

Environment Vision 2050	Environmental Policy	Governance	Products/Factories	CO ₂ Reduction
Resources Recycling	Water Resource	Chemical Substance	Biodiversity	Global Activities
Supply Chain	Social Contributions	Human Resource	Communication	

Environment : Chemical Substance Management



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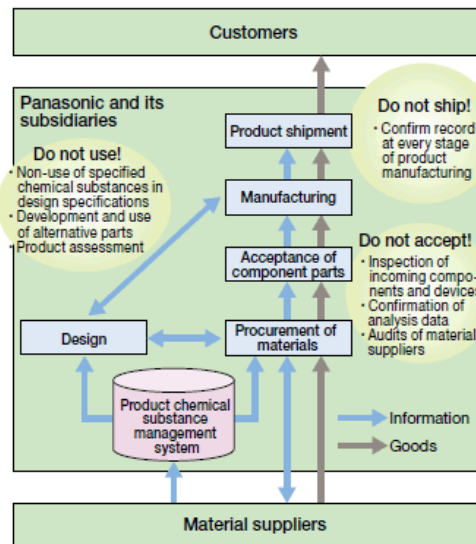
Initiatives to Reduce the Environmental Impact of Chemical Substances

In order to prevent content of hazardous substances prohibited under the EU RoHS Directive*¹, published in 2002 and recast in 2011, and the like to Panasonic products, it is important not only to be aware during the product design stage but also to be aware that certain substances are not contained in purchased components.

To ensure compliance with the Directive, Panasonic has been promoting the "Do not accept! Do not use! Do not ship!" campaign throughout the various production stages from designing to shipment inspection in business sites across the world since October 2005. Specifically, we employ a range of mechanisms using screening devices to search for and exclude specific chemical substances.

We also conduct environmental audits on suppliers of parts and materials with high risk of content of specified hazardous chemical substances to support them in building a sound chemical substance management system.

■ Specified chemical substance management system

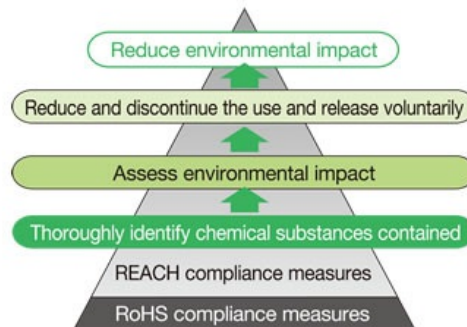


Meanwhile, as represented by the enforcement of the REACH regulation^{*2} in the European Union, the world is moving toward the goals agreed at the World Summit on Sustainable Development (WSSD) held in 2002, which is to produce and use all chemical substances in a manner that minimizes their impact on human health and the environment by 2020. In support of the precautionary approach proposed in the Rio Declaration made at the Earth Summit in 1992, we have been manufacturing products in line with our basic policy of reducing the use of chemical substances that might adversely affect human health and the environment throughout their lifecycles. As specific initiatives, we aim to reduce the environmental impact of our products by (1) identifying hazardous substances contained in our products, (2) evaluating these substances on their environmental impact, and (3) voluntarily reducing or discontinuing their use in case of any environmental risks.

*1 Directive on the Restriction of the use of certain Hazardous Substances in electrical equipment

*2 Regulations on the registration, evaluation, authorization, and restriction of chemical substances.

■ Process to Reduce the Environmental Impact of Chemical Substances



To promote our initiatives clearly, we set forth our Chemical Substances Management Rank Guidelines, which prohibit or specify certain substances for management in terms of our products and factory activities. Companies in the Panasonic Group are requested to follow the Guidelines, and suppliers are also requested for support as necessary. In fiscal 2013, we added Level 3 to the Chemical Substances Management Rank Guidelines (For Products) to review the timing for the prohibition of further substances that may adversely affect humans and the environment, in addition to the current and forthcoming prohibitions. Chemical Substances Management Rank Guidelines (For Products) and relevant documents, which prohibit or specify certain substances for management, can be downloaded from the website shown below (Green Procurement)

📄 [Green Procurement \(Download of Chemical Substances Management Rank Guidelines \(For Products\)\)](#)

Chemical Substances Management Rank Guidelines (For Products)

Rank	Definition

Prohibit	Level 1	(1) A substance contained in products that is prohibited by existing laws and regulations; or a substance where the upper limit of concentration is specified. (2) A substance that will be prohibited in products by laws and regulations or where the upper limit of concentration will be specified within one year of the revision of these Guidelines.
	Level 2	(1) Substances other than those specified as the Level 1 Prohibited Substances that will be prohibited in products after a certain period by a treaty, law, or regulation. (2) Substances that are prohibited in products by the Panasonic Group prior to the effective period specified by a treaty, law, or regulation. (3) Substances whose use is voluntarily restricted by the Panasonic Group.
	Level 3	Any substance other than those specified as a Level 1 or Level 2 Prohibited Substance that is reviewed for prohibition by legislation etc., and the clarification of substitution-related issues as well as the timing for prohibition is reviewed by the Panasonic Group in light of future legislation trends.
Manage		Substances whose consumption needs to be monitored and for which consideration needs to be given to human health, safety and hygiene, adequate treatment, etc. The intentional use of these substances is not restricted, but their use and contained concentration must be monitored.

Note: Covered legislation and chemical substances include: Class I Specified Chemical Substances under the Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.; substances whose manufacture etc. is prohibited by Article 55 of the Industrial Safety and Health Act; EU RoHS Directive; and Annex XVII of the EU REACH Regulation. For more details, see the chapter on Specified Managed Substances in the Chemical Substances Management Rank Guidelines (For Products).

Chemical Substances Management Rank Guidelines (For Factories)

Rank	Definition
Prohibit	Use of the following substances should be immediately discontinued: Carcinogens for humans Ozone depleting substances Substances whose use is prohibited by Panasonic Chemical substances designated as Class I Specified Chemical Substances by the Japanese Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc. Substances whose manufacture is prohibited by the Japanese Industrial Safety and Health Act Substances whose manufacture and use are prohibited by international treaties
Reduce	Substances whose use, release and transfer should be identified and reduced. Substances other than prohibited substances that might pose risks to human health and the environment.

Note: Covered legislation include: PRTR Act (chemical substances), environmental criteria under the Basic Environment Act; the Industrial Safety and Health Act; and the Stockholm Convention. For more details, see the contents on The Aim of Establishing the Chemical Substances Management Rank Guidelines (For Factories) in the Chemical Substances Management Rank Guidelines (For Factories).

History of Our Initiatives to Reduce the Environmental Impact of Chemical Substances

	Social trends						
	1989: The Montreal Protocol entered into force	1992: Earth Summit in Rio de Janeiro—Agenda 21	1996: Discontinuance of the use of specified chlorofluorocarbons by industrialized countries	2002: WSSD in Johannesburg	2006: The RoHS Directive entered into force	2007: The REACH Regulation entered into force	
	1990	1995	2000	2005	2010	2015	
Panasonic							
All products		1992: Discontinued use of PVC resin in packaging materials	March 2003: Discontinued use of lead in solders globally ^{*3}	October 2005: Discontinued use of six RoHS substances globally ^{*3}	March 2009: Discontinued use of PVC in internal wiring of new products to be sold in Japan ^{*3}	March 2011: Discontinued use of PVC in internal wiring of new products globally ^{*3}	July 2018 (planned): Use of four types of phthalates specified by the RoHS Directive to be discontinued in new products globally
Individual products	1991: Released mercury-free manganese dry cells	1992: Released mercury-free alkali dry cells	1995: Discontinued use of CFC refrigerant in refrigerators globally	2002: Discontinued use of HCFC refrigerant in air conditioners (Japan)	2004: Refrigerators in Japan market became fluorocarbon-free (Japan)	2006: Released lead-free plasma display panels	2010: Released fluorocarbon-free freezers using CO ₂ refrigerant and compatible display cases
Chemical substances used at factories			1996: Discontinued use of chlorinated organic solvents	1997: Began identification work for PRTR	1999: Launched the "33/50" reduction activity ^{*4}	2004 (Japan): Achieved Voluntary Action Plan Reduced release and transfer amount by 75% compared to fiscal 1999 level	2010 (Global): Achieved Voluntary Action Plan Reduced release and transfer amount of key-reduction target substances by 46% compared to fiscal 2006 level

^{*3} Excluding applications where the quality such as safety cannot be ensured, or applications where the material is designated by laws and regulations.

^{*4} A reduction activity that promotes cutbacks in the use, release, and transfer of chemical substances by 33% in three years and by 50% in six years, compared to the fiscal 1999 level.

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Management of Chemical Substances in Products

To minimize the environmental impact of chemical substances contained in products, we endeavor to identify chemical substances used in the components and materials of our products. In addition, for substances that are prohibited in products in major developed countries due to legislation such as the European RoHS Directive, we specify prohibited substances to globally ensure that they are not used or contained in our products, except in certain cases where substitution of the substances is infeasible. We will also conduct environmental impact assessments for managed substances contained in our products, take steps to reduce the use of substances where the impact on human health and the environment cannot be ignored, and plan to eventually prohibit the use.

Identifying Chemical Substances in Products

To contribute to the achievement of the global goals set at the WSSD, it is important for us to disclose and communicate information on the chemical substances used in our products across the supply chain, for which we must promote cross-industrial initiatives to establish and disseminate an effective system. We are a member of the Joint Article Management Promotion consortium (JAMP) together with about 440 major companies from various industries, such as chemical, component, and equipment manufacturers. We are proactively formulating, utilizing, and disseminating chemical substance management standards and systems through this organization. Since fiscal 2005, we have been using a product chemical substance management system to gather data concerning the chemical substances contained in the components and materials for our products from our suppliers. In July 2009 we asked our suppliers to submit the data in a common format by JAMP, and approx. 10,000 suppliers are currently using this format.

Meanwhile, in Japan alone, burden on companies grew, as a number of hazardous substance inspections were carried out throughout the supply chain using formats unique to each company that were not standardized such as the JAMP format for information communication. The Ministry of Economy, Trade and Industry recognized this issue and presented a new scheme, "chemSHERPA," for sharing and exchanging information about chemicals contained in components and products throughout the supply chain. Because chemSHERPA follows the standardized JAMP format to communicate information, Panasonic has joined the scheme and adopted the use as the information-gathering format in its system. We plan to replace the current JAMP mechanism with chemSHERPA by June 2018 when the JAMP support and maintenance period will discontinue (excluding communication of information on automotive equipment for the automobile sector for which the industry's standard information sharing system is already established).

In addition, with the supply chain expanding to a global scale, it is particularly important for overseas suppliers to deepen their

understanding on the handling of hazardous chemical substances. Towards a full changeover to the chemSHERPA format, we will continue to promote the use to our suppliers through collaboration with JAMP and JAMP counterparts in respective countries.

 [JAMP](#)

 [Chemicals in Products \(Ministry of Economy, Trade and Industry\)](#)

 [ChemSHERPA](#)

Companies that procure electronic components may need to have a full understanding of the substances contained in the components at the point of selection or usage in order to adhere to the EU RoHS Directive and REACH regulation. Particularly, as the REACH Substances of Very High Concern (SVHC) List is updated every six months, those companies expect their suppliers to provide the latest substance data to demonstrate compliance with the list.

Also, as a company supplying electronic components to other companies, we have published a table of RoHS and REACH compliance status on our website since November 2012 so that our clients can obtain relevant chemical substance information from us quickly and efficiently. The table covers our RoHS Directive compliance information and the substances designated in the RoHS / REACH Confirmation Report for all our major generic electronic components.

 [RoHS / REACH Confirmation Report for major generic electronic components](#)

For products covered by the Act on the Promotion of Effective Utilization of Resources, the Panasonic Group does not manufacture, import, or sell products that contain certain chemical substances beyond specified standards, other than in exempted parts. For more details, see Information on the Content of Certain Chemical Substances in Covered Products below.

[> Information on the Content of Certain Chemical Substances \(Japanese\)](#)

In June 2015, the Act on Preventing Environmental Pollution of Mercury was established to implement measures agreed in the Minamata Convention on Mercury. The act requires manufacturers of products containing mercury to provide information such as labelling so that such products are appropriately sorted and discharged when being disposed of. We have established a new webpage, Information Based on the Act on the Preventing Environmental Pollution of Mercury, in May 2017 to communicate information concerning the mercury used in our products to customers.

 [Act on Preventing Environmental Pollution of Mercury](#)

[> Information Based on the Act on Preventing Environmental Pollution of Mercury \(Japanese\)](#)

Assessing the Impact of Chemical Substances

Scientifically identifying the impact on human health and the environment of products containing chemical substances is vital to the development of products with low environmental impact. We are engaging in activities designed to assess the levels to which customers are exposed to substances of very high concern (SVHC), as well as safety at the time of product use.

To date, we have undertaken assessments on the impact of ceramic fibers used in certain models of commercial microwave ovens. As part of our efforts to comply with the EU REACH regulation which requires preparing information for the safe use of products containing a certain amount of SVHC, we have created and disclosed a safety assessment document. The exposure was considered to be nominal with little concern for any impact on human health. Furthermore, usage of ceramic fibers in our products was discontinued in December 2010.

[> Management of Chemical Substances in Products](#)

Reduction in Usage and Emissions of Chemical Substances

Fluorocarbons used as a heat insulator and a refrigerant for freezers and air conditioners can damage the ozone layer and cause global warming. We developed the technology to utilize CO₂, which has much smaller impact than fluorocarbons, as a refrigerant and have been supplying a home boiler using CO₂ refrigerant since 2001. Although the CO₂ refrigerant is suitable for heating purposes, it was difficult to apply to refrigerators and freezers, especially in large professional equipment due to insufficient cooling efficiency and size problems. However, with support from the New Energy and Industrial Technology Development Organization (NEDO), we developed a refrigeration system using CO₂ refrigerant, and started supplying these fluorocarbon-free freezers and refrigerator display cases to supermarkets and convenience stores in Japan from 2010. By the end of March 2017, we delivered

roughly 5,800 units to approx. 2,200 stores.

Making the best use of our expertise in the Japanese market, in May 2017 we also started sales of fluorocarbon-free CO₂ freezers designed for small stores and prefabricated refrigerator/freezers for the European market, where F-gas regulations and other environmental regulations are in place. We released the product in Norway, Denmark, Sweden, and Belgium, aiming to sell more than 300 units in the first year. We plan to expand the market to other countries, including Germany and Holland.

In addition, as measures against ozone depletion caused by HCFCs, a refrigerant called R410 that does not deplete the ozone layer was used in compact air conditioners, but this substance has a very high Global Warming Potential (GWP). Panasonic then developed a model that uses a new refrigerant R32, which has a lower GWP and introduced it to the market in 2013. Furthermore, PT. Panasonic Manufacturing Indonesia, which owns the factory for manufacturing compact air conditioners in Indonesia, redesigned its production facility that used an ozone-depleting HCFC refrigerant R22 to one using R32 in fiscal 2015, and commenced supplying new R32-based air conditioners. Panasonic contributed to the Indonesian government's initiative to eliminate the use of HCFCs.



OCU-CR2001MV, a fluorocarbon-free freezer using CO₂ refrigerant



FPW-EV085, a display case compatible with a fluorocarbon-free freezer

Mercury lamps are currently widely used as the light source for projectors, because they provide high luminosity easily. However, mercury can have a serious impact on human health and the environment if not treated properly, and the short life of the lamps causes high consumption of resources as well as high environmental impact. For these reasons, Panasonic is developing products that adopt laser light sources. The PT-RZ31K Series are projectors for professional use that provide high luminosity by employing a high-output semiconductor laser light source module and a heat-resistant phosphor wheel. In addition, the casing material does not use halogenated flame retardant, making the projector an eco-conscious product that contributes to reducing the use of hazardous substances.



PT-RZ31K Series, a laser projector for professional use

Reducing the Use of PVC Resin

Polyvinyl chloride (PVC) is a material of concerns to the generation of hazardous substances from inappropriate disposal, as well as the harmful effects of certain additive agents (phthalates) used to render PVC more pliable. In light of the significant potential for inappropriate disposal of the PVC resin used in the internal wiring of products, due mainly to difficulties associated with the sorting of this resin from used products, we have switched our new products launched from April 2011 to non-PVC.

 [List of Our PVC-free Products \(PDF:87KB\)](#)

[> REACH](#)

[> Further Proactive Actions](#)

Restriction on the Use of Phthalates

Phthalates are often used in PVC products, and the use of four phthalates*⁵ will be restricted under the EU RoHS2 from July 22,

2019. We specified these substances as Level 2 Prohibited Substances in our Chemical Substances Management Rank Guidelines Ver. 10 (for products) issued in June 2016, and delivery of such substances will be prohibited from July 22, 2018. We have specified other phthalates as Level 3 Prohibited Substances, and are promoting substitution.

As for the four phthalates, we are currently working on creating an analysis and assessment system to ensure substitution.

Since phthalates have a migration characteristic (where a substance from another article migrates through contact), materials may be contaminated by migration from production equipment as well as process equipment containing the four phthalates specified as Level 2 Prohibited Substances. Accordingly, we are also discussing management of preventive measures against contamination through contact.

To build an inspection system for purchased components, we revised the acceptance inspection standards and determined to conduct inspections on the supplied components with a high chance of containing phthalates, such as PVCs, elastomers, and glues. We have already assessed and selected a phthalate analyzer to use for these inspections, and commenced installation in our procurement sites. Phthalates contained in our products exported to the Europe used to be as high as 10 tons. This figure was reduced to less than one ton as of March 2018, and we aim at completing phthalate substitution by July 2018.

*5 Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), and Diisobutyl phthalate (DIBP).

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Management of Chemical Substances at Factories

Panasonic is working to minimize environmental impact by identifying the hazardous substances used in our products, assessing the impact of such use, and voluntarily discontinuing the use or reducing the release of such substances. Since 1999, we have been conducting the 33/50 Reduction Activity to materialize reduction by 33% in three years and by 50% in six years. In Japan, we started promoting cutbacks in the use, release, and transfer of chemical substances at our factories in fiscal 2000. Against the target in our voluntary action plan, a reduction by 50% from the fiscal 1999 level, we achieved a 75% reduction in chemical substance use and a 62% reduction in release and transfer in fiscal 2005. Since then we have been continuing the activity, focusing on substances with particularly large amounts of release and transfer, setting a voluntary action target of reduction by 30% compared to the fiscal 2006 level. As a result, we achieved a 46% reduction in the amounts of release and transfer of specified key reduction-target substances across all factories worldwide in fiscal 2011.

Reflecting international trends in chemical substance management, our reduction measures have focused increasingly on particularly hazardous substances from fiscal 2011. Our Chemical Substances Management Rank Guidelines (for Factories) was established in 1999 as a guideline to help manage the above chemical substance reduction activities. In Version 1, the guidelines specified a list of chemical substances to be managed, mainly focusing on carcinogenic substances. The guidelines were later updated to Version 2 in 2000 to include rules concerning the Japan PRTR Law. Version 3, introduced in 2004, additionally covered a list of substances specified by chemical substances management legislation in Japan. The chemical substances covered by Version 4 and later from 2009 are those specified in legislation on human health and environmental impact in Japan, the U.S., and Europe, as well as those specified under international treaties.

Under our Chemical Substances Management Rank Guidelines (For Factories), we have focused our management on select chemical substances that are hazardous to human health and the environment. Further, we have created a unique indicator, the Human Environment Impact,^{*6} which is used globally in all our factories. Conventionally the chemical substances were managed by "quantity," such as usage amount or emissions/release. However, such quantity-based management has a problem in that some highly hazardous substances do not become subject to reduction or management if the usage amount was small, and therefore would fall out of the scope of impact assessments. In addition, the toxicity criteria varied according to substance types and regional legislation, which made standardized management across the Group difficult. To address this issue, Panasonic worked together with experts from both within and outside the company, reclassified chemical substances based on an overall assessment of their hazardousness, and specified a hazardousness factor for each classification. Specifically, we set a hazard classification to each substance by utilizing carcinogen risk assessments issued by international organizations, together with publically available hazard information and lists of ozone depleting substances. For substances that have multiple hazard information items, the item ranked with the highest hazard risk is used for classification. We utilize this internal indicator as the Human Environmental Impact indicator to promote efforts to ensure reduction of highly hazardous substances with greater

environmental impacts, such as carcinogens and ozone depleting substances, according to the risk level. The Panasonic Group Chemical Substances Management Rank Guidelines is also available on the website on our Green Procurement activities to promote collaboration with our suppliers, encouraging them to offer materials that do not contain hazardous substances.

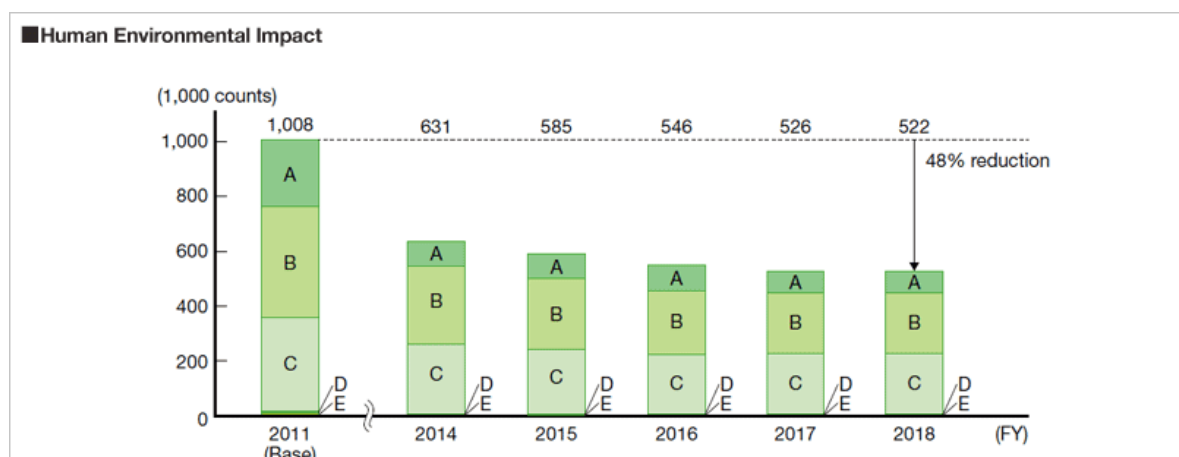
[Green Procurement \(PDF Download of Chemical Substances Management Rank Guidelines \(For Factories\)\)](#)

*6 Human Environmental Impact = Hazardousness factor x Release and transfer amount.

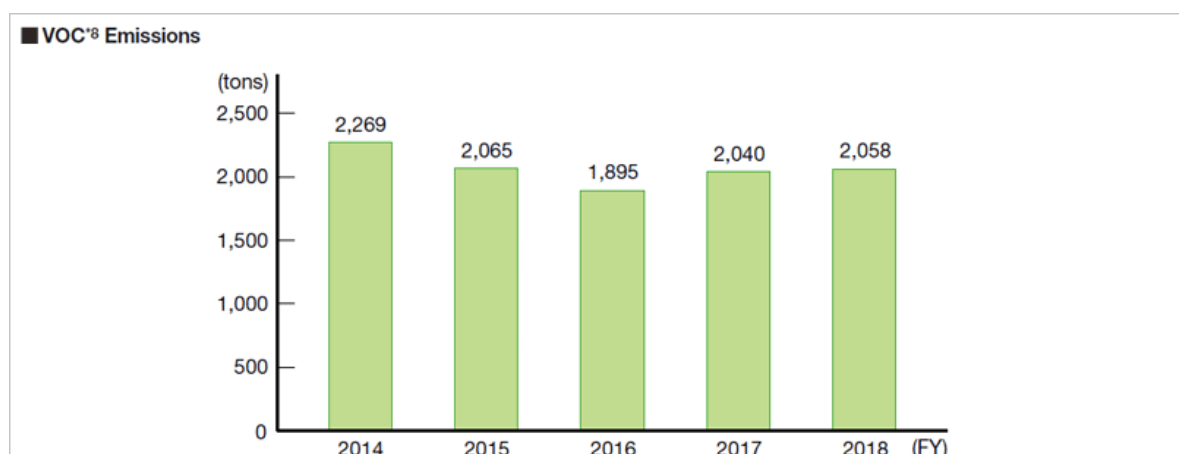
Classification of Hazards

Classification	Hazards*7	Hazardousness factor
A	Carcinogenicity/Ozone layer depletion	x 10,000
B	Serious or direct impact	x 1,000
C	Medium impact	x 100
D	Small or indirect impact	x 10
E	Minor impact or not assessed	x 1

*7 In addition to carcinogenicity, hazards to human health include genetic mutation, reproductive toxicity, and acute toxicity. In addition to ozone depleting substances, hazards to substances with impact on the environment include ecological toxicity, substances that impact global warming, and substances that generate photochemical oxidants.

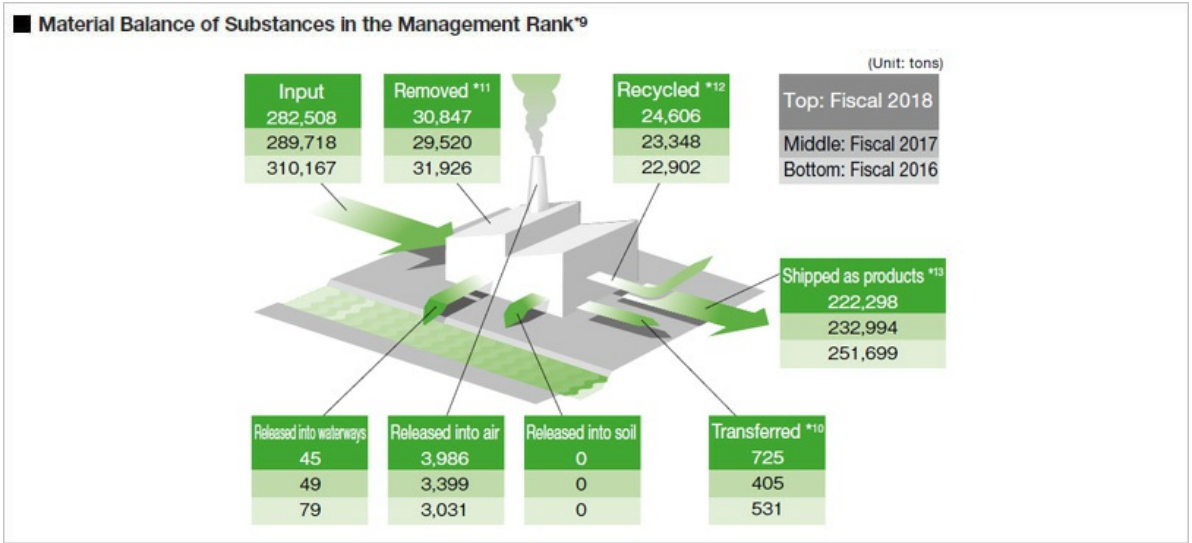


In fiscal 2017, we were able to reduce Human Environmental Impact by 48% compared to fiscal 2011 by substituting highly hazardous substances in paints, improving yields, promoting recycling, introducing substances with low-solvents and hazards, and improving processes, including reviewing the amount of paint or the number of washing cycles, as well as improving the efficiency of removal/deodorization equipment. We will continue our initiatives to minimize the amount of substances with environmental impact released through our production activities.



Note: Overseas sites of former SANYO Electric not included in fiscal 2011 through 2012.

*8 Emissions of Volatile Organic Compounds (VOC) into the air caused by use. The calculation covers 100 major VOC substances that Panasonic selected from those listed in the Air Pollution Control Act.



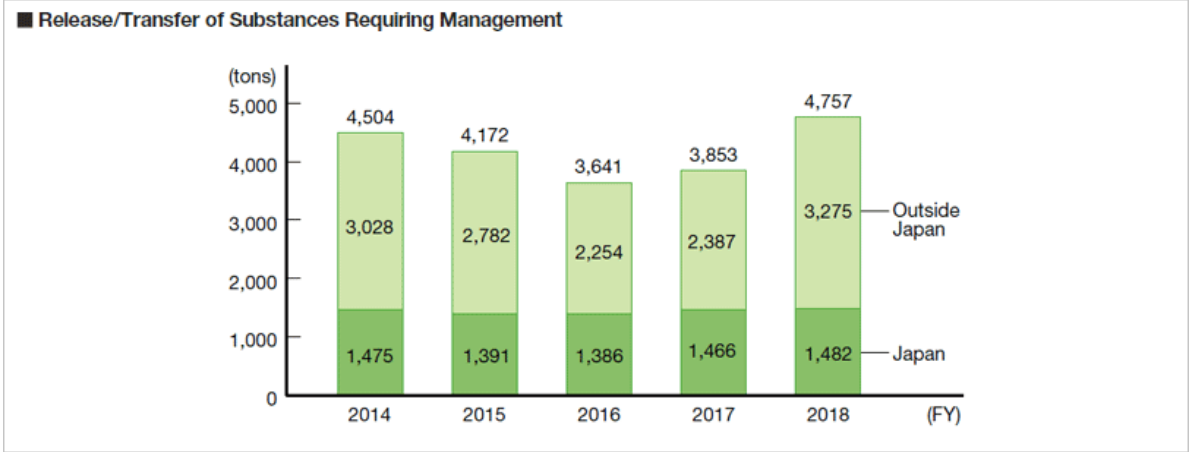
*9 Based on the Chemical Substances Management Rank Guidelines (for factories). Includes all the substances specified in the Pollutant Release and Transfer Register Act.

*10 Includes substances transferred as waste, as well as those discharged into the sewage system. Recycled amount which is free of charge or accompanies treatment cost under the Waste Management Law is included in "Recycled." (Different from the transferred amount reported under the PRTR Law.)

*11 The amount of substances converted into other substances through neutralization, decomposition, or other chemical treatment.

*12 The amount of substances recycled with revenue, as well as those recycled free of charge or with any payment.

*13 The amount of substances that have been changed to other substances as a result of chemical reactions, and/or those that are contained in or accompanied with products and shipped out of factories.



Overseas sites of former SANYO Electric are not included in fiscal 2011 through 2012.

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Corporate Profile	Company Overview	Senior Management	Business Segments	Affiliates	Panasonic Center	Global Partnerships	History
Our Company	Philosophy & Business	Corporate Governance	Code of Conduct	Procurement Activities			
Brand	Brand Story	Brand	Brand History				
Technology & Design	Research and development	R&D 10-Year Vision	Breakthrough Technology	List of Conference Presentations		History of Technology Design	
	Universal Design						
History	Corporate History	The Founder, Konosuke Matsushita					

