

Integrated Report**2018****Supplementary Information
(Environment and Safety)**

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Outline of Environment and Safety Activities

The UBE Group's Medium-Term Environmental & Safety Policy (Fiscal 2016 – 2018): Continually improving the quality of Responsible Care (RC)*1.

In order to advance its medium-term environment and safety policy, each fiscal year the UBE Group strives to improve its environment and safety activities by formulating action plans in line with its Responsible Care Code and through the use of the PDCA cycle. Fiscal 2017 evaluation: Plans were mostly achieved.

★★★: Achieved ★★: Mostly achieved ★: Not achieved

Responsible Care Code	FY2017 Action Plans	FY2017 Results	Self-Evaluation	
Process Safety and Disaster Prevention	Reinforcing process safety frameworks			
	1. Continuing to share and check accident data	1. The Accident Information Liaison Group shared accident data from inside and outside the Company		
	2. Utilize information to enhance internal process safety certification	2. The Process Safety Management Liaison Group shared examples of facility accidents as well as process safety management technologies and IoT technologies	★★	
	3. Enhance ability to respond to irregularities and emergencies	3. Continued to assess risks and deploy risk responses for irregular HAZOP*2 and other facilities		
	Earthquake and tsunami readiness			
	1. Implement Earthquake and Tsunami Countermeasure Plans and review worksite recovery plans	1. Implemented Earthquake and Tsunami Countermeasure Plans at each department and location in light of revisions to earthquake resistance standards and government notices	★★	
Occupational Safety and Health	Health management			
	1. Curb days lost to non-occupational injuries and illnesses	1. Implemented mental health initiatives, effectively used external EAPs*3, and leveraged stress check system results		
	2. Respond to regular health check results	2. Harnessed results of regular health checkups to identify and address health risks and roll out lifestyle disease, overwork, and diet improvement initiatives. Tried efforts to ensure that employees exercise habitually Addressing occupational health risks by evaluating results of special medical checkups	★★	
	3. Implement initiatives to raise internal awareness of "Health and Productivity Management"	3. UBE earned recognition for its health initiatives under the White 500 large enterprise category of the 2018 Certified Health and Productivity Management Organization Recognition Program		
	Occupational safety			
	1. Assess initiatives to foster a culture of safety	1. Continued to quantitatively evaluate eight elements of culture of safety through environmental safety audits, with business site heads sharing and improving on strengths and weaknesses Started evaluating and choosing effectiveness of activities to foster culture of safety at each business site		
	2. Support and confirm effectiveness of efforts in workplaces needing improvement	2. Registered worksites at which multiple occupational accidents had occurred over past few years and continued to provide support	★★	
	3. Promote on-the-job training (OJT) that includes key safety points and enhance on-site management capabilities	3. Incorporate key safety points in on-the-job training at business sites and enhance on-site management capabilities Produce and publish Guidelines on Preventing Accidents in which Workers Are Caught and Trapped in Machinery and similar other accident prevention tools		
	Process Safety and Disaster Prevention	Global warming countermeasures		
		Greenhouse gas reduction targets for fiscal 2021		
1. Consider and implement initiatives aimed at meeting targets at each company, division and facility		1. Greenhouse gas reductions 1-1. Greenhouse gas (GHG) emissions: Down 14% compared with the fiscal 2005 level 1-2. Third-party verifications of scope 1 and 2 emissions		
1-1. Greenhouse gas (GHG) emissions: Down 15% compared with the fiscal 2005 level (including major overseas facilities)				
2. Expand scope of application to businesses that contribute to the environment		2. Expanded scope of application to businesses that contribute to the environment 2-1. Environment-friendly products and technologies accounted for 27% of total net sales	★★	
2-1. Aim for environment-friendly products and technologies to account for 30% of total net sales				
3. Promote understanding and knowledge of global warming (including information related to medium- and long-term plans and adaptive measures inside and outside Japan)		3. Promote understanding and knowledge of global warming (including information related to medium and long-term plans and adaptive measures inside and outside Japan and biodiversity preservation) 3-1. Provided information on responding to global warming and related topics at meetings of each business division's energy saving promotion committee and elsewhere		
Reduce emissions of environmentally hazardous substances				
1. Address environmental regulations and lower risks		1. Steadily implemented response to the Fluorocarbon Emission Restriction Law and other environmental regulations		
2. Implement chemical substance emissions reduction plans		2. Emissions of 20 voluntarily selected chemical substances*4: Reduced 35% compared with fiscal 2010	★★★	
3. Implement industrial waste implementation plans	3. External final disposal: Reduced 84% compared with fiscal 2000			

★★★: Achieved ★★: Mostly achieved ★: Not achieved

Responsible Care Code	FY2017 Action Plans	FY2017 Results	Self-Evaluation
Chemicals and Product Safety (Transportation Safety)	Chemical and product safety		
	1. Internally audit product safety for in-house companies and divisions and train compliance officers and leaders	1. Internally audited product safety for in-house companies and divisions and trained compliance officers and leaders 1-1. Headquarters provided guidance specific to all sites of the Chemicals Company and the Pharmaceutical Division 1-2. Provided Companywide education about domestic and overseas laws and followed up with voluntary assessments of participants 1-3. We will continue supporting human resources development next year and beyond	
	2. Support voluntary responses of operations departments to legislation in the European Union, United States, China, Korea, and Taiwan, and digitize related tasks	2. Supported voluntary responses of operations departments to legislation in the European Union, United States, China, Korea, and Taiwan, and digitized related tasks 2-1. Audited subsidiaries in United States and Spain and confirmed future compliance setups for European and American legislation 2-2. Upgrade in-house database and deploy a system to support the development of overseas SDS*5	★★
	3. Swiftly comply with new legislation in the United States, European Union, China, Taiwan, and elsewhere	3. Swiftly complied with new legislation in the United States, European Union, China, Taiwan, and elsewhere 3-1. Presented UBE's compliance plans in monthly legislation briefings and formulated framework for individual responses by in-house companies and divisions 3-2. Reinspected UBE Group's American exports and completed filings with U.S. authorities at end-January 2018 3-3. Conducted seminar on European compliance and reinforced liaison with local subsidiaries	
	Transportation safety		
	1. Ensure compliance with internal operating rules and transportation safety management guidelines and continually reinforce the operating system	1. Pursued logistics safety and security through SDS, label, and Yellow Card guidance and audit	★★★
Dialogue with Communities	1. Promote dialogue with communities	1. Promote dialogue with communities 1-1. Held 11th RC Regional Dialogue Meetings*6 in the Yamaguchi western district and the Sakai/Senboku district 1-2. Published local newsletter Tsubasa (released semiannually)	★★★
	2. Ensure information disclosure and transparency	2. Published UBE Group CSR Report 2017 and received third-party verification related to RC and third-party opinions	
Management Systems	1. Implement environment and safety audits and inspections and quality and product safety audits	1. Implement environment and safety audits and inspections and quality and product safety audits 1-1. UBE and its divisions implemented environment and safety audits at 13 facilities and Group companies 1-2. UBE implemented quality and product safety audits at nine facilities and Group companies 1-3. Implemented environmental safety inspections at 14 facilities and Group companies	★★★

Glossary

*1 Responsible Care (RC): Under RC, corporations that handle chemical substances voluntarily preserve the environment, safety, and health throughout product lifecycles, from the development of chemicals through their manufacture, distribution, use, and final consumption to disposal and/or recycling, and communicate and engage with society by disclosing activity outcomes.

*2 Irregular HAZOP: Short for irregular hazard and operability study. A method for identifying hidden process risks in operations at times of irregular operation, such as plant startup or shutdown.

*3 External EAP (Employee Assistance Program): Programs through external institutions to support employees' mental health. These programs help provide more specialized mental health care from experts, including industrial counselors and clinical psychologists.

*4 UBE's 20 voluntarily selected chemical substances: Methyl alcohol, butyl alcohol, toluene, Epsilon-caprolactam, cyclohexane, ammonia, vinyl acetate, xylene, N,N-dimethylacetamide, 2-hexanone, ethylbenzene, n-hexane, benzene, water-soluble zinc compounds, 1,3-butadiene, cis-2-butene, boron compounds, cyclohexanone, hexadecyltrimethylammonium chloride and dichloromethane

*5 SDS (Safety Data Sheet): Documentation containing hazard and toxicity information about chemical substances that manufacturers disclose when supplying chemical substances and products incorporating them.

*6 Responsible Care (RC) Regional Dialogue Meetings: Local members of the Japan Chemical Industry Association convene these meetings biennially to build trust with residents, citizens' groups, administrative bodies, and other stakeholders in their communities, and to deepen mutual understanding about initiatives relating to conservation, security, disaster prevention, and other RC implementation items.

Process Safety and Disaster Prevention

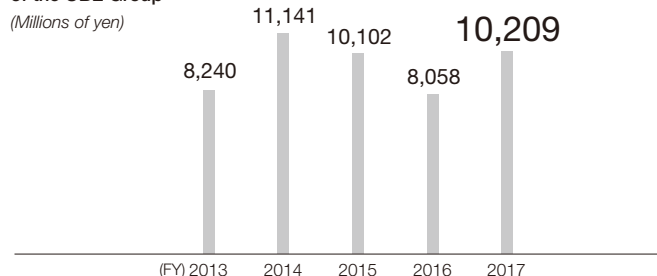
Initiatives for Process Safety and Disaster Prevention

UBE Group Facility-Related Accidents

(FY)	(Number of accidents)				
	2013	2014	2015	2016	2017
UBE	2	4	7	2	3
Group companies	2	1	2	0	1

In fiscal 2017, the UBE Group recorded four accidents, investigated their causes and implemented recurrence prevention measures.

Occupational Safety, Health and Disaster Prevention Expenditure of the UBE Group



Plant Safety Assessment

Plant safety assessments of new, additional or modified offices and facilities are carried out following the methods stipulated in the plant safety assessment standards. In fiscal 2017, the UBE Group carried out 143 such safety assessments.

Response to the Japan Petrochemical Industry Association's Industrial Process Safety Action

	Initiatives that Member Companies Should Take	UBE's Initiatives
1. Commitment of corporate management to industrial process safety	(1) Commitment to basic principles and policies related to process safety and other aspects of safety	Establishing and maintaining the UBE Group Environmental and Safety Principles and UBE Action Guidelines Messaging from top management to employees and partner companies about industrial process safety On-site roundtable meetings with top management held at facilities, facilitating direct communication between the president and employees
	(2) Commitment to policy on resource allocation for industrial process safety	Building an educational structure and using educational and training facilities to develop human resources Providing explanations to facilities regarding budgets and staffing for production plans, maintenance plans and capital investment plans prepared by process safety divisions
2. Setting goals for industrial process safety	(1) Set numerical targets for process safety	Numerical target: Zero major facility accidents
3. Formulating action plans to implement industrial process safety measures	(1) Risk assessment	Conducting risk assessments from comprehensive and diverse perspectives for normal and unstable circumstances and when deploying new facilities and processes
	(2) Education and training to develop human resources	Participating in classes, on the job training, and RA and educating about operational principles and knowhow through experiential education
	(3) Utilize information about accidents	Horizontally sharing information on accidents inside and outside the Company and their countermeasures through the Accident Information Liaison Group
	(4) Organizational operations	Implementing change management with operational management, facility management, process safety management and design divisions when facilities are newly established or renovated and when procedures change
	(5) Facility maintenance and deterioration countermeasures	Sharing information on facility failure, problems and process safety technology through the Process Safety Management Liaison Group
	(6) Maintain and enhance earthquake resistance of high-pressure gas facilities and conduct voluntary seismic assessments of existing piping	Implementing Earthquake and Tsunami Countermeasure Plans and formulating worksite recovery plans as Company-wide initiatives Assessing compliance with seismic resistance standards for high-pressure gas facilities, undertaking measures, and conducting seismic diagnoses of existing piping systems
	(7) Incorporate new methods and technologies to enhance safety	Incorporating operational data to analyze operational patterns, introducing fluctuation prediction systems and utilizing driving training simulators and smart devices
	(8) Safety management that encompasses partner companies	Group companies and related partner companies hold joint safety management meetings Staff in charge of operational management, facility management and staff from partner companies meet before construction begins to confirm safety
4. Surveying and evaluating achievement of goals and implementation of measures	(1) Structure and operations relating to attainment surveys and assessments	Progress is checked and evaluated through annual audits Environment and safety committees consider the results of the year's activities when discussing measures for the next year
	(2) Results of above survey and assessments	Based on the results, prioritize eliminating facilities accident risks, improving the security of certified high-pressure gas sites, and formulating earthquake and tsunamic countermeasures
5. Initiatives to advance each company's own process safety activities (cultivating a culture of safety)	(1) Approaches to developing a culture of safety	Continued evaluations begun in fiscal 2013 under the Process Safety Enhancement Center's Process Safety Evaluation System
6. Leveraging external knowledge	(1) Harnessing third-party institutions	Have the Process Safety Enhancement Center assess business site safety
	(2) Disseminating information externally	IoT and big data usage methods included in case studies for smart future of the Ministry of Economy, Trade and Industry's website Case presentation and panel discussion in Japan Industrial Safety and Health Association's special session of public and private council on manufacturing safety measures
7. Communicating about risks with communities	(1) Risk communications tools and frequency	Holding regular dialog with local residents Conducting plant tours
8. Efforts to prevent industrial accidents from earthquakes and tsunamis	(1) Evacuating employees in event of major earthquakes and tsunamis and approaches to facility setups	Formulating responses for earthquakes and tsunamis and conducting evacuation training and assessing and reinforcing seismic resistance of facilities and piping Creating and implementing earthquake and tsunami countermeasure plans and formulating business continuity plans

Occupational Safety and Health

Prevention of Occupational Accidents

Measures to Prevent Occupational Accidents

	Goals	Activities	Status and history of initiatives
1. Use of occupational accident information	Prevent similar accidents	(1) Create occupational accident information database	We are using information on occupational accident at each business site as important data sources for facilities and operational risk assessments.
2. Audits and inspections	Drive ongoing improvements at business sites (1) Improve weak areas (2) Enhance safety levels	(1) Audits Audits conducted by the head office and business site environmental safety personnel • Quantitative evaluation of offices in line with checklists and feedback (2) Inspections • Members of the president-chaired Group Management Committee visit business sites • Confirming results of audit and activity achievements and conveying reviews	History of improvement activities inspired by audits and inspections • Fiscal 2013: Summarize outstanding activities and internally publish in Best Practices and Safety and Health Guidelines • Fiscal 2016: Begin assessments according to eight culture of safety components, which are organizational governance, positive involvement, resource management, work management, motivation, learning and knowledge transmission, risk perception and mutual understanding • Fiscal 2017: Start disclosing evaluation criteria and verifying gaps between these and self-evaluations • Fiscal 2017: Launch small safety team reports and group discussions
3. Safety and health rallies	(1) Share information (2) Encourage activities	(1) Annual UBE Group health and safety rallies Participants: Around 400 people (Group executives and employees) participating	Zero accident efforts and resolutions to enhance workplace environments • Recognition by the president (to entities and individuals for outstanding contributions to health and safety) • Small safety team presentations on experiences • Special lectures from outside instructors on safety and health management • Executives and all employees reciting safety goals after rallies



UBE Group Occupational Safety and Health Rally

Measures against Asbestos

UBE provides asbestos-related health examinations for current and retired employees who have handled asbestos products. The Group cooperates in the submission of industrial accident reports by individuals whose examination results warrant medical attention. The Group also appropriately treats problems at locations where a high rate of asbestos diffusion has been found. In addition, the Group is promoting systematic measures for the disposal and replacement of asbestos materials. Insulation and gasket packing are replaced regularly with substitute materials when piping and reactors are opened.

Measures to Mitigate Global Warming

GHG Emissions

	(kt-CO ₂ e/y)			
	(FY)	2015	2016	
Scope 1	11,530	11,320	11,330	Direct GHG emissions from a reporting entity, due to fuel use, etc.
Scope 2	810	790	780	Indirect GHG emissions from electricity and heat purchased from other entities
Scope 3	15,930	15,380	15,770	Indirect GHG emissions throughout the supply chain, such as those that occur during material procurement, transport and product processing, use and disposal



Scope 3 Emissions by Category

Category	GHG Emissions (kt-CO ₂ e)	Note
1 Purchased goods and services	710	
4 Upstream transportation and distribution	840	
9 Downstream transportation and distribution	490	
11 Use of sold products	11,280	Sold coal, machinery, etc.
12 End-of-life treatment of sold products	1,780	
— Other categories	670	
Total	15,770	

Results of third-party scope 1 and 2 verifications

GREENHOUSE GAS EMISSIONS VERIFICATION STATEMENT

To: Ube Industries, Ltd.



 Bureau Veritas Japan Co., Ltd.
 System Certification Services Headquarters

Bureau Veritas Japan Co., Ltd. (Bureau Veritas) was engaged by Ube Industries, Ltd. (Ube Industries) to conduct independent verification of the greenhouse gas (GHG) emissions for FY2016.

1. Scope of Verification
 Ube Industries requested Bureau Veritas to verify, to a limited level of assurance, the accuracy of the following GHG information:

Scope 1 and Scope 2 emissions:

- CO₂, CH₄ and N₂O(*1) emissions from business operations of UBE Group's 20 sites within Japan for the period of April 1, 2016 through March 31, 2017
- HFCs, PFCs, SF₆ and NF₃ emissions from business operations of UBE Group's 20 sites within Japan for the period of January 1, 2016 through December 31, 2016
- CO₂ and N₂O(*2) emissions from business operations of UBE Group's two sites outside Japan for the period of April 1, 2016 through March 31, 2017

(*1) N₂O emissions from the production process of caprolactam are included.
 (*2) limited to N₂O emissions from the production process of caprolactam.

2. Methodology
 Bureau Veritas conducted the verification in accordance with the requirements of the international standard 'ISO 14064-3(2006): Greenhouse gases - Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions'.

As part of Bureau Veritas' assurance, the following activities were undertaken:

- Interviews with relevant personnel of Ube Industries responsible for the identification and calculation of GHG emissions;
- Review of Ube Industries' information systems and methodology for collection, aggregation, analysis and review of information used to determine GHG emissions; and
- Audit of a sample of source data to check accuracy of quantified GHG emissions.

3. Conclusion
 Based on the verification work and processes followed, there is no evidence to suggest that the GHG emissions assertions shown below:

- are not materially correct and are not a fair representation of the GHG emissions, as per the scope of work;
- are not prepared in accordance with the methodology for calculating GHG emissions established and implemented by Ube Industries.

Verified greenhouse gas emissions	
Scope 1 11,317,900 t-CO ₂ e	Scope 2 790,994 t-CO ₂ e

[Statement of independence, impartiality and competence]
 Bureau Veritas is an independent professional services company that specializes in Quality, Health, Safety, Social and Environmental management with over 160 years history of providing independent assurance services. No member of the verification team has a business relationship with Ube Industries, its Directors or Managers beyond that required of this assignment. We conducted this verification independently and to our knowledge there has been no conflict of interest. Bureau Veritas has implemented a Code of Ethics across the business to maintain high ethical standards among staff in their day-to-day business activities. The verification team has extensive experience in conducting assurance over environmental, social, ethical and health and safety information, systems and processes.

Environmental Preservation: Environmental Accounting and Environmental Impact Data by Facility

Environmental Accounting

Environmental Preservation Costs			(¥100 million)					
Category	Main Activity	(FY)	Capital Investment			Costs		
			2016	2017	Difference	2016	2017	Difference
Cost by business area	Pollution prevention	Investing in and maintaining energy-saving facilities	12.6	17.3	4.7	47.8	48.1	0.3
	Investing in and maintaining air and water pollution prevention facilities	Resource recycling	3.9	31.1	27.2	10.5	9.9	(0.6)
	Global environment preservation	Recycling and reducing industrial waste	2.3	8.2	5.9	32.3	29.8	(2.5)
Upstream/downstream costs	Container/packaging recycling, green purchasing		0.0	0.0	0.0	6.2	6.0	(0.2)
Costs of management activities	Acquiring, running and maintaining environmental management systems		0.3	0.4	0.1	5.5	5.2	(0.3)
Research and development costs	R&D of environment-friendly products and technologies		0.2	0.0	(0.2)	5.7	5.3	(0.4)
Costs of social activities	Greening and beautifying offices/facilities and their surroundings		0.3	0.1	(0.2)	2.1	2.0	(0.1)
Costs of cleaning up environment damage	Payment of environment-related levy		0.0	0.0	0.0	2.3	2.5	0.2
Total			19.6	57.1	37.5	112.4	108.8	(3.6)

Economic Effect			(¥100 million)					
Category	Main Activity	(FY)	2016	2017	Difference	2016	2017	Difference
Income effect	Proceeds from sales of marketable waste products					22.0	19.7	(2.3)
Savings effect	Savings achieved through resource recycling and energy conservation					63.1	62.7	(0.4)

Environmental Impact Data by Facility

Fiscal 2016 and 2017 Environmental Impact Data by Facility	(tons/year)											
	Emissions into the Atmosphere						Emissions into Water					
	SOx*1 Emissions		NOx*2 Emissions		Dust Emissions		COD*3 Emissions		Total Phosphorus Emissions		Total Nitrogen Emissions	
	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017	2016	2017
In Japan												
Chiba Petrochemical Factory	1.0	1.2	34	36	0.2	0.4	12	13	0.1	0.1	3.5	3.5
Sakai Factory	0.0	0.0	2.4	1.6	0.1	0.0	4.8	1.5	0.3	0.1	3.9	1.2
Ube Chemical Factory	1,814	1,648	3,623	3,615	120	87	420	455	5.1	5.6	426	451
UBE-Fujimagari Factory	608	628	357	333	2.8	3.0	270	258	4.5	5.0	60	58
Ube Cement Factory	25	27	1,437	1,589	55	44	8.1	8.1	—	—	—	—
Isa Cement Factory	340	355	6,676	6,554	158	171	0.0	0.0	—	—	—	—
Kanda Cement Factory	5.1	4.3	1,681	1,777	28	17	1.9	2.6	0.1	0.1	2.7	1.7
Technical Development Center	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1
Okinoyama Coal Center	—	—	—	—	—	—	—	—	—	—	—	—
Strategic Core Technology Research Laboratory	—	—	—	—	—	—	0.2	0.2	0.1	0.1	0.2	0.3
Frontier Technology Research Laboratory	—	—	—	—	—	—	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal (UBE)	2,793	2,664	13,810	13,906	364	322	717	738	10	11	496	516
UBE Film, Ltd.	—	—	—	—	—	—	—	—	—	—	—	—
Meiwa Plastic Industries, Ltd.	—	—	—	—	—	—	0.0	0.0	0.0	0.0	0.0	0.0
Ems-Ube, Ltd.	0.0	0.0	2.2	1.9	0.0	0.0	3.8	5.8	0.0	0.0	1.2	1.3
UBE-MC Hydrogen Peroxide Limited	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0
UBE EXSYMO CO., LTD.	0.0	0.0	0.6	0.4	0.2	0.2	0.4	0.4	—	—	—	—
UBE Material Industries, Ltd.	194	161	900	926	22	11	0.6	0.7	0.0	0.0	0.9	1.2
UBE Machinery Corporation, Ltd.	0.1	0.1	—	—	—	—	0.8	0.9	0.2	0.2	1.3	1.3
UBE Steel Co., Ltd.	14	14	122	114	6.5	7.5	0.6	0.7	—	—	—	—
Fukushima, Ltd.	0.4	0.4	26	26	0.1	0.1	—	—	—	—	—	—
Subtotal (Group companies)	209	176	1,051	1,068	29	19	6.4	8.7	0.2	0.2	3.4	3.8
Total (UBE Group)	3,002	2,839	14,861	14,974	393	341	724	747	10	11	500	519
Overseas												
Thailand	3.5	5.5	51	60	40	12	101	103	0.1	1.5	20	32
Spain	56	93	633	752	14	6	90	107	0.9	1.3	66	82

Glossary

*1 Sulfur oxides (SOx) originate in the sulfur (S) component of fuels. Boilers are our main source of these oxides.

*2 Nitrogen oxides (NOx) stem from fuel combustion, primarily from Group boilers and cement kilns.

*3 Chemical Oxygen Demand (COD): This is an indicator of water pollution by organic substances and represents the amount of oxygen consumed in the chemical oxidation of organic matter.

Environmental Preservation: PRTR and Treatment of Industrial Waste

Emission/Transfer of PRTR*1 Substances

Total Volume of PRTR Substances Emitted/Transferred in Fiscal 2017	Handling Volume (t)	Emissions Volume (tons)				Increase/Decrease Rate Compared with Fiscal 2016 (Total Emissions)	Transfer Volume (tons)	Number of PRTR Substances
		Atmosphere	Public Water	Soil	Total			
UBE	295,183	122.6	109.4	0.0	232.1	8.8%	1,097.5	58
Other Group companies	32,822	102.3	9.0	0.0	111.4	1.3%	1,071.5	25
Total (UBE Group)	328,005	224.9	118.4	0.0	343.3	6.2%	2,169.0	68

Volumes of Individual PRTR Substances Emitted/Transferred in Fiscal 2017 (Top 10 by UBE's Emission Volumes and Dioxins)

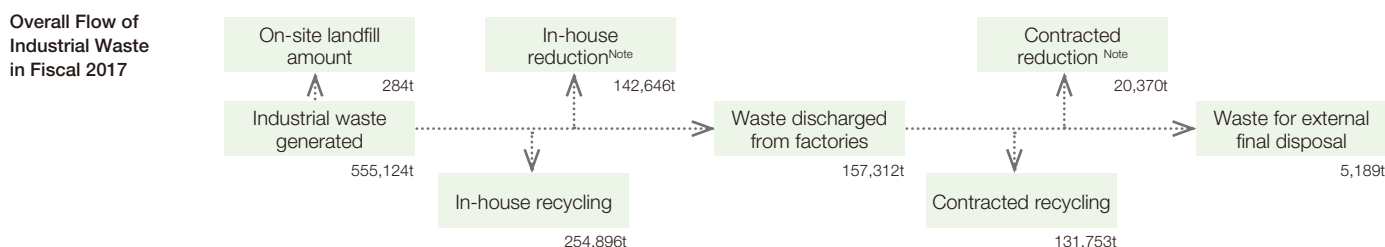
Ordinance Designation No.	Chemical Substance	CAS No.*2	Handling Volume (tons)	Total Emissions Volume (tons)				Increase/Decrease Rate Compared with Fiscal 2016 (Total Emissions)	Transfer Volume (tons)
				Atmosphere	Public Water	Soil	Total		
300	Toluene	108-88-3	1,269	84.5	26.2	0.0	110.7	(0.4)%	283.1
76	Epsilon-caprolactam	105-60-2	145,507	0.0	88.7	0.0	88.7	1.8 %	375.4
80	Xylene	—	168	26.6	0.0	0.0	26.6	(6.0)%	21.5
134	Vinyl acetate	108-05-4	5,946	23.2	0.0	0.0	23.2	10.0 %	0.0
240	Styrene	100-42-5	247	21.2	0.0	0.0	21.2	92.7 %	0.1
392	n-Hexane	110-54-3	177	15.8	0.0	0.0	15.8	3.9 %	17.1
53	Ethylbenzene	100-41-4	43	13.8	0.0	0.0	13.8	2.2 %	19.4
128	Chloromethane	74-87-3	12	12.2	0.0	0.0	12.2	—	0.0
400	Benzene	71-43-2	97	7.9	0.1	0.0	8.0	4.2 %	1.6
213	N,N-dimethylacetamide	127-19-5	551	6.2	0.0	0.0	6.2	14.8 %	252.6
243	Dioxins (Note) mg-TEQ/year	—	—	158.7	1.2	0.0	159.9	63.3 %	0.0

Note: Contains various compounds

The UBE Group has voluntarily selected 20 substances*4 that it emits in relatively large amounts and particularly strives to reduce its emissions of these substances. The 20 substances comprise substances subject to the Japanese PRTR Law as well as a number of volatile organic compounds (VOCs) *3.

Treatment of Industrial Waste

When contracting waste treatment or disposal outside the Group, the UBE Group utilizes industrial waste management forms (a waste manifest system) in compliance with waste treatment and clean-up laws (namely the Wastes Disposal and Public Cleansing Act) and carefully manages the entire process.



Note: Reductions through waste incineration and other measures

We reduced external final disposal by 940 metric tons from the fiscal 2016 level by undertaking such improvements as crushing and sorting to recycle waste bricks. (See page 53 of Integrated Report 2018 for information on external final disposal over the years)

Treatment of PCB Waste: The UBE Group is maintaining strict compliance with the amended Law Concerning Special Measures against PCB Waste, promulgated in August 2016, and is systematically advancing the treatment of such waste in coordination with the Japan Environmental Storage & Safety Corporation and certified detoxification processing operators.

Glossary

*1 PRTR (Pollutant Release and Transfer Register) Law: This legislation requires companies to identify business site chemical substance emissions and transfer volumes and report to the government. The Ministry of the Environment discloses the submitted information on its website. Such disclosure is designed to encourage voluntary efforts to improve chemical substance management.

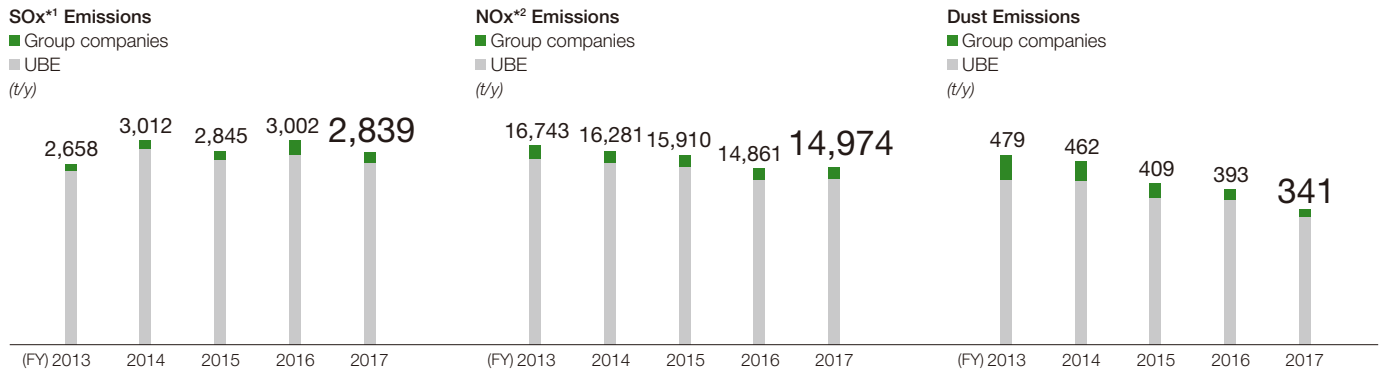
*2 CAS No.: Chemical Abstract Service registry number

*3 Volatile organic compounds (VOCs): These organic chemicals evaporate or sublime easily, entering the atmosphere as gases. They are factors in the forming of suspended particulate matter (PM) and photochemical oxidant pollution.

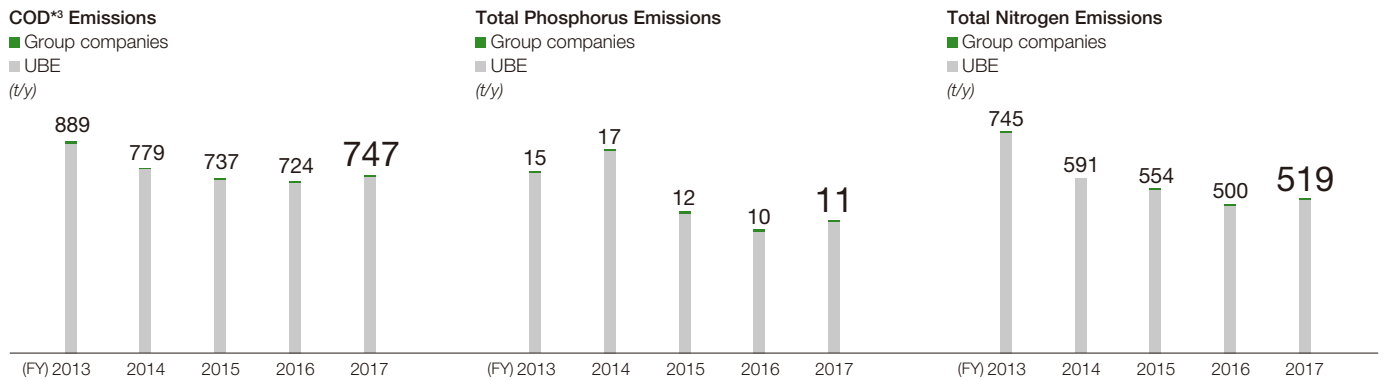
*4 See the Glossary on page 2

Environmental Preservation: Environmental Impact, Water Usage Over the Years and the Fluorocarbon Emission Restriction Law

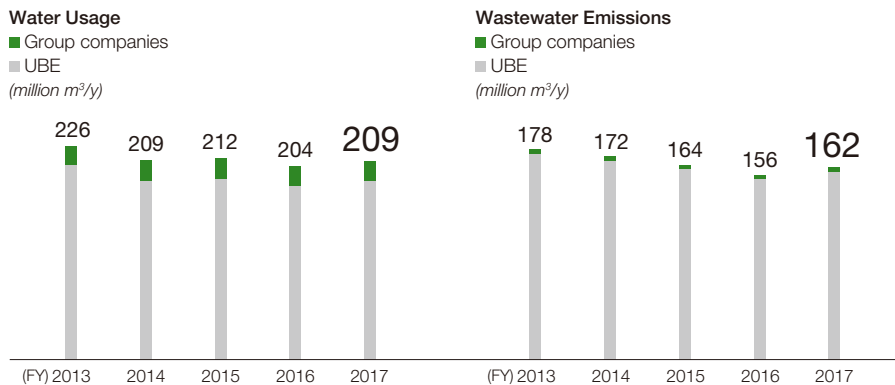
Emissions to the Air



Emissions to Bodies of Water



Water Usage and Wastewater Emissions



Reference: Please refer to page 6 for environmental impact data by facility.

Glossary

*1, *2, *3 See the Glossary on page 6.

● Measures to Prevent Odors

The UBE Group is working together with governments on odor countermeasures, installing odor reducing equipment and building proprietary odor monitoring systems in the Ube District.

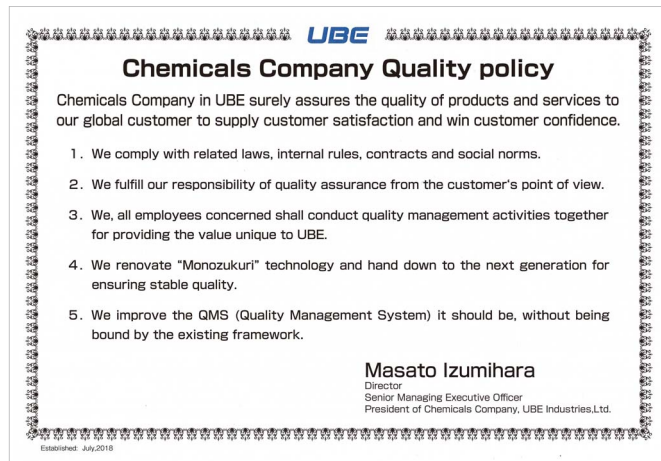
Response to the Fluorocarbon Emission Restriction Law

Promulgated in April 2015, the Fluorocarbon Emission Restriction Law is aimed reducing leaks of fluorocarbon refrigerants to help prevent global warming and the further destruction of the ozone layer. We comply strictly with laws and regulations relating to commercial refrigeration and air conditioning equipment inspections. We endeavor to prevent fluorocarbon leaks by improving their recovery and filling methods and strengthening equipment operations management.

Quality Assurance and Product Safety

Quality Assurance

The diverse operations of the UBE Group encompass such fields as chemicals, pharmaceuticals, construction materials, and machinery. Our in-house companies and divisions undertake quality assurance initiatives that match the specific markets of their businesses and have formulated their own quality policies to cater to customer needs by maintaining stable supplies of safe products.



UBE

Chemicals Company Quality policy

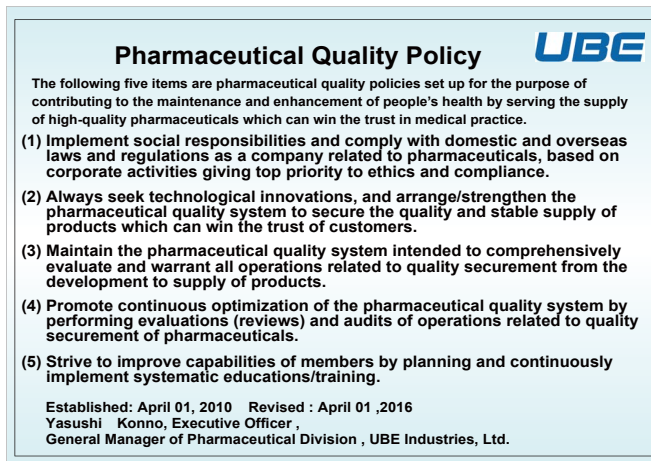
Chemicals Company in UBE surely assures the quality of products and services to our global customer to supply customer satisfaction and win customer confidence.

1. We comply with related laws, internal rules, contracts and social norms.
2. We fulfill our responsibility of quality assurance from the customer's point of view.
3. We, all employees concerned shall conduct quality management activities together for providing the value unique to UBE.
4. We renovate "Monozukurī" technology and hand down to the next generation for ensuring stable quality.
5. We improve the QMS (Quality Management System) it should be, without being bound by the existing framework.

Masato Izumihara
Director
Senior Managing Executive Officer
President of Chemicals Company, UBE Industries, Ltd.

Established: July, 2018

Chemicals Company Quality Policy



Pharmaceutical Quality Policy

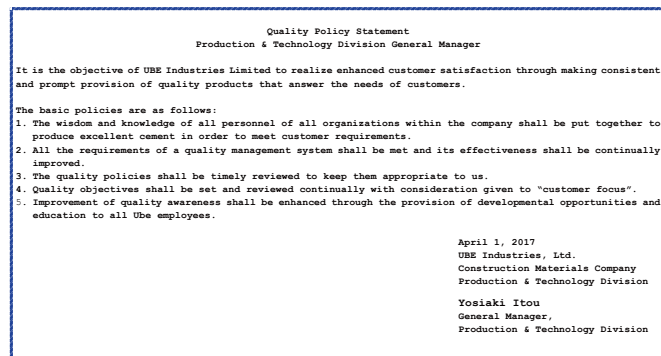
UBE

The following five items are pharmaceutical quality policies set up for the purpose of contributing to the maintenance and enhancement of people's health by serving the supply of high-quality pharmaceuticals which can win the trust in medical practice.

- (1) Implement social responsibilities and comply with domestic and overseas laws and regulations as a company related to pharmaceuticals, based on corporate activities giving top priority to ethics and compliance.
- (2) Always seek technological innovations, and arrange/strengthen the pharmaceutical quality system to secure the quality and stable supply of products which can win the trust of customers.
- (3) Maintain the pharmaceutical quality system intended to comprehensively evaluate and warrant all operations related to quality securement from the development to supply of products.
- (4) Promote continuous optimization of the pharmaceutical quality system by performing evaluations (reviews) and audits of operations related to quality securement of pharmaceuticals.
- (5) Strive to improve capabilities of members by planning and continuously implement systematic educations/training.

Established: April 01, 2010 Revised : April 01 ,2016
Yasushi Konno, Executive Officer ,
General Manager of Pharmaceutical Division , UBE Industries, Ltd.

Pharmaceutical Quality Policy



Quality Policy Statement
Production & Technology Division General Manager

It is the objective of UBE Industries Limited to realize enhanced customer satisfaction through making consistent and prompt provision of quality products that answer the needs of customers.

The basic policies are as follows:

1. The wisdom and knowledge of all personnel of all organizations within the company shall be put together to produce excellent cement in order to meet customer requirements.
2. All the requirements of a quality management system shall be met and its effectiveness shall be continually improved.
3. The quality policies shall be timely reviewed to keep them appropriate to us.
4. Quality objectives shall be set and reviewed continually with consideration given to "customer focus".
5. Improvement of quality awareness shall be enhanced through the provision of developmental opportunities and education to all Ube employees.

April 1, 2017
UBE Industries, Ltd.
Construction Materials Company
Production & Technology Division

Yoshiaki Itou
General Manager,
Production & Technology Division

Quality Policy Statement
Production & Technology Division General Manager,
Cement & Construction Materials Company



We Deliver World Class Performance

~ Providing the World with Great Products ~

The UBE Machinery Group provides the world with great products, filled with care and passion, and created by combining and balancing "products", "services" and "humans".

- We will support society through our fair business activities while taking into consideration the global environment.
- We will constantly challenge ourselves to create new value and innovative technology.
- We will be conscious of our customers' diverse needs and respond appropriately to them by providing satisfying value in all of our goods and services.
- We will always act with responsibility and speed in order to be a trusted company.
- We will work voluntarily and pro-actively to maintain safety and provide pleasant workplaces free of accidents.

UBE MACHINERY CORPORATION, LTD.
President and Representative Director
H. Miyachi

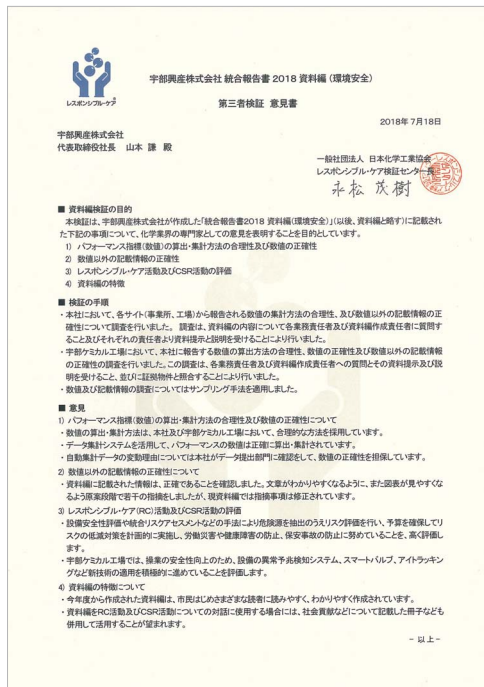
Integrated Management System of Machinery Company

Advance Safety Assessments of Chemical Substances

We conduct advance safety assessments of newly developed chemical substances and chemical substances that we will be handling in factories for the first time. In fiscal 2017, the UBE Group performed 35 advance safety assessments of chemical substances.

Third-Party Verification and Scope of This Report

Third-Party Verification



Objectives of Supplementary Information Verification

The Responsible Care Verification Center has verified the Supplementary Information (Environment and Safety) of the 2018 Integrated Report (hereinafter, "Supplementary Information"), created by Ube Industries, Ltd., in order to provide its opinion regarding the following items in its capacity as an expert in the chemical industry:

- 1) Rationality of the methods used to calculate and tabulate the performance indicators (numerical data) and accuracy of numerical data
- 2) Accuracy of the information other than numerical data provided in the Supplementary Information
- 3) Evaluation of Responsible Care (RC) and CSR activities
- 4) Characteristics of the Supplementary Information

Verification Procedures

- The Center staff visited the head office of Ube Industries, Ltd., and asked questions to verify the rationale of the methods the Company used to compile numerical data reported by each of its sites (offices and plants) and to check the accuracy of information provided in the Supplementary Information. Employees in charge of relevant business operations and those in

charge of creating the Supplementary Information answered the questions of the Center staff, presented documentation, and gave explanations.

- The Center staff also visited the Ube Chemical Factory and asked questions to verify the rationale of the methods the factory employed to calculate the numerical data reported to the head office and the accuracy of the numerical data and other information provided in the Supplementary Information. Factory employees in charge of relevant business operations and those in charge of creating the Supplementary Information answered the questions of the Center staff, presenting documentation and providing explanations. The Center staff also checked the consistency of the items used with the material evidence submitted.
- The Center used sampling methods to verify the numerical data and other information contained in the Supplementary Information.

Opinions

- 1) Rationality of the methods used to calculate and tabulate the performance indicators and accuracy of the numerical data
 - Both the head office and the Ube Chemical Factory calculated and tabulated the performance indicators in a rational manner.
 - Performance-related numerical data was accurately calculated and tabulated using the data collection system.
 - Headquarters confirms with business units providing data the reasons for changes in automatically tabulated data to ensure that numbers are accurate.
- 2) Accuracy of the information other than numerical data provided in the Supplementary Information
 - The information published in the Supplementary Information was accurate. The Center pointed out aspects of the draft that could be more clearly written or visually presented. These issues have been addressed in the final version of the Supplementary Information.
- 3) Evaluation of Responsible Care (RC) and CSR activities
 - They were rated very highly for using facilities safety evaluations, comprehensive risk assessments, and other techniques to identify sources of dangers and evaluate risks, secure budgets to undertake systematic measures to lower risks, prevent occupational accidents and maintain worker health, and prevent security incidents.
 - Ube Chemical Factory were rates well for enhancing operational safety by embracing and deploying new technologies. These included systems that detect facilities abnormalities, smart valves, and eye tracking.
- 4) Characteristics of the Supplementary Information
 - From this fiscal year, the Company ensured that the materials in this publication are easily understandable for the community members and other readers.
 - Ideally, the Company should produce a pamphlet and other materials to cover social contributions where using materials for RC and CSR initiatives.

Scope of This Report

Period Covered	Fiscal 2017 (from April 1, 2017 to March 31, 2018)	
Companies Covered	Ube Industries, Ltd. (11 operational sites)	Four chemical factories (Chiba, Sakai, Ube, and Ube-Fujimagari) Three cement factories (Ube, Isa, and Kanda) and Technical Development Center Okinoyama Coal Center Strategic Core Technology Research Laboratory and Frontier Technology Research Laboratory
Areas Covered	Japan	
Definitions	UBE: Refers to Ube Industries, Ltd. (unconsolidated)	
		The UBE Group: Refers to the UBE Group companies, including Ube Industries, Ltd.