

Fiber Type	Average Tensile Strength (Mpa)	Average Modulus (Gpa)	Temperature Resistance (℃)	Glass Transition Temperature (℃)	Chemical Stability	Fatigue Performance	Insulation Properties	Average Price(\$/kg)	Application	Major Manufacturers
Glass Fiber(E)	2000-3500	70-80	300-400	840	Generally good, especially in neutral and weakly acidic environments, but poor in alkali resistance	Performs poorly under dynamic loads and is prone to fatigue cracking	Very good	1-4	*Composite materials: used to make reinforced plastics (such as fiberglass). *Construction industry: fiberglass mesh is used to reinforce building structures. *Insulation materials: electrical insulation, thermal insulation. *Shipbuilding and automobile manufacturing: requirements for light weight and high strength.	Owens Corning Jushi Group Nippon Electric Glass Co., Ltd Saint-Gobain Vetrotex
Basalt Fiber	2800-4800	85-100	650-700	980	Better than glass fiber, excellent acid and alkali corrosion resistance, especially at high temperatures	Better than glass fiber, suitable for applications that need to withstand repeated loads	Excellent	3-8	*Civil Engineering: Reinforced geogrids are used for roads, tunnels, etc. *Construction: Reinforced concrete, fireproof materials. *Automobile and aviation: Replace some metal parts to reduce weight. *Insulation materials: Due to its high temperature resistance, it is used for insulation in high temperature environments.	ChinaGBF Kamenny Vek Basalt Fiber Technologies Basalt America Basaltex NV Mafic SA
Carbon Fiber	3500-7000	230-500	300-500	150-350	Performs well in most environments but is sensitive to strong oxidants	Very good, especially under high stress and high cycle times	Not good	20-40	*Aerospace: Manufacturing parts for aircraft, drones, etc. *Sporting goods: High-performance sports equipment, such as tennis rackets and fishing rods. *Automotive: Manufacturing lightweight car bodies and components. *Medical devices: Used to make artificial bones or prostheses.	Toray Industries Hexcel Corporation ZOLTEK Corporation SGL Group Mitsubishi Chemical Corporation Teijin Limited Hyosung Advanced Materials
Aramid Fiber	2800-3600	60-120	250-300	340	Good resistance to most chemicals, but sensitive to strong acids	Excellent performance under dynamic loads, especially in ballistic applications	Very good	15-30	*Protective equipment: bulletproof vests, stab-proof clothing. *Aerospace and aviation: for lightweight, high-strength composite materials. *Tires: improve tire wear resistance and strength. *Shipbuilding and marine engineering: impact-resistant and corrosion-resistant materials.	DuPont Teijin Aramid Kolon Industries Yantai Tayho Advanced Materials Huvivis
UHMWPE Fiber	3000-4000	80-120	150	-120(-90)	Good resistance to most chemicals, but not to UV and high temperatures	Excellent performance at low temperatures and high strain rates, excellent impact resistance	Very good	10-25	*Bulletproof equipment: Make lightweight bulletproof vests. *Marine and offshore: Used in cables, nets, etc. because of its high strength and UV resistance. *Medical: Used in artificial ligaments, sutures. *Sports equipment: Skis, climbing ropes, etc.	DSM Dyneema Honeywell International Inc Toyobo Co., Ltd
Quartz Fiber	2100-3500	65-70	1000-1200	1100	Very good, especially stable at high temperatures.	Performs well under high temperatures and repeated loading	Excellent insulation performance under high temperature and high frequency electromagnetic field	50-100	*High temperature insulation: used as insulation material in aerospace and electronics industries. *Semiconductor manufacturing: provides high purity, high temperature insulation. *Optics: used in high precision optical instruments due to its low thermal expansion characteristics.	Horaeus Quarzglas Momentive Performance Materials Nippon Electric Glass Co., Ltd
Ceramic Fiber	100-300	30-50	1200-1600	900-1200	Excellent chemical stability at high temperatures	Performs well in high temperature environments, but has poor mechanical fatigue performance at room temperature	Particularly suitable for high temperature insulation applications	10-30	*High temperature insulation: used as thermal insulation for industrial furnaces. *Automobile and aviation: thermal insulation for high temperature parts. *Fireproof material: because of its high temperature and fire resistance.	Unifrax Morgan Advanced Materials Luyang Energy-saving Materials Co., Ltd
Silicon carbide fiber	2500-3500	180-400	1400-1600	1000-1300	Stable in high temperature and corrosive environments	Excellent at high temperatures, but sensitive to temperature changes	Not an insulating material, but can be used to enhance the performance of insulating materials	100-300	*Nuclear reactors: As structural materials due to their high temperature stability and radiation tolerance. *High-performance composites: Used in the aerospace industry to manufacture components that need to withstand extreme conditions. *Bulletproof materials: Due to their high hardness and high strength properties.	NGS Advanced Fibers Co., Ltd Specialty Materials, Inc COI Ceramics