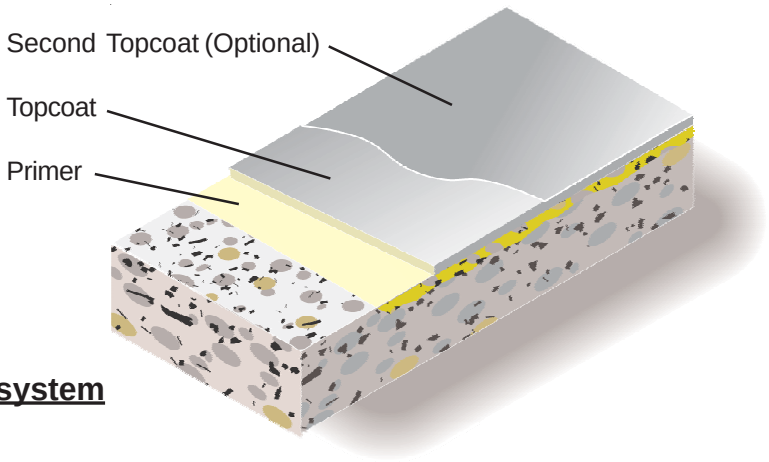
THE SHERWIN - WILLIAMS COMPANY

General Polymers®
High performance floor systems

Static Control Epoxy Coating System

General Polymers Static Control Epoxy Coating System provides a thin-mil electrostatic conductive coating in an attractive finish with a stipple finish epoxy topcoat. The same epoxy topcoat (3525E) provides a conductive coating when placed over a conductive primer or a static dissipative coating when used with a standard epoxy primer.



10 - 20 mils system

Advantages

- Conductive 25,000 to 10^6 ohms
- Static Dissipative 10^6 -10^9 ohms
- Seamless attractive finish
- Orange peel to stipple finish
- Easy to maintain
- Chemical resistant

Static Dissipative Uses

- Electronics assembly
- Electronics production
- Clean rooms
- Computer rooms
- Aircraft hangars
- Quality control labs

Conductive Uses

- Munition plants
- Volatile solvent areas
- Powder environments

Typical Physical Properties

Color	Light Gray / Medium Gray
Conductivity Resistance NFPA 99 (Static Dissipative)	10^6 -10^9 ohms
Conductivity when applied over a conductive base coat NFPA99 (Conductive)	25,000 to 10^6 ohms
Static Charge Decay MIL-B-81705B	Dissipates a 5,000 volt charge to zero in less than 0.1 seconds
Abrasion Resistance ASTM D 4060	100 mg lost
Compressive Strength ASTM D 695	8,500 psi
Tensile Strength ASTM D 638	2,500 psi
Flexural Strength ASTM D 790	10,000 psi
Hardness, Shore D ASTM D 2240	75/70
Adhesion ACI 503R	300 psi concrete failure
Flammability	Self-extinguishing over concrete
Gloss Meter 60º	Stipple gloss

ASTM C = Mortar System
ASTM D = Resin only

Installation

The following information is to be used as a guideline for the installation of the Static Control Epoxy Coating System. Contact the Technical Service Department for assistance prior to application.

Surface Preparation - General

General Polymers systems can be applied to a variety of substrates, if the substrate is properly preapred. Preparation of surfaces other than concrete will depend on the type of substrate, such as wood, concrete block, quarry tile, etc. Should there be any questions regarding a specific substrate or condition, please contact the Technical Service Department prior to starting the project. Refer to Surface Preparation Form (G-1).

Surface Preparation - Concrete

Concrete surfaces shall be abrasive blasted to remove all surface contaminants and laitance. The prepared concrete shall have a CSP 1-3 surface profile. Refer to Surface Preparation Form (G-1).

After initial preparation has occurred, inspect the concrete for bug holes, voids, fins and other imperfections. Protrusions shall be ground smooth while voids shall be filled with a General Polymers system filler. For recommendations, consult the Technical Service Department.

Temperature

Throughout the application process, substrate temperature should be 50ºF - 90ºF. Substrate temperature must be at least 5ºF above the dew point. Applications on concrete substrates should occur while temperature is falling to lessen offgassing. The material should not be applied in direct sunlight, if possible.

Application Information

Material	Mix Ratio	Theoretical Coverage Per Coat Concrete	Packaging
Conductive:			
Conductive Primer			
3524	1:1	250 sq. ft. / gal	2 or 10 gals
Wait 30 minutes for induction period			
Topcoat			
3525E	2:1	160-200 sq. ft. / gal	3 or 15 gals
Static Dissipative:			
Standard Primer			
3579	2:1	250 sq ft / gal	3 or 15 gals
Topcoat			
3525E	2:1	160-200 sq. ft. / gal	3 or 15 gals

Static Control Floors

Static control flooring can be defined as a flooring system that can drain and/or dissipate static charges by grounding personnel, equipment or other objects contacting the floor surface or that controls the generation and accumulation of static charges. The resistance to the movement of electrons across the material's surfaces defines static control floorings into the following two categories:

i) ***Conductive Floor*** has a resistance of 2.5 x 10^4 - 10^6 ohms per 3 ft. It can drain static charge dissipat- ing a 5,000 - volt charge to zero in 0.05 seconds.

ii) ***Static Dissipative Floor*** has a resistance of 10^6 - 10^9ohms per 3 ft. It adds no static electricity to the enviroment and drains off a 5,000 - volt charge to zero in less than 0.2 seconds.

A conductive floor has a much lower electrical resistance than a dissipative floor. It will carry the static charges to a ground quickly and efficiently as to prevent accidental discharge and ignition. If the floor is too conductive, an operator on the floor can become too effectively grounded and will suffer electrical shock. For this reason the NFPA requires all flooring surfaces to have a minimum resistance of 25,000 ohms. Frequent contact between tools and equipment, or dropping the tools on the floor, will cause spark and ignition. For those circumstances, a sparkproof conductive flooring system is highly recommended. The rapid rate of charge dissipation of conductive flooring can create a magnetic field which can present a problem for manufacturers of electronic components.

Dissipative flooring systems have greater resistance to electric current flow than conductive floorings. At a working environment dealing with high test voltages, such as facilities where electronic components are manufactured or assembled, a dissipative floor should be installed so that the static charges can be gradually transferred to ground, protecting personnel from electrical shock while at the same time protecting sensitive electronic equipment.

Conductive Flooring Measurement Guide

There are three test standards available for the evaluation of static dissipative or conductive floors and they are ANSI/ESD-S7.1, ASTM F 150 and NFPA 99 (56A). These test methods describe three types of measurements to be taken, which are summarized below:

(1) Surface-to-surface resistance — Two 2.5 inch diameter electrodes, each weighing 5 lbs, are placed 3 ft apart on the floor. Apply the prescribed voltage (either 500VDC for conductive flooring or 100VDC for static dissipative flooring) and take the readings 5 seconds after the application of voltage or once the reading has reached equilibrium. The resistance in ohms is read on a properly calibrated Megohmmeter ("megger").

(2) Point-to-groundable point resistance---An electrode with a 2.5 inch diameter and a weighing 5 lbs is connected to a Megohmmeter and placed on the surface being tested. The other megger lead is connected directly to a groundable point on the surface being tested.

(3) Surface resistance — Two parallel metal electrodes of equal length and cross section are placed on the surface being tested. The distance between the electrodes should be the same as the length of the electrodes. Resistance is read on a Megohmmeter connected to the two electrodes and is expressed in ohms/square.

For quality control and lab procedures, the surface-to-surface test is most convenient. The measurements of point-to-groundable point test on smaller lab samples usually vary considerably from readings on a practical large floor. Based on these test results a facility manager can check if the flooring conforms to the specification when initially installed and track continual performance of the floor periodically.

NFPA 99 requires 5 measurements in each room and the average of the five readings is used as to determine the resistance level. ANSI/ESD standards also require 5 measurements per room and a minimum of 5 tests per 5,000 square feet for larger areas. At least 3 of the 5 readings must be conducted in areas of wear due to traffic, chemical or water exposure. The ANSI/ESD and NFPA standards require testing records to include date, temperature, humidity, testing voltage, duration of the test and the equipment used.

Maintenance of Resinous Static Control Floors

Providing floors with good maintenance is always the best solution to lasting service life for any type of floor. The standard of NFPA 99 describes appropriate maintenance for a conductive floor to maintaining conductive property through its service life. There are four maintenance guidelines for static dissipative floors.

i) The surface of conductive or dissipative floors shall not be insulated by a film of oil or wax. Any waxes, polishes, or dressings used for maintenance of conductive floors shall not adversely affect the conductivity of the floor.

ii) Floors that depend upon applications of water, salt solutions, or other treatment of a nonpermanent nature for their conductivity are not acceptable.

iii) Cleaning instructions for conductive and dissipative floors shall be established, such as a daily basis cleaning, non-abrasive brush or pads being used and requirements for cleaners, then carefully followed to assure that conductivity characteristics of the floor are not adversely affected by such treatment.

iv) The floor's resistance shall be periodically tested to ensure it still falls the range as initially specified.

Grounding Static Control Flooring

All static control flooring systems must be connected through an equipotential couple to a permanent earth ground. It is absolutely critical that a true earth ground be established and that a reference ground not be used. The ground couple is established over the primer layer with a conductive strip, mesh, wire or tape in accordance with EOS/ESD S6. "Standard for Protection of Electrostatic Discharge susceptible Items—Grounding—Recommended Practice". Contact the Technical Service Department for additional information.

Installation:
Primer - Conductive Flooring
Mixing and Application

1. Premix 3524A (resin) and 3524B (hardener) separately, using a low speed drill and Jiffy mixer. Mix for three minutes and until uniform, exercising caution not to whip air into the material.

2. Add 1 part 3524A (resin) to 1 part 3524B (hardener) by volume. Mix with low speed drill and Jiffy mixer for three minutes and until uniform. Wait 30 minutes for induction period, restir and apply using a short nap roller at a rate of 250 square feet per gallon (6 WFT mils). Allow to cure at least 5 hours prior to applying topcoat but no more than 24 hours.

3. Inspect primer coat prior to application of topcoat. Test surface resistance in accordance with NFPA 99. Resistance range should be less than 150,000 ohms. If deviation from this range occurs, consult the Technical Service Department immediately.

Primer - for Static Dissipative:
Mixing and Application

1. Premix 3579A (resin) using a low speed drill and Jiffy mixer. Mix for one minute and until uniform, exercising caution not to introduce air into the material.

2. Add 2 parts 3579A (resin) to 1 part 3579B (hardener) by volume. Mix with low speed drill and Jiffy mixer for three minutes and until uniform. To insure proper system cure and performance, strictly follow mix ratio recommendations.

3. 3579 may be applied via spray, roller or brush. Apply at 250 square feet per gallon to yield 5-6 mils WFT evenly with no puddles making sure of uniform coverage. Coverage will vary depending upon porosity of the substrate and surface texture.

4. Wait until primer is tacky (usually one hour minimum), before applying the topcoat.

Topcoat (3525E)
Mixing and Application
Both A & B components of 3525E must be premixed to disperse conductive elements evenly throughout the resin. It is normal to have color variations in the components even after premixing.

1. Premix 3525EA (resin) and 3525B (hardener) separately, using a low speed drill and Jiffy mixer. Mix for one minute and until uniform, exercising caution not to whip air into the material.

2. Add 2 parts 3525EA (resin) to 1 part 3525B (hardener) by volume. Mix with low speed drill and Jiffy mixer for three minutes and until uniform. Apply material using a squeegee and backroll at a spread rate of 160-200 sq. ft. per gallon to yield 8-10 mils WFT. Do not exceed 10 mils thickness. Allow material to cure 8-10 hours.

3. Inspect topcoat. Test surface resistance in accordance with NFPA 99. Average resistance range should be 25,000 - 1,000,000 ohms for conductive coating and 1,000,000 - 1,000,000,000 ohms for static dissipative coating. If deviation from range occurs, consult the Technical Service Department immediately. Allow to cure at least 24 hours before opening to light foot traffic.

Application Equipment
Brush / Roller

Use 1/4" phenolic core rollers and professional quality, medium stiff natural bristle brushes.

Cleanup
Clean up mixing and application equipment immediately after use. Use toluene or xylene. Observe all fire and health precautions when handling or storing solvents.

Safety
Refer to the MSDS sheet before use. All applicable federal, state, local and particular plant safety guidelines must be followed during the handling and installation and cure of these materials.

Safe and proper disposal of excess materials shall be done in accordance with applicable federal, state, and local codes.

Material Storage
Store materials in a temperature controlled environment (50ºF - 90ºF) and out of direct sunlight.

Keep resins, hardeners, and solvents separated from each other and away from sources of ignition. One year shelf life is expected for products stored between 50ºF - 90ºF.

Maintenance
Occasional inspection of the installed material and spot repair can prolong system life. For specific information, contact the Technical Service Department.

Shipping
- Destinations East of the Rocky Mountains are shipped F.O.B. Cincinnati, Ohio.
- Destinations West of the Rocky Mountains are shipped F.O.B. Victorville, California.

For specific information relating to international shipments, contact your local sales representative.

Disclaimer
The information and recommendations set forth in this document are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product(s) offered at the time of publication. Published technical data and instructions are subject to change without notice.

Consult www.generalpolymers.com to obtain the most recent Product Data information and Application instructions.

Warranty
The Sherwin-Williams Company warrants our products to be free of manufacturing defects in accord with applicable Sherwin-Williams quality control procedures. Liability for products proven defective, if any, is limited to replacement of the defective product or the refund of the purchase price paid for the defective product as determined by Sherwin-Williams, NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY SHERWIN-WILLIAMS, EXPRESSED OR IMPLIED, STATUTORY, BY OPERATION OF LAW OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

