

E7 Glass Fiber

Optimal Cost-Performance Solution for
High Performance Composite Materials



New High Performance Glass Fiber



中国巨石股份有限公司
CHINA JUSHI CO., LTD

Company Profile

Jushi Group specializes in the production of glass fiber. The company has attained the leadership position in the global glass fiber industry in terms of Output, Technology, R&D, Quality and Market share. Jushi Group is a Chinese national, key high technology enterprise, operating a distinguished Post-Doctoral Scientific and Technological Innovation Program.



Jushi Group always adheres to the Environmental Management principles:

- "Apply science and technology for development,
- Build the brand name to expand market share,
- Environmental protection."

E7 New High Performance



GOALS

Provide Optimal Cost-Performance Solution
for High Performance Geosynthetic Materials

Geosynthetic Materials

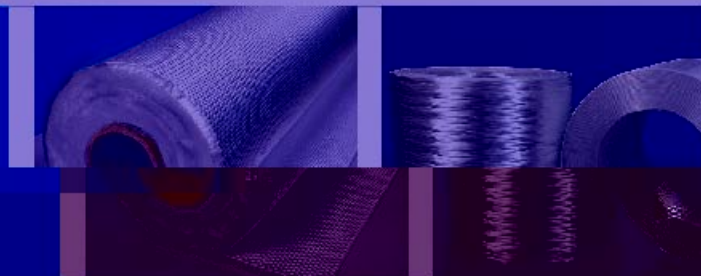
needs of the high end markets. E7 provides a brand-new technological platform for JFE Group products. The product lines developed on the basis of this new platform have various applications and offer brand new solutions to the various needs of demanding customers.

Ishihara
provide
ers.



E7 GLASS FIBER

Boost the High Performance of Composite Materials



Compared with traditional E glass, E7 delivers the following unique advantages:

- Higher strength, 30% higher than traditional E glass;
- Higher modulus, 23% higher than traditional E glass;
- Higher softening point, 10% higher than traditional E glass.

Therefore, E7 is suitable for use in composite materials which require higher mechanical properties.

Mechanical and Electrical Properties of E7 and Traditional E-glass:

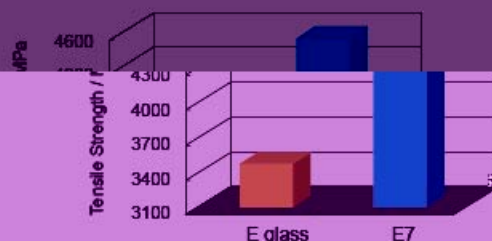
Property	Testing method	Unit	E	E7
Density	ASTM C693	g/cm ³	2.60	2.60-2.61
Refractive Index	ASTM C1648	/	1.566	1.562
Expansion Coefficient	ASTM D696	10 ⁻⁶ K ⁻¹	6.1	5.5
Softening Point	ASTM C338	°C	838	921
Elastic Modulus	ASTM E1876	GPa	72	89
Dielectric Constant (23°C, 1MHz)	ASTM D150	/	6.7	7.0

E7 has a reasonable chemical composition which has not only obviously increased mechanical properties, but also offers better corrosion resistance than boron-free E glass fiber in neutral, acidic or alkaline solutions, ensuring long-term stable performance of E7-reinforced composites in special environments.

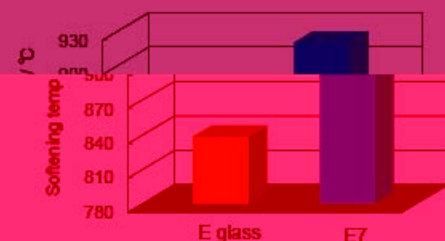
Corrosion Resistance Properties of E7 and Traditional E-glass:

Item	Testing method	Unit	E	E7
Weight loss in acidic solution	Soaking in 10% HCl solution at 23°C for 24 hours	%	18.39	0.07
Weight loss in alkaline solution	Soaking in 0.025M Na ₂ CO ₃ solution at 23°C for 24 hours	%	0.16	0.14
	Soaking in 0.5M NaOH solution at 23°C for 24 hours	%	0.16	0.23
Weight loss in boiling water	Boiling in water at 100°C for 24 hours	%	0.53	0.23

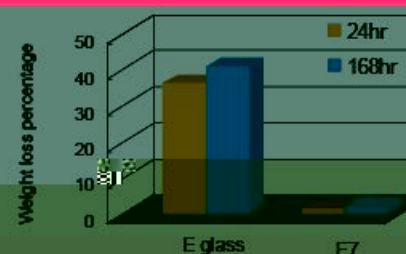
Comparison of Tensile Strength between E7 and E glass Fiber:



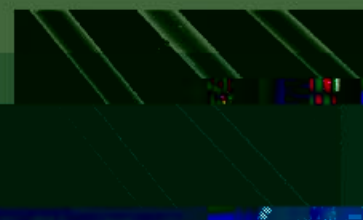
Comparison of Softening Point between E7 and E glass Fiber:



Comparison of Weight Loss in 10% H₂SO₄ at 96°C after 24 and 168 hours between E7 and E glass fiber:



SEM picture of E7 in 10% H₂SO₄ solution 96°C after 24 hours:



Note: The above tested products have a uniform filament diameter.

E7 REINFORCEMENTS

Open New Space for High End Applications of Composites

The use of glass fiber reinforcements allows customers to design high performance composites beyond the limits of the polymer material itself. Jushi E7 glass fiber enables even higher composite performance. Compared with E-glass, composites based on E7 reinforcements have better mechanical properties including higher strength, modulus and fatigue resistance. E7 reinforcement will expand the use of high performance composites in large wind blades, high pressure vessels, pultrusion profiles and many other applications.

The exiting production technology with large refractory furnaces can be used to manufacture E7 at lower cost. The volume production of E7 glass fiber with large refractory furnaces makes it possible to meet the large demand for high performance glass fiber from high end industries such as the wind energy industry. The excellent mechanical properties and volume production with refractory furnaces make E7 an optimal cost performance solution for the composites industry.

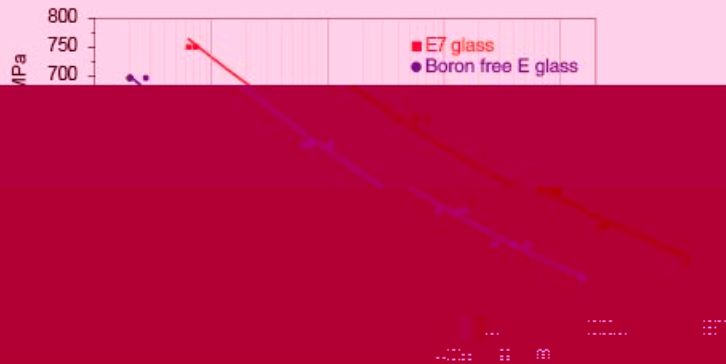
E7 E-glass fiber is suitable for high end applications and can reduce power generation cost.



E7

New High Performance Glass Fiber

Fatigue test result based on UD1200 laminate:



Test conditions for fatigue resistance:

● Tested per ISO 13003:2003

● Laminates made

UD1200

E7 - Reinforced pultrusion materials have higher strength, stiffness and performance.

Pultrusion is a common production technology for producing glass fiber reinforced composites and features high production efficiency, high strength of finished products, low processing cost and consistent quality. It now has more and more applications including, for instance, pultruded structural rods, FRP bridges and other construction profiles, which have longer service life, lower manufacturing cost and good corrosion resistance.

With the expansion of the applications of FRP, pultruded FRP products, customers are getting more demanding and require lighter and thinner pultruded FRP products which have higher strength, stiffness and fatigue resistance as well as good weatherability and corrosion resistance.

E7 glass fiber for pultrusion inherits the advantages of E7 glass and offers higher strength, stiffness

and

fatigue resistance.

ENVIRONMENTAL PROTECTION

Become A Model for Clean Production

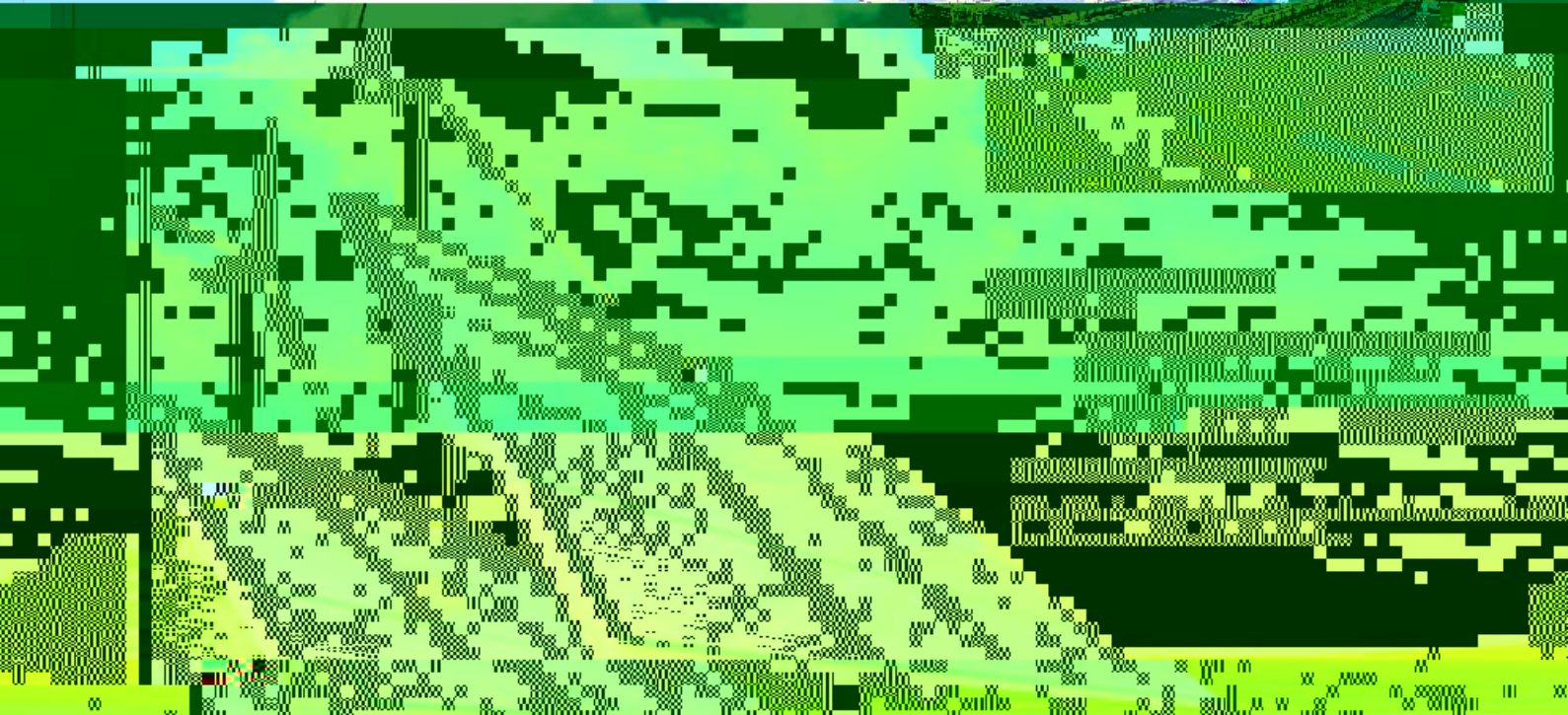
Jushi Group is committed to improving our environmental footprint. We have invested heavily in the most modern technologies available to reduce pollutant emissions into our environment. Improved oxygen firing technology reduced total waste gas emissions from the furnace by 80% and the nitrogen oxide emissions by over 90%. State of the art glass recycling technology ensures zero discharge of process waste glass fiber. Modern waste purification technology enables zero discharge of industrial waste water from our production process.

E7 Glass Fiber is produced by more scientific production technology and process which not only improve the product performances, but also significantly reduces air pollutants. The development of E7 Glass Fiber is consistent with our constant commitment to social responsibility and sustainability. Not only have we achieved the goal of improving our glass fiber products, but we also have improved our environmental footprint at the same time.

CUSTOMER AND TECHNICAL SUPPORT ORGANIZATION

Jushi Group possesses world class core technologies and advanced testing and analysis capabilities for glass, organic chemistry, glass fiber and composites. We have established a global network and technical service professionals to help customers solve problems in materials development and process optimization. We collaborate closely with customers to address market challenges and promote the growth of the composites industry.

We will share with you all the information on E7 glass fiber reinforcements as well as our considerable knowledge of compounding and molding technology and processes.





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