High-Quality PA66 (Nylon 66) Technical Data Sheet

High-quality PA66 (Polyamide 66, also known as Nylon 66) is a semi-crystalline engineering plastic with higher strength, heat resistance, rigidity and wear resistance than PA6. It features excellent oil resistance, chemical stability and mechanical stability, widely used in automotive, electronic & electrical, machinery, industrial accessories and other industries. This document is optimized for direct PDF download, with standardized typesetting and complete content, suitable for foreign trade website display and customer communication.

1. Basic Physical Properties

Property Item	Unit	Pure PA66 (Dry State)	Pure PA66 (Wet State)	30% Glass Fiber Reinforced PA66	Test Standard
Density	g/cm³	1.13-1.14	1.14-1.15	1.34-1.36	ISO 1183-1
Equilibrium Water Absorption	%	3.0-3.5	-	1.8-2.2	ISO 62
Melting Point	℃	255-265	255-265	255-265	DSC Test
Glass Transition Temperature	℃	50-60	45-55	55-65	DSC Test
Crystallinity	%	30-35	28-33	35-45	X-ray Diffraction
Appearance	-	Translucent/Milky White Granules	Translucent/Milky White Granules	Opaque/Ivory White Granules	Visual Inspection

2. Core Mechanical Properties (Key Indicators)

Performance Indicator	Unit	Pure PA66 (Dry State)	Pure PA66 (Wet State)	30% Glass Fiber Reinforced PA66	Test Standard
Tensile Strength	MPa	70-85	55-65	200-230	ISO 527-1/-2
Elongation at Break	%	10-50	150-300	3-5	ISO 527-1/-2
Flexural Strength	MPa	100-120	70-85	280-320	ISO 178
Flexural Modulus	GPa	2.6-3.2	1.8-2.2	7.5-9.0	ISO 178
Notched Impact Strength	kJ/m²	5.0-8.0	18-35	12-18	ISO 179-1
Unnotched Impact Strength	kJ/m²	60-90	120-220	90-130	ISO 179-1
Rockwell Hardness	R	115-125	95-105	125-135	ISO 2039-2
Coefficient of Friction	-	0.15-0.25	0.12-0.20	0.18-0.28	ASTM D1894

3. Thermal Properties

Thermal Performance Indicator	Unit	Pure PA66	30% Glass Fiber Reinforced PA66	Test Standard
Heat Deflection Temperature	℃	65-75 (1.82MPa)180-190	240-250 (1.82MPa)250-260	ISO 75-1/-2

(HDT)		(0.45MPa)	(0.45MPa)	
Continuous Service Temperature	℃	85-95	120-140	Long-term Test
Short-term Peak Temperature	℃	160	190	Instant Thermal Shock
Brittleness Temperature	℃	-35	-35	ISO 974
Coefficient of Thermal Expansion	10^{-5}/°C	7-9 (Transverse)13-16 (Longitudinal)	1.8-3.0 (Transverse)3.5-5.0 (Longitudinal)	ISO 11359-2
Thermal Conductivity	W/(m·K)	0.25-0.29	0.36-0.42	ISO 22007-2
Decomposition Temperature	℃	>320	>320	TGA Test

4. Electrical Properties

Electrical Performance Indicator	Unit	Pure PA66	Test Standard
Dielectric Constant	-	3.5-4.0 (1MHz)	ASTM D150
Dielectric Loss Factor	-	0.02-0.03 (1kHz)	ASTM D150
Volume Resistivity	Ω·cm	$>10^{14}$	ASTM D257
Surface Resistivity	Ω/sq	$>10^{13}$	ASTM D257
Arc Resistance	sec	120-140	ASTM D495

Dielectric Strength	kV/mm	20-25	IEC 60243-1
Flame Retardant Rating	-	UL94 HB	UL94 Test

5. Chemical Properties & Environmental Resistance

Medium Type	Corrosion Resistance	Remarks
Mineral Oil / Fuel Oil	Excellent	Almost no swelling, long-term service available
Water / Water Vapor	Medium	High water absorption causes dimensional change
Weak Acid (pH > 4)	Good	Slight influence for short-term contact
Strong Acid (pH < 4)	Poor	Easy hydrolysis and degradation
Weak Alkali (pH < 10)	Good	Stable under normal temperature
Strong Alkali (pH > 10)	Poor	Easy to be corroded at high temperature
Alcohol Solvents	Good	No obvious swelling
Ester / Ketone Solvents	Poor	Easy swelling and stress cracking
Aromatic / Chlorinated Hydrocarbons	Medium	Slight swelling
UV Radiation	Poor	UV stabilizer required for outdoor use

6. Processing Properties (Injection Molding Application)

Processing Parameter	Unit	Pure PA66	30% Glass Fiber Reinforced PA66	Remarks
Processing Temperature Range	℃	260-280	270-295	Barrel Temperature
Mold Temperature	℃	60-80	80-100	Improve crystallinity & surface finish
Melt Flow Index (MI)	g/10min	12-45	6-25	275℃/2.16kg Load
Injection Pressure	MPa	80-120	100-150	Adjust by product thickness
Holding Pressure	MPa	40-60	50-70	Avoid shrinkage mark
Cooling Time	sec	15-35	20-45	Extend for thick-wall parts
Drying Condition	-	85℃×4-6h	85℃×6-8h	Moisture < 0.1% before molding

7. Key Quality Indicators of High-Quality PA66

- Molecular Weight Stability: Uniform viscosity, stable batch performance
- Low Impurity: Ash content < 0.1%, few black spots, high surface finish
- Thermal Stability: No obvious degradation or yellowing during repeated processing
- Batch Consistency: Performance fluctuation between batches < 5%
- Environmental Compliance: Meet RoHS, REACH standard; food grade and medical grade optional

8. Common Modified PA66 Types & Performance Application

Modification Type	Key Performance Improvement	Typical Applications
Glass Fiber Reinforced	Higher strength, rigidity and heat resistance	Automotive structural parts, gears, brackets
Toughened Modification	Super low-temperature impact resistance	Auto parts, outdoor structural components
Flame Retardant Modification	Reach UL94 V-0 flame retardant grade	Electronic housings, electrical connectors
Mineral Filled	Low warpage, high dimensional stability	Precision plastic parts, home appliance parts
Weather Resistant Modification	Anti-UV, anti-aging	Outdoor engineering components, auto exterior parts

Important Notes

1. PA66 has obvious hygroscopicity; humidity will affect size and toughness, please dry sufficiently before processing.
2. All parameters are general industry typical values; different manufacturers and test conditions have slight deviation.
3. Custom grades such as halogen-free flame retardant, high toughness, heat resistant can be customized according to customer requirements.