

GRAPHISTRENGTH[®] C S-250

CARBON NANOTUBE STRENGTHENED LIQUID EPOXY RESIN

TECHNICAL DATA SHEET

Description:

Graphistrength[®] C S-250 is a bisphenol-F multi-wall carbon nanotube strengthened liquid epoxy resin suitable for numerous composites and adhesives applications.

Key features:

Graphistrength[®] C S-250 has the following key characteristics:

Property	Method	Unit	Typical value ⁽¹⁾
Aspect	Visual		Black
EEW	ISO 3000	g/eq	166-174
Viscosity at 25°C	Rheometer	mPa.s	5,000-6,000
Density at 25°C	ISO 1675	g/cm ³	1.17

⁽¹⁾ Data not intended for specification purposes

Applications and benefits:

Graphistrength[®] C S-250 is recommended for use in composite manufacturing processes such as filament winding, pultrusion, and wet lay-up. Graphistrength[®] C S-250 can be used with most reinforcing fibers and fabrics, such as carbon, glass, and aramid. It can also be used in adhesives and coatings applications.

The carbon nanotube enhancement makes Graphistrength[®] C S-250 a high strength epoxy resin. It also processes as easily as unfilled epoxy resin and can be cured with a wide range of curing agents.

Graphistrength[®] C S-250 is optimized for use in continuous fiber composites.

The use of Graphistrength[®] C S-250 allows a considerable increase in flexural and compression properties of composites.

Processing:

Strengthened with an optimum level of carbon nanotubes, Graphistrength[®] C S-250 can be used in the same conditions as for classical epoxy liquid resins.

Graphistrength[®] C S-250 can be used with different kinds of hardeners depending on the desired mechanical properties. As for classical epoxy resins, mixing the resin with the hardener can be easier with preliminary heating of Graphistrength[®] CS 250 at 70 °C or more.

Graphistrength[®] C S-250 has the lowest viscosity in the liquid epoxy based Graphistrength[®] line.

Typical properties:

Mechanical properties of the cured Graphistrength[®] C S-250 resin

System	
Curing agent (aromatic amine)	Epikure W
Resin	Graphistrength [®] C S-250
Resin/Curing (phr)	100/26
Mix viscosity at 25°C (mPa.s)	2,500 – 3,000
Pot life, 2x Initial viscosity (hours)	8
Gel time at 177°C (minutes)	13.5
Cure Cycle	1h at 120°C, 2h at 177°C
Properties⁽²⁾	
Flexural Strength (MPa)	180
Flexural Modulus (MPa)	3,300
Tg (°C)	140

⁽²⁾ Data are intended solely for indicating potential performance that can be achieved. They don't replace the reader's own evaluations and experimentation

Mechanical properties of a composite powered by Graphistrength[®] C S-250 resin

Wet lay-up/autoclave (0,5MPa)

Composite	
Curing agent (aromatic amine)	Epikure W
Carbon fabric ratio	60%vol
Carbon Fabric type	Plain weave
Number of fabric plies	4
Cure cycle	1h at 120°C, 2h at 177°C
Properties⁽³⁾	
Flexural Strength (MPa)	1,200 (+54%)
Flexural Modulus (MPa)	70,300 (+29%)
Compression Strength (MPa)	200 (+18%)
Compression Modulus (MPa)	37,230 (+21%)

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Packaging and Storage:

Graphistrength[®] C S-250 is provided in drums of 20 kg or 220 kg net.

Graphistrength[®] C S-250 should be stored in dry place, preferably in its sealed original container, at temperatures between 2 and 40°C. In these storage conditions, the shelf life is more than 9 months.

The product should not be stored exposed to direct sunlight. A potential crystallization of the product could occur. It can be restored to its original state by stirring at 70 °C.

Safety and Handling:

Graphistrength[®] C S-250 doesn't present any specific health risk when using in thermoset processing.

Mandatory and recommended industrial hygiene procedures should be followed whenever the product is being handled and processed.

Consult the product MSDS for additional information on properties, hazards and handling.

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Graphistrength[®] C S-250 is developed in collaboration with Zyvex Performance Materials

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