EZC-2

Except for U.S.A.

Product Overview

Daikin Fluorochemical Products

http://www.daikin.co.jp/chm

DAIKIN INDUSTRIES,LTD. has obtained the ISO 14001(*1) certification for the environmental management system and the ISO 9001(*2) certification for the quality management system in our fluorochemicals plants.

*1. ISO 14001 is a standard established by the ISO (International Organization for Standardization) which applies to environmental preservation activities. Activities, products and services of our fluorochemicals plant have been certified as being environmentally sound by an internationally recognized certification body.

*2. ISO 9001 is a standard established by the ISO and applied to quality management system. DAIKIN INDUSTRIES, LTD. Chemical Division has been certified by an internationally recognized certification organization for our ability to consistently provide products, which satisfy customer's demand and applicable regulatory requirements.

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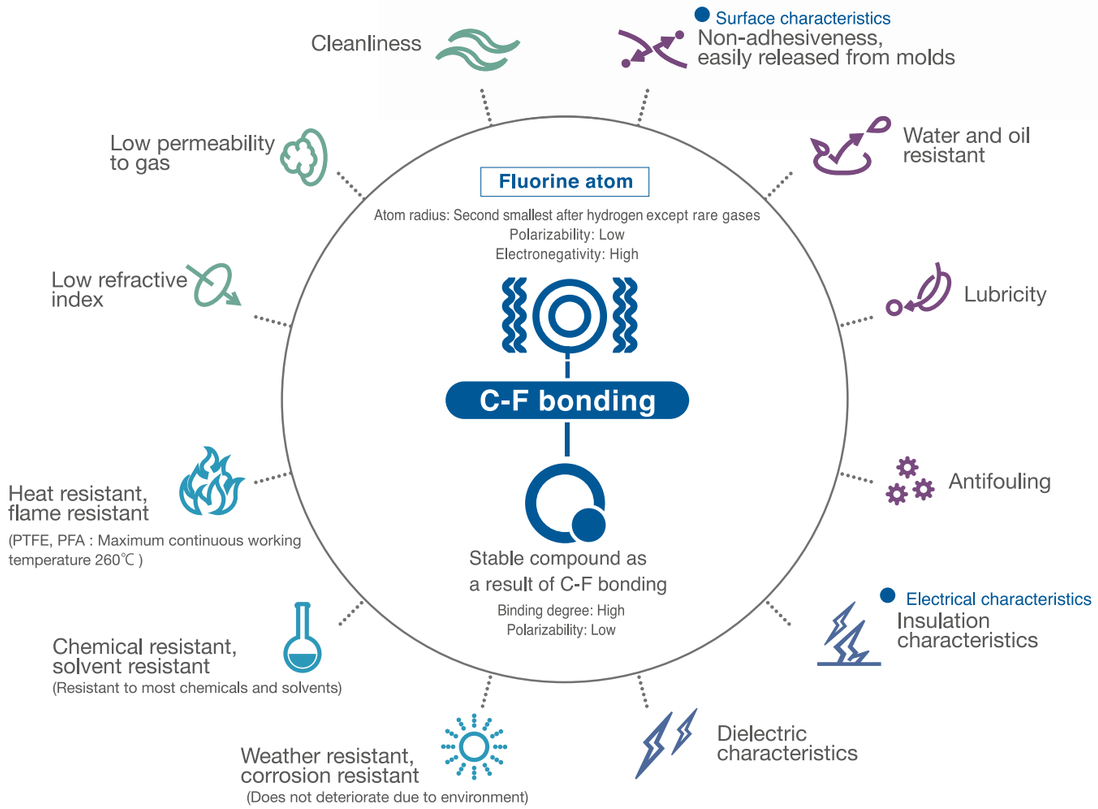
DAIKIN INDUSTRIES,LTD.

Fluorochemical Products

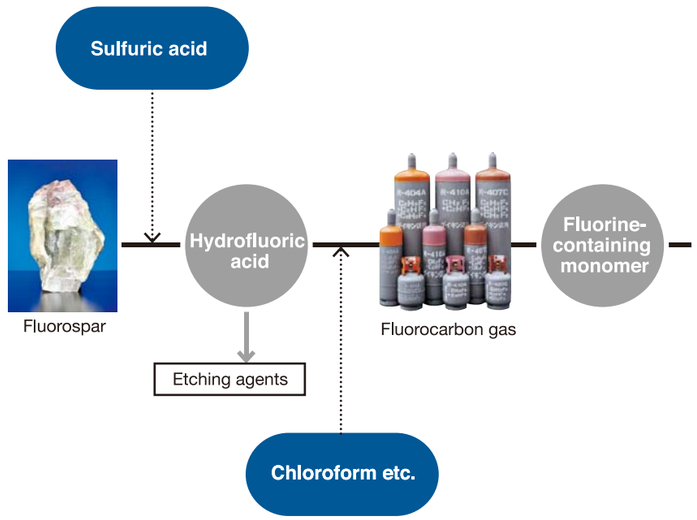
From being the first in Japan to take on fluorochemicals in 1933, Daikin has continued its role as a pioneer in bringing over 1,800 types of fluorochemical products to the world using our own unique technology.
The manufacture of fluorinated compounds begins with fluorite (which is derived from calcium fluoride), and through chemical reaction and thermal decomposition, materials such as hydrofluoric acid, fluorocarbons, fluoroplastics, fluoroelastomers and surface coating agents are produced.
Daikin's fluorochemical products feature advanced properties such as heat resistance, chemical resistance, water and oil repellency, and lubricity and are used in diverse fields ranging from automobiles and semiconductors to office automation equipment, household products, and architectural structures.

Features of fluorine compounds

Taking advantage of the various characteristics of fluorine

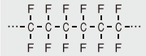
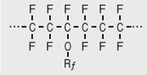
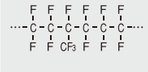
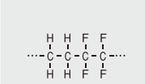
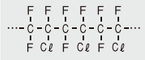
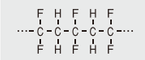


Process of manufacturing fluorochemical products



Fluoroplastics, Fluoroelastomers, Additives, Seal for semiconductor, Non-cohesive/ corrosion resistant coatings, Weather resistant fluorinated coating (varnish), Infrared reflective fluorinated coating, Functional coatings, Mold releasing agent, Water/ oil repellent, Fluorinated oils, Ultraviolet ray-cured bonding agent for optical fibers, Fluorine-containing natural leather, Fluorine-containing intermediates, etc.

Fluoroplastics

Name	Formula	Features	Type	Major applications
POLYFLON PTFE [Polytetrafluoroethylene] (PTFE)		The most commonly demanded fluoropolymer Because of its high melt viscosity, PTFE cannot be molded using conventional processing methods. Easily fibrillized under high shear.	Molding powders	Packing, gasket, pipe
			Filled molding powders	Applications requiring mechanical strength, seal ring
			Fine powders	Unsintered (raw) tape for electrical wire, tube
			Dispersions	Non-cohesive slide coating, impregnation to glass fabric
NEOFLON PFA [Copolymer of tetrafluoro-ethylene and perfluoroalkyl vinyl ether] (PFA)		Possesses the same proprieties as PTFE Melt processable fluoropolymer (Molding method used with general thermoplastic resin can be used.)	Pellets	Semiconductor parts, electrical wire, film, tube
			Dispersions	Insulation-coating materials, non-cohesive coating material
			Filled pellets	Applications requiring mechanical strength
			Films	Electrical wire, insulating sheet materials, corrosion-proof lining
NEOFLON FEP [Copolymer of tetrafluoro-ethylene and hexafluoropropylene] (FEP)		Same as PTFE and PFA, excellent in chemical resistance and electrical properties Melt processable fluoropolymer with a lower melting point than PFA	Pellets	Tube, film, electrical wire
			Dispersions	Insulation-coating materials, non-cohesive coating material
			Films	Electrical wire, insulating sheet materials, corrosion-proof lining
NEOFLON ETFE [Copolymer of tetrafluoro-ethylene and ethylene] (ETFE)		Adheres to other materials, excellent in transparency and molding processability Melt processable fluoropolymer with a lower melting point than FEP	Pellets	Electrical wire, corrosion-proof lining material, tube
			Films	Corrosion-proof and antifoulingfilms
NEOFLON PCTFE [Polychlorotrifluoroethylene] (PCTFE)		Superior in low permeability (barrier performance) against various chemical solutions Melt processable fluoropolymer with a lower melting point than ETFE	Molding powders	Packing, gasket, piping material
			Films	Medicine cartridge, moisture proof and optical penetration films
NEOFLON PVDF [Polyvinylidene fluoride] (PVdF)		Excels in mechanical properties Melt processable fluoropolymer with a lower melting point than PCTFE	Pellets	Pipe, valve, pump, electrical wire, tube, film, sheet lining
NEOFLON EFEP (EFEP)	———	Excels in transparency and molding processability Melt processable fluoropolymer that can be molded at low temperature	Pellets, Films	Automobile fuel tubes, chemical solution tubes, antifouling films
NEOFLON CPT (CPT)	———	Melt processable fluoropolymer that excels in chemical solution permeability resistance	Pellets	Low permeability tubes for semiconductors, low permeability automobile fuel tubes
NEOFLON VT	———	Melt processable fluoropolymer with a particular dielectric characteristic	Powders	Binders for lithium-ion batteries

Fluoroelastomers

Name	Major applications
DAI-EL [Copolymer of vinylidenefluoride and hexafluoropropylene]	Modings for O-rings, gaskets, roll, fuel hoses and electrical wire, etc.
DAI-EL Fluoro TPV [Composite material of fluoroplastic and fluoroelastomer]	Fuel hoses
DAI-EL THERMOPLASTICS [Thermoplastic fluoroelastomer]	Transparent tube for medical and physicochemical applications, O-ring sealing material

Additives

Name	Major applications
POLYFLON PTFE LOW POLYMER [Polytetrafluoroethylen micropowder]	Resin additive, coating additive, lubricant, grease thickener
POLYFLON MPA [Polytetrafluoroethylene powder]	Prevents the drip of plastics when they are burned
DAI-EL PPA [Fluoroelastomer powder]	Polymer processing aid (for improving mold processability of polyethylene film extrusion. etc.)
UNIDYNE	Repellent (internal melt)
UNIDYNE DS series	Anti-fogging agent for films for agricultural use, leveling agent
DAIFREE FB series	Internal mold releasing agent for rubbers
Graphite fluoride	Positive electrode material for batteries, lubricants, extreme pressure additives

Seal for semiconductor

Name	Major applications
DUPRA(★) [FFKM O-ring]	Seal for etching, ashing, CVD tools and wet process

Non-cohesive/ corrosion resistant coatings

Name	Type		Major applications
POLYFLON PTFE	Enamel (★)		Non-cohesive slide coating for industrial and household equipment
	Tough coatenamel		Abrasion resistant non-cohesive slide coating
NEOFLON PFA	Coating powder		Corrosion-proof lining, non-cohesive coating
NEOFLON ETFE	Coating powder		Corrosion-proof lining
DAI-EL LATEX	Fluoroelastomer coating [Copolymer of vinylidenefluoride and hexafluoropropylene]	Water-base G L	Binder for textile materials, surface modifier for general rubbers, protective material for metallic surfaces
		Water-base GLS	Application of non-cohesive property and low friction coefficient
		Solvent-base DPA / DPS	Surface modifier for general rubbers, protective material for metallic surfaces

Weather resistant fluorinated coating (varnish)

Name	Major applications
ZEFFLE	Exterior finish (panels), antifouling for polyvinyl chloride etc., concrete protection (panels), heavy-duty coating for architectural structures (bridges and plants)

Note: Products marked with (★) partly include controlled substances listed in Appendix Table 1 of the Export Control Order according to the provisions of the Foreign Exchange and Foreign Trade Act. Special procedures, including obtaining an export permit from the Japanese government, must be followed when exporting such items from Japan.

Infrared reflective fluorinated coating

Name	Major applications
ZEFFLE infrared reflective coating	Temperature rise suppression and energy conservation for air conditioning for factories, houses, buildings, warehouses, etc. Temperature rise suppression, cargo degradation suppression and appearance maintenance for marine vessels, vessels and cargo Volatilization suppression, thermal expansion and deformation suppression, strengthening of resistance to chemicals and salt for reservoirs in tanks and plants

Functional coatings

Name	Major applications
OPTOOL	Touch screens Surface antifouling agent for liquid crystal displays (cellular phones) and optical lenses (eye glasses, etc.) Ultraviolet cured antifouling additive
FTONE	Water repellent, oil repellent and antifouling agent for plastics and metals Water repellent, oil repellent, antifouling agent and anti-degradation agent for natural stones (marble, granite), bricks, concrete, wood, leather, etc.

Mold releasing agent

Name		Major applications
DAIFREE	Water-base	Mold releasing agents for rubber and plastic molds
	Solvent-base	
	Aerosol	

Water/ oil repellent

Name		Major applications
UNIDYNE	Water-base	Water and oil repellent for fabrics and carpets Oil resistant processing agent for food package paper
	Solvent-base	

Fluorinated oils/ greases

Name	Formula	Major applications
DAIFLOIL★ [Chlorotrifluoroethylene low polymer]	$(C_2C\ell F_3)n$	Liquid level indicator, corrosion and acid resistant lubricant, insulating oil
DAIFLOL GREASE		Chemical resistant lubricating grease, insulating grease
DEMNUM★ [Perfluoropolyether oil]	$F(C_3F_6O)nC_2F_5$	Lubricating oil, vacuum pump oil, sealing liquid, heating medium
DEMNUM GREASE		Lubricant (for high-temperature, for high-vacuum, in chemical plants and in clean rooms)

Ultraviolet ray-cured bonding agent for optical fibers

Name	Major applications
OPTODYNE UV	Binding of optical components such as optical fibersand prisms, Photoconductive wave path cladding

Fluorine-containing natural leather

Name	Major applications
LEZANOVA [Leather with improving functions of water and oil resistant and antifouling]	Shoes, bags, gloves for sports, clothing

Fluorocarbons

Name	Formula	Major applications
HFC-23	CHF_3	Refrigerants for freezers, refrigerators and air-conditioners, blowing agents for plastics, propellants for aerosols,solvents
HFC-32	CH_2F_2	
HFC-125	CHF_2CF_3	
HFC-134a	CH_2FCF_3	
HFC-152a	CH_3CHF_2	
R-404A	HFC-125/143a/134a/(44/52/4)	
R-407C	HFC-32/125/134a(23/25/52)	
R-410A	HFC-32/125(50/50)	
HCFC-22※	$CHClF_2$	
HCFC-123※	$CHCl_2CF_3$	
PFC-14	CF_4	
PFC-C318	$CF_2CF_2CF_2CF_2$	

Etching agents for semiconductors

Name	Formula	Major applications
Hydrofluoric acid★ (semiconductor grade)	HF(aq.)	[Wet etching agent for semiconductors]
Ammonium fluoride	NH4F(aq.)	
Bufferd hydrofluoric acid	HF/NH4F(aq.)	
Bufferd hydrofluoric acid U	HF/NH4F/Surfactant(aq.)	
HFC-23	CHF_3	[Dry etching agent for semiconductors]
HFC-32	CH_2F_2	
HFC-125	CHF_2CF_3	
PFC-14	CF_4	
PFC-116	CF_3CF_3	
PFC-C318	$CF_2CF_2CF_2CF_2$	

Fluorine-containing intermediates

Name	Major applications
Fluorinated alcohols	Pharmaceutical intermediates, Agrochemical intermediates, Functional material intermediates
Fluorinated methacrylate monomers	
Fluorinated methacrylate monomers	
Fluorinating agents (MEC reagents)	
Synthesis of aliphatic fluorine intermediates	

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Products marked with ※ are controlled substances listed in Appendix Table 2 of the Export Control Order according to the provisions of the Foreign Exchange and Foreign Trade Act. Special procedures, including obtaining an export approval from the Japanese government, must be followed when exporting such items from Japan.