

PLASTICYL™

CNT thermoplastic concentrates

PLASTICYL™ PA1501

Polyamide 66 – 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™ PA1501 is a conductive masterbatch based on polyamide 66 loaded with 15% of Nanocyl's MWCNTs (NC7000™). Because of its high flow, PLASTICYL™ PA1501 is ideal for injection molding and extrusion processes.

Key Applications

- Electrostatic Discharge (ESD) and electrically conductive parts
- Electrical and Electronics (E&E) and industrial
- Injection molding, extrusion
- Automotive fuel line parts and connectors
- E-painting

Benefits

- Excellent electrical conductivity at low loading
- Retention of key mechanical properties
- Ease of processing
- Meets SAE J1645 automotive standards

Technical Data

Main Characteristics

CARBON NANOTUBES LOADING (% _{WT})	REAL DENSITY (G/L) ISO 1183	MVR (cm ³ /10 MIN) NON-STANDARD TEST : 275°C; 10 kg; 4 mm	MELTING POINT (°C) ISO 11357-1,-3
15 ± 1,0	1149	21	252

Typical Performance after Injection Molding

PROPERTIES	STANDARD	UNITS	NEAT POLYAMIDE 66	DILUTION TO 2% _{WT} OF CNT	DILUTION TO 4 % _{WT} OF CNT	DILUTION TO 6 % _{WT} OF CNT
<i>Volume resistivity</i>	ASTM D4496	Ohm.cm	> 1,00.10 ¹²	7,43.10 ²	3,80.10 ¹	7,54
<i>Surface resistivity</i>	IEC 167	Ohm/sq	> 1,00.10 ¹²	> 1,00.10 ¹²	6,82.10 ⁴	3,01.10 ⁴
<i>Young's Modulus</i>	ISO 527-1,2	MPa	2910	2915	2982	3061
<i>Tensile strength at break</i>	ISO 527-1,2	MPa	59	61	62	62
<i>Strain at break</i>	ISO 527-1,2	%	37	-	2,6	2,2
<i>Charpy notched impact strength</i>	Internal method	kJ/m ²	4	6	6	5
<i>Melt flow - MVR</i> (270°C; 5 kg; 2 mm)	ISO 1133:1997	cm ³ /10 min	172	96	37	10
<i>Color</i>	-	-	White	Black	Black	Black

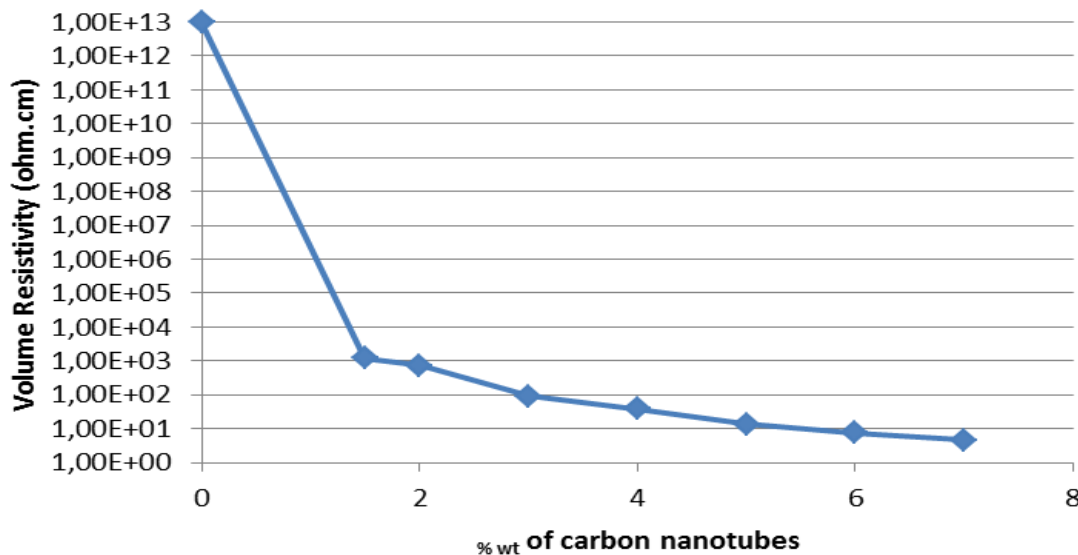
Compounds were processed using an L/D ratio and a 48 twin-screw extruder under proprietary conditions. Specimens were molded by injection, according to the processing parameters below.

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

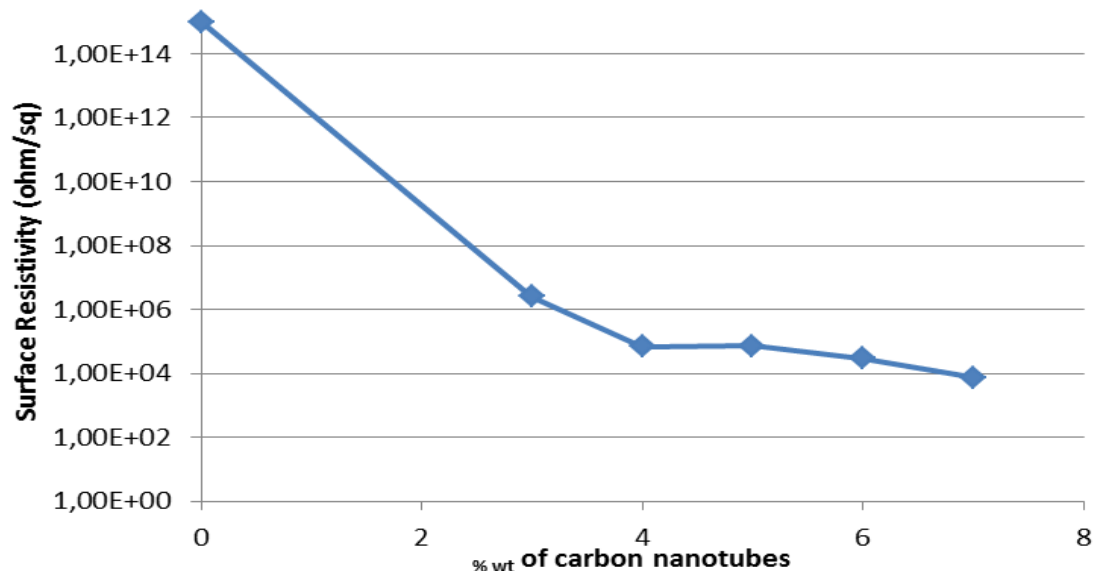
INJECTION SPEED	MOLD TEMPERATURE	MATERIAL TEMPERATURE	PLASTICIZING SPEED	BACK PRESSURE	HOLDING PRESSURE	HOLDING TIME
<i>cm³/s</i>	<i>°C</i>	<i>°C</i>	<i>m/s</i>	<i>bars</i>	<i>bars</i>	<i>s</i>
50	70	300	0,2	40	650	10

Percolation Curve for Volume 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).

Percolation Curve for Surface 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™ PA1501 masterbatches (pellets) are available in different packaging:

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

Minimum Order of Quantity

Nanocyl's minimum order of quantity for PLASTICYL™ PA1501 is 20 kg.

Custom Grades

Besides the commercial grades, Nanocyl is able to toll-compound any type of polyamide 66 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™ PA1501. 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

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