

PLASTICYL™

CNT thermoplastic concentrates

PLASTICYL™ PC1501

Polycarbonate – carbon nanotubes masterbatches

General Information

Description

PLASTICYL™ is a family of multiwall carbon nanotubes (MWCNTs) thermoplastic concentrates for applications requiring superior electrical conductivity and electrostatic discharge (ESD) properties.

PLASTICYL™ PC1501 is a conductive masterbatch based on polycarbonate loaded with 15% of Nanocyl's MWCNTs (NC7000™). Because of its low viscosity and high flow, PLASTICYL™ PC1501 is ideal for injection molding and extrusion processes.

Key Applications

- Electrical and Electronics (E&E), automotive and packaging industries
- Hard Disk Drive (HDD) internal components and handling trays
- Automotive conductive parts

Benefits

- Excellent electrical conductivity at low loading
- Excellent surface cleanliness (ionic contamination, liquid particle count, outgassing)
- Retention of key mechanical properties
- Ease of processing

Technical Data

Main Characteristics

CARBON NANOTUBES LOADING (% _{WT})	REAL DENSITY (G/L) ISO 1183	MFI (G/10 MIN) NON-STANDARD TEST : 300°C ; 20 kg ; 4 mm
15 ± 1,0	1175	≤ 5,6

Typical Performance after Injection Molding

PROPERTIES	STANDARD	UNITS	NEAT POLYCARBONATE	DILUTION TO 2% _{WT} OF CNT	DILUTION TO 3 % _{WT} OF CNT
<i>Volume resistivity</i>	ASTM D4496	Ohm.cm	1,10 ¹³	1,2.10 ³	5,40.10 ¹
<i>Surface resistivity</i>	IEC 167	Ohm/sq	1,10 ¹⁵	1,70.10 ⁴	1,2.10 ³
<i>Young's Modulus</i>	ISO 527-1,2	MPa	2141	2584	2683
<i>Tensile strength at break</i>	ISO 527-1,2	MPa	46	23	16
<i>Charpy notched impact strength</i>	Internal method	kJ/m ²	31	10	6
<i>Melt flow index</i> (300°C ; 1,2 kg)	ISO 1133:1997	g/10 min	38,6	16,9	0,9
<i>Burning behavior</i>	UL 94	Class	-	-	-
<i>Color</i>	-	-	Transparent	Black	Black

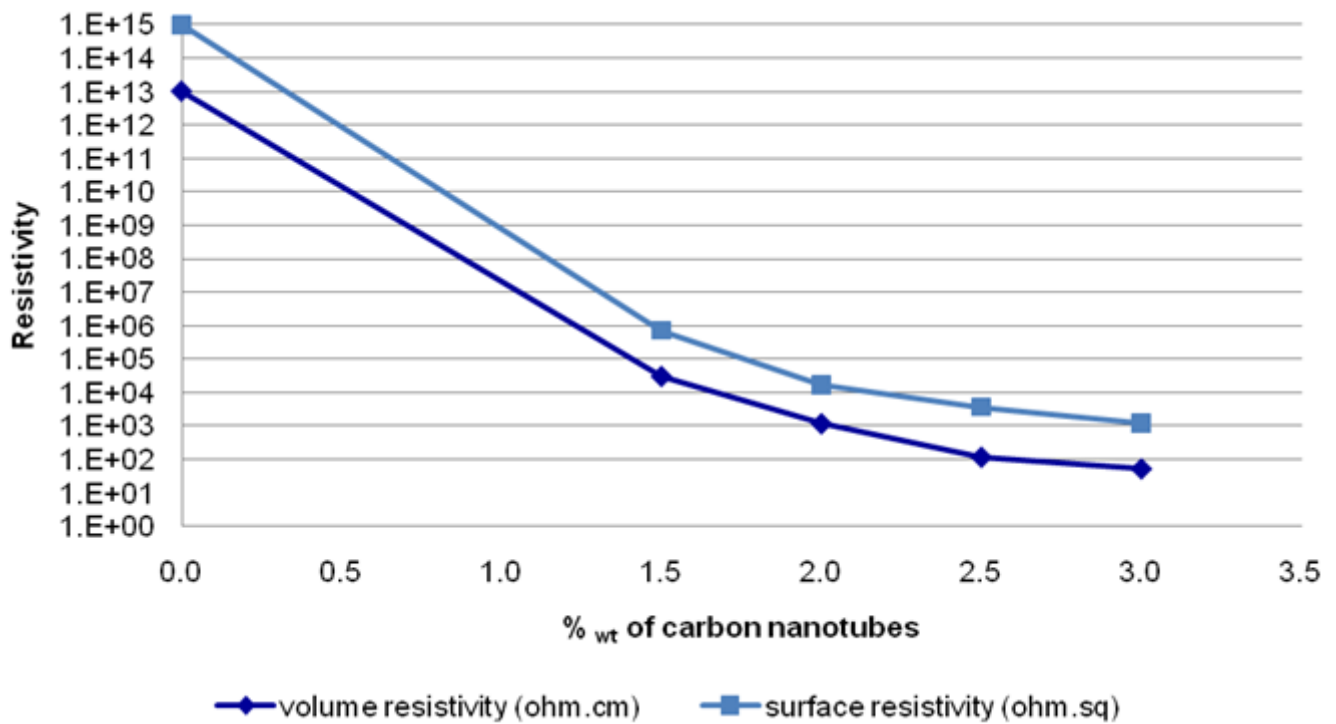
Compounds were processed using an L/D ratio and a 48 twin-screw extruder under proprietary conditions. Specimens were molded by injection, according to the processing parameters below.

In order to get well-dispersed CNT aggregates, Nanocyl recommends the use of polymers with a high Melt Flow Index (MFI). Surface Resistivity results can be significantly influenced by molding/extrusion conditions.

General Processing Guidelines for Injection Molding

INJECTION SPEED	MOLD TEMPERATURE	MATERIAL TEMPERATURE	PLASTICIZING SPEED	BACK PRESSURE	HOLDING PRESSURE	HOLDING TIME
cm ³ /s	°C	°C	m/s	bars	bars	s
30	120	300	0,4	40	450	8

Percolation Curves for Volume and Resistivity



Electrical resistivity measurement in accordance with Nanocyl standard method based on standard injection molded IZOD specimens, processed according to parameters provided before (General Processing Guide for Injection Molding).

Commercial/Safety Information

Packaging

PLASTICYL™ PC1501 masterbatches (pellets) are available in different packaging:

- 20 kg sealed white plastic bags,
- 600 kg cardboard octabins.

Minimum Order Quantity

Nanocyl's minimum order quantity for PLASTICYL™ PC1501 is 20 kg.

Custom Grades

Besides the commercial grades, Nanocyl is able to toll-compound any type of PC masterbatches to meet its clients' needs.

Health and Safety

A Material Safety Data Sheets (MSDS) is available to provide both workers and emergency personnel with the proper procedures for handling or working with the PLASTICYL™ PC1501. This MSDS includes information such as physical data (form and color, melting point, etc.), handling and storage recommendations, first aid measures and ecological information. The Safety Data Sheet is provided with any order and should be observed.

Disclaimer

The information contained in this TDS is believed to be accurate to the best of Nanocyl's knowledge and belief at the time of the TDS publication. The information is intended to be used as a guideline and for informational purpose only. Consequently Nanocyl DOES NOT WARRANT that the information or the related products are fit for any particular purpose or use by User and it is for User to check for itself the fitness of the information and/or the related products, including regarding the non-infringement of third parties intellectual property right whether related products are used alone or in combination with other products. Nanocyl shall NOT BE LIABLE, whether contractually or in tort, for damages caused through the use or the reliance on this information and/or the related products.