

SAUEREISEN

CONDUCTIVE FIBRECRETE SERIES

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 FibreCrete**
 - **Chemical & Food Grade No. 2043**
 - **Epoxy NovolaK No. 2183**

Conductive FibreCrete is an electrically conductive, 100% solids epoxy coating system. This system offers chemical resistance for use in production, assembly and packaging areas while maintaining electrically conductive properties. The fiber-reinforced matrix of the topcoat provides increased strength.

CHARACTERISTICS

- Excellent chemical resistance.
- Meets NFPA 99A guidelines.
- Consistent electrical readings with minimal maintenance.

PARTS OF THE SYSTEM

The system includes two sealers, a primer and topcoat, each performing a specific function to build a safe, spark-free surface. 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 C is then applied to serve as the conductive plane through which all the static charges will be grounded. Conductive FibreCrete is the final topcoat which carries charges down toward the primer and functions as a chemical-resistant barrier.

Conductive FibreCrete is available in two chemical resistance formulations. Chemical & Food Grade No. 2043 is suitable for areas subject to fats, oils and a wide spectrum of corrosive chemicals. Epoxy NovolaK No. 2183 is specifically designed to resist attack from mineral

PHYSICAL PROPERTIES

Application time at 70°F	
Working time	30 minutes
Initial set	12 - 24 hours
Bond strength to 3,000 psi concrete	Concrete failure
Compressive strength (ASTM C-579)	12,200 psi (857.7 kg/cm ²)
Conductivity range	
Conductive (NFPA 99A)	25,000 - 1,000,000 ohms
Density (ASTM C-905)	90.9 pcf (1.45 gm/cm ³)
Flexural strength (ASTM C-580)	6,200 psi (435.9 kg/cm ²)
Modulus of elasticity (ASTM C-580)	6.5 x 10 ⁵ psi (4.6 x 10 ⁴ kg/cm ²)
Tensile strength (ASTM C-307)	3,200 psi (225.0 kg/cm ²)

Physical properties were determined on novolak epoxy 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. Data should not be used for specification purposes.

acids, heat and solvents. When a glossy finish is required, the surface may be top-coated with Conductive ConoGlaze.

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

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

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

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 uniform surface texture exposing fine aggregate and 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 to obtain a uniform, sound substrate.

All structural cracks must be repaired. All slopes must be reestablished with Sauereisen Underlayment No. F-120. Smaller voids 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.

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, 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 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, approximately 12 hours at 70°F, the surface must be tested for electrical resistance. The ConductSeal must have an electrical resistance reading of infinity. If the sealer does not read infinity, an additional coat may be required.

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 inch short nap adhesive roller to obtain uniform coverage. If the primer is too thick or too thin, optimum electrical properties will not be attained.

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

Resistance Testing of Primer

After ConductPrime has cured a minimum of 24 hours, it must be tested for electrical resistance. In order for the complete system to read correctly, the primer must have an electrical resistance in the range of 25,000 to 200,000 ohms. If the ConductPrime does not meet the required resistance range, contact Sauereisen.

After ConductPrime has measured within electrical specifications, any high 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: Conductive FibreCrete Mixing

Conductive FibreCrete is packaged in premeasured containers consisting of Hardener Part A and Resin Part B which must be mixed together before use. Remix Parts A and 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.

Next, add Part C Fibers to the Resin/Hardener mixture and continue mixing until all fibers are uniformly dispersed. Conductive FibreCrete 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.

"cross hatch" pattern to reduce the possibility of pinholes and to assure complete coverage. When topcoating with Conductive ConoGlaze for a glossy surface, recoat times shall not exceed 4 hours.

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. Moisture Air Dryer - RFI Model DA-300 or equivalent. Moisture air dryer must be placed at least 50' from air compressor on air line.

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

Gun tip - Graco Reverse-a-Clean™ housing part No. 222-674 with 0.039 inch orifice, Model GHD-539. The diffuser should be removed prior to use.

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

Material hose - 0-25 feet overall, 1/2 inch i.d.; working pressure 4,000 psi, 16,000 psi burst.

Material hose - 25-75 feet overall, 3/4 inch 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 inch i.d.: 100 feet maximum length to mastic pump.

Trowel application - Pour the material in a thin bead across the floor. Spread the material with a steel finishing trowel to obtain a uniform thickness of 40 mils.

Backroll the topcoat with a short nap adhesive roller to smooth out the surface. Conductive FibreCrete has a working time of approximately 30 minutes. All application and backrolling should occur prior to this time.

Resistance Testing of Topcoat

After the Conductive FibreCrete has cured a minimum of 12 hours, it must be tested for electrical resistance. According to NFPA Standard 99A, the topcoat must have an electrical resistance in the range of 25,000 to 1,000,000 ohms.

RESISTANCE TESTING FUNDAMENTALS

Resistance is to be measured as specified by NFPA 99A guidelines.

Briefly summarized, resistance shall be measured by a suitably calibrated megohmmeter which shall have a nominal open circuit output of 500V 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. Electrodes should 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:

(1st coat) PenePrime

200 ft² per gallon at 8 mils.

(2nd coat) ConductSeal

267 ft² per gal. at 6 mils.

Primer:

ConductPrime

300 ft² per gal. at 5 mils.

Topcoat:

Conductive FibreCrete

40 ft² per gal. at 40 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 Conductive FibreCrete 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

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

ConductSeal

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

Primer:

ConductPrime

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

Topcoat:

Conductive FibreCrete

Unit	Part A	Part B
1 gal.	1 gal. can	1 gal. can
2.5 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 or N-methyl pyrol before material cures. If removal is required after cure consult Sauereisen for specific recommendation.

SHELF LIFE

PenePrime Liquid and Hardener, Conductive FibreCrete, ConductPrime 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