

Cleanroom & ESD Packaging Catalog



Bennett & Bennett was founded in 1991 with the sole mission of providing the highest quality static control and cleanroom products at the best possible price. With the help of our associates and customers we have grown to become an internationally recognized supplier of personal grounding, static control and cleanroom packaging, static control work stations, ionization equipment, clean room consumables, and cleanroom equipment.

This catalog is dedicated to our complete line of static control and cleanroom packaging products. All of the products represented in this catalog are manufactured in the United States Of America.

Tables Of Contents

Static Shielding Bags	3
Moisture Barrier Bags	4
Conductive	5
Anti-Static Bags	5
Cleanroom Moisture Barrier Bags	6
Cleanroom Nylon Bags	6
Cleanroom Polyethylene Bags	7
Cleanroom Particle Standard	7

Bag Selection Chart

Bag Type	Shielding	Anti-Static	Mil Thickness	Moisture Barrier	Zip Closure	Clean Level
7000 Clean Poly	no	no	.002 to .004	n/a	no	50
7100 Anti-Static	no	yes	.004 to .006	n/a	yes	100
7200 Clean Nylon	no	yes	.002	<0.16	no	50
8000 Conductive	yes	yes	.004 to .006	n/a	yes	no
8100 Shielding	yes	yes	.003	<0.40	yes	100
8300 Shielding	yes	yes	.0031	<0.40	yes	100
3000 MBB	yes	yes	.0035	<0.02	yes	100
3600 MBB	yes	yes	.0061	<0.0003	yes	100
BB 450 MBB	no	no	.005	<0.184	no	100



8100 is a reliable, low cost, transparent shielding bag. This bag meets performance specification requirements of MIL-PRF-81705D, Type III and ANSI/ESD S541 tested per ANSI/ESD S11.31. The buried metal layer is not susceptible to scratching and provides an excellent ESD shield. The anti-static polyethylene inner layer prevents tribocharging.

- Low cost, reliable shielding bag
- Meets ANSI/ESD S541 / MIL-PRF-81705D, Type III
- Available with zip top closure
- Up to 4 PMS spot color printing available
- "Clean To Level 100" option
- Made in USA

Part Number	Size
8100XXXX	3" x 5" Thru 18" x 24"
8100XXXXZ	3" X 5" Thru 18" x 24" Zipper Closure

8100 Series Static Shielding Bag

Specification:

Electricals	Values	Test
Surface Resistance		
Outer Surface	<10E11 ohms	ANSI/ESD S11.11
Inner Surface	<10E11 ohms	ANSI/ESD S11.11
Static Decay	<0.05 sec	MIL-PRF-81705D
Static Shielding	<25 nJ	ANSI/ESD S11.11
Charge Generation	Teflon: 0.09 nC/sq. in. Quartz: 0.01 nC/sq. in.	Mod. Incline Plane Mod. Incline Plane
Cap. Probe (to diss. 1 KV)	<30V	MIL-PRF-81705D
Physical Properties		
Bag Thickness	Nominal .0030" +/- 10%	
Light Transmission (%)	>40% (Tobias)	ASTM D-1003
Burst Strength (psi)	>50	FTMS 101K
Heat Seal (lbs/in)	>10	375F, 1/2 sec 60 psi
Seam Strength	Pass	MIL-PRF-81705D
Tear Strength (lbs)	>25	ASTM D-1004
Puncture Resistance (lbs)	>10	ASTM D-2065
MVTR (grams/100 in2 / 24 hrs100F)	<0.40	FTMS 101C/2065
Abrasion Resistance	>100 cycles	Sutherland Abr.
Outgassing	Pass	ASTM E595
Chemical Properties		
Corrosion	No effect on Aluminum, copper, silver, Sn-Pb coated foil, stainless steel, low carbon steel	
Polycarbonate Capability	Yes	
Amines or N-Octanoic Acid	Not present	

8300 Series Static Shielding Bag

Specification:

Electricals	Values	Test
Surface Resistance		
Outer Surface	<10E8 ohms	ANSI/ESD S11.11
Aluminum Layer	<10E2 ohms	ANSI/ESD S11.11
Inner Surface	<10E12 ohms	ANSI/ESD S11.11
Static Shielding	<20 nJ	ANSI/ESD S11.11
Charge Generation	Teflon: -0.03 nC/sq. in. Quartz: +0.10 nC/sq. in.	Mod. Incline Plane Mod. Incline Plane
Cap. Probe (to diss. 1 KV)	<30V	MIL-PRF-81705D
Physical Properties		
Bag Thickness	Nominal .0031" +/- 10%	
Light Transmission (%)	>40% (Tobias)	ASTM D-1003
Burst Strength (psi)	>50	FTMS 101K
Heat Seal (lbs/in)	>10	375F, 1/2 sec 60 psi
Seam Strength	Pass	MIL-PRF-81705D
Tear Strength (lbs)	>25	ASTM D-1004
Puncture Resistance (lbs)	>10	ASTM D-2065
MVTR (grams/100 in2 / 24 hrs100F)	<0.40	FTMS 101C/2065
Abrasion Resistance	>30 cycles	Sutherland Abr.
Outgassing	Pass	ASTM E595
Chemical Properties		
Corrosion	No effect on Aluminum, copper, silver, Sn-Pb coated foil, stainless steel, low carbon steel	
Polycarbonate Capability	Yes	
Amines or N-Octanoic Acid	Not present	



8300 is a reliable shield against external static fields. This bag meets performance specification requirements of MIL-PRF-81705D, Type III and ANSI/ESD S541 tested per ANSI/ESD S11.31. The <10e8 outer surface resistivity provides rapid charge dissipation when the bag contacts a grounded surface. The anti-static polyethylene inner layer prevents tribocharging.

provides rapid charge dissipation when the bag contacts a grounded surface. The anti-static polyethylene inner layer prevents tribocharging.

- Metal-out shielding bag meets ANSI/ESD S541 AND mil-prf-81705D, Type III
- <10E8 ohms outer surface resistivity provides rapid charge dissipation
- Available with zip top closure
- Made in USA

Part Number	Size
8300XXXX	3" x 5" Thru 18" x 24"
8300XXXXZ	3" X 5" Thru 18" x 24" Zipper Closure



3000 Series Moisture Barrier Bag

Specification:

Electricals	Values	Test
Surface Resistance		
Both Surfaces @ 12% RH	<10E11 ohms	ANSI/ESD S11.11
Resistance, metal layer	<10E2 ohms	ASTM D257
EMI Shielding		
(dB between 1 and 10 GHz)	<40	ANSI/ESD S11.31
Charge Generation	Teflon: 0.09 nC/sq. in. Quartz: 0.01 nC/sq. in.	Mod. Incline Plane Mod. Incline Plane
Energy Penetration	<10 nJ	ANSI/ESD S11.31
Cap. Probe (to diss. 1 KV) (High voltage discharge)	<20V	EIS Std 541
Physical Properties		
Bag Thickness	Nominal .0035" +/- 10%	
Burst Strength (psi)	>84	FTMS 101K
Heat Seal (lbs/in)	>10	375F, 1/2 sec 60 psi
Seam Strength	Pass	MIL-PRF-81705D
Tear Strength MD (lbs)	>4.7	ASTM D-1004
Tear Strength TD (lbs)	>4.3	ASTM D-1004
Puncture Resistance (lbs)	>20	ASTM D-2065
WVTR (grams/100 in ² / 24 hrs, 100F)	<0.02	ASTM F-1249-90
OTR (100% Oxygen, 100 in ² /24hrs)	<0.002	ASTM D3985
Outgassing	Pass	ASTM E595
Chemical Properties		
Corrosion	No evidence of corrosion or pitting	
Polycarbonate Capability	No Amines, Amides, or N-Octanoic Acid	

3000 provides an EMI/ESD shield. This bag meets performance specification requirements of MIL-PRF-81705D, Type I and ANSI/ESD S541. 3000 is manufactured on specially designed soft fold machines that prevent scratching and creases to maintain the integrity of Faraday Cage shielding. The integral static dissipative properties prevent triboelectric charging and will not wear off.



- Meets ANSI/ESD S541, Mil-Prf-81705 Type I
- Available with zip top closure
- Up to 4 PMS spot color printing available
- "Clean To Level 100" option
- Ideal for vacuum packaging and nitrogen flush
- Made in USA

Part Number	Size
3000XXXX	3" x 5" Thru 18" x 24"
3000XXXXZ	3" X 5" Thru 18" x 24" Zipper Closure



3600 is a reliable EMI/ESD shield. This bag meets the requirements of MIL-PRF-81705D, Type I., MIL-STD-1686, and EIS 583. The combination of a 0.0003 MVTR

and puncture resistance of 45 pounds make this a great choice where the product being packaged is extremely sensitive to moisture damage.

- Low cost, reliable shielding bag
- Meets ANSI/ESD S541 / MIL-PRF-81705D, Type III
- Available with zip top closure
- Up to 4 PMS spot color printing available
- "Clean To Level 100" option
- Made in USA

3600 Series Moisture Barrier Bag

Specification:

Electricals	Values	Test
Surface Resistance		
Outer Surface	<10E12 ohms	ANSI/ESD S11.11
Inner Surface	<10E12 ohms	ANSI/ESD S11.11
Static Decay	<0.01 sec	MIL-PRF-81705D
Charge Generation	Teflon: -0.03 nC/sq. in. Quartz: +0.10 nC/sq. in.	Mod. Incline Plane Mod. Incline Plane
Cap. Probe (to diss. 1 KV)	<10V, <20MS	EIA 541
Physical Properties		
Bag Thickness	Nominal .0061" +/- 10%	
Burst Strength (psi)	>97	FTMS 101K
Seam Strength	Pass	MIL-PRF-81705D
Tear Strength (lbs)	>45	ASTM D-1004
Puncture Resistance (lbs)	>20	ASTM D-2065
MVTR (grams/100 in ² / 24 hrs/100F)	<0.0003	FTMS 101C/2065
OTR (100% Oxygen, 100 in ² /24hrs)	<0.006	ASTM D3985
Outgassing	Pass	ASTM E595
Chemical Properties		
Corrosion	No effect on Aluminum, copper, silver, Sn-Pb coated foil, stainless steel, Kovar, low carbon steel	
Polycarbonate Capability	Yes	
Amines or N-Octanoic Acid	Not present	

Part Number	Size
3600XXXX	3" x 5" Thru 18" x 24"
3600XXXXZ	3" X 5" Thru 18" x 24" Zipper Closure



Our 8000 Series Conductive Bag is made of a single layer of carbon-loaded polyethylene. This bag meets performance specification requirements of MIL-PRF-82646A. 8000 material does not depend on humidity for

its conductivity. Integral properties of 8000 material provide a static shield and triboelectric charge protection.

- Meets Mil-PRF-82646A
- Available with zip top closure
- Bags, tubing and sheeting
- Non-Abrading
- Humidity Independent
- Ideal for packaging of chemicals & explosives
- Made in USA

Part Number	Size
8000XXXX	3" x 5" Thru 18" x 24"
8000XXXXZ	3" X 5" Thru 18" x 24" Zipper Closure

8000 Series Conductive Bag

Specification:

Electricals	Values	Test
Surface Resistivity	<30,000 ohms/Sq.	ASTM D257
Volume Resistivity	<30,000 ohms/cm	ASTM D991
Physical Properties		
Bag Thickness	Nominal .0040" to .0060 +/- 10%	
Burst Strength (psi)	20 to 60	FTMS 101K
Heat Seal-Temperature	250 to 375F	
Heat Seal-Time (sec)	0.5 - 3.5	
Heat Seal-Pressure (psi)	30 to 60	
Tensile Strength (psi)	>2000	ASTM D882
Elongation (MD%)	>150	ASTM D882
Tear Strength (lbs per Inch)	>400	ASTM D882
Dart Impact (gms)	250 to 700	ASTM D-2065
Chemical Properties		
Corrosion	No evidence of corrosion	

7100 Series Anti-Static Bag

Specification:

Electricals	Values	Test
Surface Resistivity	<10E12 ohms/Sq.	ASTM D257
Volume Decay Rate	5 KV-0 Volts <2 sec.	Fed. Test Method 101
Physical Properties		
Bag Thickness	Nominal .0040" to .0060 +/- 10%	
Burst Strength (psi)	20 to 60	FTMS 101K
Heat Seal-Temperature	250 to 375F	
Heat Seal-Time (sec)	0.5 - 3.5	
Heat Seal-Pressure (psi)	30 to 60	
Tensile Strength (psi)	>2000	ASTM D882
Elongation (MD%)	>550	ASTM D882
Tear Strength (lbs per Inch)	>450	ASTM D882
Dart Impact (gms)	250 to 700	ASTM D-2065
Chemical Properties		
Corrosion	Non-corrosive-Fluoride (F), Chloride (Cl), Sodium (Na), Sulfate (SO), Nitrate (NO), and Phosphate (PO) were found negligible.	

Our 7100 Series Anti-Static Bag is humidity independent and does not require the presence of moisture on its surface to function. This bag meets performance specification requirements of MIL-PRF-81705D, Type II. . The integral static dissipative properties of this material prevent triboelectric charging and will not wear off.



- Meets Mil-PRF-81705 Type II
- Available with zip top closure
- Bags, tubing and sheeting
- "Clean To Level 100" option
- Humidity Independent
- Made in USA

Part Number	Size
7100XXXX	3" x 5" Thru 18" x 24"
7100XXXXZ	3" X 5" Thru 18" x 24" Zipper Closure



BB 450 Moisture Barrier Bag

Specification:

Physical Properties	Values	Test
Bag Thickness	Nominal .0040" to .0050	+/- 10%
Burst Strength (psi)	85	FTMS 101K
Tensile Strength (lbs) MD	34	ASTM D882
Tensile Strength (lbs) TD	36	ASTM D882
Tear Strength MD (lbs)	>64	ASTM D882
Tear Strength TD (lbs)	>64	ASTM D882
WVTR (grams/100 in ² / 24 hrs100F)	<0.184	ASTM F-1249-90
OTR (cc, 100 in ² /24hrs)	2.0	Mocon

Chemical Properties

Outgassing using dynamic headspace –GC/MS specification (ng/cm²)

• Total Organics ¹	710.845	GC/MS
• Total Organics ²	508.886	GC/MS
• Hydrocarbons	261.639	GC/MS
• Organic Acid	6.427	GC/MS
• Esters	56.583	GC/MS

BB450 is a clear, durable, moisture barrier package. This bag offers a superior moisture and gas barrier with the highest degree of vacuum retention in a clear structure. BB450 MBB is available in "clean to level 100" per MIL STD 1246C and IEST STD CC1246D. This bag is ideally suited for packaging of disc media, wafers, sputtering targets, and other moisture sensitive devices where contents require visual verification.



- Clear moisture and gas barrier
- Meets MIL STD 1246C level 100 particle level
- Meets IEST STD CC1246D level 100
- Resists abrading and particulate sloughing
- Low outgassing
- High degree of vacuum retention
- Made in USA

Part Number	Size
BB450XXXX	8" x 10" Thru 28" x 36" (Level 100)
BB450XXXXUC	8" X 10" Thru 28" x 36" (UC 100)



Our 7200 Series Nylon is available in both anti-static and non anti-static versions. This bag meets NASA's specification: JSCM 5322 level 50. Our 7200 Series nylon is unplasticized, FDA approved, food-grade clear film. Nylon

is very low in ionic contamination. This material is available in bags and center-fold sheeting.

- Meets NASA JSCM 5322 Level 50
- Bags, tubing and sheeting
- FDA Approved
- Humidity Independent
- Resistant to abrasion
- Made in USA

7200 Series Clean Nylon Bag

Specification:

Physical Properties	Values	Test
Bag Thickness	Nominal .0020+/- 10%	
Tensile Strength MD (psi)	9000	ASTM D882
Tensile Strength (psi)	18000	ASTM D882
Elongation (MD%)	>250	ASTM D882
Elongation (MD%)	>550	ASTM D882
Density (g/cm)	1.13	ASTM D972
WVTR (grams/100 in ² / 24 hrs23C)	16	ASTM E96 (B)
OTR (cc, 100 in ² /24hrs)	2.6	ASTM D1434

Chemical Properties

Strong Acids	Poor	ASTM D543
Strong Alkalize	Fair	ASTM D543
Grease And Oil	Good	ASTM D722
Organic Solvents	Good	ASTM D543

Part Number	Size
7200XXXX	2" x 2" Thru 36" x 80"
7210XXXX	2" x 2" Thru 36" x 80" Anti-Static



Our Low Density 7000 Series cleanroom bags and film are produced in a fully integrated cleanroom facility. It is made of pure virgin barefoot resin. This low density polyethylene product meets IEST STD CC1246D Level 50. This

product is available in a low outgassing and a high strength versions. This product is offered in bag form, tubing and sheets. 7000 Series is proudly produced in the USA.

- Meets IEST STD CC1246D level 50
- FDA Approved Resin
- Bags, tubing and sheeting
- Low Outgassing & High Strength Options
- Produced from Virgin Barefoot Resin
- Made in USA

7000 Series Clean Polyethylene Bag

Specification:		
Physical Properties	Values	Test
Bag Thickness	Nominal .0020" to .0080	+/- 10%
Density (g/cm ³)	0.920	D1505
Tensile Strength (psi) MD	>2900	ASTM D882
Tensile Strength (psi) TD	>2300	ASTM D882
Elongation (MD%)	>350	ASTM D882
Dart Impact (gms)	80 to 100	ASTM D1709
Chemical Properties		
Corrosion	No evidence of corrosion	

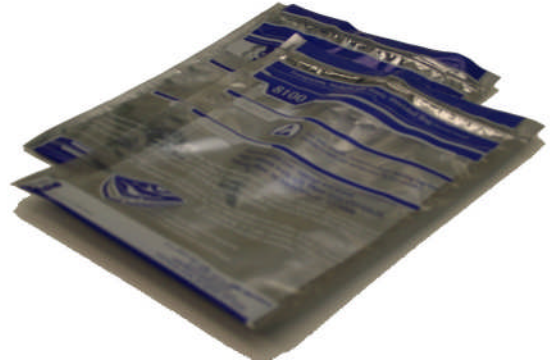
Part Number	Size
7000XXXX	2" x 2" Thru 30" x 24" x 4 mil thick

Particle Cleanliness Levels IEST-STD-CC1246D (Partial List)

Cleanliness Level	Particle Size (microns)	Maximum allowable concentration limits of particles stated size Particles per 0.1m ² of surface area or 0.1 liter of gas or liquid (N)
1	1	1
5	1	2.8
5	2	2.3
5	5	1
10	1	8.4
10	2	7
10	5	3
10	10	1
25	2	53
25	5	23
25	15	3.4
25	25	1
50	5	166
50	15	25
50	25	7.3
50	50	1
100	5	1758
100	15	265
100	25	78
100	50	11
100	100	1

Print your message, Logo or product instructions directly on any of our shielding or moisture barrier bags. Why use an expensive label or insert when you can professionally print directly on your package?

- Small minimum order
- Up to 4 PMS spot colors
- Flat or zipper bags
- Low cost



1/4" Bleed (Top & Bottom)

0.75"

Sealed side area 0.375" (99%)

& Bennett & Bennett

Custom Printed Static Shielding Bags

Small minimum order
Up to 4 PMS spot colors
Printed on both sides
Flat or zipper bag configuration

Surface FLEXO print technology

Why use an expensive label or insert to communicate when you can professionally print your message directly on the pouch?

- Labor cost reduction.
- Only one item to inventory.
- Minimize your total cost.
- Reduce liability.
(no label to come off or insert to be lost)
- Build your brand name recognition.

8100 Transparent, Multiple Use Static Shielded Bag (buried metal)

Features

Low cost, reliable, transparent static shielding bag that provides a static safe environment for your product

Benefits

Communicate your message and brand.
Keep contents static safe. Meets ANSI/ESD 520.20.
Printing allows for traceability per ISO 9000.

8100 is a shielding bag that offers enhanced durability. The outer layer is static dissipative 48-gauge polyester. A metallized layer is buried between the polyester and an antistatic polyethylene (PE) inner layer. The aluminum is an excellent ESD shield and the PE prevents tribocharging of the bag contents.

All bags are printed with product number, manufacturer's name, and lot number. Light transmission of 40% allows for easy identification of contents. 8100 is superb for packaging of static sensitive components, PC boards and electronic assemblies.

— STATIC DISSIPATIVE POLYESTER
— METALLIZATION
— STATIC DISSIPATIVE POLYETHYLENE

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