**PTFE** (Polytetrafluoroethylene)

PTFE is often required for critical applicationsin which a.o. high temperatures, chemicalresistance, low friction are important. The main difference in the fluoropolymers is that PTFE is not melt-processable while all other fluoropolymers are. Standard PTFE is not suitable for injection molding, blow molding or vacuum forming (though Moldflon is).

## Key properties

• Excellent chemical resistance  
• Working temperature -190°C to +260°C  
• Greatest resistance to fatigue (Wöhler curve)  
• FDA approved  
• Flame resistant - UL94V0  
• Antistick properties  
• Low co-efficient of friction  
• UV-resistant (does not age)  
• Not hygroscopic (water absorption < 0,01%)  
• Very good dielectric dielectric insulation properties

**In most situations, PTFE is the perfect fluoroplastic for a wide range of applications. Though when virgin PTFE is not sufficient, you can choose for PTFE with a filler to obtain better properties. Most applicable fillers are glass, carbon, graphite, bronze and Molybdenum disulfide (MoS2**).

## Glass

Fiberglass is the most commonly used filler for PTFE. It makes it more resistant to wear, more resistant to creep, makes it suitable for higher surface pressure and is very chemically resistant. The disadvantage is that it is much more abrasive for the opposite counter material.  
Application: piston rings, bushings, threaded connections.  
Most commonly used compounds:  
PTFE + 25% glass fiber  
PTFE + 15% + 5% MoS2 glass  
PTFE + glass spheres  
Often, these additional compounds are provided with a pigment, for example, red or blue.  
Glass: Type E glass  
Milled fibers having a nom. diameter = 13µm  
Nominal length: 0.8 mm

## Carbon

Carbon can be used in the form of powder or fibers. It improves the compressive strength, making it more resistant to wear, increases the thermal conductivity and makes the material electrically conductive. Carbon is less abrasive than glass. Combined with graphite it is perfect for sliding applications and piston rings.  
Carbon: Amorphous carbon Petroleum  
Purity: > 99%  
Particle size: <75µm  
Density: 1.8 g/m³



## Graphite

Graphite is a form of carbon. The flake-like crystals provide a perfect lubrication and reducing wear. Graphite is usually combined with other fillers such as glass and carbon.  
Graphite: Synthetic  
Purity: > 99%  
irregular shape  
Particle size: <75µm  
Density: 2.26 g/m³

## Bronze

Bronze makes the material more resistant to wear, generates a better heat conductivity, more pressure resistant and more resistant to creep. It has higher friction resistance than other filled PTFE compounds. By the addition of MoS2, the frictional resistance can be reduced. Chemical resistance is a lot worse. Bronze can oxidize.  
Application: ship bushings  
Most commonly used compounds:  
PTFE + 60% bronze  
PTFE + 55% bronze + 5% MoS2  
Bronze: Cu/Sn: 9/1  
Irregular or spherical shape  
Particle size: <60µm  
Density: 8.95 g/m³

**APPLICATION**

AEROSPACE

Polyfluor delivers goods which are produced according internationally accepted standards for design and manufacture of products for aerospace and environmental management system standards.

Due to the reliability of sustainable, high performance plastics (like PEEK and Polyimide) it is an often chosen material in Aerospace applicatons. These materials are able to retain their outstanding material properties even when exposed to high temperatures and aggressive fuels. Due to the low coefficient of friction of fluoroplastics, the products are also suitable for processing in small spaces.

The Crossflon range of products, such as bearings, bushes and seals are besides aerospace also suitable for petro chemical - off shore and other industrial applications. For example use in compressors, pumps, (vaccuum) valves, mixers and regulators. In those applications where temperature, wear and pressure are important parameters we can offer a proper solution with diverse Crossflon materials.

AUTOMOTIVE

PTFE, Viton, PEEK en Rulon are widely used in the Automotive industry. These fluoroplastics are able to maintain their outstanding material properties even when exposed to high temperatures and/or aggressive fuels. PTFE and PEEK are highly suitable for processing at high (or low) temperatures and are used in applications where fire and explosion need to be avoided. Due to the reliability of sustainable, high value plastics it is an often chosen material for Automotive applications.

High demands are made on materials such as UHMW-PE, POM, PA, PEEK and PTFE. Today 'thermal management' is very important in the automotive industry. In some applications we deliver Moldflon (injection moldable PTFE) products. Our products are ISO/TS16949 certified and are delivered in accordance with DIN EN ISO14001.

SEMI- CONDUCTOR

For the Semi-conductor industry, Polyfluor Plastics provides materials that are chemically inert and have non-wetting (hydrophobic) properties, such as FEP, PTFE, PCTFE, PFA, TFM and PI. Applications include: Carriers - Diffusion Filtration & Parts - Linings - Tubes (Spiral) & Fittings - Turntables - Water Cleaning.

Our PFA, PTFE and THV tubing complies with regulation SEMI5 and is mainly used for critical applications in which chemical resistance and clarity/purity of the material is very important.

CONSTRUCTION

Applications in the Construction industry often require a durable product that has a good resistance to abrasion by weather and/or high temperatures. Key properties for our fluoroplastic materials.  
Applications in this sector are very diverse; from moving large constructions such as bridges etc. by means of slide bearing sheets to the use of small seals.

DEFENCE

Sector Defence maintains a high standard for the use of materials in their applications. Due to the standard properties of fluoroplastics, they are often used in diverse applications. Mainly used in military vehicles, submarines, aircraft carriers, aircrafts and other artillery systems.

MARINE

For Maritime applications, products made out of PTFE, PTFE -composite, PTFE filled and related engineering plastics are mainly used. These materials are able to retain their outstanding material properties even when exposed to high temperatures and aggressive fuels.

When pressure and wear is combined, our fluoroplastics offer a right solution. We regularly use Crossflon (in divers materials) for among others slide bearings, skidsways, shafts and seals. Our products are used in extremely heavy transports, like loading/unloading of boats and/or drilling rigs (platforms). For these applications a right combination of lubrication and surface is required to keep the friction as low as possible

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OIL&GAS/PETROC-HEMICAL

Virgin PTFE and/or PTFE with fillers are widely used in both onshore and offshore applications in Oil&Gas companies. For example, in pumps and compressors, but also for the transportation of heavy constructions such as platforms (for which slide bearing pads are used). In the Petrochemical industry there are a lot of applications requiring high temperatures. PTFE is able to maintain its outstanding material properties even when exposed to high temperatures and aggressive fuels.

ELECTRICAL

Due to the high maximum working temperature, low coefficient of friction, low dielectric constant and tensile strength, fluoroplastics like PTFE are very suitable for divers electric (insulting) applications.

PHARMA

Fluoroplastic materials are very suitable for Pharmaceutical applications. The materials are chosen for their clean, smooth, non-toxic and non-allergenic properties. They are therefore very suitable for use in applications with human tissues and fluids.

MEDICAL

Applications in the (semi) Medical industry require clean, smooth, non-toxic and non-allergenic materials. Properties which are standard for several (fluoro)polymers. As a result, these materials are suitable for use in applications with human tissues and fluids (for short periods).  
  
Our QC and documentation are reliable at every level which results in a consistant traceability. Our products are in accordance with regulation ISO 13485:2016.

MACHINERY&EQUIPMENT

For the Machinery&Equipment industry Polyfluor Plastics delivers a wide range of products, made from PTFE, PCTFE, PEEK, PFA, FEP and other fluoroplastics

PACKING&FOOD

In the Food industry there are high standard regulations regarding hygiene. Due to the low coefficient of friction of fluoroplastic products (and hence the smooth surface), contamination is kept to a minimum. One of the key properties why products of among others PTFE are very suitable, and commonly used, in the Food&Packing industry.

Through numerous migration testing and inspections, we deliver products in accordance with regulation EU 10/2011 which is now applicable to parts supplied for processing/delivery to/by the food industry. As well, there is a FDA approval available for various other (fluoro)plastic materials.