

Statshield ESD Smocks and ESD Control

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Why use ESD Smocks in a company's ESD protected area? ESD control procedures need to be followed all the time. It does not help that an ESD sensitive item be protected from damaging electrostatic discharges (ESD) most of the time, it has to be all the time. Discipline is needed from each and every worker handling the ESD sensitive items, and outfitting a company's workforce in special ESD smocks is demonstrable proof a company considers ESD control important.

Wrist Straps reliably remove charges from a person via the moisture layer on their skin; charges on insulative clothing cannot be removed via the Wrist Strap. "While a person may be grounded using a wrist strap or other grounding methods, that does not mean that insulative clothing fabrics can dissipate a charge to that person's skin and then to ground. Clothing usually is electrically separate or isolated from the body." [ESD Handbook TR 20.20 section 5.3.13.1 Introduction and Purpose/ General Information]

The primary purpose of ESD Smocks to shield ESDS items from charges on operators clothing. In a sense, the ESD Smock creates a Faraday Cage shielding the ESD sensitive items from electrostatic charges and discharges on the person's clothing.

It should be part of a company's ESD Control Plan that all smocks are to be closed and regular clothing does not extend beyond the smock cuff. Otherwise, you are defeating the primary purpose of the ESD smock. For the smock to perform properly, it must make intimate contact with operator's skin, thus grounded when the operator is. "After verifying that the garment has electrical conductivity through all panels, the garment should be electrically bonded to the grounding system of the wearer so as not to act as a floating [conductor]. Garments should be worn with the front properly snapped or buttoned to avoid exposure of possible charges on personal clothing worn under the garment." [ESD Handbook TR 20.20 paragraph 5.3.13.2.6 Proper Use]

The recommended technical requirement range per ANSI/ESD S20.20 Table 1 for ESD Garment is 10^5 to 1×10^{11} ohms tested per ESD STM 2.1. But when specifying, we suggest selecting garments with lower resistance as they are better quality products, and the resistance may tend to increase over time due to wear and laundering. Also if the ESD Garment is used to ground the worker, via Statshield's patented hip-to-cuff feature, the total resistance should be less than 35 megohms or 3.5×10^7 ohms (the Table 1 Wrist Strap System recommended range). Good quality smocks will typically measure in the 10^5 - 10^6 ohm range when new. The hip-to-cuff designated operator ground connection can allow for

the elimination of worker's wristband as the coil cord can be attached directly to the smock for positive operator grounding and "hands-free" operation.

Per ANSI/ESD S20.20 Paragraph 6.2.3.1. Protected Areas Requirement "All nonessential insulators, such as those made of plastics and paper (e.g. coffee cups, food wrappers and personal items) must be removed from the workstation. Ionization or other charge mitigating techniques shall be used at the workstation to neutralize electrostatic fields on all process essential insulators if the electrostatic field is considered a threat."

Per ESD Handbook TR 20.20 paragraph 2.4 "It should be understood that any object, item, material or person could be a source of static electricity in the work environment. Removal of unnecessary nonconductors, replacing nonconductive materials with dissipative or conductive materials and grounding all conductors are the principle methods of controlling static electricity in the workplace, regardless of the activity."

Per ANSI/ESD S20.20 Paragraph 6.2.3.2. Protected Areas Guidance "All process essential insulators that have electrostatic fields that exceed 2,000 volts should be kept at a minimum distance of 12 inches from ESDS items." Clothing as an insulator then needs to be kept 12" away from ESD sensitive items. At all times. How do you do that?

From the ESD Association "the actual cost of ESD damage to the electronics industry as running into the billions of dollars annually"

Make sure to specify smocks that are identified as ESD protective with the ESD protective symbol. "A label should be considered with the manufacturers name or logo and date or lot code and ESD identification. This will identify the smock as an ESD protective garment and provide information as to the manufacturer and date of manufacture. The label should be legible after 50 commercial cleanings (washings)." [ESD Handbook TR 20.20 paragraph 5.3.13.3.1.6 Labels]

A company's Compliance Verification Plan should include testing to see that the ESD Garment measures in the recommended electrical resistance range of 1×10^5 ohms to 1×10^{11} ohms." A Surface Resistance Test Kit can be used for this test, and data can easily be used to determine when a garment should be removed from service prior to becoming out of spec.

ESD Garments are an optional ANSI/ESD S20.20 technical requirement, but many leading companies use them as a key for superior ESD control.