

GRAPHISTRENGTH® C TPU1-20

Thermoplastic Polyurethane MASTERBATCH

TECHNICAL DATA SHEET

Description:

Graphistrength® C TPU1-20 is a Multi Wall carbon Nanotubes (MWCNT) concentrate that is used as an additive for thermoplastic polyurethane materials. It contains 20 wt% of MWCNT dispersed in polyester based thermoplastic polyurethane matrix. Graphistrength® C TPU1-20 contains no processing aid or other additives.

Graphistrength® C TPU1-20 is well suited for the production of antistatic or semi conducting and conducting TPU based materials.

Graphistrength® C TPU1-20 is provided in pellet form with the following key characteristics:

Property	Method	Unit	Typical value ⁽¹⁾
MWCNT content	TGA	wt%	20.0 ⁽²⁾
Moisture content	Karl-Fisher	wt%	< 1000

⁽¹⁾ Data not intended for specification purposes

⁽²⁾ Graphistrength® C TPU1-20 contains MWCNT with purity > 90 %

Benefits and applications:

Graphistrength® C TPU1-20 is generally diluted in thermoplastic poly-urethanes. Typical final MWCNT loadings in the final compounds are in the range 1 to 10 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 $10^4 - 10^8$ ohm.cm. The ESD properties obtained with Graphistrength® C TPU1-20 are consistent and uniform.

Thanks to their low loading, and very small size, Graphistrength® MWCNT offer several additional advantages: high preservation of the neat matrix's ductility and mechanical properties, while enhancing thermo-mechanical properties. With low particulate generation, Graphistrength® MWCNT are also ideal additives for applications where cleanliness is key.

Drying before use:

To ensure trouble free processing it is preferable to dry Graphistrength® C TPU1-20 during 4 hours at 80°C in a desiccant dryer.

Dilution and processing:

The dilution of Graphistrength® C TPU1-20 into high quality compounds can be achieved with standard equipments used in thermoplastics compounding such as twin-screw extruders. In some cases, optimizing process conditions may be necessary to get well-dispersed compounds.

The compounds can be processed on most of moulding and extrusion equipment.

The resistivity is also depending on melt viscosity of the host matrix and process conditions. The percolation curve is normally shifted to lower CNT content for **foams, molded** articles, **compounds with mineral fillers**, etc. Higher load of CNT for similar resistivity is needed for extruded parts.

Dilution and processing guide

For optimal dispersion in other TPU, the use of a twin screw co-rotative extruder of L/D > 25 is recommended. For TPU formulation of high melt viscosity, or of hardness Shore A > 80, the single screw compounding line may also be efficient. The melting zone and the first mixing zone should be heated to 175-200°C. The last heating zones and the dye should be regulated at 220-230°C, it is recommended to avoid the increase of melt temperature above 240°C.

Packaging and Storage:

Graphistrength® C TPU1-20 is provided in lined bags of 5 kg or 25 kg net. The product is indefinitely stable in its unopened original packaging when stored at normal temperatures.

Graphistrength® C TPU1-20 may absorb water if exposed for long periods of time to the atmosphere. In this case, the pellets must be dried as recommended above.

Safety and Handling:

Graphistrength® C TPU1-20 is provided in pellet form where MWNT are strongly embedded.

Graphistrength® C TPU1-20 doesn't present any specific health risk when using in thermoplastic processing. Consult the product SDS for additional information on properties, hazards and handling.

Contacts:

- www.graphistrength.com

- **Europe**

Arkema France –

Tel.: + 33 (0)5 59 92 66 07

- **Japan**

Arkema K.K. –

Tel.: + 81 (0)75 326 7515

- **North America**

Arkema Inc. –

Tel.: + 1 610 878 6992

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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

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