

GRAPHISTRENGTH[®] C S2-03

CNT STRENGTHENED EPOXY MASTERBATCH

TECHNICAL DATA SHEET

Description:

Graphistrength[®] C S2-03 is a bisphenol-A liquid epoxy resin that contains perfectly dispersed multi wall carbon nanotubes (MWNT) at a concentration of 3.0 % by weight. Graphistrength[®] C S2-03 is suitable for numerous composites and adhesives applications.

Key features:

Graphistrength[®] C S2-03 has the following key characteristics

Property	Method	Unit	Typical value ⁽¹⁾
Aspect	Visual		Black
EEW	ISO 3000	g/eq	184-193
Viscosity at 25°C			Paste
MWNT content	TGA	wt%	3.0
Density at 25°C	ISO 1675	g/cm ³	1.2

⁽¹⁾ Data not intended for specification purposes

Applications and benefits:

Graphistrength[®] C S2-03 is recommended for use in composite manufacturing processes such as filament winding, pultrusion, and wet lay-up. Graphistrength[®] C S2-03 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.

Thanks to its high CNT loading, Graphistrength[®] C S2-03 gives the formulator all the freedom he needs to fine-tune the formulation.

Graphistrength[®] C S2-03 can be easily diluted in every kind of epoxy resin.

The use of Graphistrength C S2-03 allows a considerable increase in flexural and compression properties of composites.

Dilution and processing:

Graphistrength[®] C S2-03 can be used in the same conditions as for classical bisphenol-A liquid resins. It can be diluted with all kinds of neat epoxy resins by heating at 70 °C or more under simple stirring.

It can be used with different kinds of hardeners depending on the desired mechanical properties.

As for classical DGEBA, mixing the resin with the hardener can be easier with preliminary heating of Graphistrength[®] C S2-03 at 70 °C or more.

Typical properties:

Mechanical properties of a composite powered by Graphistrength[®] C S2-03

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

Composite	
Epoxy resin used for dilution	Bisphenol-A
Final MWNT loading	About 0.5 wt%
Curing agent (aromatic amine)	Epikure W
Carbon fabric ratio	60%vol
Carbon fabric type	Plain weave
Number of fabric plies	8
Cure cycle	1h at 150°C and 2h at 177°C
Properties⁽²⁾	
Flexural Strength (MPa)	940 (+47%)
Flexural Modulus (MPa)	60,200 (+24%)

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

Packaging and Storage:

Graphistrength[®] C S2-03 is provided in drums of 20 kg or 220 kg net.

Graphistrength[®] C S2-03 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 S2-03 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.

Contacts:

- www.graphistrength.com
- **Europe**
Arkema France –
+33 (0)4 72 39 58 14
- **Japan**
Arkema K.K. –
+81 (0) 75 326 75 15
- **North America**
Arkema Inc. –
+1 610 878 69 92

The information contained in this document is based on trials carried out by our Research Centers and data selected from the literature, but shall in no event be held to constitute or imply any warranty, undertaking, expressed or implied commitment from our part. Our formal specifications define the limit of our commitment. No liability whatsoever can be accepted by Arkema with regard to the handling, processing, or use of the product or products concerned - which must in all cases be employed in accordance with all relevant laws and/or regulations in force in the country or countries concerned.

The statements, technical information, and recommendations contained herein are believed to be accurate as of the date hereof. Since the conditions and methods of use of the product and of the information referred to herein are beyond our control, ARKEMA expressly disclaims any and all liability as to any results obtained or arising from any use of the product or reliance on such information; NO WARRANTY OF FITNESS FOR ANY PARTICULAR PURPOSE, WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, IS MADE CONCERNING THE GOODS DESCRIBED OR THE INFORMATION PROVIDED HEREIN. The information provided herein relates only to the specific product designated and may not be applicable when such product is used in combination with other materials, or in any process. The user should thoroughly test any application before commercialization. Nothing contained herein constitutes a license to practice under any patent and it should not be construed as an inducement to infringe any patent and the user is advised to take appropriate steps to be sure that any proposed use of the product will not result in patent infringement. See MSDS for Health & Safety Considerations.

Arkema France
420, rue d'Estienne d'Orves
92705 COLOMBES Cedex – France
Tel.: + 33 1 49 00 80 80 - Fax: 33 1 49 00 83 96
www.arkema.com

Graphistrength[®] C S2-03 is developed in collaboration with Zyvex Performance Materials

www.zyvexpro.com

zyvex[™]
performance
materials