



Your Dreams, Our Challenge

# Chemistry for a Blue Planet



AGC Chemicals Overview





# Chemistry for a Blue Planet

AGC Chemicals

## The Glory of Nature Inspires Our Vision of the Future.

Is it possible to protect the earth and pursue human progress at the same time?  
We think so. Chemistry holds the key because it plays such a big part in so many industries.

Our objective is to use chemical technology to create a world that is safe, secure, comfortable, and environmentally friendly.

We believe chemistry has the power to achieve all these goals together without compromise. AGC Chemicals is working for 100 years in the future, in order to respond to the challenges human beings are facing by gathering our wisdom together.

Creating a safe, secure, comfortable and environmentally friendly world with chemical technology.





**Chemical Chain**

A unique chemical chain has evolved from the electrolysis of brine to become the foundation of our businesses.

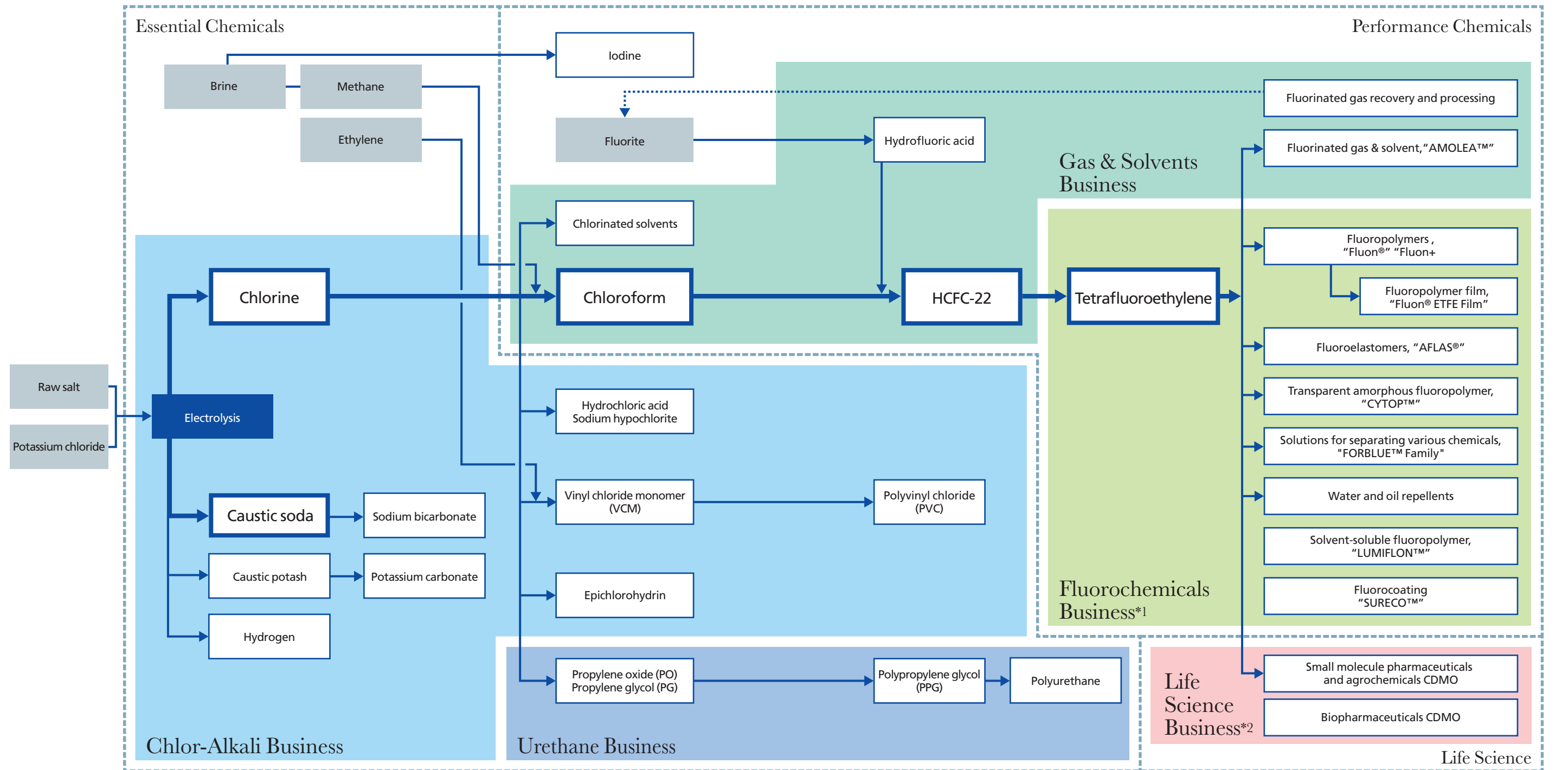
AGC Chemicals has a stable product line delivering a steady flow of high-quality products ranging from essential chemicals to performance chemicals.

AGC Chemicals started business in 1917 from the need to become self-sufficient in soda ash production, which was a key base raw material for glass. Over its 100-year history, AGC Chemicals expanded across a broad range of fields to offer a unique chemical chain with its Chlor-alkali, Urethane, Gas & Solvents, Fluorochemicals, and Life Science businesses.

AGC Chemicals' chemical chain is distinctive for its integrated production lines producing products spanning essential chemicals derived from the electrolysis

of brine to performance products. The integrated lines enable AGC to pay meticulous attention to safety, quality control, and environmental considerations for all of its processes. AGC Chemicals creates the world-leading products in numerous fields and supports the development of various industries by helping create products that enrich people's lives and society.

We are pleased to present an outline of AGC Chemicals' century-plus history and an overview of the development of our proprietary chemical chain.













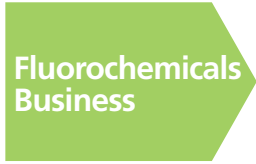


\*1 Includes some products not made from fluorine

\*2 Life Science Company established as a separate in-house company from the Chemicals Company in 2023

## History

From AGC Chemicals' beginnings as a producer of soda ash, to the present day and a diverse range of chemical business operations.

AGC Chemicals has faced ever-changing lifestyles, societies and markets as time moves forward, and has developed and produced chemical products demanded by each era along the way.

Major Events around the Globe		1914	1920	1929	1939	1945	1947	1950	1952	1962	1964	1967	1969
History of the Environment													
Eras	1910s	1920s	1930s	1940s	1950s	1960s							
<b>1907: Founding of Asahi Glass (AGC)</b> <b>Soda Ash business</b>	<b>1917</b> : Completion of an ammonia soda ash plant at the Makiyama Plant and the start of production (photo ①)	<b>1921</b> : Start of soda ash sales under the trademark of the Diamond Logo <b>1929</b> : Start of production of sodium bicarbonate for medical grade (photo ②) <b>1930</b> : Switching of the manufacturing process to produce sodium bicarbonate to the newly employed Solvay reactor at the Makiyama Plant	<b>1933</b> : Start of production of ammonia-process caustic soda at the Makiyama Plant	<b>1942</b> : Merged with Osaka Bleaching Powder and set up the Yodogawa Plant to produce mercury-process electrolysis soda <b>1943</b> : Start of production of potassium carbonate at the Makiyama Plant	<b>1950</b> : Shifting of the production process to the ammonium chloride process so as to start the full-scale production of ammonium chloride for fertilizer at the Makiyama Plant <b>1952</b> : Conclusion of a contract with an Indonesian state-run firm for the exportation of an electrolysis caustic soda plant (plant completed in 1956) <b>1958</b> : Start of a full-scale development of natural gas in Chiba (1959: Completion of a gas pipeline)	<b>1961</b> : Start of production of propylene oxide and propylene glycol at the Yodogawa Plant <b>1965</b> : Establishment of Thai Asahi Caustic Soda <b>1966</b> : Establishment of Asahi Penn Chemicals as a joint venture with PPG (U.S) for VCM production (photo ③) <b>1968</b> : Participation in the foundation of Kashima Chlor-Alkali and Kashima Vinyl Chloride Monomer	<b>1962</b> : Outbreak of World War I (ending in 1918) <b>1920</b> : Founding of the League of Nations <b>1929</b> : Start of the Great Depression <b>1939</b> : Outbreak of World War II (ending in 1945) <b>1945</b> : Founding of the United Nations <b>1947</b> : Start of the Cold War <b>1950</b> : Outbreak of the Korean War <b>1952</b> : Founding of the European Coal and Steel Community (later leading to the European Union) <b>1962</b> : Cuban Missile Crisis <b>1964</b> : Outbreak of the Vietnam War (ending in 1975) <b>1967</b> : Founding of the Association of Southeast Asian Nations (ASEAN) <b>1969</b> : Start of regulations on mercury in methylmercury compounds, along with Minamata disease becoming an issue of national concern	<b>1966</b> : Discontinuing the production of ammonia soda					
<b>Chlor-Alkali Business</b> <b>Urethane Business</b>									<b>Fluorochemicals Business</b>	<b>Gas &amp; Solvents Business</b>	<b>Life Science Business</b>		
 <p>① The Makiyama Plant in Kitakyushu</p>	 <p>② Soda ash (left) and sodium bicarbonate (right)</p>	 <p>③ Asahi-Penn Chemical</p>	 <p>④ CFC plant at the Chiba Plant</p>	 <p>⑤ Aflon COP plant at the Chiba Plant</p>	 <p>⑥ AZEC system at Kashima Chlor-Alkali</p>	 <p>⑦ ASAHIKLIN AK-225, with an award plaque for the Stratospheric Ozone Protection Award from the EPA</p>	 <p>⑧ Chemicals Business 100th Anniversary</p>	 <p>⑨ ABP building at the Chiba Plant</p>	 <p>⑩ AGC Vinythai Plant</p>				

**1973** : 1973 oil crisis (1973 Arab-Israeli War)  
**1979** : 1979 oil crisis (Iranian Revolution)

**1987** : Worldwide stock market crash (Black Monday)  
**1989** : Ending of the Cold War

**1993** : Founding of the European Union (euro currency adopted in 1999)  
**1997** : Asian Financial Crisis

**2001** : September 11 attacks  
**2008** : Bankruptcy of Lehman Brothers

**2011** : Great East Japan Earthquake

**2020** : COVID-19 pandemic

**1987** : Adoption of the Montreal Protocol against CFCs

**1997** : Adoption of the Kyoto Protocol

**2008** : Enactment of the AGC Chemicals vision "Chemistry for a Blue Planet"

**2015** : Adoption of the Paris Agreement  
**2016** : Kigali Amendment to the Montreal Protocol adopted (regulations for HFCs with high global warming potential)

## 1970s

## 1980s

## 1990s

## 2000s

## 2010s

## 2020s

**1990** : Establishing of Tenneco Soda Ash Joint Venture with Tenneco and the start of natural soda ash production in the U.S.

**1997** : Discontinuing the soda ash production at the Chiba Plant

**2001** : End of the 84-year history of soda ash production, with discontinuing the production of soda ash at the Kitakyushu Plant  
**2007** : Withdrawal from domestic sales of soda ash

**2017** : Chemicals Business 100th Anniversary (Photo ⑧)

**1974** : Establishment of Asahi-Olin as a joint venture with Olin Corporation (U.S.) for the production of raw materials for urethane  
**1975** : Success in technical development for ion-exchange membrane process caustic soda electrolysis using Flemion  
**1980** : Development of the AZEC system, a new electrolysis technology using the ion-exchange membrane process (photo ⑥)

**1986** : Establishment of Asahimas Subentra Chemical as a joint venture with Indonesian RODAMAS, Subentra, PPG (U.S.), and others

**1993** : Establishing of Keiyo Monomer, for VCM production  
**1996** : Discontinuing the production of chemical products at the Kansai Plant (former the Yodogawa Plant)  
**2000** : Stop of the electrolysis plant and liquidation of Kansai Chlor-Alkali

**2002** : Termination of manufacturing chemical products at the Kitakyushu Plant  
**2004** : Voluntary recall of sodium bicarbonate

**2012** : Withdraw from Kashima Chlor & Alkali and from Kashima Vinyl Chloride Monomer  
**2014** : Acquisition of a Vietnamese PVC manufacturer, Phu My Plastics & Chemicals (\*2)  
**2017** : Acquisition of a Thai Chlor & Alkali and PVC manufacturer, Vinythai

**2022** : Chlor-alkali business subsidiaries integrated and reorganized, AGC Vinythai established (Photo ⑩)  
Management decision to increase production capacity for chlor-alkali products in Thailand

**1971** : Development of AsahiGuard, a water and oil repellent  
**1971** : Introduction of technologies from Allied Chemical (U.S.) to produce fluoropolymers  
**1972** : Development of Aflon COP, an ETFE fluoropolymer (photo ⑤)  
**1973** : Start of manufacturing for TFE monomer  
**1973** : Start of sales for AFLAS fluorinated elastomer  
**1976** : Start of sales for ETFE film, a fluoropolymer film

**1981** : Start of a joint venture with ICI (U.K.) to found Asahi-ICI Fluoropolymers to manufacture PTFE  
**1982** : Start of sales for LUMIFLON, a solvent-soluble fluoropolymer  
**1988** : Development of CYTOP, a transparent amorphous fluoropolymer

**1999** : Buying of 100% of the shares of ICI (U.K.) to make Asahi-ICI Fluoropolymers a wholly owned subsidiary, with the acquisition of ICI's fluoropolymer business and the start of business in the U.K. and the U.S.  
**2000** : Development of the PERFECT process, a new process to produce fluorine compounds

**2001** : Unification of the fluoropolymer brands into the Fluon brand  
**2006** : Start of sales for the AsahiGuard E-SERIES, a new eco-friendly repellent  
**2007** : Start of the overseas production of ETFE in the U.K.



**2016** : Technical service center launched in Singapore, adding to the network in Europe, the U.S., and China (Photo ⑨)  
**2017** : FORBLUE Family of chemical separation solutions launched  
**2018** : Fluon+ series of fluoropolymer compounds and enhanced materials launched



**2023** : Management decision to increase production capacity for fluorochemical products at the Chiba Plant  
**2024** : Management decision to construct a new production facility in Kitakyushu City for the FORBLUE S-SERIES fluorinated ion-exchange membranes suitable for green hydrogen production

**1972** : Start of manufacturing for sulfur hexafluoride (SF<sub>6</sub>)  
**1975** : Start of manufacturing for CFC-113

**1982** : Start of manufacturing for CFC-114 and CFC-115  
**1987** : Formation of the Alternative CFC Development Project Team

**1991** : Start of manufacturing for the alternative CFC product, ASAHIKLIN AK-225 (photo ⑦)  
**1997** : Start of a joint venture with Allied Signal, Inc. (U.S.) to found Asahi Allied Signal, specializing in the mixed-refrigerant business



**2014** : Development of AMOLEA, a next-generation refrigerant for air conditioning equipment  
**2015** : Completion of a new facility to produce HFO-1234yf, an automotive refrigerant for the next generation, at the Chiba Plant  
**2018** : Start sales of AMOLEA AS-300, a new type of environmentally-friendly fluorinated solvent

**2020** : Manufacturing facility completed at the Chiba Plant for AMOLEA 1224yd next-generation lower pressure refrigerant

**1973** : Establishment of the Life Science Team to take charge of market research and strategic planning

**1985** : Start of contracted manufacturing for fluorine-containing pharmaceutical intermediates  
**1990** : Start of manufacturing and sales for active pharmaceutical ingredients based on approval for active vitamin D3 by the Ministry of Health and Welfare

**1998** : Establishment of Wakasa AGC Fine Chemicals (\*1) so as to manufacture pharmaceutical intermediates and active pharmaceutical ingredients  
**2000** : Setting up of facilities at the Central Research Center for contracted biopharmaceuticals manufacturing

**2003** : Completion of a GMP-compliant plant at the Chiba Plant  
**2008** : Approval for the manufacturing and sales of Tafuprost, an active pharmaceutical ingredient for glaucoma developed jointly with Santen Pharmaceutical  
**2008** : Completion of a large plant for biopharmaceuticals manufacturing capabilities at the Chiba Plant

**2016** : Acquisition of European biopharmaceutical CMO Biomeva (\*3)  
**2017** : Acquisition of leading European and U.S. biopharmaceutical CDMO CMC Biologics (\*4)  
**2019** : Acquisition of Spanish small molecule active pharmaceutical ingredient manufacturer Malgrat Pharma Chemicals (\*5)  
**2020** : Acquisition of cell and gene therapy CDMO Molecular Medicine (\*6)

**2020** : Acquisition of AstraZeneca U.S. bio-pharma facilities (\*7)  
**2021** : Acquisition of Novartis Gene Therapies U.S. facilities (\*8)  
**2023** : Life Science Company established as a separate in-house company from the Chemicals Company  
Management decision to expand the biopharmaceutical CDMO capability at the AGC Yokohama Technical Center



## Business Fields

# AGC Chemicals operates businesses in the fields of Essential Chemicals and Performance Chemicals.

We provide chemical products that enrich people's lives and society through our four businesses of Chlor-alkali, Urethane, Fluorochemicals, and Gas & Solvents.

## Essential Chemicals

### Chlor-alkali Business

The Chlor-alkali Business handles caustic soda and chlorine produced by electrolysis of brine and other chlor-alkali products. Caustic soda and chlorine are basic raw materials used extensively in many industrial fields to create chemical products. The Chlor-alkali Business commands high market share in Japan and established a strong presence in Southeast Asia by being among the first Japanese firms to establish electrolysis plants overseas through its expansion to Thailand in the 1960s and Indonesia in the 1980s. More recently, the business responded to the growing demand in the Southeast Asian market by acquiring a leading PVC manufacturer in Vietnam in 2014, and acquiring the listed company Vinythai (now AGC Vinythai) in Thailand in 2017. The Chlor-alkali Business is contributing to regional development as Southeast Asia's top electrolytic manufacturer.

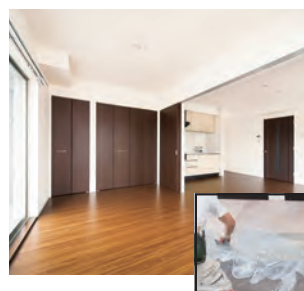


### Urethane Business

Working with propylene oxide (PO) as a base material, AGC Chemicals produces and sells polyether polyol, which is used to make polyurethane along with a wide range of other products. We offer optimal solutions utilizing polyether polyol in many applications, including for producing polyurethane, elastomers, adhesives, and sealants.

AGC Chemicals makes PO and other base materials for polypropylene glycol (PPG), the primary raw material in polyurethane. Full control of the entire production process enables us to consistently supply high quality PPG with minimal impurities.

We also manufacture and sell prepolymers, modified silicone polymer, and other product supported development of new applications for PPG. We also supply the raw materials for a wide range of polyurethane, including polyurethane foam for heat insulation, coatings/adhesives, sealants, and elastomers. Our proprietary catalyst design technology enables us to develop polymers that fully perform to customer specifications.



## Performance Chemicals

### Fluorochemicals Business

The Fluorochemicals Business creates products used in many industrial fields, including semiconductor, automotive, energy, and architecture. As the world's leading producer of ethylene tetrafluoroethylene (ETFE), the business offers a vast menu of optimal solutions to customer needs, from fluoropolymers, rubber, and compounds meeting the strict performance specifications—such as thermal resistance and chemical resistance—of the automotive and aviation industries to membrane-structured roof/ exterior fluoropolymer films for architecturally advanced structures and ultra weather-proof solvent-soluble fluoropolymer used on landmark bridges, towers, and other structures.

To support the growing number of manufacturers around the world using its products, the Fluorochemicals Business also provides rapid and advanced technical support for fluorochemical products through technical service bases worldwide.



### Gas and Solvents Business

The Gas & Solvents Business produces refrigerants used for air conditioning, freezing and refrigeration as well as solvents used in industrial cleaners, heat transfer media, and coating.

Developing and providing chlorofluorocarbon alternatives that comply with environmental regulations established related to global environmental issues, including ozone depletion, global warming, and climate change, is absolutely paramount. The Gas & Solvents Business applies its extensive knowledge cultivated from complying with all regulations to formulate environmentally friendly products, such as alternative refrigerants and solvents with reduced global warming potential to replace HFCs\*.

In the solvents field, the business seeks to provide "nonflammable, safe solvents" and supplies fluorinated solvents with high thermal stability for use in precision cleaning, various solvents, and heat transfer media as well as highly soluble chlorinated solvents suitable for degreasing and cleaning metal.

\* Hydrofluorocarbons are substances with high global warming potential. International efforts are being made to reduce their production and consumption based on the Kigali Amendment to the Montreal Protocol.



### Life Science Company (separated from the Chemicals Company in 2023)

We are globally expanding our contract development and manufacturing organization (CDMO) business, which develops manufacturing processes for and manufactures pharmaceuticals and agrochemicals. In addition to small molecule pharmaceuticals and agrochemicals that leverage organic synthesis technology fostered in the Performance Chemicals Business, the Life Science Business is focusing on biopharmaceuticals, for which demand is growing worldwide, and the leading-edge cell and gene therapy fields.

AGC has positioned the Life Science Business as a strategic business and has been expanding geographic and in technology fields through aggressive M&A and by expanding its capacity and capabilities. The business was separated from the Chemicals Company in 2023 to establish it as an independent in-house company and accelerate its business growth. Our business sites in Japan, Europe, and the United States contribute to safe, secure, comfortable, and healthy lives of people by providing high-quality services that meet the diverse needs of customers around the world.

For further details, please visit the following webpage.

[https://www.agc.com/en/products/lifescience/lifescience\\_company/index.html](https://www.agc.com/en/products/lifescience/lifescience_company/index.html)



**Business Fields**

AGC Chemicals supports a safe, secure and comfortable society in a wide range of places and situations.

AGC Chemicals offers a wide range of chemical products used in people's lives, industry and society in fields spanning Mobility, Construction and Social Infrastructure, Environment and Energy, Agricultural and Health, and Daily Life.

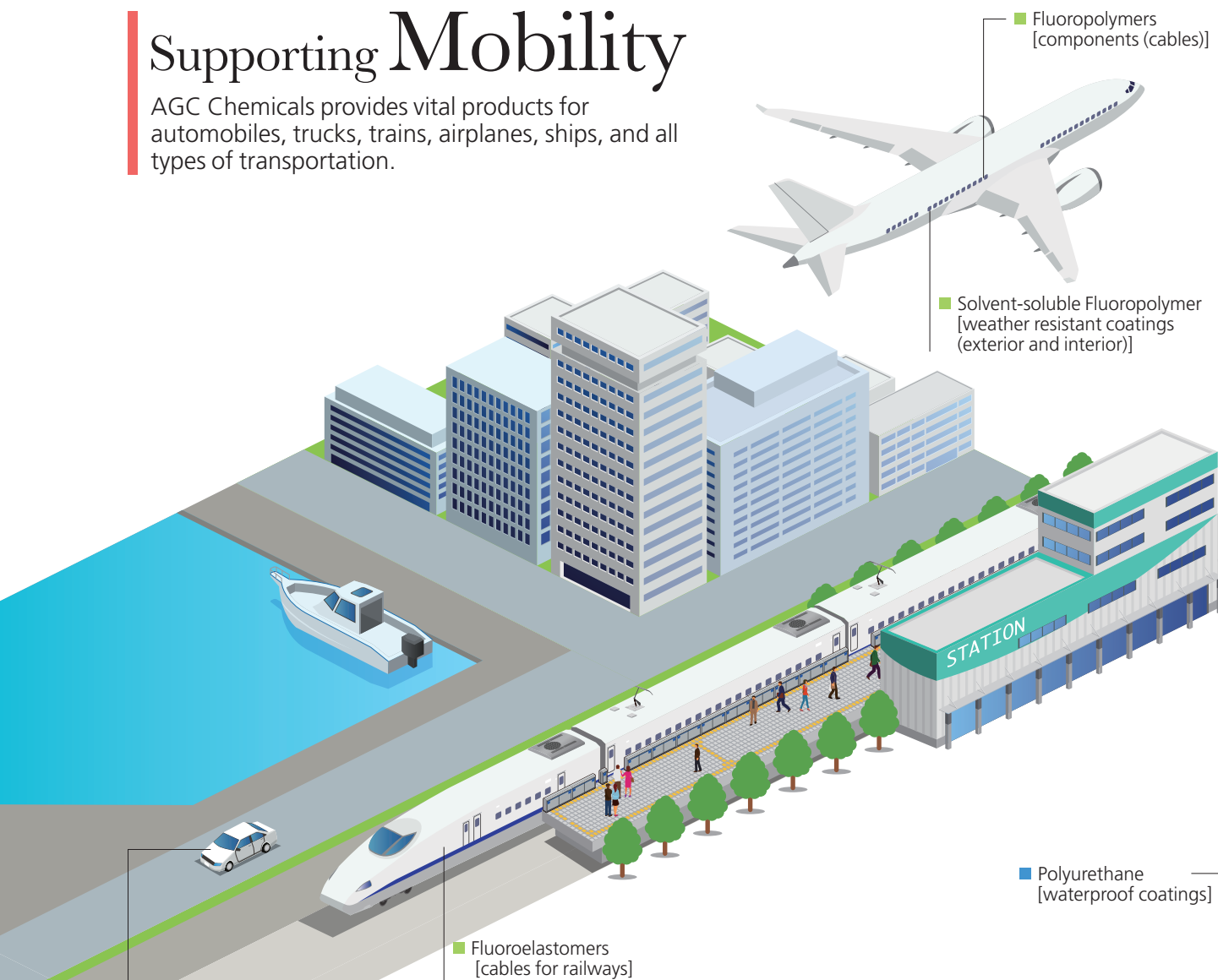
- Chlor-alkali
- Urethane
- Gas & Solvents
- Fluorochemicals\*1
- Life Science\*2
- Other

\*1 Includes some products not made from fluorine

\*2 Life Science Company established as a separate in-house company from the Chemicals Company

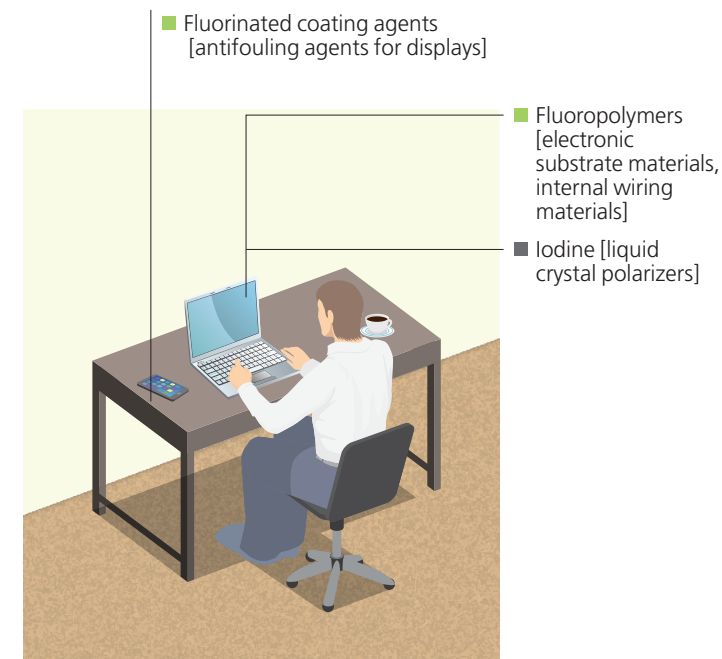
## Supporting Mobility

AGC Chemicals provides vital products for automobiles, trucks, trains, airplanes, ships, and all types of transportation.

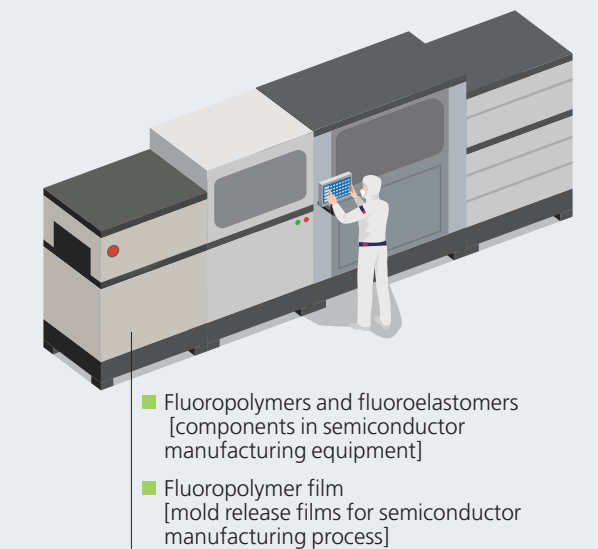


## Supporting Construction and Social Infrastructure

AGC Chemicals architectural materials and industrial materials strengthen social infrastructure.

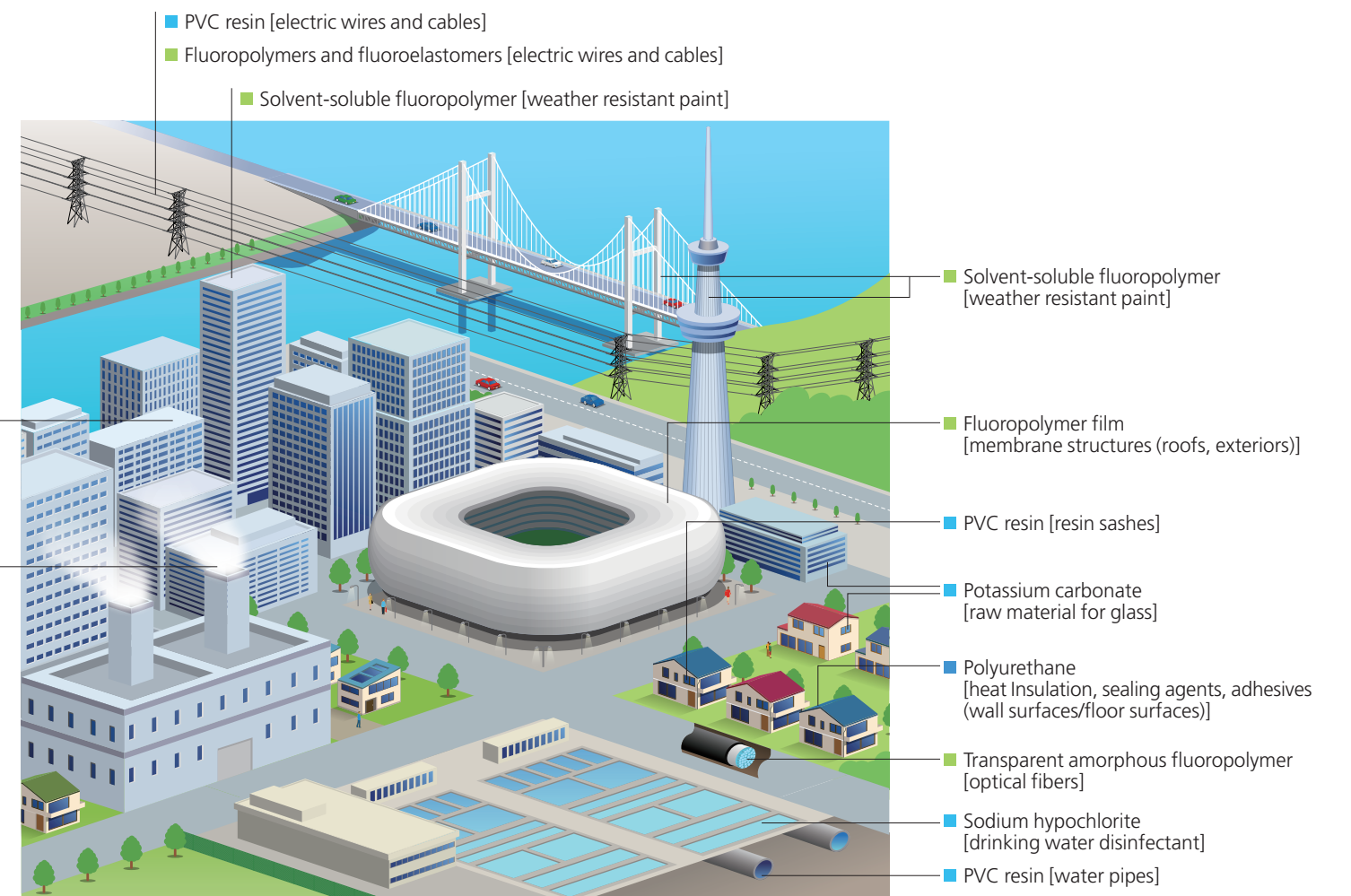


### Semiconductor manufacturing processes



## Supporting Electronics

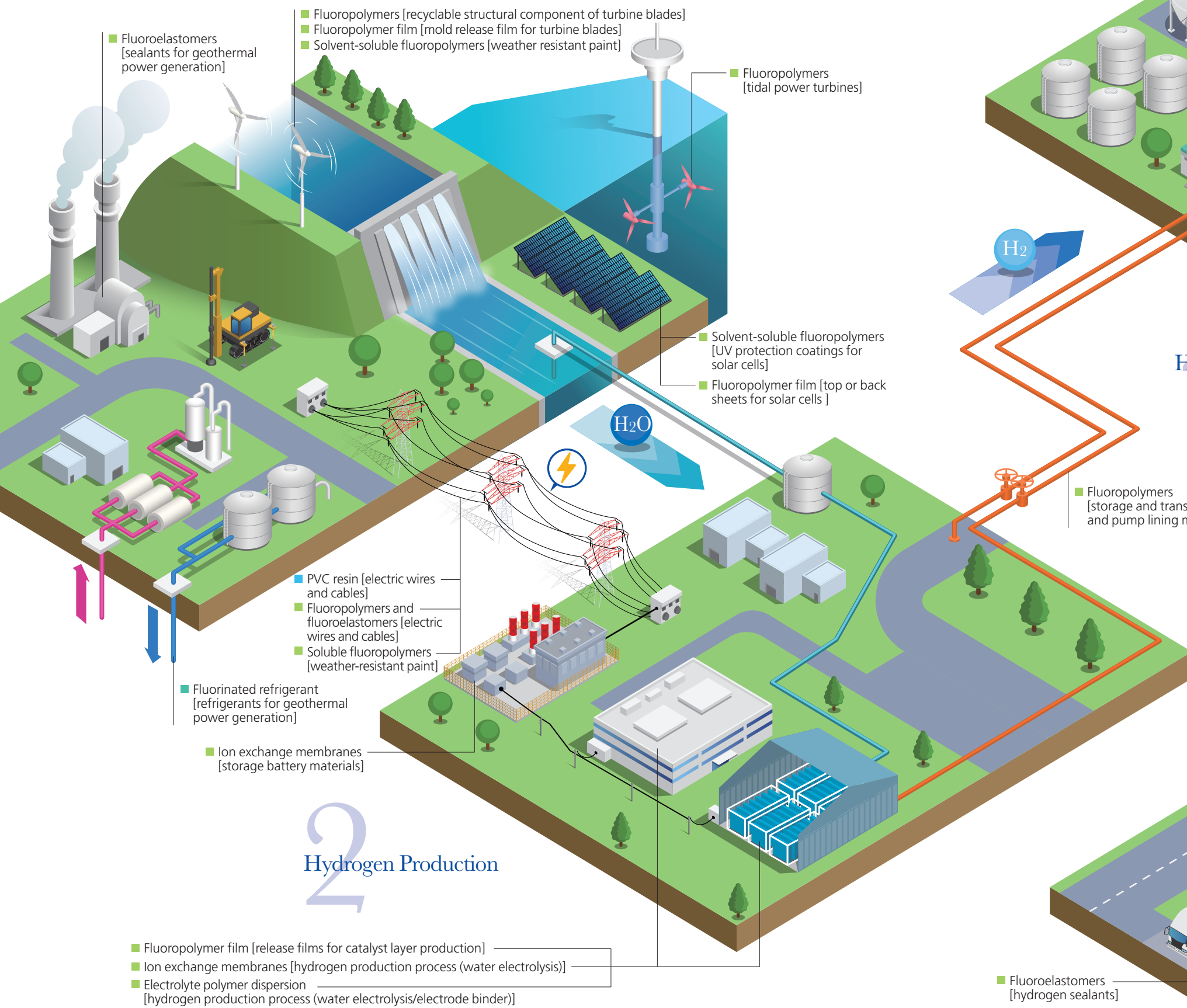
Materials and components for displays, electronic devices, and other electronic equipment.



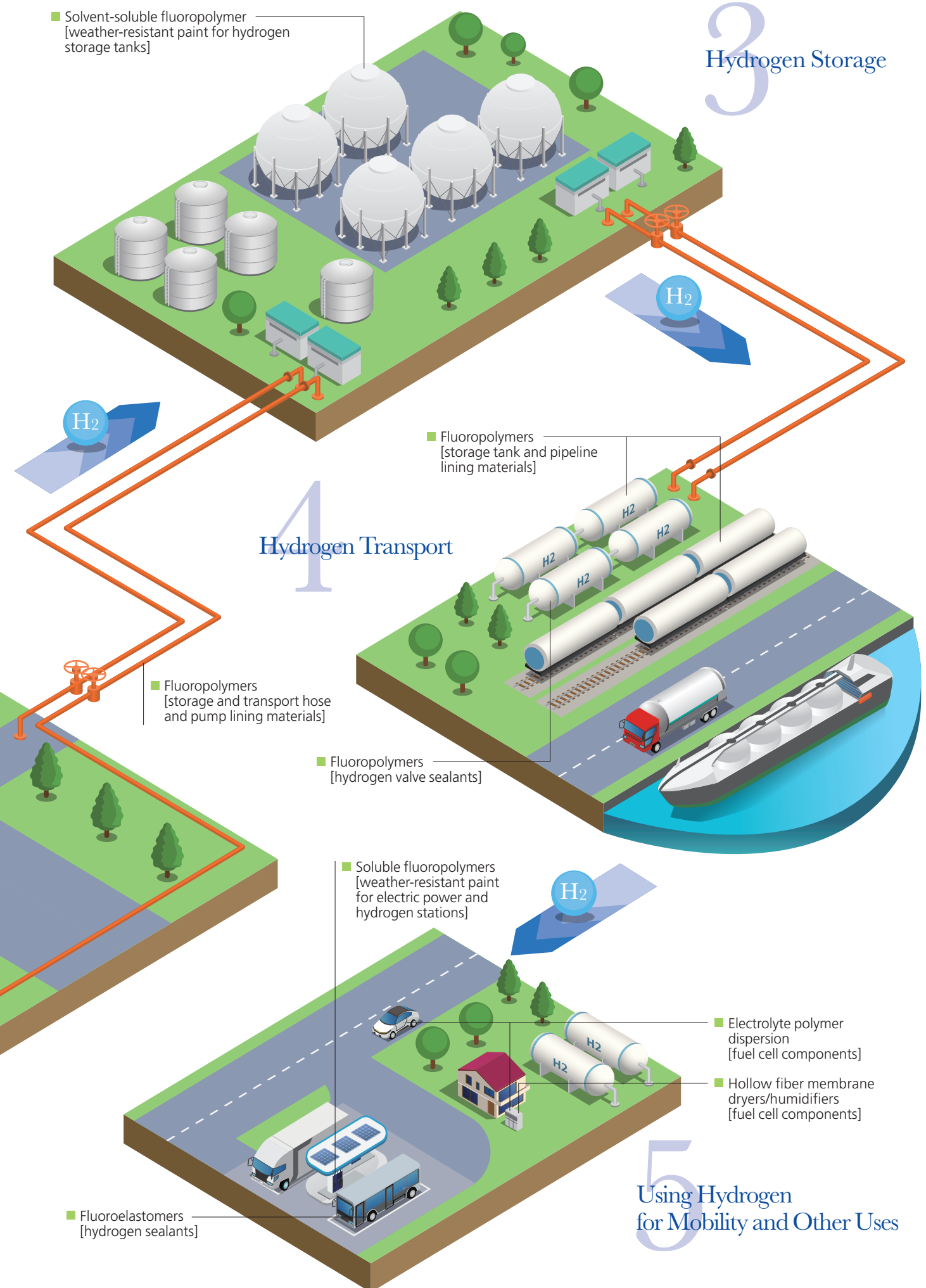


# Supporting the Environment

We provide materials facilitating wider use of renewable energy and the achievement of a hydrogen-based society.



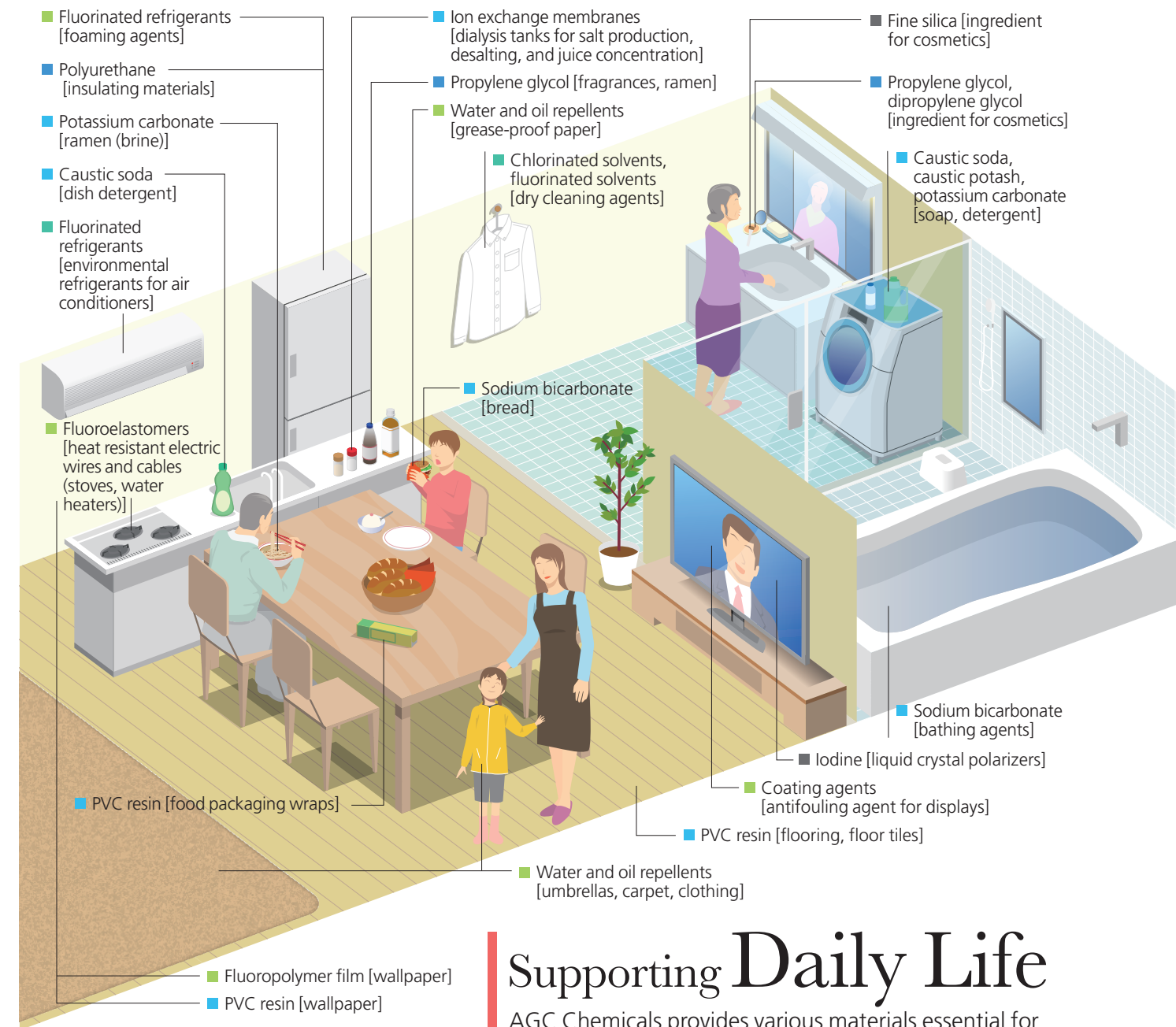
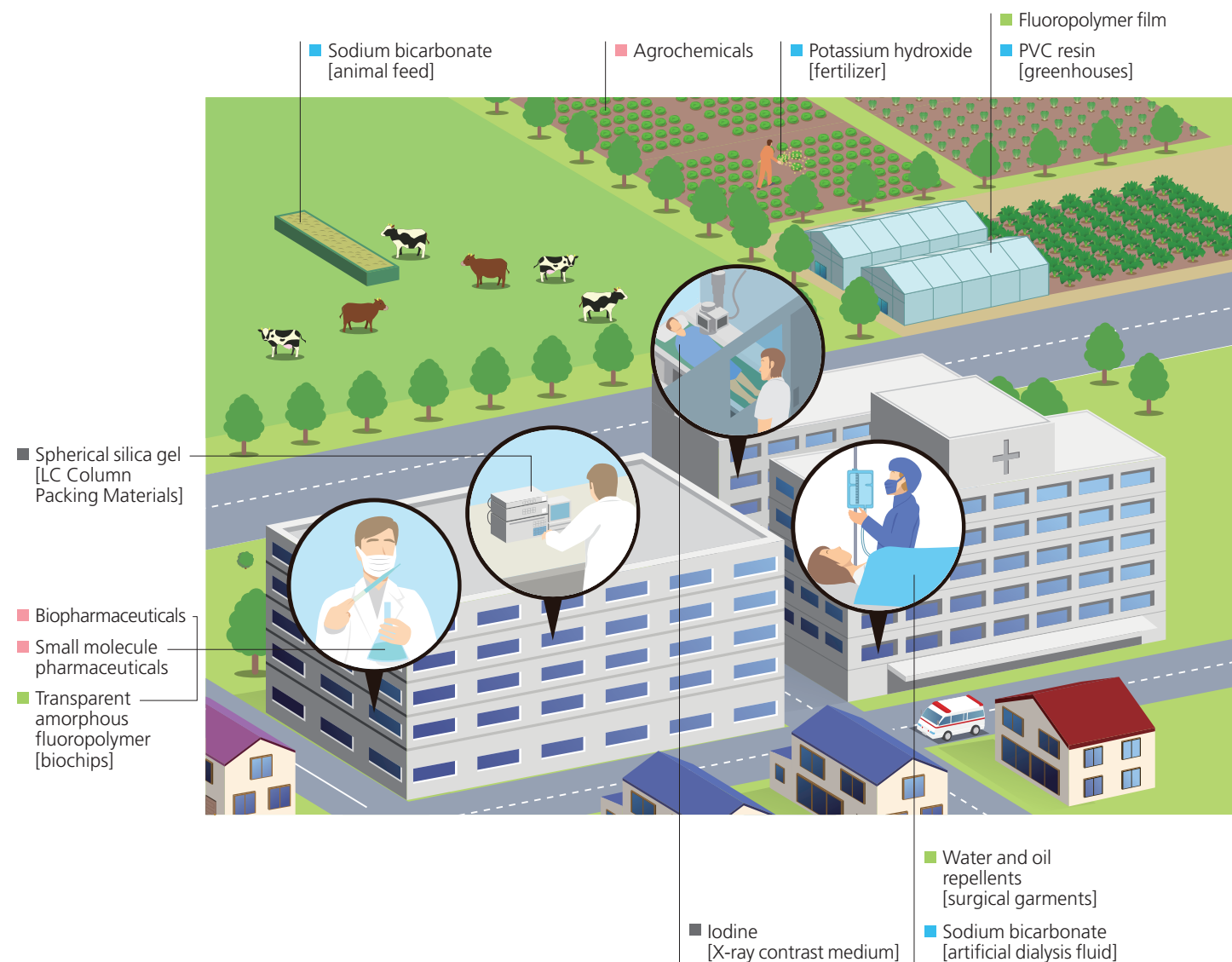
## 2 Hydrogen Production





# Supporting Agriculture and Medicine

We provide a variety of materials and services for the agriculture and medical care industries.



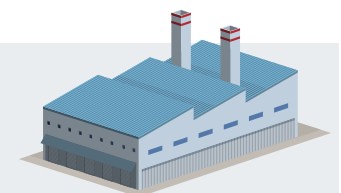
# Supporting Daily Life

AGC Chemicals provides various materials essential for daily necessities, foodstuffs, and clothing that make daily lives convenient and comfortable.

## Products Used in Manufacturing Processes

AGC Chemicals Business products are used in manufacturing processes of various industries.

	Common Name	Uses
Chlor-alkali	Caustic soda	Dissolving raw materials in papermaking and aluminum smelting processes, neutralizing wastewater treatment
	Hydrochloric acid	Etching in the electrolytic capacitor manufacturing process neutralizing in wastewater treatment
	Sodium bicarbonate	Removing coating films from machine parts, blasting applications, such as oil and scale removal, treatment of factory exhaust gas
Urethane	Propylene glycol	Brine (indirect refrigerant) in the food manufacturing process
Gas & Solvents	Fluorinated/ chlorinated solvents	Cleaning metal, resin components, and printed circuit boards, silicone/fluorine oil dilution solvents, dry cleaning solvents
	Fluorinated refrigerants	Refrigerant for large refrigeration units used in chemical plants and geothermal power plants



	Common Name	Uses
Fluorochemicals	Fluorinated ion exchange membranes	Brine electrolysis for caustic soda and chlorine production, water electrolysis applications for hydrogen production
	Fluoropolymer film	Mold release films in semiconductor manufacturing processes and catalyst films fabrication
	Ion exchange membranes	Deminceralization in the food and seasoning industry, industrial wastewater reclamation, acid recovery
	Coating materials	Mold release agent
	Fluoropolymers / fluoroelastomers	Lining for tanks, piping, and pumps, sealants, materials for semiconductor devices
Other	MS gel	Bulking agent for liquid chromatography

# Main Products

## Chlor-alkali Business Main Products

Common Product Name	Applications
Caustic Soda	Wastewater neutralization, flue gas desulfurization, bleaching, food industry applications, manufacturing of chemical fibers, paper, pulp, and soap
Caustic potash	Potash salt production, soft soaps, petrochemicals, optical glass
Potassium carbonate	Glass (cathode ray tubes, optical glass), soap, brine, photography, production of potassium salts
Hydrochloric acid	Chemical raw materials, plating pretreatment, etching
Sodium hypochlorite	Water and wastewater system disinfection and sterilization, mold remover, bleaching paper, pulp, and textiles
Liquid chlorine	Bleaching paper and pulp, water and wastewater system disinfection and sterilization, chemical raw materials
Vinyl chloride monomer and polymer	Vinyl chloride monomers (VCM)/PVC resin
Epichlorohydrin	Epoxy resin raw materials
Sodium bicarbonate ACLESYA granulated sodium bicarbonate ECOBLAST blast cleaning agent	Pharmaceuticals (dialysis, antacids), food additives (leavening agents, beverage additives), bath salts, household cleaners, chemical raw materials, animal feed, water-soluble blast cleaning media, neutralizers for exhaust gas treatment, fire extinguishing agents

## Urethane Business Main Products

Common Product Name	Applications
Propylene oxide (PO)	Raw materials for propylene glycol, dipropylene glycol and polyols, raw materials for nonionic surfactants
Propylene glycol (PG)	Cosmetics, fragrances, unsaturated polyester resin, moisturizers, antifreeze, brine, food additives, pharmaceuticals
Dipropylene glycol (DPG)	Cosmetics, fragrances, unsaturated polyester raw materials, moistening agents, solvents, hydraulic oils, antifreeze, printing inks
EXCENOL™ polyol	Soft and rigid polyurethane foams, coatings, adhesives, elastomers, waterproofing materials
PREMINOL™ high-purity, high-molecular-weight polyol	Pressure dispersion foams, vibration absorption foams, elastic adhesives, sealants
U-FINE™ L urethane prepolymer	Adhesives, outdoor clothing materials
EXCESTAR™ silane modified polyether	Elastic adhesives for construction and automotive use
EXCENOL™ functional oil	Surfactants (textile treatment), toner binders, biodegradable lubricants, refrigeration oils

## Chlor-alkali Business Feature Products

### Caustic soda

Caustic soda is a typical strong alkali product obtained from salt electrolysis and used in a wide range of applications, such as chemical fibers, paper, pulp, chemicals, food, and soap. The AGC Group delivers a reliable supply of caustic soda to its clients and society.



### Vinyl chloride monomer/polymer

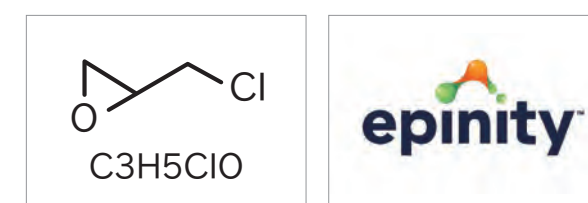
Polyvinyl chloride (PVC) is a general-purpose plastic raw material that softens when heated and is widely used in fields ranging from basic industries, such as water pipes and building materials, to cutting-edge industries, such as electronics.

The AGC Group also manufactures and sells the raw material vinyl chloride monomer (VCM).



### Epichlorohydrin

Epichlorohydrin is a monomer with epoxy and chlorine molecule groups. Numerous industries use the highly reactive characteristics of epichlorohydrin as a raw material for epoxy resin and other industrial products. AGC manufactures epichlorohydrin in Japan at Kashima Chemical Co., Ltd. and in Thailand at AGC Vinythai, producer of the EPINITY® brand products known around the world.



### Sodium bicarbonate

Sodium bicarbonate, commonly called baking soda, is a safe and mild alkaline substance widely used in familiar daily necessities and foods, for critical medical applications, and as a neutralizer for acid gas. As Japan's largest manufacturer of sodium bicarbonate, AGC employs thorough safety and quality control manufacturing of products to meet local market needs.



## Urethane Business Feature Products

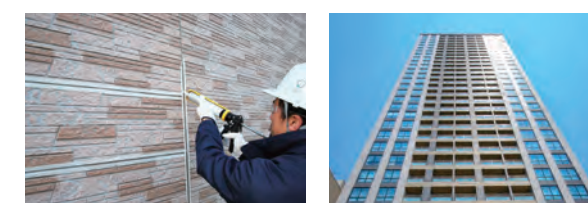
### Polyol EXCENOL™ / PREMINOL™

It is a polyether with a hydroxyl group and is used as a raw material for polyurethane, elastomers, adhesives, etc. We are developing "EXCENOL" for general-purpose applications and "PREMINOL," a high-performance product with few impurities based on our proprietary catalyst technology, and we provide solutions according to the purpose of use.



### Silane modified polyether, EXCESTAR™

It is a moisture-curable modified silicone with a hydrolyzable silyl group at the end developed based on the technology of the high-performance polyol "PREMINOL." In the presence of a catalyst, it hardens due to moisture and becomes a flexible elastic body. It is mainly used as a base material for sealants and adhesives, and we are developing products according to the required characteristics.





# Main Products

## Fluorochemicals Business\* Main Products

Common Product Name	Applications
Fluoropolymers Fluon® ETFE Fluon® PTFE Fluon® PFA Fluon+™	Wire insulation, films, tubing, filaments, lining & sealing materials
Fluoroelastomers AFLAS® FFKM AFLAS® FEPM	Wire insulation, sealing materials for semiconductor manufacturing processes
Fluoropolymer film Fluon® ETFE Film	Mold release films, roofing and exterior materials for construction, wallpaper, solar protection materials
Greenhouse film F-CLEAN™	Greenhouse covering materials
Transparent amorphous fluoropolymer CYTOP™	Antireflection coating, materials for photomask pellicle films, insulator, materials for semiconductors and optoelectronics
Solvent-soluble Fluoropolymer, LUMIFLON™	High-durability coating for architectural structures, bridges, manufacturing plants, aircraft
Water and oil repellents	Textiles including clothing & interior furnishings, paper products
Fluorocoating SURECO™	Anti-stain, anti-fingerprint, anti-fouling agents with abrasion resistance Conformal coatings
Chloromethyl styrene (CMS) highly responsive monomer	Silane coupling agent, ion-exchange membrane
Solutions for separating various chemicals FORBLUE™ family Fluorinated ion exchange membrane, FLEMION™ (for caustic soda, caustic potash, chlorine) Fluorinated ion exchange membrane, FORBLUE™ S-SERIES (for a wide variety of electrolysis) Hydrocarbon ion exchange membrane and dialyzers, Selemion™ Hollow fiber membrane gas dryer (humidifier), sunsep™ Electrolyte polymer dispersion for fuel cells, FOR- BLUE™ i-SERIES	Diaphragm for salt electrolysis Diaphragm for water and other electrolysis processes Acid recovery, desalination and condensation by electrodialysis Dehumidification/humidification of gas Ionomer for electrolyte membranes and electrodes of fuel cells

\* Includes some products not made from fluorine

## Gas & Solvent Business Main Products

Common Product Name	Applications
Chlorinated solvents	Fluorinated refrigerant feedstock, metal cleaner, dry cleaning chemicals, silicone resin solvents, surfactant, paint/coating remover
Fluorinated solvent, ASAHIKLIN®	Cleaning agents for precision equipment, defluxing, cleaning plastic parts, dewatering, drying, brine for cooling, carrier solvents
Low GWP fluorinated solvents AMOLEA™ AT SERIES, AMOLEA™ AS SERIES	Solvents for metal cleaning, precision parts cleaning, defluxing, carrier solvent for silicone resin
Low-GWP refrigerants AMOLEA™ 1224yd, AMOLEA™ 1234yf	Refrigerants for air conditioning, chillers, automobiles

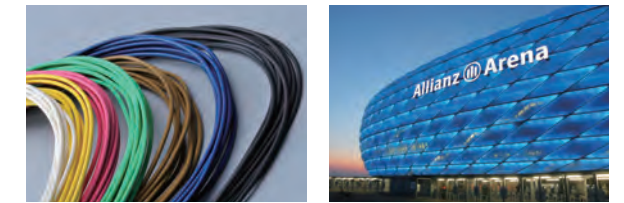
## Other Businesses Main Products

Common Product Name	Applications
Fine silica gels RESIFA™ M.S. Gel Sunsphere® Sunlovely™	Liquid chromatography packing, cosmetic materials, functional filler

## Fluorochemicals Business Feature Products

### Fluoropolymer Fluon® ETFE, Fluon® ETFE Film

Fluon® ETFE is an extremely easy to mold, well-balanced fluoropolymer with high thermal resistance, chemical resistance, and electrical properties used for high-performance wire coatings and other industrial applications. Fluoropolymer film Fluon® ETFE Film is used for stadium and airport exteriors as well as for mold release films for electronic devices.



### Fluoroelastomer AFLAS® FFKM

AFLAS® FFKM is used as a sealant in semiconductor devices for its excellent chemical-, thermal-, and plasma-resistant properties. Applications for AFLAS® FFKM are vastly expanding with the growing demand for high thermal- and plasma-resistance materials accompanying the rapid rise in semiconductor performance.



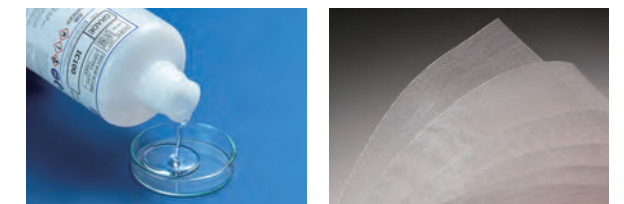
### Solutions for separating various chemicals FORBLUE™ family

FORBLUE™ is solutions for separating various chemicals.

The FORBLUE™ S-SERIES is fluorinated ion exchange membrane for various electrolysis processes. Used as a diaphragm for proton exchange membrane (PEM)-type water electrolysis which are suitable for green hydrogen production, the series improves the productivity and durability of hydrogen production equipment.

The FORBLUE™ i-SERIES is an electrolyte polymer dispersion solution used in electrolyte membranes and electrodes in vehicle and stationary fuel cells.

Our FORBLUE™ products facilitate hydrogen production and use and contribute to realizing a hydrogen-based society.



## Gas & Solvent Business

### Low GWP fluorinated solvent AMOLEA™ AS-300

Our AMOLEA™ AS-300 fluorinated solvent is an environmentally friendly next-generation environmental solution rated as Global Warming Potential (GWP) less than 1. The solvent has no flash point so does not fall under the hazardous materials category of the Fire Service Act or the Industrial Safety and Health Act (organic or specified regulations). In addition, its wide-ranging solvent applications and moderate volatility (boiling point of 54°C) give it exceptional cleansing properties.

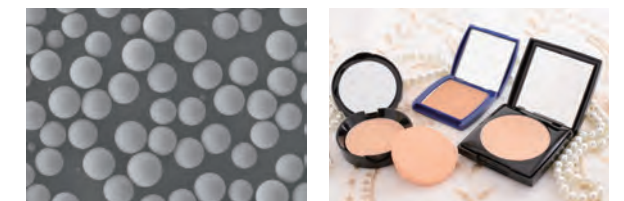
Ideal for degreasing and cleaning precision and metal parts, AMOLEA™ AS-300 is also used for defluxing of printed circuit boards and as a carrier solvent for silicone oils and fluorinated greases.



## Other Businesses

### RESIFA™ fine silica

Fine silica products utilize our unique pore control technology to meet needs for particle shapes, porous materials, non-porous materials, and surface treatment grades. Fine silica has wide applications as an alternative to microplastics in cosmetics, paints, packaging films, and electronic components thereby contributing to reducing environmental impact and addressing social issues.



# Chemicals Company Overview<sub>(as of end-December 2023)</sub>

## Company Data

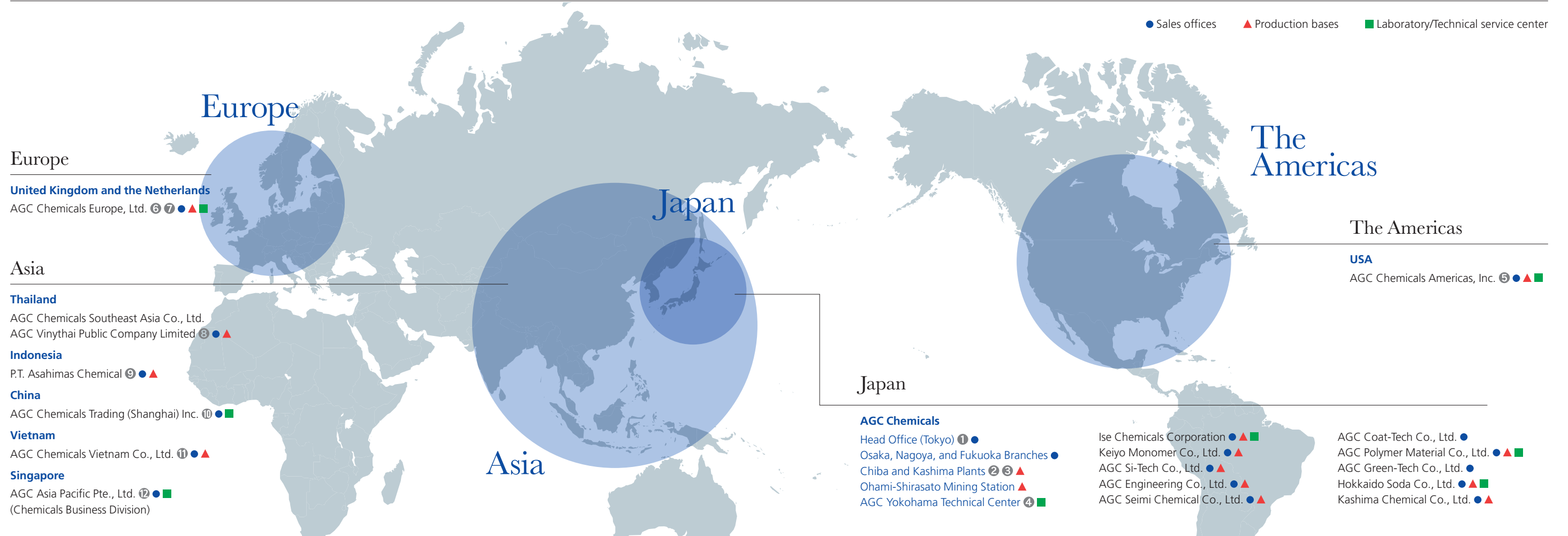
Chemical Company Inauguration	1917	Number of AGC Chemicals' Subsidiaries and Affiliates Worldwide	20
Number of Employees	Approx. 6,500	Bases Worldwide	9 Countries/regions
Net Sales	574.1 billion yen		
Operating Profit	64.8 billion yen		

## Business Contents

Manufacturing and sales of:

- Caustic soda
- Vinyl chloride materials
- Urethane raw materials
- Fluoropolymers and films
- Water and oil repellents
- Iodine-related products
- And more.

● Sales offices    ▲ Production bases    ■ Laboratory/Technical service center



① Head Office (Tokyo)



② Chiba Plant



③ Kashima Plant



④ AGC Yokohama Technical Center



⑤ AGC Chemicals Americas, Inc.



⑥ AGC Chemicals Europe, Ltd.



⑦ AGC Chemicals Europe, Ltd.



⑧ AGC Vinythai Public Company Limited



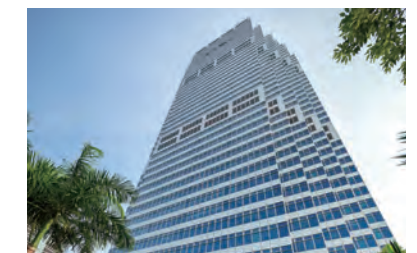
⑨ P.T. Asahimas Chemical



⑩ AGC Chemicals Trading (Shanghai) Inc.



⑪ AGC Chemicals Vietnam Co., Ltd.



⑫ AGC Asia Pacific Pte., Ltd.



AGC Chemicals  
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