ADVANCED POLYMERS

浙江鹏孚隆科技股份有限公司

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PFLUON
ADVANCED MATERIALS

做国际一流高分子材料企业

Be a World-class Polymer Enterprise

CONTENTS

PFLUON, full name Zhejiang PFLUON Technology Co., Ltd., is focused on the research and application technology development of specialty high-molecular materials for nearly 30 years, and specialized in specialty polymers, specialty coatings and biological materials, providing high-molecular polymer application solutions for the market as the product output. Among them, polyetheretherketone (PEEK) is a major part of the specialty polymers, and it will launch two high-performance polymers PPSU and PES. Based on overall innovation and intelligent manufacturing, PFLUON insists on building a world-class Chinese high-molecular material enterprise.

Mission

Industrial cornerstone, glory of the great power

Vision

Be a world-class polymer enterprise

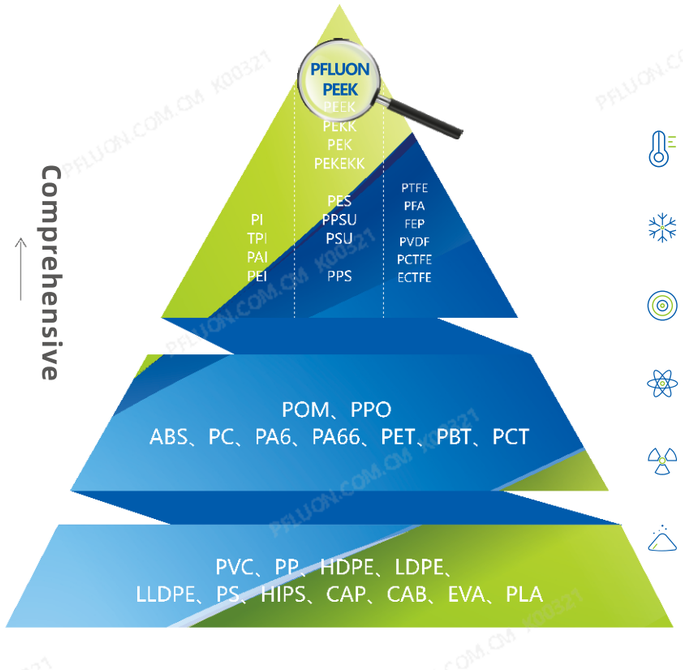
Values

Honest, professional, open, cooperative, win-win

High performance Polymer PEEK

Innovation,Better Your Life.

About PEEK



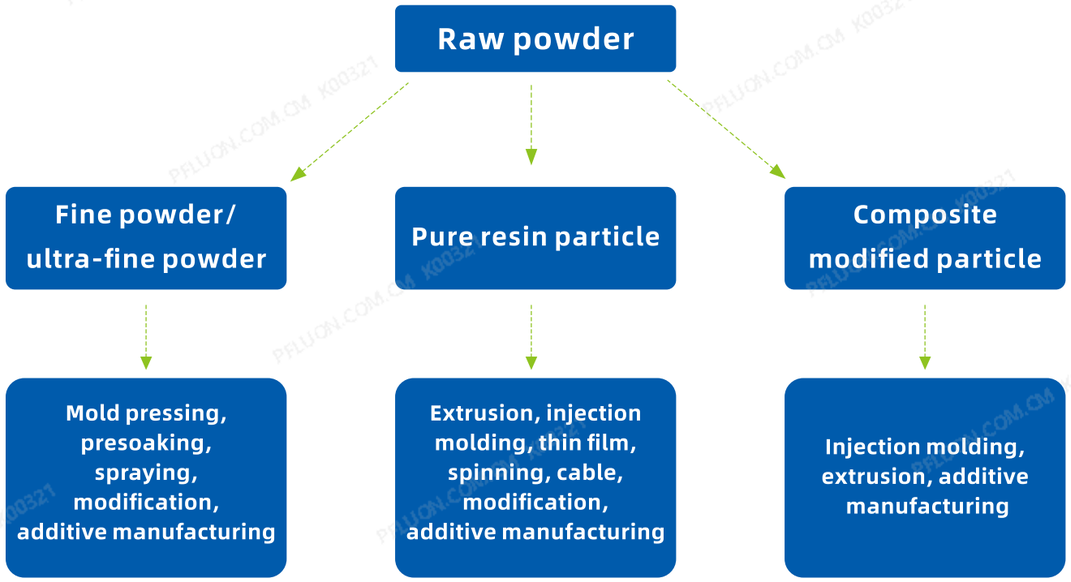
- High temperature resistance
- Low temperature resistance
- Wear resistance
- Fatigue resistance
- Radiation resistance
- Low density
- High mechanical strength
- Natural insulation
- Natural flame retardant
- Easy machining
- Corrosion resistance
- Hydrolysis resistance

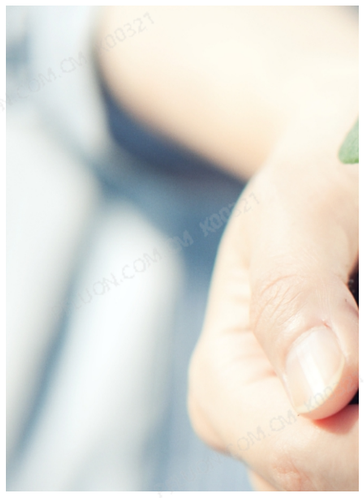
Polyetheretherketone, PEEK for short, is a kind of semi-crystalline, thermoplastic specialty engineering plastics with excellent comprehensive properties, and preferred lightweight material of replacing steel by plastics.

PFLUON PEEK Products

At PFLUON, PEEK products are dominated by five basic resins 8000, 8100, 8200, 8800, 8900, viscosity from high to low, and various composite modified product solutions arising therefrom meet different application scenarios. In the meantime, customized services are also available based on market demand.

PFLUON PEEK product format





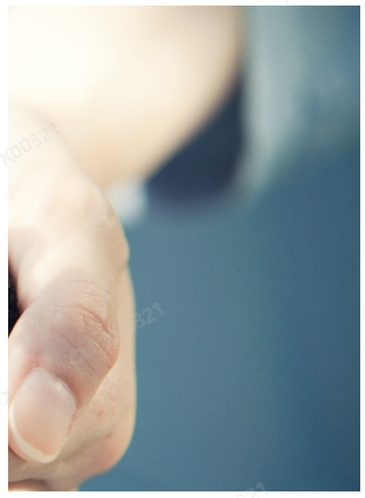


Table for common grades of PFLUON PEEK

	8000	8100	8200	8800	8900
Powder		8100P 8100FP	8200P	8800P 8800UFP-1	8900P 8900UFP
Pure resin particle	8000G	8100G	8200G	8800G	8900G
Carbon fiber reinforced	Carbon fiber content can be filled up to 50%.				
Glass fiber reinforced	Glass fiber content can be filled up to 60%.				
PTFE filling			8200FE10 8200FE20		
Fc30 self-lubricating			8200FC30	8800FC30	8900FC30
Wear resistance	HW002、HW003、HW004、8200WF30、8800WF45、HE610、HE611、HE613				
Anti-static	ESD802、ESD806、ESD826				
High modulus	FB9808、FB9809				
Low thermal conductivity	HDR410				
Ceramic filling for use of semi-conductor	HDR422、HDR425、HDR426				
High-voltage resistance	FB917、FB968				
E-cigarette application	8200G(B)、8800G(B)、8800GF30B、HDR400、HDR410、HDR489				
Fatigue resistant application	8000G				
Spinning and cable applications	8200G(B)、8800G(B)、8900G(B)				
Continuous fiber composite applications	8800UFP-1、8900UFP、8900P				

(*The above table shows some common grades, and customized application solutions are available as required)

Physical Property List of Products

Properties	Test Standard	Test Conditions	Unit	Pure Resin Series					Carbon Fiber Reinforced Series							Ceramic Filling Series	Antistatic Series	
				8000G	8100G	8200G	8800G	8900G	8200CF20	8200CF25	8200CF30	8800CF20	8800CF30	8800CF40	FB988	HDR425	ESD802	ESD806
Mechanical properties																		
Tensile strength	ISO 527	Breakage, 23℃	Mpa	/	/	/	/	/	220	245	255	235	260	275	375	105	105	130
		Yield, 23℃	Mpa	95	96	98	100	105	/	/	/	/	/	/	/	/	/	/
Elongation at break	ISO 527	Breakage, 23℃	%	40	40	35	25	25	3	2.5	2.2	2.8	2.2	1.8	1.8	30	30	2.0
Bending strength	ISO 178	Breakage, 23℃	Mpa	/	/	/	/	/	/	/	380	/	385	405	560	/	/	225
		Yield, 23℃	Mpa	150	150	155	160	160	355	370	/	355	/	/	/	165	165	/
Bending modulus	ISO 178	23℃	Gpa	3.7	3.7	3.7	3.9	3.9	19	17	23	19	23	33	38	5.0	4.5	12
Impact strength of simply supported beam	ISO 179/leA	With notch	$kJ.m^{-2}$	9	8	7	5	4	9.5	9.0	9.0	8.5	8.0	10	11	7.5	7.0	3.5
		Without notch	$kJ.m^{-2}$	/	/	/	/	/	50	50	55	50	55	60	90	/	/	30
Thermal properties																		
Fusing point	ISO 11357	—	℃	343	343	343	343	343	343	343	343	343	343	343	343	343	343	343
Glass transition temperature	ISO 11357	Start	℃	143	143	143	143	143	143	143	143	143	143	143	143	143	143	143
Thermal expansion coefficient	ISO 11359	Lower than Tg along the flow direction	$ppm.K^{-1}$	45	45	45	45	45	8	6	5	8	5	5	5	45	45	25
		Higher than Tg along the flow direction	$ppm.K^{-1}$	120	120	120	120	120	8	6	6	8	6	6	6	120	120	70
Thermal deformation temperature	1SO 75A-f	1.8 Mpa	℃	152	152	152	152	152	325	330	336	325	336	343	343	160	155	170
Electrical properties																		
Volume resistivity	IEC 60093	23°C，1V	Ω·cm	10^{16}	10^{16}	10^{16}	10^{16}	10^{16}	10^{7}	10^{7}	10^{5}	10^{7}	10^{5}	10^{4}	10^{4}	10^{16}	10^{5}	10^{6}
		275°C	Ω·cm	10^{16}	10^{16}	10^{16}	10^{16}	10^{16}	/	/	/	/	/	/	/	10^{16}	/	/
Surface resistivity	IEC 61340	23°C，100V	Ω	/	/	/	/	/	/	/	/	/	/	/	/	/	10^{6}	10^{7}
Others																		
Density	ISO 1183	Crystalline	g/cm^{3}	1.3	1.3	1.3	1.3	1.31	1.37	1.39	1.41	1.37	1.41	1.45	1.45	1.51	1.3	1.62
		Non-crystalline	g/cm^{3}	1.26	1.26	1.26	1.26	1.26	/	/	/	/	/	/	/	/	/	/
Shore D hardness	ISO 868	23℃	—	85	85	85	85	85	88	89	90	/	90	/	91	87	86	89
Molding shrinkage	ISO 294-4	Parallel to the flow direction	%	1.0	1.0	1.0	1.0	1.0	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.9	1.0	0.4
		Perpendicular to the flow direction	%	1.3	1.3	1.3	1.3	1.3	0.7	0.6	0.5	0.7	0.5	0.5	0.5	1.1	1.3	0.5

Properties	Test Standard	Test Conditions	Unit	Glass Fiber Reinforced Series							Wear Resistance Series							
				8200GF10	8200GF20	8200GF30	8800GF20	8800GF30B	8800GF60	FB905	8200FC30	8800FC30	8900FC30	8200WF30	8800WF45	HE610	HE611	HW003
Mechanical properties																		
Tensile strength	ISO 527	Breakage, 23℃	Mpa	125	155	180	160	185	235	215	155	155	155	210	235	85	75	205
		Yield, 23℃	Mpa	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Elongation at break	ISO 527	Breakage, 23℃	%	6.0	4.0	2.3	3.7	2.3	1.5	2.3	2.8	2.5	2.3	2.3	2.0	30	30	2.1
Bending strength	ISO 178	Breakage, 23℃	Mpa	210	360	285	360	290	375	330	270	270	275	330	370	/	/	330
		Yield, 23℃	Mpa	/	/	/	/	/	/	/	/	/	/	/	/	135	130	/
Bending modulus	ISO 178	23℃	Gpa	6.0	9	11	9	11	23	13	15.5	15.5	16	15	27	3.5	3.5	20
Impact strength of simply supported beam	ISO 179/leA	With notch	$kJ.m^{-2}$	7.5	9	12	9	10.5	13	17	6.5	5.0	4.0	8.0	8.0	7.0	7.5	7.0
		Without notch	$kJ.m^{-2}$	65	70	75	60	70	85	90	35	35	30	40	45	/	/	40
Thermal properties																		
Fusing point	ISO 11357	—	℃	343	343	343	343	343	343	343	343	343	343	343	343	343	343	343
Glass transition temperature	ISO 11357	Start	℃	143	143	143	143	143	143	143	143	143	143	143	143	143	143	143
Thermal expansion coefficient	ISO 11359	Lower than Tg along the flow direction	$ppm.K^{-1}$	30	25	20	25	20	13	20	15	15	15	10	5	45	45	5
		Higher than Tg along the flow direction	$ppm.K^{-1}$	50	30	25	30	25	20	25	20	20	20	15	6	120	120	6
Thermal deformation temperature	1SO 75A-f	1.8 Mpa	℃	270	315	328	315	328	343	330	315	315	315	320	330	145	145	328
Electrical properties																		
Volume resistivity	IEC 60093	23°C，1V	Ω·cm	10^{16}	10^{16}	10^{16}	10^{16}	10^{16}	10^{16}	10^{16}	/	/	/	/	/	10^{16}	10^{16}	/
		275°C	Ω·cm	/	/	/	/	/	/	/	/	/	/	/	/	10^{16}	10^{16}	/
Surface resistivity	IEC 61340	23°C，100V	Ω	/	/	/	/	/	/	/	10^{6}	10^{6}	10^{6}	10^{7}	10^{4}	/	/	10^{4}
Others																		
Density	ISO 1183	Crystalline	g/cm^{3}	1.36	1.44	1.52	1.44	1.52	1.83	1.52	1.45	1.45	1.45	1.43	1.5	1.35	1.4	1.42
		Non-crystalline	g/cm^{3}	/	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Shore D hardness	ISO 868	23℃	—	87	88	89	/	89	91	89	84	84	84	88	88	83	82	88
Molding shrinkage	ISO 294-4	Parallel to the flow direction	%	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	1.1	1.2	0.2
		Perpendicular to the flow direction	%	1.0	0.9	0.9	0.9	0.9	0.6	0.9	0.7	0.7	0.7	0.7	0.6	1.5	1.7	0.5

PFLUON PEEK Applications

Provide high-quality efficient industrial solutions for customers

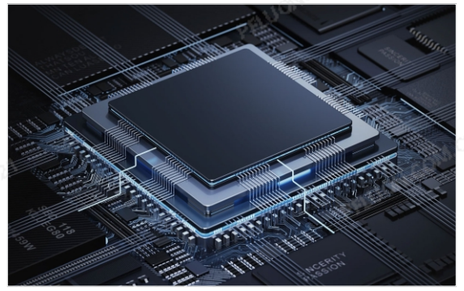
Applied in aerospace, automotive parts, home appliances, cookwares, electronic semi-conductors, energy industry, medical devices and implants, etc.

Aerospace

Medical devices and implants

Automotive parts

Electronic semi-conductors



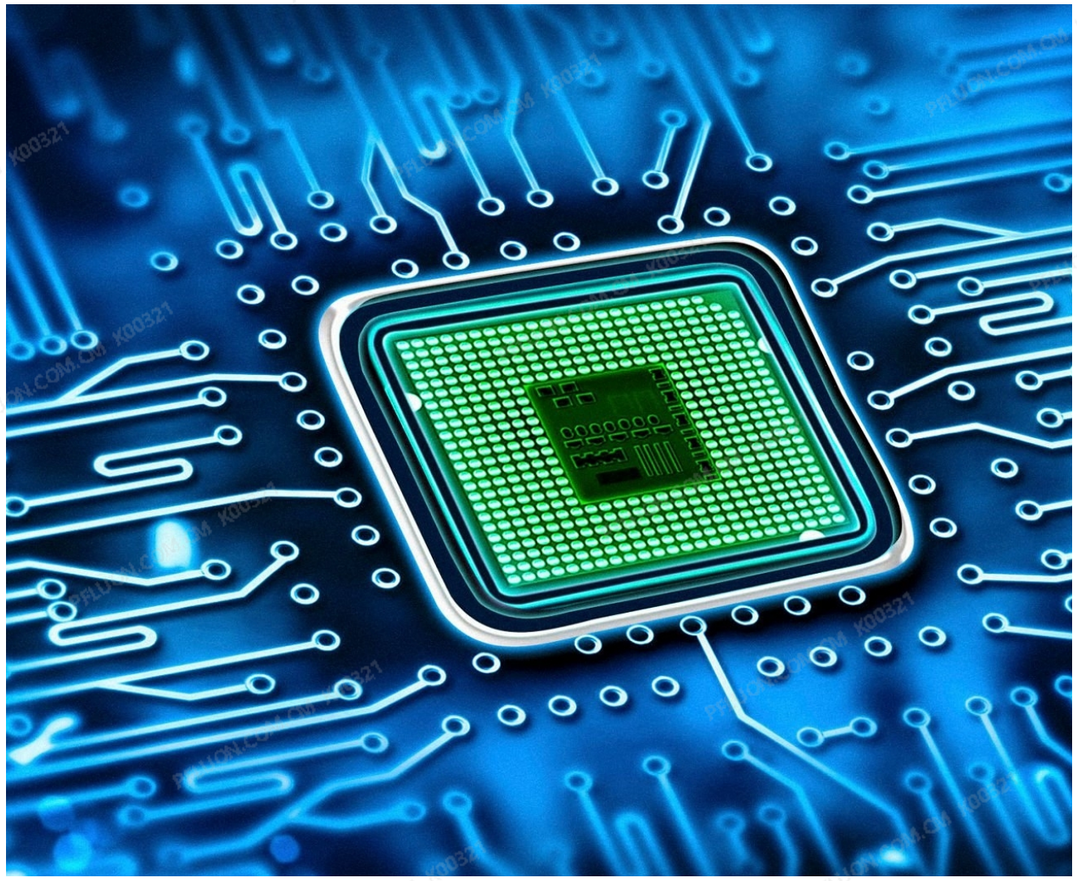
Energy industry

Automotive Parts

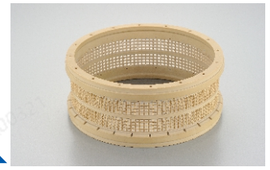
PEEK is a preferred material for lightweight automotive structural parts. PEEK polymers feature a wide range of comprehensive properties, and after blending modification, multiple grades of individual properties are developed, applied in different automotive systems to meet special functions of the applications. Up to date, the grades of various properties have been developed in PEEK industry, such as high wear resistance, high strength, high temperature resistance, low friction coefficient, impact resistance, fatigue resistance, high fluidity and more, meeting the application needs of six systems in traditional fuel vehicles, namely engine, transmission, suspension/steering, brake, fuel and HAVC. At present, 50+ PEEK components have been commercialized. In recent years, as new energy vehicles emerged, PEEK's comprehensive property advantages were recognized by the new energy vehicle industry, and more PEEK new applications were successfully developed in lithium-ion batteries and hydrogen fuel cell vehicles.

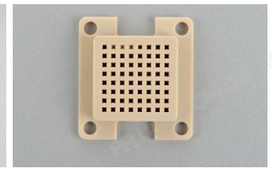
Medical devices and implants

PEEK has an elastic modulus similar to that of human bone, and excellent biocompatibility, as the most ideal orthopedic implant material now. Regarding medical devices, it rquires higher mechanical strength, excellent stress resistance and hydrolysis stability under conditions of hot water, steam, solvent and chemical reagent, etc., as well as radiation resistance, low particle formation, wear resistance and corrosion resistance. PEEK features light weight, non-toxic, corrosion resistance and more advantages, well-suited for high temperature steam disinfection of various medical equipment.



Electronic semi-conductors





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PEEK is widely applied in electronic semiconductor process, due to its self-lubrication, wear resistance, chemical corrosion resistance, high temperature resistance and excellent electrical properties. PFLUON PEEK is able to replace metal, combine parts (once forming) and simplify construction. The parts molded from PFLUON PEEK have low shrinkage and low moisture absorption to meet the high precision requirements in these applications. PFLUON PEEK can also be composite processed into glass fiber, carbon fiber, graphite, PTFE added modification, specialty wear-resistant specifications or made into conductive and antistatic characteristic specifications. Additionally, the high purity specification material of PFLUON PEEK can be used in the semi-conductor industry, especially applicable for high temperature processing scenarios. They have dimensional stability at both high and low temperatures, ensuring clean and pollution-free surfaces; and uncorroded by irritating chemicals and various solvents.

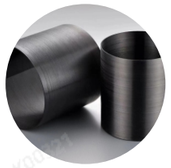
Energy Industry

Thanks to high temperature resistance, wear resistance, corrosion resistance, radiation resistance, hydrolysis resistance, high strength and excellent weather resistance, PEEK is widely applied in petroleum and natural gas exploitation, nuclear power, wind energy, solar energy, oxygen energy and other energy industries. PEEK high-performance materials integrate chemical resistance, electrical properties, wear resistance, hydrolysis resistance and high temperature resistance, with extensive presence in the petroleum industry, so as to improve operational properties and reduce the shutdown risk associated with component failure. PEEK materials boast unique comprehensive properties, alongside lower electrical interference; PEEK materials are also resistant to various corrosive chemicals, solvents and lubricants used in the petroleum industry.

Aerospace

PFLUON PEEK features low density, high strength, fatigue resistance, high temperature resistance, low temperature resistance, low smoke, flame retardant and non-toxic properties, etc., as the ideal material for lightweight aerospace aircraft. It can replace aluminum alloy, reducing weight 27%. PEEK pure grade and modified reinforced grade have been applied in aircraft pipeline clamps, floor brackets, wing leading edges, TAB heat and sound insulation blankets, threaded fasteners, electronic connectors, oxygen cylinder brackets, radar covers, aviation gasoline tank covers, aviation seat components, etc.

PFLUON PEEK 8200G thin films have been successfully applied in spacecraft, and PFLUON PEEK 8800UFP continuous carbon fiber composites have been applied in main structural parts of the aviation industry, due to ultra-high mechanical strength and excellent fatigue properties. In the future, more PFLUON PEEK composites will be used in the aerospace industry, and help aircrafts “fly in a lighter, longer, safer, more comfortable and eco-friendly manner”.



Service is our strength!

Our Turnkey Services

- Application Feasibility Analysis
- Material Selection
- Formula Customization
- Product Design
- Mold Design Proposal
- Processing Guidance
- Product Properties Evaluation
- On-site Technical Support
- Product Failure Analysis
- Customer Samples Testing & Analysis