



Your Dreams, Our Challenge

AGC Chemicals Product Range



Your Dreams, Our Challenge

“Your Dreams, Our Challenge” is AGC’s brand statement created to fulfil our mission under the group vision “Look Beyond”. Since its foundation, the AGC Group has always taken up new challenges to make people’s lives better. Working as one team, we will strive to further enhance the corporate value of the AGC Group.

AGC, an everyday essential part of our world

We aim to continue being the first choice solution provider for our customers by building long-term trusted relationships with them through unique materials and solutions developed using our wide-ranging material and product technologies.

We will continue to offer products and solutions which customers and society need, making people’s lives better around the world every day.

AGC GROUP VISION
“Look Beyond”

Our Mission

Our Shared Values

Innovation & Operational Excellence
Environment Diversity Integrity

Our Spirit

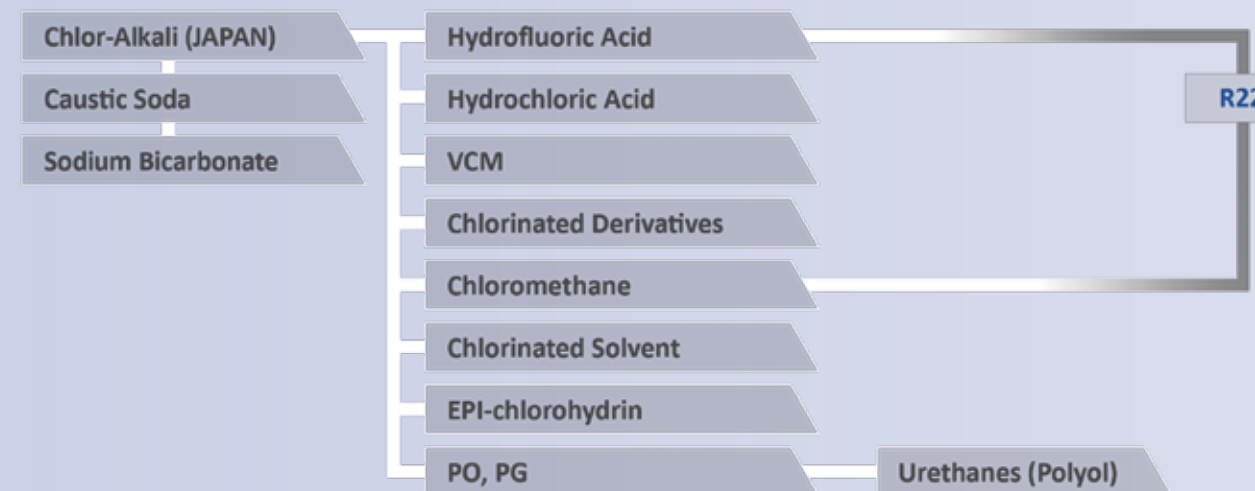
“Never take the easy way out,
but confront difficulties”

The Product Chain of AGC Chemicals

How our products are made

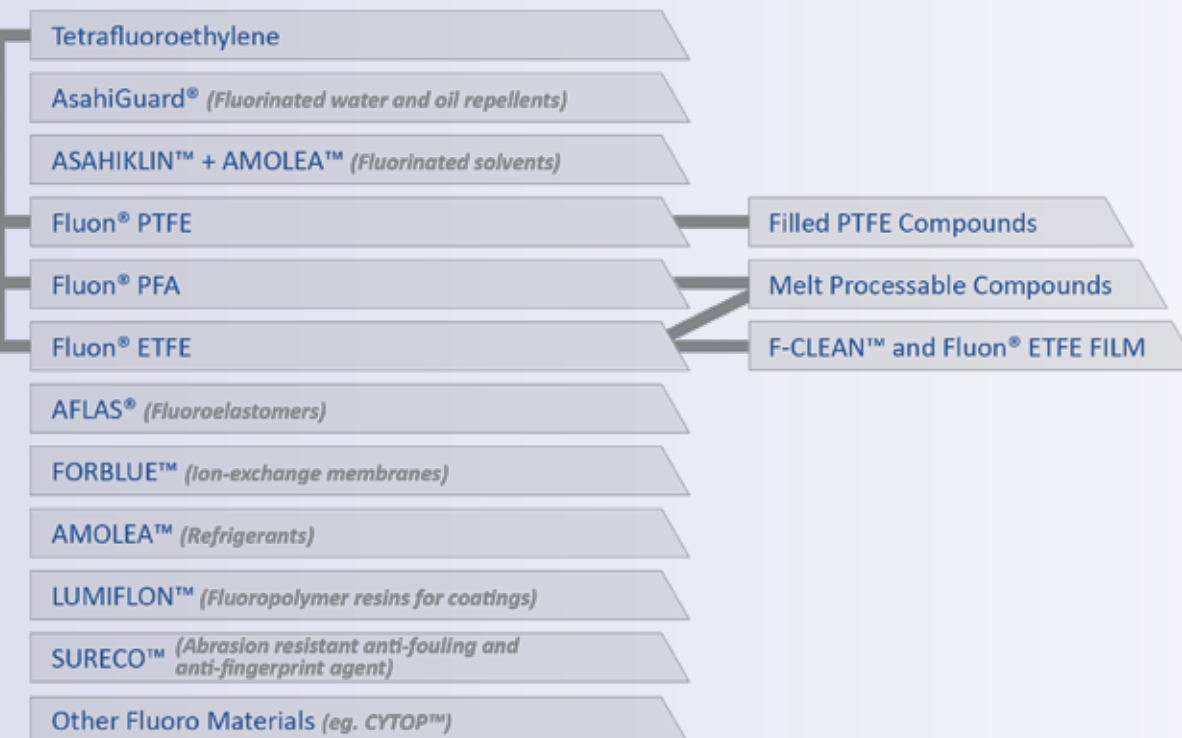
Chlor-Alkali & Polyurethanes

Chlor-Alkali



Fluorine Chemicals & Specialities

Fluorine Chemicals



Specialities



Polytetrafluoroethylene (PTFE) is a synthetic fluoropolymer used globally in thousands of applications ranging from industrial to surgical uses.

AGC Chemicals manufactures and supplies Fluon® PTFE in various forms.

Fluon® Coagulated Dispersions (CDs), also known as “fine powder”, have been developed for paste extrusion into pressure hoses (e.g. hydraulic systems), tubes, pipe liners, electrical wire insulation and tape. Fluon® CD grades are also used to make filtration membranes and technical fibres for textiles and industrial applications.

Applications

- High performance hose
- Wire coating
- Small diameter transparent tubing
- Electrical tape
- Pipeliners

Fluon® Lubricant Powders are manufactured from virgin PTFE feedstock and are used either as dry lubricants or as additives in other materials such as plastic compounds, rubbers, fluoroelastomers, inks, paint, oils and greases. Some Fluon® lubricant powders are FDA 21CFR 177.1550 (U.S. Food and Drug Administration) and EU food contact approved so are ideal for use as additives in coatings which are in contact with food and drink, such as food processing equipment and can coatings. They also give enhanced lubricity, non-stick properties and reduce friction, all of which are important in a wide range of applications.

Applications

- Additive in gravure and flexographic printing inks
- General purpose lubricant
- Friction reducing additive in thermoplastics
- Food contact coatings

High performance **Fluon® Aqueous Dispersions (ADs)** have been developed which are milky white dispersions of PTFE particles in water, stabilised by wetting agents, for use as a base coat, binder and in anti-drip applications. They are also used to coat metal, impregnate glasscloth and fabric, as well as packings, and for coagulation with pigments or fillers for use in applications such as filled bearings. The dispersion product range is under continuous development and the latest information is available from the appropriate regional sales office.

Applications

- Conveyor belts (both glass fibre & synthetic materials)
- Non-stick coatings (e.g. kitchen cookware)
- Electronics (circuit boards & insulation)
- Textile architecture (glass fibre & other fabrics)
- Industrial applications (e.g. hot melt adhesive for bonding moulded fluoropolymers)
- Cast film

Fluon® Granular PTFE is used in the form of pre-sintered powder for ram extrusion and in the form of non free flow powder for moulding various products and stock shapes, such as tubes, rod and sheet, and as a feedstock for filled compounds.

Applications

- Base resin for compounding with fillers
- General moulding of parts with high mechanical & electrical performance (e.g. expansion joints, bellows, diaphragms, piston rings, seals, linings, electronic parts & fluid handling systems)
- Billets for skived tape, film & sheet
- Ram extrusion
- Additive for coating systems



Fluon® ETFE (ethylene tetrafluoroethylene) is a fluorine-based plastic that offers impressive corrosion resistance, chemical inertness and mechanical toughness over a very wide temperature range.

Available in pellet form, Fluon® ETFE resins can be processed by extrusion, injection moulding and blow moulding. Applications include wire and cable coating for automotive applications, robotics and electronic equipment, tubes, technical and architectural films, sheets, tape and parts for the semi-conductor industry. The product is also available in powder form for rotational moulding and spray coating to achieve chemically-resistant coatings for aggressive environments.

Fluon® ETFE Resins

Fluon® ETFE resins offer excellent processability and heat resistance as well as high mechanical strength, high chemical resistance, superior thermal and electrical properties and radiation resistance.

The mechanical and electrical insulation properties are outstanding. Stable mechanical and electrical properties are maintained during exposure to temperatures ranging from -200°C up to +150°C. Superior tensile elongation and strength ensure no breakage by impact at room temperature. Low-temperature impact resistance is guaranteed to at least -80°C. Tolerant to almost all chemical agents and solvents, Fluon® ETFE resins are also resistant to ultra-violet light, making them highly suitable for outdoor use. With low smoke and flame characteristics, ETFE is rated 94V-0 by UL.

Fluon® LM-ETFE Resins

Fluon® LM-ETFE has a lower melting point, meaning it can be processed at lower temperatures than conventional ETFE, or if processed at standard or higher temperatures can give increased production rates. It has better thermal stability, a higher limiting oxygen index, improved resistance to heat and stress crack, as well as being more flexible and transparent than standard ETFE. Continuous use at 180°C is possible.

Fluon® LM-ETFE AH & LH (Adhesive) Resins

Engineered to provide enhanced adhesion when bonding with polyamides (PA). Ideal for co-extrusion applications, such as fuel hoses where ETFE barrier properties are crucial. Also available in anti-static form. Fluon® AH ETFE is used in the SUNBESTA® fuel hose system.

Fluon® ETFE HT (Heat Resistant) Resins

Designed for use at higher service temperature with greater thermal stability than conventional ETFE. Designed for wire and cable extrusion with an operating temperature window of -180°C up to 200°C.

Fluon® ETFE Compound Grades

Compound grades are used when improved properties over standard ETFE resin are needed. A variety of custom reinforcements and conductivity levels are available. A variety of filled grades are available to provide enhanced properties, such as reduced mould shrinkage, improved wear resistance and increased flexural strength.

Fluon® ETFE Powder Grades

Powder grades of ETFE are available for electrostatic coating, fluid bed dip coating and rotolining where non-stick and corrosion-resistance are required.





Fluon® PFA (or perfluoroalkoxy) is a fluoropolymer with excellent thermal and chemical resistance. PFA is similar in composition to the fluoropolymers PTFE and FEP (fluorinated ethylene propylene), sharing low coefficient of friction, non-stick properties and non-reactivity characteristics. PFA resists UV light and has better heat resistance, higher melt strength and can be used within a temperature range of -200°C to 260°C.

PFA also offers stability at high processing temperatures, excellent crack and stress resistance whilst maintaining more than ten times the flex life of FEP. A low dielectric constant allows PFA to be used in semiconductor manufacturing and many electrical applications. PFA coating is ideal when extended services are required in hostile environments including chemical, thermal and mechanical stress.

As with other thermoplastic resins Fluon® PFA can be extruded, injection moulded, blow moulded and transfer moulded for applications such as tubing, receptacles, lining and wire coating.



Fluon® Colour Concentrates are a range of colour masterbatches suitable for use with standard ETFE, high melt flow rate ETFE and high melt flow rate PFA. They are supplied as cylindrical pellets in a colour range including red, brown, orange, pink, violet, yellow, green, blue, black, grey and white. Giving excellent surface finish, colour consistency and dispersion even at high production line speeds they are typically used in colour-coded wire insulation, tubing and moulded parts.



PFA and Colour Concentrates



Fluoroelastomers have the highest heat resistance of all synthetic rubbers.

AFLAS® is the fluoroelastomer of choice for products and systems that have to work in tough environments. It is used worldwide in all kinds of industrial applications where ultimate reliability is required, along with the elastomeric properties of a synthetic rubber.

AFLAS® was launched by AGC Chemicals over 30 years ago and is based on an alternating copolymer of tetrafluoroethylene and propylene.

Properties

- Excellent heat resistance with approx. 200°C continuous service temperature with even higher peaks
- Excellent chemical resistance to strong acids and bases at high temperatures
- Excellent steam and hot water resistance
- Excellent electrical insulation properties with volume resistivity of $10^{16} \Omega \cdot \text{cm}$
- Excellent compression set with the new AFLAS® 600X
- Multi-layer ability to bond to conventional elastomers e.g. EPDM
- Colourability

Low Outgassing

AFLAS® is ideal for making precision parts due to its extremely low outgassing level

Heat Resistance

AFLAS® has outstanding heat resistance

Electrical Insulation Properties

AFLAS® exhibits class leading electrical insulation performance comparable to those of silicone rubber and ethylene-propylene rubber

Gas Barrier Properties

Compared with other synthetic rubbers AFLAS® has excellent gas barrier properties

Low Temperature Properties

At low temperatures flexibility is lost but the physical properties are maintained

Steam Resistance

AFLAS® is resistant to very hot water and to steam at high temperatures

Chemical Resistance (strong acids/bases)

AFLAS® is well known for its outstanding inherent base resistance, resisting aqueous and non-aqueous acids and bases of high concentration and at high temperatures

Chemical Resistance (non-polar solvents)

AFLAS® will swell in some solvents such as gasoline, hydrocarbon based solvents and chlorine based solvents

Applications

- O-Rings and gaskets
- Manufacture of liquid crystal and semi-conductors
- Wire and cable
- Automotive oil seals



High performance fluoropolymer film

AGC is the world's largest manufacturer of ETFE and uses a unique in-house film-forming process to convert its own ETFE resin into Fluon® ETFE FILM, an ultra-strong fluoropolymer film. Fluon® ETFE FILM has been used for many years in iconic architectural projects in Europe, South America, the Middle East and Asia. ETFE Film is safer and lighter in weight than glass which means less structural support is required which in turn reduces building time and costs.

ETFE film is also heat resistant, chemical resistant and fire resistant with excellent thermal insulation properties, high light transmission and long-term weatherability. Its high level of heat retention, combined with its ability to allow in more natural light than glass, can significantly reduce energy costs by up to 30% compared to glass. The anti-stick properties of ETFE film mean it is almost self-cleaning as dust and dirt simply washes off with rainfall and snow slides off.

Due to the flexible nature it can be used to create curved transparent façades which, impressive to view from the outside and inside, replicate almost perfectly the open space and brightness of the outdoors. Grass and even tropical plants can flourish in a climate created under Fluon® ETFE FILM.

Other applications include release film used in the manufacture of components and printed circuit boards in the electronics and aerospace industries, easy-clean and heat resistant surfaces for interior finishing, building integrated photovoltaic (BIPV) systems and curved flexible solar modules.

Features

- ⬢ Available in thicknesses between 12µm and 500µm
- ⬢ ETFE melting point is 260°C
- ⬢ High optical transparency and lightweight
- ⬢ 100% recyclable

Benefits

- ⬢ Resistant to UV light
- ⬢ Resistant to high winds
- ⬢ Repairable with ETFE film patches or sheets
- ⬢ Excellent chemical resistance
- ⬢ Low surface friction, therefore self-cleaning

Applications

- ⬢ Release film
- ⬢ Roofing and architectural facades
- ⬢ Protective film for solar cells and noise absorbers



Canary Wharf Crossrail Station
London, UK



Bringing the sunshine inside

F-CLEAN™ is a fluoropolymer (ETFE) film which improves the growth efficiency of fruits, berries, vegetables, seedlings and flowers inside greenhouses. This film has a higher transmission rate of light and UV than glass, polyethylene or polycarbonate, allowing the full spectrum of solar light to pass through into the growing area. This results in more production, earlier blooms and more colourful petals, as well as sweeter fruit, better quality vegetables and more intense pollination by bumblebees.

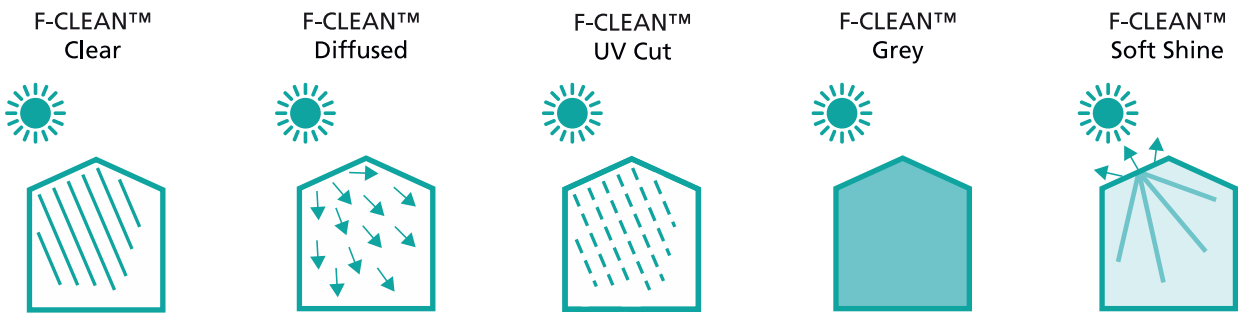
F-CLEAN™ is treated with an anti-drip coating, preventing water drops from forming and potential drip damage to the crop. Due to the low surface energy of the fluoropolymer film, dirt gets washed away easily by rain and snow, so excellent light conditions can be expected year-round. F-CLEAN™ Grey and F-CLEAN™ Soft Shine are also convenient to cover roofs of service corridors.

Benefits

- Remains naturally clean for years due to its low surface energy properties
- Excellent UV light transmission (up to 90%) – also available in a ‘UV Cut’ version
- Excellent durability due to minimal effects of ageing on tensile strength – over 30 years’ service life
- Lightweight but strong, requiring minimal structural support
- Self-extinguishing – tested to fire safety standard DIN4102, Class B-1
- Chemically resistant, ideal for use in greenhouses with sulphur vaporisers
- Available in a variety of widths based on customer request

Choose the most appropriate F-CLEAN™ grade for your crop:

F-CLEAN™ Clear (UV Open)	Uses the full spectrum of solar light and provides the same light conditions as outside
F-CLEAN™ Diffused	Diffuses light evenly, whilst maintaining high light transmission deeper into the crop
F-CLEAN™ GR Series (UV Cut)	Available in 3 grades with different rates of UV Cut
F-CLEAN™ Grey	Cuts solar light up to 99%
F-CLEAN™ Soft Shine	Blocks heat energy from sunlight transmitting 14% light



ETFE Film for Greenhouses





A fluorinated resin for highly durable coatings

AGC developed its solvent-soluble fluoropolymer, LUMIFLON™, an OH functional polyol, in 1982. Its unique alternating structure is key in providing ultra-weatherability and allows LUMIFLON™-based coatings to be highly durable and far longer lasting than other coatings. They can be cured at room temperature or at elevated temperatures. LUMIFLON™ is suitable for use in both field-applied and shop-applied coatings.

The use of LUMIFLON™ helps to maintain the original appearance of buildings, vehicles, windmills and bridges for several decades, offering protection against UV rays, oxidation, humidity, corrosion and acid rain.

LUMIFLON™ resins can be formulated into coatings with a wide range of gloss and colour. The use of a topcoat based on LUMIFLON™ significantly reduces repainting and cleaning costs for the lifetime of the coated structure.

The product is used on many iconic structures, such as Ferrari World in Abu Dhabi, Marina Bay Sands in Singapore, the Burj al Arab hotel in Dubai, the Expo Bridge in Milan as well as the aircraft of the Japanese airline, ANA.

Features

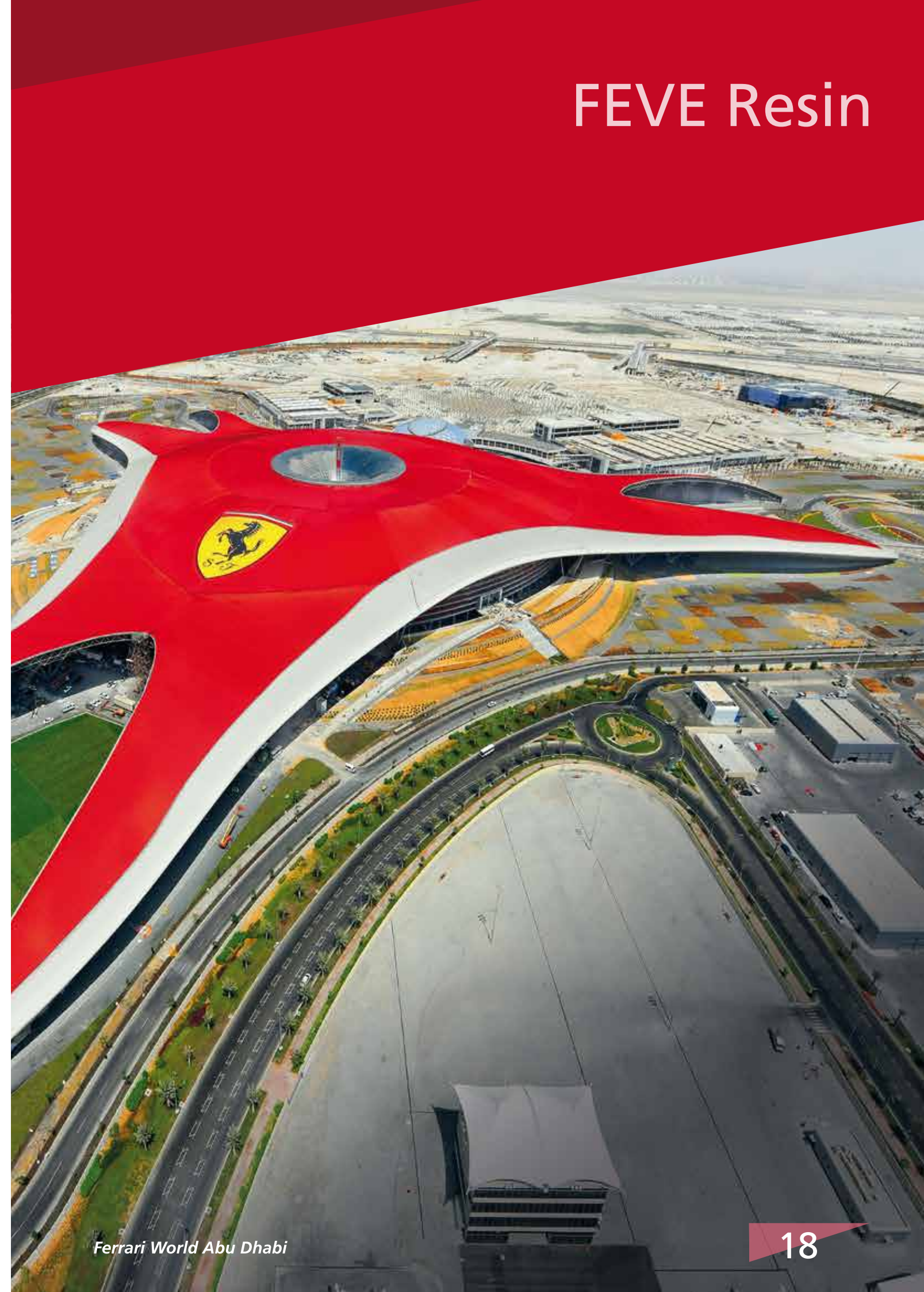
- ◻ Fluoropolymer based on fluoroethylene and vinyl ether monomers
- ◻ Available as solvent borne, water based and powder grades
- ◻ Curable from room temperature to high temperatures, (from 10°C to 220°C)
- ◻ Highly transparent film

Benefits

- ◻ Outstanding UV light and weathering resistance
- ◻ Long-lasting colour and gloss retention
- ◻ Superior corrosion protection
- ◻ Excellent chemical resistance
- ◻ Low dirt pick-up, therefore giving easy-clean surface

Applications

- ◻ Architecture (coil coatings & powder coatings)
- ◻ Industrial maintenance
- ◻ Heavy duty, marine, bridges and windmills
- ◻ Transportation and aerospace
- ◻ Protective coatings for concrete, wood and plastics



Ferrari World Abu Dhabi

A new generation of fluorinated water/oil/alcohol repellent

AsahiGuard® E-Series is a fluorinated water and oil repellent providing sustainable alternatives for many applications, including paper packaging, textiles, apparel, non-wovens, natural and synthetic leathers and home furnishings. It offers high performance properties with improved environmental and biological profiles.

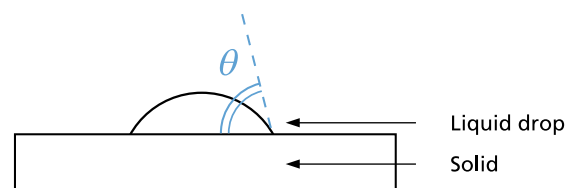
Features

- Ideal for tough and durable coatings
- Can be used either at the wet end or the size press end in paper production
- Unscented and gives a high quality, food contact use approved, non-stick, breathable barrier to water, oil and grease
- Suitable for use on operation scrubs, medical gowns, surgical drapes, surgical face masks and laboratory wear

Benefits

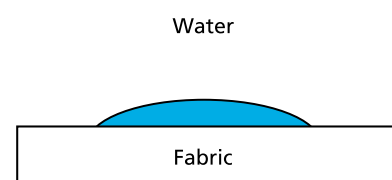
- Medical services, emergency services, police and army
- Industrial workwear, e.g. in the automotive and chemical industries
- Air and oil filters
- Outdoor leisure and sportswear
- Tents, awnings and canopies
- Food Packaging

Surface Tension (Water and Oil Repellency)



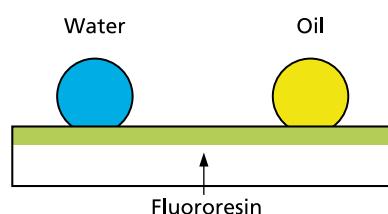
Whether an object tends to become wet or not is determined by its surface tension. When a liquid touches a solid surface it is repelled to form beads if the surface tension of the liquid is larger than the surface tension of the solid. The solid becomes wet if its surface tension is larger than the surface tension of the liquid.

Surface Tension of Fabric >
Surface Tension of Water



Fabric becomes wet because its surface tension is higher than that of water.

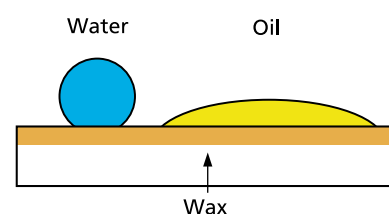
Surface Tension of Water >
Surface Tension of Oil >
Surface Tension of Fluororesin



The surface tension of fluororesin is very low, therefore fluororesin repels water and oil.

AsahiGuard® E-Series has a particularly low surface tension.

Surface Tension of Water >
Surface Tension of Wax >
Surface Tension of Oil



Wax is used as a water repellent because of its low surface tension, however wax does not repel oil, since oil has a lower surface tension.



Water & Oil Repellent



Fine Chemicals

AGC has a unique position as a producer of pharmaceutical and agricultural fine chemicals with a particular expertise in fluorine chemistry. AGC has more than twenty years experience in this field and the range of products has widened considerably as a result. As well as providing various fluorinated compounds such as fluoroanilines, fluorobenzoic acid and fluoroquinolones, AGC also supplies more advanced intermediates and bulk pharmaceuticals.

AGC owns a multi-purpose cGMP plant for the manufacture of API's (Active Pharmaceutical Ingredients) and intermediates. This facility has been substantially extended and its capacity increased to meet customers' needs.

AGC focuses constantly on the development of innovative chemicals whilst at the same time respecting the natural environment around us.

Synthetic Organic Chemistry

- Fluorination (HF, Balz-Schiemann, TFEDMA, FAR, F₂)
- Chlorination, iodination, bromination
- Friedel-Crafts reaction, Grignard reaction, Suzuki coupling
- Phosgenation
- Low temperature reaction (-100°C)
- Hydrogenation (up to 4.5 MPa)
- Peptides

Biochemistry

- Enzymatic reactions
- Proteins reduction by recombinant cells

Active Pharmaceutical Ingredients (APIs)

- Bulk actives for injection use
- Spray dryer finishing process
- Highly potent bulk actives

cGMP Multi-Purpose Plant

SUS and Hastelloy glass lined reactors from 0.1 to 6m³ capacity are configured to produce a variety of products in quantities from 10kg to several tonnes.

AGC is able to carry out reactions under high pressure (4.5 MPa) or at low temperatures in Hastelloy reactors of 0.1 and 1m³. Products are discharged into a fluororesin (PTFE) lined centrifuge (diameter 600mm) or a stainless steel filter dryer (1m³) and then into a conical dryer or a vibrating vacuum dryer for final processing. All this finishing equipment is located in a clean room.

Environmental Certification

- AGC's Chiba plant is registered to ISO 14001.



cGMP plant, Chiba



cGMP plant reactors



Fine Chemicals

Fine Silica

Fine silica products are fluorinated resin additives for improved surface smoothness and dispersion of media such as cosmetics, coatings and paint. They can also replace abrasive microplastic particles in personal care products. The particles have a lower coefficient of friction than titanium dioxide and other fillers and are perfectly spherical in shape which means they move more freely to give a superior tactile feel.

Fine silica is used as a matting agent for paints, as a filler for coated printing papers and as a catalyst support for cosmetics, film and synthetic leather.

M.S. GEL® (microspherical gel) is a silica-based high purity gel. The perfectly spherical shape enables higher loading capacity with lower column back pressure and good separation. It is a liquid chromatography column packing agent available in an average particle size range of 1.6 to 200µm with narrow particle size distribution. Custom orders allow the selection of particle size and pore diameter.

Features

- ⬡ Particle size: 2 - 200µm
- ⬡ Specific surface: 30 - 900m²/g
- ⬡ Pore size: 4 - 200nm and narrow pore size distribution
- ⬡ Packs into compact form

Applications

- ⬡ Process chromatography
- ⬡ Separation media for proteins, peptides & APIs (active pharmaceutical ingredients)
- ⬡ Purification of electronic materials
- ⬡ Release agent for cosmetics, fragrances and antiseptics
- ⬡ Catalyst support and resin filler
- ⬡ HPLC (high performance liquid chromatography) packings
- ⬡ Adsorption and removal of ionised compounds from organic solvents
- ⬡ Medical intermediates

SUNSPERA® is a high porosity microspherical silica gel used as a catalyst support or carrier for organic or inorganic materials. The properties of the silica gel have a significant effect on both the polymerisation process and the properties of the finished polymer. Using SUNSPERA® gives improved finished polymer resin by increasing the bulk density and enhances productivity. SUNSPERA® is available in average particle diameters from 3µm to 100µm to suit any application. Surface areas are available from 40 - 800m²/g.

Features

- ⬡ Precisely designed pore structure, spherical shapes and size distribution
- ⬡ Improved morphology of finished polymers
- ⬡ Optimises production
- ⬡ Narrow particle distribution and no fine particles

Applications

- ⬡ Catalyst support for PE and PP



Fine Silica

Fine Silica

SUNSPHERE® is made up freely rolling of spherical micro-porous silica particles (amorphous silicon dioxide, SiO₂). It is soft and smooth to the touch, whilst its highly porous composition maintains an excellent capacity for absorption. SUNSPHERE® has excellent heat resistance properties and is white, odourless and chemically stable, making it suitable for human contact.

Features

- ⬡ Particle size: 3 - 20µm
- ⬡ Superior moisture absorption capacity: 30 - 400ml/100g
- ⬡ Heat resistance, corrosion-free and non-polluting

Applications

- ⬡ Cosmetic ingredient in make-up and skin care products
- ⬡ Release controller for deodorants and fragrances
- ⬡ Drug carrier
- ⬡ Matting agent and surface modifier
- ⬡ Dehumidifying agent
- ⬡ Filler for ink-jet print paper
- ⬡ 3D printer resins
- ⬡ Thickening agent for paint
- ⬡ Catalyst support
- ⬡ Coating material for recording media
- ⬡ Specialised paint for electronic materials



Fine Silica



Polyols

The vertically integrated plant in Kashima (Japan) has been producing polyether polyols from propylene oxide for the polyurethane industry since 1975.

The polyol grades produced are used in rigid foams, CASE (coatings, adhesives, sealants and elastomers) and polyurethane coatings and specialities.

The Environment

AGC's plant in Kashima complies fully with the international quality management standards ISO 9001 and ISO 14001.

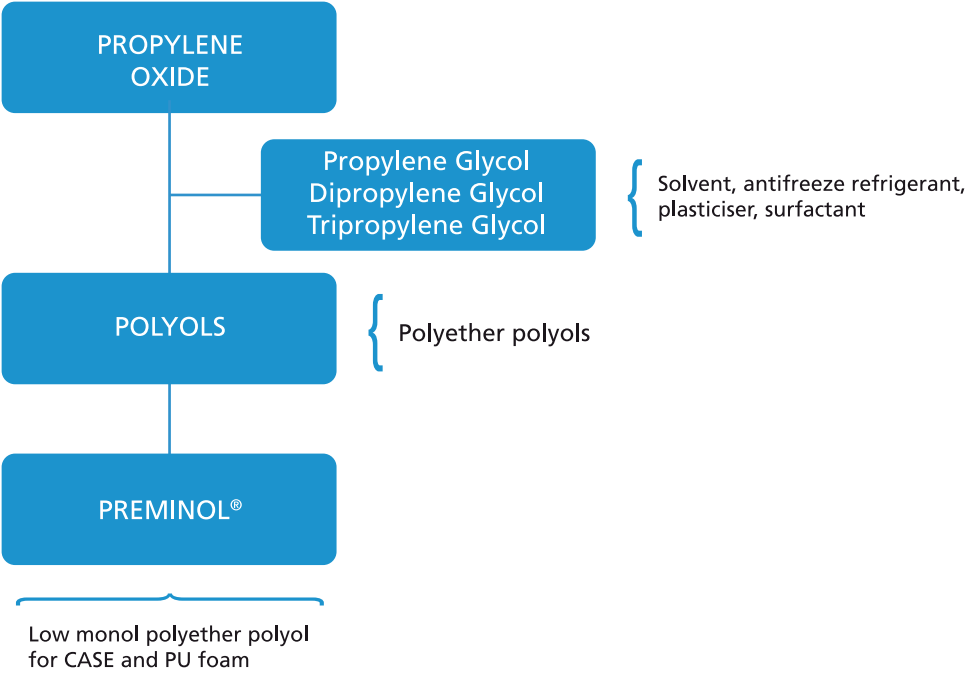
PREMINOL®

PREMINOL® is a range of polyols for CASE polyurethanes and PU foam. The use of low monol technology enables the manufacture of ultra-low unsaturated value polyols that give enhanced chemical and mechanical characteristics to the CASE polyurethane end product.



Production site in Kashima, Japan

Polyols Flowchart



Polyols



ASAHIKLIN™

The ASAHIKLIN™ series is a range of fluorinated fluids which deliver technological cleaning solutions for applications where previously ozone layer depletion and climate change were major concerns.

Features

- Tailored solvency
- Good compatibility with most plastics, elastomers, substrates and metals
- Low viscosity and surface tension
- Non-flammable / no flash point
- Recyclable through distillation
- Residue free
- Good wetting properties
- Minimal GWP (Global Warming Potential)
- Fast drying
- Good coating performance

Applications

- Precision cleaning
- Electronics cleaning
- Carrier fluid
- Solvent drying
- Rinsing

AMOLEA™ AS-300

AMOLEA™ AS-300 is a next-generation, fluorinated, non-flammable solvent with low environmental impact and maximum cleaning power.

Features

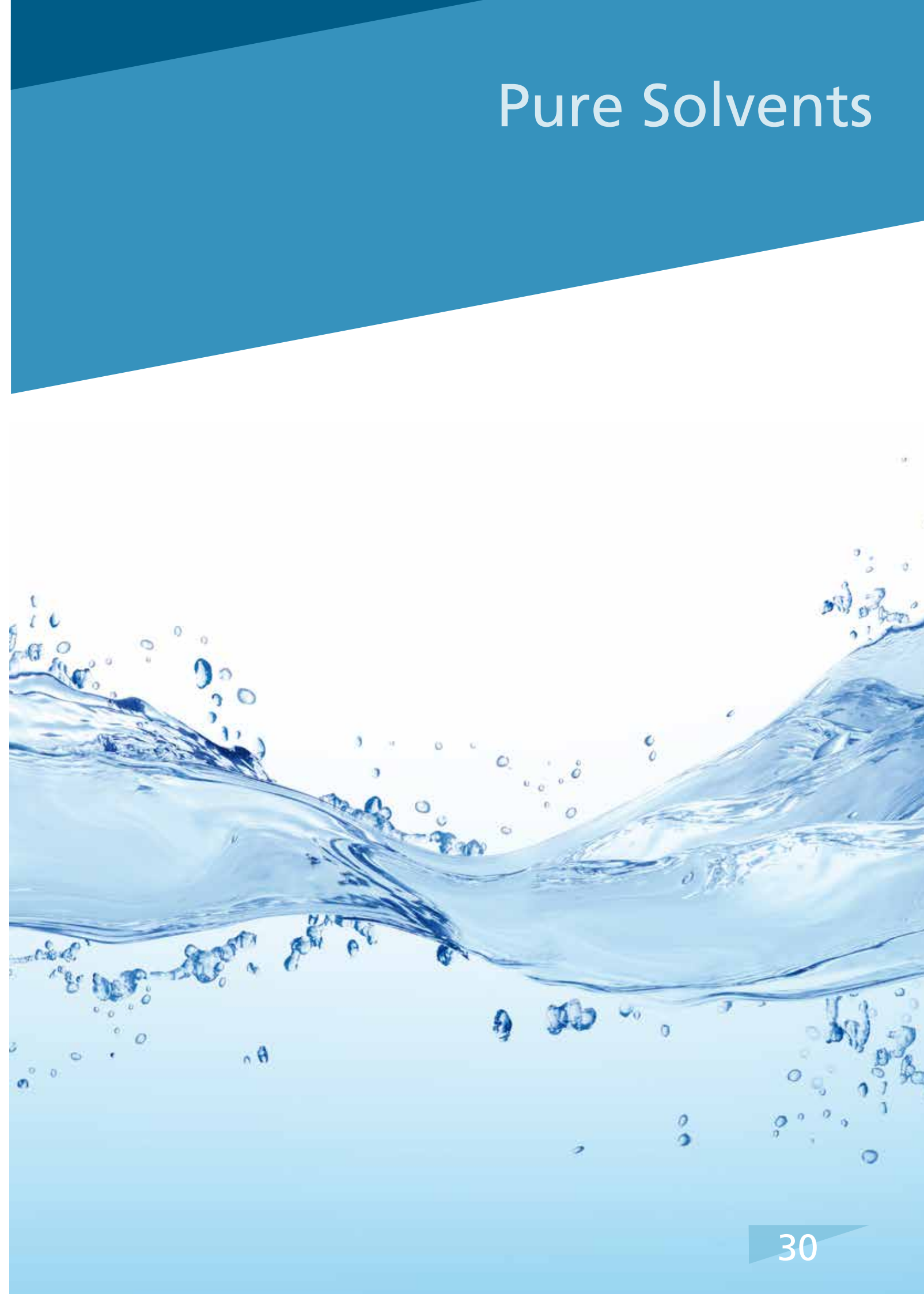
- Very low GWP (Global Warming Potential)
- Almost zero ODP (Ozone Depletion Potential)
- Excellent solvency (high Kb value) without trans-1,2-dichloroethene
- Ideal boiling point for cleaning applications (54°C)
- Improved safety – high AEL (Allowable Exposure Limit) and no flash point
- Contributes to lower consumption of solvent

Applications

- Substitution of bromine-based solvents
- Degreasing of metal and precision parts
- Degreasing of aerospace parts
- Degreasing of semiconductors and electronic parts
- Defluxing of printed circuit boards
- Cleaning during pre-plating
- Dilution of silicone oils and fluorinated greases
- Carrier for fluorinated oils and greases



Pure Solvents



AMOLEA™ AT1

AMOLEA™ AT1 is an azeotropic mixture of trans-1,2-dichloroethylene, HFE-347pc-f (ASAHIKLIN™ AE-3000) and ethanol. It is suitable for use as a carrier solvent of silicone oil.

AMOLEA™ AT2

AMOLEA™ AT2 is a mixture of trans-1,2-dichloroethylene, HFE-347pc-f (ASAHIKLIN™ AE-3000) and a fluorinated solvent. It is a non-flammable, non-ozone depleting solvent with low global impact, which allows users to more easily meet environmental regulations. AMOLEA™ AT2 is energy efficient due to its low latent heat of vaporisation.

Features

- ⬢ Safer alternative to traditional cleaning solvents
- ⬢ High Kb (Kauri-butanol) value
- ⬢ Low GWP (Global Warming Potential)
- ⬢ Zero ODP (Ozone Depletion Potential)
- ⬢ Is a drop-in replacement for TCE and nPB
- ⬢ Good compatibility with most plastics, elastomers, substrates & metals
- ⬢ Low viscosity, low surface tension and high liquid density
- ⬢ Non-flammable / no flash point
- ⬢ Recoverable through distillation
- ⬢ Excellent thermal, chemical and hydrolytic stability
- ⬢ Superior drying properties
- ⬢ Suitable for use with ultrasonics

Applications

- ⬢ Electronics industry (press oils, cutting oils, silicone oils, fluxes, greases, waxes and asphalt pitches)
- ⬢ Medical devices (orthopaedic implants, catheters, tubes, scopes, needles, dental devices and surgical tools)
- ⬢ Dewatering/moisture displacement
- ⬢ Carrier fluid



SURECO™ AF Series

SURECO™ AF Series is a surface coating agent containing a fluorinated polyether. Excellent water and oil repellency, as well as anti-fouling properties, are achieved without altering the appearance, by forming a thin monomolecular layer on a surface such as glass. SURECO™ AF Series is suitable for wet coating, spray coating, dip coating and spin coating.

Features

- Water and oil repellency
- Anti-fouling, anti-fingerprint
- Thin film thickness (<10nm)
- Low friction
- High durability for abrasion
- Non-flammable

Applications

- Touch panels
- Mobile phone chassis
- Mold releasing agents
- Anti-fouling for metals, plastics, etc.

SURECO™ CC Series

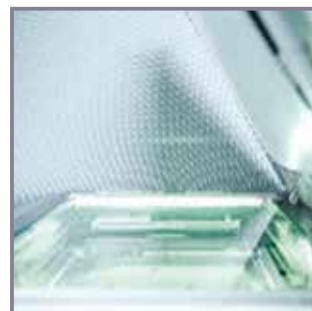
SURECO™ CC Series is a surface coating agent containing a fluorinated polymer compound. Excellent water and oil repellency, anti-corrosion properties and moisture protection are achieved by forming a thin layer on various surfaces. These features make it ideal for use in conformal coatings for PCBs (Printed Circuit Boards). SURECO™ CC Series is suitable for wet coating, dip coating, brush coating, spin coating, and is also easy to dry.

Features

- Excellent water and oil repellency, moisture protection and waterproof properties
- Anti-corrosion properties (better than PTFE resin)
- Thin film thickness (~0.1 – 1μm) and transparent coating with excellent properties
- Easy to apply and post-curing is not required as it air-dries in minutes
- Thermally stable – Decomposition Temperature >200°C
- Non-flammable

Applications

- Protective coatings against moisture, chemicals and corrosion for PCBs (Printed Circuit Boards) and their components
- Anti-migration coating for displays, spindle motors and lubricated electronic parts
- Waterproofing agent for electronic equipment



Surface Coating Agents



Dramatically reducing GWP with superior performance

AGC Chemicals launched a next-generation refrigerant, AMOLEA™ 1224yd, with the goal of reducing environmental impact. AMOLEA™ 1224yd is a non-flammable refrigerant consisting of R1224yd(Z), for use in centrifugal chillers, binary cycle generators and waste heat recovery pumps. With an Ozone Depleting Potential (ODP) of almost zero and a GWP value less than 1, it has little impact on the natural environment. Given that its physical properties match closely those of R245fa and R123, it is suitable for retrofitting to existing equipment without major changes of equipment design.

With improved chemical and thermal stability compared to R123, it also offers good compatibility with most metals, plastics, lubricating oils and elastomers. AMOLEA™ 1224yd is ideal for use as an alternative to or replacement for R245fa and R123, since its comparable performance is equivalent or superior. It also offers considerable energy savings.

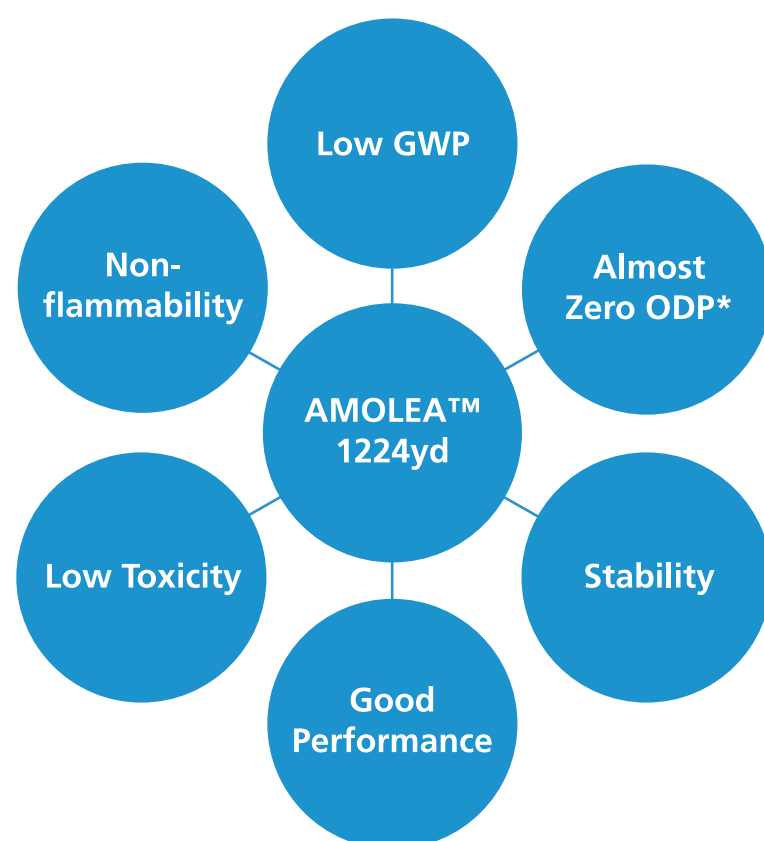
AGC continuously collaborates with equipment manufacturers to improve refrigeration, freezing and air conditioning products to ensure the lowest possible impact on the environment.

Features

- ⬢ Low Global Warming Potential (GWP) < 1*
- ⬢ Almost zero* Ozone Depleting Potential (ODP)
- ⬢ Chemical and thermal stability
- ⬢ Good performance
- ⬢ Low toxicity
- ⬢ Non-flammability
- ⬢ Good compatibility with metals, plastics, lubricating oils & elastomers
- ⬢ ASHRAE classification A1

Applications

- ⬢ Centrifugal chillers
- ⬢ Blowing agent for urethane foaming
- ⬢ High temperature heat pumps
- ⬢ Binary cycle power generation
- ⬢ Organic Rankine Cycle (ORC) power generation
- ⬢ Waste heat recovery



* Measured by the Japanese Institute of Advanced Industrial Science and Technology (AIST)



FORBLUE™ Ion Exchange Membranes

AGC's fluorinated ion exchange membranes for separating chemicals guarantee the user energy savings, due to their low electrical resistance. Another feature is their excellent durability whilst still maintaining their flexible properties.



Fluorinated cationic ion exchange membranes for chlor-alkali production

- Advantages**
- Resistant to chlorine and caustic soda
 - High current efficiency
 - Stable long-term performance; minimises the impact of brine impurities
 - High quality NaOH and KOH production

- Features**
- High resistance to both chemicals and acids
 - Highly efficient at dissociation of strong acids
 - Achieves both high ionic conductivity and ionic selectivity

- Applications**
- Manufacture of caustic soda (sodium hydroxide), caustic potash (potassium hydroxide) and chlorine



Fluorinated sulphonic acid ion exchange membranes for electrolysis & electrodialysis

- Advantages**
- Can be used in various electrolysis and electrodialysis processes

- Features**
- High resistance to both chemicals and acids
 - High resistance to strong acids and high dissociation of ions
 - Incorporates reinforced PTFE fabric for increased chemical resistance

- Applications**
- Water electrolysis for manufacture of hydrogen
 - Separating membrane for redox flow batteries

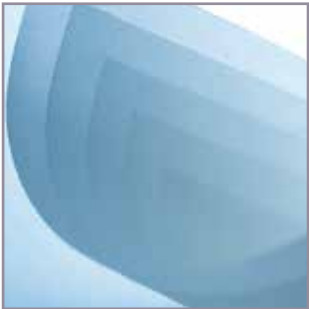


Hydrocarbon-based cationic and anionic exchange membranes for concentration, desalination & acid recovery

- Advantages**
- Easy to handle (flexible and soft, yet durable)
 - Highly efficient at concentrating the target material

- Features**
- Manufactured using new grafted polymerisation technology
 - No reinforcing fabric required

- Applications**
- Electrodialysis, diffusion dialysis and electrolysis
 - Concentration, such as producing table salt from seawater
 - Extracting salt from foodstuffs
 - Purification of food and beverages
 - Desalination of various types of water, including wastewater
 - Recovery of valuable ions from industrial solutions
 - Acid recovery



Ion Exchange Membranes

Bio-based Epichlorohydrin

100% bio-based epichlorohydrin (ECH) from Advanced Biochemical (Thailand) Co., Ltd. (part of the AGC Group), is produced using an innovative and patented process based on glycerol. Glycerol is a renewable feedstock and a by-product of biodiesel and oleochemical production. It offers significant environmental advantages compared to propylene-based ECH from fossil fuel.

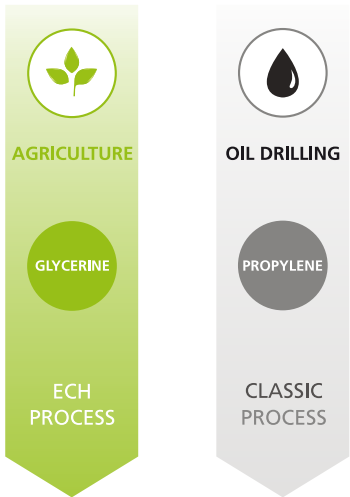
Features

- Produced using 100% renewable carbon
- Offers a 61% reduction in GWP (Global Warming Potential)
- Consumes 57% less energy

Applications

- Epoxy resins
- Cationic Reagent
- Paper chemicals
- Water treatment chemicals
- Surfactants
- Optical lens monomers
- Synthetic rubbers
- Pharmaceutical ingredients

The manufacturing process requires less water and chlorine and produces minimal water effluent and chlorinated by-products compared to the propylene-based classic production process.



Bio-based Epichlorohydrin





CYTOP™ amorphous fluoropolymer has the same excellent chemical, insulation, thermal, electrical and surface properties as conventional fluoropolymers, such as PTFE. It is often used where the thermoplastic characteristics and other favourable properties, such as solubility in specific solvents, allow thin coatings of the product to be applied by methods as diverse as screenprinting, spin coating, dip coating, slot die coating and inkjet printing.

CYTOP™ finds applications in a range of areas, including membrane coatings, organic gate insulators, protective coatings, UVC LED lenses and encapsulents, anti-reflective coatings and waveguides.

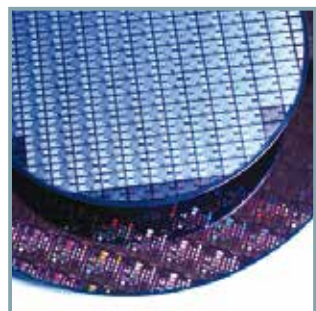
AGC offers CYTOP™ in a range of concentrations and grades (depending on the target substrate) in various perfluorinated solvents (low and high temperature boiling point solvents available) and also as a resin in solution or as pellets.

Features

- ⬡ High optical transparency
- ⬡ Mould release
- ⬡ Electric insulation
- ⬡ Water and oil repellency
- ⬡ Chemical resistance
- ⬡ Moisture-proof
- ⬡ Low refractive index
- ⬡ Low coefficient of optical dispersion
- ⬡ Good lamination properties

Applications

- ⬡ Dielectric coating for semiconductors in the electronics industry
- ⬡ Anti-reflective coatings, especially in the optical industry
- ⬡ Inter-level dielectric layer for semiconductors
- ⬡ Pellicles
- ⬡ Non-autofluorescence hydrophobic coating of microfluidics
- ⬡ Hydrophobic coating of electrowetting devices
- ⬡ Anti-fouling coatings for photomasks
- ⬡ Optical film
- ⬡ Graded-index optical fibres



Amorphous Fluoropolymer



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It is the responsibility of the purchaser to check that the specification is appropriate for any individual application. Particular care is required for special applications such as pharmaceutical, medical devices or food. Not all grades are suitable for making finished materials and articles suitable for use in contact with foodstuffs. It is advisable to contact the AGC Chemicals Europe, Ltd. sales office for the latest position. Users are advised to consult the relevant Health and Safety literature which is available from the AGC Chemicals Europe, Ltd. sales office.

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