the assertion"). The objective of this verification is to confirm that the assertion in the Organization's applicable scope has been correctly calculated and reported in the assertion in conformance with the criteria, and to express our views as a third party.

#### Scope

The scope of verification is limited to the assertion at 12 DIC parent company sites (including 3 offices and 1 laboratory),

42 domestic Group company sites (including 18 offices and laboratories), and 154 overseas Group company sites.

GHG emissions included in this performance data are Scope 1, Scope 2, and Scope 3: category 5. The performance data of Scope 1 and Scope 2 include energy-related CO<sub>2</sub> emissions and the energy consumption at 12 DIC parent company sites, 42 domestic Group company sites and 154 overseas Group company sites, and CO<sub>2</sub> emissions from non-energy consumption at DIC parent company sites, domestic Group company sites and overseas Group company sites (excluding Sun Chemical Group).

The performance data of Scope 3: category 5 and waste generation, and the number of occupational accidents including the number of accidents leading to workdays lost and the workdays lost are for DIC parent company sites and domestic Group company sites (excluding laboratories and offices).

The percentage of female employees and the percentage of management positions occupied by female employees are for DIC parent company sites and the part of domestic Group company sites.

The period subject to report is from 1 January 2017 to 31 December 2017.

#### **Procedure of Verification**

The assertion was verified in accordance with criteria of verification, and the following processes were implemented at a limited level of assurance:

- Verification of the calculation system: Interviews on the measurement, tabulation, calculation and reporting methods employed by the Organization as well as review of related documents and records.
- Verification of the assertion: On-site verification and review of vouchers at the Yokkaichi Plant and the Saltama Plant, and analytical procedures and interviews carried out at all works included in the scope of verification at the head office.

The criteria for this review is based on "GHG Emissions Calculation and Reporting Manual Ver. 4.3.1" and the protocol specified by the Organization.

#### Conclusion

Within the scope of the verification activities employing the methodologies mentioned above, nothing has come to our attention that caused us to believe that the Organization's assertion was not calculated and reported in conformance with the criteria. SGS Japan Inc. affirms our independence from the organization, being free from bias and conflicts of interest with the organization.



The DIC Group commissioned SGS Japan Inc. to conduct third-party verification of its data for greenhouse gas emissions, discharge of industrial waste and number of occupational accidents (including number of accidents leading to workdays lost).

## Third-Party Opinion Regarding DIC Report 2018



#### Counselor, The Japan Research Institute, Limited Eiichiro Adachi

In his current capacity, Eiichiro Adachi conducts industry research and assesses corporate performance from the perspective of social responsibility. He also provides financial institutions with corporate information for socially responsible investing (SRI). A member of the Market Evolution and Corporations in the 21st Century working group organized by the Keizai Doyukai (Japan Association of Corporate Executives), Mr. Adachi was involved in the preparation of The 15th Corporate White Paper on "Market Evolution" and CSR Management: Toward Building Integrity and Creating Shareholder Value. From March 2005 to May 2009, he also served as a national expert for Japan to the ISO 26000 working group. Mr. Adachi is also known as the author of Environmental Management: A Beginner's Guide and An Illustrated Guide to Environmental Issues for Companies (published in Japanese).

This third-party opinion reflects my view of the sustainability initiatives and information disclosure of the DIC Group, as understood from reading this report, from my perspective as an individual who provides corporate information to financial institutions to assist SRI. It is not intended as a comment on whether or not the information herein has been measured and calculated accurately to conform to commonly accepted standards for the preparation of environmental or other reports or a judgment on whether the report covers relevant important matters in full. Once again this year, I had the honor of reviewing the DIC Report. In this year's report, I was particularly impressed with president and CEO Kaoru Ino's comment that the DIC Group would endeavor to address increasingly varied and compelling social imperatives and contribute to the realization of a sustainable society. He explained that in order to do so the Group would cultivate new businesses, in addition to printing inks, pigments and compounds, in which it has the potential to earn global market-leading positions.

A true blue-chip organization, the DIC Group boasts leading global market shares in a number of areas, including approximately 30% for printing inks, 20% for organic pigments and 27% for PPS compounds. It is also a chemicals manufacturer that uses petroleum-derived raw materials in many of its products and has energy-intensive production processes. With the capacity of our planet and society increasingly strained, we are seeing changes in the nature of efforts to shift to more environment-friendly energy sources and promote material recycling under the banner of "sustainability." Going forward, the Group's cogency in aligning its corporate values—which emphasize making life colorful, drawing on its expertise and comprehensive strengths to offer solutions, and bringing innovation to society through its core compounding technologies to such changes while continuing to give full play to its capabilities will come under scrutiny.

The effectiveness of the DIC Group's efforts to combat climate change and disclose related information is underscored by the high marks it has received in the CDP's climate change assessment program, with the global NGO awarding it a leadership-level score of A- for two consecutive years. I look forward to seeing the Group further enhance its sustainability efforts with the need to ensure sustainability for the planet and society.

One item that particularly caught my attention in this year's report was Sun Chemical's participation in the Responsible Mica Initiative. In 2018, the DIC Group formulated a draft human rights policy, but it is important to understand that effective human rights due diligence does not end with the creation of a policy. For example, it is crucial to take steps to prevent the use of child labor across the supply chain and to implement remedial measures if issues are discovered. The fact that the natural minerals used as raw materials for pigments are a key source of funds for armed groups has long been noted, as has the fact that the inappropriate disposal of electric and electronic equipment is a cause of severe health issues in developing countries. It is my hope that the Group will make use of the OECD Due Diligence Guide for Responsible Business Conduct, published in May 2018, and other such references to step up its efforts to identify and mitigate human rights-related risks and evaluate its performance.

The Message from the President at the beginning of this year's report contains the following statement: "...in fiscal year 2018, we are promoting extensive debate and discussion to determine critical changes needed to fulfill our mission, based on which we will formulate strategies from a medium- to long-term perspective." In next year's report, I look forward to reading about incorporation of both the processes employed in such debate and discussion and the results thereof into initiatives implemented in line with the themes of "business models that respond to social imperatives" and "new technology development and value creation."

# **DIC Group Milestones**

### 1908 Established as Kawamura Ink Manufactory

Established by Kijuro Kawamura as Kawamura Ink Manufactory; adopts the dragon as its product trademark and begins manufacturing inks.



Dragon product trademark



DIC's founder, Kijuro Kawamura

### 1915

**Commences production of offset printing inks** Becomes one of the first companies to conduct research in the area of offset printing inks and succeeds in producing a viable product in only one year.

### 1925

**Begins production of organic pigments** Develops production method for organic pigments and begins production for its own use, the first step in its evolution as a fine chemicals manufacturer.

### 1940

Commences production of water-based gravure inks

Amid wartime restrictions on use of volatile oils, develops water-based gravure inks—one of several achievements that would later facilitate expansion into synthetic resins.

## **1952**

## Makes full-scale entry into the synthetic resins business

Establishes Japan Reichhold Chemicals Inc., then the second-largest joint venture with an overseas firm in the

history of the Japanese chemicals industry, and makes a full-scale entry into the synthetic resins business.



Reichhold Chemicals' San Francisco plant



1957

1962

Enters the market for helmets and

Enters the plastic products business with the aim of becoming an

integrated manufacturer with operations encompassing production

of everything from plastic raw materials to finished products.

**Changes Company name** 

to Dainippon Ink and Chemicals

Embarks on a new chapter in its history by absorbing Japan Reichhold Chemicals Inc., and changes Company name to Dainippon Ink and Chemicals Incorporated (DIC).

other molded plastic products

Launches the DIC Color Guide®, which becomes the de facto standard for color selection in numerous industries, bolstering recognition of the DIC name.

DIC's previous

corporate symbol



Promotes expansion of printing inks business

1973

safety inspections.

**Establishes the** 

**Environment and Safety** 

Creates department under the direct supervision of DIC's president to oversee safety and environmental initiatives

(today's Responsible Care Department); creates Environment and Safety Management Regulations and Interim Emergency Countermeasures Department and begins promoting decisive efforts, including the implementation of plant

**Response Department** 

Diversifies operations by building on base in printing inks, organic pigments and synthetic resins Actively introduces technologies from overseas and promotes further diversification

**Sustainability Initiatives** 

#### Opens Kawamura Memorial Museum of Art

1990

Located in Sakura, Chiba Prefecture, adjacent to the Central Research Laboratories; established to exhibit works of art collected by DIC and DIC Group companies; now called the Kawamura Memorial DIC Museum of Art.



#### 1995

Declares intention to uphold the principles of Responsible Care Takes an active role in the Responsible Care movement since the start as one of 74 founding members of the Japan Responsible Care Council (JRCC); reinforces efforts to, among others, reduce negative environmental impact of operations and lower energy consumption.



### 2006

Becomes signatory to the Responsible Care Global Charter Signs the CEO's Declaration of Support for the Responsible Care Global Charter, established by the International Council of Chemical Associations, as befits its status as a member of the global community of fine chemicals manufacturers.



Enters the multilayered films business Establishes Crown Zellerbach Packaging Materials Japan Co., Ltd., in a joint venture with Crown Zellerbach Corporation of the United States and Nippon Kakoh Seishi Co., Ltd., and enters the multilayered films business.

#### **1973** Enters the market for LCs

Develops revolutionary high-performance, long-lasting nematic LCs, commencing its evolution into one of the world's foremost manufacturers of LCs.



Nematic LCs

### 1986

Acquires the graphic arts materials division of Sun Chemical Corporation of the United States

Becomes world's largest manufacturer of printing inks in terms of market share and a leading name in the graphic arts materials business.



Sun Chemical's headquarters

### 1999

Succeeds in developing 100% soybean oil-based printing ink

Amid rising awareness of environmental issues, develops Japan's first organic solvent-free sheetfed offset ink.

### 1999

Acquires Coates, the printing inks division of France's TOTALFINA

Establishes presence in India, Central and South America and elsewhere by acquiring the Coates Group from TOTALFINA S.A., France's largest oil company.

### **2008** Changes Company name to DIC Corporation

Marks centennial anniversary by changing Company name to DIC Corporation and adopting a new corporate symbol.



DIC's new corporate symbol

### 2009

Establishes DIC Graphics Corporation In October 2009, establishes a joint venture with Dai Nippon Printing Co., Ltd., subsidiary The Inctec Inc. and integrates its domestic printing inks business with the printing inks business of The Inctec.

### 2010

Develops groundbreaking series of

green pigments for LCD color filters Develops the G58 series of green pigments for use in color filters for LCDs, which deliver marked increases in brightness and contrast compared with previous products and contribute substantially to reduced energy consumption by LCDs.

### 2015 Completes

reconstruction of corporate headquarters in Nihonbashi

In May 2015, completes the reconstruction of its corporate headquarters—the DIC Building—in Nihonbashi, Tokyo, the role of which was expanded to include oversight of the global DIC Group.



DIC Building

#### 2016 Launches DIC108 medium-term management plan

Sets forth a growth scenario aimed at realizing sustainable growth and outlines what DIC must do between now and fiscal year 2018.

## 2016

Introduces branding program

Introduces new branding program based on the Group's "Color & Comfort" brand slogan, which sets forth three corporate values, and in October airs a new television advertiement



Brand advertisement for television

## 2017

Enters capital and business alliance with Taiyo Holdings Concludes capital and business alliance with Taiyo Holdings Co., Ltd.,

one of the world's leading manufacturers of solder resist for PWBs.

Seeks to advance globalization of core businesses and diversify into new areas

Takes steps to advance environmental protection and expands global presence Prepares for a new phase of growth

### 2010

Joins United Nations Global Compact In December 2010, becomes a participant in the United Nations Global Compact (UNGC),

the United Nations Global Compact (UNGC), with the aim of maintaining its reputation as a socially responsible corporate entity.



#### 2014 Changes designation to

"sustainability" Clarifies its overall policy of achieving sustainability in a manner that takes into account, among others, the environment, ecosystems and socioeconomic issues, and changes the designation used across its program from "CSR" to "sustainability."



### 2015

Selected for inclusion in the Dow Jones Sustainability Indices Asia Pacific Index Included for the first time in the DJSI

Asia Pacific Index, a global family of indices for socially responsible investing and a benchmark of global sustainability. Included again in 2016.

### Dow Jones Sustainability Indices

In Collaboration with RobecoSAM 🍋

2007

Launches CSR program Begins promoting CSR initia

Begins promoting CSR initiatives; identifies fulfilling its responsibilities as a member of society through its business activities and contributing to the evolution of society as the cornerstones of CSR.

## Corporate Data

#### **Corporate Headquarters**

Headquarters

DIC Building, 7-20, Nihonbashi 3-chome, Chuo-ku, Tokyo 103-8233, Japan Tel: +81-3-6733-3000

#### **Branch Offices**

#### Osaka

5-19, Kyutaro-machi 3-chome, Chuo-ku, Osaka 541-8525, Japan Tel: +81-6-6252-6161 Fax: +81-6-6245-5239

#### Nagoya

7-15, Nishiki 3-chome, Naka-ku, Nagoya 460-0003, Japan Tel: +81-52-951-9381 Fax: +81-52-962-3591

#### Plants

#### Tokyo

35-58, Sakashita 3-chome, Itabashi-ku, Tokyo 174-8520, Japan Tel: +81-3-3966-2111 Fax: +81-3-3965-4320

#### Chiba

12, Yawatakaigandori, Ichihara, Chiba 290-8585, Japan Tel: +81-436-41-4141 Fax: +81-436-43-1059 Hokuriku

#### 64-2, Minatomachi-So, Hakusan, Ishikawa 929-0296, Japan

Tel: +81-76-278-2332 Fax: +81-76-278-5354 Sakai

3, Takasago 1-chome, Takaishi, Osaka 592-0001, Japan Tel: +81-72-268-3111 Fax: +81-72-268-1705 Kashima

18, Higashifukashiba, Kamisu, Ibaraki 314-0193, Japan Tel: +81-299-93-8111 Fax: +81-299-92-6384 Yokkaichi

5, Kasumi 1-chome, Yokkaichi, Mie 510-0011, Japan Tel: +81-59-364-1151 Fax: +81-59-364-1620 Komaki

151-1, Nagare, Shimosue, Komaki, Aichi 485-0825, Japan Tel: +81-568-75-2751 Fax: +81-568-73-4120

#### Saitama

4472-1, Komuro, Ina-machi, Kita-Adachi-gun, Saitama 362-8577, Japan Tel: +81-48-722-8211 Fax: +81-48-722-6087

Tatebayashi 6023, Tobukogyodanchi, Ohshima-cho, Tatebayashi, Gunma 374-0001, Japan Tel: +81-276-77-2461 Fax: +81-276-77-2468

#### Laboratories

Central Research Laboratories

631, Sakado, Sakura, Chiba 285-8668, Japan Tel: +81-43-498-2121 Fax: +81-43-498-2229

#### Art Museum

Kawamura Memorial DIC Museum of Art 631, Sakado, Sakura, Chiba 285-8505, Japan Tel: +81-43-498-2672 Fax: +81-43-498-2139

(Information is as of March 31, 2018.)

#### **Principal Subsidiaries and Affiliates**

#### Japan

Cast Film Japan Co., Ltd. DC Katsuya Co., Ltd. DIC Color Coatings, Inc. DIC Color Design, Inc. DIC Covestro Polymer Ltd. DIC Decor, Inc. DIC EP Corp. DIC Estate Co., Ltd. DIC Graphics Corporation DIC Interior Co., Ltd. DIC Investments Japan, LLC. DIC Kako, Inc. DIC Kitanihon Polymer Co., Ltd. DIC Kyushu Polymer Co., Ltd. DIC Lifetec Co., Ltd. DIC Machinery & Printer's Supplies, Inc. DIC Material Inc. DIC Plastics, Inc. Hamamatsu DIC Co., Ltd. Japan Formalin Company, Inc. KJ Chemicals Corporation Mizushima Kasozai Co., Ltd. Nippon Epoxy Resin Manufacturing Co., Ltd. Oxirane Chemical Corp. Renaissance, Inc. Seiko PMC Corporation SUNDIC Inc. Taiyo Holdings Co., Ltd. Techno Science, Inc. Topic Co., Ltd. YD Plastics Co., Ltd.

### Asia and Oceania (Excluding Japan)

Aekyung Chemical Co., Ltd. Changzhou Huari New Material Co., Ltd. DIC Alkylphenol Singapore Pte., Ltd. DIC Asia Pacific Pte Ltd DIC Australia Pty Ltd. DIC (China) Co., Ltd. DIC Colorants Taiwan Co., Ltd. DIC Compounds (Malaysia) Sdn. Bhd. DIC Epoxy (Malaysia) Sdn. Bhd. DIC Fine Chemicals Private Limited DIC Graphics (Guangzhou) Ltd. DIC Graphics (Hong Kong) Ltd. DIC Graphics (Thailand) Co., Ltd. DIC Graphics Chia Lung Corp. DIC (Guangzhou) Co., Ltd. DIC India Ltd. DIC Korea Corp. DIC Lanka (Private) Ltd. DIC (Malaysia) Sdn. Bhd. DIC New Zealand Ltd. DIC Pakistan Ltd. DIC Philippines, Inc. DIC (Shanghai) Co., Ltd. DIC Synthetic Resins (Zhongshan) Co., Ltd. DIC (Taiwan) Ltd. DIC Trading (HK) Ltd. DIC (Vietnam) Co., Ltd. DIC Zhangjiagang Chemicals Co., Ltd.

Guangzhou Lidye Resin Co., Ltd. Hainan DIC Microalgae Co., Ltd. Kangnam Chemical Co., Ltd. Lianyungang DIC Color Co., Ltd. Lidye Chemical Co., Ltd. Nantong DIC Color Co., Ltd. Nantong Shan Kai Ming Ke Trading Co., Ltd PT DIC ASTRA Chemicals PT. DIC Graphics P.T. Pardic Jaya Chemicals Qingdao DIC Finechemicals Co., Ltd. Qingdao DIC Liquid Crystal Co., Ltd. Samling Housing Products Sdn. Bhd. Seiko PMC (Shanghai) Commerce & Trading Corp. Seiko PMC (Zhangjiagang) Corporation Shanghai DIC Ink Co., Ltd. Shanghai DIC Pressure-Sensitive Adhesive Materials Co., Ltd. Shenzhen-DIC Co., Ltd. Siam Chemical Industry Co., Ltd. Sun Branding Solutions (India) Pvt. Ltd. Sun Chemical Holding (Hong Kong) Ltd. Sun Chemical Ink LLP Sun Chemical Saudi Arabia Ltd. Sun Chemical Trading (Shanghai) Co., Ltd. Suqian Lintong New Materials Co., Ltd. Suzhou Lintong Chemical Science Corp. TOA-DIC Zhangjiagang Chemical Co., Ltd. Total Acrylic Polymer Industry Corp. Zhongshan DIC Colour Co., Ltd.

#### Europe and Africa

Benda-Lutz Skawina Sp. z.o.o. Benda-Lutz Volzhsky ooo Benda-Lutz Werke GmbH Coates Brothers (East Africa) Ltd. Coates Brothers (West Africa) Ltd. Coates Screen Inks GmbH. C.T. LAY S.R.L. DIC Europe GmbH DIC Holdings Austria GmbH DIC Holdings B.V. DIC Performance Resins GmbH ECG Holdings Ltd. Gibbon FineCal Ltd. Glenside Properties Limited Gwent Electronic Materials Ltd. Hartman D.O.O. Hartmann Druckfarben GmbH Hartmann-Sun Chemical EOOD Kingfisher Colours Ltd. Lorilleux Maroc S.A. Luminescence Holdings Ltd. Parker Williams Design Ltd. Sun Branding Solutions Ltd. Sun Chemical AB Sun Chemical AG Sun Chemical AG (S.A., Ltd.) Sun Chemical A.O Sun Chemical A/S Sun Chemical A/S Sun Chemical B V Sun Chemical d.o.o.

Sun Chemical for Graphic Arts S.A.E. Sun Chemical GmbH Sun Chemical Group Coöperatief U.A. Sun Chemical Group S.p.A. Sun Chemical Holding B.V. Sun Chemical Ink Ireland Sun Chemical Inks A/S Sun Chemical Lasfelde GmbH Sun Chemical I td Sun Chemical N.V./S.A. Sun Chemical Nyomdafestek Kereskedelmi es Gyatro KFT Sun Chemical Osterode Druckfarben GmbH Sun Chemical Oy Sun Chemical Pigments S.L. Sun Chemical Portugal-Tintas Graficas Unipessoal Ltda. Sun Chemical Printing Ink d.o.o. Sun Chemical Publication A.E. Sun Chemical S.A.S Sun Chemical S.A.U. Sun Chemical (South Africa) (Pty) Ltd. Sun Chemical s.r.l. Sun Chemical, s.r.o. Sun Chemical, s.r.o. Sun Chemical Sp. z.o.o Sun Chemical Turkey Sun Chemical Ukraine Ltd. Sun Inkjet Ceramics, S.L.

#### North, Central and South America

Benda-Lutz Corporation Camus Water Technologies LLC Coates Brothers (Caribbean) Ltd. DIC Imaging Products USA, LLC Earthrise Holdings Inc. Earthrise Nutritionals, LLC Inmobiliaria Sunchem, S.A. de C.V. Joules Angstrom U.V. Printing Inks Corp. Mondis Manufacturers Insurance Company N.V. New England Manufacturers Insurance Corp. Rycoline Products, LLC SC (Puerto Rico) Ink SC Funding LLC Sinclair International Inc. Sinclair S.A.S. Sinclair Sun Chemical Ecuador S.A. Sun Chemical (Chile) S.A. Sun Chemical Corporation Sun Chemical de Centro America, S.A. de C.V. Sun Chemical do Brasil Ltda. Sun Chemical Inks S.A. Sun Chemical Ltd. Sun Chemical Management, L.L.C. Sun Chemical of Michigan LLC Sun Chemical Peru S.A Sun Chemical S.A. de C.V Tintas S.A.S. Wiseman International Co., Ltd.



# **DIC Report 2018**

Financial Section Year ended December 31, 2017

**DIC** Corporation

• ne of the world's leading diversified chemicals companies, DIC Corporation is also the core of the DIC Group, a multinational organization with operations in more than 60 countries and territories worldwide. Established in 1908 as a manufacturer of printing inks, DIC has capitalized on its extensive technologies, know-how and experience in the years since to build a broad business portfolio of materials and finished products, enabling it to provide innovative solutions to customers in diverse industries and transforming it into a global powerhouse in its key fields of endeavor.

Now in its second century in business, DIC is redoubling its efforts to develop and market innovative, high-performance products that respond to the needs of customers in markets around the world, in line with its "Color & Comfort by Chemistry" vision. A responsible corporate citizen, DIC is also committed to helping realize environmental and social sustainability.

# The DIC WAY

#### Mission

Through constant innovation, the DIC Group strives to create enhanced value and to contribute to sustainable development for its customers and society.

#### Vision

Color & Comfort by Chemistry

#### Spirit

#### Drive

The force that propels our employees to think and take action

#### Integrity

Maintaining a moral attitude, and facing matters head-on with reason and a sense of responsibility

#### Dedication

Having a sense of ownership and ambition, and taking a passionate approach to the tasks at hand

#### Collaboration

Working to resolve matters by rallying the collective power

of the global DIC Group, while respecting the individuality and diversity of each and every one of our employees

#### Harmony

Fulfilling our social responsibility as good corporate citizens, and always remaining conscious of compliance issues

#### Contents

Consolidated Six-Year Summary 1 Management's Discussion and Analysis 2 Consolidated Balance Sheet 5 Consolidated Statement of Income 7 Consolidated Statement of Comprehensive Income 8 Consolidated Statement of Changes in Net Assets 9 Consolidated Statement of Cash Flows 10 Notes to the Consolidated Financial Statements 11 Management's Report on Internal Control 40 Independent Auditor's Report 41 Investor Information and Corporate Data 43



DIC Corporation and Consolidated Subsidiaries Years ended December 31, 2017 to 2013, and year ended March 31, 2013

Dec 2017	Dec 2016	Dec 2015	exc	M ept for per share	illions of yen, e information	Thous U.S. except share info	ands of dollars, for per rmation Note 8)
¥789.427	¥751 438	¥819 999	¥830.078	¥705 647	¥703 781	\$6.98	6.080
5.1%	(8.4)%	(1.2)%	-%	—%	(4.2)%	+ 0,00	5.1%
56,483	54,182	51,068	41,076	40,181	38,484	49	9,850
38,603	34,767	37,394	25,194	26,771	19,064	34	1,619
315,129	278,535	262,467	249,749	195,218	136,921	2,78	8,752
831,756	764,828	778,857	803,703	761,690	692,991	7,36	0,673
¥3,329.60	¥2,938.12	¥2,768.41	¥ 259.63	¥ 213.13	¥ 149.48	\$	29.47
407.56	366.72	389.40	26.78	29.23	20.80		3.61
120.00	64.00	8.00	6.00	6.00	6.00		1.06
37.9%	36.4%	33.7%	31.1%	25.6%	19.8%		37.9%
13.0%	12.9%	14.6%	11.3%	16.1%	16.0%		13.0%
	Dec. 2017 ¥789,427 5.1% 56,483 38,603 315,129 831,756 407.56 120.00 37.9% 13.0%	Dec. 2017       Dec. 2016         ¥789,427       ¥751,438         \$4751,438       (8.4)%         56,483       54,182         38,603       34,767         38,603       34,767         315,129       278,535         831,756       764,828         407.56       366.72         120.00       64.00         37.9%       36.4%         12.9%       12.9%	Dec. 2017       Dec. 2016       Dec. 2015         ¥789,427       ¥751,438       ¥819,999         \$5,100       (8.4)%       (1.2)%         \$56,483       54,182       51,068         38,603       34,767       37,394         38,603       34,767       262,467         315,129       278,535       262,467         831,756       764,828       778,857         407.56       366.72       389.40         120.00       64.00       8.00         37.9%       36.4%       33.7%         13.0%       12.9%       14.6%	Dec. 2017         Dec. 2016         Dec. 2015         Dec. 2014           ¥789,427         ¥751,438         ¥819,999         ¥830,078           \$5,100         (8.4)%         (1.2)%        %           \$56,483         54,182         51,068         41,076           38,603         34,767         37,394         25,194           315,129         278,535         262,467         249,749           831,756         764,828         778,857         803,703           407.56         366.72         389.400         225,194           407.56         366.72         249,749         36.476           37.99%         36.400         8.000         6.000           37.99%         36.403         33.7%         31.1%           13.0%         12.9%         14.6%         11.3%	Dec. 2017         Dec. 2016         Dec. 2015         Dec. 2014         Dec. 2013           ¥789,427         ¥751,438         ¥819,999         ¥830,078         ¥705,647           \$100         (8.4)%         (1.2)%	Dec. 2017       Dec. 2016       Dec. 2015       Dec. 2014       Dec. 2013       Mar. 2013         ¥789,427       ¥751,438       ¥819,999       ¥830,078       ¥705,647       ¥703,781         5.1%       (8.4%)       (1.2%)	Dec. 2017         Dec. 2016         Dec. 2015         Dec. 2014         Dec. 2013         Mar. 2013         Dec. 2014           ¥789,427         ¥751,438         ¥819,999         ¥830,078         ¥705,647         ¥703,781         \$6,98           5.1%         (8.4)%         (1.2)%        %         (4.2)%         \$6,98           56,483         54,182         51,068         41,076         40,181         38,484         49           38,603         34,767         37,394         25,194         26,771         19,064         34           315,129         278,535         262,467         249,749         195,218         136,921         27,88           831,756         764,828         778,857         803,703         761,690         692,991         7,36           ¥3,329.60         ¥2,938.12         ¥2,768.41         ¥ 259.63         ¥ 213.13         ¥ 149.48         \$           ¥3,329.60         ¥2,938.12         ¥2,768.41         ¥ 259.63         20.80         \$         \$           120.00         64.00         8.00         6.00         6.00         6.00         \$         \$           37.9%         36.4%         33.7%         31.1%         25.6%         19.8%

 Number of employees
 20,628
 20,481
 20,264
 20,411

Notes: 1. The computation of equity per share has been based on the number of shares issued as of the balance sheet date.

2. The computation of earnings per share has been based on the weighted-average number of shares issued during each fiscal year.

3. Equity comprises "Total shareholders' equity" and "Total accumulated other comprehensive income."

 In order to align the fiscal year-end with that of its consolidated subsidiaries overseas, effective from fiscal year 2013, DIC Corporation changed its fiscal year-end from March 31 to December 31. As a result, the fiscal year ended December 31, 2013, was a transitional irregular nine-month period, comprising the nine months from April to December for DIC Corporation and its subsidiaries whose fiscal year-end was previously March 31 and the 12 months from January to December for its subsidiaries whose fiscal year-end is December 31. Therefore, the percent increases (decreases) for the fiscal years ended December 31, 2013 and 2014, are not given.
 The Company implemented a consolidation of shares of common stock by a factor of 10 to 1 with July 1, 2016, as the effective date. Earnings per share (basic) and equity

- The Company implemented a consolidation of shares of common stock by a factor of 10 to 1 with July 1, 2018, as the effective date. Earnings per share (basic) and equity per share are calculated respectively based on the assumption that the consolidation had been implemented at the beginning of the fiscal year ended December 31, 2015.
   The Company implemented a consolidation of shares of common stock by a factor of 10 to 1 with July 1, 2016, as the effective date. Earnings per share (basic) and equity per share are calculated respectively based on the assumption that the consolidation had been implemented at the beginning of the fiscal year ended December 31, 2015.
   The Company implemented a consolidation of shares of common stock by a factor of 10 to 1 with July 1, 2016, as the effective date. Cash dividends per share applicable to the
- 6. The Company implemented a consolidation of shares of common stock by a factor of 10 to 10 with July 1, 2018, as the energie date. Cash dividends per share applicable to the period for the fiscal year ended December 31, 2016, comprises interim dividends of ¥4.00 (before the consolidation) and year-end dividends of ¥60.00 (after the consolidation). If the consolidation had been taken into consideration, cash dividends per share applicable to the period for the fiscal year ended December 31, 2016, would be ¥100.00.
- 7. From the fiscal year ended December 31, 2017, the Company introduced the Board Benefit Trust (BBT). The shares held by the trust are recorded under net assets as treasury shares. The number of treasury shares excluded from the number of shares issued as of the balance sheet date used for the calculation of equity per share includes the number of shares held by the trust. The number of treasury shares excluded from the number of treasury shares issued are included from the number of shares issued during the fiscal year used for the calculation of earnings per share includes the number of shares held by the trust.
- 8. Yen amounts have been translated, for readers' convenience only, at the rate of ¥113 to US\$1, the approximate rate of exchange at December 31, 2017.



Net Income Attributable to Owners of the Parent



Operating Income







\* These figures have been adjusted to account for the impact of a consolidation of shares of common stock by a factor of 10 to 1 with July 1, 2016, as the effective date.





20,034

20,273

20,628



This document presents consolidated results for fiscal year 2017, comprising the accounts for the year ended December 31, 2017, of DIC and its domestic and overseas subsidiaries.

#### Operating Results

While economic conditions worldwide recovered gradually in fiscal year 2017, ended December 31, 2017, economic uncertainty, fluctuations in the financial and capital markets and the direction of oil prices, among others, continued to warrant caution. Moderate recovery persisted in the economies of North America and Europe. A revival was seen in Asia. Japan's economy also continued to rally steadily.

In this environment, consolidated net sales increased 5.1%, to ¥789.4 billion, reflecting multiple factors, including firm shipments. Operating income advanced 4.2%, to ¥56.5 billion, as increased sales of high-value-added products and the progress of cost reductions offset the impact of rising raw materials prices, among others. Ordinary income rose 2.1%, to ¥57.0 billion, with contributing factors including higher operating income and an improved financial position. Net income attributable to owners of the parent climbed 11.0%, to ¥38.6 billion, owing to a decrease in extraordinary loss and other factors.

		Billions of yen		Change o	alculated in
	FY2017	FY2016	Change (%)	local c	urrency (%)
Net sales	¥789.4	¥751.4	5.1%		3.5%
Operating income	56.5	54.2	4.2		3.9
Ordinary income	57.0	55.8	2.1		
Net income attributable to owners of the parent	38.6	34.8	11.0		
					Yen
				FY2017	FY2016
Average exchange rate (¥/US\$)				¥112.33	¥109.96

#### Segment Results

Segment results in key markets are as follows. Year-on-year percentage changes excluding the impact of foreign currency fluctuations are presented as "change calculated in local currency." Interregional transactions within the Printing Inks segment are included. Accordingly, the aggregates of regional net sales and operating income figures for the Printing Inks segment differ from the figures presented in the Notes to the Consolidated Financial Statements.

### **Printing Inks**

#### Japan

Sales of packaging inks benefited from firm shipments. Nonetheless, overall sales in Japan decreased, reflecting factors such as diminished demand for publishing inks and news inks. Operating income fell sharply, owing to the aforementioned sales results and other factors.

#### The Americas and Europe

Although demand for publishing inks and news inks waned, sales in North America were flat, with causes including higher shipments of packaging inks. In Europe, sales edged up, as firm shipments of publishing inks and packaging inks countered falling demand for news inks. Sales in Central and South America rose, buoyed by robust shipments of packaging inks. As a result, overall sales in the Americas and Europe increased. Operating income advanced, bolstered by the aforementioned sales results and rationalization measures, among others.

#### Asia and Oceania

While shipments of packaging inks were solid, sales in the People's Republic of China (PRC) decreased, hindered by factors such as flagging demand for publishing inks and news inks. In Southeast Asia, sales were pushed up by higher shipments of publishing inks and packaging inks. Sales in Oceania fell, with causes including fading demand for news inks. Sales in India increased, bolstered by brisk shipments of publishing inks and packaging inks. For these and other reasons, overall sales in Asia and Oceania rose. Operating income declined, regardless of the aforementioned sales results, a consequence of rising raw materials prices and other factors.

D'II!

		FY2017	Change (%)	Change calculated in local currency (%)
Japan	Net sales	¥ 77.1	(3.3)%	-%
	Operating income	3.9	(22.5)	_
The Americas and Europe	Net sales	241.1	3.6	1.4
	Operating income	9.5	12.9	16.5
Asia and Oceania	Net sales	64.8	5.3	2.2
	Operating income	4.0	(17.2)	(19.8)

### **Fine Chemicals**

Sales of pigments were down, despite a steep increase in shipments of functional pigments, including those for color filters, owing to flagging demand for other pigments. Sales of thin-film transistor liquid crystals (TFT LCs) rose substantially, reflecting favorable shipments. These factors supported higher segment sales. Segment operating income was up significantly, underpinned by an improved product mix, among others.

	Billions of yen		Change calculated in
	FY2017	Change (%)	local currency (%)
Net sales	¥135.4	5.7%	3.5%
Operating income	17.4	20.3	18.3

### Polymers

Sales in Japan rose, bolstered by increased shipments of high-value-added products, polystyrene and other products. Sales overseas were up sharply, thanks to generally firm shipments. For these and other reasons, segment sales advanced. Notwithstanding the impact of rising raw materials prices, segment operating income was flat. Factors behind this result included the aforementioned sales results.

	Billions of yen FY2017	Change (%)	Change calculated in local currency (%)
Net sales	¥197.9	9.4%	8.4%
Operating income	19.6	(0.2)	(0.7)

#### Compounds

Healthy shipments pushed up sales of polyphenylene sulfide (PPS) compounds. Steadily expanding shipments bolstered sales of jet inks. Owing to these and other factors, segment sales rose. Segment operating income remained level. Reasons behind this result included the aforementioned sales results, which offset increases in raw materials prices and costs associated with advance investments.

	Billions of yen FY2017	Change (%)	Change calculated in local currency (%)
Net sales	¥64.7	5.8%	4.8%
Operating income	5.0	0.3	0.9

### **Application Materials**

Segment sales increased, with contributing factors including higher shipments of industrial adhesive tapes and hollow-fiber membrane modules. Segment operating income rose substantially, spurred by an improved product mix and efforts to reduce costs, among others.

	Billions of yen		Change calculated in
	FY2017	Change (%)	local currency (%)
Net sales	¥56.1	0.7%	0.4%
Operating income	2.6	39.2	38.9

#### Analysis of Cash Flows

4

Cash and cash equivalents as of December 31, 2017, totaled ¥17.7 billion, an increase of ¥1.0 billion from the previous fiscal year-end.

#### **Operating Activities**

Net cash provided by operating activities amounted to ¥54.2 billion, down from ¥62.5 billion provided by such activities in fiscal year 2016. Income before income taxes and non-controlling interests was ¥54.8 billion, while the adjustment for depreciation and amortization amounted to ¥31.5 billion. Income taxes paid totaled ¥12.3 billion, while working capital increased ¥7.5 billion.

#### **Investing Activities**

Net cash used in investing activities came to ¥58.9 billion, up from ¥32.2 billion used in such activities in the previous fiscal year. A total of ¥33.6 billion was applied to capital expenditure, comprising the purchase of property, plant and equipment and the purchase of intangible assets, while ¥27.2 billion was used for the purchase of subsidiaries and affiliates securities. Proceeds from sales of property, plant and equipment totaled ¥2.1 billion.

#### **Financing Activities**

Net cash provided by financing activities amounted to ¥11.4 billion, compared with ¥26.9 billion used in such activities in fiscal year 2016. The net total of funds procured was ¥26.1 billion, while cash dividends paid to-taled ¥11.4 billion.

### Consolidated Balance Sheet

DIC Corporation and Consolidated Subsidiaries December 31, 2017

5

	2017	( ) ( ) ( )
c Current assets:		2010
Cash and deposits (Notes 4 and 17)	¥ 17,883	¥ 17,241
Notes and accounts receivable—trade (Notes 9, 17 and 18)	226,968	215,369
Merchandise and finished goods (Note 9)	90,010	82,611
Work in process (Note 9)	9,053	9,461
Raw materials and supplies (Note 9)	58,911	53,605
Deferred tax assets (Note 14)	9,574	9,915
Other (Note 17)	23,340	21,374
Allowance for doubtful accounts	(10,763)	(10,839)
Total current assets	424,976	398,737
Non-current assets:		
Property, plant and equipment (Notes 7, 8 and 9):		
Buildings and structures	92,443	92,092
Machinery, equipment and vehicles	70,554	66,342
Tools, furniture and fixtures	11,129	10,142
Land	50,307	50,169
Construction in progress	7,244	7,915
Total property, plant and equipment	231,677	226,660
Intangible assets (Note 8):		
Goodwill	199	501
Software	3,837	4,878
Other	3,548	3,563
Total intangible assets	7,584	8,942
Investments and other assets:		
Investment securities (Notes 5, 6 and 17)	76,867	41,007
Deferred tax assets (Note 14)	31,871	36,996
Net defined benefit asset (Note 10)	33,408	28,074
Other (Notes 5 and 17)	26,858	25,899
Allowance for doubtful accounts	(1,485)	(1,487)
Total investments and other assets	167,519	130,489
Total non-current assets	406,780	366,091

See notes to the consolidated financial statements.

Liabilities and
Net Assets

	Ν	/lillions of yen
	2017	2016
Current liabilities:		
Notes and accounts payable—trade (Notes 17 and 18)	¥117,199	¥ 94,392
Short-term loans payable (Notes 9 and 17)	61,385	52,744
Current portion of long-term loans payable (Notes 9, 17 and 18)	27,677	43,647
Lease obligations (Notes 9 and 17)	557	584
Income taxes payable (Notes 14 and 17)	4,793	4,153
Deferred tax liabilities (Note 14)	399	322
Provision for bonuses	7,071	7,050
Other (Note 17)	47,509	62,447
Total current liabilities	266,590	265,339
Non-current liabilities:		
Bonds payable (Notes 9, 17 and 18)	50,000	30,000
Long-term loans payable (Notes 9, 17 and 18)	122,017	109,918
Lease obligations (Notes 9 and 17)	4,045	4,394
Deferred tax liabilities (Note 14)	11,653	9,598
Net defined benefit liability (Note 10)	22,774	28,072
Asset retirement obligations	1,329	1,334
Other	9,397	9,156
Total non-current liabilities	221,215	192,472
Total liabilities	487,805	457,811
Net assets:		
Shareholders' equity (Notes 11 and 21):		
Capital stock (Note 12)	96,557	96,557
Capital surplus	94,445	94,094
Retained earnings	186,768	159,541
Treasury shares (Note 13)	(1,828)	(1,213)
Total shareholders' equity	375,942	348,979
Accumulated other comprehensive income:		
Valuation difference on available-for-sale securities	7,874	5,248
Deferred gains or losses on hedges	(3)	(187)
Foreign currency translation adjustment	(46,462)	(48.626)
Remeasurements of defined benefit plans (Note 10)	(22,222)	(26.879)
Total accumulated other comprehensive income	(60,813)	(70,444)
Non-controlling interests	28,822	28,482
Total net assets	343,951	307 017
Total liabilities and net assets	¥831 756	¥764 878

#### Consolidated Statement of Income 7

DIC Corporation and Consolidated Subsidiaries Year ended December 31, 2017

	Millions	
	2017	2016
Net sales	¥789,427	¥751,438
Cost of sales	605,809	571.895
Gross profit	183,618	179,543
Selling, general and administrative expenses (Note 15)	127,135	125,361
Operating income	56,483	54,182
Nie wardte stander		
Non-operating income:	1 0 1 7	E75
Dividends income	1,01/	2/2
	447	2 266
Equity in earnings of affiliates	4,069	3,266
Foreign exchange gains		607
Other	2,019	2,182
lotal non-operating income	8,352	7,031
Non-operating expenses:		
Interest expenses	3,565	3.227
Foreign exchange losses	1,456	
Other	2.854	2.189
Total non-operating expenses	7,875	5.416
	,	
Ordinary income	56,960	55,797
	4 450	
Gain on sales of non-current assets	1,156	
Gain on change in equity	641	
Gain on sales of subsidiaries and affiliates securities	315	
State subsidy		842
Gain on bargain purchase	—	78
Total extraordinary income	2,112	920
Extraordinary loss:		
Loss on disposal of non-current assets	2.682	4.412
Severance costs	951	1 416
Early termination fee	376	
Impairment loss (Note 8)	234	
Provision of allowance for doubtful accounts	254	553
		140
Total extraordinary loss	4 243	6 821
	.,	0,021
Income before income taxes and non-controlling interests	54,829	49,896
Income taxes (Note 14):		
Income taxes—current	10,517	11,565
Income taxes—deferred	3,388	767
Total income taxes	13,905	12,332
Nationa	40.024	27 564
Net income attributable to non controlling interacts	40,524	57,504 דחד כ
Net income attributable to non-controlling interests	2,321	2,797
Net income attributable to owners of the parent	¥ 38,603	¥ 34,767
		Yen
Earnings per share (Note 2):	V 407 FC	V 266 72
	¥ 407.56	¥ 300./2
Diluted		
Weighted-average number of shares issued during the period,	94,717	94,805
Cash dividends per share applicable to the period (Note 2)	¥ 120.00	¥ 64.00
cash anachas per share applicable to the period (Note 2)	+ 120.00	+ 04.00

See notes to the consolidated financial statements.

### Consolidated Statement of Comprehensive Income

DIC Corporation and Consolidated Subsidiaries Year ended December 31, 2017

	Ν	Aillions of yen
	2017	2016
Net income	¥40,924	¥ 37,564
Other comprehensive income:		
Valuation difference on available-for-sale securities	2,590	1,609
Deferred gains or losses on hedges	183	(112)
Foreign currency translation adjustment	979	(18,179)
Remeasurements of defined benefit plans, net of tax (Note 10)	4,718	6,266
Share of other comprehensive income of associates accounted for using equity method	1,563	(965)
Total other comprehensive income (Note 20)	¥10,033	¥(11,381)
Comprehensive income	¥50,957	¥ 26,183
Comprehensive income attributable to:		
Comprehensive income attributable to owners of the parent	¥48,234	¥ 23,734
Comprehensive income attributable to non-controlling interests	2,723	2,449

See notes to the consolidated financial statements.

8

### Consolidated Statement of Changes in Net Assets

DIC Corporation and Consolidated Subsidiaries Year ended December 31, 2017

9

						Millions of yen
					Sha	areholders' equity
	Issued number of common stock (thousands)	Capital stock	Capital surplus	Retained earnings	Treasury shares	Total shareholders' equity
Balance at January 1, 2016	965,372	¥96,557	¥94,161	¥137,071	¥(5,911)	¥321,878
Dividends from surplus, ¥8.00 per share (Note 11)				(7,585)		(7,585)
Net income attributable to owners of the parent				34,767		34,767
Purchase of treasury shares— 19,473 shares					(19)	(19)
Retirement of treasury shares (Notes 12 and 13)	(13,803)		(5)	(4,712)	4,717	—
Consolidation of shares (Notes 12 and 13)	(856,412)					
Change in treasury shares of parent arising from transactions with non-controlling shareholders			(62)			(62)
Net changes of items other than shareholders' equity (Notes 6 and 11)						
Balance at December 31, 2016	95,157	96,557	94,094	159,541	(1,213)	348,979
Dividends from surplus, ¥120.00 per share (Note 11)				(11,376)		(11,376)
Net income attributable to owners of the parent				38,603		38,603
Purchase of treasury shares— 155,741 shares					(615)	(615)
Change in treasury shares of parent arising from transactions with non-controlling shareholders			351			351
Net changes of items other than shareholders' equity (Notes 6 and 11)						
Balance at December 31, 2017	95,157	¥96,557	¥94,445	¥186,768	¥(1,828)	¥375,942

							Millions of yen
	Accumulated other comprehensive income						
	Valuation difference on available-for-sale securities	Deferred gains or losses on hedges	Foreign currency translation adjustment	Remeasurements of defined benefit plans	Total accumulated other comprehensive income	Non-controlling interests	Total net assets
Balance at January 1, 2016	¥3,688	¥ (73)	¥(29,925)	¥(33,101)	¥(59,411)	¥27,390	¥289,857
Dividends from surplus, ¥8.00 per share (Note 11)							(7,585)
Net income attributable to owners of the parent							34,767
Purchase of treasury shares— 19,473 shares							(19)
Retirement of treasury shares (Notes 12 and 13)							_
Consolidation of shares (Notes 12 and 13)							
Change in treasury shares of parent arising from transactions with non-controlling shareholders							(62)
Net changes of items other than shareholders' equity (Notes 6 and 11)	1,560	(114)	(18,701)	6,222	(11,033)	1,092	(9,941)
Balance at December 31, 2016	5,248	(187)	(48,626)	(26,879)	(70,444)	28,482	307,017
Dividends from surplus, ¥120.00 per share (Note 11)							(11,376)
Net income attributable to owners of the parent							38,603
Purchase of treasury shares— 155,741 shares							(615)
Change in treasury shares of parent arising from transactions with non-controlling shareholders							351
Net changes of items other than shareholders' equity (Notes 6 and 11)	2,626	184	2,164	4,657	9,631	340	9,971
Balance at December 31, 2017	¥7,874	¥ (3)	¥(46,462)	¥(22,222)	¥(60,813)	¥28,822	¥343,951

See notes to the consolidated financial statements.



### Consolidated Statement of Cash Flows

DIC Corporation and Consolidated Subsidiaries Year ended December 31, 2017

Million		lillions of yer
	2017	2016
Net cash provided by (used in) operating activities:		
Income before income taxes and non-controlling interests	¥ 54,829	¥ 49,896
Adjustments for:		
Depreciation and amortization	31,524	32,444
Amortization of goodwill	345	373
Increase (decrease) in allowance for doubtful accounts	(720)	1,540
Increase (decrease) in provision for bonuses	13	149
Interest and dividends income	(2,264)	(976
Equity in (earnings) losses of affiliates	(4,069)	(3,266
Interest expenses	3,565	3,22
Loss (gain) on sales and retirement of non-current assets	1,526	4,41
Impairment loss	234	
Loss (gain) on sales of subsidiaries and affiliates securities	(315)	
State subsidy	_	(842
Decrease (increase) in notes and accounts receivable—trade	(7,070)	(2,150
Decrease (increase) in inventories	(9,742)	(828
Increase (decrease) in notes and accounts payable—trade	9,328	(1,810
Other, net	(11,246)	(2,775
Subtotal	65,938	79,39
Interest and dividends income received	4,180	2,13
Interest expenses paid	(3,628)	(3,254
Income taxes paid	(12,294)	(15,766
Net cash provided by (used in) operating activities	54,196	62,50
let cash provided by (used in) investing activities:		
Payments into time deposits	(8,231)	(6,505
Proceeds from withdrawal of time deposits	8,560	6,21
Purchase of property, plant and equipment	(32,192)	(30,310
Proceeds from sales of property, plant and equipment	2,103	45
Purchase of intangible assets	(1,392)	(969
Purchase of investments in subsidiaries resulting in change in scope of consolidation	(515)	(114
Purchase of subsidiaries and affiliates securities	(27,209)	-
Purchase of investment securities	(851)	(97
Proceeds from sales and redemption of investment securities	465	37
Payments for transfer of business	(338)	(27
Proceeds from subsidy income	—	84
Other, net	662	(950
Net cash provided by (used in) investing activities	(58,938)	(32,202
let cash provided by (used in) financing activities:		
Net increase (decrease) in short-term loans payable	9,272	30,36
Increase (decrease) in commercial papers		(4,000
Proceeds from long-term loans payable	44,823	30,06
Repayment of long-term loans payable	(48,022)	(75,576
Proceeds from issuance of bonds	20,000	10,00
Redemption of bonds	—	(8,000
Cash dividends paid	(11,376)	(7,58
Cash dividends paid to non-controlling interests	(1,439)	(1,04
Net decrease (increase) in treasury shares	(615)	(19
Payments from changes in ownership interests in subsidiaries that do not result in change in scope of consolidation	(578)	_
Other, net	(690)	(1,058
Net cash provided by (used in) financing activities	11,375	(26,852
ffect of exchange rate change on cash and cash equivalents	(5,653)	(1,892
Net increase (decrease) in cash and cash equivalents	980	1,55
Cash and cash equivalents at beginning of the period (Note 4)	16,671	15,11
Cash and cash equivalents at end of the period (Note 4)	¥ 17,651	¥ 16,67

See notes to the consolidated financial statements.



### Notes to the Consolidated Financial Statements

DIC Corporation and Consolidated Subsidiaries Year ended December 31, 2017

#### Note 1:

Basis of	The
Presenting	set
Financiai Statements	in a
	in c

The accompanying consolidated financial statements have been prepared in accordance with the provisions set forth in the Japanese Financial Instruments and Exchange Act and its related accounting regulations, and in accordance with accounting principles generally accepted in Japan ("Japanese GAAP"), which are different in certain respects as to application and disclosure requirements of the International Financial Reporting Standards ("IFRS").

In preparing these consolidated financial statements, certain reclassifications and rearrangements have been made to the consolidated financial statements issued domestically in order to present them in a form which is more familiar to readers outside Japan. The consolidated financial statements are stated in Japanese yen, the currency of the country in which DIC Corporation (the "Company") is incorporated.

#### Note 2:

Summary of Significant Accounting Policies

#### **Consolidated financial statements**

Under the control or influence concept, those companies in which the Company, directly or indirectly, is able to exercise control over operations are fully consolidated and those companies over which the Company has the ability to exercise significant influence are accounted for by the equity method.

The consolidated financial statements include the accounts of the Company and its significant subsidiaries: Sun Chemical Group Coöperatief U.A., DIC (China) Co., Ltd., DIC Asia Pacific Pte Ltd, SEIKO PMC CORPORA-TION, DIC INVESTMENTS JAPAN, LLC., DIC Graphics Corporation and 138 other companies in the fiscal year ended December 31, 2017 (144 other companies in the fiscal year ended December 31, 2017). All significant intercompany balances and transactions have been eliminated in consolidation. All material unrealized profit included in assets resulting from transactions within the Company and its consolidated subsidiaries (the "Group") is eliminated.

Investments in 26 affiliates in the fiscal year ended December 31, 2017 (23 in the fiscal year ended December 31, 2016) are accounted for by the equity method.

#### Accounting period of consolidated subsidiaries

The closing date of the consolidated subsidiaries is the same as the consolidated closing date.

#### Cash and cash equivalents

Cash and cash equivalents consist primarily of cash on hand, certificates of deposit and short-term investments with original maturities of three months or less that are readily convertible to known amounts of cash and have insignificant risk of changes in value.

#### **Investment securities**

Investment securities are classified and accounted for, depending on management's intent, into available-forsale securities. Available-for-sale securities are carried at fair value as of the balance sheet date, with unrealized gain and loss, net of applicable taxes, reported in a separate component of net assets. Available-for-sale securities whose fair values are not readily available are carried at cost. The cost of securities sold is calculated by the moving-average method.

#### Allowance for doubtful accounts

Allowance for doubtful accounts of the Company and its domestic consolidated subsidiaries is provided based on historical experience for normal receivables and on an estimate of collectability of receivables from companies in financial difficulty.

Allowance for doubtful accounts of foreign consolidated subsidiaries is provided based on an estimate of collectability of receivables.

#### Inventories

Inventories are principally stated at cost, cost being determined by the FIFO method, which evaluates the amount of the inventories shown in the balance sheet by writing them down based on their decrease in profitability.

#### Property, plant and equipment (excluding leased assets)

Property, plant and equipment are carried at cost. Significant renewals and additions are capitalized; maintenance and repairs, and minor renewals and improvements, are charged to income as incurred.

Depreciation of buildings (other than facilities attached to buildings) of the Company and its domestic consolidated subsidiaries is calculated principally by the straight-line method. Besides, depreciation of facilities

attached to buildings and structures acquired on or after April 1, 2016, is also calculated by the straight-line method. Other property, plant and equipment are calculated by the declining-balance method.

Depreciation of property, plant and equipment of foreign consolidated subsidiaries is calculated principally by the straight-line method. The range of useful lives is principally from 8 to 50 years for buildings and structures and from 3 to 11 years for machinery, equipment and vehicles.

#### Intangible assets (excluding leased assets)

Intangible assets are carried at cost less accumulated amortization, and are amortized by the straight-line method. Goodwill is amortized by the straight-line method over a reasonable period not exceeding 20 years.

#### Leased assets

For the Company and its domestic consolidated subsidiaries, leased assets related to finance leases that do not transfer ownership of the leased property to the lessee are depreciated on a straight-line basis, with the lease periods used as their useful lives and no residual value.

Foreign consolidated subsidiaries account for lease transactions in accordance with either the accounting principles generally accepted in the United States ("U.S. GAAP") or IFRS.

#### **Retirement and pension plans**

The Company and its domestic consolidated subsidiaries account for net defined benefit asset/liability for employees' and executive officers' retirement benefits. Pension assets are deducted from retirement benefit obligations and the net amount is recognized based on the estimated amount of payment as of the balance sheet date. In calculating retirement benefit obligations, the Company applies a method of attributing expected retirement benefits to each period on a benefit formula basis. The Company and its domestic consolidated subsidiaries amortize actuarial gain and loss in the succeeding years primarily by the straight-line method over stated years that do not exceed the average remaining service period of the eligible employees (15 to 16 years). Past service costs are amortized in the accounting periods when they accrue.

Foreign consolidated subsidiaries are accounted for in accordance with either U.S. GAAP or IFRS. Actuarial gains and losses are amortized in the succeeding year primarily by the straight-line method over stated years that do not exceed the average remaining service period of the eligible employees (9 to 28 years). Past service costs are amortized over 3 to 25 years.

Unrecognized actuarial gains and losses and unrecognized past service costs are recorded in "Remeasurements of defined benefit plans" in net assets after adjusting income tax effect.

#### Asset retirement obligations

The asset retirement obligation is recognized as the sum of the discounted cash flows required for the future asset retirement and is recorded in the period in which the obligation is incurred if a reasonable estimate can be made. If a reasonable estimate of the asset retirement obligation cannot be made in the period in which the asset retirement obligation is incurred, the liability should be recognized when a reasonable estimate of the asset retirement obligation of a liability for an asset retirement obligation, an asset retirement cost is capitalized by increasing the carrying amount of the related fixed asset by the amount of the liability. The asset retirement cost is subsequently allocated to expense through depreciation over the remaining useful life of the asset. Over time, the liability is accreted to its present value each period. Any subsequent revisions to the timing or the amount of the original estimate of undiscounted cash flows are reflected as an increase or a decrease in the carrying amount of the liability and the capitalized amount of the related asset retirement cost.

#### **Income taxes**

The provision for income taxes is computed based on the pretax income (loss) included in the consolidated statement of income.

Deferred income taxes are recorded to reflect the impact of temporary differences between assets and liabilities recognized for financial reporting purposes and such amounts recognized for tax purposes. These deferred taxes are measured by applying currently enacted tax laws to the temporary differences.

#### **Research and development costs**

Research and development costs are charged to income as incurred.

#### Basis of translation of financial statements of foreign consolidated subsidiaries

The financial statements of foreign consolidated subsidiaries included in the consolidated financial statements are translated into Japanese yen based on the following procedures:

(1) Assets and liabilities of foreign consolidated subsidiaries are translated into Japanese yen at the exchange rates as of the balance sheet date.

(2) Income and expenses are translated into Japanese yen at the average rate during the year. The differences of translation are included in foreign currency translation adjustment and non-controlling interests, which are presented as separate components of net assets.

#### Translation of foreign currency accounts

Receivables and payables denominated in foreign currencies are translated into Japanese yen at the exchange rates as of the balance sheet date and any difference arising from the translation is recognized in the consolidated statement of income if hedge accounting is not applied.

#### **Derivatives and hedging activities**

To hedge risks associated with the fluctuations of exchange rates, interest rates and commodity prices, the Group uses foreign currency forward contracts, currency swaps, interest rate swaps, and commodity swaps. To hedge a part of the risks associated with the fluctuations of exchange rates for investments in foreign entities, the Company uses loans denominated in foreign currencies. The Group does not enter into derivatives for trading or speculative purposes.

Derivative financial instruments and foreign currency transactions are classified and accounted for as follows: 1) all derivatives are recognized as either assets or liabilities and measured at fair value, with gains or losses recognized in the consolidated statement of income and 2) for derivatives used for hedging purposes, if derivatives qualify for hedge accounting because of high correlation and effectiveness between the hedging instruments and the hedged items, gains or losses on derivatives are deferred until maturity of the hedged transactions.

Receivables and payables denominated in foreign currencies are translated at the contracted rates if the forward contracts qualify for hedge accounting. Gains and losses related to qualifying hedges of firm commitments or anticipated transactions are deferred and recognized in income when the hedged transaction occurs. If interest rate swaps qualify for hedge accounting and meet certain specific matching criteria, they will not be measured at market value, rather the differential paid or received under the swaps will be recognized in interest expenses or interest income.

#### Per share information

Earnings per share (basic) is computed by dividing net income attributable to owners of the parent available to common shareholders by the weighted-average number of shares issued for the period, retroactively adjusted for stock splits.

The Company implemented the consolidation of shares of common stock by a factor of 10 to 1 with July 1, 2016, as the effective date. Earnings per share (basic) is calculated based on the assumption that the consolidation had been implemented at the beginning of the fiscal year ended December 31, 2016.

Earnings per share (diluted) reflects the potential dilution that could occur if securities were exercised or converted into common stock. Earnings per share (diluted) assumes full conversion of the outstanding convertible notes and bonds at the beginning of the year (or at the time of issuance) with an applicable adjustment for related interest expense, net of tax, and full exercise of outstanding warrants.

Cash dividends per share presented in the accompanying consolidated statement of income are dividends applicable to the respective years, including dividends to be paid after the end of the year.

Cash dividends per share applicable to the period for the fiscal year ended December 31, 2016, comprises interim dividends of ¥4.00 (before the consolidation) and year-end dividends of ¥60.00 (after the consolidation). If the consolidation had been taken into consideration, cash dividends per share applicable to the period for the fiscal year ended December 31, 2016, would be ¥100.00.

From the fiscal year ended December 31, 2017, the Company introduced the Board Benefit Trust (BBT). The shares held by the trust are recorded under net assets as treasury shares. The number of treasury shares excluded from the number of shares issued as of the balance sheet date used for the calculation of equity per share includes the number of shares held by the trust. The number of treasury shares excluded from the weighted-average number of shares issued during the fiscal year used for the calculation of earnings per share includes the number of shares held by the trust.

### Note 3:

14

#### Additional Information

#### Application of Implementation Guidance on Recoverability of Deferred Tax Assets

Effective from the fiscal year ended December 31, 2017, the Company has applied the "Implementation Guidance on Recoverability of Deferred Tax Assets" (ASBJ Guidance No. 26, March 28, 2016).

#### Board Benefit Trust (BBT)

With regard to the compensation for executive officers, as well as directors who concurrently serve as executive officers (the "Target Officers"), the Company introduced a new performance-based stock compensation plan called Board Benefit Trust (BBT) (the "Plan") from the fiscal year ended December 31, 2017. The purpose of the Plan is to further clarify the linkage between the compensation of the Target Officers, and corporate performance and the value of the Company's shares. The intended result is strengthening the Target Officers' awareness of their contributions to the medium- to long-term improvement of corporate performance and value.

Accounting treatment related to the trust agreement is in accordance with "Practical Solution on Transactions of Delivering the Company's Own Stock to Employees etc. through Trusts" (PITF No. 30, March 26, 2015).

#### (1) Outline of the transactions

Cash and cash equivalents

The trust established under the Plan acquires the Company's shares by cash contributed by the Company. The trust provides shares of the Company and the cash equivalent to the market price of the shares of the Company (the "Company's Shares and Cash Benefits") to the Target Officers, in accordance with the Rules of Officer Share Benefit established by the Company. The Target Officers shall in principle receive the Company's Shares and Cash Benefits upon their retirement.

(2) The Company's shares remaining in the trust

The shares remaining in the trust are recorded under net assets as treasury shares at the book value in the trust (excluding incidental costs). The book value of the treasury shares was ¥599 million, while the number of the treasury shares was 152 thousand as of December 31, 2017.

#### Note 4:

Cash and Cash Equivalents

	-	Aillions of yen
	2017	2016
Cash and deposits	¥17,883	¥17,241
Less: time deposits and short-term investments which mature over three months after the date of acquisition	(232)	(570)

¥17,651

¥16,671

#### Note 5:

Investments in unconsolidated subsidiaries and affiliates as of December 31, 2017, and 2	016, include th. M	ne following: Iillions of ven
	2017	2016
Investments in stock of unconsolidated subsidiaries and affiliates	¥53,213	¥21,678
Investments in equity of unconsolidated subsidiaries and affiliates	1,053	1,398
Total	¥54,266	¥23,076
	Investments in unconsolidated subsidiaries and affiliates as of December 31, 2017, and 2 Investments in stock of unconsolidated subsidiaries and affiliates Investments in equity of unconsolidated subsidiaries and affiliates Total	Investments in unconsolidated subsidiaries and affiliates as of December 31, 2017, and 2016, include the Construction of Const

Cash and cash equivalents as of December 31, 2017, and 2016, include the following:

#### Note 6:

#### Investment Securities

The carrying amounts and aggregate fair values of available-for-sale securities at December 31, 2017, and 2016, are as follows:

			Ν	/illions of yen
				2017
	Cost	Unrealized gains	Unrealized losses	Fair value
Available-for-sale securities:				
Stocks	¥8,121	¥11,437	¥(21)	¥19,537
Total	¥8,121	¥11,437	¥(21)	¥19,537

			I	Millions of yen
				2016
		Unrealized	Unrealized	
	Cost	gains	losses	Fair value
Available-for-sale securities:				
Stocks	¥8,190	¥7,752	¥(54)	¥15,888
Total	¥8,190	¥7,752	¥(54)	¥15,888

#### Note 7:

15

Property, Plant and Equipment

Accumulated depreciation on property, plant and equipment as of December 31, 2017, and 2016, is ¥559,793 million and ¥545,419 million, respectively.

#### Note 8:

Impairment of Long-Lived Assets

Impairment losses on long-lived assets for the fiscal year ended December 31, 2017, for each asset group is as follows:

			Millions of yen
			2017
Used status	Category of assets	Location	Allocated impairment loss
Factory assets in use	Machinery, equipment and vehicles, buildings and structures, and other	India	¥200
Idle assets	Buildings and structures, machinery, equipment and vehicles, and other	Ibaraki, Japan	34
Total			¥234

The carrying amount of the factory assets in use was reduced to its recoverable amount because the recoverable amount is less than the carrying amount. The carrying amount of the idle assets was also reduced to its recoverable amount because the assets are no longer used.

The book value of factory assets in use has been lowered to the recoverable amount. All the book value of idle assets has been recognized as impairment loss.

#### Note 9:

Short-Term Loans Payable and Long-Term Loans Payable

Information with respect to short-term loans payable at December 31, 2017, and 2016, is as follows:

The average interest rate for the fiscal years ended December 31, 2017, and 2016, is 2.19% and 2.43%, respectively, for short-term loans payable, and -0.01% and 0.00%, respectively, for commercial papers.

Bonds payable, long-term loans payable and lease obligations at December 31, 2017, and 2016, comprise the following:

	Millions of yen	
	2017	2016
0.53% Japanese yen notes due 2022	¥ 10,000	¥ 10,000
1.00% Japanese yen notes due 2025	10,000	10,000
0.95% Japanese yen notes due 2036	5,000	5,000
0.36% Japanese yen notes due 2026	5,000	5,000
0.42% Japanese yen notes due 2027	10,000	
0.15% Japanese yen notes due 2022	10,000	_
Loans due 2018–2027, with an average interest rate of 0.75%	149,694	153,565
Lease obligations	4,602	4,978
Subtotal	204,296	188,543
Less: current portion of long-term loans payable	(27,677)	(43,647)
Less: current portion of bonds		
Less: lease obligations—current	(557)	(584)
Total	¥176,062	¥144,312

The annual maturities of bonds payable, long-term loans payable and lease obligations for the fiscal years subsequent to December 31, 2017, are as follows:

	Millions of yen
2018	¥ 28,234
2019	45,066
2020	23,270
2021	35,150
2022	30,456
Thereafter	42,120
Total	¥204,296

The amounts of assets pledged as collateral and secured borrowings and loans at December 31, 2017, comprise the following:

	ivillions of yen
Assets pledged as collateral:	
Notes and accounts receivable—trade	¥3,873
Inventories	2,002
Property, plant and equipment	572
Total	¥6,447
Secured borrowings and loans:	
Short-term loans payable	¥ 616
Total	¥ 616

#### Note 10:

16

Retirement and Pension Plans

#### (1) Overview of adopted retirement and pension plans

The Company and a number of domestic consolidated subsidiaries have defined benefit pension plans such as a cash balance–style pension plan and retirement plans, and defined contribution pension plans. Some foreign consolidated subsidiaries maintain defined benefit pension plans and defined contribution pension plans. The Company contributes certain available-for-sale securities to the employee retirement benefit trust.

#### (2) Defined benefit pension plans (including multi-employer plan)

#### Changes in defined benefit obligations

		Millions of yen
	Domestic plans	Foreign plans
As of January 1, 2017	¥95,274	¥146,257
Service cost	2,225	717
Interest cost	752	4,661
Actuarial gains and losses	(70)	4,767
Benefits paid	(4,620)	(6,342)
Past service cost	_	8
Exchange translation differences	_	3,697
Other	—	70
As of December 31, 2017	¥93,561	¥153,835

		Millions of yen
	Domestic plans	Foreign plans
As of January 1, 2016	¥97,958	¥152,302
Service cost	2,222	527
Interest cost	774	5,160
Actuarial gains and losses	(642)	10,467
Benefits paid	(5,038)	(6,549)
Past service cost	_	189
Exchange translation differences	_	(16,191)
Other	—	352
As of December 31, 2016	¥95,274	¥146,257

#### Changes in plan assets

		Millions of yen
	Domestic plans	Foreign plans
As of January 1, 2017	¥121,278	¥120,255
Expected return on plan assets	3,051	6,295
Actuarial gains and losses	4,641	6,109
Contributions by the employer	1,012	2,794
Benefits paid	(4,518)	(6,153)
Exchange translation differences	_	3,214
Other	_	52
As of December 31, 2017	¥125,464	¥132,566

		Millions of yen
	Domestic plans	Foreign plans
As of January 1, 2016	¥120,430	¥121,882
Expected return on plan assets	3,033	6,129
Actuarial gains and losses	56	9,544
Contributions by the employer	2,663	1,978
Benefits paid	(4,904)	(6,407)
Exchange translation differences	_	(13,056)
Other	_	185
As of December 31, 2016	¥121,278	¥120,255

# Reconciliation of defined benefit obligations and plan assets on retirement benefits recognized in the consolidated balance sheet

		Millions of yen
		2017
	Domestic plans	Foreign plans
Funded defined benefit obligations	¥ 92,418	¥ 152,831
Plan assets	(125,464)	(132,566)
Subtotal	(33,046)	20,265
Unfunded defined benefit obligations	1,143	1,004
Net amount of liabilities and assets recognized in consolidated balance sheet	¥ (31,903)	¥ 21,269
Liabilities (net defined benefit liability)	¥ 1,366	¥ 21,408
Assets (net defined benefit asset)	(33,269)	(139)
Net amount of liabilities and assets recognized in consolidated balance sheet	¥ (31,903)	¥ 21,269

		Millions of yen
		2016
	Domestic plans	Foreign plans
Funded defined benefit obligations	¥ 94,164	¥ 145,524
Plan assets	(121,278)	(120,255)
Subtotal	(27,114)	25,269
Unfunded defined benefit obligations	1,110	733
Net amount of liabilities and assets recognized in consolidated balance sheet	¥ (26,004)	¥ 26,002
Liabilities (net defined benefit liability)	¥ 2,017	¥ 26,055
Assets (net defined benefit asset)	(28,021)	(53)
Net amount of liabilities and assets recognized in consolidated balance sheet	¥ (26,004)	¥ 26,002

#### Retirement benefit expenses and its breakdowns

		Millions of yen
		2017
	Domestic plans	Foreign plans
Service cost	¥ 2,225	¥ 717
Interest cost	752	4,661
Expected return on plan assets	(3,051)	(6,295)
Recognition of actuarial gains and losses	(264)	1,472
Amortization of past service cost	_	8
Total	¥ (338)	¥ 563

Note: Other than these retirement benefit expenses, severance costs in the consolidated statement of income include retiree premium benefit.

		Millions of yen
		2016
	Domestic plans	Foreign plans
Service cost	¥ 2,222	¥ 527
Interest cost	774	5,160
Expected return on plan assets	(3,033)	(6,129)
Recognition of actuarial gains and losses	1,119	1,416
Amortization of past service cost	_	189
Total	¥ 1,082	¥ 1,163

Note: Other than these retirement benefit expenses, severance costs in the consolidated statement of income include retiree premium benefit.

#### Past service cost and actuarial gains and losses

The past service cost and actuarial gains and losses recognized in accumulated other comprehensive income as remeasurements of defined benefit plans (amount before income tax effect) for the fiscal years ended December 31, 2017, and 2016, are as follows:

		Millions of yen
		2017
	Domestic plans	Foreign plans
Past service cost	¥ —	¥ 4
Actuarial gains and losses	4,448	1,901
Total	¥4,448	¥1,905

		Millions of yen
		2016
	Domestic plans	Foreign plans
Past service cost	¥ —	¥ 14
Actuarial gains and losses	1,820	7,270
Total	¥1,820	¥7,284

18

#### Unrecognized past service cost and unrecognized actuarial gains and losses

The unrecognized past service cost and unrecognized actuarial gains and losses recognized in accumulated other comprehensive income as remeasurements of defined benefit plans (amount before income tax effect) for the fiscal years ended December 31, 2017, and 2016, are as follows:

		Millions	of yen
			2017
	Domestic plans	Foreig	n plans
Unrecognized past service cost	¥ —	¥	129
Unrecognized actuarial gains and losses	10,024	(4	4,549)
Total	¥10,024	¥(4	4,420)

		Millions of yen
		2016
	Domestic plans	Foreign plans
Unrecognized past service cost	¥ —	¥ 125
Unrecognized actuarial gains and losses	5,576	(46,450)
Total	¥5,576	¥(46,325)

#### Major breakdown of plan assets

		2017
	Domestic plans	Foreign plans
Equity securities	51.8%	29.0%
Debt securities	22.0%	58.0%
Other	26.2%	13.0%
Total	100.0%	100.0%

Note: 27.5% of the assets of the domestic plans is available-for-sale securities contributed to the employee retirement benefit trust.

		2016
	Domestic plans	Foreign plans
Equity securities	51.7%	27.8%
Debt securities	21.8%	56.1%
Other	26.5%	16.1%
Total	100.0%	100.0%

Note: 28.5% of the assets of the domestic plans is available-for-sale securities contributed to the employee retirement benefit trust.

#### **Actuarial assumptions**

	2017	
	Domestic plans	Foreign plans
Discount rate	0.8%	1.2%-3.7%
Expected return rate on plan assets	3.0%	5.0%-6.2%
Expected rate of increase in salary	3.3%	2.0%-3.5%

Note: Expected return rate on plan assets is determined by considering the current and anticipated future portfolio of plan assets and current and anticipated future long-term performance of individual asset classes that comprise the funds' asset mix.

	2016	
	Domestic plans	Foreign plans
Discount rate	0.8%	1.3%-4.2%
Expected return rate on plan assets	3.0%	5.5%-6.4%
Expected rate of increase in salary	3.3%	2.0%-3.5%

Note: Expected return rate on plan assets is determined by considering the current and anticipated future portfolio of plan assets and current and anticipated future long-term performance of individual asset classes that comprise the funds' asset mix.

#### (3) Defined contribution pension plans

The required contributions borne by the Company and a number of consolidated subsidiaries in relation to the defined contribution pension plans for the fiscal years ended December 31, 2017, and 2016, were ¥2,042 million and ¥1,947 million, respectively.

#### Note 11:

20

#### **Net Assets**

Japanese companies are subject to the Companies Act of Japan (the "Companies Act"). The significant provisions in the Companies Act that affect financial and accounting matters are summarized below:

#### (1) Dividends

Under the Companies Act, companies can pay dividends at any time during the fiscal year in addition to the year-end dividend upon resolution at the shareholders' meeting. For companies that meet certain criteria such as: (a) having the board of directors, (b) having independent auditors, (c) having the board of corporate auditors and (d) the term of service of the directors is prescribed as one year rather than two years of normal term by its articles of incorporation, the board of directors may declare dividends (except for dividends in kind) at any time during the fiscal year if the company has prescribed so in its articles of incorporation. The Company meets all the above criteria.

The Companies Act permits companies to distribute dividends in kind (non-cash assets) to shareholders subject to a certain limitation and additional requirements.

Semiannual interim dividends may also be paid once a year upon resolution by the board of directors if the articles of incorporation of the company so stipulate. The Companies Act provides certain limitations on the amounts available for dividends or the purchase of treasury shares. The limitation is defined as the amount available for distribution to the shareholders, but the amount of net assets after dividends must be maintained at no less than ¥3 million.

#### (2) Increases/decreases and transfer of common stocks, reserve and surplus

The Companies Act requires that an amount equal to 10% of dividends must be appropriated as a legal reserve (a component of retained earnings) or as additional paid-in capital (a component of capital surplus) depending on the equity account charged upon the payment of such dividends until the total of the aggregate amount of legal reserve and additional paid-in capital equals 25% of the common stock. Under the Companies Act, the total amount of additional paid-in capital and legal reserve may be reversed without limitation. The Companies Act also provides that common stock, legal reserve, additional paid-in capital surplus and retained earnings can be transferred among the accounts under certain conditions upon resolution of the shareholders.

#### (3) Treasury shares and treasury stock acquisition rights

The Companies Act also provides for companies to purchase treasury shares and dispose of such treasury shares by resolution of the board of directors. The amount of treasury shares purchased cannot exceed the amount available for distribution to the shareholders which is determined by a specific formula.

Under the Companies Act, stock acquisition rights, which were previously presented as a liability, are now presented as a separate component of equity.

The Companies Act also provides that companies can purchase both treasury stock acquisition rights and treasury shares. Such treasury stock acquisition rights are presented as a separate component of equity or deducted directly from stock acquisition rights.

### Note 12: Capital Stock

The Company retired its treasury shares on January 15, 2016. In addition, the Company implemented the consolidation of shares of common stock by a factor of 10 to 1 with July 1, 2016, as the effective date. As a result, the number of authorized shares as of December 31, 2017, and 2016, are 150,000,000 shares, and the number of shares issued as of December 31, 2017, and 2016, are 95,156,904 shares.



#### Note 13:

**Treasury Shares** 

The number of treasury shares as of December 31, 2017, and 2016, are as follows:

				Shares
				2017
	As of January 1,	Increase in	Decrease in	As of December 31,
	2017	FY2017	FY2017	2017
Treasury shares:				
Common stock	356,552	155,741	—	512,293
Total	356,552	155,741	—	512,293

Notes: 1. The increase of treasury shares of common stock (155,741 shares) was due to the purchase of odd shares (4,041 shares) and the acquisition of the Company's shares by the Board Benefit Trust (BBT) (151,700 shares).

2. The shares held by the Board Benefit Trust (151,700 shares) are included in the number of treasury shares.

				Shares
				2016
	As of January 1,	Increase in	Decrease in	As of December 31,
	2016	FY2016	FY2016	2016
Treasury shares:				
Common stock	17,294,751	19,473	16,957,672	356,552
Total	17,294,751	19,473	16,957,672	356,552

Notes: 1. The increase of treasury shares of common stock (19,473 shares) was due to the purchase of fractional shares in connection with the consolidation of shares (2,492 shares) and the purchase of odd shares (Total 16,981 shares, 13,440 shares for before the consolidation and 3,541 shares for after the consolidation).

2. The decrease of treasury shares of common stock (16,957,672 shares) was due to the retirement of treasury shares (13,803,000 shares) and the consolidation of shares by a factor of 10 to 1 (3,154,672 shares).

#### **Note 14:**

**Income Taxes** 

The differences between the normal effective statutory tax rate in Japan and the actual effective tax rate for the fiscal years ended December 31, 2017, and 2016, are as follows:

	2017	2016
Normal effective statutory tax rate in Japan	30.9%	33.1%
Adjustments:		
Valuation allowance change	(6.3)%	0.6%
Tax rate differences	(5.0)%	(4.9)%
Equity in earnings of affiliates	(2.2)%	(2.1)%
Entertainment and other non-deductible expenses	1.5%	1.8%
Elimination of intercompany dividends income	14.8%	8.0%
Dividends income and other non-taxable income	(9.4)%	(6.5)%
State, provincial, municipal and local taxes	0.7%	0.5%
Tax credit for research and development and others	(2.7)%	(2.4)%
Adoption of FIN48	(0.3)%	(0.9)%
Tax credit for the Special Tax Law for the March 11 Earthquake	(1.6)%	(0.4)%
Other	5.0%	(2.1)%
Actual effective tax rate	25.4%	24.7%

The tax effects of significant temporary differences and loss carryforwards, which resulted in deferred tax assets and liabilities, as of December 31, 2017, and 2016, are as follows:

	Millions of yen	
	2017	2016
Deferred tax assets:		
Inventories	¥ 3,339	¥ 4,131
Property, plant and equipment	4,371	3,061
Intangible assets	5,815	7,671
Research and development costs	4,711	7,371
Allowance for doubtful accounts	1,857	1,840
Provision for bonuses	2,112	2,109
Net defined benefit liability	5,881	8,712
Unrealized gain	992	958
Net operating loss carryforwards	20,816	27,425
Other	10,429	8,287
Subtotal	60,323	71,565
Less: valuation allowance	(13,576)	(19,052)
Total	46,747	52,513
Deferred tax liabilities:		
Property, plant and equipment	(3,359)	(3,797)
Net defined benefit asset	(3,231)	(1,008)
Contribution of securities to employee retirement benefit trust	(1,510)	(1,692)
Deferred income taxes related to gains from property, plant and equipment	(2,883)	(3,012)
Valuation difference on available-for-sale securities	(3,442)	(2,309)
Other	(2,929)	(3,704)
Total	(17,354)	(15,522)
Net deferred tax assets	¥ 29,393	¥ 36,991

#### Influence from changes in U.S. federal income tax rate

The Tax Cuts and Jobs Act, lowering the federal income tax rate from a maximum of 35% to 21% from January 1, 2018, was enacted in the United States on December 22, 2017. As a result, net deferred tax assets decreased by ¥7,863 million and income taxes–deferred (debit) recognized during the fiscal year ended December 31, 2017, increased by ¥7,863 million.

The Company records provisional amounts for an income tax accounting effect of the Act, adopting Staff Accounting Bulletin 118, "Income Tax Accounting Implications of the Tax Cuts and Jobs Act," which allows for recording provisional amounts based on a reasonable estimate for an income tax accounting effect of the Act enacted on December 22, 2017.

#### **Note 15:**

Research and Development Costs

Research and development costs charged to income for the fiscal years ended December 31, 2017, and 2016, are ¥12,427 million and ¥11,206 million, respectively.

#### Note 16:

Leases

#### **Operating leases**

Future minimum rental payments under non-cancellable operating leases at December 31, 2017, and 2016, are as follows:

	١	Villions of yen
	2017	2016
Due within one year	¥ 2,652	¥2,509
Due after one year	8,270	6,576
Total	¥10,922	¥9,085

#### Note 17:

23

Financial Instruments

#### **Group policy for financial instruments**

The Group manages funds with safe and secure financial assets. Means of financings include direct financing such as the issuance of bonds and commercial papers and liquidation of receivables, as well as indirect financing such as short- and long-term bank borrowings, the terms of which are determined based on financial market conditions and balance of account at the time.

#### Nature and extent of risks arising from financial instruments

Receivables such as trade notes and accounts receivable are exposed to customer credit risk. In addition, some of such receivables are denominated in foreign currencies and are exposed to the market risk of fluctuation in foreign currency exchange rates. Investment securities, mainly the stocks of customers and suppliers, are exposed to the risk of market price fluctuations.

Payment terms of payables, such as trade notes and accounts payable, are less than one year. In addition, some of such payables are denominated in foreign currencies and are exposed to the market risk of fluctuation in foreign currency exchange rates.

Funds needed for operations are mainly procured as short-term loans payable, whereas funds needed for capital expenditure and investment are mainly procured as long-term loans payable, bonds payable and lease obligations with regard to finance lease transactions. A part of such bank loans, bonds and lease obligations are exposed to market risks from changes in variable interest rates. Trade accounts payable and loans payable of the Company are also exposed to liquidity risk that the Company cannot meet its contractual obligations in full on maturity dates.

#### **Risk management for financial instruments**

The Company manages its credit risk from trade notes and accounts receivable on the basis of internal guidelines, which include the monitoring of payment terms and balances of customers by the sales and business administration departments to identify the default risk of customers at an early stage. The consolidated subsidiaries of the Company manage the exposure to credit risk on their own in accordance with their internal guidelines. Investment securities are managed by monitoring market values, the financial position of issuers and considering the relationship with customers and suppliers on a regular basis. The Group also tries to mitigate liquidity risk by arranging lines of credit with financial institutions, along with adequate financial planning.

#### Fair value of financial instruments

The following tables present the carrying amounts and the fair value of financial instruments at December 31, 2017, and 2016. Financial instruments whose fair value is not reliably measured are excluded from the tables below.

Millions of your

	2017			
	Carrying amount	Fair value	Difference	
Assets:				
Cash and deposits	¥ 17,883	¥ 17,883	¥ —	
Notes and accounts receivable—trade	226,968	226,968	_	
Investment securities				
Stocks of subsidiaries and affiliates	27,955	35,436	7,481	
Other	19,537	19,537		
Total	¥292,343	¥299,824	¥7,481	
Liabilities:				
Notes and accounts payable—trade	¥117,199	¥117,199	¥ —	
Short-term loans payable	61,385	61,385		
Current portion of long-term loans payable	27,677	27,690	13	
Lease obligations (current)	557	557		
Income taxes payable	4,793	4,793		
Bonds payable	50,000	50,395	395	
Long-term loans payable	122,017	122,141	124	
Lease obligations (non-current)	4,045	4,414	369	
Total	¥387,673	¥388,574	¥ 901	

Derivative financial instruments: (Note)						
Hedge accounting—not applied	¥	(394)	¥	(394)	¥	—
Hedge accounting—applied		(4)		(4)		_
Total	¥	(398)	¥	(398)	¥	_

Note: Figures are net of debts and credits that arise from derivative financial instruments. Net debt amounts are indicated in parentheses.

			Millions of yen	
	2016			
	Carrying amount	Fair value	Difference	
Assets:				
Cash and deposits	¥ 17,241	¥ 17,241	¥ —	
Notes and accounts receivable—trade	215,369	215,369	—	
Investment securities				
Stocks of subsidiaries and affiliates	2,364	5,579	3,215	
Other	15,888	15,888	_	
Total	¥250,862	¥254,077	¥3,215	
Liabilities:				
Notes and accounts payable—trade	¥ 94,392	¥ 94,392	¥ —	
Short-term loans payable	52,744	52,744	_	
Current portion of long-term loans payable	43,647	43,863	216	
Lease obligations (current)	584	584		
Income taxes payable	4,153	4,153	_	
Bonds payable	30,000	30,075	75	
Long-term loans payable	109,918	110,136	218	
Lease obligations (non-current)	4,394	4,827	433	
Total	¥339,832	¥340,774	¥ 942	
Derivative financial instruments: (Note)				
Hedge accounting—not applied	¥ 472	¥ 472	¥ —	
Hedge accounting—applied	(266)	(266)	_	
Total	¥ 206	¥ 206	¥ —	

Note: Figures are net of debts and credits that arise from derivative financial instruments. Net debt amounts are indicated in parentheses.

The valuation techniques used to estimate the fair value of financial instruments and information on the marketable securities and derivative financial instruments are as follows:

#### Assets

#### Cash and deposits and notes and accounts receivable-trade

The fair value of cash and deposits and notes and accounts receivable–trade approximates their carrying amounts as these amounts are settled in a short period of time.

#### Investment securities

The fair value of investment securities is measured at the quoted market price on the stock exchange.

#### Liabilities

#### Notes and accounts payable-trade, short-term loans payable and income taxes payable

The fair value of these accounts approximates their carrying amounts as these amounts are settled in a short period of time.

#### Current portion of long-term loans payable and long-term loans payable

For long-term loans payable bearing a floating interest rate, the fair value of those subject to special treatment of interest rate swaps are based on present value by totaling the amount of principal and interest, together with related interest rate swaps, discounted by the interest rate that would apply if equivalent long-term loans were newly entered into. The fair value of other long-term loans payable for which a floating interest rate is

applied approximates their carrying amount, due to the fact that the market rate of interest is quickly factored in while credit status of the Company remains unchanged.

On the other hand, the fair value of long-term loans payable for which a fixed interest rate is applied is determined by discounting the cash flows related to the long-term loans payable. The discount rate applied for the calculation above is the interest rate that may be currently available to the Group for loans payable with similar terms and conditions.

#### Bonds payable

The fair value is measured at the quoted market prices.

#### Lease obligations (current) and lease obligations (non-current)

The fair value of these accounts is determined by discounting the cash flows related to the lease obligations. The discount rate applied for the calculation above is the interest rate that may be currently available to the Group for lease obligations with similar terms and conditions.

#### **Derivative financial instruments**

Please see Note 18 "Derivative Financial Instruments" for more information.

#### Financial instruments whose fair value is not reliably measured

There are no market prices for non-listed stocks and others (carrying amounts as of December 31, 2017, and 2016, are ¥29,375 million and ¥22,755 million, respectively) whose future cash flows cannot be estimated. The fair value of such non-listed stocks and others is not reliably determinable and thus is excluded from investment securities.

#### Redemption schedule for financial assets and securities

The redemption schedules for financial assets and securities with contractual maturities as of December 31, 2017, and 2016, are summarized as follows:

				Millions of yen
				2017
	Due in 1 year	Due after 1 year	Due after 5 years	Due after
	or less	through 5 years	through 10 years	10 years
Notes and accounts receivable—trade	¥226,968	¥—	¥—	¥—
Total	¥226,968	¥—	¥—	¥—
				Millions of yen
				2016
	Due in 1 year	Due after 1 year	Due after 5 years	Due after
	or less	through 5 years	through 10 years	10 years
Notes and accounts receivable—trade	¥215,369	¥—	¥—	¥—
Total	¥215,369	¥—	¥—	¥—

#### Repayment schedule for bonds payable, long-term loans payable and other interest-bearing debt

The repayment schedules for bonds payable, long-term loans payable and other interest-bearing debt with contractual maturities as of December 31, 2017, and 2016, are summarized as follows:

				Millions of yen
				2017
	Due in 1 year	Due after 1 year	Due after 5 years	Due after
	or less	through 5 years	through 10 years	10 years
Short-term loans payable	¥61,385	¥ —	¥ —	¥ —
Current portion of long-term loans payable	27,677	—	—	—
Lease obligations (current)	557	—	—	—
Bonds payable	—	20,000	25,000	5,000
Long-term loans payable	_	112,017	10,000	—
Lease obligations (non-current)		1,925	2,120	
Total	¥89,619	¥133,942	¥37,120	¥5,000

				Millions of yen
				2016
	Due in 1 year	Due after 1 year	Due after 5 years	Due after
	or less	through 5 years	through 10 years	10 years
Short-term loans payable	¥52,744	¥ —	¥ —	¥ —
Current portion of long-term loans payable	43,647	—	—	—
Lease obligations (current)	584	—	—	—
Bonds payable	—	—	25,000	5,000
Long-term loans payable	_	99,878	10,040	_
Lease obligations (non-current)		1,963	2,270	161
Total	¥96,975	¥101,841	¥37,310	¥5,161

#### **Note 18:**

Derivative Financial Instruments

The Group has entered into various foreign currency forward contracts, currency options and swaps, interest rate swaps and commodity swaps.

Foreign currency forward contracts and currency options and swaps are entered into to hedge the effects of exchange rate changes on receivables and payables or anticipated transactions denominated in foreign currencies. Interest rate swaps are entered into to hedge the effects of interest rate changes and to reduce financing cost. Commodity swaps are entered into to hedge the effects of commodity price changes of fuel. Loans denominated in foreign currencies are entered into to hedge a part of risks associated with the fluctuations of exchange rates for investments in foreign entities.

The Group does not use derivative instruments for trading or speculative purposes. Derivative transactions performed by the Group have risks due to fluctuations of exchange rates, interest rates and other factors.

Because these transactions are executed with creditworthy financial institutions, the Group does not anticipate the likelihood of any losses resulting from default by the counterparties to these agreements.

Internal regulation for managing derivative transactions has been established for the purpose of risk control in the Company, and all derivative transactions are performed under this regulation.

The execution of derivative transactions is carried out by the Company's finance department, and the management of risk is monitored by the Company's accounting department. Transactions are periodically reported to the board of directors by the officer in charge of the Finance and Accounting Division.

Consolidated subsidiaries execute transactions in accordance with their regulations for derivative management and periodically report the results of those transactions to the Company.

26
Derivative transactions to which hedge accounting is not applied at December 31, 2017, and 2016 (1) Currency related

				Millions of yen
				2017
	Contract/notional amount	Contract/notional amount due after one year	Fair value	Unrealized gain/loss
Currency swaps: (Note 1)				
(Payment in H.K.\$ and receipt in U.S.\$)	¥ 826	¥—	¥ 12	¥ 12
Other	437	_	4	4
Currency options: (Note 1)				
Selling				
Euro	603	_	(5)	(5)
Buying				
U.S.\$	6,578	_	(118)	(118)
Euro	1,124	_	2	2
Foreign currency forward contracts: (Note 2)				
Selling				
Russian ruble	5,812	_	(39)	(39)
Colombian peso	1,724	_	11	11
Canadian \$	1,586	_	(108)	(108)
Other	1,486	_	(24)	(24)
Buying				
U.S.\$	2,836	_	(101)	(101)
Other	291	—	(28)	(28)
Total	¥23,303	¥—	¥(394)	¥(394)

Notes: 1. The fair value of currency swaps and currency options is measured using the quoted price obtained from financial institutions. Currency options used are called collar options, which effectively limit the risk arising from the changes in exchange rate by the combination of buying call options and selling put options, or selling call options and buying put options. 2. The fair value of foreign currency forward contracts is measured using the forward quotation.

				Millions of yen
				2016
	Contract/notional amount	Contract/notional amount due after one year	Fair value	Unrealized gain/loss
Currency swaps: (Note 1)				_
(Payment in H.K.\$ and receipt in U.S.\$)	¥ 855	¥855	¥ 88	¥ 16
(Payment in Japanese yen and receipt in Korean won)	818		(18)	(18)
Other	100		1	1
Currency options: (Note 1)				
Selling				
GB pound	277	_	1	(1)
Buying				
U.S.\$	7,835		356	337
Foreign currency forward contracts: (Note 2)				
Selling				
Russian ruble	4,638		(52)	49
Canadian \$	1,573	—	6	(5)
Other	2,075	—	1	(1)
Buying				
U.S.\$	3,694		97	94
Euro	1,029		(3)	(3)
Other	360	_	(5)	(5)
Total	¥23,254	¥855	¥472	¥464

Notes: 1. The fair value of currency swaps and currency options is measured using the quoted price obtained from financial institutions. Currency options used are called collar options, which effectively limit the risk arising from the changes in exchange rate by the combination of buying call options and selling put options, or selling call options and buying put options.

2. The fair value of foreign currency forward contracts is measured using the forward quotation.

Derivative transactions to which hedge accounting is applied at December 31, 2017, and 2016 (1) Currency related

				Millions of yen
				2017
	Hedged item	Contract/notional	Contract/notional amount due after	Fair value
Foreign currency forward contracts: (Note 1	)	uniount	one year	
Selling				
U.S.\$	Forecast	¥ 1,582	¥—	¥ 9
Other	transaction	263		(2)
Buying				
U.S.\$	Accounts	113		(1)
Other	payable—trade	14		0
Foreign currency forward contracts: (Notes 1 and 2)				
Selling				
U.S.\$	Accounts	3,094		
Other	receivable-trade	356	_	
Buying				
U.S.\$	Loans payable	1,379		
Chinese yuan	and Accounts payable—trade	1,351	—	
Currency swaps: (Notes 1 and 2)				
(Payment in Japanese yen and receipt in U.S.\$)	Loans payable	36,643	_	
Total		¥44,795	¥—	¥ 6

Notes: 1. The fair value of currency swaps and foreign currency forward contracts is measured using the quoted price obtained from financial institutions.

2. Exchange contracts and currency swaps appropriated to specific debts and credits are settled together with either accounts receivable–trade, loans payable or accounts payable–trade subject to hedged transaction. Accordingly, the fair value of such exchange contracts is reflected in accounts receivable–trade, loans payable or accounts payable–trade.

				Millions of yen
				2016
	Hedged item	Contract/notional amount	Contract/notional amount due after one year	Fair value
Foreign currency forward contracts: (Note 1)	)			
Selling				
Euro	Forecast	¥ 178	¥ —	¥ (6)
U.S.\$	transaction	3,973	_	(292)
Buying				
U.S.\$	Accounts payable—trade	76	_	2
Foreign currency forward contracts: (Notes 1 and 2)				
Selling				
U.S.\$	Accounts	2,613	—	
Euro	receivable-trade	324	_	
Buying				
Chinese yuan	Loans payable	451	_	
Currency swaps: (Notes 1 and 2)				
(Payment in Japanese yen and receipt in U.S.\$)	Loans payable	38,913	11,847	
Total		¥46,528	¥11,847	¥(296)

Notes: 1. The fair value of currency swaps and foreign currency forward contracts is measured using the quoted price obtained from financial institutions.

2. Exchange contracts and currency swaps appropriated to specific debts and credits are settled together with either accounts receivable–trade or loans payable subject to hedged transaction. Accordingly, the fair value of such exchange contracts is reflected in accounts receivable–trade or loans payable.

#### (2) Interest related

				Millions of yen
				2017
	Hedged item		Contract/notional	
	neugeu item	Contract/notional	amount due after	
		amount	one year	Fair value
Interest rate swaps: (Note)				
(Fixed rate payment, floating rate receipt)	Loans payable	¥47,540	¥36,270	
Total		¥47,540	¥36,270	¥—

Note: If interest rate swaps qualify for hedge accounting and meet certain specific criteria, they are settled together with loans payable subject to hedged transaction. Accordingly, the fair value of such interest rate swaps is reflected in loans payable.

			Millions of yen
			2016
Hedged item		Contract/notional	
neugeanem	Contract/notional	amount due after	
	amount	one year	Fair value
Interest rate swaps: (Note)			
(Fixed rate payment, floating rate receipt) Loans payable	¥46,838	¥15,000	
(Floating rate payment, floating rate receipt)	1,000	—	
Total	¥47,838	¥15,000	¥—

Note: If interest rate swaps qualify for hedge accounting and meet certain specific criteria, they are settled together with loans payable subject to hedged transaction. Accordingly, the fair value of such interest rate swaps is reflected in loans payable.

#### (3) Commodity related

				Millions of yen
				2017
	Hedged item		Contract/notional	
	neugeunem	Contract/notional	amount due after	
		amount	one year	Fair value
Commodity swaps: (Note)	Fuel	V170	V/7	V(10)
(Fixed price payment, floating price receipt)	ruei	ŧ1/U	±47	ŧ(10)
Total		¥170	¥47	¥(10)

Note: The fair value of commodity swaps is measured using the quoted price obtained from the exchange.

				Millions of yen
	Hedged item			2016
			Contract/notional	
	neugeu nem	Contract/notional	amount due after	
		amount	one year	Fair value
Commodity swaps: (Note)	Fuel	V10E	VE 1	V20
(Fixed price payment, floating price receipt)	Fuel	¥195	1C‡	¥30
Total		¥195	¥51	¥30

Note: The fair value of commodity swaps is measured using the quoted price obtained from the exchange.

#### Note 19:

31

Commitments and Contingent Liabilities

	Millions c	
	2017	2016
Trade notes discounted with banks	¥ 21	¥ 29
Liabilities for guarantee and other	705	771
Total	¥726	¥800

In the opinion of management, the eventual settlement of pending lawsuits in which any of the companies in the Group is the defendant will not have a material effect on the consolidated financial position or consolidated results of operations of the Group.



#### Note 20:

Other Comprehensive Income

Each component of other comprehensive income and related tax effects (including those on non-controlling interests) for the fiscal years ended December 31, 2017, and 2016, comprises the following:

		Millions of yen
	2017	2016
Valuation difference on available-for-sale securities:		
Gains (losses) arising during the year	¥ 3,940	¥ 2,303
Reclassification adjustments to profit (loss)	(214)	(123)
Amount before income tax effect	3,726	2,180
Income tax effect	(1,136)	(571)
Total	2,590	1,609
Deferred gains or losses on hedges:		
Gains (losses) arising during the year	37	(31)
Reclassification adjustments to profit (loss)	227	(148)
Amount before income tax effect	264	(179)
Income tax effect	(81)	67
Total	183	(112)
Foreign currency translation adjustment:		
Adjustments arising during the year	1,015	(18,179)
Reclassification adjustments to profit (loss)	(36)	
Amount before income tax effect	979	(18,179)
Total	979	(18,179)
Remeasurements of defined benefit plans:		
Adjustments arising during the year	5,137	6,380
Reclassification adjustments to profit (loss)	1,216	2,724
Amount before income tax effect	6,353	9,104
Income tax effect	(1,635)	(2,838)
Total	4,718	6,266
Share of other comprehensive income of associates accounted for using equity method:		
Gains (losses) arising during the year	1,565	(972)
Reclassification adjustments to profit (loss)	(2)	7
Total	1,563	(965)
Total other comprehensive income	¥10,033	¥(11,381)

#### Note 21:

Subsequent Events At the Company's annual general meeting of shareholders held on March 29, 2018, the shareholders approved the following appropriations of retained earnings:

	Millions of yen
Cash dividends, ¥60.00 per share	¥5,688
Total	¥5,688

Note: The total amount of dividends to be resolved at the annual general meeting of shareholders held on March 29, 2018, includes dividends of ¥9 million for the Company's shares held by the Board Benefit Trust (BBT).

#### Note 22:

33

#### Segment Information

#### (1) Segment information

#### **Description of reportable segments**

The reportable segments of the Group are components for which discrete financial information is available and whose operating results are regularly reviewed by the board of directors to evaluate their performance and determine the allocation of management resources.

The Group has seven product divisions, namely "Printing Inks," "Pigments," "Liquid Crystal Materials," "Polymers," "Liquid Compounds," "Solid Compounds" and "Application Materials," and each product division conducts its business.

The product divisions are aggregated into five reportable segments, namely "Printing Inks," "Fine Chemicals," "Polymers," "Compounds" and "Application Materials," based on the similarity of the products and services.

"Printing Inks" mainly consists of gravure inks, offset inks and news inks. "Fine Chemicals" mainly consists of organic pigments and liquid crystal materials. "Polymers" mainly consists of synthetic resins, such as acrylic, polyurethane, epoxy and polystyrene resins. "Compounds" mainly consists of polyphenylene sulfide (PPS) compounds, jet inks and plastic colorants. "Application Materials" mainly consists of industrial adhesive tapes and health foods.

## Methods of measurement for the amounts of sales, profit (loss), assets, liabilities and other items for each reportable segment

The accounting policies of each reportable segment are consistent with those disclosed in Note 2 "Summary of Significant Accounting Policies."

Millions of your

Segment profits are based on operating income.

Intersegment sales are mainly based on market price or cost of goods manufactured.

#### Information about sales, profit (loss), assets, liabilities and other items

							IVI	mons of yen
								2017
					Reporta	ble Segment		
	Printing	Fine			Application			
	Inks	Chemicals	Polymers	Compounds	Materials	Total	Others	Total
Sales:								
Sales to customers	¥373,666	¥100,878	¥193,649	¥64,605	¥56,019	¥788,817	¥ 610	¥789,427
Intersegment sales		34,542	4,234	75	58	38,909		38,909
Total sales	373,666	135,420	197,883	64,680	56,077	827,726	610	828,336
Segment profit	17,447	17,355	19,608	4,989	2,598	61,997	58	62,055
Segment assets	¥324,999	¥ 98,203	¥214,438	¥94,350	¥53,239	¥785,229	¥39,905	¥825,134
Others:								
Depreciation and amortization	10,741	4,906	7,931	4,500	2,006	30,084	408	30,492
Amortization of goodwill	54	124	137		_	315	30	345
Investments in affiliates	2,754	1,001	20,973	24,788	1,583	51,099	3,167	54,266
Increase in property, plant and equipment and intangible assets	8,549	5,193	9,111	5,385	3,034	31,272	382	31,654

							M	illions of yen
								2016
					Reporta	ble Segment		
	Printing	Fine		<b>c</b> 1	Application	<b>T</b> . 1	0.1	
	Inks	Chemicals	Polymers	Compounds	Materials	lotal	Others	lotal
Sales:								
Sales to customers	¥365,189	¥ 91,642	¥177,158	¥61,056	¥55,614	¥750,659	¥ 779	¥751,438
Intersegment sales		36,534	3,777	63	61	40,435		40,435
Total sales	365,189	128,176	180,935	61,119	55,675	791,094	779	791,873
Segment profit	18,363	14,430	19,642	4,975	1,867	59,277	45	59,322
Segment assets	¥312,608	¥ 99,280	¥195,521	¥64,499	¥53,732	¥725,640	¥37,558	¥763,198
Others:								
Depreciation and amortization	12,485	4,807	7,435	4,277	2,249	31,253	402	31,655
Amortization of goodwill	42	133	164	4		343	30	373
Investments in affiliates	1,164	1,015	17,115		1,417	20,711	2,365	23,076
Increase in property, plant and equipment and intangible assets	10,531	3,859	8,725	4,577	1,984	29,676	357	30,033

## Reconciliation between reportable segment total and amounts disclosed in consolidated financial statements

		Millions of yen
	2017	2016
Sales:		
Reportable segment total	¥827,726	¥791,094
Sales in "Others"	610	779
Elimination of intersegment transactions	(38,909)	(40,435)
Sales in consolidated financial statements	¥789,427	¥751,438

	Ν	Aillions of yen
	2017	2016
Profit:		
Reportable segment total	¥61,997	¥59,277
Profit in "Others"	58	45
Corporate expenses	(5,572)	(5,140)
Operating income in consolidated financial statements	¥56,483	¥54,182

Note: Corporate expenses consist substantially of R&D expenses incurred by the DIC Central Research Laboratories to develop new products, which is not included in reportable segment.

	1	Millions of yen
	2017	2016
Assets:		
Reportable segment total	¥785,229	¥725,640
Assets in "Others"	39,905	37,558
Elimination between segments	(39,793)	(38,942)
Corporate assets	46,415	40,572
Assets in consolidated financial statements	¥831,756	¥764,828

Note: Corporate assets consist of deferred tax assets and assets of the DIC Central Research Laboratories and Kawamura Memorial DIC Museum of Art, which is not included in reportable segment.

#### Other items are as follows:

						M	illions of yen
			2017				2016
Reportable				Reportable			
Segments	Others	Adjustments	Consolidated	Segments	Others	Adjustments	Consolidated
¥30,084	¥ 408	¥1,032	¥31,524	¥31,253	¥ 402	¥ 789	¥32,444
315	30	—	345	343	30	—	373
51,099	3,167	_	54,266	20,711	2,365	—	23,076
31,272	382	1,930	33,584	29,676	357	1,246	31,279
	Reportable Segments ¥30,084 315 51,099 31,272	Reportable Segments Others   ¥30,084 ¥ 408   315 30   51,099 3,167   31,272 382	Reportable Segments Others Adjustments   ¥30,084 ¥ 408 ¥1,032   315 30 —   51,099 3,167 —   31,272 382 1,930	2017   Reportable Segments Others Adjustments Consolidated   ¥30,084 ¥ 408 ¥1,032 ¥31,524   315 30 — 345   51,099 3,167 — 54,266   31,272 382 1,930 33,584	2017   Reportable Segments Others Adjustments Consolidated Reportable Segments   ¥30,084 ¥ 408 ¥1,032 ¥31,524 ¥31,253   315 30 — 345 343   51,099 3,167 — 54,266 20,711   31,272 382 1,930 33,584 29,676	2017   Reportable Segments Others Adjustments Consolidated Segments Others   ¥30,084 ¥ 408 ¥1,032 ¥31,524 ¥31,253 ¥ 402   315 30 — 345 343 30   51,099 3,167 — 54,266 20,711 2,365   31,272 382 1,930 33,584 29,676 357	2017   Reportable Segments Others Adjustments Consolidated Segments Others Adjustments   ¥30,084 ¥ 408 ¥1,032 ¥31,524 ¥31,253 ¥ 402 ¥ 789   315 30 — 345 343 30 —   51,099 3,167 — 54,266 20,711 2,365 —   31,272 382 1,930 33,584 29,676 357 1,246

Notes: 1. The adjustments for depreciation and amortization are mainly depreciation and amortization related to the DIC Central Research Laboratories that cannot be allocated to any reportable segment.

2. The adjustments for increase in property, plant and equipment and intangible assets are mainly capital investments of the DIC Central Research Laboratories that cannot be allocated to any reportable segment.

#### (2) Related information

#### Information about geographical areas

				Millions of yen
				2017
	Japan	USA	Others	Total
Net sales (Note)	¥288,608	¥101,129	¥399,690	¥789,427
Property, plant and equipment	125,369	26,817	79,491	231,677

Note: Net sales is based on customer location and is classified by country.

				Millions of yen
				2016
	Japan	USA	Others	Total
Net sales (Note)	¥282,457	¥97,898	¥371,083	¥751,438
Property, plant and equipment	121,982	28,360	76,318	226,660

Note: Net sales is based on customer location and is classified by country.

#### Information about major customers

Not applicable for the fiscal years ended December 31, 2017, and 2016, because there is no single customer which accounts for more than 10% of net sales shown on the consolidated statement of income.

#### (3) Impairment loss of assets by reportable segment

73

Unamortized balances

							1	Millions of yen
								2017
	Fine				Application	lication Corporate and		
	Printing Inks	Chemicals	Polymers	Compounds	Materials	Others	eliminations	Consolidated
Impairment loss	¥200	¥—	¥34	¥—	¥—	¥—	¥—	¥234

There was no impairment loss of assets for the fiscal year ended December 31, 2016.

#### (4) Amortization and unamortized balances of goodwill by reportable segment

128

							I	Villions of yen
								2017
		Fine			Application		Corporate and	
	Printing Inks	Chemicals	Polymers	Compounds	Materials	Others	eliminations	Consolidated
Amortization	¥54	¥124	¥137	¥—	¥—	¥30	¥—	¥345
Unamortized balances	65	1	103	_	_	30		199
							I	Millions of yen
								2016
		Fine			Application		Corporate and	
	Printing Inks	Chemicals	Polymers	Compounds	Materials	Others	eliminations	Consolidated
Amortization	¥42	¥133	¥164	¥ 4	¥—	¥30	¥—	¥373

240

60

501

#### (5) Gain on bargain purchase by reportable segment

There was no gain on bargain purchase for the fiscal year ended December 31, 2017.

							r	villions of yen
								2016
		Fine			Application Corporate and			
	Printing Inks	Chemicals	Polymers	Compounds	Materials	Others	eliminations	Consolidated
Gain on bargain purchase	¥—	¥—	¥78	¥—	¥—	¥—	¥—	¥78

Note: Gain on bargain purchase comes from the acquisition of a subsidiary.

#### Note 23:

36

#### Related-Party Transactions

#### (1) Related-party transactions with the Company

Related-party transactions with directors, corporate auditors, major individual shareholders and others of the Company for the fiscal years ended December 31, 2017, and 2016, are as follows:

Millions of ven

										2017
Sort of related party	Name	Location	Capital or invest- ment	Principal business	Ownership of voting rights	Relation with related parties	Contents of transaction	Amount of trans- action (Note 1)	Account	Balance at year- end (Note 2)
Companies where directors and their close	Nissei Real-Estate Co., Ltd.	Chiyoda- ku, Tokyo	10	Rental of properties and others	Owned Direct 5.61% Indirect 7.81%	Rental of buildings and others	Payment of rent for buildings and others (Note 4)	2,196	Security deposit	1,758
relatives owned a majority of the voting rights (Note 3)	Dainichi Can Co., Ltd.	Chiyoda- ku, Tokyo	10	Manufacture and sale of metallic containers	Owned Direct 4.50%	Purchase of metallic containers and others	Purchase of metallic containers and others (Note 5)	530	Trade notes and accounts payable, and other accounts payable	234
							Sales of merchandise and finished goods, and offering of service (Note 6)	55	Trade notes and accounts receivable	24
	Nissin Trading Co., Ltd.	Chiyoda- ku, Tokyo	20	Sale, import and export of petrochemical- related products	Owned Direct 3.31%	Purchase of raw materials and others	Purchase of raw materials and others (Note 7)	5,388	Trade notes and accounts payable, and other accounts payable	1,503
							Sales of merchandise and finished goods, and offering of service (Note 6)	4,079	Trade accounts receivable and other accounts receivable	1,618

Notes: 1. Excluding consumption taxes.

2. Including consumption taxes.

3. Yoshihisa Kawamura, a director of the Company, and his close relatives substantially own a majority of the voting rights.

Dainichi Can Co., Ltd. and Nissin Trading Co., Ltd. are fully owned by Nissei Real-Estate Co., Ltd. 4. "Rent of buildings and others" is determined based on an arms-length transaction in the neighboring area.

5. "Purchase of metallic containers and others" is determined based on an arms-length transaction.

6. "Sales of merchandise and finished goods, and offering of service" is determined on an arms-length transaction.

7. "Purchase of raw materials and others" is determined on an arms-length transaction.

									Millio	ns of yen
Sort of related party	Name	Location	Capital or invest- ment	Principal business	Ownership of voting rights	Relation with related parties	Contents of transaction	Amount of trans- action (Note 1)	Account	Balance at year- end (Note 2)
Companies where directors and their close relatives owned a majority of the voting rights (Note 3)	Nissei Real-Estate Co., Ltd.	Chiyoda- ku, Tokyo	10	Rental of properties and others	Owned Direct 5.61% Indirect 7.81%	Rental of buildings and others	Payment of rent for buildings and others (Note 4)	2,083	Security deposit	1,777
	Dainichi Can Co., Ltd.	Can Chiyoda- ku, Tokyo	10	Manufacture and sale of metallic containers	Owned Direct 4.50%	Purchase of metallic containers and others	Purchase of metallic containers and others (Note 5)	481	Trade notes and accounts payable, and other accounts payable	187
							Sales of merchandise and finished goods, and offering of service (Note 6)	55	Trade notes and accounts receivable	21
	Nissin Chiyoda- 20 Sale, import Trading ku, Tokyo and export of Co., Ltd. related products	Owned Direct 3.31%	Purchase of raw materials and others	Purchase of raw materials and others (Note 7)	4,882	Trade notes and accounts payable, and other accounts payable	1,142			
							Sales of merchandise and finished goods, and offering of service (Note 6)	3,741	Trade accounts receivable and other accounts receivable	1,373

Notes: 1. Excluding consumption taxes.

2. Including consumption taxes.

3. Yoshihisa Kawamura, a director of the Company, and his close relatives substantially own a majority of the voting rights. Dainichi Can Co., Ltd. and Nissin Trading Co., Ltd. are fully owned by Nissei Real-Estate Co., Ltd.

4. "Rent of buildings and others" is determined based on an arms-length transaction in the neighboring area.

5. "Purchase of metallic containers and others" is determined based on an arms-length transaction.

6. "Sales of merchandise and finished goods, and offering of service" is determined on an arms-length transaction.

7. "Purchase of raw materials and others" is determined on an arms-length transaction.

#### (2) Related-party transactions with the consolidated subsidiaries

Related-party transactions with directors, corporate auditors, major individual shareholders and others of the Company for the fiscal years ended December 31, 2017, and 2016, are as follows:

									Millio	ns of yen
Sort of related party	Name	Location	Capital or invest- ment	Principal business	Ownership of voting rights	Relation with related parties	Contents of transaction	Amount of trans- action (Note 1)	Account	Balance at year- end (Note 2)
Companies where directors and their close relatives owned a majority of the voting rights (Note 3)	Nissei Real-Estate Co., Ltd.	Chiyoda- ku, Tokyo	10	Rental of properties and others	Owned Indirect 13.42%	Rental of buildings and others	Payment of rent for buildings and others (Note 4)	16	Security deposit	8
	Dainichi Can Co., Ltd.	nichi Can Chiyoda- , Ltd. ku, Tokyo	- 10 Manu o sale o contai	Manufacture and sale of metallic containers	Owned Indirect 4.50% Purchase of metallic containers and others	Purchase of metallic containers and others (Note 5)	620	Trade notes and accounts payable, and other accounts payable	264	
							Sales of merchandise and finished goods, and offering of service (Note 6)	57	Trade notes and accounts receivable	25
	Nissin Chiyoda- 20 Sale, import 0 Trading ku, Tokyo and export of 1 Co., Ltd. related products	Owned Indirect 3.31%	Purchase of raw materials and others	Purchase of raw materials and others (Note 7)	978	Trade notes and accounts payable, and other accounts payable	186			
							Sales of merchandise and finished goods, and offering of service (Note 6)	478	Trade accounts receivable and other accounts receivable	147

Notes: 1. Excluding consumption taxes.

2. Including consumption taxes.

3. Yoshihisa Kawamura, a director of the Company, and his close relatives substantially own a majority of the voting rights.

Dainichi Can Co., Ltd. and Nissin Trading Co., Ltd. are fully owned by Nissei Real-Estate Co., Ltd.

4. "Rent of buildings and others" is determined based on an arms-length transaction in the neighboring area.

5. "Purchase of metallic containers and others" is determined based on an arms-length transaction.6. "Sales of merchandise and finished goods, and offering of service" is determined on an arms-length transaction.

7. "Purchase of raw materials and others" is determined based on an arms-length transaction.

									Millic	ons of yen
Sort of related party	Name	Location	Capital or invest- ment	Principal business	Ownership of voting rights	Relation with related parties	Contents of transaction	Amount of trans- action (Note 1)	Account	Balance at year- end (Note 2)
Companies where directors and their close relatives owned a majority of the voting rights (Note 3)	Nissei Real-Estate Co., Ltd.	Chiyoda- ku, Tokyo	10	Rental of properties and others	Owned Indirect 13.42%	Rental of buildings and others	Payment of rent for buildings and others (Note 4)	16	Security deposit	8
	Dainichi Can Co., Ltd.	inichi Can Chiyoda- ., Ltd. ku, Tokyo	10 Manufactu sale of met containers	Manufacture and sale of metallic containers	Owned Indirect 4.50%	Purchase of metallic containers and others	Purchase of metallic containers and others (Note 5)	641	Trade notes and accounts payable, and other accounts payable	172
							Sales of merchandise and finished goods, and offering of service (Note 6)	56	Trade notes and accounts receivable	24
	Nissin Chiyoda- 20 Sale, import Trading ku, Tokyo Co., Ltd. Scherical- related products	Owned Indirect 3.31%	Purchase of raw materials and others	Purchase of raw materials and others (Note 7)	690	Trade notes and accounts payable, and other accounts payable	164			
								Sales of merchandise and finished goods, and offering of service (Note 6)	387	Trade accounts receivable and other accounts receivable

Notes: 1. Excluding consumption taxes.

2. Including consumption taxes.

Yoshihisa Kawamura, a director of the Company, and his close relatives substantially own a majority of the voting rights. Dainichi Can Co., Ltd. and Nissin Trading Co., Ltd. are fully owned by Nissei Real-Estate Co., Ltd.

4. "Rent of buildings and others" is determined based on an arms-length transaction in the neighboring area.

5. "Purchase of metallic containers and others" is determined based on an arms-length transaction. 6. "Sales of merchandise and finished goods, and offering of service" is determined on an arms-length transaction.

7. "Purchase of raw materials and others" is determined based on an arms-length transaction.

#### 1. Basic framework for internal control over financial reporting

Kaoru Ino, Representative Director, President and CEO, and Masayuki Saito, Representative Director, Executive Vice President and CFO of DIC Corporation (the "Company"), are responsible for designing and operating internal control over the Company's financial reporting and have designed and operated internal control over financial reporting in accordance with the basic framework for internal control set forth in "On the Revision of the Standards and Practice Standards for Management Assessment and Audit concerning Internal Control Over Financial Reporting (Council Opinions)," issued by the Business Accounting Council of the Financial Services Agency of Japan.

Internal control aims to achieve its objectives to a reasonable extent with the organized and integrated function of basic individual elements of internal control as a whole. Accordingly, due to the inherent limitations, there is a possibility that misstatements may not be completely prevented or detected by internal controls over financial reporting.

#### Scope of assessment, the basis date of assessment and assessment procedures

The assessment of internal control over financial reporting for fiscal year 2017 was conducted as of December 31, 2017, which is the end of this fiscal year. The assessment was performed in accordance with relevant assessment standards generally accepted in Japan for internal control over financial reporting.

In conducting this assessment, we began by evaluating internal control which may have a material impact on overall consolidated financial reporting ("company-level controls") and, based on the results of this assessment, business processes to be assessed were selected. We then analyzed these selected business processes to identify key controls therein that may have a material impact on the reliability of the Company's financial reporting, after which we examined the design and operation of these controls. These procedures thus allowed us to accurately evaluate the effectiveness of the Company's internal control.

We determined the required scope of assessment of internal control over financial reporting for the Company and its consolidated subsidiaries and equity-method affiliates from the perspective of materiality or the degree to which it may affect the reliability of financial reporting. Materiality of the impact which may affect the reliability of financial reporting is determined based on potential quantitative and qualitative impact on financial reporting. In light of the results of assessment of company-level controls, we reasonably determined the scope of assessment of process-level controls. Consolidated subsidiaries and equity-method affiliates which were concluded as immaterial taking into account the degree of quantitative and qualitative impact are not included in the scope for assessment of company-level controls.

With regard to the process-level controls, significant locations and business units to be tested were selected based on the changes in the scope of consolidation during the year, as well as on net sales for the previous year, with locations and business units the combined sales volume of which reached approximately two-thirds of consolidated net sales being defined as "significant." The scope of assessment at these locations and business units encompassed business processes relevant to net sales, accounts receivable-trade, accounts payable-trade, inventories and manufacturing facilities included in property, plant and equipment as significant accounts that may have a material impact on the business objectives of the Company. In addition, business processes relating to (i) greater likelihood of material misstatements, and/or (ii) significant accounts involving estimates and management's judgment, were also identified as business processes having greater materiality, taking into account their impact on financial reporting, and were included in the scope.

#### 3. Results of the assessment

Based on the results of the assessment, we concluded that as of the end of the fiscal year ended December 31, 2017, the Company's internal control over financial reporting was effectively maintained.

n (

Kaoru Ino Representative Director, President and CEO DIC Corporation

# Deloitte.

Deloitte Touche Tohmatsu LLC Shinagawa Intercity 2-15-3 Konan Minato-ku, Tokyo 108-6221 Japan

Tel: +81 (3) 6720 8200 Fax: +81 (3) 6720 8205 www.deloitte.com/jp/en

#### **INDEPENDENT AUDITOR'S REPORT**

To the Board of Directors of DIC Corporation:

#### **Report on the Consolidated Financial Statements**

We have audited the accompanying consolidated balance sheet of DIC Corporation and its subsidiaries as of December 31, 2017, and the related consolidated statements of income, comprehensive income, changes in net assets, and cash flows for the year then ended, and a summary of significant accounting policies and other explanatory information.

#### Management's Responsibility for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with accounting principles generally accepted in Japan, and for such internal control as management determines is necessary to enable the preparation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

#### Auditor's Responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in Japan. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

#### Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the consolidated financial position of DIC Corporation and its subsidiaries as of December 31, 2017, and the consolidated results of their operations and their cash flows for the year then ended in accordance with accounting principles generally accepted in Japan.

#### **Report on Internal Control**

We have audited management's report on internal control over financial reporting of the consolidated financial statements of DIC Corporation as of December 31, 2017.

#### Management's Responsibility for Report on Internal Control

Management is responsible for designing and operating effective internal control over financial reporting and for the preparation and fair presentation of its report on internal control in accordance with assessment standards for internal control over financial reporting generally accepted in Japan. There is a possibility that misstatements may not be completely prevented or detected by internal control over financial reporting.

#### Auditor's Responsibility

Our responsibility is to express an opinion on management's report on internal control based on our audit. We conducted our internal control audit in accordance with auditing standards for internal control over financial reporting generally accepted in Japan. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether management's report on internal control is free from material misstatement.

An internal control audit involves performing procedures to obtain audit evidence about the results of the assessment of internal control over financial reporting in management's report on internal control. The procedures selected depend on the auditor's judgment, including the significance of effects on reliability of financial reporting. An internal control audit includes examining representations on the scope, procedures and results of the assessment of internal control over financial reporting made by management, as well as evaluating the overall presentation of management's report on internal control.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

#### Opinion

In our opinion, management's report on internal control referred to above, which represents that the internal control over financial reporting of the consolidated financial statements of DIC Corporation as of December 31, 2017 is effectively maintained, presents fairly, in all material respects, the results of the assessment of internal control over financial reporting in accordance with assessment standards for internal control over financial reporting generally accepted in Japan.

itte Touche Tohmatsa LLC

March 29, 2018



### Investor Information and Corporate Data

(As of December 31, 2017)

#### **Investor Information**

Common Stock

DIC common stock is listed and traded on the Tokyo Stock Exchange. There were 36,895 shareholders of record on December 31, 2016. On the Tokyo Stock Exchange, the high and low prices for each quarter of the years 2017 and 2016 were as follows:

	20	17	2016		
	High	Low	High	Low	
Jan.–Mar.	¥4,365	¥3,300	¥3,310	¥2,260	
Apr.–Jun.	4,195	3,650	2,630	2,340	
Jul.–Sept.	4,415	3,710	3,270	2,037	
OctDec.	4,375	3,820	3,845	2,915	

\*Stock price figures have been adjusted to account for the impact of a consolidation of shares of common stock by a factor of 10 to 1 with July 1, 2016, as the effective date.

Total Number of Shares Authorized	150,000,000 shares					
Number of Unit Shares	100 shares					
Paid-in Capital	¥96,556,692,787 (95,	156,904 sh	ares)			
Independent Public Accountants	Deloitte Touche Tohmatsu LLC					
Distribution of Shareholders	Japanese financial institutions	Other Japanese corporations 17.5%	Foreign corporations 27.8%	Japanese individual investors and others 11.9%		

Financial instruments business operators: 4.7%

Number of Shares Owned Percentage (Thousands) of Total Nissei Real-Estate Co., Ltd. 5,310 5.60% Major Shareholders Japan Trustee Services Bank, Ltd. (Trust Account) 4.715 4.97 Dainichi Can Co., Ltd. 4,256 4.49 The Master Trust Bank of Japan, Ltd. (Trust Account) 3,948 4.17 JP MORGAN CHASE BANK 385632 3,527 3.72 The Dai-ichi Life Insurance Company, 3,500 3.69 Limited Nissin Trading Co., Ltd. 3,127 3.30 Japan Trustee Services Bank, Ltd. (Trust Account 4) 3,055 3.22 Aioi Nissay Dowa Insurance Co., Ltd. 2,590 2.73 Japan Trustee Services Bank, Ltd. 2.47 (Trust Account 9) 2,337 36,365 38.36% Mitsubishi UFJ Trust and Banking Corporation Transfer Agent 10-11, Higashisuna 7-chome, Koto-ku, Tokyo 137-8081, Japan Meeting of Shareholders Our annual meeting of shareholders is held in March.

	5
For Further Information, Contact:	Corporate Communications Dept.
	DIC Corporation
	DIC Building, 7-20, Nihonbashi 3-chome, Chuo-ku,
	Tokyo 103-8233, Japan
	Tel.: (03) 6733-3033
	E-mail: prir@ma.dic.co.jp

#### **Corporate Data**

#### **Registered Address**

35-58, Sakashita 3-chome, Itabashi-ku, Tokyo 174-8520, Japan

#### **Corporate Headquarters**

DIC Building, 7-20, Nihonbashi 3-chome, Chuo-ku, Tokyo 103-8233, Japan Tel.: (03) 6733-3000 http://www.dic-global.com/

#### Principal Domestic Offices, Plants and Laboratories (Nonconsolidated)

Number of Branch Offices:	2	
Number of Plants:	9	
Number of Laboratories:	1	

Number of Employees 20,628

#### Date of Foundation

February 15, 1908

#### Date of Incorporation

March 15, 1937

Treasury stock: 0.4%

(Contact)

### **DIC** Corporation

Corporate Communications Dept. Sustainability Dept.

DIC Building, 7-20, Nihonbashi 3-chome, Chuo-ku, Tokyo 103-8233, Japan Tel: +81-3-6733-3034 Fax: +81-3-6733-3038 http://www.dic-global.com/en/

# **Color & Comfort**

Making it Colorful Innovation through Compounding Specialty Solutions



MEMBER OF Dow Jones Sustainability Indices In Collaboration with RobecoSAM (

