



<http://www.ogc.co.jp/>

OSAKA GAS CHEMICALS
COMPANY PROFILE

Aiming to be a Sustainable Value Creator

The Osaka Gas Chemicals Group carries the development and growth of the chemical businesses as one of the core companies of the Osaka Gas Group, providing customers with chemical materials and customized solutions.

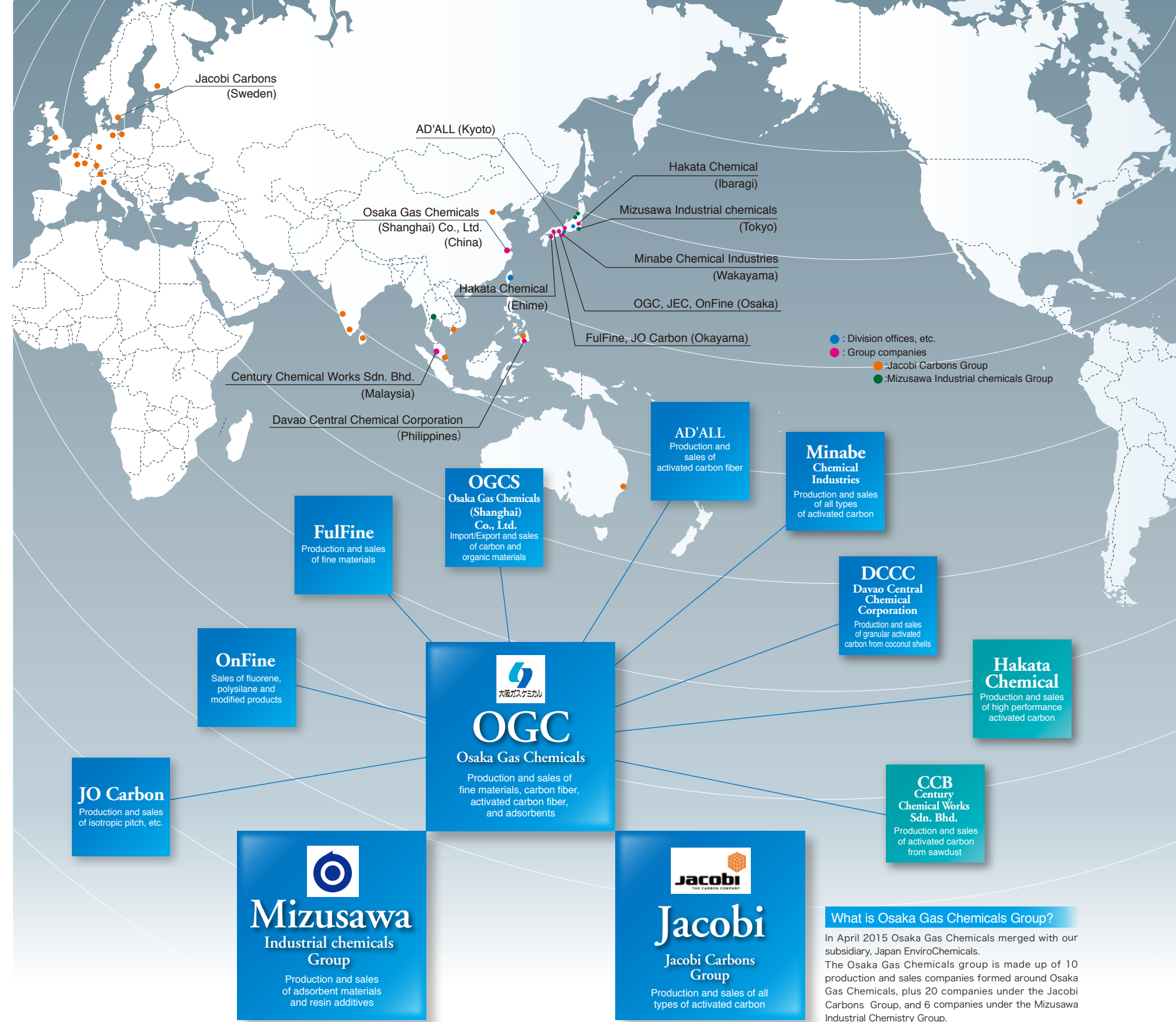
Our materials are based on the original core technologies. The one is Coal Chemistry which was developed by Osaka Gas Co., LTD.. The others are Adsorption technology and Antibiotics technology which were related to Takeda Pharmaceutical Co., LTD.' s medical and agrochemical businesses. We develop, manufacture, and sell materials and components that meet the needs of and are used by a wide range of customers to manufacture products in fields such as new energy, the environment, and electronics.

We acquired the Jacobi Carbons Group, with its global manufacturing and sales of activated carbon in 2014, and the Mizusawa Industrial Chemistry Group, with its manufacturing and sales of fine inorganic materials in 2015. So, we significantly broaden our range of products.

We will continue to develop new products and technologies using our cumulative expertise to match customers' needs and create a better living environment.

Management Principle

We contribute to the enhancement of people's quality of living through the fulfilment of enriched environment and pleasant life by continuing to proactively identify customers' needs and to develop quality products with our unique technology in performance material.



What is Osaka Gas Chemicals Group?

In April 2015 Osaka Gas Chemicals merged with our subsidiary, Japan EnviroChemicals. The Osaka Gas Chemicals group is made up of 10 production and sales companies formed around Osaka Gas Chemicals, plus 20 companies under the Jacobi Carbons Group, and 6 companies under the Mizusawa Industrial Chemistry Group.



OSAKA GAS CHEMICALS GROUP

3E Business areas

New Energy

Development and manufacturing of production equipment components and next-generation materials for new energy products, such as solar and lithium ion secondary batteries.



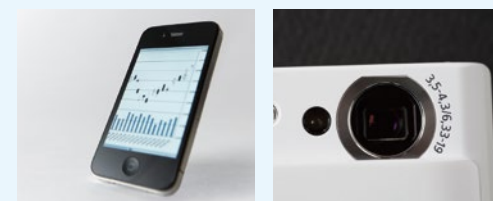
Environment

Development and sales of adsorption purification and applications made purifier, as well as preservatives against deterioration and damage



Electronics Optics

Development and sales of electro-optic materials for high digital equipment such as smart phone, films for liquid crystal displays and semiconductor.



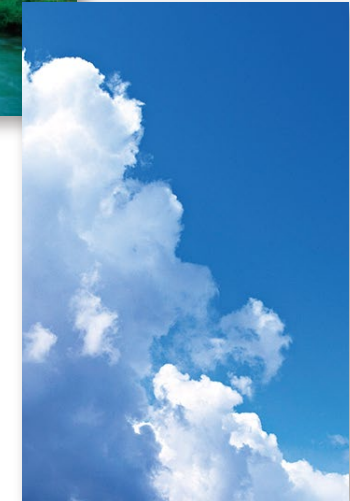
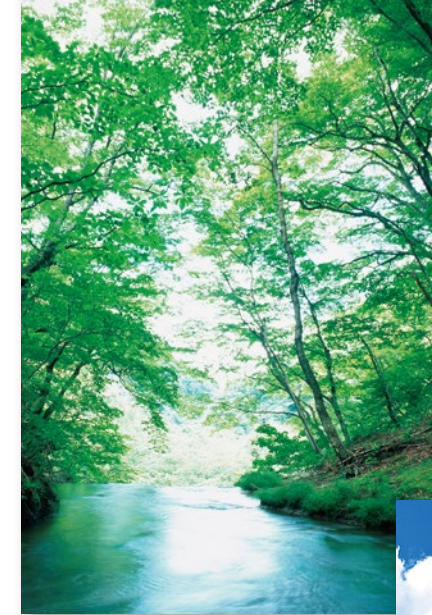
About the Frontier Materials Laboratories

Frontier Materials Laboratories was established in 2013 to further strengthen our research and development functions. This new R&D base will expand our range of business by creating new materials and new technologies in fields that show high growth potential. Also it will strive on an ongoing basis to develop new applications using materials technologies related to each business segment.





Osaka Gas Chemicals is developing the business of functional chemical products to add greater value to our customers' products.



Pursuing the full potential of raw materials

One of the roots of Osaka Gas Chemicals' technology is Coal chemistry technology which was used and developed since Osaka Gas had started to produce utility gas from coal about 100 years ago. We have inherited and developed the technology to produce such materials as pitch-based carbon fiber, activated carbon fiber, DONACARBO[®], and fluorene derivatives, which have excellent properties and are used in such products as insulation, water purifier cartridges, and high performance lens resin, OKP[®].

The other roots are Adsorption technology and Antibiotics technology which were related to Takeda Pharmaceutical Co., LTD.'s medical and agrochemical businesses. We have developed the top brand in Japan of activated carbon, SHIRASAGI[®], along with XYLADecor[®] wood preservative, another flagship product.

We both customize products to match customers' needs and actively develop new products.

We are constantly working to develop wide-ranging applications that utilize the particular strengths of materials and components, and have earned the support of manufacturers around the world as a leading company in the respective industries that we are involved in. At Osaka Gas Chemicals we will continue to use advanced technologies and a rich storehouse of experience to break new ground in the future together with our customers.

Business Areas

Carbon Materials

DONACARB[®] is a pitch-based isotropic (general purpose) carbon fiber made from coal pitch that has excellent properties including heat resistance, abrasion resistance, and electrical conductivity. It is used in a broad range of fields, including as high-temperature furnace insulation and as a friction material.



Fine Materials

Fluorene derivatives made from coal tar excel in optical properties and heat resistance, and are used in many devices familiar to us in our daily lives, for example mobile phone camera lenses, films and color filter for LCD, semiconductor manufacturing process.



Activated Carbon

The activated carbon brand SHIRASAGI[®] is known for its high level of technology, quality, and performance, and is used in a wide range of applications such as in food and medical products, water purification and waste disposal plants, and solvent recycling in factories. We also create customized products from activated carbon to meet customer requests, helping to build pleasant environments.



Preservatives (Wood / Industrial)

XYLADecor[®], XYLAMON[®], and other wood preservatives protect wooden buildings from deterioration and rotting due to exposure to ultraviolet rays, the elements, and termite damage. Our industrial preservatives protect against contamination damage from microorganisms hidden in the production line across a range of industries. Preservatives also add anti-bacterial properties to products as requested by customers.





Utilizing the power of carbon

We develop and deliver products for a broad range of needs with confidence in the limitless potential of carbon.

Carbon Fiber (CF) Materials

DONACARBO is a pitch-based isotropic (general purpose) carbon fiber made from coal pitch that has excellent properties including heat resistance, abrasion resistance, and electrical conductivity. It is used in a broad range of fields, including as high-temperature furnace insulation and as a friction material.



Light weight acoustic insulation for train cars



Light weight insulation

Felt insulation



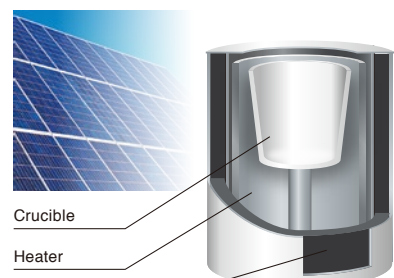
Milled for automobile clutches



Milled



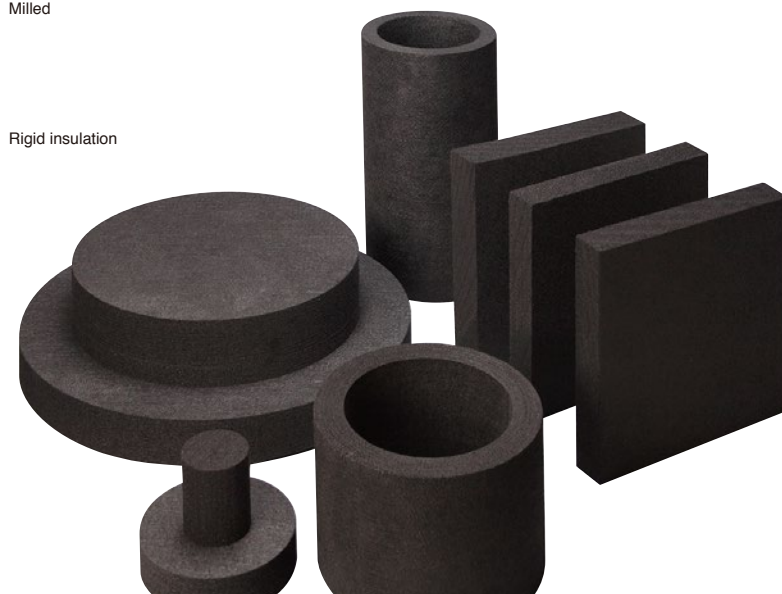
Paper



Crucible
Heater
Rigid insulation

Rigid insulation for silicon melting furnaces used in solar battery production

Rigid insulation



We develop anode materials for electric cars and mobile device lithium ion batteries.

Electrode Material

Osaka Gas Chemicals develops and commercializes anode active materials for lithium-ion batteries based on manufacturing and improvement technologies originally used for coal-derived pitch. Gramax[®], which offers excellent charging and discharging performance, and high-capacity OMAC-R[®] have earned a solid reputation in the field of secondary batteries for mobile phones, hybrid vehicles, and electric vehicles.

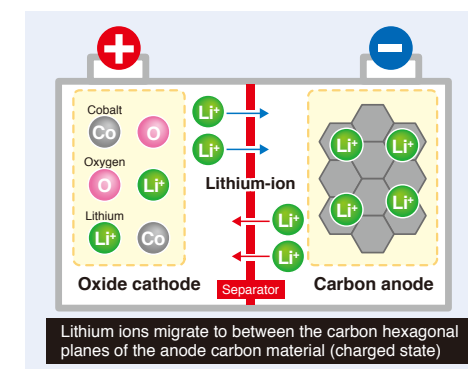
Our activated carbon SHIRASAGI[®] series is widely used for electrical double-layer capacitors (EDLC), which have gained attention recently as supercapacitors. We also customize materials to match customer specifications and meet a variety of needs.



OMAC-R



Gramax



Lithium ion battery diagram



Digital devices



Battery for Electric car

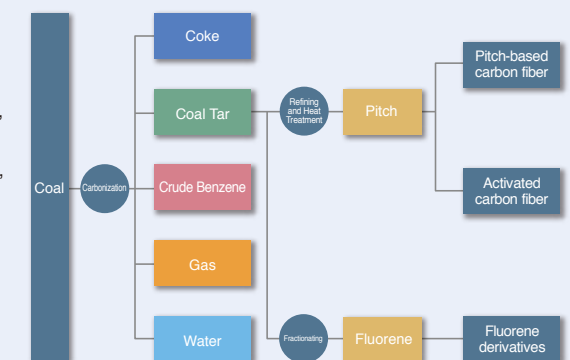
Businesses Developed from Coal

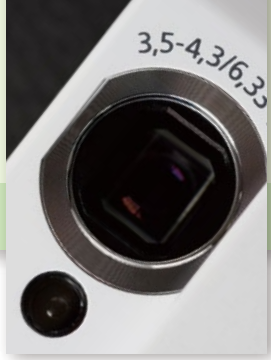
By heating (carbonizing) coal in a sealed state, the coal is separated and resolved into coke, gas, benzene, coal tar and other materials. While coke is used in steel making, gas is used for utility gas, and benzene is used as a chemical, coal tar, being made up of many carbon compounds, can be transformed to coal tar pitch which exhibits excellent properties, and can produce fluorene, which has a unique chemical structure.

Osaka Gas Chemicals is an expert on coal and can bring out all the possibilities inherent in coal.



Process from Coal to Products





Changing the world through the power of materials

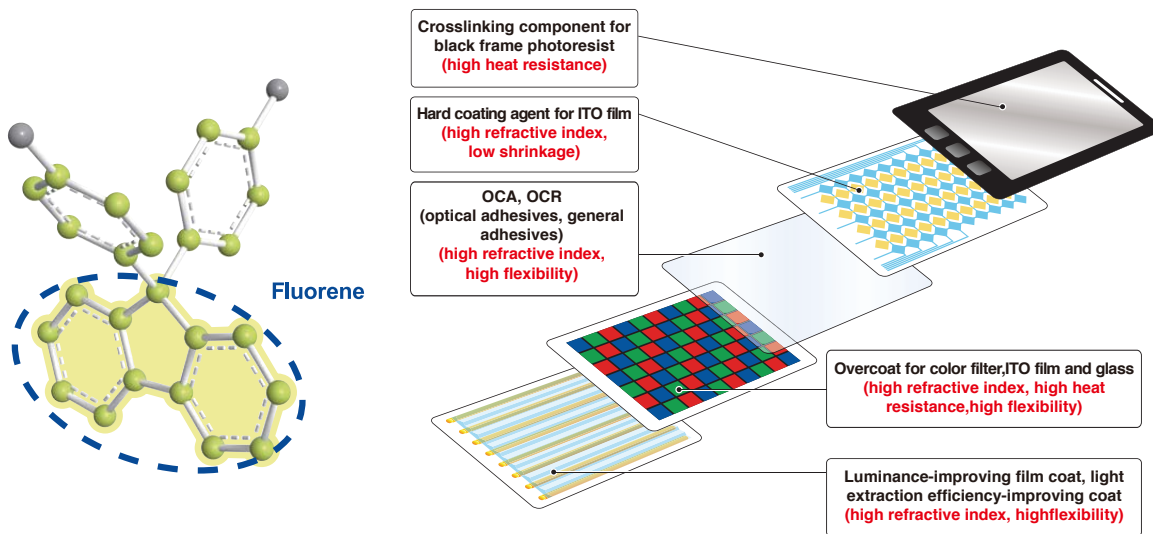
We develop and produce fine chemical materials for various advanced electronics optics technologies including digital household electronics and telecommunication equipment.

Osaka Gas Chemicals' fine chemical materials have been developed and produced through our development of coal tar application technologies, such as synthetic organic chemistry, polymerization technologies, and molding technologies. Starting with specialized chemicals such as fluorene and polysilane, we provide many raw materials with the high refractive indices, high heat resistance, and high photoreactivity needed in sophisticated technologies such as in digital household electronics. Also, with our blending and molding technical platforms, we provide technological solutions for environmental issues and improved productivity.

Fluorene derivatives

Fluorene is a useful component obtained from coal tar. Fluorene derivatives are bonded with the different aromatic rings in fluorene and have a specific hinge-like configuration called a "cardo structure." This structure has high heat resistance, a high refractive index, and low birefringence. As a fluorene pioneer, Osaka Gas Chemicals produces many types of fluorene derivatives.

- ◆ Monomers: Bisphenols and bisalcohols, with a fluorene skeleton—used as a raw material for various types of optical resin.
- ◆ Photo-setting resin acrylates with a high refractive index, high heat resistance, and high hardness—used as a raw material for LCD films, etc., for their superb optical performance.
- ◆ Epoxy resin with a high refractive index, high heat resistance, and high flexibility—used as a raw material for LCD photoresists, etc.



Fluorene derivative cardo structure

Applications of fluorene derivatives in a touch panel

Optical polyester resin (OKP®)

OKP® is a thermoplastic resin with a high refractive index of 1.6 or more and extremely low birefringence. It is used as a high-performance lens material that allows cameras in mobile phones and digital cameras to be made thinner and lighter.



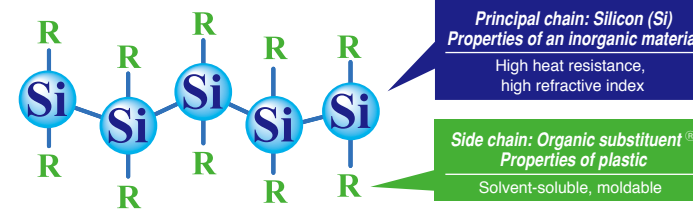
Optical lenses



Digital devices

Polysilane

Polysilane is a material with silicon as its principal chain. Its features include: water repellency, polyolefin resin compatibility, adhesion, flame retardance, heat resistance, resistance to oxidation, a high refractive index, and photoreactivity. It is therefore well suited for such purposes as a film or pipe resin additive, performance enhancer for coating materials, and photoresist material.



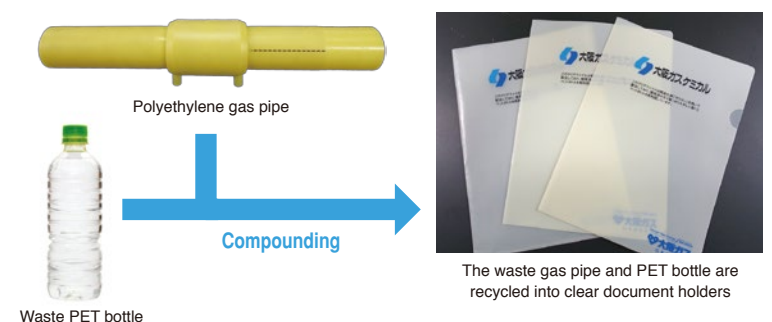
The Structure of Polysilane



Resin pipe

Compatibilizer

The MARICOM® additive helps to compound scrap such as polyethylene and PET films, combining them into a recycled resin with practical physical properties inherited from all sources. It also has applications for compatibilizing filler or additives with resin, making it possible to add functionality to resins.





Clarifying water, Cleaning up air

As a world-class activated carbon manufacturer, we are enhancing people's lives and helping to improve the environment around the world.

Activated carbon plays a vital role in supporting our lifestyles and promoting ecology. It is used in refining processes for producing food, alcohol, and pharmaceuticals. It is a key material used in water purifiers, air purifiers, filters, and other amenities we use in our daily lives. It is used to improve water quality and deodorize at water treatment plants and sewage plants, to remove dioxins at waste treatment plants, and to recover volatile substances at chemical plants.

Osaka Gas Chemicals uses raw materials procured globally (coconut shells, wood flour, coal, etc.), and makes activated carbon in various forms—powdered, granulated, and fibrous. We also produce intermediate products such as filters and finished products up and down the value chain to meet customers' varied needs.

The Trusted SHIRASAGI® Brand

The Osaka Gas Chemicals company DNA is in manufacturing pharmaceuticals, with activated carbon production begun in 1937. Since then we have continued to engage steadily in R&D, resulting in the SHIRASAGI® brand, which represents world-class technological capabilities and experience-based knowledge, and is trusted by customers worldwide.



SHIRASAGI®

The History of SHIRASAGI®

1937: Production and sales under the SHIRASAGI brand of activated carbon are started by Takeda Chemical Industries, Ltd.

2003: Japan EnviroChemicals, Ltd. is spun off as a wholly-owned subsidiary of Takeda

2015: SHIRASAGI becomes an Osaka Gas Chemicals brand through the merger



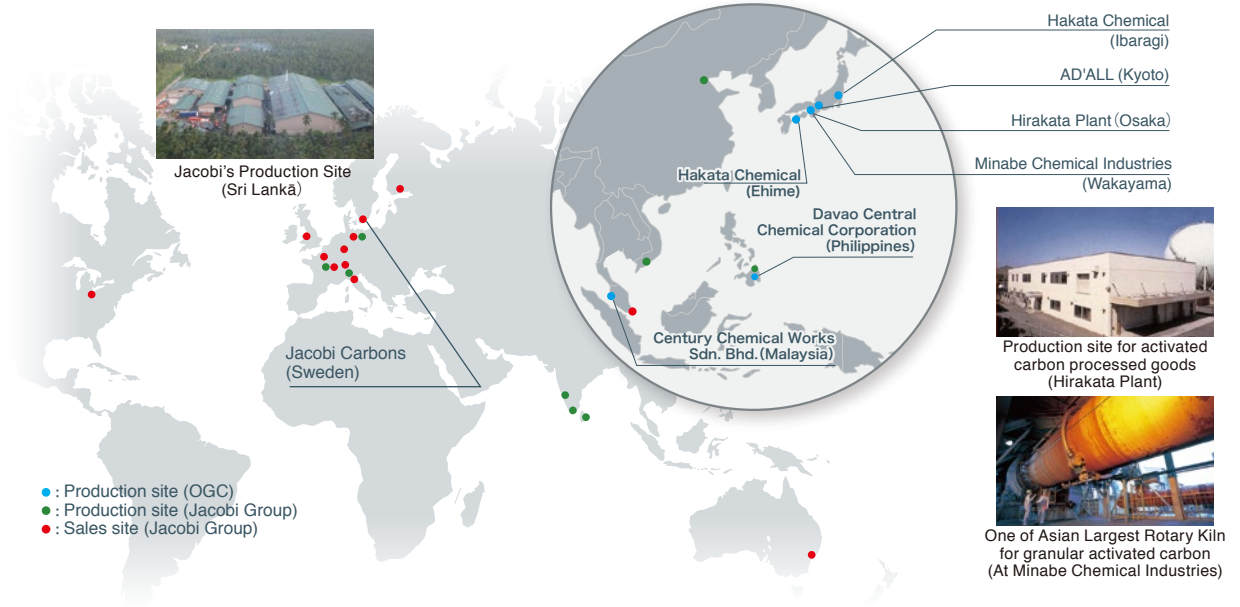
Solutions through Processed Goods

The Osaka Gas Chemicals Group employs first-rate design, compounding, and processing techniques and technologies based on our groups granular activated carbon and fibrous activated carbon meet customer requirements. Applications include household water purifying cartridges, industrial water treatment and solvent recovery, air purifiers, medical and industrial deodorizers, and other water and air cleaning solutions.

A Network that Spans the Globe

We procure raw materials globally in coordination with partner firms in the Philippines and Malaysia, and carry out integrated manufacturing at production sites around Japan to ensure high Japanese standards and the stable supply of high-performance activated carbon at low cost.

By bringing the Jacobi Group into the OGC fold in 2014, we expanded the scale of our activities as a global activated carbon producer, increasing our manufacturing of products that meet global standards to production sites in 10 countries and our customer base to more than 100 countries worldwide.



● : Production site (OGC)
● : Production site (Jacobi Group)
● : Sales site (Jacobi Group)

Hirakata Plant.Osaka Gas Chemicals Co., Ltd.	1-38-1, Deyashiki-nishimachi, Hirakata city,Osaka 573-0003
Minabe Chemical Industries, Ltd.	173-1, Kisato, Minabe-cho, Hidaka-gun, Wakayama 645-0011
Hakata Chemical Co., Ltd.	290, Kinoura Otsu, Hakata-cho, Imabari City, Ehime 794-2305
Hakata Chemical Co., Ltd. (Kanto Plant)	2-1-2, Koyodai, Ryugasaki City, Ibaraki 301-0852
Ad'all Co., Ltd.	Tonouchi-5, Uji, Uji City, Kyoto 611-0021
Davao Central Chemical Corporation(DCCC)	Km.19 Tibungco, Davao City 8000, Philippines
Century Chemical Works Sdn.Bhd.(CCB)	Mk. 1, No. 1026, Lorong Perusahaan Dua, Parai Industrial Complex, 13609 Prai, Proivnc Wellesley, Penang, Malaysia
Jacobi Carbons Group	15 countries worldwide (Sri Lanka, India, Vietnam, Philippines, China, Europe, North America)



Protecting wood, enhancing lives

Keeping wooden structures safe to preserve their beauty.

Preserving our CO2-absorbing forests by carefully conditioning and ensuring the long use of this valuable resource is crucial to achieving a low-carbon society. Wood preservatives help protect the environment by being an effective "potion" for wood which protects wooden buildings against deterioration from ultraviolet rays, the elements, micro-organism rot, and termite damage.

Osaka Gas Chemicals' wood preservatives are trusted brands used widely for private homes and public facilities. They also help to preserve the beauty of and maintain many historic structures, important cultural properties, and national treasures.

Wood Preservative Coatings

The active ingredients of the XYLADDECOR® wood preservative coating exhibit superb anti-rot, anti-fungal, and insect repelling performance by penetrating into wood to protect it from inside while the pigments of excellent weatherability conserve the wood surface against deterioration from UV rays and the elements. XYLADDECOR® improves the durability of wood while maintaining texture, accentuating the beauty of the grain and surface, thereby inspiring the inherent charm of the wood since no coating film is formed on the surface. Furthermore, recoating and maintenance are also made easier.



XYLADDECOR® for professionals



XYLADDECOR® available for do it yourselfers



Hakkoda Hotel (XYLADDECOR®)



Kumamoto Castle (XYLADDECOR® & XYLAMON®)

Termite Control Agent

Advanced preservation techniques and high-performance chemical treatments are essential for making wooden buildings last for posterity. Since the release of our XYLAMON® termite control agent in 1964, the product has been used to preserve numerous structures that have been designated as national treasures or important cultural properties, and we have continued to refine the technologies behind it which minimize risks to humans and the environment. The product we developed for consumer use, TAKELOCK®, is based on our success and expertise with XYLAMON®. Micro-encapsulation and other original formulations were developed to suit various forms of use. We will continue to pursue technical innovation as we strive to help protect wooden buildings—from national treasures and important cultural properties to ordinary homes—from destructive insects and rotting.



TAKELOCK®



XYLAMON®



Itsukushima Shrine (XYLAMON®)

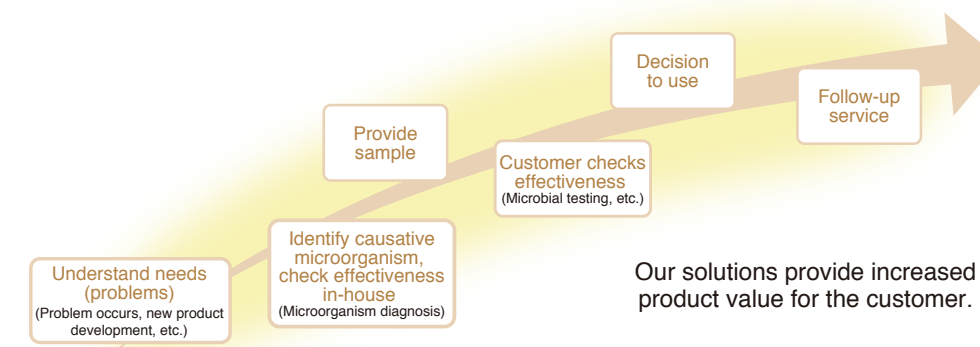


Shuri Castle (XYLAMON®)

Contributing to the art of design and manufacturing

Preserve customer's products from microorganisms and insect pests

Industrial preservatives are used in many fields, from construction materials textiles, papermaking and paints as a way to protect products from microorganisms and insect pests. As chemical agents they add functionality to products such as quality preservation, mold prevention, algae prevention, and insect pests, repellency. Our preservatives are used in coating materials, ink, artists' paints, wallpaper, adhesive agents air conditioning filters, aromatic air fresheners, and many other products. Through these many products we solve specific issues for customers in many fields based on advanced technologies and extensive know-how.



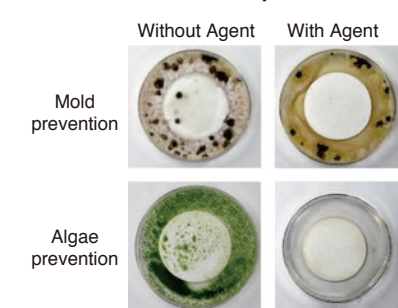
Customization We swiftly provide fundamental and comprehensive solutions to micro-organism-derived damage and contamination issues presented by our customers. We identify the causes, select and combine agents, and verify the efficacy based on systematic experimentation.

Industrial Preservatives

■ Solvent medium or form based on usage



■ Effectiveness of our products



Industrial Antiseptics	Industrial Fungicides	Industrial Fungicides and Algicides	Industrial Germicides	Photocatalytic Deodorizers
For various industries DELTOP® brand has a history of over 40 years. • DELTOP® series • SLAOFF® series • SLOUT® series • SLAMONIE® series	For coatings, building materials and other industries • COATCIDE® series • SLAMONIE® series	For coatings, building materials for exteriors • MONICIDE® series • SLAMONIE® series	For various industries • FRESHMATE® series • SLAMONIE® series	For coatings and building materials to adsorb and decompose ammonia, formaldehyde and other odors. • SEVENTOL® N series



Surface treatment processing

Improving production efficiency.

We propose solutions for our customers and offer most suitable coatings using our state-of-the-art technologies.

Surface processing

On a contract basis we conduct surface processing that gives product surfaces excellent non-adhesiveness, smoothness, sliding properties, abrasion resistance, and corrosion resistance using special coating technologies that combine organic materials such as fluoropolymers and silicone polymers and inorganic materials such as ceramics. Using one of the largest curing furnaces in Japan, we can coat substrates as large as 2.5 x 2.5 x 10 meters. We also employ organic-inorganic hybrid coating materials developed in-house to enable higher performances about non-adhesiveness and sliding property.

Production procedure



Thermal spraying



Coating



Curing



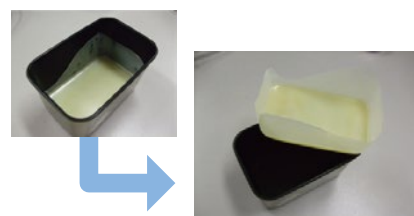
Curing furnace for coating substrates as large as 2.5 x 2.5 x 10 meters

Examples of properties that can be added

Non-adhesive, good sliding, chemical resistant, antistatic, heat resistant, abrasion resistant, and anti-corrosive properties



Industrial adhesive agents or resins can be peeled off easily even after they solidified.



Hot-melt resins can be peeled from vessels easily.



Gum substances can be spread easily

Examples of usage

Industrial rolls (for paper mills, adhesive tape manufacturing, etc.), molds, jigs, hoppers, pipes, tanks, food equipment (griddles), etc.



Industrial Rolls



Grids for gas ovens



Hoppers for powders



OSAKA GAS CHEMICALS

Company Name	Date of Establishment
Osaka Gas Chemicals Co., Ltd.	Company Establishment September 21, 1931 Beginning of Business June 29, 1949

Locations			
Head Office	Domestic Gas Bldg. 2-37, Chiyozaeki 3-chome-minami, Nishi-ku, Osaka 550-0023, Japan	TEL +81-6-4393-0181	FAX +81-6-4393-0191
Tokyo Office	Shibakoen ND Bldg., 2-5-10, Shiba, Minato-ku, Tokyo 105-0014, Japan	TEL +81-3-5444-9888	FAX +81-3-5444-9860
Torishima Technical Center	5-11-61, Torishima, Konohana-ku, Osaka 554-0051, Japan	TEL +81-6-6467-1200	FAX +81-6-6467-1244
Frontier Materials Laboratories	5-11-61, Torishima, Konohana-ku, Osaka 554-0051, Japan	TEL +81-6-6467-1571	FAX +81-6-6467-1604
Hirakata Plant	1-38-1, Deyashiki-nishimachi, Hirakata city, Osaka 573-0003, Japan	TEL +81-72-898-0109	FAX +81-72-898-0136
Nara Surface Technology Center	3977-1, Hari-cho, Nara 632-0251, Japan	TEL +81-743-82-1890	FAX +81-743-82-1922

Business Activities	Capital
<ol style="list-style-type: none"> 1. Production and sale of carbon fiber and its applied material (molded insulators, nonwoven felt, lightweight acoustic insulator) 2. Production and sale of activated carbon, activated carbon fiber and adsorbent (air-conditioning filters, water purifier cartridges, etc.) 3. Production and sale of fine materials (for liquid crystals, optics, and electronics field) 4. Production and sale of wood preservatives, termite control products, and industrial preservatives 	14.2 billion yen (shareholder: Osaka Gas Co., Ltd.)

Employees
About 400

Company history

