

What is PTFE GF25 EN

PTFE + 25 % glass fibre (GF25)

PTFE + 25 % glass fibre (GF25) – glass-fibre-filled PTFE, higher wear/compressive strength, reduced creep

PTFE GF25 is a PTFE (polytetrafluoroethylene) filled with 25 % glass fibre. The glass-fibre content remedies the two main weaknesses of virgin PTFE – low compressive strength and pronounced cold flow (creep) – and at the same time markedly increases wear resistance. The typical PTFE advantages are retained: almost universal chemical resistance, a very low coefficient of friction, a service range from -200 to +260 °C and non-flammability. This makes GF25 the standard compound for loaded sliding, sealing and bearing elements.

Classification and basic character

PTFE GF25 consists of a PTFE matrix with 25 % by weight of glass fibre. PTFE is a semi-crystalline fluoropolymer that is not melt-flowable and is therefore – like virgin PTFE – only machined and not welded. The embedded glass fibres stiffen the soft PTFE base material, increase compressive and wear resistance and reduce cold flow. The colour is white-grey.

Why glass fibre? Compressive strength, wear, creep

Virgin PTFE is excellent chemically and thermally, but mechanically soft and prone to creep. The 25 % glass-fibre content considerably improves compressive strength and dimensional stability under continuous load and reduces wear many times over. Glass fibre is also largely chemically inert, so chemical resistance is largely retained – except for hydrofluoric acid and strong hot alkalis, which attack glass.

How PTFE GF25 is processed

PTFE GF25 is machined from pressed and sintered semi-finished products (sheet, rod, bush) – turning, milling, drilling and sawing work well, whereby sharp, wear-resistant tools and dust extraction are important because of the glass-fibre content. Like all PTFE materials, GF25 is not melt-processable/weldable; overheating must be avoided during machining (thermal decomposition from approx. 260 °C).

Mechanical, thermal and chemical properties

PTFE GF25 reaches a tensile strength around 17 MPa with an elongation at break around 180 % and a hardness of 58–60 Shore D; the density is around 2.21 g/cm³. The material can be used from -200 to +260 °C, is non-flammable (UL 94 V-0) and a good electrical insulator. The coefficient of friction remains very low at around 0.17. Chemically GF25 is almost universally resistant; only hydrofluoric acid, fluorine and molten alkali metals as well as strong hot alkalis (glass attack) are limits.

When PTFE GF25 is the right choice

PTFE GF25 is worthwhile when the advantages of PTFE must be combined with higher mechanical load capacity – for example:

- Seals, sealing rings and guide bands under pressure and wear loading
- Plain bearings, wear strips and guiding elements
- Piston rings and sealing elements in compressors and pumps
- Valve seats and components in chemical process technology
- Chemically loaded sliding and sealing parts up to 260 °C

When PTFE GF25 is NOT the right choice

Equally important are the limits of the material:

- Contact with hydrofluoric acid, fluorine or molten alkali metals (attack)
- Applications with strong hot alkalis (glass fibre is attacked)
- Unambiguous food contact without verification (then virgin/FDA PTFE)
- Applications requiring high impact strength or elongation
- Joining by welding – not possible for PTFE (machining only)

What does PTFE GF25 cost?

PTFE materials are among the higher-priced engineering plastics; PTFE GF25 is in the range of virgin PTFE or slightly below (glass fibre is cheaper than PTFE powder). The part price is mainly determined by semi-finished shape and dimension, material utilisation (offcut), machining effort and lot size. We are happy to quote binding prices on request based on your drawing.

Processing at Liedtke

PTFE GF25 machines well – turning, milling, drilling and sawing give clean results; because of the glass-fibre content we use sharp, wear-resistant tools and ensure dust extraction. We consistently avoid overheating. This is how we reliably produce load-bearing sealing, sliding and bearing parts – from single pieces to series production.

Advantages and disadvantages at a glance

An honest assessment – and how the disadvantages can be mitigated in practice:

Advantages

- Markedly higher compressive and wear resistance than virgin PTFE
- Reduced creep (cold flow) under continuous load
- Almost universal chemical resistance retained
- Very low friction, -200 ... +260 °C, non-flammable
- Good electrical insulator

Disadvantages

- Not resistant to hydrofluoric acid, fluorine, hot strong alkalis
- Lower elongation/toughness than virgin PTFE
- Filled grade – food contact only with verification
- Not melt-processable/weldable (machining only)
- Higher price than standard plastics

Practical tip: PTFE GF25 is the right choice when PTFE properties meet compressive, wear and creep loading – for example in seals, piston rings and plain bearings. If unambiguous food contact or maximum chemical resistance against hydrofluoric acid/alkalis matters, virgin PTFE is the better choice; for higher hardness and wear resistance at lower abrasiveness, carbon-fibre- or bronze-filled PTFE grades are an alternative.

Typical properties

- Higher compressive and wear resistance than virgin PTFE
- Reduced creep (cold flow)
- -200 ... +260 °C, non-flammable (UL 94 V-0)
- Almost universal chemical resistance
- Very low friction, self-lubricating
- Good electrical insulator
- Colour white-grey
- Machining only (not weldable)

Product examples

- Seals, sealing rings, guide bands
- Plain bearings and wear strips
- Piston rings for compressors
- Valve seats and components
- Bellows and sealing elements
- Chemically loaded sliding parts

Typical industries

- Sealing technology
- Chemical apparatus and plant engineering
- Pump and valve technology
- Compressor and drive technology
- Mechanical engineering (plain bearings)
- Electrical and insulation technology

	Test method	Unit	Value
Mechanics / Tribology			
Tensile strength	ISO 527	MPa	≥ 17
Elongation at break	ISO 527	%	≥ 180
Hardness	ISO 868	Shore D	58-60
Coefficient of friction	DIN 53375		~ 0.17
Thermal			
Service temperature		°C	-200 ... +260
Thermal conductivity	DIN 52612	W / (m·K)	≈ 0.38
Flammability	UL 94		V-0
General			
Density	ISO 1183	g / cm ³	2.21
Dielectric strength	IEC 60243-1	kV / mm	~ 13
Colour			white-grey

PTFE + 25 % glass fibre (GF25) is a glass-fibre-filled PTFE compound. The values stated are typical characteristic values; they serve as an aid to material selection and are not a legally binding warranty of specific properties and may vary between manufacturers. Food-contact suitability of the filled compound depends on the filler and must be confirmed case by case. PTFE must not be overheated (decomposition from approx. 260 °C releasing harmful gases).