Environmental management

Environmental idea

INOAC respects the natural environment of our irreplaceable earth and contributes to realizing an affluent society that is comfortable to live in through technology harmonized with our environment and environment-friendly corporate activities.

Environmental policy

① We comply with environment-related laws and regulations and other requirements, and implement business activities that society can trust.

② We promote reducing CO2 emission such as energy saving to prevent global warming.

③ We work on resource conservation, waste reduction and recycling to contribute to a recycling-oriented society.

④ We appropriately manage chemicals that may influence the environment and reduce the risk to preserve our environment.

⑤ We actively develop products with less environmental impacts contributing to conservation of the nature throughout the lifecycles of the products.

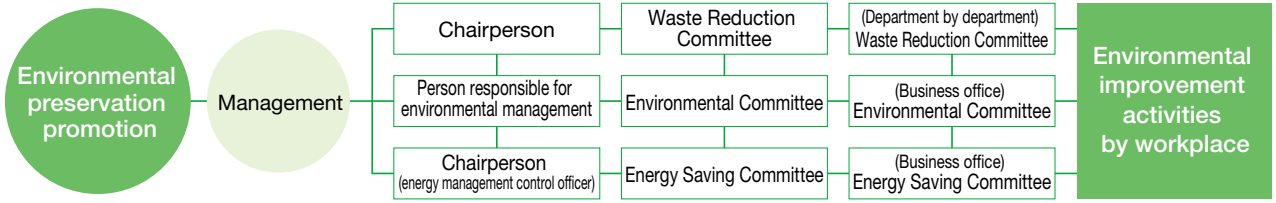
⑥ We promote environmental management, educate employees about the environment, implement environmental audits and continue to improve.

⑦ We contribute to establishing a sustainable society through local environmental preservation work as good corporate citizens.

Environmental management system

The person responsible for environmental management implements the integrated management of the environment under the direct control of top management and implements environmental activities for the whole company in the activities of the Environmental Committee, working to promote environmental activities in an organized fashion. We organized a specific section committee to handle industrial waste and energy saving to further accelerate reduction and to promote environmental management in cooperation with each committee.
We also started activities conformable to ISO 14001:2015 in January 2017 and are working to achieve our objectives under a regime close to our main work by completely reviewing manuals.

■ Environmental preservation promotion



Internal environmental audits

We implement internal environmental audits to check the operational state of our environmental management.
The audit team consists of two to three employees who have completed the auditor training prescribed by the company, and checks if the environmental management system is appropriately operated, maintained and improved. Regarding organizations with inappropriate operations, additional audits are implemented and followed by corrective action.

External environmental examination

We ask the Japan Quality Assurance Organization (JQA), which is an external certification registration body, to implement examinations to check if the environmental management system is appropriately operating in accordance with ISO 14001:2015.
We also implemented an examination for shifting to ISO14001:2015 whose activities started in January in FY 2017. As the result, no items indicated for improvement were found, and the system including shifting was determined to be sustained. As an overall assessment, issues to be considered about influence on management in expanding objectives and others were listed.

Environmental management

Summarization of major activities in FY 2017

The results of INOAC's main work for the environment in FY 2017 are shown in the table below.
We reduced energy consumption compared with the previous fiscal year even though we could not reach our reduction objectives due to insulation countermeasures in our facilities. Although we moved forward on recycling, we did not reach our objectives for reducing waste disposal because the market standards for valued resources have become stricter year after year. About the release amount of PRTR substances, we introduced CO2 foaming equipment to reduce methylene chloride as a foaming agent, promoted substituting a cleaning agent with non-PRTR substances for a cleaning agent with PRTR substances, reached our objectives and substantially passed it.

Items to be worked on	Policy and objectives of activities in FY 2017		Activity results in FY 2017	Results
Energy	Factory-related site	Intensity (used amount/production sum) 337.2 and below [Used amount (crude oil equivalent) 28,303 kL (2016 result)]	Intensity 348.5 [Used amount (crude oil equivalent) 28,244 kL (2017 result)]	●
	Office-related site	Used amount (crude oil equivalent): 92.9 kL or below	Used amount (crude oil equivalent): 91.6 kL	●
Reduction in waste	Factory-related site	Intensity (treated amount/production sum) 5.45 and below [Treated amount: 4,634 t (2016 results)]	Intensity 6.48 [Treated amount: 5,254 t (2017 results)]	▼
	Office-related site	Treated amount: 1,818 kg or below	Treated amount: 1,553 kg	●
PRTR substances Reduction in release and transfer amounts	Intensity (release amount + transfer amount)/production sum) 2.67 and below [Release amount + transfer amount 187,930 kg (2016)]		Intensity 1.64 [Release amount + transfer amount 132,887kg (2017)]	●
Environmental improvement work	Environmental improvement cases (total in the entire company): 1,046 cases or more		1,726 cases	●
Environmental communication	Issue CSR report		Issued	●

● Objectives reached ● Objectives not reached but progress made ▼ Objectives not reached

* Business places from which environment data are collected to summarize major activities are shown below:

INOAC CORPORATION	Anjo Plant, Sakurai Plant, Nanno Plant, Yana Plant, Ishimaki Plant, Ikeda Plant, Ikeda Second Plant, Ono Plant, Jinno Plant, Ukiha Plant, Headquarters (Nagoya City), Tokyo branch, Osaka branch		
INOAC Living Co., Ltd	Ibigawa Plant,	Kyushu INOAC Co., Ltd.	Kikuchi Plant, Ukiha Plant, Kita-Kyushu Plant,
Techno Foam Japan Co., Ltd.	Headquarters, Saitama Plant	Kyushu Color Foam Co., Ltd.	

Compliance with environmental laws and regulations

INOAC specifies the environmental laws and regulations related to our business and implements daily management. Each business facility implements environmental risk management such as preventing environmental pollution by monitoring and measuring the responses on the basis of laws and regulations concerning noise and industrial waste treatment, evaluating them as part of the environmental management system. We strictly comply with the agreements about environmental preservation and other items with local governments and thoroughly comply with environmental ordinances.

Main environment-related laws and regulations in our business

Air	Air Pollution Prevention Law, Automobile NOx/PM Reduction Law, Law Concerning Special Measures against Dioxins
Water quality and soil	Water Pollution Prevention Law, Purification Tank Law, Sewerage Law, Soil Contamination Countermeasures Law
Noise, vibration and malodor	Noise Control Law, Vibration Regulation Law, Malodor Prevention Law
Chemicals	PRTR and Promotion of Chemical Management Law, Poisonous and Deleterious Substances Control Law
Resource conservation and cycle	Energy Saving Law, Container and Packaging Recycling Law, Freon Emission Control Law, Law Concerning Special Measures Against PCB Waste, Waste Management and Public Cleaning Law
Disaster prevention	Fire Service Law, High Pressure Gas Safety Law
General and others	Factory Location Law, Law concerning the Improvement of Pollution Prevention Systems in Specified Factories (Pollution Prevention Organization Law), Radio Law

- Local government ordinances are omitted.
- Some of the laws are described in abbreviated forms.

Training for emergencies

We identify accidents and emergencies in accordance with the characteristics of each business facility, and periodically implement training to prevent environmental pollution such as fires and chemical leakage (oils, solvents, etc.) from facilities.
General disaster training was held on June 2 and November 30, 2017, and individual training is implemented in accordance with the characters of departments including training for preventing raw materials from flowing out and evacuation drills at night in the Anjo Plant. In other facilities, trainings for emergencies are implemented as preparation.


Anjo Plant: Water drainage by fire-fighting team

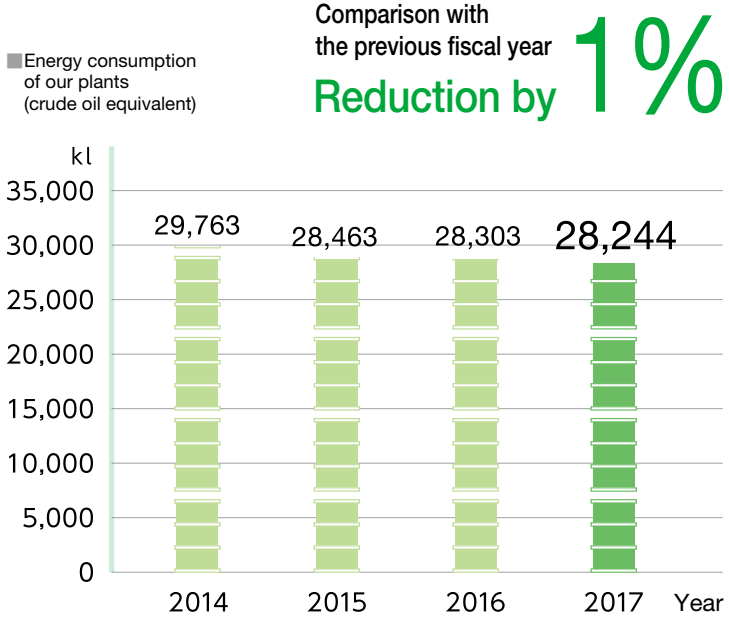

Sakurai Plant: Training in early fire extinguishment


Nanno Plant: Measures against raw material leakage

Reducing the environmental burden

Reduction of energy consumption

INOAC has promoted reducing CO2 emissions and saving energy to prevent global warming. We implemented efficiency increases in dryers and room heating by utilizing waste heat from boilers and fans, heat insulation measures on factory roofs, boiler piping, cure furnaces and more, and promoted LED use.
The amount of energy used in FY 2017 almost leveled off in comparison with FY 2016, and was reduced by approximately 5 percent (crude oil equivalent) compared with FY 2014.



[Cases]

Significant implementation contents for energy saving promotion in 2017

- Increase in air conditioning efficiency by removing waste heat from rooms (summer) and bringing waste heat into rooms (winter)
- Curing furnace heat insulation with INOAC's THERMAX, a heat insulating material
- Countermeasures to prevent air leakage by ultrasonic air leak detectors
- Installation of insulation jacket on tank in boiler room
- Heat insulation by covering plant roof
- LED illumination management by control switch
- Enhanced air conditioning efficiency by partition curtains
- Power reduction by utilizing waste heat from boiler room


Anjo Plant: Heat insulation cover on plant roofs


Affiliated companies: Installation of insulation jacket on tanks


Kita-Kyushu Plant: Taking-out and taking-in of waste heat from fans

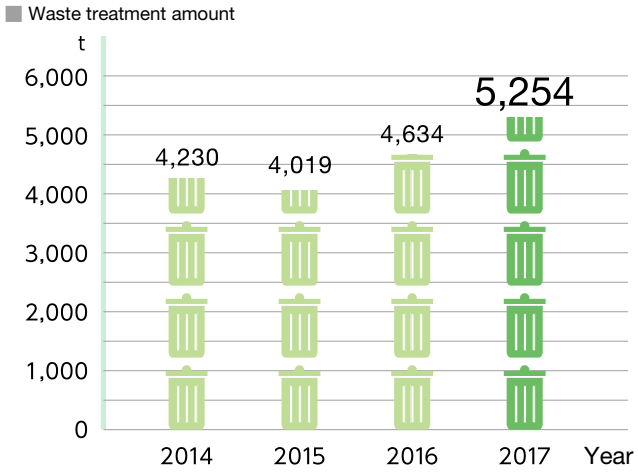
Other work for preventing global warming

INOAC is working on preventing global warming from other perspectives too. We provide our employees with education on power saving including cool biz, which is our energy-saving attire campaign, with summer eco-style campaigns. We also work on cooperative transportation and smooth deliveries, a modal shift to railway and maritime transport, and distribution base intensiveness. In addition, we participate in the CO2 Reduction and Lights Off Campaign propelled by the Ministry of the Environment every year, and implemented the campaign at 10 facilities including our group companies on June 21 (summer solstice) and July 7 (Star Festival) in 2017 too.

Reducing the environmental burden

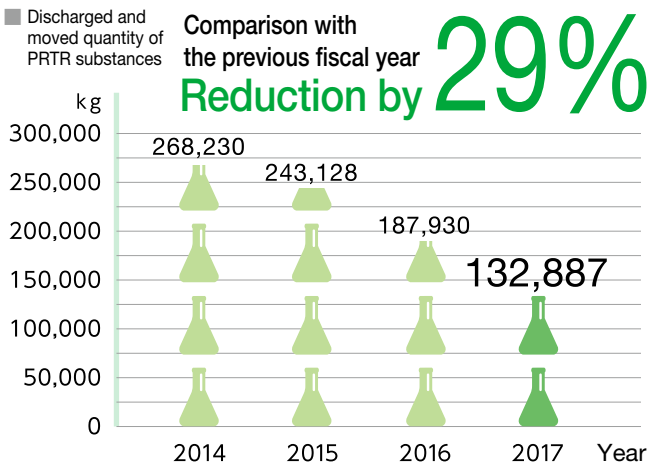
Waste reduction

Regarding waste reduction, the companywide waste reduction committee, as the leader, promotes reports of waste reduction cases, application of such waste reduction to other facilities, reductions in loss by detecting the reductions and improvements in yields and expansion of utilizing recycled resources including recycling by separating used paper and material recycling at each business place. However, the criteria for valued resources have become stricter; therefore, in many cases we had to disposal resources as industrial waste.



Reducing environmental burden substances

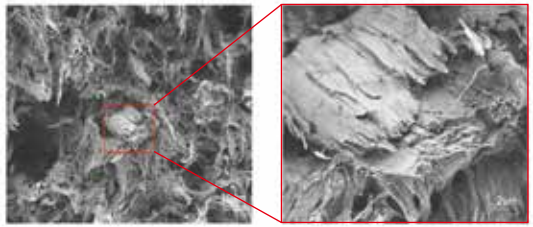
INOAC uses PRTR substances such as m-tolylene diisocyanate, which is a raw material of polyurethane foams, xylene or toluene, which are used in the coating process. We have promoted increases in using paints with low solvent rates (high solid type) and stopped using 1-bromopropane at the cleaning process of a urethane injection machine as work for reduction in handling amounts and the releasing amount of such target substances. Thanks to this work, we achieved remarkable reductions in 2017 by approximately 29% compared with 2016 and by approximately 50% compared with 2014.



NCV project participation

The NCV (Nano Cellulose Vehicle) project was launched by the Ministry of the Environment to improve automobile fuel consumption by weight and CO2 reduction by applying cellulose nanofiber (CNF), which is a light-weight and high-strength next generation material, to the automotive field. Kyoto University leads the project and more than 20 industrial, academic and governmental institutions participate. INOAC CORPORATION has participated in this project from the beginning, evaluated moldability, physical properties and more, and worked to implement practical realization.
http://www.rish.kyoto-u.ac.jp/ncv/

CNF-contained foaming PP resin molded article (product picture)



Microphotograph of CNF-contained foaming PP resin molded article

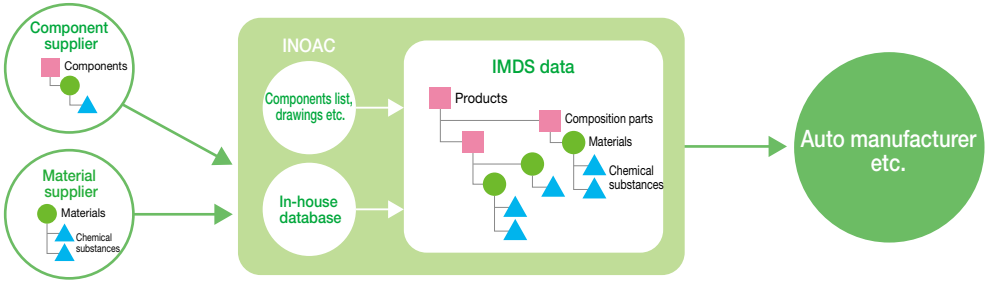
Business places from which environment data are collected on pages 14 and 15 are shown below.
INOAC CORPORATION/Anjo Plant, Sakurai Plant, Nanno Plant, Yana Plant, Ishimaki Plant, Ikeda Plant, Ikeda Second Plant, Ono Plant, Jinno Plant, Ukiha Plant, Headquarters (Nagoya City), Tokyo branch, Osaka branch
◎ Ibigawa Plant, INOAC Living Co., Ltd. ◎ Kikuchi Plant, Ukiha Plant, Kita-Kyushu Plant, Kyushu INOAC Co., Ltd. ◎ Headquarters, Saitama Plant, Techno Foam Japan Co., Ltd. ◎ Kyushu Color Foam Co., Ltd.

Management of chemical substance information

Promoting IMDS, chemSHERPA*2 and more

INOAC registers information on chemicals and reports it to our customers through IMDS*1, especially in the automotive field, which is our main strength, and has a management system to obtain the necessary information via our supply chain and to register IMDS.

■ nformation collection through IMDS in INOAC - reporting process and chemical management system



Information collection and report to our customers using the chemSHERPA*2 format that has been widely used in the industry, especially in the electrical machinery industry are supported (The format was changed from the previously used JAMP format to the above).

*1 IMDS (International Material Data System): A database for transmitting and obtaining information on materials and chemicals over the internet for the automotive industry, which was developed to comply with the EU ELV Directive as a start

*2 chemSHERPA: A unified format to transmit information on chemicals contained in products in the supply chain, which the Ministry of Economy, Trade and Industry took the initiative in developing

Establishment of in-house database

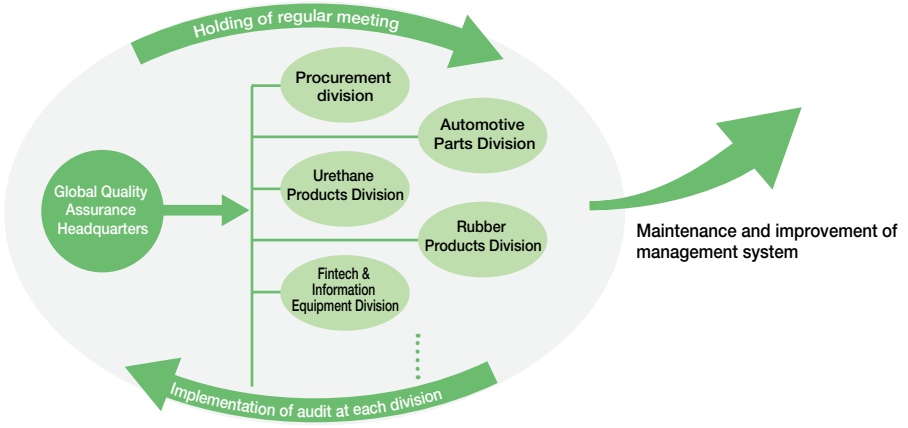
The automotive division operates the in-house database through which information on chemical substances contained in purchased parts and raw materials is managed in an integrated manner, which contributes to improved work efficiency, the accuracy of the contents to be reported in the registration with IMDS and the investigation of Substances of Concern contained in the purchased parts and raw materials.

Establishment and execution of green procurement criteria

We list chemical substances regulated by laws and regulations, or customers, and list chemical substances that we should reduce after understanding their content. We show them as green procurement criteria to suppliers; we use such lists to obtain information on chemical substances contained in raw materials to be purchased.

Communication about chemical substance management

The global quality assurance headquarters that is a company-wide organization and leader regarding environmental management gathers the chemical management section in each department and meets once every two months. At the meetings, they review the green procurement criteria, check the management system, establish or change operation rules, and exchange opinions concerning the latest trends in chemical regulations such as the REACH regulation and RoHS Directive, as well as periodically implementing auditing the management system in each department to maintain and improve an appropriate and reliable management system.



Environment-friendly products ①

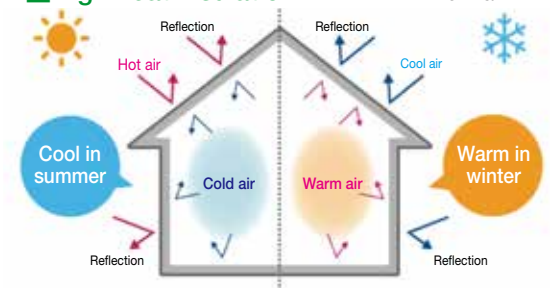
Energy saving Residential heat insulator that can achieve both heat insulation and incombustibility

“THERMAX SW-G”

Recently, the demand for heat insulation materials has increased because of increasing interest in energy saving at residences; the demand for heat insulators for residences that can achieve both heat insulation and incombustibility has also increased due to frequent large-scale fires. We developed THERMAX SW-G to respond to this demand. THERMAX SW-G is a rigid polyisocyanurate (PIR) foam board that prevents fire from entering inside due to a surface char layer formed by the isocyanurate structure; THERMAX SW-G has extremely high incombustibility even when burning on a burner at the temperature of 1200°C for 5 minutes as well as excellent thermal insulation performance.

THERMAX SW-G

■High heat insulation ■ Thermax



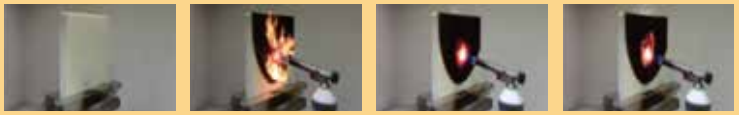
■ 他の素材との性能比較

PF: Phenolic foam, XPS: Extruded styrene foam

	THERMAX SW-G	General PIR	PF	XPS	Fiber-based heat insulation material
Thermal conductivity	○	○	○	○	△
Fire protection and fireproof performance	◎ Carbonization/Shape retaining	△ Ignition/Combustion	○ Carbonization/Decomposition	△ Dissolution	○ Shrinkage deformation
Oxygen index	○	△	○	○	◎
Moistureproof performance	◎	◎	○	◎	△

THERMAX SW-G burning

Impenetrable in 6 minutes



Before burning | 15 seconds later | 3 minutes later | 6 minutes later

Reference: Combustibility of general heat insulation material

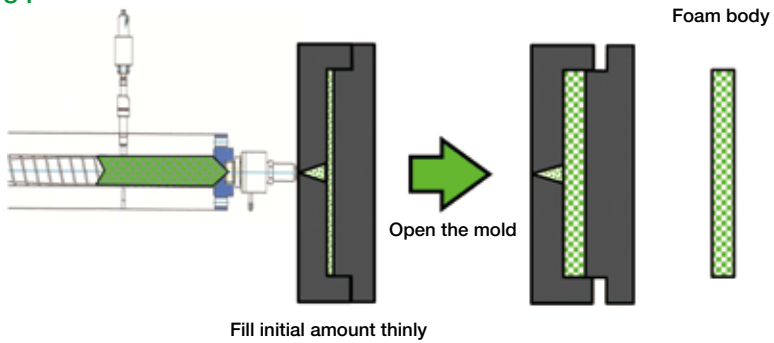
General PIR ... Penetrable in 15 seconds | PF ... Penetrable in 5 minutes 40 seconds | XPS ... Penetrable in 5 seconds

Resource saving Interior finishing material with strength and weight reduction

Foam injection lightweight deck box

The deck is placed on both sides of the automobile luggage area and the part where the tool kit for repairing flat tires and other tools are stored. This was an injection molded article previously made of normal resin, but we now use a resin material containing a chemical foaming agent and have reduced the weight by approximately ten percent while retaining the same strength with the high foaming method by opening the mold a little after filling gas generated by the heat inside the cylinder in the mold. The foaming type usually needs coating due to surface design, but this product does not need any coating and has the same level of design, contributing to improving the operation environment at production.

■Molding process



Environment-friendly products ②

Clean Special resin material using clean supercritical foaming technique

“TURBOFLEXⅡ”, a lightweight and high resilience material for shoes

TURBOFLEXⅡ is a special resin material with low specific gravity and high impact resilience that is manufactured by supercritical injection foam molding without any chemical foaming agents that generate harmful gas. The material is used for the midsole heel of high-performance sport shoes. For example, this material is used for SKY MID/SKY LO volleyball shoes manufactured by DESCENTE LTD. and some players in the V Premier League use these shoes.

“SKY MID”

TURBOLEXⅡ, the material having both high resilience and impact absorption capacity

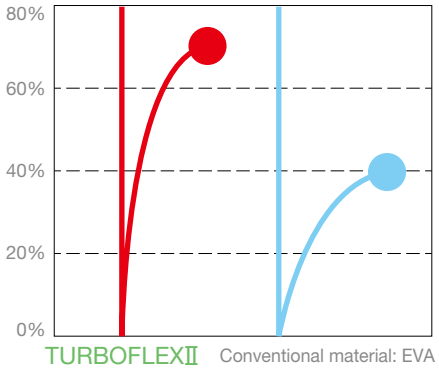
TURBOFLEX is a registered trademark of INOAC Corporation.

Performance comparison with conventional models

Item	Unit	TURBOFLEXⅡ	Conventional material: EVA
Density	kg/cm³	300	130
Impact resilience	%	70	40
C-rigidity	°	53	48
Compression permanent strain	%	49	71

* The values shown above are measures of central tendencies and are not guaranteed values.

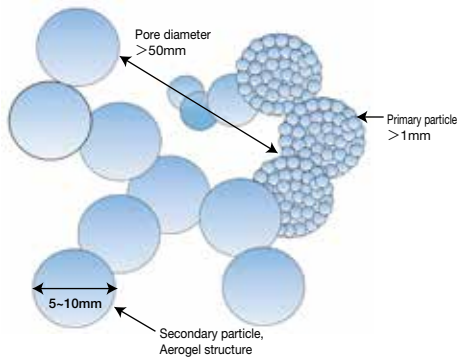
Impact resilience (ball reboundability)



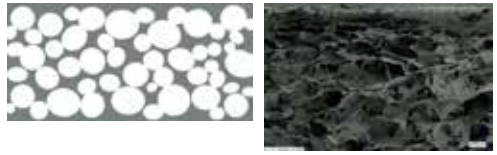
Energy saving Composite with excellence in heat insulation, processability and flexibility

“Flexible aerogel”, a next-generation heat insulating material

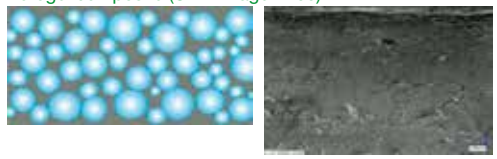
Aerogel is a dried porous gel with low density and high porosity, which is notably weak as a simple substance. Therefore, impregnating a nonwoven fabric base material with it or the like is required for commercialization, as a heat insulation material, due to weak points such as gel falling (powder falling) during use and insufficient heat insulation. Aerogel becomes an excellent product featuring extremely rare powder falling, high heat insulation, processability and flexibility by making a composite (filling in cell) with a special foamed body with a skin layer having a fine cell structure. Aerogel is expected to be utilized in various fields such as automobiles and construction materials in the future.



Micro cellular foamed body, simple substance



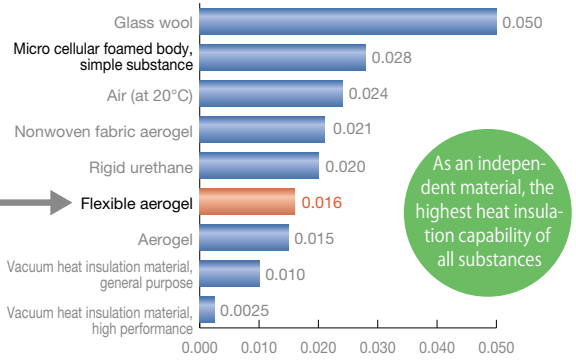
Aerogel composite (SEM image X200)



Adiabaticity

Item	Unit	Foamed body, simple substance	Aerogel composite
Thickness	mm	1.75	1.75
Apparent density	g/cm³	50	200
Thermal conductivity	W/m·K	0.028	0.016

Thermal conductivity (W/m·K)



As an independent material, the highest heat insulation capability of all substances