

品行 **创新** **责任** **学习** **激情**
BEHAVIOR INNOVATION RESPONSIBILITY LEARNING ENTHUSIASM

 **浙江振石新材料股份有限公司**
ZHEJIANG ZHENSHI NEW MATERIALS CO.,LTD.

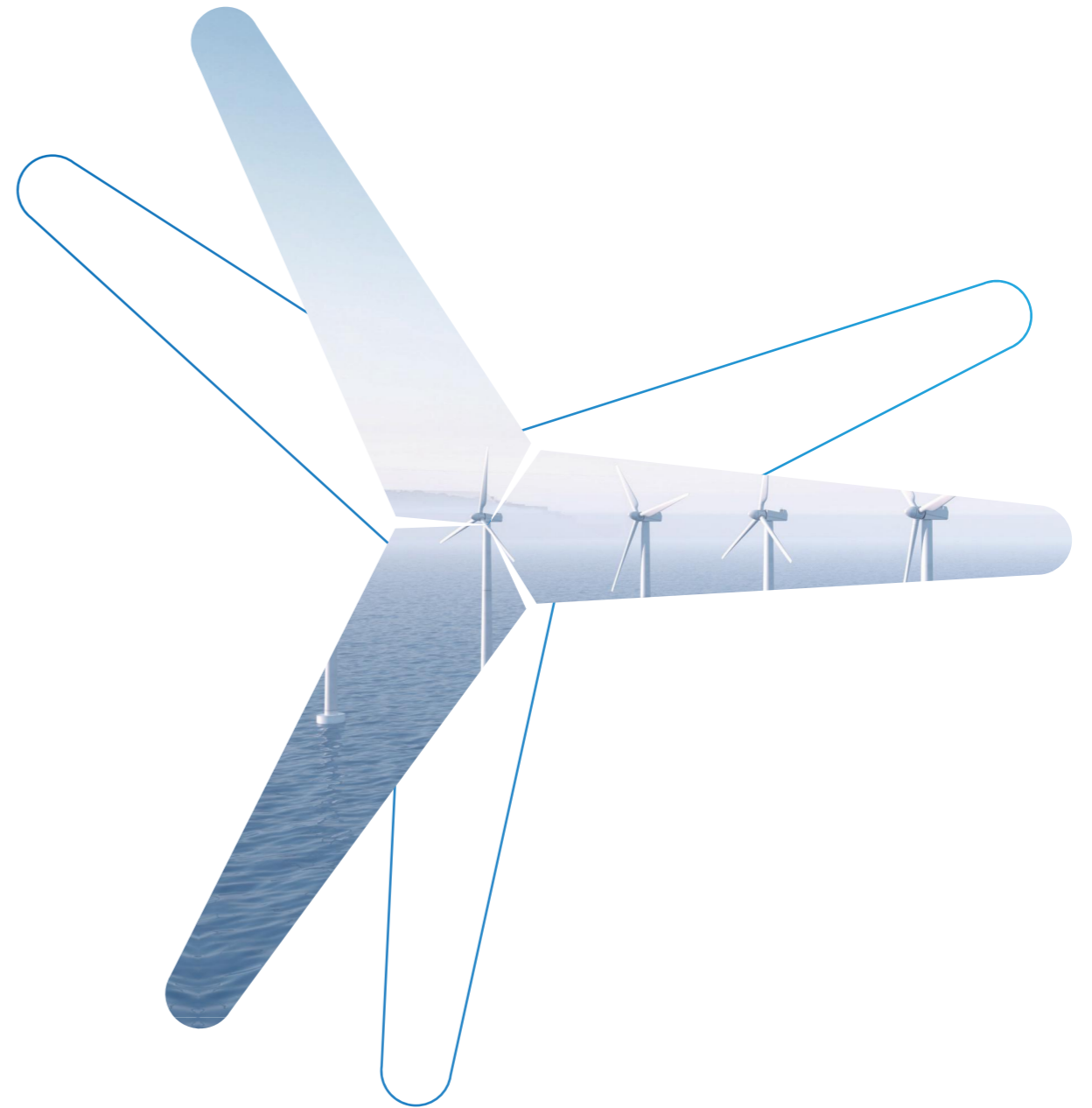
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Wechat Public Account



WIND POWER SERIES
风电系列

新材料 新领域 新高度 新贡献 新发展
NEW MATERIALS, NEW FIELDS, NEW HEIGHTS
NEW CONTRIBUTIONS AND NEW DEVELOPMENT



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企业简介

COMPANY PROFILE

浙江振石新材料股份有限公司(简称“振石股份”，股票代码：SH601112)，专业从事清洁能源领域高性能纤维增强复合材料研发、生产及销售的国家级高新技术企业。公司始于2000年，历经二十余年的创新发展，现已成为中国复合材料行业领军企业。公司深耕高性能纤维编织及热固、热塑性复合材料领域，产品广泛应用于新能源风电、太阳能光伏、新能源汽车等战略性新兴产业。

目前，公司拥有中国桐乡、埃及苏伊士、土耳其泰基尔达、西班牙加的斯等地9个生产基地，同时在美国洛杉矶和中国香港设有销售公司，可以快速响应全球客户的产品需求，产品远销50多个国家和地区。

Zhejiang Zhenshi New Materials Co., Ltd. (hereinafter referred to as “Zhenshi Co., Ltd.” ; Stock Code: SH601112) is a national high-tech enterprise specializing in the research and development, manufacturing and distribution of high-performance fiber-reinforced composite materials for the clean energy sector. Founded in 2000, the Company has emerged as a leading enterprise in China’s composite materials industry following more than two decades of innovation. Specializing in high-performance fiber fabrics, thermosetting and thermoplastic composites, the Company supplies products widely used in strategic emerging industries such as wind power, solar photovoltaics and new energy vehicles.

Currently, the company has 9 production bases located in Tongxiang China, Suez Egypt, Tekirdag Turkey, and Cádiz Spain and it also has sales companies in Los Angeles, USA, and Hong Kong, China, which can quickly respond to the product needs of global customers. Its products are exported to more than 50 countries and regions.

愿景 Vision

保持与实现新材料行业的创新者与引领者
KEEP AND REALIZE THE INNOVATOR AND LEADER OF NEW MATERIAL INDUSTRY

使命 Mission

新材料 新领域 新高度 新贡献 新发展
NEW MATERIALS, NEW FIELDS, NEW HEIGHTS
NEW CONTRIBUTIONS AND NEW DEVELOPMENT

9 ↑
生产基地
Production Bases



50 国家+
地区
Countries and regions
产品远销
Sales Area

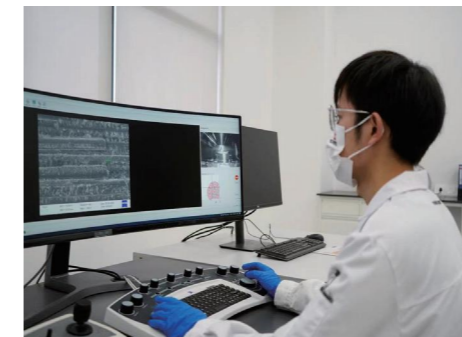
300 +
项
专利和认证
Patents and Certifications





测试中心：成立于2004年，现拥有专业技术人员50余名，试验场地5000余平方米，各类仪器设备150余台套，进口设备占比40%以上。测试中心已通过中国合格评定国家认可委员会（CNAS）国家认可和全球风电行业权威认证机构 DNV-GL 认证。

The testing center was founded in 2004 and now has more than 50 professional and technical personnel, a test site of more than 5000 square meters, more than 150 sets of various instruments and equipments, and imported equipment accounts for more than 40%. The testing center has passed the national certification of China National Accreditation Service for Conformity Assessment (CNAS) and DNV-GL certification, an authoritative certification agency in the global wind power industry.



测试内容达60余项，满足碳纤维、玻璃纤维及织物、纤维增强材料、光伏产品、汽车部件等领域的物理性能测试、静态力学测试、疲劳力学测试、化学分析测试、微观结构分析等，测试方法采用国际ISO或ASTM标准。

The testing contents covers more than 60 items, meeting the physical performance testing, static mechanical testing, fatigue mechanical testing, chemical analysis testing, and microstructure analysis, etc., in the fields of carbon fiber, glass fiber and fabrics, fiber-reinforced materials, photovoltaic products, automotive components, etc. The testing methods adopt international ISO or ASTM standards.



体系认证：公司先后通过了 ISO9001 质量管理体系、ISO14001 环境管理体系、ISO45001 职业健康安全管理体系、IATF16949 汽车质量管理体系、知识产权体系、ISO10012 测量管理体系认证以及 UL 产品认证、DNVGL 产品认证，为产品的品质提供了保障。

System Certification: The company has successfully obtained ISO9001 Quality Management System, ISO14001 Environmental Management System, ISO45001 Occupational Health and Safety Management System, IATF16949 Automotive Quality Management System, Intellectual Property System, ISO10012 Measurement Management System certifications, as well as UL product certification and DNVGL product certification, providing quality assurance for our products.

品质保证 QUALITY ASSURANCE

WIND ENERGY APPLICATION 风电领域应用

高性能复合材料，以玻纤和碳纤维复合材料为典型代表，在新能源风电领域发挥着重要作用。高性能复合材料不仅能够满足叶片的强度和刚度要求，还能实现轻量化、大型化和高稳定性，助力提升风力发电效率。

In the field of wind energy, high-performance composite materials with glass fiber and carbon fiber composite materials as typical representatives plays a significant role. High-performance composites can meet the strength and stiffness requirements of the blade, also can achieve light weight, large-scale and highly stable blade, helping to improve the efficiency of wind power generation.

产品系列

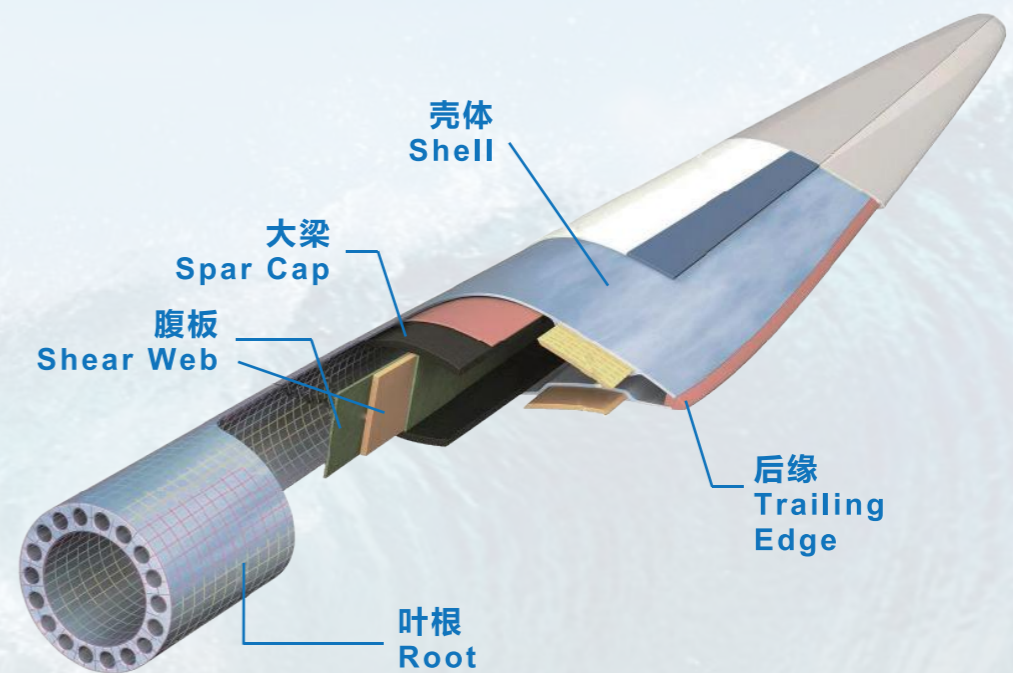
Product Series

风电用高性能纤维织物，公司产品种类覆盖碳纤维、碳玻混编、单轴向、多轴向织物等，可适用于风电叶片的各个部位。

风电用拉挤板，公司产品种类覆盖玻纤、碳玻混、碳纤维拉挤板等，主要应用于风电叶片的主梁，作为主要承载受力部件。

High-performance fabric for wind power, the company's products cover carbon fiber, carbon glass hybrid, uniaxial, multiaxial fabric, etc., which can be applied to all parts of wind blade.

Wind power pultruded profile, the company's product types cover glass fiber, carbon glass hybrid, carbon fiber pultruded profile, etc., mainly used in the Spar Cap of wind power blade, as the main bearing components.



全球领先的风电叶片基材解决方案供应商
低成本、轻量化、大型化、高稳定性
THE WORLD'S LEADING SUPPLIER OF WIND TURBINE BLADE SUBSTRATE SOLUTIONS
LOW COST, LIGHT WEIGHT, LARGE SCALE, HIGH STABILITY

CARBON FABRICS

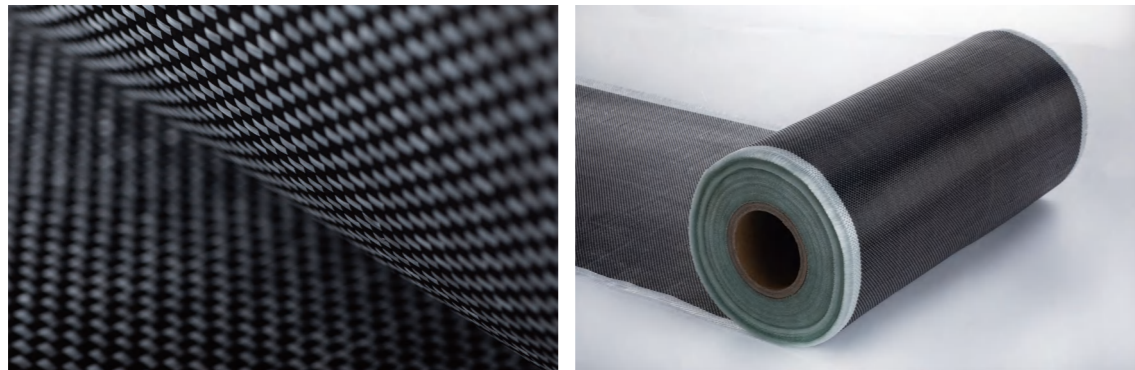
碳纤维导流织物

产品介绍/INTRODUCTION

碳纤维具有比玻璃纤维更出色的力学性能和化学稳定性，使碳纤维系列织物成为风电叶片大型化、轻量化的首选材料。碳纤维与玻璃纤维缝编形成碳玻混编织物，兼具低成本和轻量化的优势，通过改变碳纤维和玻纤的比例，可实现模量线性变化，为叶片设计优化、减重降本提供更多解决方案。

Carbon fiber has better mechanical properties and chemical stability than glass fiber, making carbon fiber fabrics the preferred choice for large-scale and lightweight wind turbine blades. Carbon fiber and glass fiber are weaved to form a hybrid fabric, which has the advantages of low cost and light weight, and can realize the linear change of the modulus by changing the ratio of carbon fiber and glass fiber, providing more solutions for blade design optimization, weight and cost reduction.

产品图片/PRODUCT PICTURES



主要特点/CHARACTERISTICS

-  轻便
Light
-  抗冲击性
Impact Resistance
-  耐久性
Durability
-  剪切性能优异
Excellent Shear Performance
-  高强度
High Strength
-  弯曲性能良好
Good Bending Performance
-  拉伸性能优异
Excellent Tensile Properties

产品系列/APPLICATIONS

产品系列 Product Series		
碳纤维方格布系列	C-WR系列	Carbon Fiber Woven Roving: C-WR Series
碳玻混编方格布系列	C/E-WR系列	Carbon And Glass Hybrid Woven Roving: C/E-WR Series
碳纤维单轴向织物	C-UD系列	Carbon Fiber Unidirectional Fabric: C-UD Series
碳纤维多轴向织物	C-BX、C-TLX系列	Carbon Fiber Multiaxial Fabric: C-BX、C-TLX Series
产品规格 Product Specification		
克重范围	200-1500G/M ²	Area Weight Range: 200-1500g/m ²
门幅范围	150-3100MM	Width Range: 150-3100mm
角度范围	0-90°	Angel Range: 0-90°
适用树脂	环氧树脂等	Applicable Resin: Epoxy Resin, etc

技术参数/TECHNICAL PARAMETERS

测试样品 Testing Sample	测试项目 Testing Item	测试标准 Testing Standard	测试数据 Testing Data
碳纤维 Carbon Fiber	拉伸强度(MPa) Tensile Strength (MPa)	ASTM D2343	> 3500
	拉伸模量(GPa) Tensile Modulus (GPa)		> 230
碳玻混方格布(环氧树脂) Carbon And Glass Hybrid Woven Fabric (Epoxy resin)	拉伸强度(MPa) Tensile Strength (MPa)	ISO527-5	600-700
	拉伸模量(GPa) Tensile Modulus (GPa)		45-46
碳玻混单向布 Carbon And Glass Hybrid Unidirectional Fabric	拉伸强度(MPa) Tensile Strength (MPa)	ISO527-5	1500-1800
	拉伸模量(GPa) Tensile Modulus (GPa)		120-130

E-UNIDIRECTIONAL FABRICS

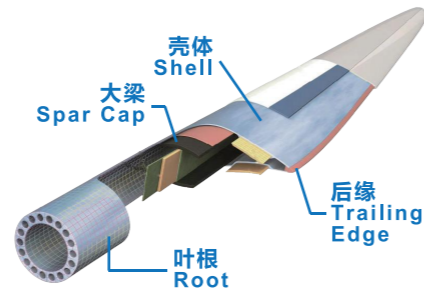
玻璃纤维单轴向编织物

产品介绍/INTRODUCTION

由无捻粗纱在 0°或 90°方向排列后，线圈结构编织而成的，可根据用途选择带毡或不带毡。

Made by arranging non-twisted yarns in the 0° or 90° directions and then stitch together with a coil structure, with the option to choose with or without chop mat depending on the application.

适用范围/SCOPE OF APPLICATION



风电叶片主梁，辅梁，后缘，壳体和叶根增强层
Spar cap, TE grider, Trailing Edge, Shell and Root Reinforcement layer of Wind Turbine Blade

主要特点/CHARACTERISTICS

低密度
Low Density

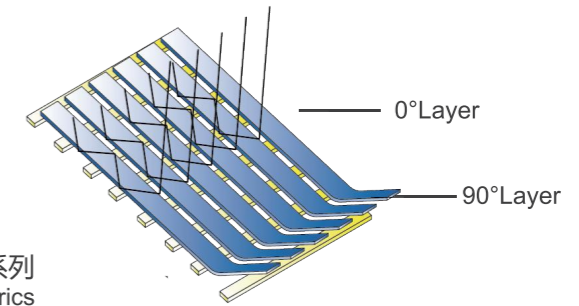
高强度
High Strength

高模量
High Modulus

寿命更长
Longer Life

效率更高
Higher Efficiency

模型图/MODEL DIAGRAM



单轴向织物系列
E-unidirectional Fabrics

常用规格/NORMAL SPECIFICATION

规格 Specifications	总克重 Total AreaWeight (g/m ²)	90°层 90°Layer (g/m ²)	0°层 0°Layer (g/m ²)	涤纶丝 Polyester Yarn (g/m ²)
UD650	655	40	598	17
UD1200	1219	50	1152	17
UD1250	1247	40	1196	11
UD1560	1566	40	1514	12

可选玻纤纱/ROVING OPTIONS

主要性能 Main Material Properties	直接纱: 2400tex (环氧树脂) Direct Roving (Epoxy Resin)		0°单轴向织物 UD1250 (环氧树脂) 0°UD Fabric (Epoxy Resin)		
	测试项目 Testing Items	拉伸强度(MPa) Tensile Strength	拉伸模量(GPa) Tensile Modulus	拉伸强度(MPa) Tensile Strength	拉伸模量(GPa) Tensile Modulus
测试标准 Testing Standards	ASTM D2343	ASTM D2343	ISO527-5	ISO527-5	
E-GLASS	≥2200	≥81	1000-1100	43-45	
E7-GLASS	≥2800	≥90	1100-1250	47-49	
E8-GLASS	≥3000	≥95	1250-1350	52-53	
E9-GLASS	3100-3500	100-103	1350-1500	55-56	

BIAXIAL FABRICS

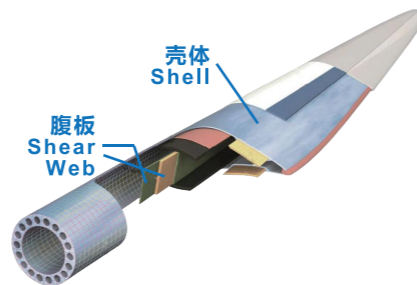
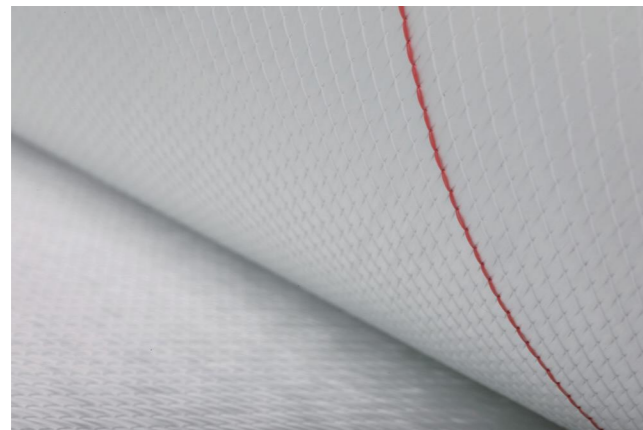
玻璃纤维双向编织物

产品介绍/INTRODUCTION

由无捻粗纱 +45°/-45°或 0°/90°方向排列后，线圈结构编织而成的，可根据用途选择带毡或不带毡。

Made by arranging non-twisted yarns in the +45°/-45° or 0°/90° directions and then stitch together with a coil structure, with the option to choose with or without chop mat depending on the application.

适用范围/SCOPE OF APPLICATION



风电叶片腹板，壳体增强层
Shear Web of Wind Turbine Blade
Shell Reinforcement Layer

主要特点/CHARACTERISTICS



轻便
Light



高强度
High Strength



耐久性
Durability

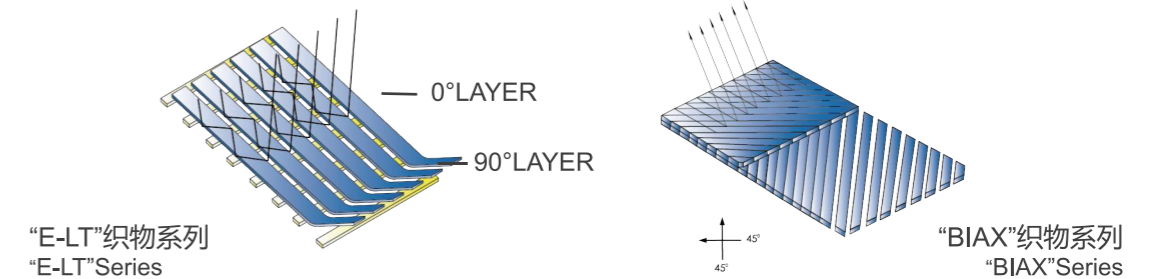


抗冲击性
Impact Resistance



剪切、弯曲、拉伸性能优异
Excellent Shear, Bending and Tensile Properties

模型图/MODEL DIAGRAM



常用规格/NORMAL SPECIFICATION

规格 Specifications	总克重 Total Area Weight (g/m ²)	+45°层 +45°Layer (g/m ²)	90°层 90°Layer (g/m ²)	0°层 0°Layer (g/m ²)	-45°层 -45°Layer (g/m ²)	涤纶丝 Polyester Yarn (g/m ²)
BIAX600	612	301	2	2	301	6
BIAX808	812	401	2	2	401	6
BIAX1000	1012	501	2	2	501	6
BIAX1200	1212	601	2	2	601	6

可选玻纤纱/ROVING OPTIONS

主要性能 Main Material Properties	直接纱: 2400tex (环氧树脂) Direct Roving (Epoxy Resin)	0°单轴向织物 UD1250 (环氧树脂) 0°UD Fabric (Epoxy Resin)		
测试项目 Testing Items	拉伸强度(MPa) Tensile Strength	拉伸模量(GPa) Tensile Modulus	拉伸强度(MPa) Tensile Strength	拉伸模量(GPa) Tensile Modulus
测试标准 Testing Standards	ASTM D2343	ASTM D2343	ISO527-5	ISO527-5
E-GLASS	≥2200	≥81	1000-1100	43-45
E7-GLASS	≥2800	≥90	1100-1250	47-49
E8-GLASS	≥3000	≥95	1250-1350	52-53
E9-GLASS	3100-3500	100-103	1350-1500	55-56

TRIAXIAL FABRICS

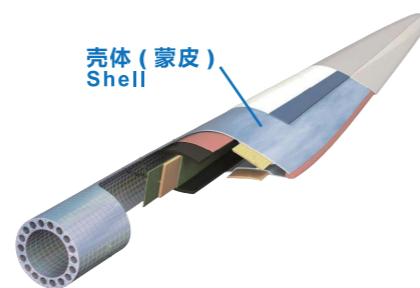
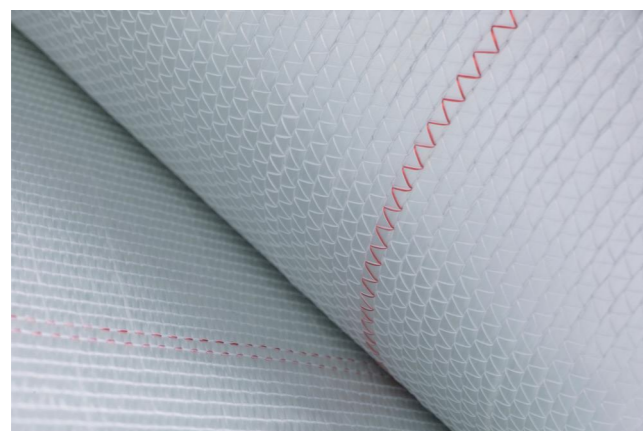
玻璃纤维三轴向缝编织物

产品介绍/INTRODUCTION

由无捻粗纱在 0°/+45°/-45°或 +45°/90°/-45°方向排列后，线圈结构编织而成的，可根据用途选择带毡或不带毡。

Made by arranging non-twisted yarns in the 0° /+45° /-45° or +45° /90° /-45° directions and then stitch together with a coil structure, with the option to choose with or without chop mat depending on the application.

适用范围/SCOPE OF APPLICATION



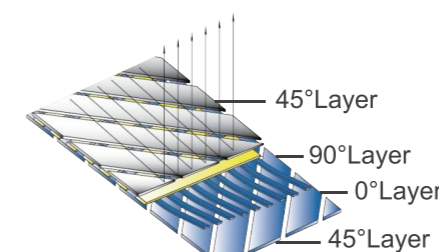
风电叶片蒙皮
Shell of Wind Turbine Blade

主要特点/CHARACTERISTICS

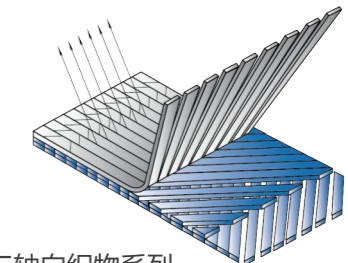
- 耐热性强
Strong Heat Resistance
- 绝缘性好
Strong Insulation
- 力学性能优
Excellent Mechanical Properties

- 抗腐蚀性好
Strong Corrosion Resistance
- 机械强度高
High Mechanical Strength

模型图/MODEL DIAGRAM



“TTX”三轴向织物系列
“TTX”Triaxial Series



“TLX”三轴向织物系列
“TLX”Triaxial Series

常用规格/NORMAL SPECIFICATION

规格 Specifications	总克重 Total Area Weight (g/m ²)	0°层 0°Layer (g/m ²)	+45°层 +45°Layer (g/m ²)	90°层 90°Layer (g/m ²)	-45°层 -45°Layer (g/m ²)	涤纶丝 Polyester Yarn (g/m ²)
TLX750	758	142	301	/	301	14
TLX975	975	567	200	/	200	8
TLX1200	1177	567	301	/	301	8
TLX1215	1203	701	247	/	247	8
TLX1350	1364	283	535	/	535	16
TTX1215	1222	2	251	709	251	9
TTX1350	1372	2	251	960	251	9

可选玻纤纱/ROVING OPTIONS

主要性能 Main Material Properties	直接纱: 2400tex (环氧树脂) Direct Roving (Epoxy Resin)		0°单轴向织物 UD1250 (环氧树脂) 0°UD Fabric (Epoxy Resin)	
测试项目 Testing Items	拉伸强度(MPa) Tensile Strength	拉伸模量(GPa) Tensile Modulus	拉伸强度(MPa) Tensile Strength	拉伸模量(GPa) Tensile Modulus
测试标准 Testing Standards	ASTM D2343	ASTM D2343	ISO527-5	ISO527-5
E-GLASS	≥2200	≥81	1000-1100	43-45
E7-GLASS	≥2800	≥90	1100-1250	47-49
E8-GLASS	≥3000	≥95	1250-1350	52-53
E9-GLASS	3100-3500	100-103	1350-1500	55-56

POWDER BONDED FABRIC

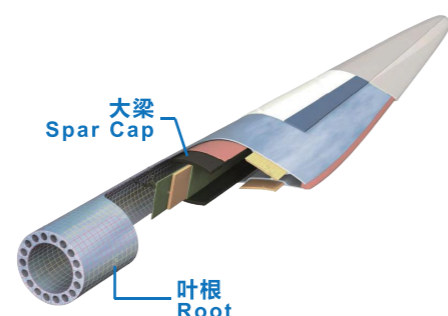
撒粉预定型织物

产品介绍/INTRODUCTION

玻璃纤维纱线通过一定铺层结构并经缝编线捆绑成型后，在织物一侧表面均匀喷撒一层环氧树脂粉剂，加热固化在织物表面形成撒粉预定型织物。

Glass fiber is formed into fabric by a certain laying structure and bundled with stitching. A layer of epoxy resin powder is evenly sprayed on one side of the fabric surface, then heated and cured to form the powder bonded fabric.

适用范围/SCOPE OF APPLICATION



风电叶片壳体和叶根增强层
Wind Turbine Blade Shell
and Root Reinforcement Layer

主要特点/CHARACTERISTICS



优异的机械性能
Excellent Mechanical Properties



有效减少喷胶使用
Effectively Reduce the Use of Spray Adhesives



浸润效果优，减少富树脂
Excellent Mechanical Properties



低熔点固化，环境友好型
Low Melting Point Curing, Environmentally Friendly

常用规格/NORMAL SPECIFICATION

规格 Specifications	总克重 Total AreaWeight (g/m ²)	织物 Fabric (g/m ²)	粉剂 Powder (g/m ²)
BIAX600	625	612	13
UD625	649	635	13
TLX750	765	755	10

可选玻纤纱/ROVING OPTIONS

主要性能 Main Material Properties	直接纱: 2400tex (环氧树脂) Direct Roving (Epoxy Resin)		0°单轴向织物 UD1250 (环氧树脂) 0°UD Fabric (Epoxy Resin)	
测试项目 Testing Items	拉伸强度(MPa) Tensile Strength	拉伸模量(GPa) Tensile Modulus	拉伸强度(MPa) Tensile Strength	拉伸模量(GPa) Tensile Modulus
测试标准 Testing Standards	ASTM D2343	ASTM D2343	ISO527-5	ISO527-5
E-GLASS	≥2200	≥81	1000-1100	43-45
E7-GLASS	≥2800	≥90	1100-1250	47-49
E8-GLASS	≥3000	≥95	1250-1350	52-53
E9-GLASS	3100-3500	100-103	1350-1500	55-56

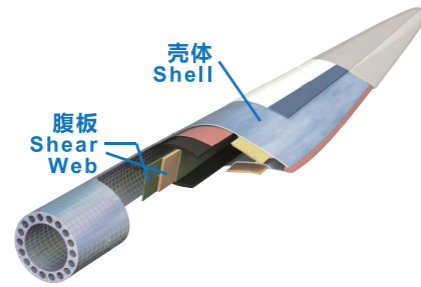
UD GLASS FIBER ROPE 玻纤绳产品介绍

产品介绍/INTRODUCTION

玻纤绳由多根玻璃纤维直接纱或膨体纱合股后经外层玻璃纤维纱线缠绕捆绑成型，分为芯层和缠绕层结构。





The fiberglass rope is formed by twisting multiple strands of direct or bulked glass fiber yarn together, which are then bundled and wrapped with an outer layer of glass fiber yarn. It has a core layer and a wrapping layer structure.

适用范围/SCOPE OF APPLICATION



风电叶片腹板，壳体增强层
Shear Web of Wind Turbine Blade
Shell Reinforcement Layer

主要特点/CHARACTERISTICS

-  可填充铺设缝隙，减少富树脂
Can Fill and Seal Gaps, Reducing Excess Resin
-  可定制化直径和线密度
Diameter and Linear Density Can be Customized
-  随型性好，易于使用
Good Drapability, Easy to Use
-  优异的树脂浸润性
Excellent Wetting Effect

常用规格/NORMAL SPECIFICATION

类型 Type	规格 Specifications	总克重 Total AreaWeight (g/m ²)	芯层 Core Layer Weight (g/m)	缠绕层 Wrapping Layer Weight (g/m)
膨体纱玻纤绳 Bulked Yarn Fiberglass Rope	E6-GLASS UD ROPE_5MM DIAMETER	9	5	4
直接纱玻纤绳 Direct Yarn Fiberglass Rope	E6-GLASS UD ROPE WITH 8 ROVINGS	19.3	19.2	0.1
直接纱玻纤绳 Direct Yarn Fiberglass Rope	E6-GLASS UD ROPE WITH 20 ROVINGS	48	0.1	48.1

FIBERGLASS PULTRUDED PROFILE 玻璃纤维拉挤板

产品介绍/INTRODUCTION

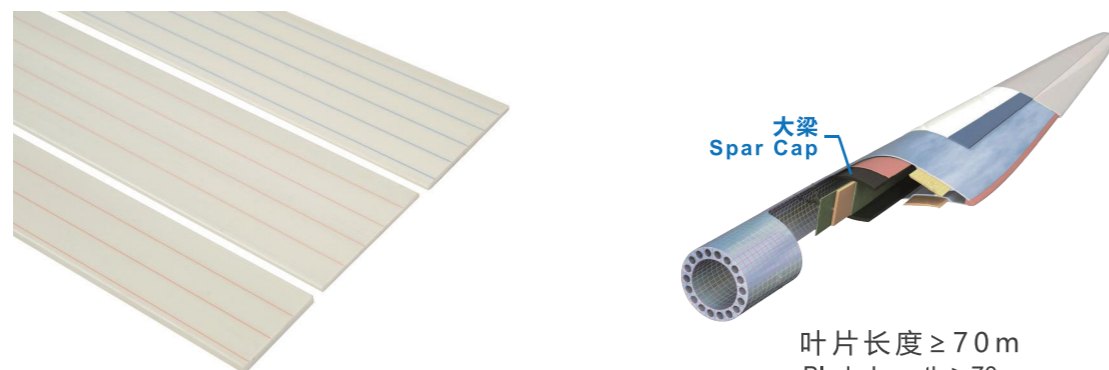
玻璃纤维拉挤板是一种由玻璃纤维和树脂通过拉挤成型工艺制成的复合材料板材。

产品模量集中在 60-65GPa 范围内，主要应用于 70-120 米长度风电叶片的需要。

The glass fiber pultruded profile is a composite material panel made from glass fiber reinforced materials and resin through the pultrusion process.

The product modulus is concentrated in the range of 60-65GPa, mainly used for onshore 70-120 meters long wind turbine blades.

适用范围/SCOPE OF APPLICATION



主要特点/CHARACTERISTICS

轻质
Light Weight

疲劳性能好
Good Fatigue

耐水
Highly Waterproof

耐化学腐蚀
Excellent Chemical Resistance

高强高模
High Strength & High Modulus

环保、无VOC/甲醛排放
Environment Friendly, No voc

技术参数/TECHNICAL PARAMETERS

物性指标 Properties	典型数值 Typical Value		
	E7-390	E8-390	
玻纤体积含量% Fiber Volume Fraction (%)	67-74		
密度 (G/CM ³) Density	2.1-2.2		
产品宽度 (MM) Width	50-200		
产品厚度 (MM) Thickness	2-8		
玻纤体积含量% Fiber Volume Fraction%	69-73	69-72	72-74
0°拉伸强度 (MPa) Char 0°Tensile Strength (MPa) Char	≥1260	≥1300	≥1400
0°拉伸模量 (GPa) Avg 0°Tensile Modulus (GPa) Avg	62-63	63-64	≥65
0°压缩强度 (MPa) Char 0°Compression Strength (MPa)Char	≥1100	≥1200	≥1200
0°压缩模量 (GPa) 0°Compression Modulus (GPa)	62-63	63-64	≥65
90°拉伸强度 (MPa) Char 90°Tensile Strength (MPa) Char	≥50	≥50	≥52
90°拉伸模量 (GPa) 90°Tensile Modulus (GPa)	≥15	≥15	≥16
90°压缩强度 (MPa) Char 90°Compression Strength (MPa)Char	≥155	≥150	≥160
90°压缩模量 (GPa) 90°Compression Modulus (GPa)	≥19	≥19	≥20
面内剪切强度 (MPa) In-plane Shear Strength (MPa)	≥60	≥60	≥65
面内剪切模量 (GPa) In-Plane Shear Modulus (GPa)	≥5	≥5	≥5.2
层间剪切强度 (MPa) Interlaminar Shear Strength (MPa)	≥60	≥60	≥65
弯曲强度 (MPa) Flexural Strength (MPa)	≥1200	≥1200	≥1200
弯曲模量 (GPa) Flexural Modulus (GPa)	≥55	≥50	≥55
TG(°C)	≥105	≥105	≥105
疲劳M值 R=0.1 Fatigue M R=0.1	≥8.5	≥8.5	≥8.5

注：典型数值受测试手法影响。

Note: Typical value is affected by the test method.

CARBON-GLASS-HYBRID PULTRUDED PROFILE 碳玻混合拉挤板

产品介绍/INTRODUCTION

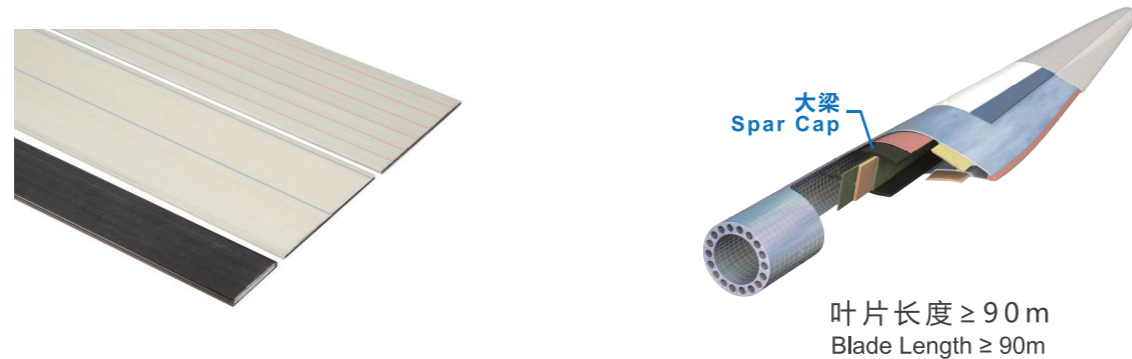
碳玻混拉挤板是利用碳纤维的高模量和玻纤的低成本寻求一种拉伸模量和疲劳性能介于两种材料之间的高性价比新型复合材料。可设计碳纤维和玻纤的不同比例来调整，满足不同叶型设计的需求。

产品模量可以达到 100GPa 以上，主要应用于 90-100 米长度叶片的需要。

The carbon-glass-hybrid pultruded profile is a new type of cost-effective composite material that utilizes the high modulus of carbon fibers and the low cost of glass fibers to seek a tensile modulus and fatigue performance between the two materials. The design can adjust the different proportions of carbon fibers and glass fibers to meet the needs of different blade designs .

The product modulus can reach more than 100GPa, mainly used in offshore 90-100 meters long blades.

适用范围/SCOPE OF APPLICATION



主要特点/CHARACTERISTICS

-  轻质
Light Weight
-  疲劳性能好
Good Fatigue
-  耐水
Highly Waterproof
-  耐化学腐蚀
Excellent Chemical Resistance
-  高强高模
High Strength & High Modulus
-  具有可设计性
Designability

技术参数/TECHNICAL PARAMETERS

物性指标 Properties	典型数值 Typical Value
玻纤体积含量% Glass Fiber Volume Fraction (%)	40-43
碳纤维体积含量% Carbon Fiber Volume Content(%)	29-32
密度 (G/CM ³) Density	1.9-2.1
产品宽度 (MM) Width	50-200
产品厚度 (MM) Thickness	2-8

物性指标 Properties	测试指标 Test Index	测试标准 Test Standard
0°拉伸强度 (MPa) Char 0°Tensile Strength (MPa) Char	≥1400	IOS 527-5/A
0°拉伸模量 (GPa) Avg 0°Tensile Modulus (GPa) Avg	≥100	IOS 527-5/A
90°拉伸强度 (MPa) Avg 90°Tensile Strength (MPa) Avg	≥45	IOS 527-5/B
90°拉伸模量 (GPa) Avg 90°Tensile Modulus (GPa) Avg	≥13.5	IOS 527-5/B
0°压缩强度 (MPa) Cgar 0°Compression Strength (MPa)Char	≥1000	IOS 14126
0°压缩模量 (GPa) Avg 0°Compression Modulus (GPa)Avg	≥96	IOS 14126
弯曲强度 (MPa) Avg Flexural Strength (MPa) Avg	≥1200	IOS 14125
弯曲模量 (GPa) Avg Flexural Modulus (GPa) Avg	≥63	IOS 14125
层间剪切强度 (MPa) Avg Interlaminar Shear Strength (MPa) Avg	≥65	IOS 14130
TG(°C)AVG	≥100	IOS 11357-2
疲劳M值 R=0.1 Fatigue M R=0.1	≥13	IOS 13003

注：典型数值受测试手法影响。

Note: Typical value is affected by the test method.

CARBON PULTRUDED PROFILE 碳纤维拉挤板

产品介绍/INTRODUCTION

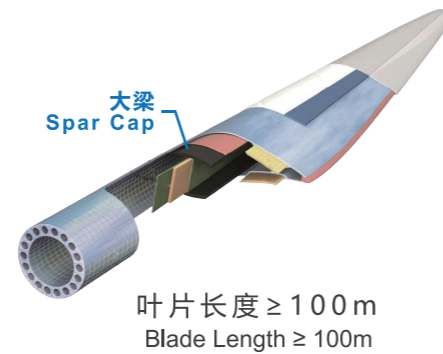
碳纤维拉挤板是一种由碳纤维和树脂通过拉挤成型工艺制成的复合材料板材。

产品模量达 150GPa 以上，满足叶片大型化和轻量化的需求，主要应用于 100 米以上叶片的需要。

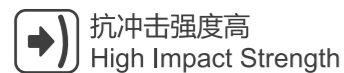
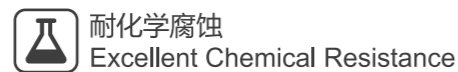
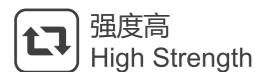
The carbon pultruded profile is a composite material panel made from carbon fiber reinforced plastics and resin through the pultrusion process.

The product modulus reaches more than 150GPa, meeting the needs of large-scale and lightweight blades, mainly used in offshore blades over 100 meters.

适用范围/SCOPE OF APPLICATION



主要特点/CHARACTERISTICS



技术参数/TECHNICAL PARAMETERS

物性指标 Properties	典型数值 Typical Value
纤维含量% Carbon Fiber Volume Content(%)	60-70
密度 (G/CM ³) Density	1.55±0.1
产品宽度 (MM) Width	50-200
产品厚度 (MM) Thickness	2-8

物性指标 Properties	参数值 Parameter Values	测试标准 Test Standard
0°拉伸模量 (平均值) 0°Tensile Modulus(Mean)	140-160	IOS 527
拉伸应变 (特征值) Tensile Strain(Char)	≥1.0	IOS 527
0°压缩模量 (平均值) 0°Compression Modulus(Mean)	130-145	IOS 14126
0°压缩延伸率 (特征值) 0°Compression Elongation(Char)	> 0.9	IOS 14126
0°弯曲模量 (平均值) 0°Compression Modulus(Mean)	130-140	IOS 14125
0°弯曲延伸率 (特征值) 0°Flexural Elongation(Char)	> 0.8	IOS 178
90°拉伸强度 (平均值) 90°Tensile Strength(Mean)	> 50	IOS 527

注：

典型数值受测试手法影响。

Note:

Typical value is affected by the test method.

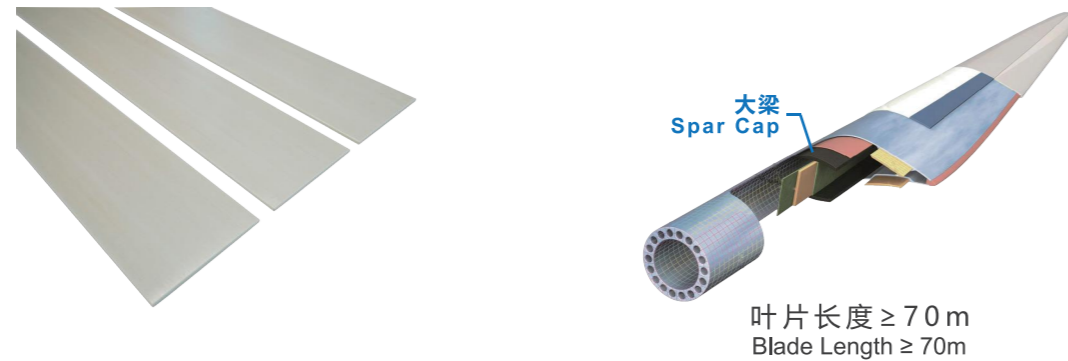
PULTRUDED PROFILE WITHOUT PEELPLY 无脱膜布拉挤板

产品介绍/INTRODUCTION

无脱膜布拉挤板是在传统玻纤拉挤板的基础上，以连续玻璃纤维为增强材料，通过调整树脂配方，以化学改性的方式和拉挤工艺来进行生产的产品。产品在保留原有性能同时，大大降低了拉挤板的材料成本。产品模量集中在 60-65GPa 范围内，主要应用于 70-90 米长度风电叶片的需要。

Pultruded profile without peelply is a product produced on the basis of traditional glass pultruded profile with continuous glass fiber as the reinforcement material and through the adjustment of resin formulation and chemical modification and pultrusion process. While retaining the original performance of the product, the cost of the pultruded profile material has been significantly reduced. The product modulus is concentrated in the range of 60-65GPa, mainly used for onshore 70-90 meters long wind turbine blades.

适用范围/SCOPE OF APPLICATION



主要特点/CHARACTERISTICS

- 耐水
Water Resistance
- 低成本
Low Cost
- 高强高模
High Strength, High Modulus
- 绿色环保
Environmental Friendly
- 耐化学腐蚀
Corrosion Resistance
- 疲劳性能好
High Fatigue Resistance

技术参数/TECHNICAL PARAMETERS

物性指标 Properties	典型数值 Typical Value		
	E7-390	E8-390	E8-390
玻纤体积含量% Fiber Volume Fraction (%)	67-74		
密度 (G/CM ³) Density	2.1-2.2		
产品宽度 (MM) Width	50-200		
产品厚度 (MM) Thickness	2-8		
玻纤体积含量% Fiber Volume Fraction%	69-73	69-72	72-74
0°拉伸强度 (MPa) Char 0°Tensile Strength (MPa) Char	≥1260	≥1300	≥1400
0°拉伸模量 (GPa) Avg 0°Tensile Modulus (GPa) Avg	62-63.5	63-64	≥65
0°压缩强度 (MPa) Char 0°Compression Strength (MPa)Char	≥1100	≥1200	≥1200
0°压缩模量 (GPa) 0°Compression Modulus (GPa)	62-63.5	63-64	≥65
90°拉伸强度 (MPa) Char 90°Tensile Strength (MPa) Char	≥50	≥50	≥52
90°拉伸模量 (GPa) 90°Tensile Modulus (GPa)	≥15	≥15	≥16
90°压缩强度 (MPa) Char 90°Compression Strength (MPa)Char	≥155	≥150	≥160
90°压缩模量 (GPa) 90°Compression Modulus (GPa)	≥19	≥19	≥20
面内剪切强度 (MPa) In-plane Shear Strength (MPa)	≥60	≥60	≥65
面内剪切模量 (GPa) In-plane Shear Modulus (GPa)	≥5	≥5	≥5.2
层间剪切强度 (MPa) Interlaminar Shear Strength (MPa)	≥60	≥60	≥65
弯曲强度 (MPa) Flexural Strength (MPa)	≥1200	≥1200	≥1200
弯曲模量 (GPa) Flexural Modulus (GPa)	≥55	≥50	≥55
TG(°C)	≥105	≥105	≥105
疲劳M值 R=0.1 Fatigue M R=0.1	≥8.5	≥8.5	≥8.5

注：典型数值受测试手法影响。

Note: Typical value is affected by the test method.

