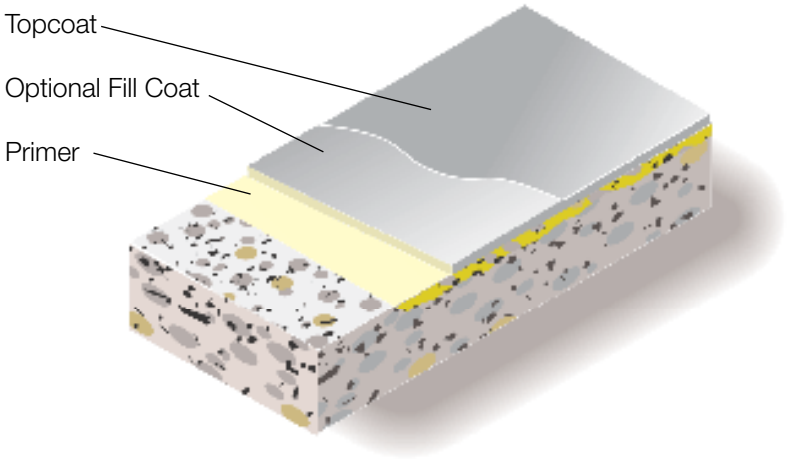
Water Based ESD / Conductive Floor Coating System

General Polymers Water Based ESD/Conductive Floor Coating System is an economic, easy to install system that provides protection against the accumulation of static electricity that could be harmful to personnel or sensitive electronic components. Water Based ESD / Conductive Floor Coating System is designed for use in light or foot traffic only areas with general purpose chemical resistance. If a Conductive Coating is required, the 3425E can be placed over 3424 Conductive primer to provide resistance from 25,000 to 1,000,000 ohms.



10 - 20 mils system

Advantages

- Conductive 25,000 to 10^6 ohms
- Static Dissipative 10^6 -10^9 ohms
- Seamless attractive finish
- Can be applied to “green” concrete
- MVT protection
- 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 3425E

Electrical Resistance ANSI S7.1 NFPA 99		10^6 -10^9 ohms
Static Charge Decay MIL-B-81705B		Dissipates a 5,000 volt charge to zero in less than 0.1 seconds
Viscosity, mixed		2,225 cps
Pot Life		4-6 hours
Cure Time	Dry to touch (as coating)	7 hours
	Recoat	7-24 ours
	Light Foot Traffic	24 hours
	Full Cure	7-10 days
Hardness @ 14 days Shore D ASTMD 2240		58/60
Abrasion Resistance ASMT D 4060, CS17 Wheel , 1,000 cycles		60-70 mg loss
Adhesion ACI 503R		250 psi concrete failure

ASTM D = Resin only

Installation

General Polymers materials shall only be installed by approved contractors. The following information is to be used as a guideline for the installation of the **Water Based ESD/Conductive Floor 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 prepared. 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 surface profile depending upon system selected. Refer to 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 system compatible 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 substrate should occur while temperature is falling to lessen offgassing. The material should not be applied in direct sunlight, if possible. Protect material from freezing prior to installation. **DO NOT ALLOW MATERIAL TO FREEZE.**

Application Information — Surface Prep Profile CSP 2-3

VOC MIXED		MATERIAL	MIX RATIO	THEORETICAL COVERAGE PER COAT CONCRETE	PACKAGING
<50 g/L	**ESD Primer**	3460	1:4	250 sq. ft./gal	1.25 or 25 gals
<50 g/L	**Optional Fill Coat**	3460	1:4	100-200 sq. ft./gal	1.25 or 25 gals
<100 g/L	**Topcoat**	3425E	4:1	275-400 sq. ft./gal	3 or 15 gals
<50 g/L	**Conductive Primer**	3424 1-1.5 pints water per 1.25 gallon kit	4:1	250 sq. ft./gal	1.25 - 25 gals
<100 g/L	**Topcoat 3425**	3425E	4:1	275-400 sq.ft. / gal	3 or 15 gals

For ESD: Primer

Mixing and Application

1. Premix 3460 Part B (hardener), using a low speed drill and Jiffy blade. Mix until uniform, exercising caution to not entrain air into the product.

2. Add 1 part 3460A (resin) to 4 parts 3460B (hardener) by volume. Mix with low speed drill and Jiffy blade until uniform (typically 90 seconds), material will thicken as you mix. To insure proper cure and performance, strictly follow the mix ratio. DO NOT REDUCE PRODUCT UNTIL BOTH COMPONENTS HAVE BEEN MIXED TOGETHER FOR 90 SECONDS. Can reduce 10-20% with potable water.

3. Apply 3460 using a flat or notched squeegee coat and backroll with a high quality 3/8" nap roller. Apply at a spread rate evenly with no puddles, making sure of uniform coverage. Cross hatch backrolling is recommended for uniformity.

4. Allow to cure 2-10 hours minimum before recoating. (Cure times will vary dependent upon environmental conditions).

Optional Fill Coat

Mixing and Application

1. Premix 3460 Part B (hardener), using a low speed drill and Jiffy blade. Mix until uniform, exercising caution to not entrain air into the product.

2. Add 1 part 3460A (resin) to 4 parts 3460B (hardener) by volume. Mix with low speed drill and Jiffy blade until uniform (typically 90 seconds), material will thicken as you mix. To insure proper cure and performance, strictly follow the mix ratio. DO NOT REDUCE PRODUCT UNTIL BOTH COMPONENTS HAVE BEEN MIXED TOGETHER FOR 90 SECONDS. Can reduce up to 10% with potable water only is necessary.

3. Apply 3460 using a flat or notched squeegee coat and backroll with a high quality 3/8" nap roller. Apply at a spread rate 100-200 sq. ft. per gallon, evenly with no puddles, making sure of uniform coverage. Cross hatch backrolling is recommended for uniformity.

4. Allow to cure 2-10 hours minimum before recoating. (Cure times will vary dependent upon environmental conditions).

Topcoat (3425E)
Mixing and Application

1. Premix 3425EA (hardener) using a low speed drill and Jiffy blade. Mix for one minute and until uniform, exercising caution not to whip air into the materials.

2. Add 4 parts 3425EA (hardener) to 1 part 3425EB (resin) by volume. Mix with low speed drill and Jiffy blade for three minutes and until uniform. 3425E may be reduced with potable water 5 - 10%. DO NOT reduce product until after both components have been mixed together for 90 seconds. Apply using a squeegee or short nap roller at a spread rate of 275-400 sq. ft. per gallon to yield 4-6 mils WFT. Allow to cure at least 24 hours before opening to light foot traffic.

3. Inspect topcoat. Test surface resistance in accordance with ASTM F150. 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.

For Conductive: Primer
Mixing and Application

1. Premix 3424A (hardener) using a low speed drill and Jiffy blade Mix for one minute and until uniform, exercising caution not to whip air into the material.

2. 3424 must be reduced 10-20% with potable water to aid in placement. Add 4 Parts 3424A (hardnener) to 1 Part 3424B (resin) and 10-20% potable water. Mix with low speed drill and jiffy blade for 3 minutes and until uniform.

3. Apply using a short nap roller at a rate of 250 - 320 square feet per gallon (5-6 WFT mils). Allow to cure at least 4 hours prior to topcoating but no more than 24 hours. A light sanding may be required prior to applying topcoat.

4. Inspect primer coat prior to application of system. 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.

5. Inspect primer coat prior to application of system. 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.

Topcoat (3425E)
Mixing and Application

1. Inspect base coat prior to application of seal coat. Test surface resistance in accordance with NFPA 99. Resistance range should be less than 150,000 ohms when used as a conductive coating over a conductive primer. If deviation from this range occurs, consult the Technical Service Department immediately.

2. Premix 3425EA (hardener) using a low speed drill and Jiffy blade. Mix for one minute and until uniform, exercising caution not to whip air into the materials.

3. Add 4 parts 3425EA (hardener) to 1 part 3425EB (resin) by volume. Mix with low speed drill and Jiffy blade for three minutes and until uniform. 3425E may be reduced with potable water 5 - 10%. DO NOT reduce product until after both components have been mixed together for 90 seconds. Apply using a squeegee or short nap roller at a spread rate of 275-400 sq. ft. per gallon to yield 4-6 mils WFT. Allow to cure at least 24 hours before opening to light foot traffic.

NOTE: For conductive applications, light colors may require 2 coats to hide the 3424 Conductive Black Primer.

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 dissipating a 5,000 - volt charge to zero in 0.05 seconds.
ii) Static Dissipative Floor has a resistance of 10^6 - 10^9 ohms per 3 ft. It adds no static electricity to the environment 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 basic 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.

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. 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.

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

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