

Controlling ESD From The Floor Up

ESD (electrostatic discharge) is a growing problem in this electronic age. A simple touch from a person in a non-static controlled environment can damage an electrical component with charges up to 35,000 volts of electricity. To combat this, static control solutions are needed.

Taking care of static generated on the floor is a key place to start any ESD control program. Static starts to build on people as they walk around. As more and more companies are relying on their employees to be mobile due to the changing work requirements and space issues, static control needs to start from the floor up. This increases the effectiveness of other static control devices, such as the wrist strap, by fighting static at the source.

So how does your company stack up? Does your floor provide proper grounding for mobile employees, equipment and visitors? By answering the following "self test" questions, you can evaluate your company based on your needs and requirements for ESD floor protection.

Self Test:

| | YES | NO |
|---|-----|-----|
| Does your company manufacture, handle, transport, test or repair static sensitive devices? | ___ | ___ |
| Does your company manufacture, build, test or repair these devices on the shop floor? | ___ | ___ |
| Do your employees wear heel grounders or ESD shoes? | ___ | ___ |
| Do your employees walk ungrounded while handling or transporting ESD sensitive devices? | ___ | ___ |
| Are your ESD sensitive parts stored in areas that require employees to be mobile to kit them? | ___ | ___ |
| Are your ESD sensitive devices kitted and/or transported on pushcarts? | ___ | ___ |
| Do you use pushcarts that are grounded with a drag chain? | ___ | ___ |
| Do assemblers need to disconnect their wrist straps to retrieve, move, or test ESD sensitive devices? | ___ | ___ |
| Are your assemblers and operators grounded using an ESD chair? | ___ | ___ |
| Do you use ESD safe chairs that ground using a drag chain? | ___ | ___ |

If you answered YES to ANY of these questions and your floor is not grounded, you are in danger of damaging components sensitive to ESD. Allow your floor to ground your ESD carts, chairs, mobile assemblers and operators.

What steps can be taken to help reduce the problem of static generation? ESD floor protection can help stop this problem. Depending on your existing floor, it may be possible to easily gain ESD protection from existing vinyl, concrete, sealed floor surfaces and carpeting with little investment. This is where ESD floor finish comes in.

ESD Floor Finish

Good ESD floor finishes will provide the ability to ground mobile personnel and eliminate the static charges generated by walking across the floor. They are easy to apply and are easily implemented into an existing floor finish program. Ninety percent of the cost of maintaining a floor is labor. Changing your current floor finish to a good ESD floor finish (at about the cost of \$0.02 more per sq. ft. in material cost) will give an ESD safe and grounded floor. There are several ESD finishes out on the market today. To help you select the right ESD finish for you, here are some tips and questions you can ask:

1. *Is it a wax or a polymer finish?* A polymer cross-linked finish will last much longer than a non-cross-linked finish or a wax based finish.
2. *What are the percentage of solids in the finish?* A finish with at least 18% solids will give you good coverage, thereby reducing your time and labor costs.
3. *How is the slip resistance?* If UL has independently tested and approved the product, it is considered safe. (Look for the UL mark).
4. *How do the finish's electrical and durability properties stand up at humidity extremes (10% humidity is low and 70% is high)?* Some ESD finishes will soften as the humidity increases, wearing the finish down. These finishes will require frequent maintenance and exhibit reduced electrical properties.

The tips mentioned above also apply for no-zinc finishes. No-zinc finishes are great finishes for companies that have environmental protection policies or are reducing their company's waste

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DESCO FLOOR CARE PRODUCTS



STATGUARD® FLOOR FINISH

81010 Floor Finish, 1 Gallon Bottle
81020 Floor Finish, 5 Gallon Pail
81030 Floor Finish, 55 Gallon Drum

FEATURES

Zinc-free

Non-tribocharging
18% solids
Shines without buffing
UL classified for slip resistance

BENEFITS

For companies wanting to reduce discharge of zinc in waste water
Prevents charge generation
Easy to apply, improving productivity
Buffing is optional
Ensures walker safety and mitigates user's liability exposure

Technical Bulletin TB-2045

STATGUARD® FLOOR STRIPPER

10440 5 Gallon Pail

FEATURES

Non-ammoniated and phosphate-free
Low pH formulation

Strips floor finish from vinyl, VCT, concrete, rubber, terrazzo, quarry tile, brick, slate and unglazed ceramic

Technical Bulletin TB-2089

BENEFITS

Environmentally safe, biodegradable
Breaks up and lifts multiple layers of Statguard® or Statfree® Floor Finish
Multiple uses



STATGUARD® FLOOR CLEANER

10560 1 Gallon Bottle
10565 5 Gallon Pail

FEATURES

Formulated with dissipative agents that rejuvenate and improve the properties of Floor Finish
Cleans conductive tile flooring
Clean effectively
15% solids

BENEFITS

Cleans floors coated with Statguard® and Statfree® Floor Finish
Cleans dissipative and conductive floors
Does not leave behind insulative residue
Easy to apply; improvign productivity

Technical Bulletin TB-2090



DESCO FLOOR CARE PRODUCTS

STATFREE® BURNISHING RESTORER

81060 Burnishing Restorer, 5 Gallon
81065 Burnishing Restorer, 1 Gallon

FEATURES

Renews the unique protective properties of Statfree® Floor Finish

Static decay properties, surface resistance characteristics and durability of floor finish are enhanced

BENEFITS

Minimal investment in time, effort and money

Extends the re-coat cycle and significantly reduces cost of maintaining the floor finish



Technical Bulletin TB-2049



STATFREE® SPRAY BUFF

81050 Spray Buff, 1 Quart

FEATURES

Cleans away surface soils and marks, while repairing ground-in scratches and scuffs

Renews the surface of the floor

BENEFITS

Extends the life of Statfree® Floor Finish

Brings back the gloss to a protected floor

Technical Bulletin TB-2048

SURFACE RESISTANCE/RESISTIVITY TEST KIT

19770 Test Kit, 120 V, NIST
19775 Test Kit, 220 V, NIST
19771 Tester Only, 120 V, NIST
50003 Five Pound Electrodes (set of 2)
50075 Leads for Electrodes (set of 2)

FEATURES

Complete resistance measuring tool

Dual test range

Rechargeable battery

LCD digital display

Two built-in parallel probes on the bottom of the unit

BENEFITS

Everything necessary for measuring RTT, RTG, and Surface Resistivity to ESD S4.1

10 and 100 volts

Ideal for field technicians

Easy to read; no interpretation needed

Check surface resistivity without the use of external probes

Range: 10^3 - 10^{11} Ohms @ 10 volts and 10^6 - 10^{12} @ 100 volts

Technical Bulletin TB-2024



Above products can be purchased through your local Desco distributor.

DESCO
3651 WALNUT AVENUE
CHINO, CA 91710

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Good ESD floor finishes will provide most floors with the ability to ground mobile personnel and eliminate the static charges generated by walking across the floor. They are easy to apply and are easily plugged into an existing floor finish program.

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discharge of metals that are found in shampoos, cleaners and finishes. With a no-zinc floor finish you will typically sacrifice gloss and durability with the elimination of the zinc cross linker. A quality no-zinc finish will minimize these sacrifices.

Good quality floor finish will remain in service for 3 months to 6 months, depending on floor traffic, type and frequency. In one year on a high traffic floor, you could expect to use 6 coats of floor finish - three initial coats plus three individual coats every three months. For low traffic areas you could expect to use 4 coats total in one year - three initial coats and one single coat after six months. Periodic testing will always tell you how the ESD floor finish is performing electrically and if it needs maintenance. As the finish wears away the resistance will increase depending on the thickness of the finish on the floor.

Grounding floor finish is easy. Finish and/or paints can be grounded by connecting a ground wire, flat wire or copper strip from a grounded outlet (connect to the center screw or to the box itself) running the wire down the wall and extended enough to get good contact to the floor. It can be bolted, screwed or adhered to the floor or to a plate that in turn is bolted or adhered to the floor. Get at least 2+ square inches of contact from the wire, copper pad or flat wire that is bolted to the floor. This surface is then finished over to connect it and ground to the floor finish. This may be needed every 20 feet along the perimeter or as RTG (resistance to ground) readings indicate. High quality finishes may not require grounding if they cover an area of least 50 square feet. Some finishes are able to drain a 5000 volt charge to zero in less than 0.1 seconds (per FTMS 101C method 4046) and not require actual hard ground points.

How do you know if floor finish is right for you? Depending on your existing floor, you may be able to gain ESD protection by using floor finish on your floors to allow you to properly ground your employees and equipment. If you have vinyl tile, concrete, or carpeting, you should consider ESD floor finish as an option. These floor materials, and their applications, are illustrated here:

Existing Vinyl Tile:

Vinyl tiles, commonly referred to as VC tile (vinyl composite tile), come in 1-foot square tiles that are installed directly on concrete or sub flooring. These tiles are large static generators and need to be finished with a good protective ESD floor finish to fight static generation.

If your vinyl tile is an ESD tile, you may still want to finish it with a good protective ESD finish. ESD tile companies have discouraged the use of ESD floor finish primarily because they have marketed the tiles as not requiring an ESD finish. It turns out that an ESD vinyl tile left bare will become scratched and stained over time. This is fine if the appearance of the floor is not a concern but if you are looking for a nice glossy floor, the ESD tile needs a protective ESD finish on top. Floor tiles without a protective finish tend to become scratched and dull due to floor traffic. ESD floor finish helps prevent this. It is just a whole lot easier to maintain a floor finish than to sand or bleach out scratches and stains on tile.

Existing Concrete:

If you have a concrete floor that is in good shape you have the option of applying an ESD finish to its surface to provide an ESD safe floor. Floor finish can be applied right onto a concrete surface as long as its clean, dry and level. Concrete may be sealed prior to applying a floor finish to fill in the surface pores and gain more coverage of the floor finish. For concrete with moisture concerns, a sealer with moisture barrier properties will protect the surface adhesion of paint or finish from separating due to moisture. Painting the concrete is also an option and can provide a uniform color in addition to sealing the porous surface and increasing the coverage of the floor finish.

Existing Carpeting:

Carpeting is another flooring material that creates large static charges on the people and objects that move across it. Carpets can be treated with a spray-on 50/50 mixture of 18% solid polymer based ESD finish and water. This treatment will adhere to the carpet fibers and give it static dissipative as well as non-triboelectric properties. Even carpets that are rated as anti-static can be treated to bring their high resistance range ($> 10^{11}$ ohms) down below 10^9 ohms. Carpets by nature are more difficult to clean and keep clean. The spray treatment can be done after the carpet has been cleaned or vacuumed, two or three times as needed, each time letting it dry for an hour or letting it sit overnight. This treatment will wear due to traffic and cleaning cycles and may require reapplying every three to six months depending on traffic type and frequency. Testing can be done with a megohmmeter using 5 lb. probes to verify its resistance.

Conclusion:

As we look at all the different floor types, floor finish makes a great solution to controlling the static charge generation.