



Otsuka

Otsuka Chemical Co., Ltd.



Corporate Profile

Introduction

Message
from
the President

Corporate Philosophy of the Otsuka Group

Otsuka—people creating new products for
better health worldwide

Corporate Philosophy of Otsuka Chemical

Trusted by individuals,

Trusted by the company,

Trust is the dream of our society.

Building trust with technology

and commitment.

Otsuka Chemical's Vision for the Future

Otsuka Chemical is a company that
collaborates with customers to find
creative new ways to utilize advanced
materials.

Takeharu Harashima



President and Representative Director



Otsuka Chemical's corporate philosophy is "Trusted by individuals, trusted by the company, trust is the dream of our society. Building trust with technology and commitment. Spreading trust with the people around the world." Following this philosophy, we have for years now leveraged our original technologies to provide one-of-a-kind, number-one products. As a result, we enjoy the trust of customers and continue to contribute to society.

While coping with constant change, society today faces many global-scale challenges, including issues related to energy, environmental destruction, food, water resources, and climate change. Otsuka Chemical got its start by extracting chemicals from seawater bittern. Our products and technologies benefit from the gifts of nature and are now being used in a variety of industries. By further broadening our perspective from chemistry to other sciences, Otsuka Chemical will continue to create original technologies. Moreover, we will maintain our earnest efforts to address global issues, seeking to ensure that future generations can inherit a healthy planet.

Many of Otsuka Chemical's products make a strong environmental contribution, including compounds which help make plastics recyclable and chemicals which lower the fuel consumption of automobiles. As countries worldwide face nuclear power issues, the "capability of materials" will be essential for developing renewable energies, which will be in even greater demand in the future. Otsuka Chemical aims to work with customers in all kinds of situations, creating new solutions by utilizing advanced materials. By continuing to expand our R&D sites worldwide, we will continue to advance and develop materials that can contribute to a more sustainable world.

"Following the philosophy of our parent company Otsuka Holdings, 'Otsuka—people creating new products for better health worldwide,' the goal of Otsuka Chemical is to contribute to enriched life and health as the Otsuka Group's leader in the field of chemicals."

Overview

Otsuka Chemical Co., Ltd.

Established: August 29, 1950
Capital: 5,000 million yen
President and Representative Director: Takeharu Harashima
Head Office: 3-2-27 Ote-Dori, Chuo-Ku, Osaka 540-0021, Japan
Employees: 541 (as of December 2015)
Net sales: Consolidated*: 60,351 million yen (FY2015)
Non-consolidated: 29,240 million yen (FY2015)

* The consolidated figures have been calculated using data from Otsuka Chemical Co., Ltd. and its subsidiaries (including overseas affiliates), and have not been audited.



Head Office

Locations

Head Office
3-2-27 Ote-Dori, Chuo-Ku, Osaka 540-0021, Japan
TEL: +81-6-6943-7701

Tokyo Headquarters
2-2 Kanda-Tsukasamachi, Chiyoda-ku, Tokyo 101-0048, Japan
TEL: +81-3-5297-2727

Central R&D & Performance Compound R&D Laboratory, Corporate R&D HQ
Kagasuno 463, Kawauchi-cho, Tokushima-shi, Tokushima 771-0193, Japan
TEL: +81-88-665-1689

Tokushima Factory
Kagasuno 463, Kawauchi-cho, Tokushima-shi, Tokushima 771-0193, Japan
TEL: +81-88-665-1516

Matsushige Factory
139-40 Aza-toyohisakaitaku, Toyohisa, Matsushige-cho, Itano-gun, Tokushima 771-0213, Japan
TEL: +81-88-699-7980

Tokushima Factory
Kagasuno 463, Kawauchi-cho, Tokushima-shi, Tokushima 771-0193, Japan
TEL: +81-88-665-1516

Otsuka Chemical Group

Otsuka-MGC Chemical Company, Inc.

Established: April 1, 2004
Capital: 450 million yen
Address: 3-5-29 Kitahama, Chuo-ku, Osaka-shi, Osaka 541-0041, Japan

TEL: +81-6-4706-7562
FAX: +81-6-4706-7564
Business description: Manufacture and marketing of hydrazine hydrate

Otsuka-MGC Chemical Company is the largest maker of hydrazine hydrate in the world and the only company that makes it in Japan. The company was created by spinning off and merging the hydrazine businesses of Mitsubishi Gas Chemical Company, Inc. and Otsuka Chemical Co., Ltd. in April 2004. In addition to its main applications in water treatment, chemical foaming agents, and agricultural chemicals, hydrazine hydrate is now being used in a broader range of fields including electronics, healthcare, power plants, plastics, and chemicals. It is becoming increasingly important as a product indispensable for maintaining today's safe and prosperous lifestyles. The company is proud of its position and responsibilities as the top global manufacturer of hydrazine hydrate, and it will strive to expand its business into new fields while continuing to contribute to the environment and energy sectors.



Higashiyama Film Co., Ltd.

Established: May 1949
Capital: 1,087 million yen
Address: 1-2460 Kanenawate, Nakashidami, Moriyama-ku, Nagoya, Aichi 463-0002, Japan

TEL: +81-52-736-0473
FAX: +81-52-739-1500
Business description: Processing of industrial films

Established in 1949, Higashiyama Film has a history of more than half a century. It started by making paper-covered wire for electric fan motors and transformers, and then moved on to molding polyester film, using equipment developed in-house. Today, the company provides new materials with high added value by adding to the functionality of polyester film, such as film coatings with optical properties used to make touch panels.

Based on a history of trust, Higashiyama Film is meeting customer needs through its ability to select materials in cooperation with raw material manufacturers, its technology for film processing using equipment developed in-house, as well as its human resources and field experience necessary to realize this expertise.



ILS Co., Inc.

Established: May 20, 2003
Capital: 100 million yen
Address: 1-2-1 Kubogaoka, Moriya-shi, Ibaraki 302-0104, Japan

TEL: +81-297-45-6342
FAX: +81-297-45-6353
Business description: Manufacture and marketing of peptides, pharmaceuticals, and functional foods

Aiming to be a company that can contribute to the development of the life sciences and healthy lifestyles, ILS is pursuing product development that utilizes biological component extraction, separation and purification, as well as peptide synthesis technology. The company will continue developing and manufacturing products in both the pharmaceutical and health food fields to help maintain and promote health.



Agribest Co., Ltd.

Established: September 1, 2003
Capital: 80 million yen
Address: 25 Nishihara, Kagami, Ichiba-cho, Awa-shi, Tokushima 779-0301, Japan

TEL: +81-883-36-6201
FAX: +81-883-36-6202
Business description: Manufacture and marketing of agricultural crops

Agribest was established to provide consumers with fresh and delicious agricultural products that make the most of the power of nature and can be clearly traced back to the farms of origin. The company offers consumers safe and reliable agricultural products with excellent quality and at a good price. Through crop production using the latest cultivation techniques, Agribest provides reliability to both consumers and farmers, while also pursuing earnings growth.



Otsuka Foods Co., Ltd.

Established: May 19, 1955
Capital: 1,000 million yen
Address: 3-2-27 Otedori, Chuo-ku, Osaka-shi, Osaka 540-0021, Japan

TEL: +81-6-6943-7755
FAX: +81-6-6943-7745
Business description: Manufacture, marketing, and import of foods and beverages

Otsuka Foods creates high value-added products, such as Bon Curry, to support new lifestyles while opening up new markets. In addition to compliance with Japan's Food Sanitation Act, the company has its own safety standards, and uses strict production and quality controls in its manufacturing processes. With a commitment to good food and an unwavering approach to quality and peace of mind, Otsuka Foods is committed to great taste, safety, reliability and health. It will continue to make products with value that win the hearts of customers.



Otsuka Ohmi Ceramics Co., Ltd.

Established: July, 1973
Capital: 300 million yen
Address: 3-2-21, Ote-Dori, Chuo-Ku, Osaka, 540-0021, Japan

TEL: +81-6-6943-6695
FAX: +81-6-6943-6487
Business description: Planning, design, production and installation of ceramic products

Since its foundation in 1973, Otsuka Ohmi Ceramics has offered a product lineup in three main categories—large ceramic boards, terracotta, and OT ceramics—with a wide array of products to satisfy our customers' needs, from flat and three-dimensional art materials to architectural pieces and decorative works for living spaces. Utilizing our highly acclaimed reproduction techniques, we have worked to document and preserve valuable cultural heritage on ceramic boards, which includes full-scale restorations of the murals found in the ancient Kitora burial mound. At the Otsuka Museum of Art, Otsuka Ohmi Ceramics has reproduced more than 1,000 pieces of art to their original size using ceramic boards.



Otsuka Turftech Co., Ltd.

Established: March 12, 2007
Capital: 20 million yen
Address: 1256 Shimomatsu-cho, Kishiwada-shi, Osaka 596-0823, Japan

TEL: +81-72-427-4781
FAX: +81-72-426-0597
Business description: Manufacture and marketing of artificial turf, and artificial clay for tennis courts

With the aim of making even better artificial turf products, Otsuka Turftech carries out continual research from the standpoint of athletes and facility operators. As Japan's top artificial turf maker, the company has an extensive track record with installations in indoor and outdoor sports facilities, including stadiums and tennis courts across the country. It has also created G-CLAY, a next-generation artificial clay for tennis courts, developed especially for the Japanese climate. This product has been certified by the Japan Soft Tennis Association. The use of G-CLAY for the Maruyama Park tennis courts in Hokkaido in 2012 has been the trigger for its use in a variety of places, and it has been decided to use G-CLAY for 20 courts for the 70th National Sports Festival in Wakayama. Otsuka Turftech is now working to further expand sales of G-CLAY.



New-generation artificial clay for tennis courts

Otsuka Chemical maintains a worldwide network in 8 countries gaining trust globally.

Since establishing a company to manufacture and market hydrazine in South Korea in 1988, Otsuka Chemical has established production and marketing bases around the world. These companies strive every day to earn respect as good corporate citizens in their respective countries and communities.

Bases Outside Japan



① KOC Co., Ltd.

Established: November 2, 1988
Capital: W150billion
Address: 67-34,Jijn-ro,Onsan-eup, Ulju-gun,Ulsan,44998,Korea
TEL: +82-52-240-1200
FAX: +82-52-238-5886
Business description: Manufacture and marketing of hydrazine
URL: <http://www.ikoc.co.kr>



② Higashiyama (Shanghai) Function Film Co., Ltd.

Established: December 29, 2005
(capital invested November 13, 2014)
Capital: US\$2.83million
Address: 2831 Jia-hang Road, Jiading District, Shanghai, P.R. China
TEL: +86-21-5995-9408
FAX: +86-21-5995-9407
Business description: Processing and marketing of functional film

③ Higashiyama Film Korea Co., Ltd.

Address: #802, ITTO Tower, 1456, Guwol-dong, Namdong-gu, Incheon-City, 21573 Korea

④ Higashiyama Film (Taiwan) Techo, Co, Ltd.

Address: 5F-3 NO.2 Sec.4,Zhouyang Rd.,Tucheng Dist.,New TaipeiCity236,Taiwan



⑤ P.T. Lautan Otsuka Chemical

Established: July 17, 1989
Capital: US\$22.5million
Address: Graha Indramas, 5th floor Jl. AIP II K.S. Tubun Raya No. 77, Jakarta 11410 Indonesia
TEL: +62-21-5367-1251
FAX: +62-21-5367-1250
Business description: Manufacture and marketing of foaming agents
URL: <http://www.loc.co.id/>



⑯ Otsuka Chemical America, Inc.

Established: February 6, 2014
Capital: US\$22million
Address:100 The Lakes Parkway, Griffin GA 30224 USA
TEL: 678-572-4665
Business description: Manufacturing and selling Terraceas (fiber-free potassium titanate)



⑰ Otsuka Chemical do Brasil Ltda.

Established July 11, 1997 (acquired February 28, 2007)
Capital: R\$33.21million
Address: Rua do Paraíso, 45 - Conj. 31 ZIP 04103-000 - Paraíso - São, Brazil
TEL: +55 11 4306-0001
FAX: +55 11 2368-6373
Business description: Manufacture and marketing of polyolefin foams
URL: <http://www.otsukachemical.com.br/>



⑥ Hebron S.A.

Established: November 22, 1961
Capital: € 329,000
Address: Graha Indramas, 5th floor Jl. AIP II K.S. Tubun Raya No. 77, Jakarta 11410 Indonesia
TEL: +34-93-574-2011
FAX: +34-93-560-1559
Business description: Manufacture and marketing of general chemicals, especially resin additives
URL: <http://www.hebronsa.es/index.php/en/>



⑦ Trocellen Iberica S.A.

Established: December 29, 1988
Capital: €6.66million
Address: Avda. Avilla, s/n E-28804, Alcala de Henares, Madrid, Spain
TEL: +34-91-885-5500
FAX: +34-91-885-5501
Business description: Manufacture and marketing of polyolefin foams
URL: <http://zjg.otsukac.com.cn>



⑧ Zhangjiagang Otsuka Chemical Co., Ltd.

Established: October 26, 2004
Capital: US\$15million
(capital invested July 31, 2006)
Address: No. 33, Nanhui Road, Jiangsu Yangtzejiang International Chemistry Industrial Park, Zhangjiagang City, Jiangsu 215635, China
TEL: +86-512-5690-7600
FAX: +86-512-5690-7616
Business description: Manufacture and marketing of flaky titanate and special compounds
URL: <http://zjg.otsukac.com.cn>



⑨ Otsuka Material Science & Technology (Shanghai) Co., Ltd.

Established: March 21, 2013
Capital: RMB10million
Address: 1st Floor, #10 Building, No.471 Guiping Road, Xuhui District, Shanghai 200233, China
TEL: +86-21-6091-7675
FAX: +86-21-6191-2937
Business description: Research and development, and assessment of high-valued-added compounds and combination agents



⑩ Noble Skill Limited

Established: February 27, 2004
(capital invested January 10, 2014)
Capital: HK\$28.14million
Address: 503A Westlands Centre, 20 Westlands Road, Quarry Bay, Hong Kong.
TEL: +852- 2861-0995
Business description: Resin, Resin parts and Assembling parts



⑪ Otsuka South China Precision Instruments(Shenzhen) Co., Ltd.

Established: November 13, 2011
(capital invested January 10, 2014)
Capital: RMB6.22million
Address: Block B10, A-5 District, Tongfuyu Industrial Zone (Buchong), Shajing, Baoan, Shenzhen, Guangdong, China
TEL: +86-755-8144-4001
FAX: +86-755-8144-4008
Business description: Manufacture and sale of plastic precision parts
URL: <http://www.otsukaindia.com/>



⑫ Otsuka Chemical India Ltd.

Established: January 2, 2006
Capital: Rp365million
Address: 416 JMD Pacific Square, Sector-15, Part-II, Near 32nd Mile Stone Gurgaon-122001 Haryana India
TEL: +91-124-4597979
FAX: +91-124-4597980
Business description: Manufacture and marketing of pharmaceutical intermediates
URL: <http://www.otsukaindia.com/>

Subsidiaries Outside Japan

Aiming to Earn Global Trust

Since establishing a company to manufacture and market hydrazine in South Korea in 1988, Otsuka Chemical has established production and marketing bases around the world. The company is striving each day to enhance its reputation as a good corporate citizen in countries and territories worldwide.

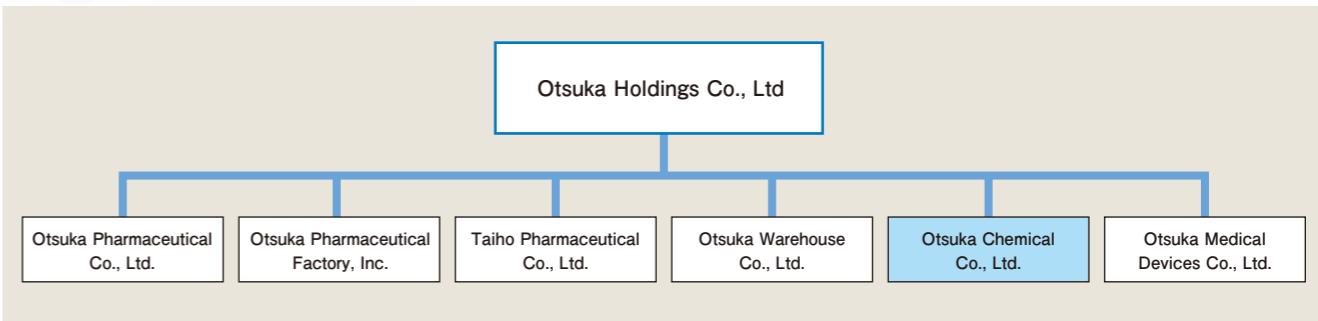


Otsuka Group

In keeping with its corporate philosophy of "Otsuka-people creating new products for better health worldwide," the Otsuka Group endeavors to create new and innovative products in diverse areas related to health, as a global healthcare company devoted to better health worldwide. After its founding in 1921 in Naruto, Tokushima Prefecture, as a manufacturer of chemical raw materials, the Otsuka Group entered the pharmaceutical industry with I.V. solutions, and built its business across Japan. In the 1970s, it launched its own drug discovery research, while expanding into other parts of Asia. Today, the Group's business is focused on pharmaceuticals such as prescription medications, and nutraceuticals such as the nutritional drink Oronamin C and the ion supply beverage Pocari Sweat. The Otsuka Group is promoting activities worldwide as a company that supports total healthcare needs.

III Group Organization

(as of end of December, 2015)



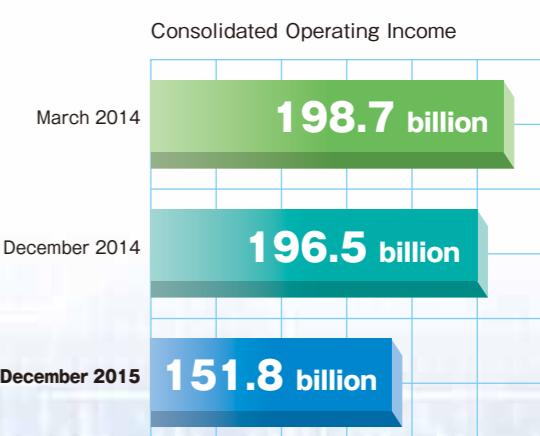
III Number of Base Locations and Employees

(as of end of December, 2015)

	Companies	Factories	Research Institutes	Employees
Worldwide	178	194	48	Approx. 47,000
Japan	49	54	25	Approx. 18,000
Outside Japan	129	140	23	Approx. 29,000

III Group Performance (Consolidated)

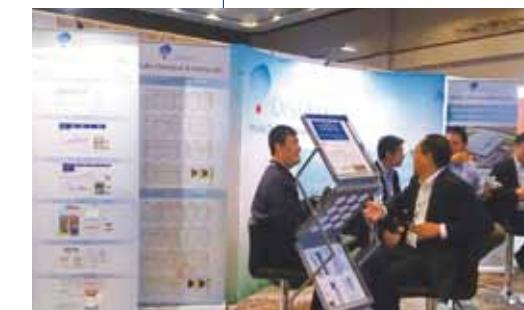
(as of end of December, 2015)



Otsuka Chemical has continued to grow by living up to the trust of its customers through technology and heartfelt commitment.

Since its founding in 1950, Otsuka Chemical has won the trust of numerous customers as a top manufacturer and marketer of chemical products. Going forward, Otsuka Chemical will pursue further growth as a core company in the Otsuka Group.

1950	Otsuka Chemicals Inc. established. Manufacture and marketing of potassium nitrate and hydrazine started. Tokushima Factory (present-day Naruto Factory) established.	1984	Merged with Otsuka Furniture Co., Ltd. Capital increased to 2.8 billion yen. Furniture division established. Company name changed to Otsuka Chemical Co., Ltd.	2002	Otsuka Food Co., Ltd., made a subsidiary through share exchange. Capital increased to 3.3 billion yen. Company name changed to Otsuka Chemical Holdings Co., Ltd. Moved to an operating holding company structure. Otsuka Chemical Co., Ltd., established to take over the chemicals and agrochemicals business Otsuka Furniture MS Co., Ltd. established to take over the furniture business	2009	Otsuka Chemical Holdings merges with subsidiary Otsuka Chemical, and company name changed to Otsuka Chemical. Became a wholly owned subsidiary of Otsuka Holdings Co., Ltd., through a share exchange.
1956	Uniform AZ foaming agent launched.	1988	Otsuka Chemical Korea Co., Ltd. (Present KOC Co., Ltd) established.	2003	Agribest Co., Ltd., established.	2010	AgriTechno business became independent and established Otsuka AgriTechno Co., Ltd. (Present OAT Agro Co., Ltd.)
1965	Oronamin C Drink launched. (Note: Otsuka Pharmaceutical Co., Ltd., markets Oronamin C Drink at present.)	1989	P.T. Lautan Otsuka Chemical (Indonesia) established. Hebron S.A. (Spain) acquired.	2004	Otsuka-MGC Chemical Company, Inc., established. Zhanjiagang Otsuka Chemical Co., Ltd., (China) established.	2011	Otsuka Holdings listed on the First Section of the Tokyo Stock Exchange.
1968	Production and marketing of Bon Curry started. (Note: Otsuka Foods Co., Ltd., markets Bon Curry at present.)	1990	Antibiotic intermediate GCLE launched.	2006	Otsuka Chemical India Ltd. (India) established. Capital invested in Trocellen Iberica S.A. (Spain).	2013	The 90th anniversary of the Otsuka group.
1969	Imaire Factory (now Tokushima Factory) opened. Capital increased to 2.4 billion yen.	1991	β -Lactamase inhibitor YTR bulk drug manufacturing facility completed.	2007	Otsuka Chemical do Brazil Ltda. established.	2014	Otsuka Chemical Co., Ltd. established Otsuka Material Science & Technology (Shanghai) Co., Ltd. (China)
1974	Hydrazine manufacturing equipment increased.			2008	Ito Life Science Co., Ltd., (now ILS Inc.) acquired.	2015	Noble Skill Limited (Hong Kong) acquired. Otsuka South China Precision Instruments (Shenzhen) Co., Ltd. acquired. Otsuka Turftech Co., Ltd. became a subsidiary. Otsuka Chemical America Inc. established. TERPLUS production facility completed at Tokushima Factory. Higashiyama Film Co., Ltd., Higashiyama (Shanghai) Function Film Co., Ltd., and Higashiyama Film Korea Co., Ltd. acquired.
1977	Food additive (flavoring agent) Maltol launched.						TERRACESS production facility completed at Otsuka Chemical America Inc..
1978	Potassium titanate fiber TISMO launched.	2000	Matsushige Factory opened. Advanced titanate products TERRACESS launched.				



Chemical Business Based on a Division System

Chemical
Solutions
Business

Otsuka Chemical succeeded in establishing Japan's hydrazine industry.

With a focus on hydrazine derivatives, and using advanced synthesizing technologies, it provides high-performance polymers and functional chemicals that can meet a wide range of needs.

Otsuka Chemical is developing its inorganic salts business with a focus on pharmaceutical salts, which the Otsuka Group has long produced. As a top hydrazine manufacturer, Otsuka Chemical produces hydrazine derivatives, foaming agents and azoic catalysts to meet customer needs from the lab to the factory scale.

In its high-performance polymer (TERPLUS) business, Otsuka Chemical developed original catalysts for living radical polymerization, and then constructed a dedicated manufacturing facility for this product. It is being adopted for a wide range of applications including dispersants and adhesives.



Material
Solutions
Business

Otsuka Chemical carries out original R&D and manufactures new materials and resin compound materials especially in the fields of organic and inorganic materials.

Along with the organic and inorganic material fields, the company is researching, developing and manufacturing distinctive advanced materials and compound materials. In the organic material field, it is developing reactive UV absorbers and the non-halogen flame retardant Phosphazene. In the inorganic materials field, development is focused on ceramic materials used for brakes, resin reinforcing, and electrical conduction. This material R&D is advancing from the micro level to the nano level. The company is also researching and developing various functional compound materials with sliding, precision reinforcing, conductive, dielectric and other properties.



Chemical
Science
Business

Otsuka Chemical is highly regarded worldwide for its development and manufacturing of pharmaceutical intermediates, reagents, and bulk drugs using proprietary technologies.

Otsuka Chemical is highly regarded worldwide for its development and manufacture of medical and agrochemical intermediates, synthesis reagents, and bulk drugs using proprietary technologies.

Otsuka Chemical researchers independently developed GCLE, an intermediate for cephalosporin antibiotics. Building on the technology accumulated during that process, the company is undertaking R&D into β -Lactam and other medical and agrochemical intermediates and bulk drugs. The company also manufactures aromatic compounds and their derivatives as well as other pharmaceutical intermediates, synthetic reagents, and more. These product lines are highly regarded worldwide not only in the pharmaceutical field, but also in a wide range of other areas such as electronic materials, cosmetic intermediates, and food flavor ingredients.

In 2006, the company established Otsuka Chemical India, which is now a manufacturing plant for GCLE.



By focusing on advanced materials and always pursuing technological innovation, Otsuka Chemical aims to create products that help realize more prosperous lifestyles. Centered on hydrazine, inorganic materials, compound materials, and pharmaceutical intermediates, the company provides products globally in the fields of automobiles, electrical and electronic products, housing, and medicine.

Main Products

Potassium nitrate



Sodium chloride



Hydrazine dihydrochloride



ADH



CHEMCATCH



TERPLUS



Inorganic salts

- Potassium nitrate, potassium chloride, magnesium chloride, sodium chloride, and more.

Foaming agent for resin

- Unifoam AZ, Blended Foaming Agents, Inorganic Foaming Agents

Hydrazine hydrate

- Hydrazine hydrate derivatives (hydrazine salts, dihydrazide compounds, heterocyclic compounds)
- * Otsuka-MGC Chemical Company manufactures and markets hydrazine hydrate.

- ADH, DDH, SDH, IDH, and more (resin curing, cross-linking agents)

● CHEMCATCH (deodorizers)

Rust Preventive Agents

- SHADAN (corrosion inhibitors, detergents, surface preparation agents)
- High performance polymer

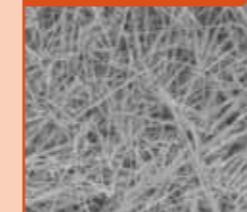
- TERPLUS (dispersant and pressure sensitive adhesive)

Azo type initiators

- AIBN, ADVN, AMBN, ACVA, and others (Azoic radical polymerization initiator for resin)

Main Products

TISMO



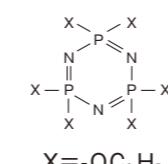
TERRACESS



POTICON



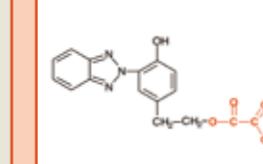
Phosphazene



Q-CHARGE



RUVA



Advanced materials

- TISMO (staple material for disk brake pads)
- TERRACESS (scale-like filler, raw material for next-generation disk brake pad)
- Phosphazene (non-halogen flame retardant)
- RUVA (reactive ultraviolet absorbing agent)

Compound materials (resin compounds with TISMO or TERRACESS)

- POTICON (high rigidity, surface characteristics, tribological characteristics)
- POTICON for films

Electric double layer capacitors (EDLC)

- Q-CHARGE (electrolyte for use in capacitor)

Azo-type initiators

Main Products

GCLE



Piromatol



Piromatol E



PHME



1,2,3-Triazole



Levulinic acid



β -Lactam compounds (antibiotic intermediates)

- GCLE and other custom-made compounds

Aromatic-related compounds (pharmaceutical intermediates)

- PHME, PHEP, PHPA
- Levulinic acid

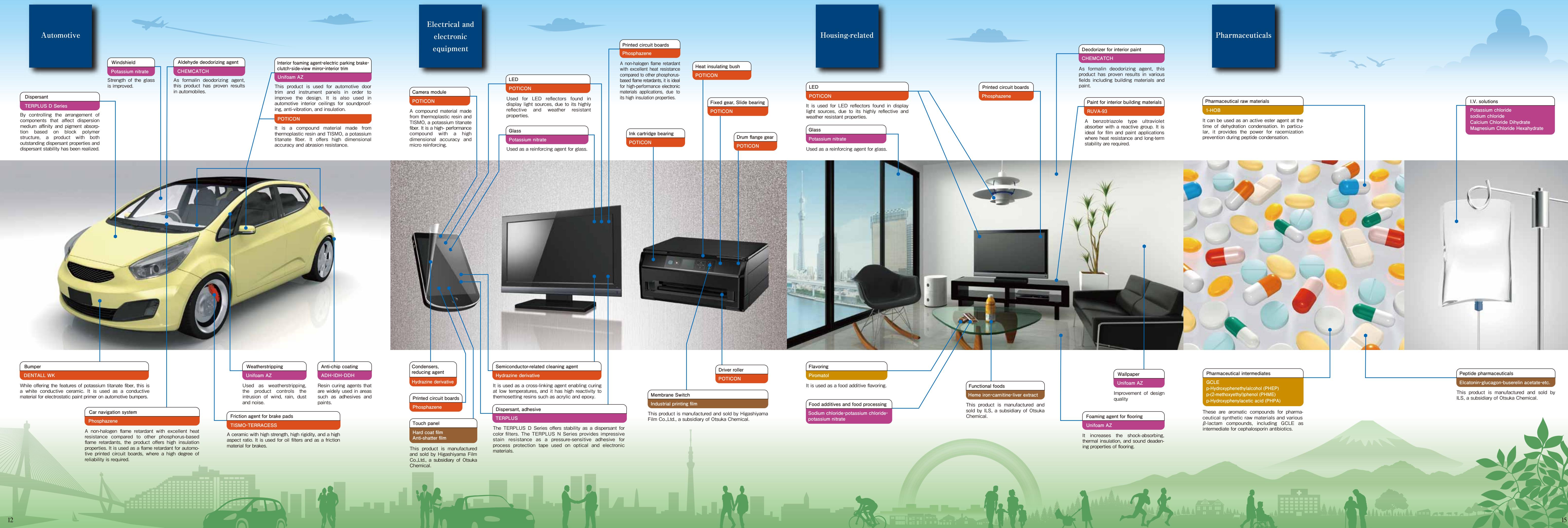
Pharmaceutical-related synthetic compounds

- 1-HOB (dehydration condensing agent)
- 1,2,3-Triazole

Flavor-related compounds

- Piromatol, Piromatol E (Maltol)"

With a focus on enhancing people's lifestyles and health, the products of Otsuka Chemical are used in the many different scenes of everyday life.



Focusing research and development on creating the products the world needs

The research and development sections of Otsuka Chemical research and develop products for the global market using world-class technology, under the motto of "contributing to the customer using innovative technology." The organization includes the Central R&D and Performance Compound R&D Laboratory and the Technology Development Department. The labs' experiments range from basic research, to mid-stage research trial manufacturing, to applied research.

III Central R&D



Otsuka Chemical conducts research and development that contributes to society by creating core technologies, building confidence in technologies, and achieving sustainable development.

The Central R&D Laboratory aims to develop innovative, one-of-a-kind products through research and development from the perspectives of new market needs and technology seeds. These efforts are based on elemental technologies in the organic and inorganic fields developed in past research activities in the areas of polymeric materials, inorganic materials, and functional organic materials, as well as on core technologies acquired through product development. To achieve its goal, the laboratory also makes the most of external resources—domestic and worldwide, which helps to accelerate development, rather than relying solely on in-house resources.

In the area of polymeric materials, the Central R&D Laboratory is developing high-performance polymers using living radical polymerization technology. The newly developed TERP method, which is living radical polymerization technology, has the features of high-functional group tolerance and broad versatility that can be adapted for a variety of monomers and high-level molecular weight control. This technology is being used to develop high-performance polymers with completely new properties.

Inorganic function materials research is focused on the development of ceramic materials for friction material applications such as titanate. The Central R&D Laboratory is conducting research and development of derivatives and, with development moving from the micro level to the nano scale, materials with new functionalities.

In the area of functional organic materials, Otsuka Chemical is developing the nitrogen chemistry expertise it built in its hydrazine business, one of its foundational businesses, and it is also developing materials for next-generation power storage devices. The company is also developing elemental technology called chemical substance design built up in pharmaceutical intermediates and is conducting research and development not only for pharmaceutical purposes but also for chemical products on request.

In line with Otsuka Chemical's aim of becoming a company that collaborating with customers to find creative new ways to utilize advanced materials, the Central R&D Laboratory aims to create technologies and products that will serve as the basis for this.



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TEL: +81-88-665-1689 FAX: +81-88-665-6331



III Performance Compound R&D Laboratory

LED devices, printers, smartphones... Virtually limitless potential for application

Performance Compound R&D Laboratory develops tailor-made plastic compounds based on potassium titanate fiber (TISMO). The laboratory works with customers to consider the issues they face and offer solutions.

POTICON utilizes the functions of TISMO and is widely used in familiar applications such as precision parts in wristwatches and smartphones and the mechanism element in printers and automobiles. The scrap from injection molding, such as sprues and runners, is also recyclable, contributing to the achievement of zero emissions.

In recent years, the laboratory has moved beyond the development of pellets (materials) and expanded its business domain to films and injection molding parts, putting into practice the aim of collaborating with customers to find creative new ways to utilize advanced materials. The laboratory intends to provide a one-stop solution and remain a presence trusted by customers.



III Technology Development Department, Production Headquarters

Creating Competitiveness in the Global Market through Development and Production

The Technology Development Department plays an active role with a mission to maintain the expansion of existing businesses by pursuing constant innovation. As the company's products are manufactured and sold both in and outside of Japan, the department's platform of activity has also expanded worldwide. Customers around the world have diverse needs, but the need for "high quality, low cost and stable supply" is universal. The department's greatest mission is to meet these needs while competing with the company's rivals in the global market.

Its strength lies in the integration of organic, inorganic and advanced material products as well as engineering and equipment maintenance. By bringing together engineers from different fields, the department is strengthening the innovation capacity of production sites as well as product competitiveness in ways that would not have been possible simply by expanding the former structure, as well as pursuing research and development themes aimed at future commercialization.

In addition, it is developing processes which are innovative and safe, in the name of "Ensuring safety through safe processes and safe equipment." The Technology Development Department is committed to strong manufacturing in every area, and its goal, going forward, is to deliver the company's products to the global market together with a high level of trust.



III The Living Radical Polymerization Technology (TERP method) Patented by Otsuka Chemical

Otsuka Chemical has been conducting research and development with a group led by Professor Shigeru Yamago of Kyoto University on the TERP method. *2 *3 *4

Living radical polymerization (LRP) can avoid the termination reaction of the radical polymerization scheme. Therefore, LRP can precisely control molecular weight, distribution and polymer structure (such as block polymer). The TERP method has greater versatility of monomer species, reaction solvents and controllable molecular weight ranges, compared to conventional living radical polymerization.

Therefore, there are high expectations of the TERP method as a fundamental technology for functional polymer synthesis to support nanotechnology.

Otsuka Chemical will continue to develop high-performance polymers using the TERP method, while earning further trust and building stronger relationships with customers.

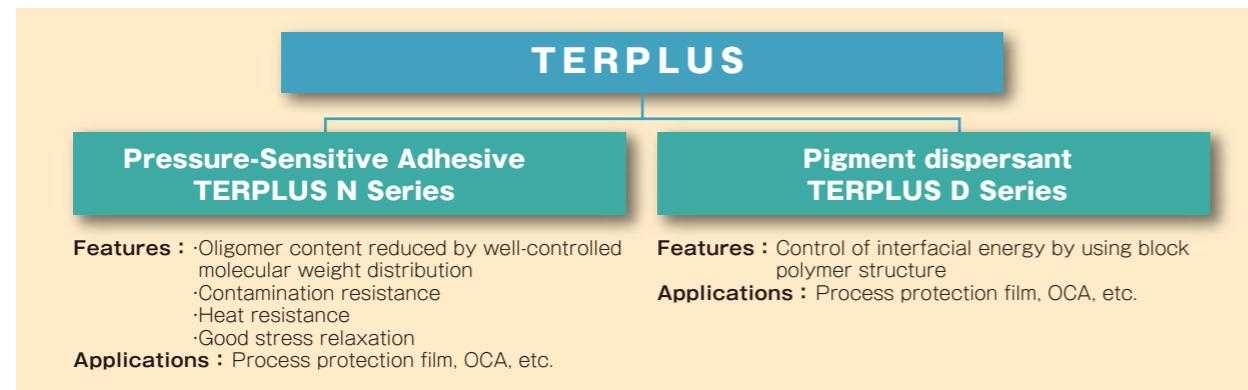
*1 TERP method: Organotellurium-mediated Living Radical Polymerization

*2 Result of joint research by Otsuka Chemical and the group led by Professor Shigeru Yamago, Institute for Chemical Research, Kyoto University (basic patent obtained)

*3 Professor Yamago was received the 2010 Chemical Society of Japan Award for Creative Work.

*4 Otsuka Chemical and Professor Yamago were awarded one of the 51st Technology Awards of the Adhesion Society of Japan, held in 2013, and the Technical Development Award from the Adhesion Society of Japan in 2013.

■ High performance polymer products using the TERP method



■ Production System



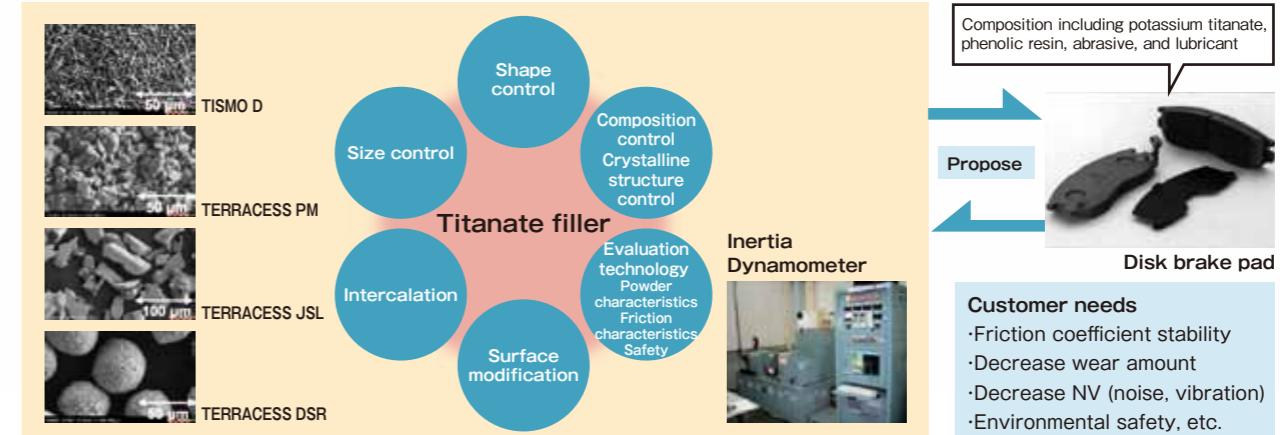
Otsuka Chemical built a dedicated TERPLUS plant on the premises of the Tokushima Factory, after TERPLUS market development and investigation of mass production technology.

The plant is one of the few such mass production facilities in the world, and has succeeded in industrializing the living radical polymerization technology, which was once thought to be impractical. The facility can handle production scale ranging from a trial of few hundred kilograms to a level of several tons.

While graphically incorporating the name TERP, the ceramic plate design on the outer wall of the plant depicts citrus *sudachi* blossoms, the flower of Tokushima Prefecture. The colors used, indigo and green, represent the natural beauty of the prefecture and one of its famous traditional products, indigo dye. Since TERP was developed jointly by Otsuka Chemical and Kyoto University, the design also expresses the creation of something new based on the coming together of two forces.

III Development of Titanate for Friction Materials

We are pioneering new chemical frontiers in the effects of titanate to meet the needs of diverse customers.

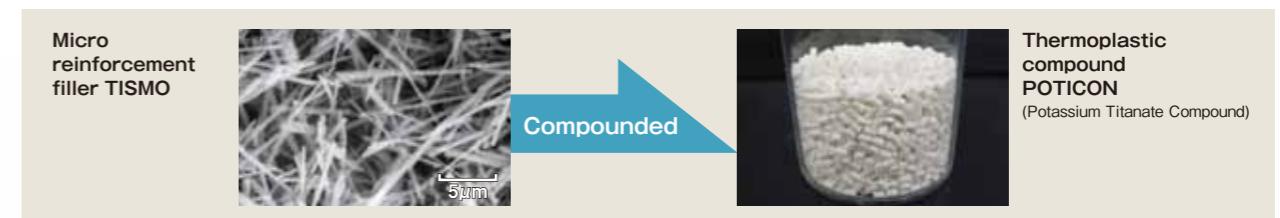


Recent conference presentations

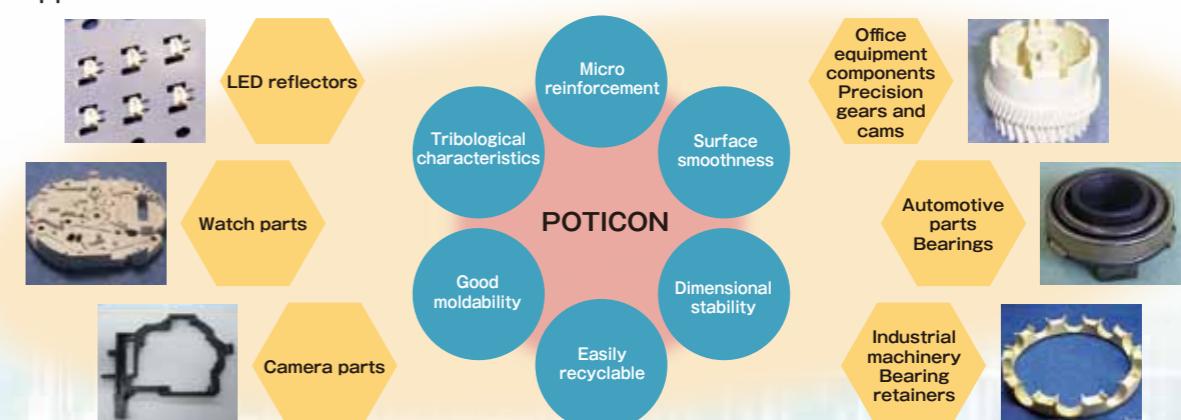
- SAE Brake Colloquium & Exhibition (2011-2013): "Chemical Effects of Titanate Compounds on the Thermal Reactions of Phenolic Resins in Friction Materials, Parts 1-3"
- Euro Brake (2014): "Microstructure of Metal Pick up and Its Surroundings"

III Development of the Resin Compound POTICON

We propose optimal compounds for various precision parts and sliding parts.



■ Applications



Factories in Japan

As an environmentally friendly company, Otsuka Chemical ensures its factories address global warming.

Otsuka Chemical has three production factories in Japan, all in Tokushima Prefecture. These factories actively engage in environmental initiatives, including efforts to save energy, reduce environmental impact, and create environmentally friendly systems. All three factories have obtained ISO 14001 environmental management certification.

Tokushima Factory



The Tokushima Factory opened in 1969 and began production of hydrazine. The following year it began production of Bon Curry and other foods in retort pouches. (Today, the Otsuka Group's foods business is operated by Otsuka Foods Co., Ltd.) In 1973, the factory acquired a license to manufacture pharmaceuticals.

Main Production Lines:

TISMO (functional inorganic fiber),
TERPLUS(dispersant and pressure adhesive)
Maltol (flavor enhancer), resin additives
and softeners, resin modifiers

Kagasuno 463, Kawauchi-cho, Tokushima-shi,
Tokushima 771-0193, Japan
TEL: +81-88-665-1516 FAX: +81-88-637-1099

Anzen Dojo (Safety Training Center)

Located in the Tokushima Factory, the Anzen Dojo not only imparts safety knowledge through classroom learning, but also aims to improve the hazard awareness of all participants, through hazard experience training. In 2014, this program was recognized by the Japan Chemical Industry Association's 8th Responsible Care Awards.



Quality Assurance Initiatives

The products of Otsuka Chemical are used in various applications in a variety of fields including pharmaceuticals, food products, automobiles, electronics, and housing. By ascertaining individual customer needs as well as the needs of each industry, the company is creating products that satisfy customers based on stringent quality control.

The company's three sites in Japan have obtained integrated international ISO 9001 quality management system and ISO 14001 environmental management system certification. Accordingly, the sites are pursuing continual improvements from both the quality and environmental perspectives. Five subsidiaries outside Japan have also obtained ISO 9001 certification, and Otsuka Chemical has created a global production and quality assurance system.

With a corporate philosophy of trust, Otsuka Chemical is working to continually enhance not just product quality, but also the quality of its people, systems and work. In this way, the company is improving its quality assurance level and the performance of the company as a whole, as well as the value and quality of its products and services. The aim is sustainable growth.



Naruto Factory



The Naruto Factory opened in 1950 as the company's first production site. It started with the manufacture of inorganic chemicals, polymerization initiators, and other chemicals.

Main Production Lines:

Inorganic salts

615 Aza-Hanamen, Satoura, Satoura-cho, Naruto-shi,
Tokushima 772-8601, Japan
TEL: +81-88-684-2266 FAX: +81-88-684-2359

Matsushige Factory



The Matsushige Factory was established in 2000 and started to manufacture pharmaceutical intermediates. The following year it began production of the functional plastic compounds POTICON and WHISTATT. It is the company's most advanced production site.

Main Production Lines:

POTICON (functional plastic compound), GCLE derivative
(pharmaceutical intermediate)

139-40 Aza-toyohisakaitaku, Toyohisa, Matsushige-cho,
Itano-gun, Tokushima 771-0213, Japan
TEL: +81-88-699-7980 FAX: +81-88-699-7965

Reducing CO₂ emissions by switching fuels and consolidating equipment

Business sites belonging to Otsuka Group companies operating in the Imagire area of Tokushima City (Otsuka Pharmaceutical's Tokushima Factory and Second Tokushima Factory, Taiho Pharmaceutical's Tokushima Plant) have all done major overhauls to their fuel oil boiler systems. Otsuka Chemical's Tokushima Factory installed 17 small through-flow boilers that run on natural gas (municipal gas), which operate to meet each site's changing production demands. Since January 2009 it has been supplying steam to all sites.

This change was successful in the reduction of annual CO₂ emission generated during steam production by about 700 tons for Otsuka Pharmaceutical's two factories and about 2,200 tons for Taiho Pharmaceutical's Tokushima Factory.

Otsuka Group Tokushima Factories' Steam Supply System

Otsuka Pharmaceutical
Tokushima Factory
steam supplied
by Otsuka Chemical
[100%]

Otsuka Foods
Tokushima Factory
steam supplied
by Otsuka Chemical
[100%]

Otsuka Chemical Tokushima Factory

17 additional
smallthrough-flow
boilers
Natural gas
(municipal gas)

Taiho Pharmaceutical
Tokushima Plant
steam supplied
by Otsuka Chemical
[100%]

Steam supply started
Steam supply started
supplied from before
Otsuka Pharmaceutical Second
Tokushima Factory
steam supplied
by Otsuka Chemical
[100%]

Diversity Promotion and Enhanced Employee Education

Otsuka Chemical is creating supportive workplace environments for all its employees through initiatives for diversity promotion, human resources education and employee welfare.

III Diversity Promotion

Otsuka Chemical has established a Diversity Committee as part of its management strategy. The committee aims to improve organizational performance by taking steps to enhance the diversity of human resources, to allow all individuals to demonstrate their abilities, and to generate knowledge synergy. While also aiming to ensure that Otsuka Chemical is an attractive place to work and a company trusted by society, the company is carrying out diversity promotion measures according to the following three company policies, starting with work-life balance initiatives for all employees.



Otsuka Group diversity promotion personnel meeting

Work-Life Balance



The company is enhancing its work-hours programs to support employees with childcare and home care responsibilities. For example, the company offers programs providing shorter or staggered working hours for employees with a young child up through grade 3 of elementary school. There are also similar programs for employees providing home care to an eligible family member, which can be utilized for up to one year. No-overtime days also help to promote work-life balance. As a result of these initiatives, Otsuka Chemical received the 2014 "Kurumin Mark" certification from Japan's Minister of Health, Labour and Welfare, as a company that supports child rearing.

Global Human Resource Exchange Program

The Global Employees Exchange Program has been established from fiscal year 2014 as part of the activities to discover and develop human resources who can contribute to the global business expansion of the Company group and to promote diversity in the Company. We currently accept employees from our overseas affiliates and subsidiaries for three weeks to three months.



Global exchange of human resources(Visits to Agribest)

Workplace Daycare Facilities

In fiscal 2014, the company established a global personnel exchange program. This move was part of its effort to promote diversity and to discover and develop human resources that can contribute to the global expansion of the Otsuka Group. The company is currently accepting employees from overseas affiliates and subsidiaries for placements of between three weeks and three months.



Osaka

Tokushima

III Employee Welfare



Otsuka Shiosaiso (Tokushima)

The Otsuka Group has four guesthouse facilities operated directly by the group as retreats to support the health of employees. There are six more such facilities under contract to the Otsuka Pharmaceutical Health Association and Otsuka Pharmaceutical Group Pension Fund.



Otsuka Hieizanso (Shiga)

Otsuka Amagisanso (Shizuoka)

III Initiatives for Human Resources Development



Project Management Training

Otsuka Chemical provides opportunities for training and practice to ensure that employees steadily learn new things and make substantial gains through experience. Based on this belief, the company promotes human resources development using on-the-job training. Young employees are often included as members of major projects, regardless of their job title, and actively selected and promoted to positions of responsibility. This approach has not changed over the years, and the company remains focused on systematic human resources development at a time when there is an urgent need for global management due to the rapid social, economic, and industrial changes in recent years.

Training and Education System (Grade-Specific Training)

Along with grade-specific training when employees join the company and at the time of promotion to section chief, assistant manager, and manager, the company provides follow-up training two years after joining the company (for those hired directly from high school, university, etc.) and ample step-up training every four to five years. The aim is for younger employees to experience steady growth. In addition to cross-cultural and foreign language training for employees to be posted outside Japan, the company regularly sends employees to courses at outside educational institutions for systematic management study. Outside instructors are also invited to come and provide special training to employees. Otsuka Chemical is committed to flexible, effective training.



Training session

MBA Support

Each year since 2011, Otsuka Chemical has invited interested employees to apply for company support for tuition toward an MBA. The idea is to foster future management human resources who are ready for the global stage. In addition to performing their jobs and studying at the same time, participants receive instruction entirely in English starting in the second year of the program. The experience is quite demanding for the participants, but they report improved abilities in advanced business administration as well as better English skills and helpful networking with other motivated participants. The employees get a lot out of the program, including the reward of taking on a big challenge.



MBA earned in March 2016



Self-Development Support

Otsuka Chemical has programs to enhance motivation and the desire to learn in employees, such as a language certification reward program and a self-development grant system, which pays half the cost of eligible courses. The company has also implemented the Computerized Assessment System for English Communication (CASEC) and free e-learning courses. This has created an environment where employees have access to a wide range of study opportunities.

Otsuka Chemical strives to enrich people's lives through cultural, educational, and other social contributions.

Otsuka Chemical not only conducts R&D to create better products, but also undertakes social contribution initiatives to enrich people's lives.

The company is deeply committed to its various efforts to make a difference in the world, including support for traditional events, school education, and community cleanups.

III Participating in the Awa-odori Festival: Otsuka Hatsuatsu Ren dance team

The Awa-odori Festival in Tokushima is one of Japan's three main Bon-odori dance festivals and is an important event for the local community. Otsuka Chemical's dance team has participated in the event since 1963, and the group changed its name from "Otsuka Chemical Ren" to "Otsuka Hatsuatsu Ren" in 1988. Employees and their families participate in the event every August.



III Support for Education in Schools

Every year, Otsuka Chemical continues to take part in the "Adopt an Eco-School" program, an alliance among business, government and academia in Tokushima Prefecture. The company does this in partnership with two other Otsuka Group companies, Taiho Pharmaceutical and Otsuka Pharmaceutical. The program supports opportunities to make environmental education part of the lessons at local schools. Students participate in water quality surveys in their own communities and tours of Otsuka Group facilities to see environmental initiatives, both of which help to deepen their interest in environmental conservation.



Tour of a tomato sorting and packing plant

Water quality survey by high school students

III Volunteer Community Cleanups

Many employees and their families participate in community cleanup activities around the company's business sites.



III CSR Reports

The CSR activities of Otsuka Chemical are shared in the Otsuka Group CSR Report. The report is prepared based on the five CSR areas of health, environment, quality, culture, and employees.

Otsuka Group CSR website: <http://otsuka csrportal.jp/en>



大塚国際美術館
OTSUKA MUSEUM OF ART

<http://www.o-museum.or.jp/english/>

III Tokushima Vortis

The Tokushima Vortis professional soccer team was formed in 2004 to help to revitalize the local region, based on a core group of players from the Otsuka Pharmaceutical soccer club. Working with Tokushima Prefecture's board of education, Vortis is the first J-League team to be involved in the creation of a physical education supplementary textbook. The team is also helping to create a school dietary education program, and is contributing to the healthy growth of children in Tokushima. By taking part in special events at its home stadium as well, Tokushima Vortis is helping to promote the development of the prefecture through soccer.



<http://www.vortis.jp/> (in Japanese only)



Otsuka Group
CSR Report 2015
Otsuka Group creating new solutions for better health worldwide



(C)TOKUSHIMA VORTIS



Otsuka

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