

What is PTFE GF15 EN

PTFE + 15 % glass fibre (GF15)

PTFE + 15 % glass fibre (GF15) – glass-fibre-filled PTFE, higher wear/compressive strength than virgin PTFE, tougher than GF25

PTFE GF15 is a PTFE (polytetrafluoroethylene) filled with 15 % glass fibre. The lower glass-fibre content (compared with GF25) noticeably improves compressive strength, wear and creep behaviour of virgin PTFE, while retaining more of its elongation and toughness. The core PTFE advantages remain: almost universal chemical resistance, a very low coefficient of friction, -200 to +260 °C and non-flammability. GF15 is the somewhat tougher, less abrasive alternative to GF25 for sliding and sealing elements.

Classification and basic character

PTFE GF15 consists of a PTFE matrix with 15 % by weight of glass fibre. PTFE is a semi-crystalline fluoropolymer that is not melt-flowable and is therefore only machined and not welded. The glass fibres stiffen the soft PTFE base material and reduce cold flow; the lower 15 % filler content makes the material tougher and more ductile than GF25. The colour is white.

GF15 versus GF25 – the difference

GF15 and GF25 differ in glass-fibre content. GF25 offers the higher compressive and wear resistance and the lowest creep and is first choice for high continuous mechanical load. GF15 has less filler and is therefore somewhat more ductile and tougher, less abrasive to mating surfaces and electrically/chemically somewhat closer to virgin PTFE. Choose GF15 when a good wear/creep improvement is sufficient and additionally a little more toughness or protection of the mating surface is required.

How PTFE GF15 is processed

PTFE GF15 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, GF15 is not melt-processable/weldable; overheating must be avoided during machining (thermal decomposition from approx. 260 °C).

Mechanical, thermal and chemical properties

PTFE GF15 reaches a tensile strength around 20 MPa with an elongation at break around 250–350 % and a hardness of 58–62 Shore D; the density is around 2.20 g/cm³. The material can be used from -200 to +260 °C, is non-flammable (UL 94 V-0) and a good electrical insulator (dielectric strength around 16 kV/mm). The coefficient of friction is very low at around 0.15. Chemically GF15 is almost universally resistant; limits are hydrofluoric acid, fluorine, molten alkali metals and strong hot alkalis (glass attack).

When PTFE GF15 is the right choice

PTFE GF15 is worthwhile when PTFE properties must be combined with moderate mechanical loading and a little more toughness – for example:

- Seals, sealing rings and guide bands
- Plain bearings, wear strips and guiding elements
- Piston rings and sealing elements in compressors and pumps
- Valve seats and components in chemical process technology
- Applications where the mating surface should be protected

When PTFE GF15 is NOT the right choice

Equally important are the limits of the material:

- Highest compressive/wear loading (then GF25 or carbon-filled)
- Contact with hydrofluoric acid, fluorine or molten alkali metals
- Strong hot alkalis (glass fibre is attacked)
- Unambiguous food contact without verification (then virgin/FDA PTFE)
- Joining by welding – not possible for PTFE (machining only)

What does PTFE GF15 cost?

PTFE materials are among the higher-priced engineering plastics; PTFE GF15 is in the range of virgin PTFE. 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 GF15 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

- Better compressive and wear resistance than virgin PTFE
- Tougher and more ductile than GF25 (lower filler content)
- Almost universal chemical resistance retained
- Very low friction, -200 ... +260 °C, non-flammable
- Less abrasive to mating surfaces than GF25

Disadvantages

- Lower compressive/wear resistance than GF25
- Not resistant to hydrofluoric acid, fluorine, hot strong alkalis
- Filled grade – food contact only with verification
- Not melt-processable/weldable (machining only)
- Higher price than standard plastics

Practical tip: PTFE GF15 is the right choice when a moderate wear and creep improvement is sufficient and a little more toughness or protection of the mating surface is required. For highest compressive and wear loading GF25 is preferable; for unambiguous food contact or maximum resistance to hydrofluoric acid/alkalis, virgin PTFE.

Typical properties

- Better compressive/wear resistance than virgin PTFE
- Tougher/more ductile than GF25
- -200 ... +260 °C, non-flammable (UL 94 V-0)
- Almost universal chemical resistance
- Very low friction, self-lubricating
- Good electrical insulator
- Colour white
- 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
- Sliding parts protecting the mating surface

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	~ 20
Elongation at break	ISO 527	%	250-350
Hardness	ISO 868	Shore D	58-62
Coefficient of friction	DIN 53375		~ 0.15
Thermal			
Service temperature		°C	-200 ... +260
Thermal conductivity	DIN 52612	W / (m·K)	≈ 0.30
Flammability	UL 94		V-0
General			
Density	ISO 1183	g / cm ³	2.20
Dielectric strength	IEC 60243-1	kV / mm	~ 16
Colour			white

PTFE + 15 % glass fibre (GF15) is a glass-fibre-filled PTFE compound with a lower filler content than GF25 - giving higher elongation and toughness with a somewhat smaller improvement in compressive and wear resistance. The values stated are typical characteristic values of a PTFE GF15 compound; they serve as an aid to material selection and are not a legally binding warranty of specific properties and may vary between manufacturers. The glass-fibre content improves compressive strength, wear and creep behaviour compared with virgin PTFE and can reduce chemical resistance to hydrofluoric acid and strong hot alkalis. PTFE must not be overheated (decomposition from approx. 260 °C releasing harmful gases).