

## Statshield® Moisture Barrier Bags Application Instructions



Made in America

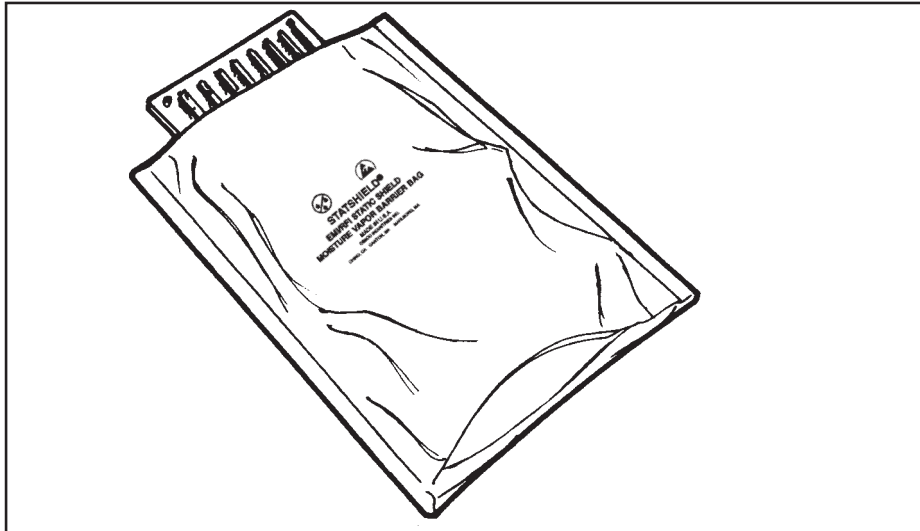


Figure 1. The Statshield® Moisture Barrier Bag.

### 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 High 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 TR20.20 section 5.4.3.2.2)

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

### Description

ESD Systems.com 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 EIA 583, EIA 541, EIA 625, and MIL-PRF-81705D, Type 1. All Statshield® Moisture Barrier Bags are 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.

ESD Systems.com offers a 3.5 mil bag with EMI/RFI shielding properties. The bag is available in a wide range of sizes. Also, custom sizes and custom imprinting are available.

### Construction

ESD Systems.com Moisture Barrier Bags are manufactured from a laminated film which features static dissipative surfaces. The configuration is similar to the metal-in shielding material, but with a metal layer being placed between two layers of dissipative film. Statshield® series provides full protection from ESD, static fields, and tribocharging. The metal layer is approximately ten times thicker than that of traditional static shielding material and provides the EMI attenuation and moisture proof 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.

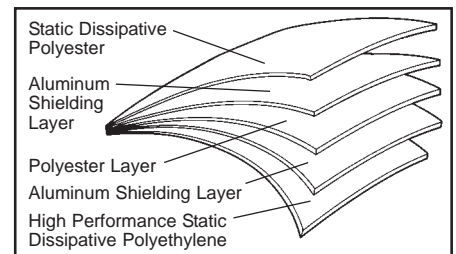


Figure 2. Statshield® Moisture Barrier Bag construction.

## 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 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 for use in military applications.

Statshield® Moisture Barrier Bags, desiccant packs, and humidity indicator cards have been developed for use in "DRY PACKAGING" applications. In order for the Moisture Barrier Bag and its accessories to perform properly, ESD Systems.com recommends the user follow procedures defined in EIA-583. A copy of EIA-583 may be obtained from the Electronic Industries Association, Engineering Department, 2001 Pennsylvania Ave. N.W., Washington, D.C. 20006, Phone (202) 457-4966.

## DESICCANT



Figure 3. Desiccant packs.

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

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	0.5
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.

\*MIH - Maximum Interior Humidity (%)

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.

In order to provide a complete moisture barrier packaging assembly, 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.

Desiccant packs are available from ESD Systems.com in the following unit sizes and standard packages:

Item #	Unit Size	Std. Package
32302	1/2 unit	Pail of 550
32304	1 unit	Pail of 300

Desiccant packs sold by ESD Systems.com meet the requirements of MIL-D-3464.

## HUMIDITY MONITOR CARDS

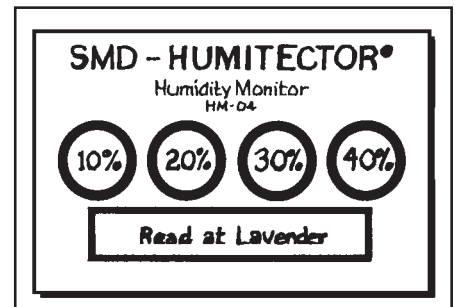


Figure 5. 32320 Humidity Indicator.

An integral part of a complete moisture barrier packaging assembly is the Humidity Monitor Card. The Monitor 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.

Humidity Monitor cards are sold as Item #32320 in cans of 100 each. The

2" x 3" blotting paper cards indicate 10, 20, 30 or 40% relative humidity. Humidity Monitor Cards should be inserted and sealed within an Misture Barrier Bag with the desiccant packs. The 32320 humidity monitor cards meet the requirements of MIL-I-8835.

## Specifications

### Electrical Properties

Resistance of polyester layer  
<math>10^{12}</math> ohms per ANSI EOS/ESD-S 11.11

Resistivity, conductive metal layer  
100 per ANSI EOS/ESD-S 11.11

Resistance of polyethylene layer  
<math>10^{12}</math> ohms per ANSI EOS/ESD-S 11.11

EMI Shielding (dB between 1 and 10 GHz)  
<math><10</math> per Mil-B-81705 Rev C

### Physical Properties

Thickness (mils)  
 $\geq 3.5$  per ASTM D2103

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

MVTR (gms / 100 in<sup>2</sup> / 24 hrs, 100°F)  
 $\leq 0.02$  per ASTM F1249-90

Puncture Strength (lb)  
 $\geq 20$  per FTMS 101-C, Method 2065.1

Heat Seal Temperature (°F)  
325 (60 PSI @ 3 sec dwell)

For more detailed information, see Drawing 32200.

## Limited Warranty

ESD Systems.com expressly warrants that for a period of one (1) year from the date of purchase, our shielding bags and components will be free of defects in material (parts) and workmanship (labor). Within the warranty period, the product will be tested, repaired or replaced at our option, free of charge. Call Customer Service at 508-485-7390 for a Return Material Authorization (RMA) and proper shipping instructions and address. You should include a copy of your original packing slip, invoice, or other proof of purchase date. Any product under warranty should be shipped prepaid to the ESD Systems.com factory. Warranty repairs will take approximately two weeks.

## 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

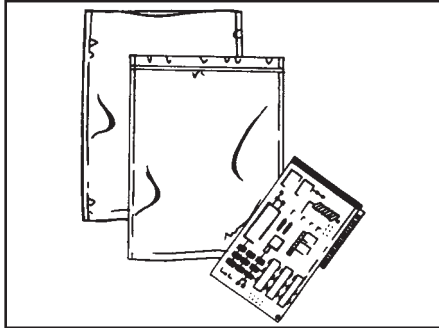
In no event will ESD Systems.com or any seller be responsible or liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, users shall determine the suitability of the product for their intended use, and users assume all 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 [ESDsystems.com](http://ESDsystems.com).

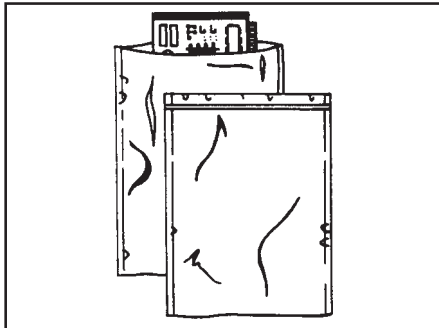
# Other Packaging Products Available from ESD Systems.com

## Transparent Shielding Bag Metal Out



ESD Systems.com's metal out shielding bags are designed to protect against static induced damage. The lower surface resistivity of the metal out bag means less charge retention on its exterior. The bag will dissipate a 5,000 volt charge in less than 100 microseconds. Metal out bags feature a conductive, abrasion resistant exterior layer and provide better than 30% light transmission, to allow contents to be seen without removal. Metal out bags are available in standard sizes with and without a zipper closure. For detailed specifications ask for drawings 31005 and 31090.

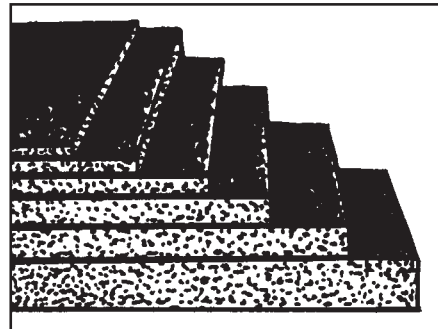
## Transparent Shielding Bag - Buried Metal - Metal In



ESD Systems.com's metal in shielding bags offer superior durability at a low cost. This bag is constructed of an

alloy electrostatic shield with a tough layer of polyester protection, providing a level of abrasion and puncture resistance never before possible in a transparent shielding bag. Light transmission of better than 40% allows for easy identification of contents without removal. Metal in bags are available in standard sizes with and without a zipper closure. For detailed specifications ask for drawings 30010 and 30100.

## Conductive Foam



Conductive polyurethane foam is an open cell foam designed to protect devices from ESD as well as physical damage. This carbon-impregnated material provides permanent and uniform protection for sensitive electronic components. Cross-linked foam is ideal for long-term storage. For detailed specifications ask for drawing 33010.

## Labels



These labels are used to indicate that an electrical or electronic device or assembly is susceptible to damage from an ESD event. Use labels to seal bags properly so that Faraday Cage protection is ensured. For detailed specifications call Customer Service at (508) 485-7390.

 **ESD SYSTEMS.com**

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