



Technical Data Sheet

ABC-SC-PA6-101 - Polyamide 6 – Carbon Nanotubes (CNT) Masterbatches

General Information

ABC3D's ABC-SC-PA6-101 is a conductive thermoplastic masterbatch developed for applications demanding superior electrical conductivity and electrostatic discharge (ESD) performance. This material is based on polyamide 6 (PA 6) and is loaded with 15% multiwall carbon nanotubes (MWCNTs), offering advanced conductivity and mechanical properties. ABC-SC-PA6-101 features excellent flow characteristics, making it an ideal solution for injection molding and extrusion processes. Leveraging the inherent properties of PA 6, such as high strength, stiffness, and impact resistance, ABC-SC-PA6-101 ensures reliable performance in a variety of industrial applications, particularly where durability and precision are crucial.

Key Applications:

- Electrostatic Discharge (ESD) and electrically conductive parts
- Electrical and Electronics (E&E) and industrial
- Injection molding, extrusion

Features & Benefits

- Excellent electrical conductivity at low loading
- Retention of key mechanical properties
- Ease of processing
- 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. 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 | MFI (G/10 MIN) NON-STANDARD TEST: 280°C; 20 kg; 4 mm | MELTING POINT (°C) ISO 11357-1,-3 |
|-----------------------------------|--------------------------------|--|--------------------------------------|
| 15 ± 1,0 | 1175 | 3,16 | 221 |

Typical Performance after Injection Molding

| Properties | Standard | Unit | Neat PA 6 | Antistatic PA 6 | EMI/RFI Shielding PA 6 |
|------------------------------------|---------------|-------------------------|-----------|-----------------|------------------------|
| Melt flow index (280°C; 1,2 kg) | ISO 1133:1997 | cm ³ /10 min | - | 42,48 | 5,40 |

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} | ↓ | Metals |
| | | 1×10^{-4} | | |

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-PA6-101 is 20 kg.

Custom Grades:

Besides the commercial grades, ABC3D is able to toll-compound any type of polyamide 6 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-PA6-101. 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.