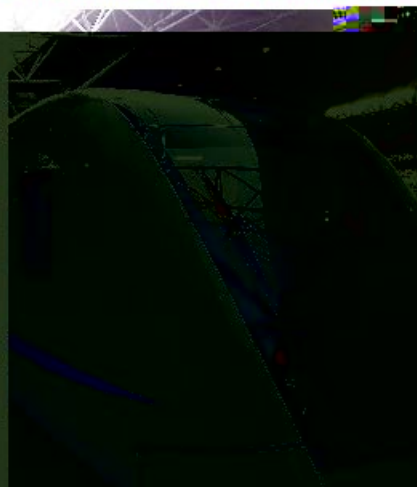




E7 Glass Fiber

Optimal Cost-Performance Solution for
High Performance Composite Materials



E7

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 Research program.

Jushi Group always adheres to the following Management principles:

- "Apply science and technology for development,
- Build the brand name to expand market,
- Optimize management to improve efficiency and
- Employ talented people to enable future growth".

The company owns proprietary, world-class core technologies for large E-glass fiber furnaces, C-glass fiber furnaces and waste fiber recycling furnaces. The company has its own core technology of world-class and achieved certifications to ISO9001, ISO14001,

the leadership position in the glass fiber industry through endless pursuit of innovation and excellence.

F7 New High Performance



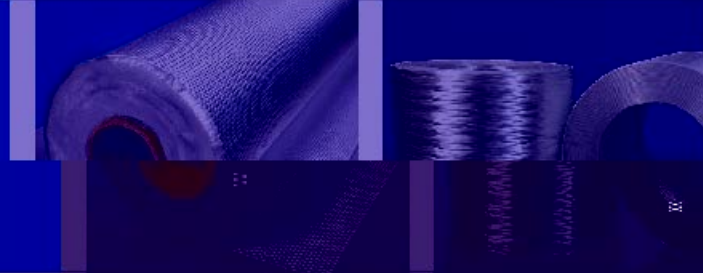
GOALS

Provide Optimal Cost-Performance Solution
for High Performance Concrete Materials



E7 GLASS FIBER

Boost the High Performance of Composite Materials



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

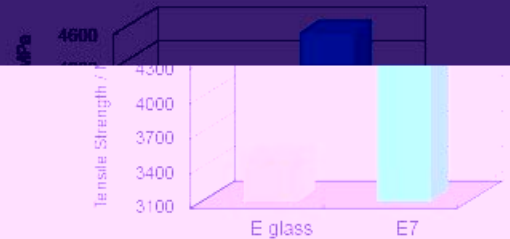
- Higher strength, 30% higher than traditional E glass;
 - Higher modulus, 23% higher than traditional E glass;
 - Higher softening point, 13% higher than traditional E glass.
- Therefore, E7 is suitable for use in composite materials which require higher mechanical properties.

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

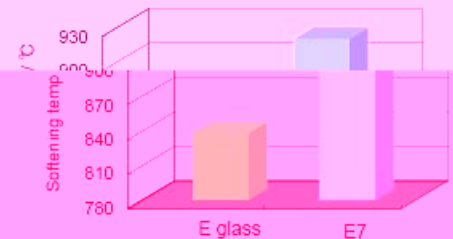
Property	Test Method	Unit	E	E7
Density	ASTM C693	g/cm ³	2.60	2.60-2.61
Refractive Index	ASTM C1648	/	1.566	1.562
Expansion Coefficient	ASTM D696	10 ⁻⁶ K ⁻¹	6.1	5.5
Softening Point	ASTM C338	°C	838	921
Elastic Modulus	ASTM E1876	GPa	72	89
Dielectric Constant (23°C, 1MHz)	ASTM D150	/	6.7	7.0

E7 has a reasonable chemical composition which has not only obviously

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:



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.

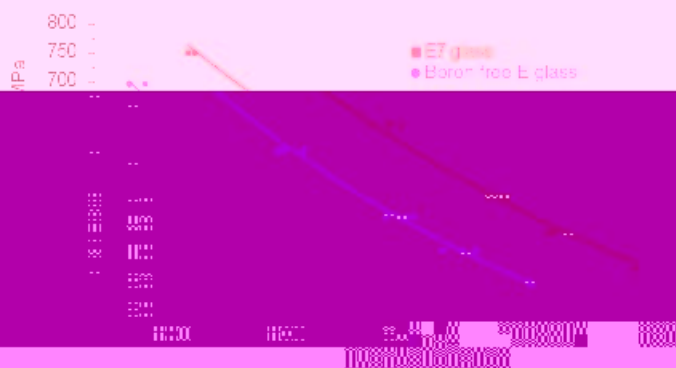
The exiting production technology with large refractory furnaces can be used to manufacture E7 at lower cost. The volume production of E7 glass fiber with large refractory furnaces makes it possible to meet the large demand for high performance glass fiber from high end industries such as the wind energy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

E7-reinforced wind blades are longer and more durable and reduce power generation cost.



New High Performance Glass Fiber

Fatigue test result based on UD1200 laminate:



Test conditions for fatigue resistance:

☉ Tested per ISO 13003:2003

☉ Laminates made with

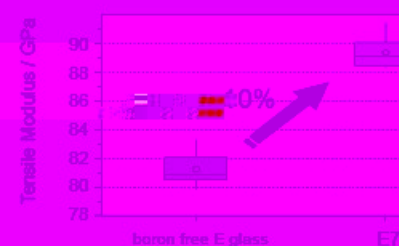
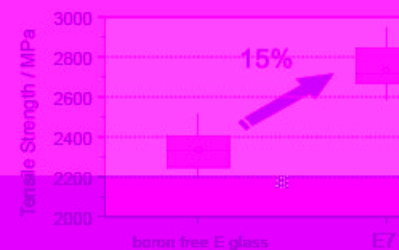


E7 glass fiber has higher tensile strength, and have longer fatigue life and hence longer service life under the same stress. In addition, E7 glass fiber has corrosion resistance equivalent with that of ECR glass fiber in various environments, ensuring long-term stability in use of the pultruded final products.

Take for instance the new generation 312T for pultrusion. Compared with the boron free E glass based 312T, the E7 based version has 15% higher tensile strength and 10% higher tensile modulus.

Test Performance Comparison between boron free E glass 312T and E7 312T (Glass content: E7 58.6 wt%, boron free E glass 59.1 wt%, resin: UP, Test standard: ASTM D2343)

TEST SAMPLE	ITEM	UNIT	BORON FREE E GLASS	E7
DR23-4400-312T	Tensile strength	MPa	2350.6	2720.4
	Tensile modulus	GPa	81.5	89.5



ENVIRONMENTAL PROTECTION

Become A Model for Clean Production

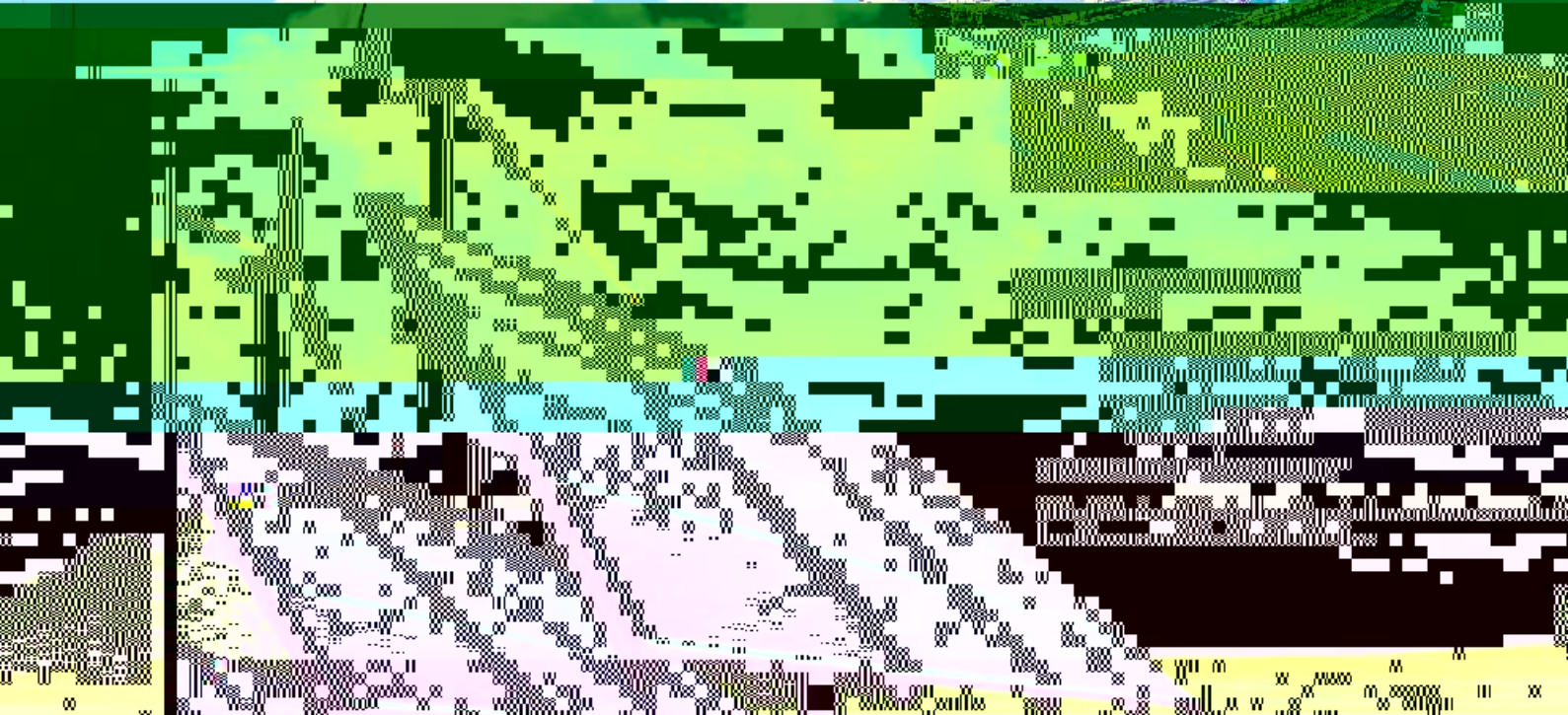
Jushi Group is committed to improving our environmental footprint. We have invested heavily in the most modern technologies available to reduce pollutant emissions into our environment. Improved oxygen firing technology reduced total waste gas emissions from the furnace by 80% and the nitrogen oxide 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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