PFAS-Free Nylon 66 Wear & Friction Compound

Drop-in PFAS-free replacement for legacy wear-grade Nylon 66.

Insight Polymers PFAS-Free Nylon 66 Wear & Friction Compound is a high-performance engineering thermoplastic designed for applications requiring **low friction, high wear resistance, and regulatory-ready material selection**. This compound eliminates PFAS chemistries while delivering tribological performance comparable to traditional fluoropolymer-filled nylon 66 grades.

- PFAS-free formulation (no PTFE, PFOA, PFOS)
- Low and stable coefficient of friction
- Excellent wear resistance under dynamic load
- High mechanical strength and dimensional stability
- Compatible with standard nylon 66 processing
- Supports ESG and sustainability initiatives

Industry	Applications
Automotive	Gears, bushings, seat adjusters, actuators
Industrial	Bearings, conveyor wear strips, slide plates
Consumer	Appliance gear trains, wear pads
Electronics	Moving housings, internal mechanisms
Aerospace	Interior moving components, PFAS-restricted uses

Material Description

Attribute	Description
Base Polymer	Polyamide 66 (Nylon 66)
Reinforcement Options	Unfilled or glass fiber reinforced (10–30%)
Lubrication System	Proprietary non-PFAS solid lubricants
Color	Natural / Black (custom colors available)

Physical & Mechanical Properties (unfilled)

Property	Test Method	Typical Value
Density	ASTM D792	1.1 – 1.2 g/cm³
Tensile Strength	ASTM D638	60 - 80 MPa
Tensile Modulus	ASTM D638	2.4 – 2.8 GPa
Flexural Strength	ASTM D790	70 – 90 MPa

Property	Test Method	Typical Value
Flexural Modulus	ASTM D790	1.2 – 1.4 GPa
Elongation at Break	ASTM D638	4 – 6 %

Tribological Performance

Wear & Friction Properties (unfilled)

Property	Test Method	Value
Coefficient of Friction (Dynamic)	ASTM G77[a]	0.25 – 0.35
Wear Rate	ASTM G77[b]	Up to 50% lower vs. unfilled PA66

[a] 0.2 m/s for 20 min. [b] 1 m/s for 20 hours

Figure 1 – Relative Wear Resistance (Lower is Better)

Figure 2 – Coefficient of Friction Comparison (Lower is Better

Performance comparable to PFAS-based compounds

Regulatory & Sustainability Advantages

Feature	Benefit
PFAS-Free	Reduced environmental persistence
REACH-Friendly	Supports EU and global compliance
ESG-Aligned	Helps meet OEM sustainability goals
Improved End-of-Life	Better recyclability vs. fluoropolymer blends

Processing Guidelines

Parameter	Recommendation
Drying	80°C for 4–6 hours
Melt Temperature	290–310°C
Mold Temperature	80–110°C
Screw Design	Standard PA screw
Tooling	Hardened steel recommended

Minimal processing changes required when converting from PFAS-based nylon 66.

Competitive Advantage Summary

Feature	Standard PA66	PFAS-Based PA66	Insight Polymers PFAS-Free
Low Friction	✕	✓	✓
High Wear Resistance	✕	✓	✓
PFAS-Free	✓	✕	✓
Regulatory-Ready	✓	✕	✓
Drop-In Replacement	✕	✓	✓

About Insight Polymers & Compounding

Insight Polymers is a materials innovation leader dedicated to sustainable engineering solutions. We partner with industry to develop high-performance polymer compounds that meet the evolving needs of modern design, environmental stewardship, and manufacturing excellence.

Contact Information
insightpolymers.com
info@insightpolymers.com

Technical data, samples, and custom formulations available upon request.