

A technical bulletin detailing the capabilities and application instructions for these ESD coatings by Sauereisen:

- ◆ PenePrime No. 500
- ◆ ConductSeal No. 5035
- ◆ ConductPrime C No. 5073
(Conductive)
- ◆ ConductPrime D No. 5093
(Dissipative)
- ◆ ConducTop SL No. 1313

ConducTop SL No. 1313 is a seamless, self-leveling epoxy monolithic that provides a conductive or dissipative flooring system for concrete, vinyl tile and similar surfaces. ConducTop SL exhibits an extremely durable, high-gloss finish that maintains its electrical properties.

CHARACTERISTICS

- Consistent electrical readings with minimal maintenance.
- Meets EOS/ESD Standard 7.1 or NFPA 99A guidelines.
- Excellent chemical resistance.
- 100% solids epoxy formulation.
- Self-leveling.
- Strong bond to concrete.

PARTS OF THE SYSTEM

The system includes two sealers, a primer and a topcoat, each performing a specific function to build a safe, spark-free surface. Sauereisen PenePrime is the initial base that seals the substrate from moisture. Next, ConductSeal is applied to electrically isolate the substrate and enhance the bond of the other coatings that follow. ConductPrime is then applied to serve as the conductive plane through which all the static charges will be grounded. ConducTop is the final topcoat which directs charges to the primer and functions as a protective barrier.

ConducTop floors are available in both dissipative and conductive systems. The primer selection will determine the type of flooring system. A dissipative surface

PHYSICAL PROPERTIES

Application time at 70°F	
Working time	30 minutes
Initial set	12 - 24 hours
Coefficient of friction (ASTM D-2047)	> 1.00 wet; > 1.20 dry
Compressive strength (ASTM C-579)	8,800 psi (618.7 kg/cm ²)
Conductivity range	
Conductive (NFPA 99A)	25,000 - 1,000,000 ohms
Dissipative (EOS/ESD Standard 7.1)	10 ⁶ - 10 ⁹ ohms
Density (ASTM C-905)	88.8 pcf (1.42 gm/cm ³)
Flexural strength (ASTM C-580)	3,600 psi (253.1 kg/cm ²)
Modulus of elasticity (ASTM C-580)	2.1 x 10 ⁴ psi (1.5 x 10 ³ kg/cm ²)
Tensile strength (ASTM C-307)	2,000 psi (140.6 kg/cm ²)

Physical properties were determined on specimens prepared under laboratory conditions using applicable ASTM procedures. Actual field conditions may vary and yield different results; therefore, data are subject to reasonable deviation.

safe for use with sensitive electrical equipment will be attained by using ConductPrime D No. 5093. Where instant grounding is necessary to prevent combustion of airborne dust or vapors, the alternative conductive primer is ConductPrime C No. 5073.

AREA PREPARATION

Temperature of Working Area

For optimum conditions, maintain a temperature of 65°-85°F on air, substrate and materials during mixing, application, and cure. Material temperature should be maintained at 65°F to 80°F for a minimum of 48 hours prior to beginning work. At temperatures below 65°F, the application becomes more difficult and curing is retarded. Above 80°F, the material working time decreases.

Application in direct sunlight and rising surface temperature may result in blistering of the materials due to expansion of entrapped air or moisture in the substrate. In rising temperatures it may be necessary to postpone the application or apply during cooler hours.

Surface Preparation

Concrete - Refer to SSPC-SP13/NACE 6 "Surface Preparation of concrete" for detailed guidelines.

Surfaces should be made free of oil, grease, water, and other contaminants that may inhibit bond. This can be achieved by chemical cleaning.

New Concrete - All structures must have the necessary strength to withstand imposed loads during normal use and operation. Surface should be floated free of ridges or depressions and all voids filled with Sauereisen Underlayment No. F-120 or No. 209 Filler Compound. The choice of underlayment will depend on the severity of the voids to be filled. Surfaces should be sloped a maximum 1/4 inch per foot for drainage.

Abrasive blast, high-pressure water blast, or acid etch concrete to remove laitance and obtain a uniform surface texture exposing fine aggregate resembling coarse sandpaper.

Old Concrete - Concrete must be dry, firm and must have the necessary strength to withstand imposed loads during normal use and operation. Mechanical methods should be utilized to remove old paints, protective coatings, and deteriorated concrete.

Abrasive blast, high-pressure water blast, or acid etch concrete to remove laitance and obtain uniform sound substrate. All

structural cracks should be repaired. All slopes should be reestablished with Sauereisen Underlayment No. F-120. Smaller voids and cracks should be filled with Filler Compound No. 209.

All prepared surfaces must be allowed to dry prior to coating application. Regardless of preparation method used all surfaces must be vacuumed to remove any loose deposits or contamination.

Vinyl Tile/Resilient Flooring - All subfloor materials must be physically sound and well-bonded as specified by the architect/engineer. Any loose, chipped, scratched or damaged subfloor must be replaced prior to surface preparation. Remove old sealers and waxes by power sanding to a uniform surface texture resembling sandpaper. Edges and areas not accessible to power sanding shall be sanded by hand.

If vinyl tile or existing flooring is suspected of containing asbestos, do not sand. Prior to the coating application, vacuum any loose deposits or contamination.

APPLICATION

Sealers: PenePrime/ConductSeal

PenePrime and ConductSeal are packaged in premeasured containers consisting of Hardener Part A, and Resin Part B which must be mixed together before use. Remix the Part A and Part B before combining.

Mixing - PenePrime No. 500

Completely empty contents of Hardener Part A into Resin Part B container. Using a slow speed 1/2 inch drill motor with a "Jiffy" type blade, mix thoroughly for three minutes until blended to uniform color. Primer is ready for use immediately after mixing.

Installation

Apply PenePrime to concrete at 8 mils using a squeegee, short nap adhesive roller with a nondetachable core, or nylon bristle brush. These materials may also be sprayed.

Prior to application of a ConductSeal No. 5035, PenePrime 500 should be allowed to cure for a minimum of 3 hours

at 70°F or until tacky. Inspect the primed surface for voids, bubbles, or defects that may result in blistering or pinholes. Repair with Sauereisen No. 209 Fast Set to ensure a sealed surface.

Mixing - ConductSeal No. 5035

Completely empty contents of Hardener Part A into Resin Part B container. Using a slow speed 1/2 inch drill motor with a "Jiffy" type blade mix thoroughly until blended for five minutes. While mixing, occasionally scrape the sides of the container to ensure uniformity of the material. ConductSeal is ready for use immediately after mixing.

Installation

Immediately pour all of the ConductSeal into a thin bead across the length of the substrate. Do not allow the material to remain in the mixing container. Spread the ConductSeal with a stiff rubber squeegee at 5 - 8 mils. After spreading, lightly backroll with a 1/8 inch short nap adhesive roller to obtain uniform coverage. ConductSeal will cure in approximately 12 hours at 70°F. The substrate should have a completely sealed and glossy surface. Inspect the primed surface for voids, bubbles, or defects that may result in blistering or pinholes. If necessary, repair with Sauereisen No. 209 Fast Set to ensure a sealed surface.

An alternative method of application is by airless spray. Consult Sauereisen for details.

Grounding

Grounding must be accomplished immediately after placing the ConductSeal. A true earth ground is preferred. Consult with an electrical engineer if a ground plane other than true earth is used. Sauereisen recommends either of the following two procedures.:

Bus Ground - Prior to installation of the static control flooring, a wire (usually #10 or #12 gauge) is dropped inside the wall from any convenient bus ground so that the wire emerges at the floor/wall juncture. A small hole is cut into the drywall, or chipped out of the subfloor, at the exit point of the ground wire. A copper strip (2 inch x 6 inch x .012 inch) is then soldered to the ground wire. The connection of the wire and grounding strip is

then laid into the wet ConductSeal. The ConductSeal will act as an adhesive to anchor the strip flat on the floor.

Care must be taken to keep the top surface of the ground strip and wire connection free from Conduct Seal. After the sealer has cured, ConductPrime C No. 5073 or ConductPrime D No. 5093 will be applied over the grounding strip to provide a continuous path to ground.

Steel Columns - If there are exposed steel columns supporting the building, the ground connection can be made directly to the columns. A copper grounding strip (2 inch x 6 inch x .012 inch) is laid flat into the wet ConductSeal allowing a 2 inch perpendicular protrusion at the junction next to the base of the column. Care must be taken to keep sealer free from the top of the grounding strip. Tap a hole in the column and secure the ground strip with a bolt and flat washer. To assure a good connection, all metal surfaces must be free of paint, rust, ConductSeal or other contaminants that will prevent a metal to metal contact. After the sealer has cured, ConductPrime C No. 5073 will be applied over the grounding strip to provide a continuous path to ground.

Expansion and Control Joints - All Concrete pads should be electrically connected across expansion, control and isolation joints by placing a copper grounding strip (2 inch x 6 inch x .012 inch) across each joint. The copper strip shall have a small 'V' bend in its center. The grounding strip should be placed across the joint with the bend placed as flush as possible because any bulges or protrusions will reflect through the topcoat. It may be necessary to grind the floor so that the copper strip is even with the concrete surface. In the absence of a written specification, a minimum of one grounding strip should be placed across each joint.

Resistance Testing of Sealer

When ConductSeal has reached its initial cure, after approximately 12 hours at 70°F, the surface could be cured enough to start electrical resistance testing. ConductSeal must have an electrical resistance reading of infinity. If the sealer does not read infinity, an additional coat may be required. Immediately following, the same test must be done to the additional topcoat of ConductSeal.

Primer: ConductPrime

Mixing

ConductPrime is packaged in premeasured containers consisting of Hardener Part A and Resin Part B which must be mixed together before use. Remix the Part A and Part B before combining. Completely empty contents of Hardener Part A into Resin Part B container. Using a slow speed 1/2 inch drill motor with a "Jiffy" type blade, mix thoroughly until blended for 5 minutes.

While mixing, occasionally scrape the sides of the container to ensure uniformity of the material. ConductPrime is ready for use immediately after mixing.

Installation

Immediately pour all of the ConductPrime into a thin bead across the length of the subfloor. Do not allow the material to remain in the mixing container. Spread the ConductPrime with a stiff rubber squeegee to a thickness of 5 mils. After spreading, lightly backroll with a 1/8" short nap adhesive roller to obtain uniform coverage. If the primer is too thick or too thin, optimum electrical properties will not be attained.

An alternative method of application is by airless spray. Consult Sauereisen for details.

Resistance Testing of Primer

When ConductPrime has cured a minimum of 12 hours at 70oF, the surface may be tested for electrical resistance. In order for the total installed system to read correctly, ConductPrime C No. 5073 must have an electrical resistance in the range of 25,000 to 200,000 ohms. ConductPrime D No. 5093 must have an electrical resistance of 1M ohms to 50M ohms. If the ConductPrime does not meet the required resistance range at this time, recheck every three hours up to 24 hours. If the ConductPrime continues to not meet the resistance range contact Sauereisen.

After ConductPrime has measured within electrical specifications, any protrusions or peaks in the ConductPrime should be removed by lightly scraping the surface. Once accomplished, the floor must be vacuumed to remove any dust or debris.

Topcoat: ConducTop SL

Mixing

ConducTop SL No. 1313 is packaged in premeasured containers consisting of Hardener Part A and Resin Part B which must be mixed together before use. Remix the Part A and Part B before combining.

Completely empty contents of Hardener Part A into Resin Part B container. Using a slow speed 1/2 inch drill motor with a "Jiffy" type blade, mix thoroughly until blended for 3-5 minutes. ConducTop SL is ready for use immediately after mixing.

Mix only complete units of material - do not mix partial batches. Improperly mixed material will not cure, affecting adhesion and electrical properties.

Installation

Spray application - A single coat of 50 mils thick is suitable for most ConducTop applications. Application should be done with a 50% overlap in a "cross hatch" pattern to reduce the possibility of pinholes and to assure complete coverage. Care must be taken not to damage the primer. Each unit of ConducTop SL should be sprayed within 15 minutes after mixing.

The following equipment is typically used for spray application.:

Mastic pump - Sauereisen materials may be sprayed with a minimum 45:1 piston-primed, airless pump such as the model formerly manufactured by Graco. The current specifications for new equipment is the Graco 56:1 King Piston Primed Airless, Model 236-477. Remove filter from surge tank. Remove cage above lower ball valve located near "foot" (lower end) of pump. Other pumps may be suitable, depending on job site requirements.

Gun - Graco Pistol-Grip Flo Gun, Model 224-991.

Gun tip - Graco Reverse-a-Clean™ housing part No. 222-674 with 0.041" orifice, Model GHD-539. The diffuser should be removed prior to use.

Material hose - 6' whip end, 3/8" i.d.; working pressure 5,000 psi, 16,000 psi burst.

Material hose - 0-25' overall, 1/2" i.d.;

working pressure 4,000 psi, 16,000 psi burst.

Material hose - 25-75' overall, 3/4" i.d.; working pressure 4,000 psi, 12,000 psi burst.

Air compressor - 180 ft³ per minute at 100 psi, minimum.

Air hose from compressor - 3/4" to 1" i.d.: 100' maximum length to mastic pump.

Measures such as water traps, dryers, or filters should be used to prevent pump freeze-up.

Notched squeegee application - Pour the material in a thin bead across the floor. Spread the material with a notched squeegee to obtain a uniform thickness of 50 mils. Distribution of the material in a parallel pattern will improve the aesthetics of the application by allowing the epoxy to self-level more easily. Squeegee notches should measure 3/8 inch for best results.

Lightly backroll the topcoat in a direction perpendicular to the squeegee application, with a dense textured loop roller to release any entrapped air and to smooth out the surface. After at least two passes of the textured roller, backroll with a single pass of a porcupine roller. The ConducTop SL will begin to lose its ability to self-level after approximately 15 minutes. All application and backrolling should occur prior to this time.

Resistance Testing of Topcoat

After the ConducTop SL has cured a minimum of 12 hours, the surface could be cured enough to start testing for electrical resistance. ConducTop must have an electrical resistance of 25,000 to 1,000,000 ohms for conductive applications (NFPA 99A) or 10⁶ to 10⁹ ohms for dissipative applications (EOS/ESD Standard 7.1).

RESISTANCE TESTING FUNDAMENTALS

Resistance is to be measured as specified by NFPA 99A guidelines or EOS/ESD Standard 7.1 specifications depending on whether a conductive or

dissipative surface is desired. Briefly summarized, resistance shall be measured by a suitably calibrated megohmmeter which shall have a nominal open circuit output of 500V DC or 100V DC.

Measurements shall be made between two electrodes placed 36 inches apart on the floor surface, or one electrode and ground. One to five readings shall be taken for each 1,000 ft² of flooring but not fewer than five readings in any one electrically connected area. Electrodes shall weigh 5 pounds and have a flat circular contact area of 2-1/2 inches in diameter with a base contact of electrically conductive rubber that is 1/4 inch thick with a Shore A hardness between 40 and 60. Connect the ground lead to one electrode or ground, and the positive lead to the other electrode. Apply the appropriate test voltage and record the resistance value after the measurement has stabilized. Consult Sauereisen for more details.

COVERAGE

Sealers:

PenePrime:

200 ft² per gallon at 8 mils

ConductSeal

Second Coat - 267 ft² per gal. at 6 mils.

Primer:

ConductPrime

300 ft² per gal. at 5 mils.

Topcoat:

ConducTop SL

32 ft² per gal. at 50 mils.

Coverage is theoretical and will vary depending upon surface conditions, porosity, application techniques and specific project conditions.

SETTING/CURING

Do not allow water, chemicals or traffic on the ConducTop surface for a minimum of 24 hours. For harsh chemical or physical environments, cure a minimum of 72 hours at 70°F prior to exposure.

PACKAGING

Sealers:

PenePrime 500

Unit size	Part A	Part B
1 gal.	1 gal. pail	2 gal. can
3 gal.	3.5 gal. pail	2 gal. pail

ConductSeal 5035

Unit size	Part A	Part B
1 gal.	1 gal. can	2 gal. can
3 gal.	2 gal. can	3.5 gal. pail

Primer:

ConductPrime 5073

Unit size	Part A	Part B
1 gal.	1 gal. can	1 gal. pail
3 gal.	2 gal. can	3 gal. pail

Topcoat:

ConducTop SL

Unit size	Part A	Part B
3 gal.	1 gal. can	3.5 gal. pail
5 gal.	2 gal. pail	6 gal. pail

*Containers are filled by weight, not volume. Container size does not indicate volume of contents.

CLEAN-UP

All equipment should be cleaned with MEK before material cures. If removal is required after cure consult Sauereisen for specific recommendation.

SHELF LIFE

ConducTop, ConductPrime, PenePrime Liquid and Hardener, and ConductSeal components have a shelf life of one year when stored in unopened, tightly sealed containers in a dry location at 70°F. If there is doubt as to the quality of the materials, consult a Sauereisen representative.

CAUTION

Consult Material Safety Data Sheets and container label Caution Statements for hazards in handling these materials.

WARRANTY

We warrant that our goods will conform to the description contained in the order, and that we have good title to all goods sold. WE GIVE NO WARRANTY, WHETHER OF MERCHANTABILITY, FITNESS FOR PURPOSE OR OTHERWISE, EXPRESS OR IMPLIED, OTHER THAN AS EXPRESSLY SET FORTH HEREIN. We are glad to offer suggestions or to refer you to customers using Sauereisen cements and compounds for a similar application. Users shall determine the suitability of the product for intended application before using, and users assume all risk and liability whatsoever in connection therewith regardless of any suggestions as to application or construction. In no event shall we be liable hereunder or otherwise for incidental or consequential damages. Our liability and your exclusive remedy hereunder or otherwise, in law or in equity, shall be expressly limited to our replacement of nonconforming goods at our factory or, at our sole option, to repayment of the purchase price of nonconforming goods.

- Distributors and agents in major cities throughout the world. Consult manufacturer for locations.**
- Information concerning government safety regulations available upon request.**
- Sauereisen also produces inorganic compounds for assembling, sealing, electrically insulating and grouting.**

SAUEREISEN ...since 1899
160 Gamma Drive
Pittsburgh, PA 15238-2989 USA
Phone 412/963-0303 Fax 412/963-7620
www.sauereisen.com