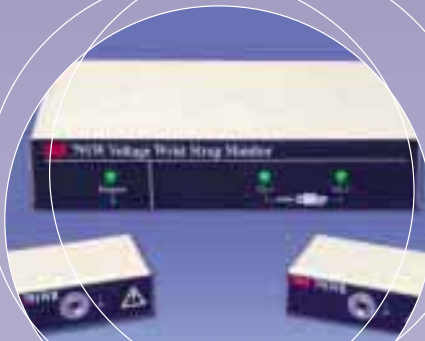




Static Control Products and Services Catalog



It's a Matter of Control

www.3M.com/market/electronic/ehpd

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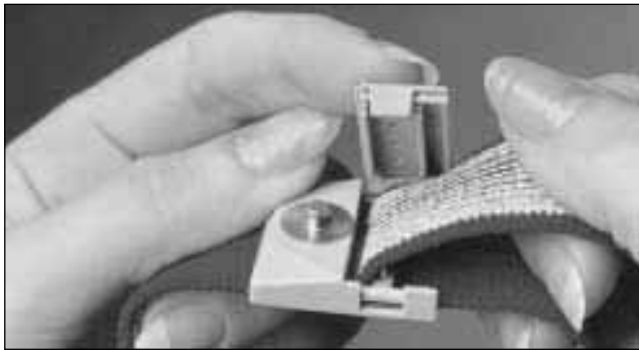
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Static Control Workstation Solutions

Adjustable Fabric Wrist Straps (Single Conductor)

3M™ Adjustable Wrist Straps are the front line of defense in all static control processes. Provide a comfortable, custom fit with these adjustable wrist straps. One size adjusts to any size wrist to provide reliable, 360 degree protection. These wrist straps feature a band made of a silverplated, monofilament, continuous thread woven together with elastic nylon to assure full conductivity, comfort and reliability, while providing rapid and continuous drain of static charge. Adjustability also simplifies ordering procedures and inventory control by eliminating the need to order and stock several band sizes. A one megohm resistor is built into the ground cord. All wrist strap sets include an alligator clip, which fits over the installed banana jack on the ground cord, to provide an alternative ground attachment method. Available with 4 mm snap end. Adjustable bands fit wrist circumference up to 9.0" (228, 6 mm).



Adjustable Wrist Strap for Single Conductor Cords



3M Metal Wrist Straps feature quality Speidel™ metal expansion bands for durability and comfort. Each link is covered with an insulative plastic cap. Compatible with the 2210, 2220 and 4610/4611 wrist strap ground cords.

Three sizes are available: small for wrists from 4.5 in. to 6 in. (114 mm to 152 mm) in circumference; medium for wrists from 5.5 in. to 7.25 in. (140 mm to 184 mm); and large for wrists larger than 6.5 in. (165 mm). All wrist strap sets include an alligator clip, which fits over the installed banana jack on the ground cord, to provide an alternative ground attachment method. Available with 4 mm snap end.



2205 Series Wrist Band

Product No.	Description
2204	Adjustable Fabric Wrist Band, made of knitted fabric, in burgundy color.
2214	Fabric Wrist Band with coiled cord. 5 ft. (1,5 m) practical extended length with burgundy adjustable fabric band.
2224	Fabric Wrist Band with coiled cord. 10 ft. (3,0 m) practical extended length with burgundy adjustable fabric band.

Product No.	Description
2271	Economy adjustable Fabric Wrist Band is made of stretch weave fabric, blue color with white trim.
2272	Economy adjustable Wrist Band with coiled cord. 5 ft. (1,5 m) practical extended length, blue color with white trim.

Product No.	Description
2205	Bulk pack of 25 metal wrist bands. (Small)
2206	Bulk pack of 25 metal wrist bands. (Medium)
2207	Bulk pack of 25 metal wrist bands. (Large)

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Adjustable Thermoplastic Wrist Straps

The 3M™ 4600 Series Adjustable Wrist Straps feature a thermoplastic band with an integrally molded conductive interior. It comes with an easy on/easy off adjustable “zipper” style latching mechanism and is available with 4 mm snaps and 5 ft. ground cords. (10 ft. ground cord available with 4 mm snap only.) All wrist straps and cords include alligator clips.



4600 Series Wrist Band shown with ground cord and alligator clip

Product No.	Description
4610	Ground Cord, Coiled, 5 ft. (1,5 m), 4 mm snap end.
4611	Ground Cord, Coiled, 10 ft. (3,0 m), 4 mm snap end.

Product No.	Color	Description
4620	Blue	Wrist Band with 4 mm stud.
4650	Blue	Wrist Band with 5 ft. coiled cord, 4 mm stud.

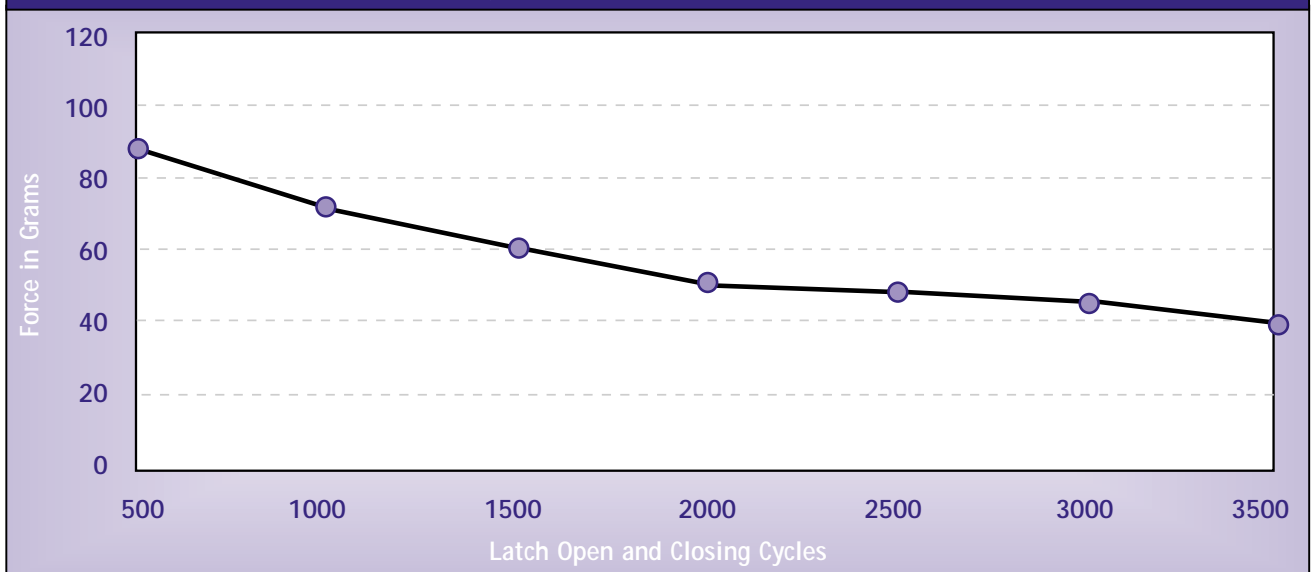
4600 Grounding Cord Properties

Grounding Cord	Typical Value
Tensile Strength	> 15 lbs. (6,8 kg)
Average Termination flex life per ESD S1.1 and MIL-PRF-87893	> 200,000 flexes
Resistance End-to-end	1M Ω \pm 20%
Resistor Type	1M Ω -metal film \pm 20%

4600 Wrist Band Properties

Wrist Strap	Typical Value
Wrist Band Size	Adjustable, small/large, trim to size 1.7 to 2.7 in dia. (43,2 mm to 68,6 mm)
Resistance - Inside/Outside	> 100M Ω
Cleanable	Water/mild detergent or 10% isopropyl solution

3M 4600 Series Latch Durability





Static Control Workstation Solutions

Wrist Strap Ground Cords

3M™ 2210, 2220 and 4610 Series Wrist Strap Ground Cords are highly durable with segmented strain relief, and a single bundle of tinsel conductors laced for great strength and reinforced with strong synthetic fibers. These features provide long cord life and easy movement. Each cord has a 1 megohm resistor molded into the snap end. All wrist straps and cords include alligator clips.



2210 Ground Cord



4610 Ground Cord (includes Alligator Clip not shown)

Product No.	Description
2210	Ground Cord, coiled 5 ft. (1,5 m) practical extended length.
2220	Ground Cord, coiled 10 ft. (3,0 m) practical extended length.
4610	Ground Cord, Coiled, 5 ft. (1,5 m), 4 mm snap end.
4611	Ground Cord, Coiled, 10 ft. (3,0 m), 4 mm snap end.

⚠ Warning on all wrist strap products:

A one megohm resistor is molded into 3M Wrist Strap Ground Cords. DO NOT REMOVE. If it becomes damaged, replace ground cord immediately. These products are not to be used in areas where the individual may come in contact with exposed electrical circuitry exceeding 250 Volts AC.

These products are for static control. They will not reduce or increase your risk of receiving electrical shock when using or working on electrical equipment. Follow the same precautions you would use without wrist straps, including:

- Make certain that equipment having a grounding type plug is properly grounded.
- Make certain that you are not in contact with grounded objects other than through the 3M Wrist Strap.

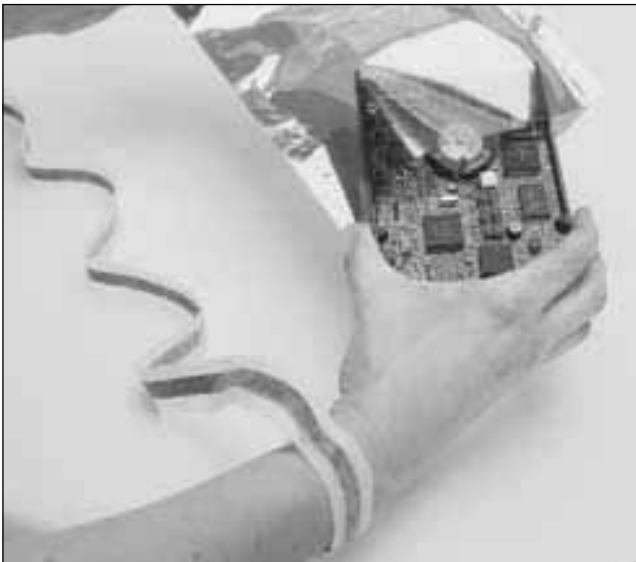


Disposable Wrist Straps

The 3M™ 2209 Disposable Wrist Strap provides cost-effective and reliable static protection. The wrist strap is ideally suited for shipment along with components and devices, such as memory upgrades, sound cards, etc., to provide protection at the receiving end. It may also be used for short-term use in the plant for visitors and others who don't need the durability of a reusable strap.

At the end that wraps around the wrist, a hypoallergenic adhesive provides 360-degree contact with the skin to minimize skin-to-band resistance. At the other end, the conductive adhesive on the copper foil tape adheres to any convenient electrical ground. A current-limiting resistance is fabricated into the plastic ribbon below the wrist band.

Each 2209 Disposable Wrist Strap is individually packaged in a clear poly envelope. Custom printing is available by special order.



2209 Disposable Wrist Strap



2209 Disposable Wrist Strap



Product No.	Description
2209	Disposable Wrist Strap.

Custom envelope imprinting is available.

2209 Properties

Item	Typical Properties
Ground/Bonding End	Copper foil with conductive adhesive on both attached to conductive ribbon.
Conductive Ribbon	Flexible conductive film, with fabricated current limiting resistance near wrist band end. Conductive ribbon enclosed in non-woven adhesive tape.
Wristband End	Conductive ribbon with exposed hypo-allergenic adhesive along each side of conductive ribbon
Practical Working Length	4 ft. (1,2 m)
Electrical Resistance End to End	1.0 to 5.0 Megohms

3M
2209
Disposable Wrist Strap

INSTRUCTIONS

1. Unwrap 12" (30 cm) of the band and wrap adhesive side around your wrist.
2. Unroll rest of band and remove liner from copper tape.
3. Attach the copper tape to electrical ground or the metal frame of equipment you are servicing.

UL LISTED

Standard envelope

A • B • C
Electronics
1•800•000•0000

Manufactured for ABC Electronics by 3M.

INSTRUCTIONS

1. Unwrap 12" (30 cm) of the band and wrap adhesive side around your wrist.
2. Unroll rest of band and remove liner from copper tape.
3. Attach the copper tape to electrical ground or the metal frame of equipment you are servicing.

UL LISTED

Custom envelope example



Static Control Workstation Solutions

Disposable Shoe Grounding Assembly

3M™ Velostat™ 2045 Disposable Shoe Grounding Straps provide a reliable path for static charge to drain to ground when personnel are wearing shoes with insulative soles.

The shoe grounding straps are especially desirable in work situations where personnel must move around – wave soldering, automatic insertion or operation of sensitive computerized equipment. To be effective, the shoe grounders must be worn on both feet.



2045 Velostat Disposable Shoe Grounding Straps

Product No.	Description
2045	Disposable Shoe Grounding Straps. (100 per box). One size fits all low cut shoes.

⚠ Warning:

The 2045 Disposable Shoe Grounding Strap is not to be used in areas where the individual may come in contact with exposed electrical circuitry exceeding 120 Volts AC.

Note: Shelf life of products made with Velostat resin is five years. Variations in storage conditions such as temperature fluctuation, exposure to sunlight or high humidity may reduce the shelf life.

Toe Grounding Assembly

Designed for use with high-heeled shoes, the 3M™ 2053 Toe Grounding Assembly grounds personnel when they are in contact with conductive/dissipative flooring. A comfortable elastic ankle strap and 12-inch (30,5 cm) long conductive ribbon for insertion into the shoe complete the ground path to the operator. To be effective, the shoe grounders must be worn on both feet. The 2053 is available with a 1 megohm resistor.



2053 Toe Grounding Assembly

Product No.	Description
2053	Toe Grounding Assembly with a 1 megohm resistor.

⚠ Warning:

The 2053 Grounding Assembly is not to be used in areas where the individual may come in contact with exposed electrical circuitry exceeding 250 Volts AC.

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Heel Grounding Assembly

The new 3M™ 2044 Economy Heel Grounder—a cup-style heel grounder with a high visibility “yellow glow” strap that helps facility supervisors effectively manage their static control program. With the new 2044 Economy Heel Grounder, supervisors may now see at a single glance whether employees are properly wearing their heel grounding assemblies, and ensure their company is protected against static damage. Dependable and cost-efficient, the 2044 Heel Grounder effectively grounds mobile personnel when they are in contact with conductive and dissipative flooring, and should be an integral part of any static control system in the workplace.

In addition to the bright yellow coloring, the 2044 Heel Grounder’s cup construction satisfies customer need for durability, while the one-inch width of the ankle strap material ensures a “one size fits all” conformity of fit that will accommodate a wide variety of shoe shapes and sizes.



3M 2044 Shoe Grounding Assembly

The 3M™ 2051 Shoe Grounding Assembly effectively grounds mobile personnel when they are in contact with conductive and dissipative flooring. The conductive, no-slip outer sole provides a reliable static ground. After being trimmed to a desired length, an extra-long contact ribbon is inserted between the shoe and sock. The function of the Heel Grounding Assembly depends upon foot perspiration in the shoe to sustain electrical contact between the conductive ribbon and the body. The 2051 comes with a one megohm resistor.



3M 2051 Shoe Grounding Assembly

Product No.	Description
2044	Economy Shoe Grounding Assembly with a 1 megohm resistor.
2051	Economy Shoe Grounding Assembly with a 1 megohm resistor.
2056	Economy Non-marking Shoe Grounding Assembly with a 1 megohm resistor.

*To be effective, shoe grounders must be worn on both feet.

Warning:

The 2044, 2051 and 2056 Series Heel Grounding Assemblies are not to be used in areas where the individual may come in contact with exposed electrical circuitry exceeding 250 Volts AC.

The 3M™ 2056 Non-Marking Heel Grounding Assembly reliably grounds mobile personnel when they are in contact with conductive and dissipative flooring. The non-marking conductive, carbon-free, non-slip outer layer provides a dependable static ground while the inner layer provides a non-marking surface for the shoe. After being trimmed to a desired length, an extra-long contact ribbon is inserted between the shoe and sock. The function of the heel grounding assembly depends upon the foot perspiration in the shoe to sustain electrical contact between the conductive ribbon and the body. The 2056 is designed with a one megohm resistor.








3M 2056 Non-marking Shoe Grounding Assembly



Static Control Workstation Solutions

Wrist Strap / Continuous Workstation Monitor Applications Chart

Function	Monitors				
	3M™ 791E Equipment Ground Monitor	3M™ 791W Wrist Strap Monitor	3M™ 790 Static Monitor	3M™ 724 Wrist Strap Workstation Monitor	3M™ 725 Wrist Strap Monitor
					
Monitors one wrist strap					•
Monitors two wrist straps		•	•	•	
Monitors worksurface to ground connections	•			•	
Monitors equipment ground	•				
Monitors person's voltage		•	•		
Monitors wrist strap resistance				•	•
Uses dual conductor wrist strap		•	•	•	•
Logs data	•	•			
Feature					
Audible alarms	•	•	•	•	•
Visual alarms	•	•	•	•	•
Portable			•		•
Wrist band type					
Regular (Dual conductor)				•	•
VM Series (Dual conductor)		•	•		
Housing					
Stainless steel	•	•			
Anonized steel				•	
Dissipative plastic			•		•

Wrist Strap / Continuous Workstation Monitor Compatibility Chart

Wrist Band	Monitors			
	3M™ 791W Wrist Strap Monitor (voltage type)	3M™ 790 Static Monitor (voltage type)	3M™ 724 Wrist Strap Workstation Monitor (resistance type)	3M™ 725 Wrist Strap Monitor (resistance type)
2368 Fabric Wrist Band, Adjustable, Dual Conductor			•	•
2368VM Fabric Wrist Band, Adjustable, Dual Conductor	•	•		
2381 Metal Wrist Strap with 5' Dual Conductor Cord, Small			•	•
2381VM Metal Wrist Strap with 5' Dual Conductor Cord, Small	•	•		
2382 Metal Wrist Strap with 5' Dual Conductor Cord, Medium			•	•
2382VM Metal Wrist Strap with 5' Dual Conductor Cord, Medium	•	•		
2383 Metal Wrist Strap with 5' Dual Conductor Cord, Large			•	•
2383VM Metal Wrist Strap with 5' Dual Conductor Cord, Large	•	•		
2384 Metal Wrist Band, Dual Conductor Cord, Small			•	•
2384VM Metal Wrist Band, Dual Conductor Cord, Small	•	•		
2385 Metal Wrist Band, Dual Conductor Cord, Medium			•	•
2385VM Metal Wrist Band, Medium	•	•		
2386 Metal Wrist Band, Large			•	•
2386VM Metal Wrist Band, Large	•	•		
4720 Dual Conductor Wrist Band, Blue	•	•	•	•

Size Key:

Small—for wrists 4 1/2"–6"
 Medium—for wrists 5 1/2"–7 1/4"
 Large—for wrists >6 1/2"

Phone: 1-800-328-1368 or www.3M.com/eisd



Equipment Ground Monitor

As part of the *Integrated Static Control Solution* offering from 3M, the 3M™ 791E Equipment Ground Monitor is a time saving, cost effective solution for maintaining the new standards of static control safeguards through a reliable, automated data acquisition, logging, and reporting system.



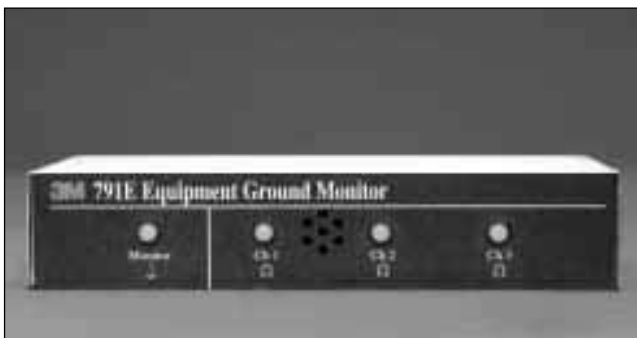
Developed with the requirements of disk drive and semiconductor facilities in mind, this new continuous monitoring system communicates with the building monitoring system already in the workplace, offering early electrostatic discharge (ESD) detection of grounding problems. This saves your company valuable time and money caused by faulty or improperly grounded equipment. The monitor also allows for easy data collection, which in turn gives supervisors the information they need to make adjustments and improvements to the present ESD program by either replacing equipment or offering specialized ESD training for employees.

The new 3M 791E Equipment Ground Monitor was developed as a modular cost-efficient system, thus allowing your company to purchase only the units required for your specific static control applications.

The 3M 791E Equipment Ground Monitor provides three channels to continuously measure the ground connections of manufacturing equipment and ESD worksurfaces.

Product Features

- Modular design
- Data output
- Small and compact size
- Stainless steel case
- Visual and audible alarms
- Regulatory compliance: UL and CE



791E Equipment Ground Monitor

Product No.	Description
791E	Equipment Ground Monitor Monitor includes: • 791E Equipment Ground Monitor • 791AC Adapter (available without AC Adapter) • 5-Wire Connector • 3M™ Dual Lock™ Mounting Fasteners • 791CG Chassis Ground Cord

Product No.	Description
Accessories	
791AC	AC Adapter
791CG	Chassis Ground Cord
2390	10' Mat Ground Cord
791EVK	Verification Kit
791D6	6x6 Data Output Cord

791E Properties

Item	Typical Properties
Monitor Size	1.3 x 6.3 x 3.3 in. (33 x 160 x 84 mm), approximate H x W x D
Power Supply Requirements	
Input	120 Vac ±10% (North America) Outside North America (As required)
Output	18 Vdc @ 100 mA rated load
Output Plug Polarization	Center negative
Output Plug Dimensions	5,5 mm x 2,1 mm x 9,5 mm (OD x ID x l)
Self-Ground Monitoring	Five-wire quick disconnect screw terminal; 1 ohm ±20%
Measurement Voltage	Low Range : < 1 Vdc; High Range: < 12 Vdc
Measurement Current	Low Range : < 1 mA; High Range: < 1 uA
Data Output Jack	RJ-11 style; 10 foot cable (optional)
Environmental	
Operating Conditions	
Temperature	Max. 104°F (40°C); Min. 50°F (10°C)
Humidity	Max. 75% relative humidity
Accuracy	
Fixed	Low range 1Ω ± 20%; High range 5 M Ω ± 5%
Adjustable	Low range 1Ω to 100Ω ± 20%; High range 5 M Ω to 35 M Ω ± 5%
Self-Ground Monitor (Mon)	1Ω – 20%





Static Control Workstation Solutions

Voltage Wrist Strap Monitor

As part of the *Integrated Static Control Solution* offering from 3M, the 3M™ 791W Voltage Wrist Strap Monitor is a time saving, cost effective solution for maintaining the new standards of static control safeguards through a reliable, automated data acquisition, logging, and reporting system.



Developed with the requirements of disk drive and semiconductor facilities in mind, this new continuous monitoring system communicates with the building monitoring system already in the workplace, offering early electrostatic discharge (ESD) detection of wrist strap problems. This saves your company valuable time and money caused by faulty or improperly worn wrist straps. The monitor also allows easy data collection, which in turn gives supervisors the information they need to make adjustments and improvements to the present ESD program by either replacing equipment or offering specialized ESD training for employees.

The new 3M 791W Voltage Wrist Strap Monitor was developed as a modular cost-efficient system, thus allowing your company to purchase only the units required for your specific static control applications.

The 791W is capable of grounding and monitoring two dual conductor wrist straps that plug into two separate remotes. The 791W simultaneously provides continuous monitoring of two operators by comparing the voltage on the operators to one of four internal voltage levels (1V, 3V, 6V, and 9V).

Product Features

- Modular design
- Data output
- Small and compact size
- Stainless steel case
- Visual and audible alarms
- Regulatory compliance: UL and CE
- VM and metal bands are to be used specifically with the 791W Monitor



791W Voltage Wrist Strap Monitor

Product No.	Description
791W	Voltage Wrist Strap Monitor Monitor includes: <ul style="list-style-type: none"> • 791W Voltage Wrist Strap Monitor • 791AC AC Adapter (available without AC Adapter) • 791WR Wrist Strap Remote • 791D6 Remote Interface Cable (10') • 791CG Chassis Ground Cord • 2-Wire Connector • 3M™ Dual Lock™ Mounting Fasteners

Product No.	Description
Accessories	
791AC	AC Adapter
791CG	Chassis Ground Cord
791WVK	Verification Kit
791D10	10x10 Data Output Cord
3057	Stand By Jack Dual Conductor Bands and Cords (see page 8 for additional information on wrist band and cord combinations.)

791E Properties

Item	Typical Properties
Monitor Size	1.3 x 6.3 x 3.3 in. (33 x 160 x 84 mm), approximate H x W x D
Power Supply Requirements	
Input	120 Vac ±10% (North America)
Outside North America	(As required)
Output	18 Vdc @ 100 mA rated load
Output Plug Polarization	Center negative
Output Plug Dimensions	5,5 mm x 2,1 mm x 9,5 mm (OD x ID x l)
Self-Ground Monitoring	Two-wire quick disconnect screw terminal; 1 ohm ±20%
Wrist Strap Remotes	Stainless steel; 10' cables (detachable); RJ-11 style mounting with 3M Dual Lock Fasteners
Data Output Jack	RJ-45 style; 10 foot cable (optional)
Environmental Operating Conditions	
Temperature	Max. 104°F (40°C); Min. 50°F (10°C)
Humidity	Max. 75% relative humidity
Accuracy	
Input	1V ± 15%; 3V, 6V and 9V ± 10%
Ground Disconnect	1Ω ± 20%
Analog Output	Voltage 1-5 Vdc ± 10%, 4-20 mA ± 10%





Static Monitor

The 3M™ 790 Static Monitor is a cost efficient unit that is small, compact and versatile in its usage, and may be mounted directly onto device handling equipment, testers, and auto insertion equipment.

Housed in static dissipative plastic, the 790 works by measuring the voltage potential on a person referenced to earth ground. The 790 uses a slide switch allowing the user to select the voltage level necessary for the specific job function being performed.

The 790 has two wrist strap input jacks located on its front, which allows two operators to use one 790 monitor unit at a workstation simultaneously. Power is supplied to the 790 through an AC adapter.

Three distinct alarms make it easy to identify operators and the type of fault condition. The audible alarm can be adjusted to a low or high level to overcome background noise from other equipment that may be in use in the area. Ring terminals on the end of the 790's ground and chassis cords provide a permanent connection.

Product Features

- Audible and visual alarms
- Compact system
- Select voltage alarm levels of 1V, 3V, 6V & 9V
- Static-dissipative plastic housing
- Mounts easily to ESD worksurface
- Regulatory Compliance: UL & CE
- VM fabric and metal bands are to be used specifically with the 790 monitor



790 Static Monitor

Product No.	Description
790	Static Monitor Monitor includes: • 790 Static Monitor • 790AC Adapter (available without AC Adapter) • 3M™ Dual Lock™ Mounting Fasteners • 2-Wire Connector

Product No.	Description
Accessories	
790AC	AC Adapter
790VK	Verification Kit
3057	Stand By Jack Dual Conductor Bands and Cords (see page 8 for additional information on wrist band and cord combinations.)

790 Properties

Item	Typical Properties
Monitor Size	3.5 x 4.0 x 1.25 in. (8,9 x 10,2 x 3,2 cm), approximate H x W x D
Power Supply Requirements	
Input	120 Vac ±10% (North America)
Outside North America	(As required)
Output	25 Vdc @ 50 mA rated load
Output Plug Polarization	Center negative
Output Plug Dimensions	5,5 mm x 2,1 mm x 9,5 mm (OD x ID x l)
Accuracy	(The following parameters are valid for altitudes up to 2000 m. Pollution degree 2, Class 3, Equipment)
Voltage Detection Levels	(1V ±15%) (3V, 6V, & 9V ±10%)
Ground Disconnect	10 ohms ±20%
Environmental Operating Conditions	
Temperature	Max. 104°F (40°C); Min. 50°F (10°C)
Humidity	Max. 75% relative humidity





Static Control Workstation Solutions

Heel Grounding Assembly

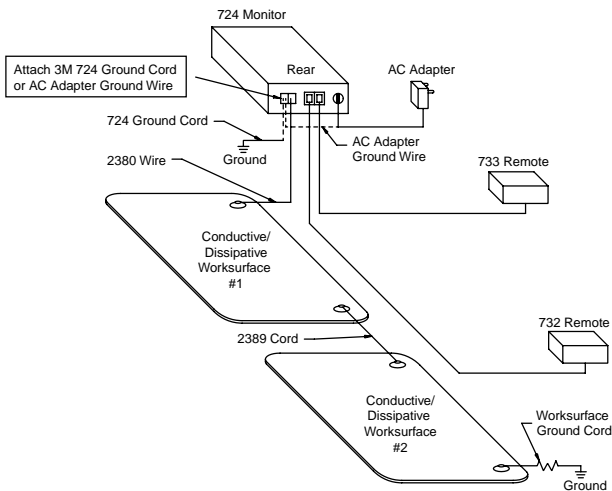
The 3M™ 724 Wrist Strap Workstation Monitor continuously verifies the resistance of the operator and worksurface ground connections. The monitor uses a reliable resistance method that actually includes the operator's skin resistance to determine if the system is operating properly. If the operator's resistance exceeds pre-set levels of 10 megohms or 35 megohms, or the wiring connections exceed 3.7 megohms, audible and visible alarms are triggered. The unit will also warn of potentially dangerous low-resistance situations. A switch allows the user to select either a 9V or 16V test voltage, and 10 megohms or 35 megohms resistance setting.

The monitor uses the light, compact dual conductor wrist strap (purchased separately; see page 16). Dual conductors provide the resistance circuit that is monitored and grounding redundancy. If one conductor fails, the other will still function to prevent sensitive components from being exposed to static.

The 724 monitors a visitor to the workstation or a second operator. In addition, the loudness of the alarm is adjustable. A quick connect/disconnect 732 Dual Remote comes with the 724.



724 Wrist Strap Workstation Monitor pictured with 3M 732 Dual Remote, 3M 4700 Dual Conductor Wrist Band and the 3M 2360 Dual Conductor Cord. (Ground Cord and band not included)



Product No.	Description
724	Workstation Monitor complete with a quick connect/disconnect 732 Remote Jack and mounting hardware.

Manufactured in ISO 9002 registered facility.
Packaged with Certificate of Conformance.

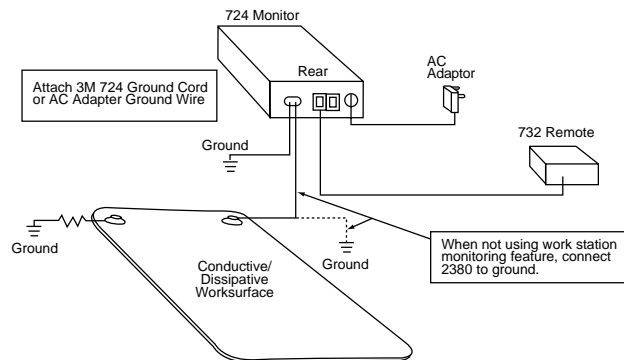
724 Properties

Item	Typical Properties
Dimensions	6.5 x 3.125 x 1.375 in. (16,5 x 7,9 x 3,5 cm)
Power Supply	25 Vdc @ 50 mA minimum
Test Voltage	9 Vdc or 16 Vdc (Switch selectable)
Test Current	Less than 3 microamps
Upper Resistance Limits	Wrist Strap: 10 or 35 Megohms Switch selectable Worksurface: 3.7 Megohms
Lower Resistance Limit	Wrist Strap: 1.5 Megohms Worksurface: None
Accuracy	± 15%
Environmental Operating Conditions	
Temperature	Max. 110°F (43°C) Min. 50°F (10°C)
Humidity	Max. 75% R.H.
Accessories	Model 733 Remote Splitter Kit Model 3057 Stand-By Jack

Note: Only use 3M Dual Conductor Bands and Cords with 724 and 725 Monitors. 3M workstation monitors were designed to work with the 3M 8200, 8300 and 8800 Series worksurfaces. Other types of mats may cause the "Mat" lamp on the monitor to light. This is due to a high electrical resistance between the grounding snaps.

The worksurface ground resistance circuit of the 3M workstation monitor indicates a malfunction when the ground loop resistance exceeds 3.7 megohms. To determine if your mat is within this limit, perform the following procedure using an ohmmeter.

Measure the resistance between the snap on the mat, where you intend to connect the monitor mat cord (2380), and the ground point for the mat. Be sure the mat is connected to ground.





Dual Conductor Portable Wrist Strap Monitor

The 3M™ 725 Wrist Strap Monitor is a small, compact, battery-powered unit that continuously monitors both the worker and the worker's wrist strap. The monitor uses a reliable resistance method that includes the worker's skin resistance to determine if the system is operating properly. The monitor uses the same dual conductor wrist strap as used with the 3M™ 724 Workstation Monitor. In addition, the 725 also monitors the ground wire connection and battery level.

The 725 Wrist Strap Monitor immediately alerts the individual when a wrist strap is operating improperly. The 725 monitor continuously supplies a current that is returned through a wrist band and cord that contain two separate independent conductors.

The monitor is a compact, portable, battery-powered unit with a visual and an audible alarm. A "parking plate" mounted on the 725 monitor allows an individual to disconnect the ground cord and clip it to the parking plate to "silence" the alarm when moving from one work area to another. The 3M™ 723 belt clip is available as an accessory item and may be purchased separately.

The competitively priced 725 Wrist Strap Monitor can be used in manufacturing and field service environments. By contributing to the protection of static sensitive devices and printed circuit boards from static damage, the 725 can save money and time as a result of improved yield rates and lower field service costs.

The 725 Wrist Strap Monitor is manufactured in an ISO 9002 registered facility and ships with a Certificate of Conformance.

Product No.	Description
725	Personal and portable Wrist Strap Monitor for use in manufacturing and field service environments. The 725 monitor features wrist strap monitoring and grounding for ESD mats/work surfaces. Accessory belt clip Model 723 converts the 725 into a portable/personal monitor.
723	Accessories: 723 Belt Clip Size, in. (cm) 2.5 x 2.625 x 1.125 (6,4 x 6,7 x 2,9)

725 Properties

Item	Typical Properties
Dimensions	2.5 x 2.6 x 1.1 in. (6,4 x 6,6 x 2,8 cm)
Power Supply	9 Volt alkaline battery (Not supplied)
Test Voltage	9 Vdc maximum
Test Current	Less than 1 microamp
Upper Resistance Limits	Wrist Strap: 35 Megohms Ground Clip: 10 Megohms
Accuracy	± 15%
Environmental Operating Conditions	Temperature: Max. 110°F (43°C), Min. 50°F (10°C) Humidity: Max. 75% R.H.
Accessories	Model 723 Belt Clip



725 Wrist Strap Monitor



Note: Only use 3M Dual Conductor Bands and Cords with the 725 Monitor. See page 8 for additional information on wrist band and cord combinations.



723 Belt Clip

 **Product Referral Generator**

724VK and 725VK pg. 14



Static Control Workstation Solutions

Monitor Verification Kits

The 3M™ 724VK and 725VK Verification Kits were designed to check the wrist strap input resistance ranges of the 700 Series Workstation, Wrist Strap, and Worksurface Monitors. The 3M™ 790VK Verification Kit contains hardware items for connecting to the 3M™ 790 Static Monitor, that are recommended when performing the verification procedure. Use of this kit allows for reliable connections to the 790 Monitor. In addition to this kit, a DC power supply and resistance substitution box are required (supplied by user). See instruction manual for complete details.



724VK Verification Kit



725VK Verification Kit



790VK Verification Kit



791EVK Verification Kit

Product No.	Description
724VK	Verification Kit Six 1% Resistor Plugs and Case
725VK	Verification Kit Four 1% Resistor Plugs and Case
790VK	Verification Kit One 5' 2360 dual conductor cord, one test wrist band socket assembly, and one two-wire male connector with 24" lead wire.
791EVK	Verification Kit
791WVK	Verification Kit

724VK Properties

Item	Typical Properties
Test Plug #1	Resistor, Metal Film, 1.33 Megohms ± 1%, 1/4 Watt
Test Plug #2	Resistor, Metal Film, 1.69 Megohms ± 1%, 1/4 Watt
Test Plug #3	Resistor, Metal Film, 8.45 Megohms ± 1%, 1/4 Watt
Test Plug #4	Resistor, Metal Film, 11.5 Megohms ± 1%, 1/4 Watt
Test Plug #5	Resistor, Metal Film, 29.4 Megohms ± 1%, 1/4 Watt
Test Plug #6	Resistor, Metal Film, 40.2 Megohms ± 1%, 1/4 Watt

725VK Properties

Item	Typical Properties
Test Plug #1	Resistor, Metal Film, 29.4 Megohms ± 1%, 1/4 Watt
Test Plug #2	Resistor, Metal Film, 40.2 Megohms ± 1%, 1/4 Watt
Test Plug #3	Resistor, Metal Film, 4.99 Megohms ± 1%, 1/4 Watt
Test Plug #4	Resistor, Metal Film, 11.5 Megohms ± 1%, 1/4 Watt



791WVK Verification Kit



Dual Conductor Remote Input Jacks

The 3M™ 732 Remote Input Jack may be purchased as a replacement part for the 3M™ 724 Workstation Monitor. It provides two phonejacks – one for the primary worker and one for use by visitors to the work area. The 3M™ 733 Remote Splitter Kit may be purchased for use in conjunction with the 724 Workstation Monitors. It offers the versatility of grounding and monitoring two workers at independent workstations that are in close proximity. The 732 and 733 feature a quick “connect/disconnect” system.



732 Remote Input Jack



733 Remote Splitter Kit

Product No.	Description
732	Replacement Remote Input Jack for the 724 Workstation Monitor. 6 ft. (1,8 cm) long cord.
	Size, in. (cm) 3.188 x 1 x 1.5 (8,1 x 2,5 x 3,8)
733	Remote Splitter Kit, 6 ft. (1,8 cm) long cord.
	Size, in. (cm) 3.188 x 1 x 1.5 (8,1 x 2,5 x 3,8)

Monitor Stand-By Jack

The 3M™ 3057 Monitor Stand-by Jack allows an operator to disconnect a ground cord from the wrist band and leave the workstation without deactivating the 724 Workstation Monitor or the 3M™ 790 Static Monitor. Simply detach the cord from the wrist band and plug it into the 3M 3057 stand-by jack.



3057 Stand-By Jack

Product No.	Description
3057	Stand-By Jack.

The 3M™ 2380 Monitor/Table Mat Replacement Cord extends from the 724 Workstation Monitor to the static-control worksurface to be monitored.

The 3M™ 2389 Monitor/Table Mat Interconnect Cord is a 10 ft. straight cord with male snap fasteners at each end. It is used to interconnect two monitored worksurfaces together.



2380 Monitor/Table Replacement Cord



2389 Monitor/Table Mat Interconnect Cord

Product No.	Description
2380	Monitor/Table Mat Replacement Cord, 6 ft. (1,8 m).
2389	Monitor/Table Mat Interconnect Cord, 10 ft. (3 m).

Note: These cords do not have a resistor molded into the snap fastener cap.



Static Control Workstation Solutions

Dual Conductor Fabric Wrist Straps for Monitors

The 3M™ 2368 Dual Conductor Fabric Wrist Strap is used exclusively with the 724 Workstation Monitor and 725 Wrist Strap Monitor.

One size adjusts to any size wrist to provide reliable protection. The wrist strap features a band made of a silver plated, monofilament, continuous thread woven together with elastic nylon to maintain full conductivity, comfort and reliability, while providing rapid and continuous drain of static charge. Two-one megohm resistors are built into the ground cord. Adjustability also simplifies ordering procedures and inventory control by eliminating the need to order and stock several band sizes.



2368 Series Fabric Wrist Band

Note: The 3M 2300 Series, 2300VM Series and 2200 Series bands and cords are not interchangeable. See page 8 for additional information on wrist band and cord combinations.

Product No.	Description
2368	Turquoise Dual Conductor Adjustable Fabric Wrist Band.
2368VM	Turquoise Dual Conductor Adjustable Fabric Wrist Band.
2360	Dual Conductor Coiled Cord, 5 ft. (1,5 m) practical length.
2370	Dual Conductor Coiled Cord, 10 ft. (3,0 m) practical length.
2371	Dual Conductor Coiled Cord, 20 ft. (6,0 m) practical length.

⚠ Warning:

These products are not to be used in areas where the individual may come in contact with exposed circuitry exceeding 250 Volts AC.

These products are for static control. It will not reduce or increase your risk of receiving electrical shock when using or working on electrical equipment. Follow the same precautions you would use without wrist straps, including:

- Make certain that equipment having a grounding type plug is properly grounded.
- Make certain that you are not in contact with grounded objects other than through the 3M Wrist Strap.
- A current limiting resistor(s) is located in these 3M Ground Cords. DO NOT REMOVE. If the resistor(s) become damaged, replace ground cord immediately.

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Dual Conductor Metal Wrist Straps for Monitors

The 3M 2300 Series Dual Conductor Metal Wrist Straps are for use exclusively with the 724 Workstation Monitors and 725 Wrist Strap Monitor. These long lasting metal expansion bands are for use in clean rooms and applications requiring extended band life.

Three sizes are available: small for wrists from 4.5 in. to 6 in. (114 mm to 152 mm) in circumference; medium for wrists from 5.5 in. to 7.25 in. (140 mm to 184 mm); and large for wrists larger than 6.5 in. (165 mm).



2381 Series Metal Wrist Strap

Note: The 3M 2300 Series, 2300VM Series, and 2200 Series bands and cords are not interchangeable. See page 8 for additional information on wrist band and cord combinations.

Product No.	Description
2381	Dual Conductor Metal Wrist Strap. Includes band and 5 ft. (1,5 m) cord. (Small)
2381VM	Dual Conductor Metal Wrist Strap. Includes band and 5 ft. (1,5 m) cord. (Small)
2382	Dual Conductor Metal Wrist Strap. Includes band and 5 ft. (1,5 m) cord. (Medium)
2382VM	Dual Conductor Metal Wrist Strap. Includes band and 5 ft. (1,5 m) cord. (Medium)
2383	Dual Conductor Metal Wrist Strap. Includes band and 5 ft. (1,5 m) cord. (Large)
2383VM	Dual Conductor Metal Wrist Strap. Includes band and 5 ft. (1,5 m) cord. (Large)
2384	Dual Conductor Metal Wrist Band. (Small)
2384VM	Dual Conductor Metal Wrist Band. (Small)
2385	Dual Conductor Metal Wrist Band. (Medium)
2385VM	Dual Conductor Metal Wrist Band. (Medium)
2386	Dual Conductor Metal Wrist Band. (Large)
2386VM	Dual Conductor Metal Wrist Band. (Large)
2360	Dual Conductor Coiled Cord, 5 ft. (1,5 m) practical length.
2370	Dual Conductor Coiled Cord, 10 ft. (3,0 m) practical length.
2371	Dual Conductor Coiled Cord, 20 ft. (6,0 m) practical length.



Static Control Workstation Solutions

Dual Conductor Wrist Bands

The 3M™ 4720 Dual Conductor Wrist Band consists of a molded, insulative, thermoplastic, colored exterior with an integrally molded conductive interior insert and low profile faceplate design. Made to be used in conjunction with the 3M 724 Workstation Monitor and the 3M 725 Wrist Strap Monitor, the 4720 Dual Conductor Band offers several unique features to provide high-tech businesses cutting edge equipment at low cost.

The dual conductor wrist band is connected to the 3M Workstation or Wrist Strap Monitor via a 3M 2300 Series Dual Conductor Ground Cord. The cords (2360, 2370, and 2371) are sold separately to allow customers the option of purchasing a cord in 5', 10' and 20' lengths respectively.

3M's exclusive "comfort bumps" design on the conductive interior insert ensures not only increased contact with the skin, but also air flow between the band and skin, resulting in more comfort for the wearer.

Made of thermoplastic material, the 4720 Dual Conductor Wrist Bands are lightweight and low profile, making reliable contact to the skin, improving employee acceptance while providing an effective grounding device. It is well known that high contact resistance between a wrist band and arm can be attributed to improper fit, dry skin or arm hair. The pliable thermoplastic material of the 4720 Wrist Band conforms to the arm, increasing the amount of contact area. The comfort bumps also aid in bringing the conductive interior of the band into contact with the skin. In 3M field trials with the 4720 wrist bands, reduced contact resistance between the wrist band and arm were noted. This improvement was also observed when compared to standard metal and fabric wrist bands.

The "zipper" style latching mechanism easily adjusts to any size wrist, effecting a "one size fits all," allowing for a secure and comfortable fit. After adjusting for proper fit to the arm, any excess band material is cut off so that the end will be contained within the latch area. The 4700 is highly visible, making it easy for supervisors to see that the wrist straps are properly used.

Product No.	Color	Description
4720	Blue	Dual Conductor Wrist band.*

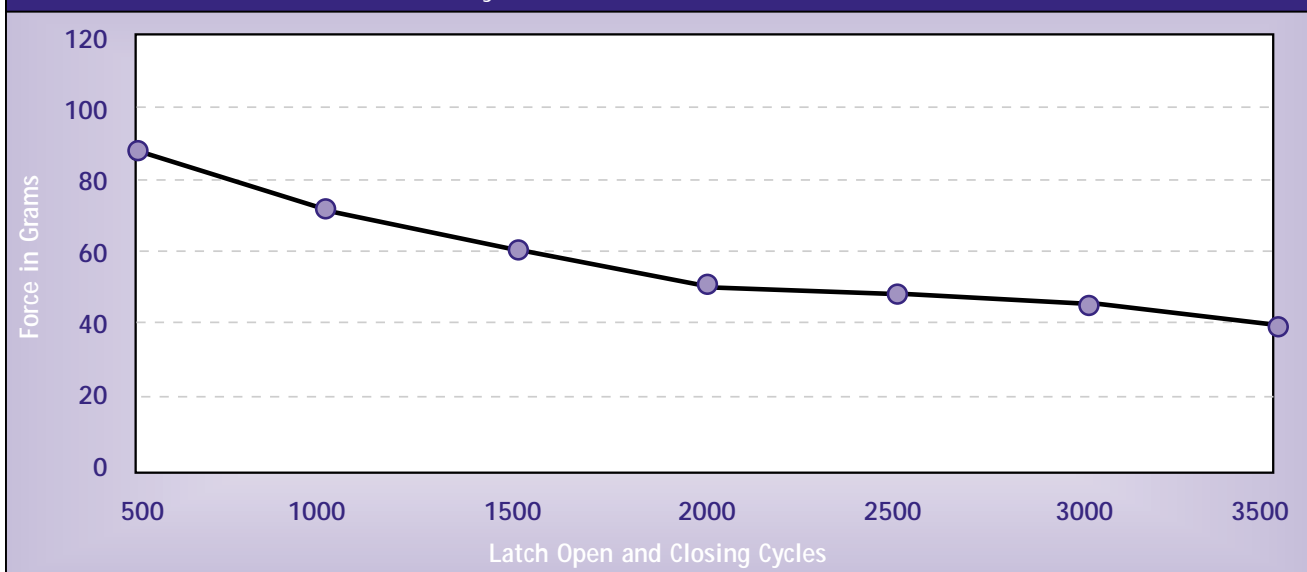
*Ground Cord not included

Product No.	Description
2360	Dual Conductor Coiled Cord, 5 ft. (1,5 m) practical length.
2370	Dual Conductor Coiled Cord, 10 ft. (3,0 m) practical length.
2371	Dual Conductor Coiled Cord, 20 ft. (6,0 m) practical length.



4720 Wrist Band with 2360 Dual Conductor Wrist Strap Ground Cord

3M 4700 Series Latch Durability





Dual Conductor Wrist Strap Ground Cords

The 3M™ Dual Conductor Wrist Strap Ground Cord is for use exclusively with 3M Dual Conductor Wrist Straps. Used in conjunction with 3M's ESD workstation monitors, the 3M 2300 series Dual Conductor Cord features an improved grip that is wider in diameter and easier to grasp when inserting and removing the cord from the remote unit. The terminations at both ends of the cord have been redesigned for a secure fit when plugged into the dual remote.

The cord's tip components are made of stainless steel, providing strength and alleviating breakage at the tip. A retaining ring prevents the tips from pulling out of the plug. Designed for heavy-duty use, the strain relief at both ends of the cord has been improved to increase the life of the cord.



2300 Series Dual Conductor Cord

Product No.	Description
2360	Dual Conductor Coiled Cord, 5 ft. (1,5 m) practical length.
2370	Dual Conductor Coiled Cord, 10 ft. (3,0 m) practical length.
2371	Dual Conductor Coiled Cord, 20 ft. (6,0 m) practical length.



Static Control Workstation Solutions

Dissipative Vinyl Three-Layer Mats and Runners

3M™ 8200 Series Mats and Runners are soft table and floor mats with a unique three-layer construction. The top layer is durable static dissipative vinyl, which has sufficiently low resistance to discharge static-laden conductors, yet will prevent the shorting of pins on the backs of printed circuit boards laid on the mat. The middle layer is a highly conductive scrim that provides the main discharge path to ground, and the bottom layer is static-dissipative foam, providing a durable nonskid cushion. Nonstandard sizes are available on a custom order basis.

8200 Series Floor Mats

Includes one 15 ft. (4,6 m) 3040 Ground Cord and two 3050 Snap Fasteners (installed).

8250 Series Floor Runners

Includes two 15 ft. (4,6 m) 3040 Ground Cords and two 3050 Snap Fasteners to be installed by customer.

8210 Series Table Mats

Includes two 3M 3050 Snap Fasteners (installed) and one 3M 3048 Wrist Strap Grounding System. Wrist Straps must be ordered separately.

8260 Series Table Runners

Includes two 15 ft. (4,6 m) 3040 Ground Cords and two 3M 3050 Snap Fasteners to be installed by user.



8200 Series Mats and Runners

8200 Properties

Property	Typical Value
Material	Top and Bottom Layers - Vinyl
Thickness	0.138 in. (3,5 mm)
Hardness	40 – 50 Shore A
*Resistance	
(Surface to Ground)	1 x 10 ⁷ Ω
(Surface to Surface)	4 x 10 ⁷ Ω

* Tested per ESD Association Standard S4.1 at 72°F, 50% RH using 3M 701 Test Kit for Static Control Surfaces (Megohmmeter)

Note: Non-standard sizes available on custom order basis up to 50 ft. maximum length

Product No.	Description	Size, ft. (m)
8201	Floor Mat, Brown.	4 x 6 (1,2 x 1,8)
8203	Floor Mat, Gray.	4 x 6 (1,2 x 1,8)
8204	Floor Mat, Blue.	4 x 6 (1,2 x 1,8)
8211	Table Mat, Brown.	2 x 4 (0,6 x 1,2)
8213	Table Mat, Gray.	2 x 4 (0,6 x 1,2)
8214	Table Mat, Blue.	2 x 4 (0,6 x 1,2)
8251	Floor Runner, Brown.	4 x 24 (1,2 x 7,2)
8253	Floor Runner, Gray.	4 x 24 (1,2 x 7,2)
8254	Floor Runner, Blue.	4 x 24 (1,2 x 7,2)
8261	Table Runner, Brown.	2 x 24 (0,6 x 7,2)
8263	Table Runner, Gray.	2 x 24 (0,6 x 7,2)
8264	Table Runner, Blue.	2 x 24 (0,6 x 7,2)
8281	Floor Runner, Brown.	2 x 40 (0,6 x 12,2)
8283	Floor Runner, Gray.	2 x 40 (0,6 x 12,2)
8284	Floor Runner, Blue.	2 x 40 (0,6 x 12,2)
8291	Floor Runner, Brown.	4 x 40 (1,2 x 12,2)
8293	Floor Runner, Gray.	4 x 40 (1,2 x 12,2)
8294	Floor Runner, Blue.	4 x 40 (1,2 x 12,2)



Product Referral Generator

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- Shoe Straps pg. 6-7
- Wrist Straps..... pg. 2-5, 16-18

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Dissipative Rubber Mats and Runners

3M™ 8800 Series Static Dissipative Rubber Mats and Runners consist of a top layer of static dissipative rubber laminated to a bottom layer of conductive rubber. Both layers are made from vulcanized synthetic rubber (Nitrile™), which offers excellent resistance to oil, grease and most common solvents. They offer superior resistance to heat and hot solder as compared to vinyl or olefinic materials. Non-standard sizes are available on a custom order basis.

8870 Series

Dissipative floor mats include one 15 ft. (4,6 m) 3040 ground cord and two 3034 snap fasteners (installed).

8880 Series

Dissipative floor runners include two 15 ft. (4,6 m) 3040 ground cords and five 3034 snap fasteners to be installed by user.

8810/8820/8830 Series

Dissipative table mats include two 3034 snap fasteners (installed) and one 3048 wrist strap grounding system.

8840/8850/8860 Series

Dissipative table runners include two 15 ft. (4,6 m) 3040 ground cords and five 3034 snap fasteners to be installed by the user.



Static Dissipative Rubber Mat

Product No.	Description	Size, ft. (m)	
8810	Table Mat, Gray	2 x 4	(0,6 x 1,2)
8811	Table Mat, Blue	2 x 4	(0,6 x 1,2)
8830	Table Mat, Gray	3 x 4	(0,9 x 1,2)
8831	Table Mat, Blue	3 x 4	(0,9 x 1,2)
8840	Table Runner, Gray	2 x 24	(0,6 x 7,2)
8841	Table Runner, Blue	2 x 24	(0,6 x 7,2)
8860	Table Runner, Gray	3 x 24	(0,9 x 7,2)
8861	Table Runner, Blue	3 x 24	(0,9 x 7,2)
8870	Floor Mat, Gray	4 x 6	(1,2 x 1,8)
8871	Floor Mat, Blue	4 x 6	(1,2 x 1,8)
8880	Floor Runner, Gray	4 x 24	(1,2 x 7,2)
8881	Floor Runner, Blue	4 x 24	(1,2 x 7,2)

Non-standard sizes available on custom order basis up to 50 ft. maximum length.

8800 Properties

Property	Typical Value
Material	Top and Bottom Layers - Nitrile™ Rubber
Thickness	0.065 in. (1,7 mm)
Hardness	60 Shore A
*Resistance	
(Surface to Ground)	$1 \times 10^6 \Omega$ to $5 \times 10^6 \Omega$
(Surface to Surface)	$1 \times 10^6 \Omega$ to $1 \times 10^7 \Omega$

* Tested per ESD Association Standard S4.1 at 72°F, 50% RH using 3M 701 Test Kit for Static Control Surfaces (Megohmmeter)



Static Control Workstation Solutions

Conductive Floor Mats for Hard Floors

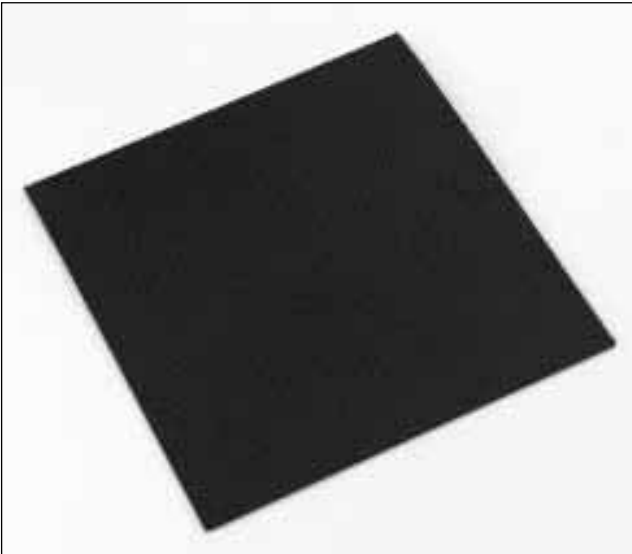
The main purpose of a conductive floor mat or runner is to remove static charge from personnel as they approach work areas. This could include supervisors and parts delivery personnel, as well as the worker who removes his or her wrist strap and momentarily steps away. Floor mats provide significant passive protection in well-traveled assembly areas. Continuous runners extend static protection throughout and between entire areas.

3M™ Velostat™ 1864 Floor Mat

This is a semi-flexible conductive floor mat that contains a rubber filler for resilience. It also has a textured surface for better traction. It includes two 3034 snap fasteners (installed) and one 15 ft. (4,6 m) 3040 ground cord with a 1 megohm resistor.

Velostat 1864R Floor Runner

The 1864R is a 50 ft. long runner of the 1864 mat material. It includes two 15 ft. (4,6 m) 3040 ground cords with 1 megohm resistor, five 3034 snap fasteners and one snap fastener installation tool.



1864 Floor Mat

Note: Shelf life of products made with Velostat resin is five years. Variations in storage conditions such as temperature fluctuation, exposure to sunlight or high humidity may reduce the shelf life.

Product No.	Description
1864	Floor Mat. 0.125 in. (3,2 mm) thick.
	Size ft. (m) 4 ft. x 6 ft. (1,2 x 1,8) 4 ft. x 8 ft. (1,2 x 2,4)
1864R	Floor Runner. 0.125 in. (3,2 mm) thick.
	Size ft. (m) 2 x 50 (0,6 x 15,0)

1864 conductive floor mats are black.
Nonstandard sizes are available on a custom order basis.

1864/1864R Properties

Property	Typical Value
Material	EVA Copolymer/Rubber
Thickness	0.125 in. (3,2 mm)
Hardness	80-85 Shore A
*Resistance (Surface to Ground) (Surface to Surface)	9 x 10 ² Ω 6 x 10 ² Ω
**Resistivity	10 ² Ω-cm

* Tested per ESD Association Standard S4.1 at 72°F, 50% RH using 3M 701 Test Kit for Static Control Surfaces (Megohmmeter)
**Tested per ASTM D 257

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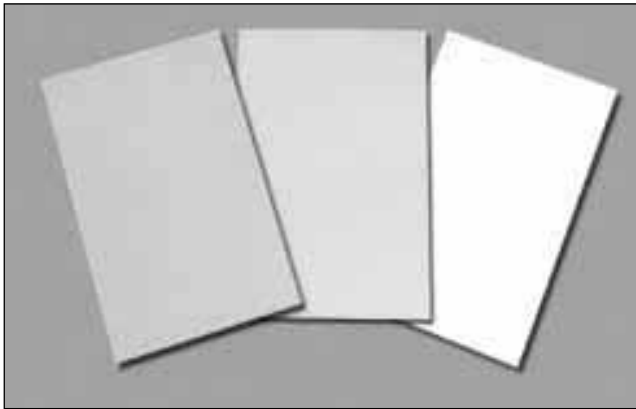
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Dissipative Hard Laminate Sheets

3M™ Dissipative Hard Laminate Sheets are used where a hard, durable, electrically safe surface is needed, providing a low coefficient of friction to permit heavy objects to slide easily. Controlled conductivity (surface-to-ground) eliminates shock hazard when working on a powered component.

This material is post-formable with normal high pressure laminate process techniques used by furniture makers. Using this technique, a tight 0.5 in. (12,7 mm) radius is possible, which allows installation without seams in corners and over rounded edges when forming parallel to sanding lines. The laminate can provide a comfortable rounded front on which personnel can rest their arms. It is resistant to common solvents and to hot solder droppings.



Dissipative Hard Laminate Sheets

Note: For consistent static charge dissipation from rigid, conductive flat-bottomed totes and trays, use of a pad or mat of 3M 8200 material in conjunction with this static-protective hard laminate is suggested, especially in areas where relative humidity often drops below 30%.

Static Dissipative 3M rigid worksurfaces, manufactured with 3M™ 8300 Series Static Dissipative Hard Laminate, have the high abrasion resistance of a laminate, yet are as easy to install as table mats. The nonglare surface also resists staining, scorching and common solvents. All edges and corners are rounded, and the 8300 Series comes ready to use with two factory-installed snap fasteners, and one 3048 grounding system for wrist strap/table mat.



8300 Series Rigid Worksurface

Product No.	Color	Size, ft. (m)	
8360	Beige	4 x 8	(1,2 x 2,4)
		3 x 12	(0,9 x 3,7)
		5 x 12	(1,5 x 3,7)
8365	Gray	4 x 8	(1,2 x 2,4)
		3 x 12	(0,9 x 3,7)
		5 x 12	(1,5 x 3,7)
8375	White	5 x 12	(1,5 x 3,7)

Nonstandard sizes and colors are also available, subject to minimum order quantity.

8300 Properties

Property	Typical Value
Thickness	0.037 in. (0,94 mm)
Hardness	
Abrasion resistance:	> 1500 cycles Tabor Wheel 32
*Resistance	
(Surface to Ground)	7 x 10 ⁶ Ω
(Surface to Surface)	6 x 10 ⁷ Ω

* Tested per ESD Association Standard 4.1 at 72°F, 50% RH using 3M 701 Test Kit for Static Control Surfaces (Megohmmeter)



Product Referral Generator

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Monitors.....	pg. 8-13
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Product No.	Color	Size, in. (cm)	
8343	Beige	0.125 x 24 x 36	(0,32 x 61,0 x 91,0)
8344	Gray	0.125 x 24 x 36	(0,32 x 61,0 x 91,0)
8353	Beige	0.125 x 24 x 48	(0,32 x 61,0 x 122,0)
8354	Gray	0.125 x 24 x 48	(0,32 x 61,0 x 122,0)



Product Referral Generator

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8800 Series Dissipative Rubber Mats/Runners.....	pg. 21
8400 Series Static Conductive Floor Tile.....	pg. 66-67
8900 Series ESD Epoxy Flooring.....	pg. 68-69
9500 Series Anti-Fatigue Mats/Runners.....	pg. 24

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Static Control Workstation Solutions

Anti-Fatigue Mats

3M™ 9500 Series Anti-Fatigue Matting may be the simplest and most effective way to reduce standing worker fatigue while providing ideal protection against static electricity problems. Physical fatigue is reduced by encouraging subtle movement of leg and calf muscles, which in turn promotes blood flow back to the heart. The use of 3M 9500 anti-fatigue mats/runners results in more comfortable, more productive workers.

The 9500 static control anti-fatigue mats/runners have excellent static-control properties. They are carbon loaded rubber with the carbon being mixed evenly throughout the material to ensure the edges are as conductive as the center. Resistance from the surface of the mat to the grounding point – the truest measure of the mat's static draining capability – is typically in the range of 2.5×10^4 to 1×10^7 ohms (measured according to ESD Standard 7.1).

The rubber surface is bonded to a highly resilient insulative sponge base. This construction provides outstanding cushioning, and reduces stress on the spine and lower back muscles, which reduces worker fatigue.

3M 9500 Series mats/runners can be cleaned by all common commercial detergents (3M 8001 Cleaner for Static Control Mats), and may be either scrubbed with a brush or damp mopped. Let dry before returning to service.



9500 Anti-Fatigue Mat

Values

Features	Advantages	Benefits
Rubber surface bonded to highly resilient sponge base.	Exceptional comfort Long lasting Easy to clean	Reduce complaints and physical problems; Improve productivity; durable and low maintenance
Carbon filled (conductive)	Excellent static dissipation	Reliable grounding
Heavy	Will stay in place	Customer acceptance
Beveled edges	Reduced tripping hazard	Reduce liability
Smooth surface maintenance	Easy to clean	Low cost
Custom sizes available	Better meet application needs	User acceptance

Product No.	Description	Size, ft. (m)
9500	Static Control Anti-Fatigue Mat (includes one installed ground snap and one 15' ground cord)	3 x 5 (0,9 x 1,5)
9510	Static Control Anti-Fatigue Mat (includes one ground snap installed every 15 linear feet with appropriate number of ground cords)	3 x up to 75 (0,9 x up to 22,9)

Note: 9510 non-standard sizes available on custom order basis.

9500 Properties

Property	Test Method	Typical Value	
Material	Top Layer	Carbon Filled Styrene Butadiene Rubber	
	Bottom Layer	- 100% Natural Rubber	
Electrical	ESD-S7.1	2.5×10^4 to 1×10^7 ohms (surface to ground resistance)	
Thickness	Caliper	0.5 in.	
Flammability	ASTM D 2859	Non-burning	
Tensile Strength	3M	630 PSI	
Durometer	Shore A	82	
Coefficient of Friction	ASTM 2047	Surpasses ADA and OSHA Recommendations	
Temperature	3M	5 to 40°C	
Compression Strength (Resiliency)	ASTM 1667	Recovery after 30 minutes = 80%	
		Recovery after 24 hours = 69%	
Chemical Deflection	ASTM 1056	3.0 - 5.0 PSI	
Compression Set	ASTM 1056	Recovery after 24 hours = 77%	
Chemical	ASTM D 543	Acetone	No visual effect
		Detergent	No visual effect
		Heptane	No visual effect
		Gasoline	No visual effect
		Isopropanol	No visual effect
		Mineral Oil	No visual effect
		Mineral Spirits	No visual effect
		Potassium Hydroxide	No visual effect
		Sodium Hydroxide	No visual effect
		Trichloroethylene	No visual effect
Xylene	No visual effect		



9500 Anti-Fatigue Mat



Anti-Fatigue Mat ground snap

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Workstation Grounding Kits

Each 3M™ Workstation Grounding Kit provides the basic items needed to create a static-safe work environment. They include a floor mat, table mat, adjustable wrist strap with grounding cord and accessories to properly connect all of the kit components.

Each kit contains:

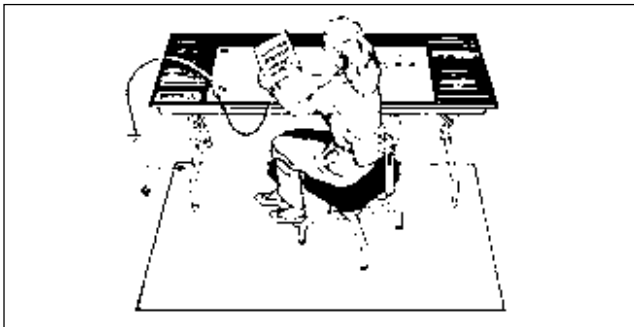
- Table Mat; 2 ft. x 4 ft. (0,6 m x 1,2 m)
- Floor Mat; 4 ft. x 6 ft. (1,2 m x 1,8 m)
- 3M 3040 Ground Cord; 15 ft. (4,6 m)
- 3M 3048 Grounding System for Wrist Strap/ Table Mat
- 3M 2214 Adjustable Wrist Strap

8020 Series Workstation Grounding Kit

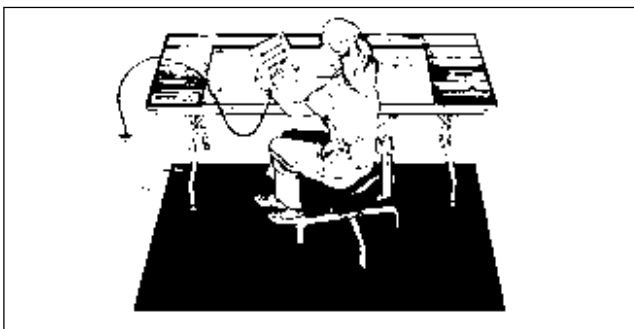
The 3M 8020 Workstation Grounding Kits provide the complete static protection offered by all the 3M kits. Both the floor and table (8200) mats are made from our soft three-layer static dissipative material.

8030 Series Workstation Grounding Kit

These kits contain two different types of static control mats. The table mat is made of the soft three-layered, static dissipative 8200 material, while the floor (1864) mat is of the more rigid, conductive Velostat™ material.



8021–8024



8031–8034

Note: Shelf life of products made with Velostat resin is five years. Variations in storage conditions such as temperature fluctuation, exposure to sunlight or high humidity may reduce the shelf life. Not recommended for use with chairs that have wheels.

Product No.	Description
8021	Brown Table and Floor Mat, 3-layer construction.
8023	Gray Table and Floor Mat, 3-layer construction.
8024	Blue Table and Floor Mat, 3-layer construction.
8031	Brown 3-layer Table Mat, Black Velostat Floor Mat.
8033	Gray 3-layer Table Mat, Black Velostat Floor Mat.
8034	Blue 3-layer Table Mat, Black Velostat Floor Mat.



Product Referral Generator

701 Test Kit..... pg. 29, 52, 54
724 Wrist Strap Workstation Monitor pg. 12

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Static Control Workstation Solutions

Worksurface Cleaning Products

The 3M™ 8001 Cleaner for static control mats is an extra-strength fluid that removes ordinary dirt and grime as well as difficult spots and stains from all types of static control surfaces, such as table mats, floor mats, hard-laminate benchtops, portable field-service kit work surface, etc. Unlike many cleaning products, the 3M 8001 Cleaner is not corrosive, per FTMS 101C, Method 3005, and leaves no tacky residue that attracts dirt, attacks delicate parts, or increases the contact resistance of the surface. It is a clear, colorless, homogeneous, water-based liquid that contains detergents, conditioners and other cleaning additives and has a fresh, clean scent.

3M laboratory tests have proven the cleaner to be an excellent topical antistat, maintaining a consistent surface resistivity (1×10^{11} ohms/square) over extended periods in both normal (55% RH) and dry (13% RH) environments. Simply spray on any washable surface and wipe off with a clean cloth or sponge—no rinsing required. The cleaner is designed to be used full-strength and supplied in handy quart spray bottles. Also available in a five-gallon jug with spigot.

Product No.	Description
8001	Cleaner for Static Control Mats.
	Size
	1 quart spray (32 oz.)
	5-gallon jug with spigot Shelf life two years



8001 Cleaner for Static Control Mats

Clean Walk Mats

3M™ 5800 Series Clean Walk Mats remove dirt and contaminants from shoe soles, wheels and other passing objects on contact. When the top sheet becomes soiled, it can be peeled back to reveal a clean adhesive sheet underneath.



5800 Clean Walk Mat

Product No.	Description
5800	Clean Walk Mats, 30 mats per pad.
	Size, in. (cm) 18 x 36 (45,7 x 85,7)
5801	Clean Walk Mats, 30 mats per pad.
	Size, in. (cm) 18 x 45 (45,7 x 114,3)
5802	Clean Walk Mats, 30 mats per pad.
	Size, in. (cm) 25 x 45 (63.5 x 114,3)

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Field Service Kits

Sensitive microelectronic components can be damaged, even destroyed, by one ever-present enemy – static electricity. Electronic equipment is especially susceptible to static electricity during servicing.

3M's static-dissipative products are designed to provide protection at a variety of field service sites, from typical office environments to remote telephone terminals. The standard field service kit quickly and reliably removes any static charge on the technician and provides a durable, static-free surface upon which to lay parts. The lightweight version offers the

same protection in a flexible, compact package. The telephone terminal service kit is especially designed to be installed at remote telephone switches or CEVs to ensure convenient static protection on site.

Practicing proper static control in the field can save time, money, and aggravation for both your customers and your company. Enable your technicians to do the job right the first time – safely and productively – with a static-dissipative portable field service kit from 3M.

Portable Field Service Kit

The 3M™ 8501 Portable Field Service Kit provides effective static protection in a compact package for the electronics field technician. The entire kit folds to a size that fits easily into most tool cases. Two pockets sewn into the worksurface provide storage for the cords.



8501 Field Service Kit

Product No.	Description
8501	Static-Dissipative Portable Field Service Kit. Kit includes: <ul style="list-style-type: none"> • Static-Dissipative Worksurface 0.021 in. x 22 in. x 24 in. (0,53 mm x 56 cm x 61 cm) • 3051 Ground Cord Assembly • 3038 Alligator Clip • 2204 Adjustable Wrist Band

Custom logo imprinting on the worksurface is available.

8501 Properties

Typical Property	Value
Resistance: (Surface-to-ground)	$1 \times 10^6 \Omega$ to $1 \times 10^9 \Omega$

Tested per ESD Association Standard 4.1 at 72°F, 50% RH using 3M 701 Test Kit for Static Control Surfaces (Megohmmeter).

The 3M™ 8502 Static-Dissipative Field Service Kit is a specially designed static-dissipative kit for installation in remote, unattended telephone switching enclosures.

The worksurface has a strip of 3M™ Hook and Loop Fastener Tape stitched to the back so it can be left suspended from the permanently mounted instruction sign.



8502 Field Service Kit

Product No.	Description
8502	Static-Dissipative Field Service Kit for remote, unattended telephone switching sites. Kit includes: <ul style="list-style-type: none"> • Static-Dissipative worksurface 0.021 in. x 8.75 in. x 24 in. (0,53 mm x 22,2 cm x 61 cm) with two pockets • Two 5 ft. (1,5m) coiled ground cords: one for mat, one for wrist band • 2204 Adjustable Wrist Band • Static Caution Sign • Plastic Instruction Sign

8502 Properties

Typical Property	Value
Resistance: (Surface-to-ground)	$1 \times 10^6 \Omega$ to $1 \times 10^9 \Omega$

Tested per ESD Association Standard 4.1 at 72°F, 50% RH using 3M 701 Test Kit for Static Control Surfaces (Megohmmeter).

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Static Control Workstation Solutions

Portable Field Service Kit

The 3M™ 8505 Portable Field Service Kit is a small, lightweight kit that offers the same level of static control as the full-sized 8501 field service kit, yet is small enough to fit in a shirt pocket.



8505 Field Service Kit

Product No.	Description
8505	<p>Lightweight Portable Field Service Kit.</p> <p>Kit includes:</p> <ul style="list-style-type: none"> • Static-Dissipative Worksurface with Pocket 0.015 in. x 15 in. x 20 in. (0,38 mm x 38 cm x 51 cm) • 2204 Adjustable Wrist Band • Lightweight Heavy-Duty Coiled Ground Cords: <ul style="list-style-type: none"> 2240 Wrist Strap Ground Cord, 5 ft. (1,5 m) 2243 Extension Ground Cord, 5 ft. (1,5 m) 3063 worksurface Ground Cord, 5 ft. (1,5 m) • 3038 Alligator Clip

Custom logo imprinting on the worksurface is available.

8505 Properties

Typical Property	Value
Resistance: (Surface-to-ground)	1 x 10 ⁶ Ω to 1 x 10 ⁹ Ω

Tested per ESD Association Standard 4.1 at 72°F, 50% RH using 3M 701 Test Kit for Static Control Surfaces (Megohmmeter).

Portable Field Service Kit

The new 3M™ 8507 Field Service Kit with a 3M™ 725 Wrist Strap Monitor bundles together two static control products to give a field technician the same continuously monitored, static protected working environment as that enjoyed by workers in a manufacturing facility.



8507 Field Service Kit

Product No.	Description
8507	<p>Portable Field Service kit includes 725 Wrist Strap Monitor and Dual Conductor Wrist Strap</p> <p>Kit includes:</p> <ul style="list-style-type: none"> • Static-Dissipative Worksurface, foldable, 0.021" x 22" x 24" red with gray cotton edging. Two pockets, each 8" x 11" ground snap. • 725 Portable Wrist Strap Monitor, 2.5" x 2.6" x 1.1", black. Battery-powered, 9V (not included). Ground cord, 6', with ground clip. Ground snap on unit to connect to the worksurface. • 2368 Dual-Conductor Fabric Wrist Band, adjustable. • 2370 Dual-Conductor Wrist Strap Ground Cord, 10'.

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Test Kits for Static Control Surfaces

The 3M™ 701 Test Kit contains a lightweight, user-friendly megohmmeter plus all of the components needed to make testing mats and other surfaces simple and accurate. All of the items are packaged in a foam-lined carrying case.

The kit meets the intent of ANSI/ESD Standard 4.1, “Worksurfaces – Resistive Characterization.” ANSI/ESD Standard 7.1, “Floor Materials – Resistive Characterization of Materials,” and MIL-PRF-87893, “Workstation, Electrostatic Discharge (ESD) Control,” for auditing purposes. The meter has separate scales and test settings for measuring surface-to-ground and surface-to-surface resistance at two prescribed test voltages (10V and 100V), and system continuity. The scales are both color-coded and numbered, and easy to read.



701 Test Kit



Product Referral Generator

- 8200 Series Floor Mats/Runners pg. 20
- 8800 Series Dissipative Rubber Mats/Runners pg. 21
- 9500 Series Anti-Fatigue Mats/Runners pg. 24
- 8400 Series Static Conductive Floor Tile pg. 66-67
- 8900 ESD Epoxy Flooring pg. 68-69

Product No.	Description
701	Test Kit for Static Control Surfaces. Certified only. Kit contains: <ul style="list-style-type: none"> • 1 Megohmmeter 12 oz. (340 g) 1.8 x 3.3 x 4.6 in. (4,57 x 8,38 x 11,68 cm) • 2 Test Weights 5 lbs. (2,27 kg) each • 2 Test Leads, 10 ft. (3 m) each • 1 Insulated Bulldog Clip • 1 Alligator Clip • 1 Continuity Test Plate • 2 Batteries (22.5V and 1.5V) • 1 Operator's Manual • 1 Molded Carrying Case
701-L	Test Leads
701-M	Megohmmeter only
701-W	5 lb. Test Weight













Test Kit Properties

Product	Item	Typical Properties
Kit	Weight:	14 pounds (6,35 kg)
	Case Dimensions:	5.125" x 10" x 13.5" (13,02 cm x 25,4 cm x 34,29 cm)
	Case Material:	Blow-molded, high density polyethylene with foam inserts
	Case Color:	Gray
Meter	Weight:	12 ounces (0,34 kg)
	Dimensions:	1.8" x 3.3" x 4.6" (4,57 cm x 8,38 cm x 11,68 cm)
	Resistance Ranges:	
	Continuity Test Mode	0 – 10M Ω (internal R=500 K Ω)
10V Surface Test Mode	10 ⁵ – 10 ¹¹ Ω (internal R=2 M Ω)	
100V Surface Test Mode	10 ⁵ – 10 ¹¹ Ω (Internal R=2 M Ω)	
Weights	2 Test Weights:	5 pounds (2,27 kg) each
	Dimensions:	Diameter – 2.5 in. (6,35 cm) Height – 5.06 in. (12,85 cm); includes handle and pad
	Pad Material:	Conductive silicone rubber
	Pad Dimensions:	Diameter – 2.5 in. (6,35 cm) Thickness – 0.25 in. (0,64 cm)
Leads	Length:	10 feet (3,05 m)
	Wire Size:	18 gauge
	Insulation:	Silicone rubber
	Diameter:	0.125" (0,32 cm)
Power Supply	Batteries (2):	22.5 volt (Eveready #505 or equivalent) and 1.5 volt (AA).








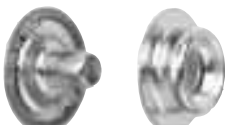
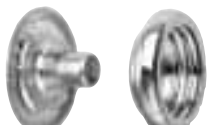



Static Control Workstation Solutions

Product No. Description

	723	Accessory Belt Clip to be used with the 3M™ 725 Wrist Strap Monitor.
	724P	Power supply for 724 Monitor and 790 Static Monitor.
	724VK	Verifies the resistance range of the 724 Workstation Monitor.
	725VK	Verifies the resistance range of the 725 Monitor.
	732	Replacement Remote Input Jack. 6 ft. (1,8 m) long cord. To be used with 724 Workstation Monitor.
	733	Remote Splitter Kit. 6 ft. (1,8 m) long cord. To be used with 724 Workstation Monitor.
	740P	Power Supply for 740.
	790P	Power Supply for 790 Static Monitor.
	790VK	Verification Kit. One 5' 2360 dual conductor cord, one test wrist band socket assembly, and one two-wire male connector with 24" lead wire.
	791CG	Chassis Ground Cord
	791D6	6x6 Data Output Cord
	791D10	10x10 Data Output Cord

Static Control Workstation Solutions












Product No.	Description
	<p>791WWK Verifies the resistance range of the 791 Voltage Wrist Strap Monitor.</p>
	<p>791EVK Verifies the resistance range of the 791 Equipment Ground Monitor.</p>
	<p>2380 Monitor/Table Mat Replacement Cord, 6 ft. (1,8 m), with 10 mm snap. Extends from the 724 Workstation Monitor to the static control worksurface to be monitored. This cord does not have a resistor molded into the snap fastener cap.</p>
	<p>2389 Monitor/Table Mat Interconnect Cord, 10 ft. (3 m), with 10 mm snap. A straight cord with male snap fasteners at each end, and no resistors. Used to interconnect two monitored worksurfaces.</p>
	<p>2390 Mat Replacement Cord for use with 791E, 10 ft. (3 m) with 10 mm snap. Extends from the 791E Equipment Ground Monitor to the static control worksurface to be monitored.</p>
	<p>3033 Snap Fastener, male, 0.125 in. (3,2 mm) hole, 10 mm diameter. For mats and runners.</p>
	<p>3034 Snap Fastener, female, 0.125 in. (3,2 mm) hole, 10 mm diameter. For mats and runners.</p>
	<p>3037 Insulated Bulldog Clip. Fits standard banana plug.</p>
	<p>3038 Uninsulated Alligator Clip. Fits standard banana plug.</p>
	<p>3040 Ground Cord, 15 ft. (4,6 m), with 10 mm snap. Molded-in male snap fastener with integral 1-megohm resistor on one end, solderless terminal on other. Connects all 3M™ static control mats and runners to building ground.</p>



Static Control Workstation Solutions

Product No. Description

	<p>3041 Grounding Kit for Static Protective Hard Laminate includes #10 screw, lock washer, #10 nut, lock washer wing nut, #10 self-tapping screw and one 10 ft. (3,0 m) ground cord. Ground cord has a 1-megohm resistor.</p>
	<p>3042 Wrist Strap Grounding System. Grounds two single conductor wrist straps and conveniently mounts beneath the edge of most work benches. Comes complete with 10 ft. (3,0 m) ground cord.</p>
	<p>3043 Interconnect Cord 5 ft. (3,5 m), with 10 mm. Snap molded-in male snap fastener at each end. Connects all 3M static control mats and runners to each other. Ground cord has a 1-megohm resistor.</p>
	<p>3047 Common Point Grounding System, 10 ft (3m) to ground workstation components. Single-row, six-terminal strip, protective cover, three cable clips. Ground cord has a 1-megohm resistor.</p>
	<p>3048 Grounding System for Wrist Strap/Table Mat. Easily snaps onto mats and runners, (10 mm snap); grounds two single conductor wrist straps. Comes complete with ring connector and 15 ft. (4,6 m) ground cord. Ground cord has a 1-megohm resistor for mat connection only.</p>
	<p>3050 Snap Fastener, female, 10 mm diameter. For 3M™ 8200 series table and floor mats and runners.</p>
	<p>3051 Ground Cord with center snap for standard field service kits. Wrist strap cord section 10 ft. (3,0 m) and ground cord section 5 ft. (1,5 m). Each contains a 1-megohm resistor.</p>
	<p>3057 Monitor Stand-By Jack. Allows operator to disconnect a ground cord from the wrist band and leave the workstation without deactivating the 3M™ 724 Workstation Monitor or 3M 790 Static Monitor.</p>
	<p>8001 Cleaner for Static Control Mats. One quart (32 oz.) trigger-spray bottle or 5-gallon jug with spigot. An extra-strength cleaner for removing dirt and stains from all types of static control surfaces, including table and floor mats, hard laminate bench tops and portable field service kits. It will also remove difficult grime from epoxy or tile flooring. Used full strength, it is a clear, colorless, water-based liquid that leaves no tacky or corrosive residue. Read all Health Hazard Precautionary and First Aid statements found in the Material Safety Data sheet and/or product label prior to handling or using. Refer to www.3M.com to obtain copy of MSDS.</p>



Ionized Air Gun

The 3M™ 980/980E Ionized Air Gun is an excellent tool for blowing particulate contamination off of any surface. It releases a balanced stream of compressed ionized air that neutralizes the static charge that can hold particulates to a surface. The loose particles can then be easily blown away. Patented technology ensures balanced ionization for consistent control of surface charges. The 980 does not need adjustment and requires very little maintenance.



980 Ionized Air Gun



The 3M 980 air gun is a multi-component device that consists of a hand unit, an air hose and a mounting console. Compact and lightweight, the console for the 980 can be mounted anywhere on the workstation for easy access. It connects to any supply of clean, dry air or nitrogen, and an internal disposable filter collects particles from the air supply. The low-voltage electrical feed from the console to the hand unit is incorporated into the 7 ft. (2,1 m) light, flexible air hose. The gun itself is very lightweight and ergonomically designed for long-term user comfort and efficient operation. The console, gun and air hose are all made of static-dissipative, ESD-safe materials.

The 3M 980 air gun operates from 100/120 AC power; the 980E is a 230V version for European use.

Product No.	Description	
980	Ionized Air Gun AC 100/120V 50/60 Hz	
	Hand unit 8.0 in. x 3.0 in. x 1.0 in. (20,3 cm x 7,6 cm x 2,5 cm)	
	Construction	Dissipative rigid polycarbonate
	Weight	12.0 oz (341 g) with 7 ft. air hose
	Emitter points	Tungsten alloy
	Air Hose Construction	Dissipative flexible polyurethane
	Size	7 ft. long, 0.38" OD
	Filter efficiency	99.9% for 0.1 micron particle size
	Console 8.5 in. x 3.0 in. x 1.6 in. (21,6 cm x 7,6 cm x 4,1 cm)	
	980E	Ionized Air Gun – European version AC 230V ~ 50/60 Hz
Hand unit 8.0 in. x 3.0 in. x 1.0 in. (20,3 cm x 7,6 cm x 2,5 cm)		
Console 8.5 in. x 3.0 in. x 1.6 in. (21,6 cm x 7,6 cm x 4,1 cm)		

Product No.	Description
Accessories	
980F	Replacement Air Filters (4 pack of 3)
980T	Replacement Nozzle Tip
960X/980X	Replacement Wall Transformer, 120V
980E-X	Replacement Wall Transformer, 230V

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Static Control Workstation Solutions

Benchtop Air Ionizers

The use of ionized air in electronics work environments will remove the build up of potentially damaging static charges. Air ionizers are primarily used to control static charge on nonconductive materials. The 3M™ 963 Series Benchtop Air Ionizers blanket the benchtop with ionized air to help prevent static from damaging sensitive electronics.

Features

- Two versions available: the 963 operates using AC 120V power, and the 963E from DC 24V power supplied by an included universal power transformer (power line cord not included).
- Fast neutralization of static charges on nonconductive objects. < 1 second at 1 ft. (30 cm) distance using ANSI/ESD S3.1 test procedure.
- Maintains equal balance of positive-negative ions
- Two-speed fans
- Static-dissipative housing prevents static charge build-up on the surface of the housing, a common problem with ionizers. "ESD-safe" design allows the ionizer to be part of your overall static-safeguarded electronic workstation.
- UL, C-UL, NOM certification. CE-marked.

Product No.	Description
963	Benchtop Air Ionizer, including ionizer, Operator's Manual, and power cord; 120VAC
963E	Benchtop Air Ionizer, including ionizer, Operator's Manual, and power transformer, 100VAC-240VAC



963 Benchtop Air Ionizer



Product Referral Generator

- 8200 Series Floor Mats/Runners pg. 20
- 8800 Series Dissipative Rubber Mats/Runners pg. 21
- 718A Air Ionizer Test Kit..... pg. 38

963 Benchtop Air Ionizer Physical Characteristics

Property	Typical Values	
	Model 963	Model 963E
Power Ratings	AC 120V 60 Hz 0.20 A 20 W	DC 24V 0.5A 10W
Power Inlet	IEC 320 Socket	Mini DIN socket
Power Transformer	-	Input: AC 100V-240V, 0.4A, 50/60 Hz Into IEC320 Socket. Output: DC24V, 0.5A 3' (0.9M) cord with Mini DIN plug
Power Outlet Cord	6' (1.8m) cord with IEC 320 and NEMA 5-15 plugs	Not included
Dimensions (w/mounting base)	7.0" W x 9" H x 4" D 18 cm W x 23 cm H x 10 cm D	7.0 in. W x 9 in. H x 4 in. D 18 cm W x 23 cm H x 10 cm D
Weight	2.5 lb. (1.1 kg)	2.5 lb. (1.1 kg)
Air Flow		
Low Speed		
Feet per Minute	200 fpm (1.0 m/s)	100 fpm (0.5 m/s)
Standard Cubic Feet per Minute	56.8 scfm	37.3 scfm
High Speed		
Feet per Minute	370 fpm (1.8 m/s)	300 fpm (1.5 m/s)
Standard Cubic Feet per Minute	105 scfm	112 scfm
Operating Temperature	59°F (15°C) to 104°F (40°C) 59°F	59°F (15°C) to 104°F (40°C)
Static discharge time * @ 1 ft. (30 cm)	< 1 second	< 1 second
Offset Voltage	±15V	±15V
Certifications and approvals	UL, C-UL, NOM	UL, C-UL, NOM, CE
Warranty	1-year	1-year

* When tested according to ANSI/ESD S3.1-1991 at high fan speed.

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Mini Air Ionizer

The 3M™ 960 Mini Air Ionizer is a small and versatile blower available for equipment or local area ionization. Its small size makes it ideal for use in those situations where space is at a minimum. Possible applications include in or around electronic product equipment, inside OEM equipment, or on ESD workstations.

The 960 Mini Air Ionizer generates a well-balanced flow of ionized air particles, which neutralizes any stray electrostatic buildup on a surface. Charges are dissipated in seconds and the possibility of a damaging electrostatic discharge (ESD) event is minimized. The 960 also maintains a reasonably balanced flow ($\pm 20V$) of ionized air.

The 960 runs off of low-voltage 24VAC power, that can be supplied by the 3M 960X Wall Transformer (sold separately). Included with the 960 are a mounting bracket and a 3ft. telephone cable (with modular plugs) to connect the ionizer to the 960X.

Features

- Steady-state DC ion emission for efficient ion delivery
- Intrinsically balanced - no adjustment necessary
- Small/compact design utilizes very little work bench space
- UL/C-UL/CE for global acceptance



960 Mini Air Ionizer



Product No.	Description
960	Mini Air Ionizer
960X/980X	Wall Transformer

960 Mini Air Ionizer

Item	Typical Properties
Input Voltage	AC 24V
Power	5.5 watts
Power Input Connection	RJ-11 socket
Size	4.5 in. (H) x 3.3 in. (W) x 2 in. (D) (including bracket) 11.5 cm x 8.4 cm x 5.1 cm
Weight	0.75 lb.
Air Flow Velocity	(@1 ft. in front of grille): 300 ft./min.
Air Flow Volume	22 scfm
Certifications	UL, C-UL, CE
*Offset Balance @ 1 ft.	$\pm 20 V$
*On Center Discharge Times	@ 1 ft. <4 seconds @ 2 ft. <10 seconds @ 3 ft. <18 seconds @ 4 ft. <28 seconds

*Testing was performed with a charged plate monitor in accordance with ionization standard ANSI/ESD 3.1 - 1991.

960X/980X Wall Transformer (sold separately)

Item	Typical Properties
Input	AC 120V, 50/60 Hz, 270 mA
Output	AC 24V, 1.0 A through RJ-11 socket connector
Dimensions	3.2 in. (H) x 2.6 in. (W) x 1.9 in. (D) 8.1 cm x 6.6 cm x 4.8 cm
Weight	16 oz.
Certifications	UL

Note: One transformer will supply four 960 Mini Air Ionizers.



Static Control Workstation Solutions

Air Ionizer Tester/Field Meter and Charger

718 Static Sensor

The 3M™ 718 Static Sensor is an easy-to-use, hand-held instrument designed to measure static voltages on objects and surfaces, arising from electrostatic charge buildups. This instrument can play a valuable role in an organization's ESD-control program by helping the user locate and quantify ESD trouble-spots.

Features

- Small-size, lightweight, conductive plastic housing
- Membrane switches for Power, Range/Zero, and Hold functions
- Digital, LCD (liquid-crystal) display is easy to read and updates quickly
- Ranging systems assist user in making quick and easy measurements
- Measurements accurate to 5%
- Output jack available for continuous measurements



718 Static Sensor

718A Air Ionizer Test Kit

The 3M™ 718A Air Ionizer Test Kit, when used in conjunction with the 718 Static Sensor, can be used for periodic verification of air ionizer performance. The 718A consists of a charge plate and a charger.



718A Air Ionizer Test Kit

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Product No.	Description
718	Static Sensor, including meter, Operator's Manual, and Certificate of Performance verification. Certified only.
718A	Air Ionizer Test Kit, including charge plate assembly, charger, Operator's Manual, and Certificate of Performance verification.

718 Static Sensor Physical Characteristics

Item	Typical Properties
Dimensions	0.85" (H) x 2.4" (W) x 4.15" (L) 2.2 cm (H) x 6.1 cm (W) x 10.5 cm (L)
Weight	4.5 oz. (128 g) with battery
Power Requirements	One 9-volt alkaline battery (not included)
Measurement Ranges	0 – 2 kV Low Range 0 - 20 kV High Range
Voltage Display	3½ digit liquid crystal display
Distance indicator	LED targets. Aligned targets indicate 1 in. (2.54 cm) measurement distance
Measurement accuracy	Within 5% of actual voltage
Certifications	UL, C-UL, CE, CB-scheme, NOM

3M 718A Air Ionizer Test Kit Physical Characteristics

Item	Typical Properties
Charge Plate Assembly	Per ESD Association Standard Practice - 3.3
Charge Plate assembly Weight	2.5 oz (70 g)
Charger Dimensions	0.85" (H) x 2.4" (W) x 5.0" (L) 2.2 cm (H) x 6.1 cm (W) x 12.7 cm (L)
Charger Weight	6 oz. (170 g) with battery
Charger Power Requirements	One 9 volt alkaline battery
Charger Output	1100V minimum for positive or negative voltage
Certifications	UL, C-UL, CE, CB-scheme, NOM





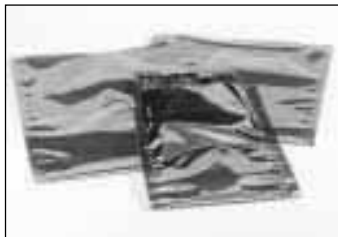
Static Control Packaging and Transportation Products

Static Shielding Bags

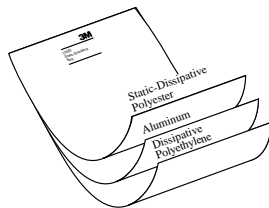
The 3M™ 1900/1910 Metal-In Static Shielding Bag is an economical alternative shielding bag for less demanding applications where testing and reusing bags are not prime considerations.

Aluminum is vapor-coated on half-mil polyester. This shielding layer is bonded between the polyester layer and a static-dissipative polyethylene inner layer. 1900/1910 bags are amine-free, non-corrosive and meet EIA-541 definition for static shielding/dissipative packaging.

The 1910 features a zipper closure for easy opening and closing.



1900/1910 Shielding Bag



Cross-section

1900/1910 Properties

Property	Test Method	Typical Value
Thickness	ASTM D2103	2.9 mil (74 microns)
Strength Tensile	ASTM D882	18 lbs./in. width > 6200 PSI MD/TD
Puncture Seam	FTMS 101 MIL PRF 81705	>12 lbs. (5,4 kg) Pass
Optical Density	ASTM D1003	.35-.45
Surface Resistance/Resistivity		
Interior	ESD S-11.11	<10 ¹¹ ohms
Exterior	ESD S-11.11	<10 ¹¹ ohms
Metallized Layer	Monroe #267	<10 ² ohm/sq.
Electrostatic Shielding	EIA-541 (V-Zap) ANSI/ESD S11.31	<30V <25nJ
Electrostatic Decay Interior	EIA-541	<2 sec.
Contact Corrosivity	FTMS 101C, Method 3005	Pass
Outgassing		
TML	ASTM E595	<1.0%
CVCM	ASTM E595	<0.1%
Heat Seal Properties		
Temperature		180°F – 250°F (82°C – 121°C)
Time		0.5 – 5.0 Sec.
Pressure		20 – 60 PSI (1.4 x 10 ⁵ – 4.1 x 10 ⁵ N/m ²)
Shelf Life		1 – Year

Product No.	Description																																																								
1900	Metal-In Static Shielding Bag. 100 bags per pack																																																								
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Dimensions are inside measurements (W x L).
Custom printing on bags also available by special order.
(Please contact 3M Customer Service for quotations.)



Product Referral Generator

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Static Shielding Bags

The 3M™ 1960 Metal-In Bag is a low-cost, lightweight bag that meets the electronic industry's static shielding requirements. The construction consists of vapor-coated aluminum on half-mil polyester, which is then bonded to a static-dissipative polyethylene inner layer. The 1960 bag meets the electrical and physical performance requirements of standard static shielding bags, and is lighter in weight to provide significant cost savings.

1960 Static Shielding Bag Properties

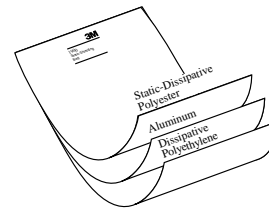
Property	Test Method	Typical Value
Thickness	Measure	2.0 mil (51 microns)
Tensile Strength	ASTM D 882	>4000 PSI MD/TD
Puncture Resistance	FTMS 101C Method 2065	>8 lbs.
Optical Density	ASTM D 1003	0.35-0.45
Seam Strength	Mil PRF 81705C	Pass (3.5 lb, 1.6 kg. Hanging weight: <3.175 mm 1/8 inch separation)
Surface Resistance Exterior	ANSI/ESD S 11.11	<1 x 10 ¹¹ ohms @12%R.H
Surface Resistance Interior		> 1 x 10 ⁸ , < 1 x 10 ¹¹ ohms @12% R.H.
Static Discharge Shielding	ANSI/ESD S 11.31	< 10 nJ (1 kV discharge)
Polycarbonate Compatibility	EIA 564	Pass - 185°F, 3400 PSI
Amines, Amides, Silicone	FTIR/NMR	None Added
Shelf life (from date of manufacture)		1 year

The 3M 1970 Static Shielding Bags are designed to meet the demanding static shielding requirements in the electronic assembly and disk drive storage markets. The 1980 bag, a zipper version of the 1970 bag, is also available upon request in the same standard sizes.

1970 Static Shielding Bag Properties

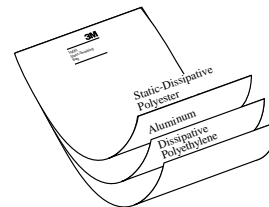
Property	Test Method	Typical Value
Thickness	Measure	2.9 mil. (74 microns)
Tensile Strength	ASTM D 882	>6200 PSI MD/TD (2.4 x 10 ⁷ N/m ²)
Puncture Strength	FTMS 101C Method 2065	>10 lbs. (>4.54 kg)
Optical Density	ASTM D 1003	0.35-0.45
Transparency	ASTM D 1003	40%
Seam Strength	Mil PRF 81705D	Pass (3.5 lb./1.6 kg Hanging weight)
Surface Resistance	ANSI/ESD S 11.11	<1 x 10 ¹¹ ohms @12% R.H.
Static Discharge Shielding	ANSI/ESD S 11.31	< 25 nJ
Outgassing	Static Headspace	<10µg/g Total < 1µg/g Hydrocarbons
Ionic Contamination	Extraction/IC	<30ng/cm ² : Na, F, PO ₄ , SO ₄ , Cl, NH ₄
Non Volatile Residue	ASTM E 1235 (reference)	<150ng/cm ² : NO ₃ < 1µg/cm ²
Polycarbonate	EIA 564	Pass - 185°F (85°C), 3400 PSI
Compatibility Amines, Amides, Silicone	FTIR/NMR	None Added
Shelf life (from date of manufacture)		1 year

Product No.	Description
1960	Static Shielding Bag.
	Standard Sizes, in. (cm)
	4 x 6 (10,2 x 15,2)
	5 x 8 (12,7 x 20,3)
	6 x 8 (15,2 x 20,3)
	6 x 10 (15,2 x 25,4)
	8 x 10 (20,3 x 25,4)
	8 x 12 (20,3 x 30,5)
	10 x 12 (25,4 x 30,5)
	12 x 18 (30,5 x 45,7)
15 x 18 (38,1 x 45,7)	
18 x 18 (45,7 x 45,7)	



Cross-section

Product No.	Description
1970	Static Shielding Bag.
	Standard Sizes, in. (cm)
	3 x 5 (7,6 x 12,5)
	4 x 6 (10,2 x 15,2)
	5 x 8 (12,7 x 20,3)
	6 x 10 (15,2 x 25,4)
	7 x 10 (17,8 x 25,4)
	8 x 10 (20,3 x 25,4)
	8 x 12 (20,3 x 30,5)
	10 x 12 (25,4 x 30,5)
	10 x 14 (25,4 x 35,6)
	11 x 15 (27,9 x 38,1)
	12 x 16 (30,5 x 40,6)
15 x 18 (38,1 x 45,7)	



Cross-section

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Static Control Packaging and Transportation Products

Static Shielding Bags

3M™ 2100R Metal-Out Static Shielding Bags are produced with a construction in which the shielding layer is very near the exterior surface. A thin abrasion-resistant coating protects this metal surface from scratches, but still permits rapid charge draining when the bag is placed on a conductive or dissipative work surface.

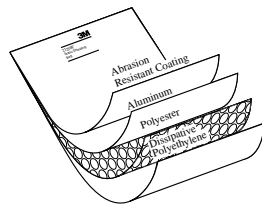
2100R bags use a polyester layer that is double the thickness found in economy bags. This polyester is the sturdy foundation to which the thin metallization layer is applied. This makes 2100R bags more durable and provides electrical isolation that prevents electrical currents from passing through the bag.

The interior features an amine-free antistat agent that limits triboelectric charging of parts as they move around inside the bag. It does not contribute to corrosion of parts or crazing of polycarbonate materials, and it does not rely solely on the ambient humidity for effective performance. It functions properly in conditions as low as 10% R.H.

3M 2110R bags use the same film as the 2100R, but feature a zipper closure for easy opening and closing.



2100R Shielding Bag



Cross-section

2100R/2110R Properties

Property	Test Method	Typical Value
Thickness	ASTM D2103	3.2 mil (81 microns)
Strength Tensile	ASTM D882	9000 PSI (6.2 x 10 ⁷ N/m ²)
Puncture Seam	FTMS 101 MIL PRF 81705	24 lbs. (10,9 kg) Pass
Optical Density	ASTM D1003	.35-.45
Surface Resistance/Resistivity		
Interior	ANSI/ESD S11.11	<10 ¹¹ ohms
Exterior	ANSI/ESD S11.11	<10 ⁹ ohms
Metallized Layer	Monroe #267	<10 ² ohm/sq.
Electrostatic Shielding	EIA-541 (V-Zap) ANSI/ESD S11.31	<30V <25nJ
Decay Time	EIA-541	<2 sec.
Contact Corrosivity	FTMS 101C Method 3005	Pass
Outgassing TML	ASTM E595	<1.0%
CVCM	ASTM E595	<0.1%
Heat Seal Properties		
Temperature		180°F - 250°F (82°C - 121°C)
Time		0.5 - 5.0 sec.
Pressure		20 - 60 PSI
Shelf Life (from date of manufacture)		1 - Year

Product No.	Description	
2100R	Metal-Out Static Shielding Bag. 100 bags per pack	
	Standard Sizes, in. (cm)	
	3 x 5	(7,6 x 12,5)
	4 x 4	(10,2 x 10,2)
	4 x 6	(10,2 x 15,2)
	4 x 26	(10,2 x 66,0)
	4 x 30	(10,2 x 76,2)
	5 x 8	(12,7 x 20,3)
	6 x 8	(15,2 x 20,3)
	6 x 10	(15,2 x 25,4)
	7 x 15	(17,8 x 38,1)
	8 x 8	(20,3 x 20,3)
	8 x 10	(20,3 x 25,4)
	8 x 12	(20,3 x 30,5)
	10 x 12	(25,4 x 30,5)
	10 x 14	(25,4 x 35,6)
	10 x 24	(25,4 x 61)
	11 x 15	(27,9 x 38,1)
	12 x 16	(30,5 x 40,6)
	12 x 18	(30,5 x 45,7)
	14 x 18	(35,6 x 45,7)
	15 x 18	(38,1 x 45,7)
16 x 24	(40,6 x 61)	
18 x 18	(45,7 x 45,7)	
18 x 24	(45,7 x 61)	
	Custom Size Limits, in. (cm)	
	2 x 3 to 36 x 36 (5,1 x 7,6 to 91,4 x 91,4)	

Product No.	Description	
2110R	2100R with Zipper Closure. 100 bags per pack	
	Standard Sizes, in. (cm)	
	3 x 5	(7,6 x 12,5)
	4 x 4	(10,2 x 10,2)
	4 x 6	(10,2 x 15,2)
	5 x 8	(12,7 x 20,3)
	6 x 8	(15,2 x 20,3)
	6 x 10	(15,2 x 25,4)
	8 x 8	(20,3 x 20,3)
	8 x 10	(20,3 x 25,4)
	8 x 12	(20,3 x 30,5)
	10 x 12	(25,4 x 30,5)
	10 x 14	(25,4 x 35,6)
	11 x 15	(27,9 x 38,1)
		Custom Size Limits, in. (cm)
		3 x 3 to 24 x 30 (7,6 x 7,6 to 61 x 76,2)

Dimensions are inside measurements (W x L).
Custom printing on bags available by special order.
(Please contact 3M Customer Service for quotations.)

TEPRO s.r.o.

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The 3M™ 2100R product line will be discontinued due to a sudden and unrecoverable interruption in the availability of a raw material. 3M will continue to service orders that can be supported by current finished goods and raw materials inventory until they are depleted. 3M is currently developing an alternative film that is identified as 2170, which is targeted for release mid-year, 2003. If you have questions, please contact your local 3M Sales Representative or Customer Service Representative.



Static Shielding Bags

3M™ 2120R Metal-Out Cushioned Static Shielding Bags protect devices from physical damage as well as provide proper static shielding. The open-cell cushioning structure provides physical shock protection even when punctured. This system offers a more convenient packaging method than two-part packaging systems.

The five-layer construction of the 2120R protects against direct discharge, triboelectric charge and static fields. The inside layer, next to the components, is a smooth static-dissipative polyethylene liner that minimizes snagging of pins or sharp edges during insertion or removal.

2120R Properties

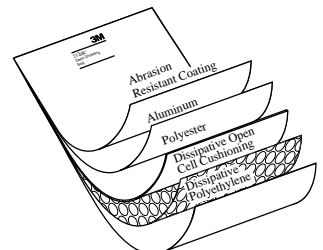
Property	Test Method	Typical Value
Thickness	PPP-C-1842	125 mil (3,175 mm)
Strength		
Tensile	ASTM D882	34 lbs./in.
Puncture	FTMS 101	22 lbs. (10 kg)
Seam	MIL PRF 81705	Pass
Surface Resistance/Resistivity		
Interior	EIA-541, ASTM D257	<10 ¹² ohm/sq.
Exterior	ANSI/ESD S11.11	<10 ¹¹ ohms
Metallized Layer	Monroe #267	<10 ² ohm/sq.
Shielding	EIA-541 (V-Zap)	<30V
Electrostatic Decay		
Interior	EIA-541	<2 sec.
Contact Corrosivity	FTMS 101C, Method 3005	Pass
Shelf life (from date of manufacture)		1 - Year

Product No.	Description
2120R	Cushioned Static Shielding Bags. 100 bags per pack
	Standard Sizes, in. (cm)
	6 x 7 (15,2 x 17,8)
	8 x 7 (20,3 x 17,8)
	8 x 11 (20,3 x 27,9)
	10 x 7 (25,4 x 17,8)
	12 x 11 (25,4 x 27,9)
	14 x 11 (35,6 x 27,9)
	14 x 15 (35,6 x 38,1)
	16 x 11 (40,6 x 27,9)
16 x 15 (40,6 x 38,1)	
18 x 11 (45,7 x 27,9)	
18 x 15 (45,7 x 38,1)	
18 x 23 (45,7 x 58,4)	
Custom Size Limits, in. (cm)	5 x 4 to 24 x 23 (12,7 x 10,2 to 61 x 58,4)

Dimensions are inside measurements (W x L).

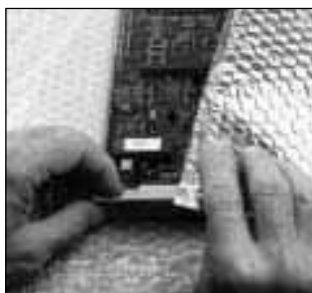


2120R Shielding Bag

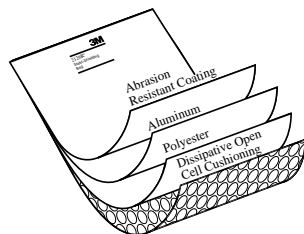


Cross-section

3M 2126R Cushioned Wrap provides static shielding and physical protection for large or irregularly shaped circuit boards. It is made of the same open-cell cushioning construction used for the 2120R bag and is heat-sealable, but does not have the smooth inner liner. Supplied in rolls, it can be cut to fit various wrapping applications.



2126R Shielding Wrap



Cross-section

Product No.	Description
2126R	Cushioned Static Shielding Wrap. Supplied in rolls
	Standard Sizes, in. x ft. (cm x m)
	24 x 250 (61 x 76) 48 x 250 (122 x 76)

2126R Properties

Property	Test Method	Typical Value
Thickness	PPP-C 1842	125 mil
Strength		
Tensile	ASTM D882	34 lbs./in.
Puncture	FTMS 101	22 lbs. (10 kg)
Surface Resistance/Resistivity		
Interior	ANSI/ESD S11.11	<10 ¹² ohm/sq.
Exterior	ANSI/ESD S11.11	<10 ¹¹ ohms
Metallized Layer	Monroe #267	<10 ² ohm/sq.
Shielding	EIA-541 (V-Zap)	<30V
Electrostatic Decay		
Interior	ANSI/ESD S11.11	<2 sec.
Contact Corrosivity	FTMS 101C, Method 3005	Pass
Shelf life (from date of manufacture)		1 - Year

The 3M™ 2100R product line will be discontinued due to a sudden and unrecoverable interruption in the availability of a raw material. 3M will continue to service orders that can be supported by current finished goods and raw materials inventory until they are depleted. 3M is currently developing an alternative film that is identified as 2170, which is targeted for release mid-year, 2003. If you have questions, please contact your local 3M Sales Representative or Customer Service Representative.

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Static Control Packaging and Transportation Products

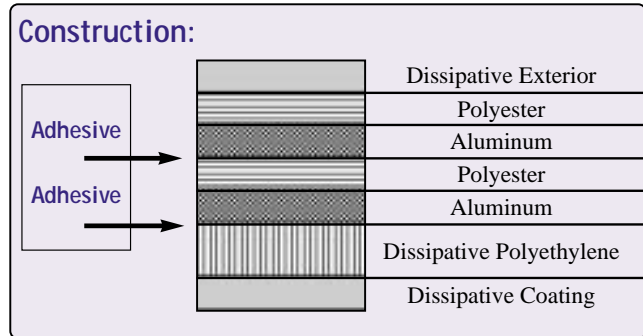
Moisture Vapor Barrier Bag

The 3M™ 3370 Moisture Barrier Bag has been designed to meet the demanding moisture protection needs of the electronics market.

- **Durability** – Utilizes a multi-layer 3.6 mil film design that provides puncture and tear resistance. Proven reliability in vacuum packaging applications.
- **Moisture Protection** – Provides proven long-term protection in the most critical seepage area – the seams. 3M provides a 1/2" side seam to increase reliability that the finished bag is capable of maintaining the MVTR level equivalent to that of the film. The 3370 bag's multi-layer design eliminates problems associated with "pinholes" found in many foil bags.
- **ESD/EMI shielding** – Provides high frequency protection and static shielding to protect the most sensitive parts.
- **Cleanliness** – Uses a clean barrier film which exceeds the requirements of EIA-583 Class I and contains no amines, amides or N-Octanoic Acid. Outgassing levels are extremely low.
- **Construction** – Opaque bag is a highly durable construction (from the outside layer to the innermost layer): static dissipative layer, two aluminized polyester layers each 48 gauge, 2.6 mil static dissipative polyethylene.
- **Industry Standards** – Meets the electrical and physical requirements of JESD 625A, MIL-PRF-81705, Type 1, EN100015, IEC61340-5-1.

The 3370 bag is available in many standard sizes and can be custom-sized for your specific application.

Product No.	Description																		
3370	Moisture Vapor Barrier Bag. 100 bags per pack.																		
	<table border="1"> <thead> <tr> <th>Size, in.</th> <th>(cm)</th> </tr> </thead> <tbody> <tr> <td>4 x 6</td> <td>(10,2 x 15,2)</td> </tr> <tr> <td>5 x 8</td> <td>(12,5 x 20,3)</td> </tr> <tr> <td>6 x 10</td> <td>(15,2 x 25,4)</td> </tr> <tr> <td>8 x 10</td> <td>(20,3 x 25,4)</td> </tr> <tr> <td>10 x 12</td> <td>(24,4 x 30,5)</td> </tr> <tr> <td>12 x 16</td> <td>(30,5 x 40,6)</td> </tr> <tr> <td>16 x 18</td> <td>(40,6 x 45,7)</td> </tr> <tr> <td>18 x 24</td> <td>(45,7 x 61)</td> </tr> </tbody> </table>	Size, in.	(cm)	4 x 6	(10,2 x 15,2)	5 x 8	(12,5 x 20,3)	6 x 10	(15,2 x 25,4)	8 x 10	(20,3 x 25,4)	10 x 12	(24,4 x 30,5)	12 x 16	(30,5 x 40,6)	16 x 18	(40,6 x 45,7)	18 x 24	(45,7 x 61)
Size, in.	(cm)																		
4 x 6	(10,2 x 15,2)																		
5 x 8	(12,5 x 20,3)																		
6 x 10	(15,2 x 25,4)																		
8 x 10	(20,3 x 25,4)																		
10 x 12	(24,4 x 30,5)																		
12 x 16	(30,5 x 40,6)																		
16 x 18	(40,6 x 45,7)																		
18 x 24	(45,7 x 61)																		



3370 Static Shielding Bag

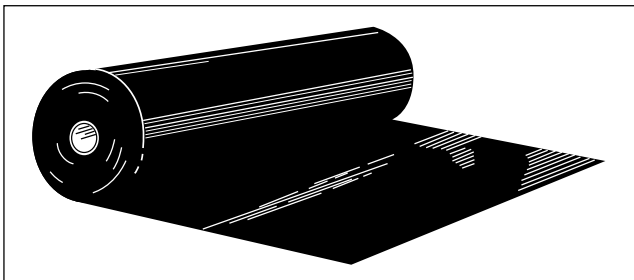
Property	Test Method	Typical Value
Thickness	Measure	3.6 mil. (92 microns)±10%
Moisture Vapor Transmission Rate	ASTM F 1249	< 0.015 grams/100 inches ² /24 hours (645.2 cm ²) (film and seams)
Tensile Strength	ASTM D 882	> 8200 PSI (5.7 x 10 ⁷ N/m ²)
Puncture Resistance	FTMS 101C Method 2065	> 20 lbs. (9.07 kg)
Seam Strength	Mil PRF 81705(D)	Pass (3.5 lb./1,6 kg hanging weight)
Surface Resistance (Interior and Exterior)	ANSI/ESD S 11.11	<1 x 10 ¹¹ ohms @12% R.H.
Metal Layer	Monroe 267 Buried Layer	< 100 ohms
Static Discharge Shielding	ANSI/ESD S 11.31	< 7 nJ
Outgassing	Static Headspace	<10µg/g Total < 1µg/g Hydrocarbons
Ionic Contamination	Extraction/IC	<20ng/cm ² : Na, F, PO ₄ , SO ₄ , Cl, NH ₄ <100 ng/cm ² : NO ₃
Non Volatile Residue	ASTM E 1235 (reference)	<1 µg/cm ²
Polycarbonate Compatibility	EIA 564	Pass - 185°F (85°C), 3400 PSI
Amines, Amides, Silicone	FTIR/NMR	None Added



Conductive Film and Tubing

The 3M™ Velostat™ family of products is made of opaque, volume-conductive, carbon-impregnated polyolefin. Easily grounded, the electrical characteristics are not affected by age or humidity, and are suited for material handling, shipping and storage.

Velostat Electrically Conductive Film
Velostat film made of opaque, volume-conductive, carbon-impregnated polyolefin, in both short and long rolls, is a versatile product – adaptable to numerous applications commonly found in the electronic or chemical industries.



1700, 1760 Series Film

Velostat Conductive Tubing
1724 conductive tubing, made of opaque, volume-conductive carbon-impregnated polyolefin in 500 ft. (152 m) rolls, is used to make bags or protective sleeves for specialized packaging or storage requirements. The tubing is heat-sealable and is readily adaptable to automated packaging lines.



1724 Tubing

Note: Shelf life of products made with Velostat resin is five years. Variations in storage conditions such as temperature fluctuation, exposure to sunlight or high humidity may reduce the shelf life.

Product No.	Description
Short Rolls 1704	Film. Thickness: 4.0 mil. (102 microns)
	Widths, in. (m) Approximate Length/Roll, ft. (m)
	36 (0,9) 150 (45,7)
	54 (1,4) 150 (45,7)
1706	Film. Thickness: 6.0 mil. (152,4 microns)
	Widths, in. (m) Approximate Length/Roll, ft. (m)
	36 (0,9) 150 (45,7)
	45 (1,1) 150 (45,7)
1708	Film. Thickness: 8.0 mil. (203,2 microns)
	Widths, in. (m) Approximate Length/Roll, ft. (m)
	36 (0,9) 150 (45,7)
	54 (1,4) 150 (45,7)
Long Rolls 1764	Film. Thickness: 4.0 mil. (102 microns)
	Widths, in. (m) Approximate Length/Roll, ft. (m)
	36 (0,9) 1,500 (457)

Velostat is a trademark of 3M.

Product No.	Description
1724	Lay Flat Conductive Tubing. Thickness: 4.0 mil. (102 microns)
	Widths, in. (cm) Approximate Length/Roll, ft. (m)
	8 (20,3) 500 (152)
	12 (30,5) 500 (152)

Other widths and lengths available upon quotation.

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Static Control Packaging and Transportation Products

Conductive Bags and Drum Liners

Conductive Bags

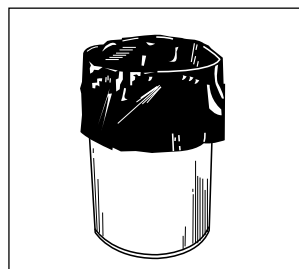
3M™ Velostat™ 2004 conductive bags are made of opaque, volume – conductive carbon-impregnated polyolefin. They are easily grounded, and the electrical characteristics are not affected by age or humidity. The standard bags are readily heat-sealable and 4 mil thick.



2004 Shielding Bags

Drum Liners

3M™ Velostat™ 2014 drum liners are simply larger sizes of the 2004 conductive bags; bags wider than 18 inches (45,7 cm) are called drum liners. They do not hold static charge when grounded. They are commonly used for holding explosive chemicals that could be ignited by a static-caused spark, or dry chemicals that tend to cling to ordinary nonconductive static-laden plastics. A common application in the electronic or chemical industries is as a waste container liner.



2014 Drum Liner

Velostat Film, Bag and Tubing Properties*

Property	Test Method	Typical Value
Thickness	ASTM D2103	4 mil (102 microns)
Strength		
Breaking Factor	ASTM D882	10 lbs./in.
Puncture	Fed Std 101	8 lbs.
Heat Seal Parameters		
Temperature		180°F – 250°F
Time		0.5 – 5.0 sec.
Pressure		20 – 60 PSI (1.4 x 10 ⁵ – 4.1 x 10 ⁵ N/m ²)
Temperature Limits		-50°F – 150°F (-46°C – 66°C)
Vicat Softening Temperature	ASTM D1525	83°C
Electrical Properties		
Volume Resistivity	ASTM D991	<500 ohm-cm
Static Decay	EIA-541	<2 sec.
Water Vapor Transmission	ASTM F372	3 g/sq. m/day
Chemical Susceptibility	ASTM D543	
Dilute Acids and Alkalies		Resistant
Concentrated Acids & Alkalies		Slight attack
Alcohols (Isopropanol)		Resistant
Hydrocarbons (Heptane)		Moderate attack
Ketones (Acetone)		Slight attack
Oil and Gasoline		Moderate attack
Aromatic Hydrocarbons (Toluene)		Severe attack
Shelf Life		Indefinite

* Typical values for 4.0 mil film.
Physical characteristics will change with other thicknesses.

Product No.	Description
2004	Conductive Bags. Wall thickness: 4.0 mil. (102 microns) 100 bags per pack
	Standard Sizes, in. (cm)
	4 x 4 (10,2 x 10,2)
	4 x 6 (10,2 x 15,2)
	5 x 8 (12,7 x 20,3)
	5 x 10 (12,7 x 25,4)
	6 x 10 (15,2 x 25,4)
	8 x 8 (20,3 x 20,3)
	8 x 10 (20,3 x 25,4)
	8 x 12 (20,3 x 30,5)
	10 x 12 (25,4 x 30,5)
	10 x 14 (25,4 x 35,6)
	12 x 16 (30,5 x 40,6)
12 x 18 (30,5 x 45,7)	
14 x 18 (35,6 x 45,7)	
15 x 18 (38,1 x 45,7)	
Custom Size Limits, in. (cm)	
4 x 4 to 42 x 72 (10,2 x 10,2 to 106,7 x 182,9)	

Product No.	Description
2014	Drum Liners. Wall thickness: 4.0 mil. (102 microns) 100 per box
	Typical Drum Size, in. (cm)
	5 gallon: 18 x 24 (45 x 60)
	20 gallon: 24 x 36 (61 x 91)
	30 gallon: 30 x 36 (76 x 91)
*55 gallon: 38 x 58 (96 x 147)	
* available 50 per box	

Dimensions are inside measurements (W x L).
Other film thicknesses and bag sizes are available by special order.

Note: Shelf life of products made with Velostat resin is five years. Variations in storage conditions such as temperature fluctuation, exposure to sunlight or high humidity may reduce the shelf life.

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Single Card Carriers

3M™ Static-Shielding Single Card Carriers protect individual printed circuit boards from static and physical damage during storage and transport. Interiors are lined with dissipative cushioning foam.

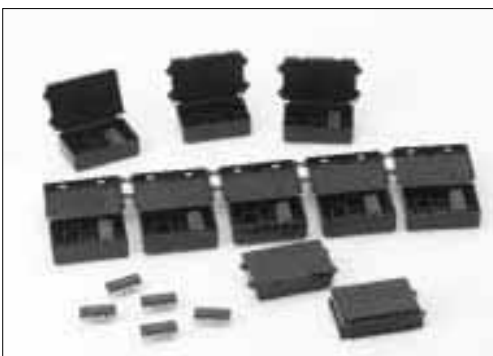


Single Card Carrier

Product No.	Length, in. (cm)	Width, in. (cm)	Depth, in. (cm)
8520	10 (25,4)	8 (20,3)	1.25 (3,2)
8521	12 (30,5)	9 (22,9)	1.25 (3,2)
8522	18 (45,7)	17 (43,2)	2 (5,1)
8523	10 (25,4)	8 (20,3)	2 (5,1)

All dimensions are referenced from the inside bottom of the container and are nominal dimensions.

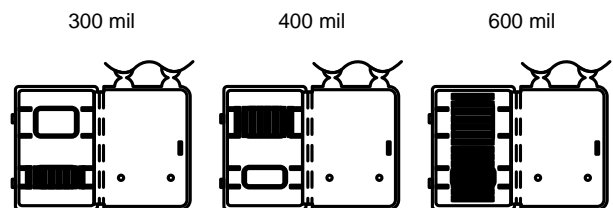
The rugged injection-molded 3M™ Velostat™ 5701 Single Device Carrier provides cost-effective physical and static protection for DIPs. The conductive units are volume resistive and will not lose their conductivity with age, nor do they depend on humidity to function. 5701 single device carriers meet EIA-541 requirements for static shielding. A unique “saddle” design supports device leads and helps prevent accidental bending. Other design features include a smooth front surface on the container to adhere labels and a living hinge cover that snaps securely shut. Carrier accepts up to 18-pin 300 mil and 400 mil devices, and up to 28-pin 600 mil devices.



5701 Single Device Carriers

Product No.	Length, in. (cm)	Width, in. (cm)	Depth, in. (cm)
5701	1.55 (3,9)	1.01 (2,6)	0.46 (1,2)

All dimensions are referenced from the inside bottom of the container and are nominal dimensions.



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Static Control Packaging and Transportation Products

Labels

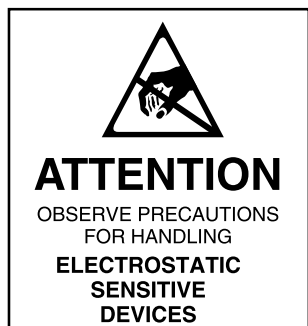
3M™ 7000 Series Labels are designed to alert personnel handling bags, boxes or other carriers that the contents are static-sensitive. When made part of a comprehensive static control process, the labels help prevent improper handling of static-sensitive components. Available in single use or reusable forms using the accepted industry static symbols: JEDEC-14 (Joint Electronic Device Engineering Council) and Military Standard 129.



7101/Reusable



7102/Destructible



7201/Reusable
7202/Destructible
7203/Reusable
7204/Destructible

Product No.	Description	Labels per Roll
7101	Reusable Orange w/Black Type JEDEC-14 Symbol	500
7102	Destructible Yellow w/Black Type Size, in. (cm) 1.875 x 2.5 (4,6 x 6,4)	500
7201	Reusable Yellow w/Black Type MIL-STD-129 Symbol	500
7202	Destructible Yellow w/Black Type MIL-STD-129 Symbol Size, in. (cm) 2 x 2 (5,1 x 5,1)	500
7203	Reusable Yellow w/Black Type MIL-STD-129 Symbol	250
7204	Destructible Yellow w/Black Type MIL-STD-129 Symbol Size, in. (cm) 4 x 4 (10,2 x 10,2)	250

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Test Equipment

	3M™ Test Equipment	Measures	Application
	701 Test Kit for Static Control Surfaces (Certified only)	Resistance: surface-to-ground and surface-to-surface	1800 Series Velostat™ Mats and Sheets 8000 Series Workstation Kits 8200 Series Mats 8300 Series Laminate 8400 Series Floor Tile 8500 Series Field Service Kits 8800 Series Rubber Mats 8900 Series Epoxy Flooring 9500 Series Anti-Fatigue Mats Other static-dissipative surfaces and surface treatments
	711 Charge Analyzer (Certified only)	Charge retention/drainage Charge generation/drainage	960/963 Ionized Air Blowers 980 Ionized Air Gun Other benchtop air ionizers Static Shielding Bags 1800 Series Velostat Mats and Sheets 8200 Series Mats Other mats 8400 Series Floor Tile 8800 Series Rubber Mats 8900 Series ESD Epoxy Flooring 9500 Series Anti-Fatigue Mats 2200 Series Wrist Straps 2050 Series Shoe Straps Other wrist straps and shoe straps Tapes
	718 Static Sensor (Certified only)	Static Voltages	Objects and Surfaces
	718A Air Ionizer Test Kit	Ion balance Static decay	Air Ionizers
	724 Continuous Workstation Monitor	Resistance	1800 Series Velostat™ Mats and Sheets 8200 Series Mats 8300 Series Hard Laminate 8800 Series Mats Dual Conductor Wrist Straps

Phone: 1-800-328-1368 or www.3M.com/eisd



	3M™ Test Equipment	Measures	Application
	725 Continuous Wrist Strap Monitor	Resistance	Dual Conductor Wrist Straps
	746 Wrist Strap Tester (Certified only)	Resistance	Single Conductor Wrist Straps Other single conductor wrist straps
	747 Shoes/Wrist Strap Tester (Certified only)	Resistance	Single Conductor Wrist Straps Other single conductor wrist straps Data logging capability
	790 Static Monitor	Voltage	Dual Conductor Wrist Straps
	791W Wrist Strap Monitor	Voltage	Dual Conductor Wrist Straps
	791E Equipment Ground Monitor	Resistance Data logging capability	Monitoring equipment grounds



Test Equipment

701 Test Kit

The 3M™ 701 Test Kit contains a lightweight, user-friendly megohmmeter plus all of the components needed to make testing mats and other surfaces simple and accurate. All of the items are packaged in a foam-lined carrying case.

The kit meets the intent of ANSI/ESD Standard 4.1, “Worksurfaces – Resistive Characterization.” ANSI/ESD Standard 7.1, “Floor Materials – Resistive Characterization of Materials,” and MIL-PRF-87893, “Workstation, Electrostatic Discharge (ESD) Control,” for auditing purposes. The meter has separate scales and test settings for measuring surface-to-ground and surface-to-surface resistance at two prescribed test voltages (10V and 100V), and system continuity. The scales are both color-coded and numbered, and easy to read.



701 Test Kit



Product Referral Generator

- 8200 Series Floor Mats/Runners pg. 20
- 8800 Series Dissipative Rubber Mats/Runners pg. 21
- 9500 Series Anti-Fatigue Mats/Runners pg. 24
- 8400 Series Static Conductive Floor Tile pg. 66-67
- 8900 ESD Epoxy Flooring pg. 68-69

Product No.	Description
701	<p>Test Kit for Static Control Surfaces. Certified only.</p> <p>Kit contains:</p> <ul style="list-style-type: none"> • 1 Megohmmeter 12 oz. (340 g) 1.8 x 3.3 x 4.6 in. (4,57 x 8,38 x 11,68 cm) • 2 Test Weights 5 lbs. (2,27 kg) each • 2 Test Leads, 10 ft. (3 m) each • 1 Insulated Bulldog Clip • 1 Alligator Clip • 1 Continuity Test Plate • 2 Batteries (22.5V and 1.5V) • 1 Operator's Manual • 1 Molded Carrying Case
701-L	Test Leads
701-M	Megohmmeter only
701-W	5 lb. Test Weight

Test Kit Properties

Product	Item	Typical Properties
Kit	Weight:	14 pounds (6,35 kg)
	Case Dimensions:	5.125" x 10" x 13.5" (13,02 cm x 25,4 cm x 34,29 cm)
	Case Material:	Blow-molded, high density polyethylene with foam inserts
	Case Color:	Gray
Meter	Weight:	12 ounces (0,34 kg)
	Dimensions:	1.8" x 3.3" x 4.6" (4,57 cm x 8,38 cm x 11,68 cm)
	Resistance Ranges:	
	Continuity Test Mode	0 – 10M Ω (internal R=500 K Ω)
10V Surface Test Mode	10 ⁵ – 10 ¹¹ Ω (internal R=2 M Ω)	
100V Surface Test Mode	10 ⁵ – 10 ¹¹ Ω (internal R=2 M Ω)	
Weights	2 Test Weights:	5 pounds (2,27 kg) each
	Dimensions:	Diameter – 2.5 in. (6,35 cm) Height – 5.06 in. (12,85 cm); includes handle and pad
	Pad Material:	Conductive silicone rubber
	Pad Dimensions:	Diameter – 2.5 in. (6,35 cm) Thickness – 0.25 in. (0,64 cm)
Leads	Length:	10 feet (3,05 m)
	Wire Size:	18 gauge
	Insulation:	Silicone rubber
	Diameter:	0.125" (0,32 cm)
Power Supply	Batteries (2):	22.5 volt (Eveready #505 or equivalent) and 1.5 volt (AA).



Charge Analyzer

The 3M™ 711 Charge Analyzer was designed to test the performance of products used for the purpose of static control and elimination. The 711 can be used as a laboratory analytical tool, evaluating the performance of ionizing equipment, static-protective packaging, worksurfaces, and personnel grounding systems. It is very effective for use as a demonstration tool in employee static awareness training sessions.

The lightweight and compact construction of the 711 offers versatility in the workplace. The modular internal construction simplifies modifications and repair by exchange of the functional printed circuit boards. All parameter settings are controlled via a built-in EEPROM. Periodic calibrations can be performed without the need to open the chassis. When the 711 is switched off, all last set parameters are stored in the EEPROM. These parameters are defaulted to when the 711 is switched on again. The 711 is powered by built-in rechargeable NiMH-batteries or an AC wall plug-in adapter. All interfacing connections are made at the rear of the 711.

Product No.	Description
711	<p>The 711 Charge Analyzer is shipped in a durable black case with foam interior, containing the following accessories: (Certified only)</p> <ul style="list-style-type: none"> Cup electrode Plate electrode Cylinder electrode AC/DC Adapter, DC 12 V / 500 mA Sensor cover Teflon™ measuring lead, 1 m Grounding cord with alligator clip RS 232 interface cable 50 mm (2 inches) high conductive container with insulating handle Insulated bulldog clip Metal spacers (3) with thread, 76 mm, (3 in. length) Software disk for data acquisition Operating instructions Transport case Certificate of Conformity Sensor, Model 711 RS for measuring electrostatic fields, with 2 meter cord (6.5 ft.)



711 Charge Analyzer



711 Charge Analyzer





Test Equipment

3M™ 711 Charge Analyzer Properties

Item	Typical Properties
Dimensions	Base unit: 6 x 6 x 6 inches (15,2 x 15,2 x 15,2 cm)
Weight	3.53 lbs. (1,6 kg)
High Voltage Power Supply (internal)	> 1100 V positive or negative (current limiting resistor: 10 MΩ)
Low Voltage Power Supplies	Built-in NiMH-rechargeable batteries, 1400 mAh AC/DC Adapter: secondary side, DC 12 V/500 mA
Operating Time (rechargeable batteries)	4 hours (approximately) with full charge
Storage Memory Capacity	128 k EEPROM (e.g. sufficient for approximately 100 CPM*-measurements)
Response Time	0 to 100%; 100 ms
Impedance	10 ¹⁵ Ω (Teflon™-separators cleaned)
Accuracy	± 2.5% of range end value (digitized) ± 5% for the analog output (for 1000 Volt range) ± 10% for the analog output (25, 100, 500 and 5000 Volt ranges)
Operating Functions	CPM* (positive/negative/automatic), voltmeter and fieldmeter
Interfaces	Analog output ± 2 V (± 1 V, in 500 V range for voltmeter), serial PC-COM, and external field sensor type 711 RS
Displays	Two, 11-segment positive & negative LED-bar charge indicators 16-digit alphanumeric dual row LCD
Settings - CPM* Operating Function	Starting voltage: 600 V - 1200 V in 1 V-steps Stop voltage: 1 V - 500 V in 1 V-steps (in decimal mode)
Static Decay Time	0.1 seconds - 99.9 seconds
Offset-Voltage Time	1 - 10 seconds in 1 second steps and 10 - 60 seconds in 10 second steps
Voltmeter Operating Function	Ranges: 25 V, 100 V, 500 V, 1.0 kV, 5.0 kV and auto range
Fieldmeter Operating Function	Ranges: Manual 1.25 kV/m, 5 kV/m, 25 kV/m, 50 kV/m, 250 kV/m, and automatic
Plate Electrode	SS-steel (152 x 152) mm/(6 x 6) inches, removable, capacitance (20 ± 2) pF
Cup Electrode	Gold-plated electrode with 4mm-banana socket, for voltage measurements
Selection of Operating Function	Pre-setting is "FIELDMETER", additional automatic settings by applying the plate or cup electrode
Operating Temperature	32°F to 113°F (0°C to 45°C)
Humidity	Maximum 60 % Note: At high relative humidity, charge leakage may occur affecting the decay time measurement.
Storage Temperature	-22°F to 140°F (-30°C to 60°C)
Declaration of Conformity	EN 60204-1/85 EN 60204-1/91 EN 61010 (SAFETY) EN 50082-1 EN 50082

*Charge Plate Monitor



Wrist Strap Tester

The 3M™ 746 Wrist Strap Tester can be used to test wrist straps in a variety of situations, from daily testing in a production facility to periodic testing at remote sites or field service locations. This versatility allows the 746 to be the standard for all applications in your company.

The 746 is supplied with an AC adapter, but it also contains a long-life lithium battery as back-up power for portable applications or during power failures. (A “battery” light notifies the user when the battery needs replacement.)

As with other 3M wrist strap testers, the 746 is easy to use. It can test the entire wrist strap system while it is being worn, or it can test the individual components to isolate a fault condition.



746 Wrist Strap Tester



AC Adapter

Product No.	Description
746	Wrist Strap Tester supplied with an AC adapter, a lithium battery, and a wall mounting kit. Certified only.
	Size, in. (cm)
	6.25 x 3.75 x 1.25 (15,8 x 9,5 x 3,3)

746 Properties

Item	Typical Properties
Weight	7 oz. (200 g) without battery
Power	9-volt regulated 75 mA AC/DC adapter (supplied with 746)
Battery	9-volt lithium manganese (NEDA 1604LC) (supplied with 746) *does not contain mercury, cadmium, or lead.
Test Voltage	19 Volts DC, ± 1 volt (open circuit)
Resistance Ranges	Upper limit – 10 M ohms ± 10% Lower limit – 750K ohms +20% -0%
Wall Mounting	3M™ Dual Lock™ System
AC Adapter Specifications	
Input Voltage:	AC 120 V
Output Voltage:	DC 9 V (Regulated)
Output Current:	75 mA
Output Connector	
Dimensions:	5.5 mm (O.D.) x 2.1 mm (I.D.) x 11 mm (L)
Output Connector Polarity:	Center Negative



Test Equipment

Shoes/Wrist Strap Tester

3M™ 747 Shoes/Wrist Strap Tester

Daily inspection and recording of wrist straps and shoes testing are very important as a fundamental countermeasure against static on personnel. A fully functional resistance tester, the new 3M 747 Shoes/Wrist Strap Tester makes it possible to control both in a single unit. Use of the external data port allows automatic recording of test results eliminating manual recording and possible errors.



Features

- Checks personnel wearing wrist straps, ESD shoes and heel straps against preset resistance limits
- Actual measurements are indicated on a 3½ digit display and by LED lamps
- Test results available on RS-232C Serial Port and output jack
- Testing data automatically recorded when utilizing the 3M™ 747DLS Data Logging Software

ESD Shoe and Heel Strap Testing

- Electrical resistance of ESD shoes and heel straps is measured and compared to preset limits.
- Set value for the upper and lower resistance limits can be varied. Upper limit: 10M ohms, 35M ohms, or 100M ohms. Lower limit: 100k ohms, 1.0M ohms.
- LCD display (3½ digit) indicates actual resistance measurement value.*
- LEDs on the tester indicate Low, OK, and High test results.
- Measurement requires standing on the Shoe Testing Plate and pressing the touch panel.

*Includes body resistance

Wrist Strap Testing

- Electrical resistance of wrist straps is measured and compared to preset limits.
- Set value for an upper resistance limit can be varied. (5M ohms, 10M ohms and 35M ohms). Lower resistance limit 650K ohms preset internally.
- LCD display (3½ digit) indicates actual resistance measurement value.*
- LEDs on the tester indicate (Low, OK and High) test results.
- Measurement requires inserting ground cord plugs into a test jack and pressing the touch panel.

*Includes arm to wrist band contact resistance

External Output Functions

- RS-232C Serial Data Port provides resistance value and pass/fail test result information for computer data logging. Used with 3M 747DLS Data Logging Software.
- Open collector output configuration provides High and Low signal levels for pass/fail test result indication. When used with an external relay door, entries can be controlled.

Product No.	Description
747	Shoes/Wrist Strap Tester

747 Shoes/Wrist Strap Tester Physical Characteristics

Item	Typical Properties
Dimensions	7.7" x 4.7" x 1.89" (H x W x D) 196 mm x 120 mm x 48 mm
Weight	1.2 lb. (550 g) without batteries
Power Requirements	AA (LR6) alkaline battery (1.5 VDC x 6) or AC adapter (9 VDC, center positive)
Environmental Operating Conditions	Temperature range (0° to 40°C) 80% Relative Humidity



747 Shoes/Wrist Strap Tester

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Data Logging Software

747DLS Data Logging Software

Designed to work with the 3M™ 747 Shoes/Wrist Strap Tester, the 3M™ 747DLS Data Logging Software offers you a complete system of testing and recording results of your wrist straps and footwear. Our complete system performs an accurate resistance measurement of either or both your wrist straps and footwear. Once completed, the results will then be automatically saved on a PC which allows efficient data storage and faster data retrieval.



The software communicates via RS-232 signal to a personal computer and can handle up to eight stations using a single PC. Longer distances of up to 4000 ft. (1200 m) can also be accommodated.

Features

- Electronic data logging eliminates manual logging thus provides highly reliable record
- Can accommodate up to 8 stations which saves money
- Can be used with barcode, magnetic stripe or proximity card readers/identification cards
- Can be used for up to 4000 ft. (1200m), allowing it to serve almost an entire facility
- Incorporates a pilot lamp in monitoring so it can identify which testing stations are currently being used
- Printable records feature allows hard copies to be kept for documentation

System Requirements

Windows™ 95, 98 2nd Edition, 2000 with Service Pack 2 and Millennium Edition. Pentium 133 MHz; 32 MB RAM; 26 MB Hard Disk Space; 800x600 True Color 32 Bit Display. It will also require one (1) PCI available slot, two (2) are recommended for multi-station. For a single station, it will only require two (2) communications ports available (COM1 & COM2).

Card Reader Technical Requirements

Serial Interface Specification	
Bit Rate	110, 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 (selectable)
Word Length	Data Format-4, 5, 6, 7, 8 (selectable); Parity Bit-Even, Odd, None, Mark, Space (selectable); Stop Bit-1, 1.5, 2 (selectable)
Handshaking (Flow Control)	None, Xon/Xoff, RTS/CTS, RTS/Xon/Xoff (selectable)
Magnetic Card Reader Data	
Message Indicator	Start of Text - Single ASCII character; End of Text - Single ASCII character
Track Framing Characters	Track 1 Start - Single ASCII character; Track 1 End - Single ASCII character
	Track 2 Start - Single ASCII character; Track 2 End - Single ASCII character
	Track 3 Start - Single ASCII character; Track 3 End - Single ASCII character
Barcode Reader Data	
Message Indicator	Start of Text - Single ASCII character; End of Text - Single ASCII character
Proximity Card Reader Data	
	Start of Text - Two ASCII characters; End of Text - CR, LF, CR/LF (selectable)

Product No.	Description
747DLS	Data Logging Software



747 Shoes/Wrist Strap Tester

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Test Equipment

Phone: 1-800-328-1368 or www.3m.com/eisd

Air Ionizer Tester/Field Meter and Charger

718 Static Sensor

The 3M™ 718 Static Sensor is an easy-to-use, hand-held instrument designed to measure static voltage, on objects and surfaces, arising from electrostatic charge buildups. This instrument can play a valuable role in an organization's ESD-control program by helping the user locate and quantify ESD trouble-spots.

Features

- Small-size, lightweight, conductive plastic housing
- Membrane switches for Power, Range/Zero, and Hold functions
- Digital, LCD (liquid-crystal) display is easy to read and updates quickly
- Ranging systems assist user in making quick and easy measurements
- Measurements accurate to 5%
- Output jack available for continuous measurements



718 Static Sensor

718A Air Ionizer Test Kit

The 3M™ 718A Air Ionizer Test Kit, when used in conjunction with the 718 Static Sensor, can be used for periodic verification of air ionizer performance. The 718A consists of a charge plate and a charger.



718A Air Ionizer Test Kit

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www.3m.com

Tel/fax: 02/4487 3134, 0903.439 332, 0905.616 722

Product No.	Description
718	Static Sensor, including meter, Operator's Manual, and Certificate of Performance verification. Certified only.
718A	Air Ionizer Test Kit, including charge plate assembly, charger, Operator's Manual, and Certificate of Performance verification.

718 Static Sensor Physical Characteristics

Item	Typical Properties
Dimensions	0.85" (H) x 2.4" (W) x 4.15" (L) 2.2 cm (H) x 6.1 cm (W) x 10.5 cm (L)
Weight	4.5 oz. (128 g) with battery
Power Requirements	One 9-volt alkaline battery (not included)
Measurement Ranges	0 - 2 kV Low Range 0 - 20 kV High Range
Voltage Display	3½ digit liquid crystal display
Distance indicator	LED targets. Aligned targets indicate 1 in. (2.54 cm) measurement distance
Measurement accuracy	Within 5% of actual voltage
Certifications	UL, C-UL, CE, CB-scheme, NOM

3M 718A Air Ionizer Test Kit Physical Characteristics

Item	Typical Properties
Charge Plate Assembly	Per ESD Association Standard Practice - 3.3
Charge Plate assembly Weight	2.5 oz (70 g)
Charger Dimensions	0.85" (H) x 2.4" (W) x 5.0" (L) 2.2 cm (H) x 6.1 cm (W) x 12.7 cm (L)
Charger Weight	6 oz. (170 g) with battery
Charger Power Requirements	One 9 volt alkaline battery
Charger Output	1100V minimum for positive or negative voltage
Certifications	UL, C-UL, CE, CB-scheme, NOM



Product Referral Generator

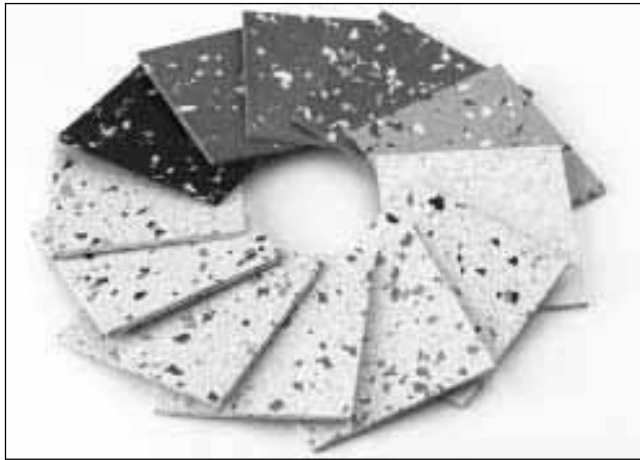
960 Mini Air Ionizer	pg. 37
963/963E Benchtop Air Ionizer	pg. 36
980/980E Ionized Air Gun	pg. 35
990 Overhead Air Ionizer	pg. 34



Permanent Flooring Products

Static Control Vinyl Floor Tile

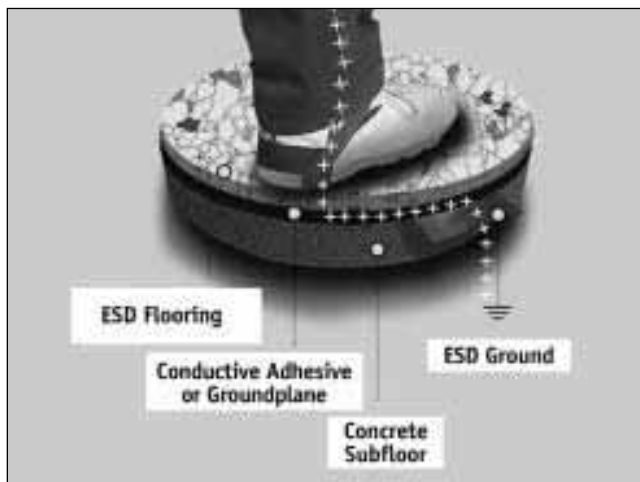
3M™ 8400 Series Static Control Floor Tile is a long-term solution to controlling ESD. This solid vinyl tile is durable and attractive and can easily be installed by competent flooring contractors. The flexible, resilient tiles are made with only 100% pure vinyl and contain a minimum amount of filler and none of the regrind that can make tile brittle. Both the "conductive" and "static-dissipative" versions are available in a selection of bright, vivid colors. A proprietary manufacturing process completely seals in the conductive carbon medium, resulting in a unique tile that can be easily cleaned and shined to a gloss while maintaining its electrical properties—without the use of an ESD wax or polish.



8400 Series Static Control Vinyl Floor Tiles

Key Features

- Lifetime warranty on electrical performance
- 10-year limited warranty on materials
- Long-term ESD protection
- Superior wear resistance and durability
- Lowest outgassing
- Easy, low-cost maintenance (no waxing — ever!)
- Made with 100% pure homogeneous vinyl; no regrind
- Micro-edged for perfect squareness for ease of installation
- Available in 24.25" size for raised access floors, plus 12", 24", and 36" sizes
- Available in 12 standard colors; custom colors can be formulated
- May be seam welded or self-coved



Product No.	Color
Static Dissipative	
8411	Brown
8412	White
8413	Gray
8414	Blue
8415	Green
8416	Maroon
8417	Black
8421	Reverse Brown
8423	Reverse Gray
8424	Reverse Blue
8425	Reverse Green
8427	Reverse Black
Conductive	
8431	Brown
8432	White
8433	Gray
8434	Blue
8435	Green
8436	Maroon
8437	Black
8441	Reverse Brown
8443	Reverse Gray
8444	Reverse Blue
8445	Reverse Green
8447	Reverse Black
Accessories	
8403	Conductive Adhesive. Two-Part Epoxy. (1-gallon unit. covers approx. 135 sq. ft.)
8405	Calcium Chloride Moisture Test Kit.



Permanent Flooring Products

Epoxy Flooring System



The 3M™ 8900 ESD Epoxy Flooring System is a multi-layer, self-leveling liquid epoxy system that hardens to an attractive durable finish. Its formula can be adjusted to produce electrical properties in either the conductive or static-dissipative range and it can be installed in standard thicknesses from 17 mil to 125 mil (0.017" to 0.125"). Custom thicknesses are also available.

Key Features

- Tough and abrasion-resistant; excellent for heavy traffic (forklifts, constant cart or foot traffic, etc.).
- Electrical properties can be formulated for resistance –to-ground readings in the conductive (2.5×10^4 to 1×10^6 ohms) or static-dissipative (1×10^6 to 1×10^9 ohms) range.
- 10-year limited warranty on electrical properties, 3-year limited warranty on surface integrity.
- Resistant to most chemicals used in the electronics industry.
- Resistant to fire; does not support combustion.
- Available in six standard colors. Custom colors available upon request.
- Custom logos or messages can be embedded.



Permanent Flooring Products



Epoxy Flooring System

Installation

3M™ 8900 ESD Epoxy Flooring System should be applied by a 3M-approved, highly trained applicator.

Maintenance

3M 8900 ESD Epoxy Flooring is a true “no-wax” system. The cost of cleaning and maintenance over the life of the floor is among the lowest of any type of ESD flooring.

(See 3M Epoxy Flooring Maintenance Instructions for complete details.)



Product No.	Description
8900	ESD Epoxy Flooring System.
	Standard Colors
	Off White—available in 50 mil, 90 mil, 125 mil
	Light Gray—available in 50 mil, 90 mil, 125 mil
	Oyster Gray—available in 17 mil, 30 mil, 50 mil, 90 mil, 125 mil
	Tower Gray—available in 17 mil, 30 mil, 50 mil, 90 mil, 125 mil
	Sky Blue—available in 50 mil, 90 mil, 125 mil
	Country Blue—available in 17 mil, 30 mil, 50 mil, 90 mil, 125 mil
	Note: Colors represented on inside back cover of catalog

8900 Epoxy Flooring System

Mechanical	Test Method	Typical Value
Tensile Strength	ASTM D 638	2000 PSI (minimum)
Compressive Strength	ASTM C 579	6000 PSI (minimum)
Flexural Strength	ASTM D 790	2325 PSI
Surface Abrasion	ASTM D 1044	0.13 (Wear Index)
Hardness	ASTM D 2240	50-80 Shore D
Indentation @ 2000 lbs.		None
Coefficient of Friction	Slip Coefficient	0.507
Rate of Burning	ASTM D 635	Self-extinguishing
Linear Thermal Expansion	ASTM E 831	No expansion noted
Water Absorption	ASTM C 413	0.03%
Elongation		(70) 3.5%
Electrical		
Electrical resistance (Surface-to-ground, ESD S.7.1)		Can be formulated to either the conductive (2.5×10^4 to 1×10^6 ohms) or static-dissipative (1×10^6 to 1×10^9 ohms) range.



Permanent Flooring Products

Test Your ESD Flooring

Only systematic testing of your static-control flooring products can assure that they are providing the protection you paid for. 3M test equipment will be calibrated and certified on request in a 3M laboratory with NIST Traceable equipment specified in MIL-STD 45662A.



3M™ 701 Test Kit

All of the surfacing products in this catalog remove static charges by grounding; their effectiveness is determined by the amount of "surface-to-ground" resistance. The 3M 701 Test Kit meets all the requirements defined in ESD Association Standards S4.1/S7.1 and MIL-PRF-87893 for surface testing methods and equipment. It contains all of the components and instructions needed to properly test the charge-draining capability of any static-control surface, including mats, laminate, tile, epoxy floors, and waxes. The 701 Test Kit comes with all of its components nested in a

foam-lined, molded plastic carrying case, and is designed to be very "user friendly." The small, lightweight meter is easy to use, with its scales both color-coded and numbered. The meter also includes separate scales for surface resistance measurements, battery testing and continuity testing. The five-pound test weights are covered in a black, anti-static jackets and are fitted with easy-to-grasp handles and conductive silicone-rubber contact pads. The two test leads are insulated with silicone rubber, making them virtually tangle-free in spite of their generous 10-foot length. The right-angle banana plugs at the meter end are designed to seat close to the meter face; at the weight end, the plugs are covered by retractable sheaths for added safety. Use the 701 Test Kit to verify that your 3M static-control surfacing products perform within the resistance values allowable. Your local 3M sales representative is always available to assist you with static-control testing.

The 3M 701 Test Kit includes:

- One 701 megohmmeter
- Two five-pound test weights
- Two 10-foot test leads
- One insulated bulldog clip
- One non-insulated alligator clip
- Two batteries
- One continuity test plate
- Operators Manual
- Molded Carrying Case

For additional information, refer to pages 52, 54.



Tapes

Antistatic Tape

3M™ 40 Antistatic Utility Tape combines 3M's remarkable antistatic adhesive with a clear, one mil polyester film backing, and is perfect for use in static-sensitive areas. In fact, an optional special pattern of ESD symbols alerts users that this is the only tape that should be used in static-safe areas.

At the heart of all 3M antistatic tapes is a unique, conductive polymer adhesive that suppresses static, both during unwind from the roll and during removal from a surface. In fact, they generate less than 50 volts on unwind from the roll or removal from a stainless steel surface, even in extremely dry conditions of 10% relative humidity.

Use 40 antistatic utility tape as a third hand to hold work orders, notes, documentation or instructions in place, to seal static shielding bags and boxes containing electronic components, or to bundle DIP tubes and JEDEC shipping trays. It can also be used to hold down obstructions such as wires or attachments during manufacturing.



40PR Antistatic Utility Tape

Product No.	Description
40/40PR*	3 in. Antistatic Plastic Cores Antistatic Utility Tape.*
	Widths, in. (mm) Length, yd. (m)
	0.25 (6,3) 72 (66)
	0.375 (9,5) 72 (66)
	0.50 (12,7) 72 (66)
	0.625 (15,8) 72 (66)
	0.75 (19,0) 72 (66)
	0.875 (22,2) 72 (66)
	1 (25,3) 72 (66)
	2 (50,0) 72 (66)
	1 in. Antistatic Plastic Cores
	Widths, in. (mm) Length, yd. (m)
	.50 (12,6) 36 (33)
.75 (19,0) 36 (33)	

Specify at time of order.
Custom widths available upon request.

*PR designation means printed

40 and 40PR Tape Properties

Property	Test Method	Typical Value
Static Charge Generation		
Removal from Roll, 10% RH, volts	3M	20
Removal from Roll, 50% RH, volts	3M	5
Removal from Stainless Steel, 10% RH, volts	3M	20
Removal from Stainless Steel, 50% RH, volts	3M	5
Surface Resistance		
Adhesive @ 50% RH	ESD S11.11	5 x 10 ⁶ Ω
Adhesive @ 10% RH	ESD S11.11	5 x 10 ⁸ Ω
Tape Properties		
Adhesion to Steel	ASTM D1000	19 oz/in.
Unwind Force from Roll	ASTM D1000	24 oz/in.
Thickness	ASTM D1000	2.2 mils
Break Strength	ASTM D1000	20 lb/in.
Slit Width	ASTM D1000	± 1/64 in.
Rolling Ball Tack	ASTM D1000	70 mm
Outgassing		
TML	ASTM E595	<1.0%
CVCM	ASTM E595	<0.1%

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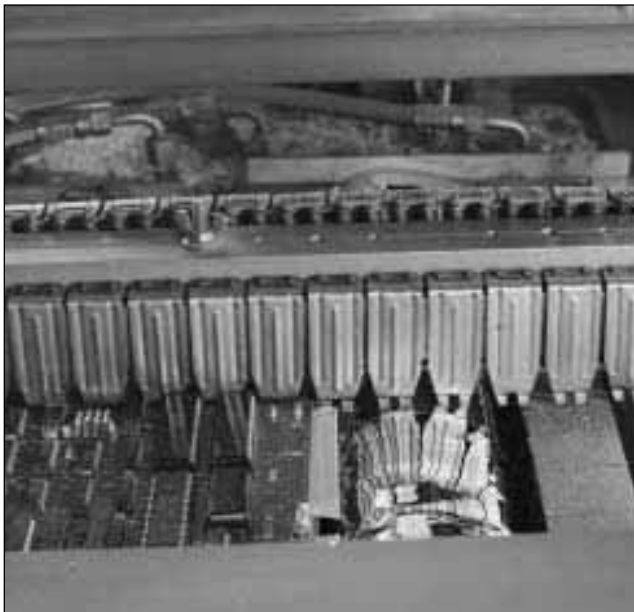
Tel/fax: 02/4487 3134, 0903.439 332, 0905.616 722



Antistatic Tape

3M™ 42 Antistatic High Temperature Masking Tape is perfect for protecting gold leads and other components on boards with sensitive integrated circuits. It withstands the high temperatures of wave soldering, and leaves virtually no residue, which can help reduce the after soldering cleaning process.

To give the convenience of a wave solder masking tape without the fear of static damage, 3M has combined a special antistatic adhesive with a high-temperature polyimide backing that withstands temperatures up to 500°F (260°C).



42 Antistatic Utility Tape

Product No.	Description													
42	3 in. Antistatic Plastic Core Antistatic High Temperature Mask Tape.													
	<table border="1"> <thead> <tr> <th>Widths, in. (mm)</th> <th>Length, yd. (m)</th> </tr> </thead> <tbody> <tr> <td>0.25 (6,3)</td> <td>36 (33)</td> </tr> <tr> <td>0.375 (9,53)</td> <td>36 (33)</td> </tr> <tr> <td>0.50 (12,6)</td> <td>36 (33)</td> </tr> <tr> <td>0.75 (19,0)</td> <td>36 (33)</td> </tr> <tr> <td>0.875 (22,2)</td> <td>36 (33)</td> </tr> <tr> <td>1 (25,3)</td> <td>36 (33)</td> </tr> </tbody> </table>	Widths, in. (mm)	Length, yd. (m)	0.25 (6,3)	36 (33)	0.375 (9,53)	36 (33)	0.50 (12,6)	36 (33)	0.75 (19,0)	36 (33)	0.875 (22,2)	36 (33)	1 (25,3)
Widths, in. (mm)	Length, yd. (m)													
0.25 (6,3)	36 (33)													
0.375 (9,53)	36 (33)													
0.50 (12,6)	36 (33)													
0.75 (19,0)	36 (33)													
0.875 (22,2)	36 (33)													
1 (25,3)	36 (33)													

Custom widths available upon request.

42 Tape Properties

Properties	Test Method	Typical Value
Static Charge Generation (12 in./sec.) Volts		
Removal from Core, 10% RH	3M	20
Removal from Core, 50% RH	3M	5
Residual charge on substrate (12 in./sec.) Volts		
Removal from Stainless Steel, 10% RH, volts	3M	50
Removal from Stainless Steel, 50% RH, volts	3M	5
Surface Resistance	ESD Assoc.	>1 x 10 ⁵ Ω
Adhesive @ 10% RH	S11.11	<1 x 10 ¹¹ Ω
Tape Properties		
Application Temperature Range		>40°F (5°C)
Upper range Dwell Time, 5 sec.		<500°F (260°C)
Unwind Force from Core	ASTM D1000	30 oz./in.
Thickness	ASTM D1000	2.2 mils
Break Strength	ASTM D1000	28 lb./in.
Slit Width Tolerance	ASTM D1000	± 1/64 in.
Outgassing		
TML	ASTM E595	<1.6%
CVCM	ASTM E595	<0.1%
Chemical Properties		
Contact Corrosivity, FTMS 101C, Method 3005		
Copper		Pass
Aluminum		Pass
Stainless Steel		Pass
Silver		Pass
Tin Lead		Pass
Kovar		Pass

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EMI Shielding Tapes

3M™ EMI Shielding Tapes are designed for applications requiring reliable point-to-point electrical contact, particularly EMI shielding, grounding and static charge draining. The tapes have a multitude of uses in electronic design and test laboratories for prototyping, design and troubleshooting.



Foil Shielding Tape Engineering Kit

The Engineering Kit enables engineers who need only a few inches of a particular tape for specifying, prototyping, troubleshooting, testing and repairing to avoid the problems and expense associated with meeting minimum order quantities. The kit also eliminates the problem of rolls of tape lost between multiple users or kept loose in desk drawers.

The compact dispenser box also serves as a desktop reference for the tapes. The box panels provide basic technical information about each tape, including product number, backing and adhesive type and thickness, adhesion, resistance and shielding effectiveness.

Engineering Kit for Foil Shielding Tapes

Engineering Kit: Kit includes one roll of each foil tape, 3/4 in. x 4 yds. (1,9 cm x 8,3 m)

Dispenser box is 4 in. x 4 in. x 8.5 in. (10,0 cm x 10,0 cm x 21,3 cm)

Product No.	Description
1170	Smooth aluminum foil, conductive acrylic adhesive, 3.2 mil total, supplied on liner.
1181	Smooth copper foil, conductive acrylic adhesive, 2.6 mil total, supplied on liner.
1182	Smooth copper foil coated on both sides, conductive acrylic adhesive, 3.5 mil total, supplied with liner on each side.
1183	Smooth tin-plated copper foil, conductive acrylic adhesive, 2.6 mil total, supplied on liner.
1190	Copper-plated, polyester ripstop fabric, conductive acrylic adhesive, 5.5 mil total, supplied on liner.
1194	Smooth copper foil, nonconductive acrylic adhesive, 3.0 mil total, supplied on liner.
1245	Embossed copper foil, nonconductive acrylic adhesive, 4.0 mil total, conductivity "through the adhesive," supplied on liner.
1267	Embossed aluminum foil, nonconductive acrylic adhesive, 5.0 mil. total, conductivity "through the adhesive," supplied on liner.
1345	Embossed tin-plated copper foil, nonconductive acrylic adhesive, 4.0 mil. total, conductivity "through the adhesive," supplied on liner.

All tapes are furnished on 3 in. (7,6 cm) I.D. cores.
Minimum width is 1/4 in. (0,6 cm). Maximum width is 23 in. (58 cm).

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