

GRAPHISTRENGTH[®] C E1-20

CNT MASTERBATCH

TECHNICAL DATA SHEET

Description:

Graphistrength[®] C E1-20 is a CNT masterbatch for fluoroelastomer formulations that contains perfectly dispersed MWNT at a concentration of 20% by weight.

Graphistrength[®] C E1-20 is suited for the production of conductive or antistatic materials based on FKM.

Key features:

Graphistrength[®] C E1-20 is provided in pellet or sheet form with the following key characteristics.

Property	Method	Unit	Typical value ⁽¹⁾
MWNT content		wt%	20 ⁽²⁾
Moisture content	Karl-Fisher	wt%	0.05 -0.10
Bulk density	ISO 8130-2	g/cm ³	1,845
Bulk resistance		Ohms·cm	1
Mooney viscosity (ML1+4, 100°C) pellets	ASTM D1646		60
Mooney viscosity (ML1+4, 100°C) sheets	ASTM D1646		115

⁽¹⁾ Data not intended for specification purposes

⁽²⁾ Graphistrength[®] C E1-20 contains Graphistrength[®] C100 MWNT with purity > 90 %

Benefits and applications:

Graphistrength[®] C E1-20 is generally formulated with various FKM resins. Typical final MWNT loadings in the final compounds are in the range 1,5 to 5 wt% depending on the host matrix characteristics, the targeted performances, processing methods and conditions.

The typical electrical resistivity that can be achieved is in the range $10 - 10^8$ ohm·cm. The electric conductive properties obtained with Graphistrength[®] C E1-20 are outstandingly consistent and uniform.

Thanks to their low loading, and very small size, Graphistrength[®] MWNT offer several additional advantages: smooth surface aspect, high preservation of the neat matrix's ductility and considerable improvement of its mechanical properties.

Graphistrength[®] C E1-20 offers particular advantages for the formulation control due to high concentration of CNT in masterbatch; and for the process, it offers the possibility to introduce NTC using common mixing equipment without special safety precautions.

Dilution and processing:

The use of Graphistrength® C E1-20 into final formulation will depend on the process technology.

For molding applications (rings, flexible parts etc) the masterbatch can be introduced in final formulation in cylinder, internal, conical, or other conventional mixing equipment.

- The FKM basic resin used in the masterbatch (80% in mass) should be taken into account for the vulcanization/accelerator part in the final formulation.
- The CNT content to introduce will depend on request in electrical resistance, viscosity of the basic FKM resin and process conditions. In most of cases 1,5 – 3 % of CNT load is needed to reach the electrical percolation.
- The molded article becomes conductive after the vulcanization. There is no relation found between the resistance level of the FKM formulation and vulcanized article. The use of vulcanized articles is recommended to judge the electrical properties of FKM material.

For extrusion application (sheet extrusion, casting on textile and other substrates, etc.)

The presence of CNT may bring an increase in viscosity of the final FKM formulation. This increase should not impact extrusion/casting process conditions or the adhesion of the rubber to the substrate. If the viscosity factor happened to be critical, the use of lower viscosity basic FKM resin is recommended.

Solvent based formulations for coatings and adhesives

The benefit of Graphistrength carbon nanotubes in adhesives and coatings is to bring the electrical conductivity when keeping the adhesive properties of the polymer adhesive. To use Graphistrength® C E1-20 by solvent process it is recommended to swell the masterbatch in the solvent base of the formulation (ketenes, DMSO, DMF, NMP, othes) for a few hours. The pellet form of the Graphistrength® C E1-20 is recommended for this purpose. The masterbatch swelled or dissolved in the solvent may be easily formulated with other components.

Safety and Handling:

Graphistrength® C E1-20 is provided in pellet or sheet form where MWNT are strongly embedded.

Graphistrength® C E1-20 doesn't present any specific health risk when using in rubber processing.

Graphistrength® C E1-20 is provided in 5 or 25 kg bags as pellets or 5 or 25 kg boxes as sheets. The product is stable in its unopened original packaging when stored at normal temperatures.

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

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