



Technical Data Sheet

ABC-SC-PA12-101 - Polyamide 12 – Carbon
Nanotubes (CNT) Masterbatches

General Information

ABC3D's ABC-SC-PA12-101 is a conductive thermoplastic masterbatch designed for applications requiring excellent electrical conductivity and electrostatic discharge (ESD) properties. This advanced material is based on polyamide 12 (PA 12) and is loaded with 15% multiwall carbon nanotubes (MWCNTs), delivering exceptional performance for a range of industrial uses. Thanks to the high flow properties of ABC-SC-PA12-101, it is particularly well-suited for injection molding and extrusion processes, ensuring ease of processing and consistent results. PA 12 provides excellent chemical resistance, low moisture absorption, and superior dimensional stability.

Key Applications:

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

Features & Benefits

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

Available Sizes:

See website for details.

Quality

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, ABC3D recommends the use of polymers with a high Melt Flow Index (MFI). Surface Resistivity results can be significantly influenced by molding/extrusion conditions.

Main Characteristics

CARBON NANOTUBES LOADING (%WT)	Real Density (G/L) ISO 1183	MVR (cm ³ /10 MIN) NON-STANDARD TEST: 300°C; 15 kg; 2 mm	MELTING POINT (°C) ISO 11357-1,-3
15 ± 1,0	1110	52 ± 8	179

General Processing Guidelines for Injection Molding

Injection Speed	Mold Temp.	Material Temp.	Plasticizing Speed	Back Pressure	Holding Pressure	Holding Time
cm ³ /s	°C	°C	m/s	bars	bars	s
30	30	250	0,2	20	600	25

Typical Performance after Injection Molding

Properties	Standard	Unit	Neat PA 12	Antistatic PA 12	EMI/RFI Shielding PA 12
Young's Modulus	ISO 527-1,2	MPa	1204	1311	1510
Tensile strength at break	ISO 527-1,2	MPa	39	39	42
Strain at break	ISO 527-1,2	%	244	30	14
Charpy notched impact strength	Internal method	kJ/m ²	6	8	8
Melt flow -MVR (230°C; 5 kg; 2mm)	ISO 1133:1997	cm ³ /10 min	-	-	36
Color	-	-	White	Black	Black

Volume Resistivity Index

Volume Resistivity (Ω -CM)

Insulative →	1×10^{14}		Unfilled Plastics
	1×10^{12}		
Antistatic →	1×10^{10}		Antistatic Compounds
	1×10^8		
Dissipative →	1×10^6		ESD Compounds
	1×10^4		
	1×10^2		EMI/RFI Shielding Compounds
	1×10^0		
Conductive →	1×10^{-2}		
	1×10^{-4}		Metals

Note: Electrical resistivity measurement in accordance with ABC3D standard method based on standard injection molded IZOD specimens, processed according to parameters provided before (General Processing Guidelines for Injection Molding).

Commercial/Safety Information

Minimum Order Quantity:

Minimum order quantity for ABC-SC-PA12-101 is 20 kg.

Custom Grades:

Besides the commercial grades, ABC3D is able to toll-compound any type of polyamide 12 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 ABC-SC-PA12-101. 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 technical data contained on this data sheet is furnished without charge or obligation and accepted at the recipient's sole risk. This data should not be used to establish specifications limits or used alone as the basis of design. The data provided is not intended to substitute any testing that may be required to determine fitness for any specific use.