Product Data Sheet

Commercial Product

3M™ Dyneon™

Ultra High Purity PFA 6515UHPZ

Product Description

3M™ Dyneon™ Ultra High Purity PFA 6515UHPZ, a fully fluorinated copolymer made from tetrafluoroethylene and perfluorvinylether, is characterized by its excellent temperature resistance, optimal chemical and weathering resistance and very good dielectric capabilities and ultra low levels of extractable ions.

Special Features

- Wide service temperature range
- Extremely high weathering resistance and UV stability
- High limiting oxygen index: Does not support combustion
- Good non-stick characteristics
- Broad processing window
- Improved mould release property
- High transparency
- Extremely low level of extractable trace elements
- Excellent, almost universal resistance to solvents and chemicals
- Excellent electrical insulation properties, e.g.: dielectric breakdown strength, dielectric constant
- Smooth surfaces
- Good low-friction properties
- Improved stress crack resistance
- Extremely low levels of fluoride ions and other anions
- UHP packaged to assure clean, contamination-free product

Properties	Test method	Unit	Value
Specific Gravity	DIN EN ISO 12086	g/cm³	2.15
Melting Point	DIN EN ISO 12086	°C	308
Melt Flow Index (372 °C/5 kg)	DIN EN ISO 1133	g/10 min	15
Limiting Oxygen Index (LOI)	ASTM D2863	%	> 95
Hardness Shore D	ASTM D2240/ISO 868	-	60
Tensile Strength at Break (23 °C)	ASTM D638	MPa	29
Elongation at Break (23 °C)	DIN EN ISO 527-1	%	400
Flexural Modulus	DIN EN ISO 527-1	MPa	620
MIT Folding Endurance (200 µm film)	ASTM D 2176	double folds	38,000

* typical values

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Typical Properties

In ccomparison to the T grades 3M Dyneon Fluoroplastic PFA Ultra High Purity grades are a new series of ultra-high purity fluorothermoplastics. These resins are especially suitable for high-purity applications requiring ultra-low levels of extractable ions, making it suitable for critical wet chemical processes in the semiconductor industry.

Typical Applications

Generally, 3M Dyneon Fluoroplastic PFA Ultra High Purity grades can be compression-moulded, transfer-moulded, extruded or injection-moulded. 3M Dyneon Ultra High Purity PFA 6515UHPZ, with a Melt-Flow-Index (372 °C/5 kg) of 15 g/10 min, is a material with a low viscosity and is used in high shear processes like wire and cable extrusion and injection moulding, especially when the good mechanical performance needs to be combined with ultra-low levels of extractable ions, making it suitable for critical wet chemical processes in the semiconductor industry.

Processing Recommendations

3M Dyneon Ultra High Purity PFA 6515UHPZ can be processed according to the known processing methods for thermoplastic polymers. All machine parts coming into contact with the melt or fumes of 3M Dyneon Ultra High Purity PFA 6515UHPZ should be made from highly corrosion resistant materials – usually high-nickel alloys such as Inconel® 625, Haynes® 242, Hastelloy® C, and Reiloy®. Off-gases and decomposition products during processing shall be managed via an appropriate exhaust fume management system, especially at the extruder die. For safe processing of Dyneon PFA please also check safety instructions below.

Typical processing temperatures for Dyneon PFA lie between 360 °C and 390 °C. The medium melt viscosity makes 3M Dyneon Ultra High Purity PFA 6515UHPZ a standard material for injection moulding and wire & cable extrusion.

Injection moulding: Detailed processing information with typical processing parameters and processing equipment recommendations please find in Dyneon's "Injection Moulding Guide".

Wire & cable extrusion: For the wire & cable extrusion a 25 - 30 mm D extruder with a cylinder L/D ratio of 20 - 30:1 is required. The cylinder should have 3-4 heating zones that are independent from each other. High line speeds can be obtained with a high draw down ratio of up to 150:1. The draw down balance should be maintained between 0.95 – 1.05.

Storage and Handling

3M™ Dyneon™ Fluoroplastic PFA 6515UHPZ can be stored for a relatively long period of time provided it is stored in a clean, dry place. 3M™ Dyneon™ Fluoroplastic PFA 6515UHPZ is hydrophobic and generally does not require drying before processing unless high humidity conditions create surface moisture absorption (Opened containers should be tightly resealed to prevent dust contamination from static charge accumulation and moisture ingress).

Safety Instructions

Follow the normal precautions observed with all fluorothermoplastic materials.

Please consult the Material Safety Data Sheet and Product Label for information regarding the safe handling of the material. By following all precautions and safety measures, processing these products poses no known health risks. General handling/processing precautions include: 1) Process only in well-ventilated areas. 2) Do not smoke in areas contaminated with powder/residue from these products. 3) Avoid eye contact. 4) If skin comes into contact with these products during handling, wash with soap and water afterwards. 5) Avoid contact with hot fluoropolymer.

Potential hazards, including release of toxic vapours, can arise if processing occurs under excessively high temperature conditions. Vapour extractor units should be installed above processing equipment. When cleaning processing equipment, do not burn off any of this product with a naked flame or in a furnace.

Delivery Form

3M™ Dyneon Ultra High Purity PFA 6515UHPZ is delivered in pellet form.

Packaging sizes are:

- 50 kg cardboard box, containing two PE-bags with 25 kg content each

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Important Notice

All information set forth herein is based on our present state of knowledge and is intended to provide general notes regarding products and their uses. It should not therefore be construed as a guarantee of specific properties of the products described or their suitability for a particular application. Because conditions of product use are outside Dyneon's control and vary widely, user must evaluate and determine whether a Dyneon product will be suitable for user's intended application before using it.

The quality of our products is warranted under our General Terms and Conditions of Sale as now are or hereafter may be in force.
Technical information, test data, and advice provided by Dyneon personnel are based on information and tests we believe are reliable and are intended for persons with knowledge and technical skills sufficient to analyse test types and conditions, and to handle and use raw polymers and related compounding ingredients. Testing in accordance with DIN, ISO and ASTM.

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General recommendations on health and safety in processing, on work hygiene and on measures to be taken in the event of accident are detailed in our material safety data sheets.

You will find further notes on the safe handling of fluoropolymers in the brochure "Guide for the safe handling of Fluoropolymers Resins" (download link) by PlasticsEurope, Box 3, B-1160 Brussels, Tel. +32 (2) 676 17 32.

You can also download it with your smartphone using the QR code below.

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We will gladly supply further contact details for our full network of global sales offices. Alternatively, find them here.

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