Anti-Static Packaging Policy Requirements for Packaging Used in Flammable Liquid Environments

1. Thin-mil plastic is not an acceptable packaging material for use in packaging raw materials for delivery to any PPG facilities that USE FLAMMABLE LIQUIDS OR HAS A FLAMMABLE LIQUIDS ATMOSPHERE PRESENT (defined as using any liquid with a flash point < 60.5°C / 141° F).

For these PPG facilities, raw materials only should be packaged in:

A. A metal pail or drum that can be grounded; or
B. A double walled paper bag with a thin-mil plastic liner sandwiched in between and bonded to one of the paper layers, ensuring that only paper is in contact with bag contents.
C. Coating lined fiber drums where phenolic or a similar coating is fused to the drum and in contact with metal chime where the drum can be grounded. If the coating thickness is ≥ 2 mils, it must have an anti-static volume resistivity of 107 – 1011 Ω-m. If a removable thin-mil plastic drum liner is required, it must meet the requirements addressed in Items 2.A.(iv) 1 thru 2.A.(iv) 4 below.
D. FIBC **(Super Sacks/Big Bags/Sling Bags) per section 3 below**.

2. The only exceptions to this Policy are:

A. If a supplier's only option for packaging from its production line is:

(i) Thin-mil plastic package, or
(ii) Fiber drum, or cardboard box of any size with a thin-mil plastic liner in contact with the supplier's raw material, or
(iii) A paper bag with a thin-mil plastic liner attached to one or more of the paper layers in contact with the supplier's raw material.
(iv) If either A(i) thru A(iii) type packaging is used, the supplier must provide official documentation demonstrating static dissipative characteristics of the thin-mil plastic. This documentation should verify that the test results were conducted in accordance with a recognized standard for measuring surface resistivity. Some of the recognized standards, though not limited to these, are:

1) For each thin-mil plastic, the supplier should provide documentation that demonstrates static dissipative characteristics as reflected in the the table below

	Surface Resistivity *(ohms per sq.)*	Conditioning Temp.(1) *(C°)*	Conditioning Humidity(1) *(% RH)*	Conditioning Time(1) *(hrs.)*
LAB RESULTS NEED ONLY MEET ONE DATA SET TO BE ACCEPTABLE	$\leq 1 \times 10^{12*}$	23°C ±5	<20%	>12
	$\leq 1 \times 10^{11}$	23°C ±5	20 - 30%	>12
	$\leq 1 \times 10^{9}$	23°C±5	31-55%	>12

2) This documentation should verify that the test results were conducted in accordance with a recognized standard for measuring surface resistivity. Some of the recognized standards, though not limited to these, are: ASTM D257, IEC/TS 60079-32-2, IEC 62631-3-2, IEC 61340-2-3.
3) The laboratory results should be provided by a nationally recognized testing laboratory (NRTL) or a laboratory that follows the standards mentioned above.
4) An alternative test that can be performed is MIL-STD-3010B "Department of Defense Test Method Standard Test Procedures For Packaging Materials." The applicable test to meet PPG's requirement is found at Section 5.4.3 "Test Method 4046 – Electrostatic Properties." As defined by PPG, static dissipating means applied charge must decay from 5 kV to 500 volts in less than 0.5 seconds.
5) The certifying report from the laboratory is to be sent to the attention of the Quality Assurance Department of each PPG facility that consumes the material (i) prior to the first shipment of the material to the facility and (ii) prior to shipping any material where there has been any change in the anti-stat or packaging materials since the certifying report first was issued.

3. FIBCs (Super Sacks/Big Bags/Sling Bags)

A. All FIBCs used in PPG facilities must meet requirements of ***CLC/TR 50404: 2003 and*** IEC 61340-4-4: (ED. 2.0); NO EXCEPTIONS.

B. Thin-mil plastic vapor barriers must meet the following IEC 61340-4-4: (ED. 2.0) requirements:

Type of Inner Liner	Requirements	Intended Use
Type L1	Inner liners made from materials with surface resistivity on at least one surface less than or equal to 10^7 Ω Breakdown voltage less than 4 kV	Type C FIBC
Type L2	Inner liners made from materials with surface resistivity on at least one surface between 10^9 Ω and 10^{12} Ω Breakdown voltage less than 4 kV	Type B, C or D FIBC
Type L3	Inner liners made from materials with surface resistivity of greater than 10^{12} Ω Breakdown voltage less than 4 kV	Type B FIBC
Note: This table only summarizes the requirements for inner liners.		

Summary of IEC 61340-4-4 (Ed. 2.0) Classification and Requirements for Liners

C. There are currently five different types of FIBC commercially available, but only two are Approved for use in all PPG facilities:

a. **Type D FIBCs <u>are preferred</u> and can be used in any PPG facility** - This type of FIBC, also referred to as a “Dissipating” type of FIBC, is constructed with isolated conductive elements woven into the fabric of the bag and will dissipate a static charge that has accumulated during an operation where the FIBC has been filled or emptied. This type of FIBC is <u>not</u> conductive but it is suitable for use in most locations where flammable vapor/air mixtures are normally present, i.e. Class I, Div. I areas.

The inherent safety of a Type D bag will be compromised if the bag is damp or contaminated with a foreign substance such as oil. Type D bags can be used in all PPG facilities.

b. **Type C FIBCs can be used where there is no objection by the receiving PPG facility.** - This type of FIBC is conductive. Type C FIBCs typically are made using either a conductive cloth or a material having conductive elements woven in to it. Regardless of how the FIBC is made, it must have a resistance to ground from any point on the bag to the designated grounding location of less than 1×10^7 ohms, using a 50 mm diameter electrode (equivalent to maximum safe charging current of 30 µA).

c. Both Type C & D FIBCs must have a label attached that ensures the Type is immediately obvious and the intended use expressed in a way that is familiar to safety personnel, please see example below. Note the use of any other designations (e.g. D+, D plus, C/D etc.) will not be permitted on safety labels for FIBCs in compliance with IEC 61340-4-4 (Ed. 2.0).