

# ESD Statshield® Protective Smocks Grounding, Testing and Maintenance

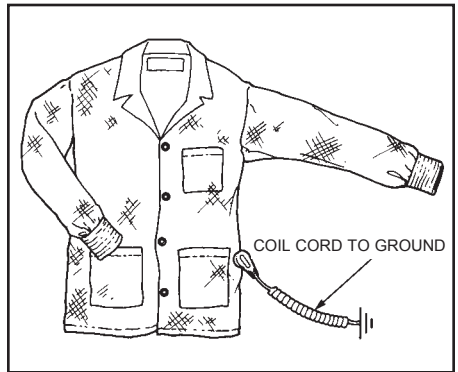


Figure 1. Charleswater Statshield® Premium Smock with Conductive Cuffs.

## Description

Per IEC 61340-5-2 paragraph 5.2.5, "Garments on which high levels of static electricity can be generated are one of the causes of ESD damage. It is important that such charged garments do not come into contact with ESDS. The covering garments need to be grounded, either through direct contact with the wearer's skin, or by alternative means such as being electrically connected to a wrist strap. It is important that the ESD protective garment sleeves cover the end of the inner garment sleeves."

Outfitting a work force in ESD smocks is the single most powerful step to demonstrate a company's commitment to their ESD control program. The Charleswater Statshield® ESD protective smock is designed to be antistatic, low tribocharging, and offers protection from electrostatic fields generated by clothing on the user's body. Using high quality material with a minimum 9% carbon nylon monofilament, the smock creates a Faraday Cage around the torso of the wearer. Static charges generated by the wearer and wearer's clothing will be shielded from ESD susceptible products. The dissipative material becomes part of the ground path to remove static charges. The smock is available in jacket length with conductive elastic cuffs.

The Charleswater Statshield® premium smock incorporates our "hip to cuff" grounding feature which allows for hands-free grounding with no tugging at the operator's wrist. This feature allows connection of a ground cord to a 4mm snap stud on the hip. A seam of carbon-suffused threads provides a secure and direct electrical connection from the snap stud on

the hip to conductive elastic cuffs, providing a highly reliable connection via the user's skin. The smock will quickly and effectively ground the person when used in this manner.

The smock is constructed of a lightweight dissipative material which incorporates texturized polyester and a minimum of 9% carbon nylon monofilament. The conductive nylon fibers are woven in a chain-link design throughout the material, providing continuous and consistent charge dissipation. All of the seams in the garment are designed to maintain electrical continuity from panel to panel and from sleeve to sleeve in accordance with the ESD Association Garment Standard, ESD-STM2.1.

The conductive fabric in smock is a conductor. If not grounded, the smock can become an isolated charged conductor. Proper ESD control requires that "All conductors in the environment, including personnel, must be . . . connected and attached to a known ground", there is no occasion "when grounding the garment is not required" in an ESD protected area. If not grounded via a wrist strap coil cord, ground ESD garment via the person's wrist removing charges using foot grounders, to ESD protective flooring.

ESD protective smocks are available in the following styles and sizes:

### JACKETS WITH CUFFS IN BLUE

Item#	Size	Chest	Sleeve
<a href="#">72100</a>	Small	86-91 cm	86.3 cm
<a href="#">72101</a>	Medium	96-101 cm	87.31 cm
<a href="#">72102</a>	Large	106-112 cm	88.90 cm
<a href="#">72103</a>	X Large	117-122 cm	90.17 cm
<a href="#">72104</a>	2X Large	127-132 cm	90.17 cm

### JACKETS WITH CUFFS IN BURGUNDY

Item#	Size	Chest	Sleeve
<a href="#">72110</a>	Small	86-91 cm	86.36 cm
<a href="#">72111</a>	Medium	96-101 cm	87.31 cm
<a href="#">72112</a>	Large	106-112 cm	88.90 cm
<a href="#">72113</a>	X Large	117-122 cm	90.17 cm
<a href="#">72114</a>	2X Large	127-132 cm	90.17 cm

## Installation

Follow the directions below for proper installation and grounding of the ESD smock.

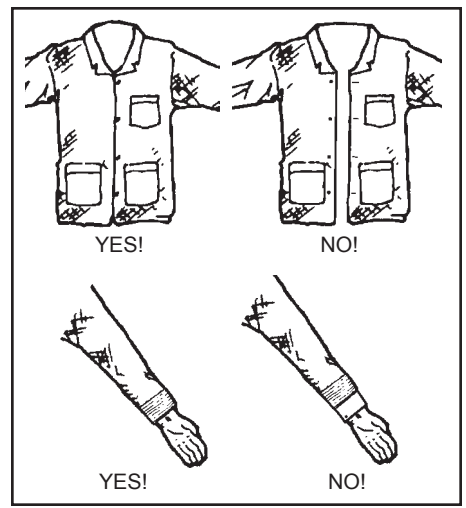


Figure 2. Proper installation of smock on wearer's body

1. Put on the smock and fasten all of the snaps on the front of the smock, making sure that clothing is not exposed outside of the smock.
2. Throughout use, it is essential that conductive cuff be in intimate contact with wrist skin; conductive cuff should never be allowed to be pulled up and over shirt sleeve.
3. Install a ground cord to the snap stud located above the left hand hip pocket. Take the other end of the ground cord and connect to a verified ground point such as a grounding block or common point mat ground.

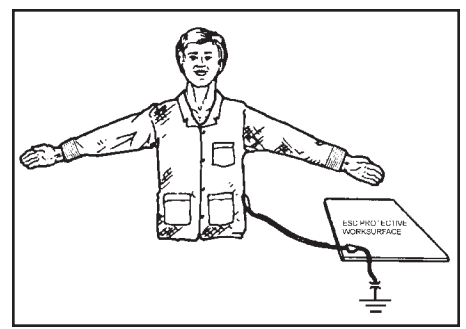


Figure 3. Grounding the smock

The user and the smock will now be properly grounded. The “hip to cuff” grounding feature allows greater freedom of movement of user’s arms and hands, and a reliable path to ground while the ESD smock offers extra protection against damaging electrostatic fields which may be generated by the user’s clothing.

**NOTE: PROPER ESD CONTROL REQUIRES THAT THE GROUND CORD SELECTED FOR GROUNDING OF PERSONNEL CONTAIN A BUILT-IN CURRENT LIMITING 1 MEGOHM RESISTOR.**

### Heat Sealed Patches

It is possible to heat seal patches to our smocks. The patch should be small and the smock should be tested before and after application.

### Grounding Integrity Testing

For daily testing or monitoring of the grounding integrity of Charleswater ESD protective smocks and ground cords, we recommend the use of standard wrist strap testers or single-wire workstation continuous monitors.

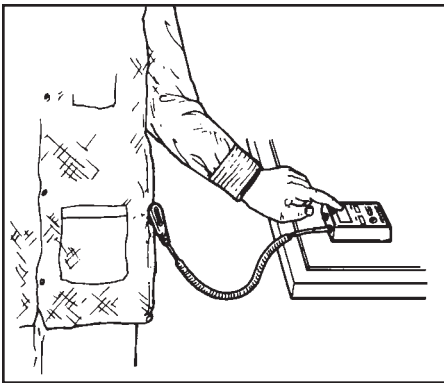


Figure 4. Testing and monitoring of smock and ground cord assembly

Panel to panel conductivity is essential so as not to leave portions of the smock as isolated charged conductors. Panel to panel conductivity is easy to test using our Surface Resistance Test Kit Item #99105, by placing 5 pound electrodes on different panels. Unless properly grounded, the smocks can hold a charge and become a possible source for discharge to ESD susceptible products. For additional information, refer to IEC 61340-5 and the ESD Association Garment Standard, ESD-STM2.1.

Charleswater has several testers available for this purpose. For more information ask for specification drawings or operating instruction manuals by item number.



Figure 5. Testers

### Maintenance

For proper operation, the ESD protective smock must be laundered periodically. Woolite works well.. Liquid detergents are better than dry in that there is less caking and frictional wear. Launder garment in cool or warm water, tumble dry with low heat or hang dry. In terms of laundering, the smocks by hand or with a washing machine, most prefer a washing machine. This works well if using a standard house machine on gentle cycle. Industrial machines are fine if “pony” (typical under 90.7 Kg loads) machines are used. It is not recommended to launder these garments in heavy industrial laundry machines as it will lead to premature wear. Garments should be tumbled dry using low heat. DO NOT BLEACH. The carbon-suffused mono-filament nylon is sensitive to heat and should not be exposed to laundering heat in excess of 49°C. Use only non-ionic softeners and detergents when laundering. Under normal wearing and recommended washing conditions, Charleswater Statshield® ESD protective smocks will maintain their usefulness and effectiveness for a minimum of 100 washings. Some other ESD smocks have as little as 1% suffused carbon and lose their ESD protective qualities after a few washings.

### Specifications

#### Fabric Weight

74.6 grams/sq metre

#### Fabric Content

88% texturized polyester and 12% carbon suffused mono-filament nylon.

#### Carbon Mono-filament

Conductive at 10E4 ohms, non-flaking and non-sloughing.

#### Surface Resistivity of Fabric

10E5 - 10E6 ohms, per ESD-STM2.1

#### Static Decay Rate

5000 volts to 500 volts in less than 0.1 seconds, per FTMS-101C

#### Glass Transition Temp

121°C

#### Flash Point

560°C

**Note:** Material sample swatches are available upon request. Fabric lots vary slightly in color and weight. If you have any question please don’t hesitate to request a sample material from our Customer Service Team.

### Limited Warranty

Charleswater expressly warrants that for a period of two (2) years from the date of purchase or (100) one hundred wash cycles, whichever occurs first, Charleswater Statshield® ESD Smocks will be free of defects in material (parts) and workmanship (labour). Within the warranty period, a credit for purchase of replacement Charleswater Statshield® ESD Smocks, or, at our option, the Statshield® ESD Smock will be repaired or replaced free of charge. If product credit is issued, the amount will be calculated by multiplying the unused portion of the expected two year or 75 wash cycle life times the original unit purchase price. Call Customer Service at 00 44 (0) 1892-665313 for a Return Material Authorisation (RMA) and for proper shipping instructions and address. You should include a copy of your original packing slip, invoice, or other proof of purchase date. Any unit under warranty should be shipped prepaid to the Charleswater factory. Warranty replacements will take approximately two weeks.

If your unit is out of warranty, call Customer Service at 00 44 (0) 1892 - 665313 for a Return Material Authorisation (RMA) and proper shipping instructions and address. Ship your unit freight prepaid. Charleswater will quote repair charges necessary to bring your unit up to factory standards.

### Warranty Exclusions

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

### Limit of Liability

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