

Electrostatic Properties of Expandable Polystyrene

I. GENERAL

Resistive measurements are used in the static control industry to help categorize materials. Although resistance and resistivity measurements alone cannot tell everything about a material's electrostatic performance, it is a good indicator and can help to establish a baseline, indicate differences between additives or additive levels, show differences within a sample group and characterize the effects of relative humidity on a material's performance.

II. TEST METHODS

Surface resistivity per ASTM-D257 is generally used to describe the conductive, dissipative or insulative range of static control for a material. This test method is specified in industrial specifications such as EIA-541 (Electrical Institute Association) and military specification MIL B 81705C. These specifications categorize surface resistivity and surface resistance as follows:

CATEGORY	SURFACE RESISTIVITY	SURFACE RESISTANCE
CONDUCTIVE	$1 \times 10^5 \Omega / \text{sq.}$	$1 \times 10^4 \Omega / \text{sq.}$
DISSIPATIVE	1×10^5 to $1 \times 10^{12} \Omega / \text{sq.}$	1×10^4 to $1 \times 10^{11} \Omega / \text{sq.}^*$
INSULATIVE	$1 \times 10^{12} \Omega / \text{sq.}$	$1 \times 10^{11} \Omega / \text{sq.}$

* NFPA 99 has an upper acceptance limit for static dissipative material of 1×10^{11} ohms/sq.

III. SURFACE RESISTIVITY OF EXPANDED POLYSTYRENE

The surface resistivity of molded expandable polystyrene has been found to range from 2.00×10^{12} to 1.20×10^{13} ohms/sq. using a test voltage of 100 volts and is consequently considered to be insulative.

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