

What is PVDF FG natural

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PVDF, food grade (FG)

PVDF FG natural is a polyvinylidene fluoride in a food grade compound (FG). The fluoropolymer combines excellent chemical resistance, high purity and inherent flame retardancy with strength and stiffness unusually high for fluoropolymers – designed for direct contact with food.

Properties

PVDF FG natural is resistant to most acids, alkalis, halogens, hydrocarbons and cleaning agents, hydrolysis and UV resistant and self-extinguishing (UL 94 V0). With a yield stress of 55 MPa, a tensile modulus of 2,100 MPa and a notched impact strength of 12 kJ/m², it is strong and tough at the same time; the continuous service temperature of 140 °C and negligible moisture absorption allow hot cleaning and sterilisation. The smooth, low-porosity surface is easy to clean.

PVDF is not resistant to strongly polar solvents such as ketones, esters and amines or to fuming sulphuric acid; the density of 1.78 g/cm³ is high. Heating above 300 °C releases hydrogen fluoride.

Advantages

- Compound suitable for food contact (see FDA declaration)
- Excellent chemical, hydrolysis and UV resistance
- Inherently flame retardant (UL 94 V0), continuous service up to 140 °C
- High strength and toughness, smooth, easy-to-clean surface

Disadvantages

- Not resistant to ketones, esters and amines
- High density
- Releases hydrogen fluoride when overheated

Processing

PVDF FG natural can be machined using all conventional cutting methods; sharp carbide tools and good cooling via chip removal avoid heat build-up and residual stresses in the part.

For tight tolerances and thick-walled parts, we recommend intermediate annealing to relieve machining stresses; thanks to the low moisture absorption, no conditioning is required.

Do not allow temperatures above 300 °C during machining – overheating releases hydrogen fluoride; extract grinding dust.

Typical Applications

PVDF FG natural is used wherever food-contact components must withstand aggressive cleaning media and high temperatures – for example in the food and beverage industry, the pharmaceutical industry and chemical plant engineering.

- Valve, pump and fitting parts for food and pharmaceutical media
- Scrapers, guides and format parts in filling lines
- Linings and vessel parts for aggressive cleaning media

Typical Properties

- Compound suitable for food contact
- High chemical resistance
- Inherently flame retardant

Product Examples

- Valve and pump parts
- Scrapers and format parts
- Linings and vessel parts

Typical Industries

- Food Industry
- Pharmaceutical Industry
- Chemical Plant Engineering

	Test Method	Unit	Value
General Properties			
Density	DIN EN ISO 1183-1	g / cm ³	1.78
Water absorption	DIN EN ISO 62	%	0.040
Flammability (Thickness 3 mm / 6 mm)	UL 94		V0 / V0
Mechanical Properties			
Yield stress	DIN EN ISO 527	MPa	55
Elongation at break	DIN EN ISO 527	%	30
Tensile modulus of elasticity	DIN EN ISO 527	MPa	2.100
Notched impact strength	DIN EN ISO 179	kJ / m ²	12.0
Ball indentation hardness	DIN EN ISO 2039-1	MPa	130
Shore hardness	DIN EN ISO 868	scale D	80
Thermal Properties			
Melting temperature	ISO 11357-3	°C	178
Thermal conductivity	DIN 52612-1	W / (m * K)	0.20
Thermal capacity	DIN 52612	kJ / (kg * K)	1.20
Coefficient of linear thermal expansion	DIN 53752	10 ⁻⁶ / K	140
Service temperature, long term	Average	°C	-20 ... 140
Service temperature, short term (max.)	Average	°C	150
Heat deflection temperature	DIN EN ISO 75, Verf. A, HDT	°C	115
Electrical Properties			
Dielectric constant	IEC 60250		9
Dielectric strength	IEC 60243-1	kV / mm	21
Surface resistivity	DIN EN 62631-3-2	Ω	10 ¹⁴