

Company Profile

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GOALS

Best Corrosion Resistance Solution for
High-Performance Composite Materials

To achieve clean production and minimize environmental footprint, Jushi Group successfully developed E6[®] enhanced glass fiber in 2003. With the rapid development of new applications, the design of fiber glass composite parts is becoming more and more demanding, for example, both the manufacturers and end users want products with long-term consistency and reliability.

To meet these demands, as well as to meet the technical requirements from corrosion resistance application field, the development of E6-CR glass fiber was successfully completed by Jushi Group and was commercially available since 2012.

E6-CR enhanced glass fiber is a new E-glass fiber, with enhanced properties. It combines all the benefits of E6[®] glass fiber with excellent corrosion resistance, thus meeting the requirements of the most demanding applications. E6-CR provides customers with best solutions for corrosion resistance.

E6-CR GLASS FIBER

Excellent Corrosion Resistance



Compared with typical E6[®] glass fiber, E6-CR offers the following unique benefits:

- Higher chemical stability
- Boron-free fluorine-free, to ensure clean production

E6-CR glass fiber is produced with a unique glass composition, resulting in significant improvement in chemical corrosion resistance in neutral, acidic or alkaline solutions.

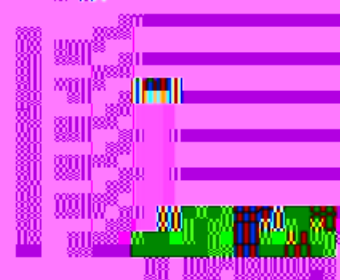
The improvement in corrosion resistance is especially significant in the resin systems listed below.

Resin System	E6 [®]	E6-CR	E6-CR	E6-CR	E6-CR
Unmodified Epoxy Resin	100%	100%	100%	100%	100%
Modified Epoxy Resin	100%	100%	100%	100%	100%
Unmodified Polyester Resin	100%	100%	100%	100%	100%
Modified Polyester Resin	100%	100%	100%	100%	100%
Unmodified Vinyl Ester Resin	100%	100%	100%	100%	100%
Modified Vinyl Ester Resin	100%	100%	100%	100%	100%
Unmodified Urethane Resin	100%	100%	100%	100%	100%
Modified Urethane Resin	100%	100%	100%	100%	100%

Weight loss comparison of E, E6[®], ECR and E6-CR glass fibers soaking in 10% HCl solution.



Weight loss comparison of E, E6[®], ECR and E6-CR glass fibers soaking in 10% NaOH solution.



Resin System	E6 [®]	E6-CR	E6-CR	E6-CR	E6-CR
Unmodified Epoxy Resin	100%	100%	100%	100%	100%
Modified Epoxy Resin	100%	100%	100%	100%	100%
Unmodified Polyester Resin	100%	100%	100%	100%	100%
Modified Polyester Resin	100%	100%	100%	100%	100%
Unmodified Vinyl Ester Resin	100%	100%	100%	100%	100%
Modified Vinyl Ester Resin	100%	100%	100%	100%	100%
Unmodified Urethane Resin	100%	100%	100%	100%	100%
Modified Urethane Resin	100%	100%	100%	100%	100%

E6-CR REINFORCEMENTS

Excellent Environment Durability

In the future, end-use composite products will operate in even harsher environments and the end-users will expect enhanced durability. Compared with E6® glass fiber, **E6-CR enhanced glass fiber** reinforced composite materials offer better corrosion resistance and temperature endurance, making composite parts more reliable and cost effective.

Superior Mechanical Properties

Test Sample	Property	Standard	E	E6®	E6-CR
Tensile property of impregnated roving, Epoxy resin	Tensile strength (MPa)	ASTM D2343	1900~2000	2500~2700	2500~2700
	Tensile modulus (MPa)	ASTM D2343	73~75	81~83	81~84
1200 g/m ² UD fabric, (tested in 0° direction), Infusion process, Epoxy resin	Tensile strength (MPa)	ISO 527-5	/	1120.6	1125.0
	Tensile modulus (MPa)	ISO 527-5	/	42.6	42.9
	Fiber Volume Content (%)	ISO 1172	/	53.6	54.0
	Tensile strength (MPa)	ISO 14126	/	805.5	810.5
	Tensile modulus (GPa)	ISO 14126	/	42.9	43.1
	Fiber Volume Content (%)	ISO 1172	/	54.3	54.4

Chemical Stability

Degradation (% Loss) after boiling in water for 7 days

Sample	Property	Standard	E6®	E6-CR
800g/m ² woven roving	Glass content (%)	ISO 1172	57	57
	Tensile strength (MPa)	GB/T 1447	38.1%	11.4%
Unsaturated polyester Hand laid laminates	Tensile modulus (GPa)	GB/T 1447	2.8%	1.9%
	Flexural strength (MPa)	GB/T 1449	29.5%	22.3%
	Flexural modulus (GPa)	GB/T 1449	2.6%	1.5%

Temperature Resistance

Glass fiber reinforced composites are increasingly used in harsh environments, such as pipes used in oil-field processing or in treatment of high temperature waste gases. Drastic changes in ambient temperature reduce the strength and thus shorten the operating life of composite materials.

The composite samples tested below were dried for 10 days at 180, and then put in an -60 environment for another 10 days. The relative loss of properties after the exposure is shown in the table below.

Sample	Property	Standard	E6®	E6-CR
800g/m ² woven roving	Glass content (%)	ISO 1172	58	58
	Tensile strength (MPa)	GB/T 1447	4.9%	4.5%
Unsaturated polyester	Tensile modulus (GPa)	GB/T 1447	6.8%	6.1%
	Flexural strength (MPa)	GB/T 1449	17.0%	15.4%
Hand laid laminates	Flexural modulus (GPa)	B/T 1449	14.0%	12.8%

ENVIRONMENTAL PROTECTION

Become a Model for Clean Production

China Jushi 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. E6-CR glass fiber is produced by more scientific production technology and process which not only improve the product performances, but also control air pollutants at source. The development of E6-CR 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

Offer Best Technical Support

China Jushi possesses world class core technologies and advanced testing and analysis capabilities for glass, organic chemistry, fiberglass and composites. We have established a global network of marketing and technical support.





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