Statshield® Moisture Barrier Bags Application Instructions

Made in America

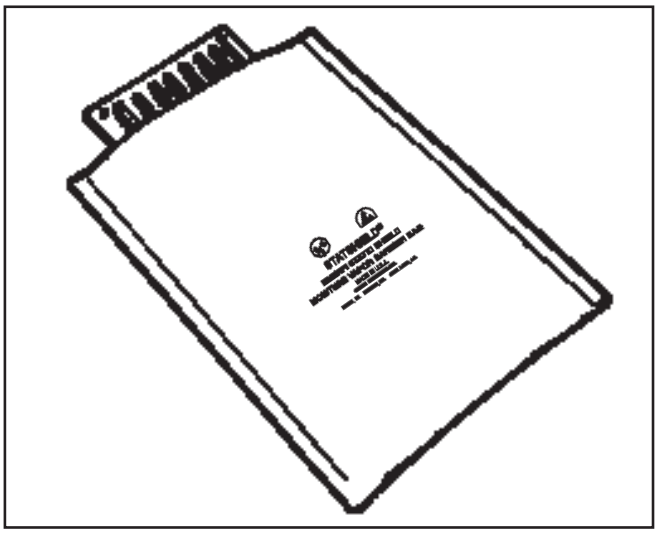

Figure 1. Protektive Pak Statshield® Moisture Barrier Bag

Introduction

Corrosion and thus moisture protection is becoming increasingly important. From ESD Association 22nd EOS/ESD Symposium Proceedings*, “As electronic components use less material they become more sensitive to voltage and current variations. This increases their operational speed and functionality. Corrosion that was heretofore inconsequential now becomes a major factor in the current electronic components. . . . This underlines the importance of protection from angstrom level corrosion of surfaces beyond the normal solderability level problems on circuitry.” Statshield® EMI/RFI ESD Moisture Barrier Bags addresses this concern providing physical, ESD, EMI/RFI, and moisture protection.

"...it is important to take possible temperature exposure into account when shipping electronic parts. It is particularly important to consider what happens to the interior of a package if the environment has high humidity. If the temperature varies across the dew point of the established interior environment of the package, condensation may occur. The interior of a package should either contain desiccant or the air should be evacuated from the package during the sealing process. The package itself should have a low WVTR." (ESD Handbook ESD TR20.20 section 5.4.3.2.2)

*Paper entitled “Corrosion Induced Electrostatic Damage” by John P. Franey of Lucent Technologies Bell Labs

Description

Protektive Pak Statshield® Moisture Barrier Bags combine the properties of a MOISTURE BARRIER constitution with EMI-RFI-ESD shielding. Statshield® Moisture Barrier Bags meet the electrical and physical requirements of ANSI/ESD S541, EIA 583, EIA 541, EIA 625, and MIL-PRF-81705D, Type I. All Statshield® Moisture Barrier Bags are amide and amine free and pass outgassing and corrosion tests. All bags are printed with ESD and moisture warning symbols and are dated and lot coded for ease of traceability.

Protektive Pak offers two styles of Moisture Barrier Bags. The first is a .0065” (.1651mm) thick heavy-duty bag with EMI shielding, and the second is a .0040” (.1016mm) bag with EMI/RFI shielding properties. Both bags are available in a wide range of sizes. Also, custom sizes and custom imprinting are available.

Construction

Protektive Pak Statshield® Moisture Barrier Bags are manufactured out of a laminated film which features static dissipative surfaces. The configuration is similar to the metal-in shielding material, but with two metal layer being placed between layers of dissipative film. A polyester layer provides pull strength and heat seal capability. The metal layer is approximately ten times thicker than that of traditional static shielding material and provides the EMI attenuation and moisture barrier properties.
The metal layer within the Moisture Barrier Bag is vacuum deposited rather than being a foil layer. This difference allows the bag to be much softer and flexible, therefore the metal portion of the bag is less likely to tear or rip providing a more reliable barrier against moisture and static electricity.

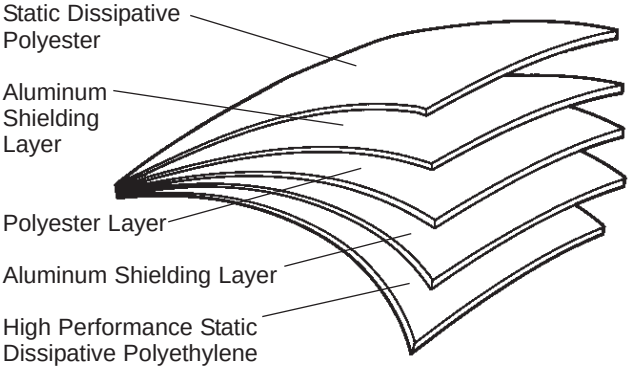

Figure 2. Statshield® MBB bag construction.

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General Information

Failures in certain electronic devices and microcircuits have been linked to the rapid expansion of internally absorbed moisture during the soldering process. Moisture absorption into these devices has been traced to have taken place primarily during shipping and storage in non-humidity controlled environments. Additionally, “Dry Packaging” is usually required for electronic assemblies or devices that are to be placed into long term storage or for use in military applications.

The Statshield® Moisture Barrier Bag, Desiccant Packs and Humidity Indicator Cards have been developed for use in “DRY PACKAGING” applications. In order for the MBB bag and its accessories to perform properly, Protektive Pak recommends the user follow procedures defined in IPC/JEDEC J-STD-033B.

DESICCANT

Desiccant is a drying agent used to lower the moisture content of air inside a closed space, such as an Moisture Barrier bag. Desiccant is packaged in fractional units in order to facilitate its usage with a variety of bag sizes. One full “unit” of packaged desiccant will absorb the following quantities of water at equilibrium with air at 77°F (25°C): 3.00 grams @ 20% rH and 6.00 grams @ 40% rH, when tested to MIL-D-3464.

Figure 3. Desiccant packs.

In order to provide a moisture barrier packaging assembly system, desiccant must be inserted into the bag, prior to having the bag vacuum sealed. The recommended amount of desiccant is dependent on the interior surface area of the bag to be used. Figure 4 is a reference table indicating recommended minimum amounts of desiccant that should be used with Moisture Barrier Bags.

INTERIOR BAG SURFACE AREA	NUMBER OF DESICCANT UNITS *MIH <20%	MIH <30%	MIH < 40%
100 sq. in.	1.5	1.0	1.0
130 sq. in.	2.0	1.5	1.0
160 sq. in.	2.0	1.5	1.5
200 sq. in.	2.5	2.0	1.5
240 sq. in.	3.0	2.0	1.5
290 sq. in.	4.0	2.5	2.0
340 sq. in.	4.5	3.0	2.5
390 sq. in.	5.0	3.5	2.5
450 sq. in.	5.5	4.0	3.0
510 sq. in.	6.5	4.5	3.5
580 sq. in.	7.5	5.0	4.0
650 sq. in.	8.0	5.5	4.0
720 sq. in.	9.0	6.0	4.5

Figure 4. Table for recommended desiccant usage. Information taken out of EIA-583, Table 1, Page 8.

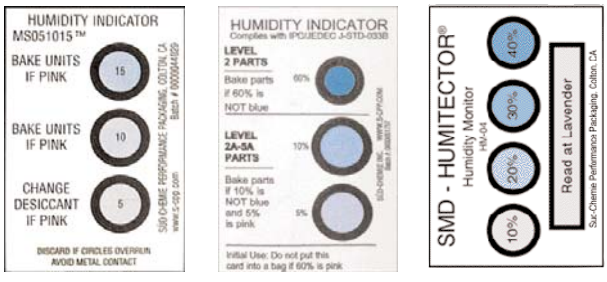
Desiccant packs are available from Protektive Pak in the following unit sizes and standard packages:

ITEM #	UNIT SIZE	STANDARD PKG.
48883	1/2 unit - 1.2" x 2.4"	Box of 700
48884	1 unit - 5" x 3.5"	Box of 500
48880	1/2 unit - 1.2" x 2.4"	Pail of 550
48881	1 unit - 5" x 3.5"	Pail of 300

Desiccant packs sold by Protektive Pak meet the requirements of MIL-D-3464. For more detailed information, see Drawing 48881.

HUMIDITY INDICATOR CARDS

Another integral part of a moisture barrier packaging assembly system is the Humidity Indicator Card. The Indicator Card contains chemically impregnated, humidity sensitive, indicating spots that will change color with moisture. The comparison bar is used to determine relative humidity of air. Select the indicating spot that most closely matches the color of the comparison bar. The measured relative humidity is the percentage indicated on the matching spot. The chemical reaction of the indicating spots is completely reversible; the spots will continue to change color as the moisture levels change.



48886 48885 48882

Figure 5. Humidity Indicator Cards

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The Humidity Indicator Cards sold are sold as Item #'s 48882 in a can of 100 each, and 48885, 48886 in cans of 125 each. The 2" x 3" blotting paper cards indicate relative humidity. Humidity Indicator Cards should be inserted and sealed within an Moisture Barrier Bag along with the recommended amount of Desiccant Packs. All three humidity indicator cards meet the requirements of MIL-I-8835A and J-STD-033B. For more detailed information, see Drawing 48882.

*MIH - Maximum Interior Humidity

Specifications

Electrical Properties

Resistance of polyester outer layer
<10E11 ohms per ANSI/ESD S11.11

Resistance of aluminum layer
<10E2 ohms per ANSI/ESD S11.11

Resistance of polyethylene inner layer
<10E11 ohms per ANSI/ESD S11.11

EMI Shielding (dB between 1 and 10 GHz)
<45 per Mil-PRF-81705D

Energy Penetration <10nJ per ANSI/ESD S11.31

Physical Properties .0065" (.1651mm)

Thickness (nominal)
≥ .0065" (.1651mm) per ASTM D2103

Light Transmission (%)
<0.01 per ASTM D1033-92

MVTR (grams / 100 in^2 / 24 hrs, 100°F)
≤0.005 per ASTM F1249-90

Puncture Strength (lb)
≥30 per FTMS 101-C, Method 2065.1

For more detailed information, see Drawing 48782.

Electrical Properties

Resistance of polyester layer
<10E11 ohms per ANSI/ESD S11.11

Resistance of aluminum layer
<10E2 ohms per ANSI/ESD S11.11

Resistance of polyethylene layer
<10E11 ohms per ANSI/ESD S11.11

EMI Shielding (dB between 1 and 10 GHz)
<45 per Mil-PRF-81705D

Energy Penetration <10nJ per ANSI/ESD S11.31

Physical Properties .0040" (.1016mm)

Thickness (nominal)
≥ .0040" (.1016mm) per ASTM D2103

Light Transmission (%)
<0.01 per ASTM D1033-92

MVTR (grams / 100 in^2 / 24 hrs, 100°F) ≤0.0003 per ASTM F1249-90

Puncture Strength (lb)
≥27.8 per FTMS 101-C, Method 2065.1

For more detailed information, see Drawing 48950.

Limited Warranty
Protektive Pak expressly warrants that for a period of one (1) year from the date of purchase, Protektive Pak products will be free of defects in material (parts) and workmanship (labor). Within the warranty period, a unit will be tested, repaired or replaced at Protektive Pak's option, free of charge. Call our Customer Service Department at 909-627-2578 for a Return Material Authorization (RMA) and proper shipping instructions and address. Please include a copy of your original packing slip, invoice, or other proof of date of purchase. Any unit under warranty should be shipped prepaid to the Protektive Pak factory. Warranty replacements will take approximately two weeks.If your unit is out of warranty, call our Customer Service Department at 909-627-2578 for a Return Material Authorization (RMA) and proper shipping instructions and address. Protektive Pak will quote repair charges necessary to bring your unit up to factory standards.

Warranty Exclusions
THE FOREGOING EXPRESS WARRANTY IS MADE IN LIEU OF ALL OTHER PRODUCT WARRANTIES, EXPRESSED AND IMPLIED, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH ARE SPECIFICALLY DISCLAIMED. The express warranty will not apply to defects or damage due to accidents, neglect, misuse, alterations, operator error, or failure to properly maintain, clean or repair products.

Limit of Liability
In no event will Protektive Pak or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all risk and liability whatsoever in connection therewith.

RoHS Compliance Statement
None of the following materials are intentionally added in manufacturing this product: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) or polybrominated diphenyl ethers (PBDE) as outlined in the Directive 2002/95/EC Article 4.1. See Desco Industries Inc. letter on-line at ProtektivePak.com.

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