

CNT CONCENTRATE IN POLYOL

TECHNICAL DATA SHEET

Description

Graphistrength® C PU2-30 is a Multi Wall carbon Nanotubes (MWCNT) concentrate that is used as an additive for polyurethane-based materials, coatings or adhesives. It contains 30 wt% of MWCNT perfectly dispersed in a polyester polyol.

Graphistrength® C PU2-30 is intended for use in electrostatic discharge (ESD) protection or mechanical reinforcement of composites, coatings and adhesives. Graphistrength® C PU2-30 is provided in pellets form.

Benefits and applications

Graphistrength® C PU2-30 is generally diluted in polyurethane precursors. Typical final MWCNT loadings in the final compounds are in the range 0.1 to 2 wt% depending on the host matrix characteristics, targeted performances, processing methods and conditions.

The typical electrical resistivity that can be achieved is in the range of $10 - 10^8$ ohm.cm. The ESD properties obtained with Graphistrength® C PU2-30 are outstandingly consistent and uniform. Graphistrength® C PU2-30 offers particular advantages for the formulation control due to high concentration of MWCNT. It also offers a process advantage, with the possibility to efficiently introduce MWCNT using conventional mixing equipment.

Dilution and processing guide

For optimal dispersion, C PU2-30 granules should be diluted (up to 20 wt%) in the liquid polyurethane precursor and stirred at high temperature (80-120°C) for at least 2 hours (overnight recommended). This procedure yields a homogeneous dispersion containing CNT clusters below 70 microns.

For improved dispersion quality, the resulting dispersion can be post-treated with high shear mixers such as rotor-stator mixers (5,000 rpm for a few minutes), 3-roll mills (at least 4 runs) or ball mills. This procedure, while reducing the number and size of MWCNT clusters, will also modify the rheology of the system, leading to a more pronounced gel behavior (solid behavior at zero shear), at MWCNT loadings higher than ca 2 wt%. This gel behavior indicates that rheological percolation is reached (more MWCNTs are individually dispersed).

- MWCNT even in small quantities lead to increased viscosity of formulations. Viscosity regulating additives may be needed.
- In some formulations, the presence of MWCNTs may lead to variations in curing times. Adjustment of reactive components may be needed.

Safety and Handling

Graphistrength® C PU2-30 is provided in pellet form where MWCNT are strongly embedded.

Graphistrength® C PU2-30 does not present any specific health risk when used in polymer synthesis.

Graphistrength® C PU2-30 is provided in metal vessels of 3 kg and 25 kg net. The preliminary impregnation of the granules with base resin can be done in original packaging.

Graphistrength® C PU2-30 should be stored in dry place, preferably in its sealed original container, at temperatures between 10 and 35°C. In these storage conditions, shelf life is up to 6 months.

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

Contacts:

- www.graphistrength.com

- **Europe**

Arkema France –

Tel.: + 33 (0)5 59 92 67 81

- **Japan**

Arkema K.K. –

Tel.: + 81 (0)75 326 7515

- **North America**

Arkema Inc. –

Tel.: + 1 610 878 6992

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 – 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

www.graphistrength.com

ARKEMA
INNOVATIVE CHEMISTRY