

Unlocking the promise of Carbon Nanotubes
(CNT) usage, economically!

Technical Data Sheet

ANTIS™ - ACR
CONDUCTIVE CNT - ACRYLIC MASTERBATCH

DESCRIPTION

A multi-walled carbon nanotube (MWCNT) - acrylic system specifically designed as an additive for acrylic, vinyl ester, and unsaturated polyester based static dissipative and electrically conductive applications.

PRODUCT OVERVIEW

Delivery form : Viscous paste

Volume Resistivity : $2\Omega\text{cm}$

Carrier : Ethoxylated (4) bisphenol A dimethacrylate monomer

MWCNT concentration : 1 wt.%

Cure system : Consult the resin manufacturer for recommended curing agents and conditions

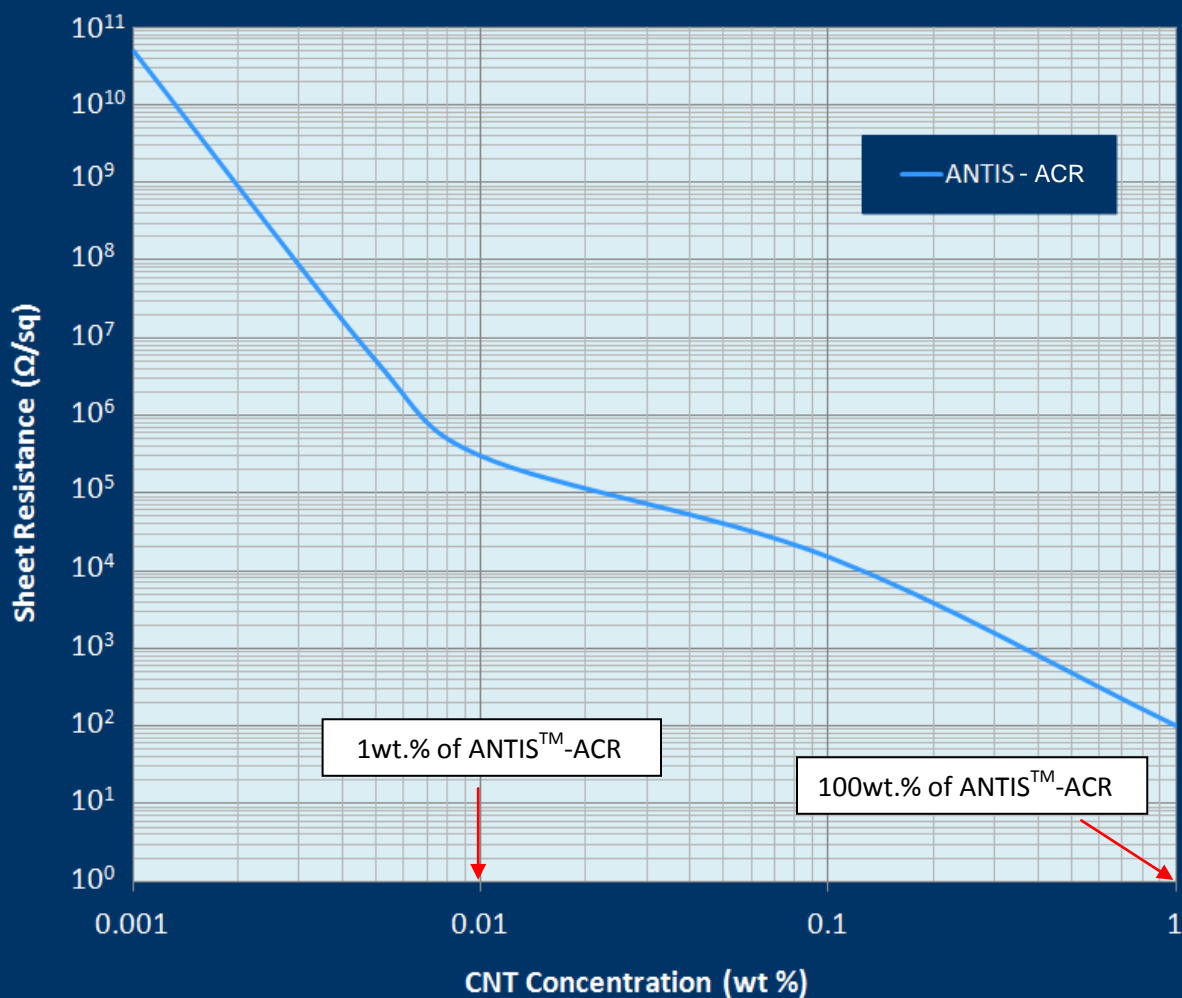
Specific Gravity : 1.14

Color : black

Carrier solvents/Diluents : none

When formulating to the Mohm/sq. regime ($\geq 10^6 \Omega$ approx.), the carbon content is extremely low, Therefore, it is generally acceptable to treat ANTIS™ - ACR as dimethacrylate monomer for stoichiometry calculations.

SHEET RESISTANCE



Volume resistivity measurements were conducted using a <100μm (<4 mil) film prepared with ANTIS™-ACR, EPON 828/D.E.R. 331, EPIKURE 3370 curing agent, without pigment. Volume resistivity may vary for different formulations, curing agents, film thicknesses and measurement conditions.

The weight percentage of ANTIS™ - ACR is in the final compound, including Part B.

EXAMPLE:

1 wt.% of ANTIS™ - ACR sample can be made using 1g of ANTIS™ - ACR and 99g of resin part A (e.g., Acrylics, Vinyl ester, Unsaturated Polyester) and B (curing agent). The ratio of resin part A and B must be selected according to the supplier recommendation.

APPLICATIONS

ESD/anti-static protection	Conductive inks
Coatings and paints	Adhesives
Gelcoats	Fiber-reinforced composites
Lightning strike protection	Corrosion protection
EMI/RFI protection	

DILUTION GUIDELINES

Dilute ANTIS™ - ACR masterbatch in a clean, compatible container. The container volume should be 3 to 4 times the total mixed material volume. Accurate weighing of all material components on a suitable scale is recommended for optimal product performance.

Use a mechanical mixer equipped with a mixing element and stir until the mixture is homogeneous. Inspect the mixing impeller and container surfaces for any ANTIS™ - ACR concentrate that remains undispersed in the surrounding host material (darker and more viscous than host material). Remove any undispersed ANTIS™ - ACR concentrate from the container and mixing impeller surfaces and continue stirring until dispersion is complete. ***For optimum dispersion, Nanorial would recommend to use high shear mixing blades and mixing speeds around 1500rpm.***

If needed, a multi-stage letdown is recommended for concentrations < 5 wt.% ANTIS™ - ACR, to achieve optimal homogeneity in the final compound. In this case, first, dilute 1 - 5 wt.% of ANTIS™ - ACR in a sufficient amount of host resin and then top up and mix with the rest of the host resin. After letdown is complete, a defoaming step is recommended. Mix the solution at 100-200 rpm for up to 10 min. and then vacuum the container, if possible. Add other secondary additives, such as pigments, as needed.

Shelf life of the final compound (following letdown) is concentration-and-viscosity-dependent and should be determined by experimentally. For best results, dilute the compound when ready to use and cure it immediately.

MEASURING THE RESISTANCE

Measuring sheet resistance of static dissipative coatings ($> 10^6$ ohm) usually involves very low currents. It is important to use highly sensitive measuring equipment, such as a Megohm meter with 5-lb resistance probes in compliance with ASTM F150, or a DC four-point probe analyzer with silver-painted electrodes in accordance with ANSI/ASTM D257. In both cases, the

electrodes have much lower resistance than the sample and should not contaminate the sample (in the case of the silver-painted electrodes).

STANDARD PACKAGING

1kg, 20 kg quantities, Non-permeable, plastic-lined container
Larger quantities available

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