

June 1, 2000

Technical Bulletin

97-08 - Revision 1 - Revised 5/1/00

Subject: Definition of Antistat, Static Dissipative and Conductive Properties

Background:

Due to inquiries concerning the definition of the above properties, the following information has been compiled.

The build up of static charge is usually due to the contact of 2 non conductive materials moving across each other. An example is film traveling over a rubber roller. Others are dry product being poured from a plastic bag or liquid tumbling into a pail from a fill nozzle above the liquid level in the pail. If the surfaces are conductive, charges quickly dissipate.

The most common reasons for specifying conductive or antistatic parts are (1) a reduction of potential for fire due to a spark discharge and (2) the elimination of ability for dust particles to build up on parts due to static charges. Antistatic parts are best suited for use in high relative humidity, non or low hazard environments. Conductive or static dissipative parts are better suited for hazardous environments. For total effectiveness conductive parts need to be grounded or bonded during use.

There are several codes used to regulate these types of materials. Most commonly sited are the NFPA 56A or 99 Mil. Spec. MIL-B-81705B, Federal Test Method 101C (Method 4046) or ASTM D257. Most guidelines suggest end users test the products at their lowest possible humidity level. The two conditions called out in the specs. are "Rate of Decay" and Surface Resistivity". Surface Resistivity measures the electrical resistance of the surface of the plastic. Two electrodes are placed on the same side of the surface. A DC electric charge is passed through the electrodes. The current (amps) that passes over the plastic is measured. Resistance can then be calculated. Static Decay measures the rate of discharge of an induced charge. A charge is induced on the sample by contact with electrodes, which is then grounded. After charging, the time for the charge to bleed down is measured. The static decay test has been found to be more selective than the surface resistivity for use in screening antistats.

The NFPA spec. calls out both Surface Resistivity and Static Decay (50% RH). The Mil Spec. only calls out Static Decay (15% RH).

Hedwin Liners:

By way of background, an anti-stat option is available for users of Hedwin Corporation's PAYLINER® pail insert, HEDLINER® a form-fitting polyethylene drum inserts and the WINLINER® film liner. Used for in-plant storage and mixing of liquids, paste, and powder materials, these inserts for open pails, standard open-head steel and fibre drums help avoid the need to dispose of contaminated pails and drums. The antistatic additive helps reduce the accumulation of static charge during handling.

Hedwin Antistat and Static Dissipative liners are formed from polyethylene material compounded with an antistatic additive. The additive modifies the surface properties of the plastic allowing static charge to dissipate. Static Dissipative liners are routinely tested against Mil Spec. or Customer Requirements. As required, Hedwin has conducted extensive time base testing which indicate that the film retains its original antistatic properties from 18 months of date of manufacture.

Hedwin also manufactures a conductive liner upon request, see Technical Bulletin #97-11 for further details.

Technical Definitions:

Antistatic

Describes an ability to prevent the build-up of electrostatic charges which can be dangerous in a flammable environment. The rate at which charges are dissipated is often dependent upon atmospheric conditions, (relative humidity and temperature). The effectiveness of the additive can be depleted over time.

Static Dissipative

Describes an ability to discharge static charge at a rate faster than typical antistats. These materials may be affected by atmospheric conditions. These materials are sufficient to pass some, but not all standard specifications.

Conductive

Describes an ability to rapidly discharge electrostatic charges. Electrostatic charges flow through impregnated material. Unaffected by atmospheric conditions, conductive material can pass standard testing for static discharge.

Resistance Classification

Contact Hedwin Product Manager or Technical Services for complete data on Antistat, Static Dissipative and Conductive liners and their properties.