



Atlas Minerals & Chemicals, Inc.



# DATA SHEET

4-2211PI (5-01<sup>2</sup>)  
Supersedes 4-2211PI (3-99)

## CHEMPRUF® 2211 SERIES

**ChemPruf 2211 Lining System**  
**ChemPruf 2211 C Lining System**  
**ChemPruf 2211 AO Lining System**

### DESCRIPTION

CHEMPRUF 2211 SERIES of linings are highly chemical resistant fabric reinforced lining systems. Applied to concrete and steel substrates, the CHEMPRUF 2211 SERIES Lining Systems are composed of a **novolac bisphenol F epoxy resin**, an inert filled basecoat, fabric reinforcement and an inert filled topcoat. The 1/8" (3.2 mm.) linings can be used in immersion service to 190°F (88°C) and in intermittent service to 200°F (93°C).

The CHEMPRUF 2211 SERIES is designed for primary or secondary containment applications for tanks, trenches, containment dikes, absorbers, scrubbers and floors. The CHEMPRUF 2211 SERIES may be used as a lining or as a membrane in conjunction with chemically resistant brick sheathing. When used as a membrane, the lining can be used at higher process temperatures.

### CHEMICAL RESISTANCE

CHEMPRUF 2211 SERIES Lining Systems are resistant to broad range of strong acids, such as 98% sulfuric acid, nitric acid to 40%, chromic acid to 20%, alkalis, as well as many organic solvents, such as butyl acetate, ethyl alcohol, toluene, xylene and 1,1,1-trichloroethane. Refer to the CHEMPRUF 2000 SERIES Chemical Resistance Chart, 4-2000, for specific information. Typical of novolac bisphenol F epoxy systems, contact with certain concentrated acids may cause the surface of CHEMPRUF 2211 SERIES Lining Systems to change color. This color change will not affect the chemical resistance.

**ChemPruf 2211** is a silica filled basecoat and topcoat with an intermediate layer of fiberglass reinforcement system.

**ChemPruf 2211 C** is a carbon filled basecoat and topcoat with an intermediate layer of carbon fabric reinforcement system. The carbon filled system offers excellent chemical resistance to environments exposed to hydrofluoric acid, fluoboric acid, fluosilicic acid and sodium hydroxide.

## PHYSICAL PROPERTIES

PROPERTY	TEST METHOD	TYPICAL VALUE	
		2211	2211 C
Density, Composite	ASTM C905	115 lb./cu. ft. (1.84 g./cc.)	83 lb./cu. ft. (1.33 g./cc.)
Tensile Strength, Composite 7 days @ 77°F (25°C)	ASTM D638	3,700 psi. (25.5 MPa)	6,100 psi. (42.1 MPa)
Compressive Strength, Mortar 7 days @ 77°F (25°C)	ASTM C579	13,400 psi. (92.4 MPa)	14,000 psi. (96.5 MPa)
Flexural Strength, Composite 7 days @ 77°F (25°C)	ASTM C580	8,000 psi. (55.2 MPa)	7,100 psi. (49.0 MPa)
Coefficient of Thermal Expansion, Composite in./in./°F (cm./cm./°C)	ASTM C531	1.5 x 10 <sup>-5</sup> (2.7 x 10 <sup>-5</sup> )	3.26 x 10 <sup>-5</sup> (5.87 x 10 <sup>-5</sup> )
Temp. Resistance, Composite Immersion, Continual Immersion, Intermittent Dry Heat	—	190°F (88°C) 200°F (93°C) 225°F (107°C)	190°F (88°C) 200°F (93°C) 225°F (107°C)
Hardness, Barcol	—	50	45
Cure Rate @ 77°F (25°C), Max Chemical Resistance	—	7 days	7 days

**ChemPruf 2211 AO** is a silica filled basecoat, an intermediate layer of fiberglass reinforcement and a aluminum oxide filled topcoat system. This abrasion resistant system is preferred for service conditions with abrasive slurries, high velocity air containing particulate matter or environments exposed to flourides, flouride salts and sodium hydroxide.

### CHEMPRUF 2211 SERIES Consists of:

#### PRIMER

**ChemPruf E Primer**, a two-component, moisture-tolerant, brush or roller applied, solvent free penetrating primer.

#### BASECOAT / TOPCOAT

**ChemPruf 2211**, a novolac bisphenol F epoxy resin, silica filled basecoat and topcoat, each trowel coat applied at a nominal thickness of 1/16" (1.6 mm.).

**ChemPruf 2211 C**, a novolac bisphenol F epoxy resin, carbon filled basecoat and topcoat, each trowel coat applied at a nominal thickness of 1/16" (1.6 mm.).

**ChemPruf 2211 AO**, a novolac bisphenol F epoxy resin, silica filled basecoat and aluminum oxide filled topcoat, each trowel coat applied at a nominal thickness of 1/16" (1.6 mm.).

**NOTE:** ATLAS makes it a practice to continuously update and enhance our CCM (Corrosion Resistant Construction Materials) products. For the most recent version of any Data Sheet, please visit our Web site at [www.atlasmin.com](http://www.atlasmin.com).

**REINFORCING FABRIC**

**ChemPruf 10 oz. Reinforcing Fabric**, 10 oz./sq. yd. (339 g./m<sup>2</sup>) woven fiberglass reinforcing fabric for use with ChemPruf 2211 or ChemPruf 2211 AO Lining Systems.

**ChemPruf Carbon Fabric**, 5.6 oz./yd<sup>2</sup> (159 g./m<sup>2</sup>) carbon fabric for use with ChemPruf 2211 C Lining Systems.

**SATURANT**

**ChemPruf 2211 Saturant**, a novolac bisphenol F epoxy resin, roller applied to the reinforcing fabric.

**SMOOTHING LIQUID**

**ChemPruf E Smoothing Liquid**, a one-component, roller applied material used to smooth the basecoat and topcoat surface.

**FINISHER\* (OPTIONAL)**

**ChemPruf 211**, a two-component novolac bisphenol F epoxy resin, brush or roller applied sealer.

**ChemPruf 121**, a two-component, flake filled bisphenol F epoxy resin, brush or roller applied sealer.

\*Depending on service conditions, ATLAS may recommend use of an optional finisher.

**AVAILABLE COLORS**

**ChemPruf 2211** is available in natural and gray.

**ChemPruf 2211 C** is available in black.

**ChemPruf 2211 AO** is available in brown.

**ChemPruf 211** is available in white and gray.

**ChemPruf 121** is available in white and gray.

**ADDITIONAL INFORMATION**

For specific information pertaining to Surface Preparation, Packaging or Mixing and Application, refer to the following ATLAS literature:

- Surface Preparation Data Sheet (PS-30)
- ChemPruf 2211 Lining System Installation Instructions (I-4-2211)
- ChemPruf 2211 C Lining System Installation Instructions (I-4-2211C)
- ChemPruf 2211 AO Lining System Installation Instructions (I-4-2211AO)
- ChemPruf 121 Data Sheet (4-121PI)
- Lining System Termination Drawing (4-3000DG)
- Termination at Drain Drawing (4-3001DG)
- Control Joint & Structural Crack Drawing (4-3003DG)
- Horizontal / Vertical Transition Drawing (4-3004DG)
- Pipe Outlets Drawing (4-3005DG)

**SURFACE PREPARATION**

The substrate must be structurally sound, clean, dry and free of all contaminants, such as sealers, curing compounds, coatings, oil, dirt, dust and water.

Previously applied coatings or paint must be removed.

**Concrete:** The prepared concrete substrate shall have a minimum tensile strength of 250 psi. (1.72 MPa). Concrete surface must be sufficiently cured and comply with moisture testing as prescribed by ACI Test Method 515 R-16 "Dryness of Surface".

Concrete surfaces should be grit blasted to a finish similar to the profile of 100 to 120 grit sandpaper. Cracks in the concrete substrate 1/16" (1.6 mm.) wide or greater must be opened to a minimum 1/4" (6.4 mm.) cleaned, primed and filled with ChemPruf 2211.

**Carbon Steel:** Metal surfaces should be grit blasted to a SSPC-SP5 or NACE #1 white metal blast cleaned surface finish. Profile height must be 3 (0.076 mm.) to 4 mils (0.102 mm.).

**TEMPERATURE DURING APPLICATION**

Store all materials referred to in this Data Sheet at 70°F (21°C) to 80°F (27°C) for 24 hours prior to use. Minimum temperature for installation is 65°F (18°C). Do not apply when the relative humidity is greater than 75% or the substrate temperature is less than 5°F (3°C) above the dew point.

**APPLICATION**

1. Apply ChemPruf E Primer with a brush or roller.
2. Trowel apply a 1/16" (1.6 mm.) WFT basecoat. Imbed the ChemPruf Fabric and roll into the wet basecoat. Apply ChemPruf 2211 saturant with a medium nap roller. Allow saturant coat to harden.
3. Trowel apply a 1/16" (1.6 mm.) WFT topcoat. Smooth with a short nap roller lightly wetted with ChemPruf E Smoothing Liquid. Allow to harden.
4. If ATLAS recommends use of an optional finisher, apply ChemPruf 211 or ChemPruf 121 with a short nap roller. Depending on service conditions, two coats may be required.

Protect uncured primer, basecoat, saturant, topcoat and finisher coat(s) from moisture contamination until minimum cure time is attained.

**INSPECTION**

1. Inspect lining for imperfections after basecoat, fabric and saturant have hardened. Repair defects and imperfections prior to application of the topcoat.
2. When specified or required, spark test for pinholes using 100 volts per mil (0.025 mm.) of lining thickness. Spark testing of ChemPruf 2211 and ChemPruf 2211 AO Lining Systems applied to concrete substrates requires ChemPruf E Primer with ATLAS<sup>®</sup> Carbon Powder.

## MEMBRANE

When the ChemPruf 2211 Lining System is to be used as a membrane with chemical resistant masonry sheathing, a release agent, such as silicone or paste wax, must be applied to the surface of the lining system. Apply the release agent after the ChemPruf 2211 has attained the minimum drying time. The use of a release agent allows the masonry sheathing to move independent of the lining system.

## PRODUCT SPECIFICATION

The lining system shall be ChemPruf 2211 Series as manufactured by Atlas Minerals & Chemicals, Inc. **ChemPruf 2211 Lining System**, a novolac bisphenol F epoxy resin lining system. The lining system shall consist of a silica filled basecoat and topcoat, each trowel applied at a nominal thickness of 1/16" (1.6 mm.), with an intermediate layer of 10 oz./yd<sup>2</sup> (339 g./m<sup>2</sup>) fiberglass fabric reinforcement. Service conditions as determined by the manufacturer may require the application of the optional ChemPruf 211 or ChemPruf 121.

**ChemPruf 2211 C Lining System**, a novolac bisphenol F epoxy resin lining system. The lining system shall consist of a carbon filled basecoat and topcoat each trowel applied at a nominal thickness of 1/16" (1.6 mm.) with an intermediate layer of 5.6 oz./yd<sup>2</sup> (159 g./m<sup>2</sup>) carbon fabric reinforcement. Service conditions as determined by the manufacturer may require the application of the optional ChemPruf 211 or ChemPruf 121.

**ChemPruf 2211 AO Lining System**, a novolac bisphenol F epoxy resin lining system. The lining system shall consist of a silica filled basecoat and aluminum oxide filled topcoat each trowel applied at a nominal thickness of 1/16" (1.6 mm.), with an intermediate layer of 10 oz./yd<sup>2</sup> (339 g./m<sup>2</sup>) fiberglass fabric reinforcement. Service conditions as determined by the manufacturer may require the application of the optional ChemPruf 211 or ChemPruf 121.

## CLEANING OF TOOLS AND EQUIPMENT

Steel wool, soap and warm water will remove the materials referred to in this Data Sheet from mixing tools and equipment if cleaning is done immediately after use. Solvents, such as methyl ethyl ketone, toluene or xylene, will have to be used after the material has begun to harden. Fully hardened material will have to be removed by mechanical means.

Dispose of residues and wastes in accordance with the directions in the Safety Data Sheets and government regulations.

## STORAGE AND SHELF LIFE

ChemPruf 2211 Resin must be stored at temperatures above 50°F (10°C) to prevent crystallization. Uncrystallized resin is a clear, amber-colored liquid while crystallized resin has a milky, translucent appearance. If crystals form, heat slowly to 120°F (49°C) and stir until crystals dissolve.

Cool before using. This will not affect the chemical or physical properties of the finished product.

Store all materials in a cool, dry environment. Keep all materials out of direct sunlight and temperatures above 86°F (30°C). Protect from freezing. In unopened original containers, ChemPruf E Primer Resin and Hardener, ChemPruf 2211 Hardener and ChemPruf 211 Resin and Hardener have a shelf life of approximately one year. ChemPruf 2000 S Powder, ChemPruf C Powder, ChemPruf 2000 AO Powder, ATLAS Carbon Powder, ChemPruf E Smoothing Liquid, ChemPruf Carbon Fabric and ChemPruf 10 oz. Reinforcing Fabric can be stored indefinitely.

## MAINTENANCE

Should the liner be damaged in any way, it can be repaired by thoroughly cleaning and reapplying the ChemPruf 2211 Series Lining System.

## PRECAUTIONS

The materials referred to in this Data Sheet are for Industrial Use Only. They contain materials that present handling and potential health hazards. Consult Safety Data Sheets and the container labels for complete precautionary information.

## TECHNICAL SERVICES

ATLAS maintains a staff of Technical Service Representatives who are available to assist you with the use of ATLAS products. In the event of difficulties with the application of ATLAS materials, the installation should be stopped immediately and ATLAS' Technical Service Department consulted for assistance.

## WARRANTY

ATLAS warrants that its products will be free from defects in workmanship and materials under normal use for a period of one (1) year from the date of shipment by ATLAS (provided the products are installed before the expiration of the shelf life). THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR THE PURPOSE FOR THIS PRODUCT WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. ATLAS' LIABILITY FOR ALLEGED BREACH OF THIS WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT (BUT NOT INCLUDING REMOVAL OF THE DEFECTIVE PRODUCT OR INSTALLATION OF REPLACEMENT PRODUCTS). ATLAS SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES DURING THE WARRANTY PERIOD OR THEREAFTER. **ATLAS' WARRANTY IS VOIDED IF PAYMENT FOR PRODUCT IS NOT RECEIVED IN FULL.**



Atlas Minerals & Chemicals, Inc.



# Installation Instructions

I-4-2211 (7-15)  
Supersedes I-4-2211 (10-12)

## CHEMPRUF® 2211 Lining System

### DESCRIPTION

CHEMPRUF 2211 Lining System consists of a 1/16" (1.6 mm.) trowel applied basecoat of ChemPruf 2211, an intermediate layer of fiberglass fabric reinforcement saturated with ChemPruf 2211 saturant and a 1/16" (1.6 mm.) trowel applied topcoat of ChemPruf 2211.

If specified, roll apply an optional finisher of ChemPruf 211 or ChemPruf 121, Installation Instructions (I-4-121).

### ESTIMATED COVERAGE

#### CHEMPRUF E PRIMER

1/2-Gallon Unit .....	100 ft <sup>2</sup> (9.29 m <sup>2</sup> )
1-1/2-Gallon Unit.....	350 ft <sup>2</sup> (32.5 m <sup>2</sup> )
15-Gallon Unit.....	3,800 ft <sup>2</sup> (353 m <sup>2</sup> )

#### CHEMPRUF E CONDUCTIVE PRIMER

1/2-Gallon Unit .....	60 ft <sup>2</sup> (5.57 m <sup>2</sup> )
1-1/2-Gallon Unit.....	210 ft <sup>2</sup> (19.5 m <sup>2</sup> )
15-Gallon Unit.....	2,800 ft <sup>2</sup> (212 m <sup>2</sup> )
ATLAS® Carbon Powder* .....	3,550 ft <sup>2</sup> (330 m <sup>2</sup> )

\*Per pail for Conductive Primer

#### CHEMPRUF 2211 (Basecoat / Topcoat)

5-Gallon Unit	
Total System @ 1/8" (3.2 mm.) .....	189 ft <sup>2</sup> (17.6 m <sup>2</sup> )
Basecoat @ 1/16" (1.6 mm.) .....	379 ft <sup>2</sup> (35.2 m <sup>2</sup> )
Topcoat @ 1/16" (1.6 mm.) .....	379 ft <sup>2</sup> (35.2 m <sup>2</sup> )

#### CHEMPRUF 2211 (Saturant)

5-Gallon Unit.....	1,084 ft <sup>2</sup> (101 m <sup>2</sup> )
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#### CHEMPRUF 10 OZ. REINFORCING FABRIC

1.1 ft<sup>2</sup> (0.1 m<sup>2</sup>) per ft<sup>2</sup> (0.09 m<sup>2</sup>)

#### CHEMPRUF E SMOOTHING LIQUID

1-Gallon .....	200 ft <sup>2</sup> (18.6 m <sup>2</sup> )
5-Gallon .....	1,000 ft <sup>2</sup> (92.9 m <sup>2</sup> )

#### CHEMPRUF 211 (Optional Finisher)

1-1/2-Gal. Unit @ 5 mils (0.13 mm.)..	391 ft <sup>2</sup> (36.3 m <sup>2</sup> )
7-Gal. Unit @ 5 mils (0.13 mm.)...	1,959 ft <sup>2</sup> (182.0 m <sup>2</sup> )

**Note:** All references to application thickness and coverage per unit in this Installation Instructions are WFT (wet film thickness). Material estimating quantities may vary depending on project conditions and application techniques. Material quantities are theoretical and do not include a safety factor.

### PACKAGING

#### CHEMPRUF E PRIMER

##### 1/2-Gal. Unit (3 lb. 7 oz. [1.6 kg.]) Consisting of:

One - 1/2-gal. can ChemPruf E Primer Resin  
(2 lb. 8 oz. [1.1 kg.])

One - 1-pt. can ChemPruf E Primer Hardener  
(15 oz. [425 g.])

##### 1-1/2-Gal. Unit (12 lb. 2 oz. [5.5 kg.]) Consisting of:

One - 1-gal. can ChemPruf E Primer Resin  
(9 lb. [4.1 kg.])

One - 1/2-gal. can ChemPruf E Primer Hardener  
(3 lb. 2 oz. [1.4 kg.])

##### 15-Gal. Unit (128 lb. 4 oz. [58.2 kg.]) Consisting of:

Two - 5-gal. pails ChemPruf E Primer Resin  
(47 lb. 8 oz. [21.5 kg.]) ea.

One - 5-gal. pail ChemPruf E Primer Hardener  
(33 lb. 4 oz. [15.1 kg.])

#### ATLAS CARBON POWDER (for Conductive Primer)

5-gal. pail (38 lb. [17.2 kg.])

#### CHEMPRUF 2211 (Basecoat / Topcoat)

##### 5-Gal. Unit (225 lb. 11 oz. [102.4 kg.]) Consisting of:

One - 5-gal. pail ChemPruf 2211 Resin  
(46 lb. 4 oz. [21.0 kg.])

One - 5-gal. pail ChemPruf 2211 Hardener  
(17 lb. 7 oz. [7.9 kg.]) ea.

Three - bags ChemPruf 2000 S Powder  
(54 lb. [24.5 kg.]) ea.

#### CHEMPRUF 2211 (Saturant)

##### 5-Gal. Unit (63 lb. 11 oz. [28.9 kg.]) Consisting of:

One - 5-gal. pail ChemPruf 2211 Resin  
(46 lb. 4 oz. [21.0 kg.])

One - 5-gal. pail ChemPruf 2211 Hardener  
(17 lb. 7 oz. [7.9 kg.]) ea.

#### CHEMPRUF 10 OZ. REINFORCING FABRIC

10 oz./yd.<sup>2</sup> (339 g./m<sup>2</sup>) fabric (38" [97 cm.] wide roll)

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**CHEMPRUF E SMOOTHING LIQUID**

1-gal. can (6 lb. 8 oz. [2.9 kg.])

5-gal. pail (32 lb. 8 oz. [14.7 kg.])

**CHEMPRUF 211 (Optional Finisher)**

**1-1/2-Gal. Unit (15 lb. 10 oz. [7.1 kg.]) Consisting of:**

One - 1-gal. can ChemPruf 211 Resin  
(12 lb. [5.4 kg.])

One - 1/2-gal. can ChemPruf 211 Hardener  
(3 lb. 10 oz. [1.6 kg.])

**7-Gal. Unit (78 lb. 2 oz. [35.4 kg.]) Consisting of:**

One - 5-gal. pail ChemPruf 211 Resin  
(60 lb. [27.2 kg.])

Five – 1/2-gal. cans ChemPruf 211 Hardener  
(3 lb. 10 oz. [1.6 kg.]) ea.

**AVAILABLE COLORS**

**ChemPruf 2211** is available in natural and gray.

**ChemPruf 211** is available in white and gray.

**SURFACE PREPARATION**

ChemPruf 2211 Lining System can be applied to concrete and steel surfaces. The substrate must be structurally sound, clean, dry and free of all contaminants, such as sealers, curing compounds, coatings, oil, dirt, dust and water. Previously applied coatings or paint must be removed.

**Concrete:** Finished concrete must be free of ridges, protrusions, fins, mortar splatter and have a tight laitance-free steel trowel finish. Abrasive grit blasting is recommended. Where impractical, chemical preparation by acid washing is acceptable. A finish similar to the profile of 100 to 120 grit sandpaper is suggested.

The prepared concrete substrate shall have a minimum tensile strength of 250 psi. (1.72 MPa).

Concrete surface must be sufficiently cured and comply with moisture testing as prescribed by ACI Test Method 515 R-16 "Dryness of Surface".

**Carbon steel:** Metal surfaces should be grit blasted to a SSPC-SP5 or NACE #1 white metal blast cleaned surface finish. Profile height must be 3 (0.076 mm.) to 4 mils (0.102 mm.).

The primer will hold the finish on carbon steel for approximately two weeks at relative humidity of 75%. Should flash rusting occur at any time before ChemPruf 2211 basecoat is applied, the surface must be grit blasted again and reprimed.

For additional information, refer to Surface Preparation, Data Sheet PS-30.

**TEMPERATURE / HUMIDITY DURING APPLICATION**

Store all materials referred to in this Installation Instructions at 70°F (21°C) to 80°F (27°C) for 24 hours prior to use. The best working characteristics of the materials will be attained when the temperature of the substrate, air and ChemPruf 2211 Lining System components are between 65°F (18°C) and 85°F (29°C).

Minimum temperature for installation is 65°F (18°C). At temperatures below 65°F (18°C), the product may not set or cure properly.

Do not apply when the relative humidity is greater than 75% or the substrate temperature is less than 5°F (3°C) above the dew point.

**CONSTRUCTION DETAILS**

For additional information on Construction Details, refer to the following ATLAS literature:

- Surface Preparation Data Sheet (PS-30)
- Horizontal / Vertical Transition Drawing (4-3004DG)
- Structural Crack Drawing (4-3006DG)
- Control Joint Drawing (4-3003DG)
- Lining System Termination Drawing (4-3000DG)
- Termination at Drain Drawing (4-3001DG)
- Pipe Outlets Drawing (4-3005DG)

Protect uncured primer, basecoat, saturant, topcoat and optional finisher coat(s) from moisture contamination until minimum cure time is attained.

Do not apply the ChemPruf 2211 Lining System to substrates that flex.

**INSTALLATION EQUIPMENT AND SUPPLIES\***

- KOL type mixer & Jiffy type mixer
- 5-gallon (18.9 liter) plastic or metal containers
- Cement finishing, margin & pointing trowels
- Short (3/16" to 1/4") & medium (3/8") nap paint rollers
- Paint brushes
- Rubber & cotton gloves
- Organic respirator, Safety goggles
- Electric grinder
- Scissors, measuring tape, chalk line, felt tip marker

\*The safety equipment listed above is the minimum required to install the ChemPruf 2211 Lining System. The installer must provide any equipment necessary to comply with existing federal, state, local and customer safety regulations.

**APPLICATION OF THE CHEMPRUF 2211 LINING SYSTEM**

1. **Primer:** All substrates must be primed with ChemPruf E Primer. Apply ChemPruf E Primer with a brush or medium nap roller. Do not allow puddling. Work ChemPruf E Primer into the pores of concrete substrates.

The primed surface should be tacky or dry before applying ChemPruf 2211 basecoat. If the primer is allowed to dry for longer than the maximum drying time, the surface must be sanded and the area reprimed before proceeding.

**Conductive Primer:** When the ChemPruf 2211 Lining System is applied to concrete substrates, spark testing of the lining may be specified or required. Apply ChemPruf E Primer with ATLAS Carbon Powder. Stir the mixed components frequently during the application to avoid settlement of the carbon powder. Apply as described above.

**CHEMPRUF E PRIMER**

Temperature	Working	Minimum	Maximum
	Time	Drying Time	Drying Time
65°F (18°C)	40 min.	12 hours	30 hours
75°F (24°C)	30 min.	8 hours	24 hours
85°F (29°C)	20 min.	6 hours	20 hours

2a. **Basecoat:** Trowel apply a basecoat of ChemPruf 2211 at a thickness of 1/16" (1.6 mm.) with a plaster's or concrete finishing trowel.

2b. **Fabric:** Immediately apply the ChemPruf 10 oz. Reinforcing Fabric into the wet basecoat. Roll the ChemPruf 10 oz. Reinforcing Fabric with a medium nap roller to imbed the fabric into the ChemPruf 2211 basecoat. Roll the fabric from the center to the edges to smooth the surface and remove entrapped air.

2c. **Saturant:** Immediately apply a mixture of ChemPruf 2211 Resin and Hardener as a saturant over the fabric. Apply the mixed saturant to the fabric from the center toward the edges with a medium nap roller. Use only enough saturant to remove the whiteness and produce a uniform darker appearance to the fabric. A brush may be used to apply saturant in corners and around appurtenances.

Allow saturant coat to harden sufficiently so that the fabric will not be disturbed before continuing with the topcoat application.

If the saturant is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying the ChemPruf 2211 topcoat.

**CHEMPRUF 2211 (Saturant)**

Temperature	Working	Minimum	Maximum
	Time	Drying Time	Drying Time
65°F (18°C)	35 min.	16 hours	30 hours
75°F (24°C)	30 min.	16 hours	24 hours
85°F (29°C)	20 min.	12 hours	20 hours

3. **Inspection:** Inspect lining for imperfections after basecoat, fabric and saturant have hardened. Repair defects and imperfections prior to application of the topcoat.

When specified or required, spark test for pinholes using 100 volts per mil (0.025 mm.) of lining thickness. Spark testing of ChemPruf 2211 Lining System applied to concrete substrates requires ChemPruf E Primer with ATLAS Carbon Powder.

4. **Topcoat:** Trowel apply a topcoat of ChemPruf 2211 at a thickness of 1/16" (1.6 mm.) with a plaster's or concrete finishing trowel.

Smooth trowel marks with a short nap roller lightly wetted with ChemPruf E Smoothing Liquid. Before rolling, shake the wet roller to remove excess ChemPruf E Smoothing Liquid. Use only enough smoothing liquid to prevent

picking up of the topcoat. Excess smoothing liquid may cause the lining to remain soft.

Allow the ChemPruf 2211 topcoat to harden sufficiently so that the surface will not be disturbed before continuing with the optional finisher application, if specified.

If the ChemPruf 2211 topcoat is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed if applying the optional finisher.

**CHEMPRUF 2211 (Basecoat / Topcoat)**

Temperature	Working	Minimum	Maximum
	Time	Drying Time	Drying Time
65°F (18°C)	35 min.	16 hours	30 hours
75°F (24°C)	30 min.	16 hours	24 hours
85°F (29°C)	20 min.	12 hours	20 hours

5. **Optional Finisher:** If specified, apply a 5 mil (0.13 mm.) coat of ChemPruf 211 with a short nap roller. If ChemPruf 121 is specified, refer to Installation Instructions, I-4-121. Depending on service conditions, two coats may be required.

If the ChemPruf 211 is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying a second finisher coat.

**CHEMPRUF 211**

Temperature	Working	Minimum	Maximum
	Time	Drying Time	Drying Time
65°F (18°C)	40 min.	18 hours	48 hours
75°F (24°C)	30 min.	10 hours	36 hours
85°F (29°C)	20 min.	8 hours	24 hours

**MEMBRANE**

When applying a masonry sheathing over the ChemPruf 2211 Lining System, a release agent must be applied to the surface of the lining system. The use of a release agent allows the masonry sheathing to move independent of the lining system. Silicone or paste wax can be applied after the maximum drying time.

**MIXING OF THE CHEMPRUF E PRIMER**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

**1/2-Gallon and 1-1/2-Gallon Units:**

- Combine the contents of the cans of ChemPruf E Primer Resin and Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

**15-Gallon Unit:**

The following mixing instructions are for a batch size of 1.4 gallons (5.1 liters) or 12 lb. 2 oz. (5.5 kg.). Estimated coverage of the batch size is 350 ft<sup>2</sup> (32.5 m<sup>2</sup>). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 125 fluid ounces (3.7 liters) of ChemPruf E Primer Resin with 49 fluid ounces (1.5 liters) ChemPruf E Primer Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

**MIX RATIO OF THE CHEMPRUF E PRIMER**

	by Weight	by Volume
CHEMPRUF E PRIMER Resin	100	100
CHEMPRUF E PRIMER Hardener	35	40

Conductive Primer

- Mix the ChemPruf E Primer Resin and Hardener as described above.
- 1/2-Gallon Unit:** Add 10 oz. (284 g.) or approximately 12 fluid ounces (0.36 liters) of ATLAS Carbon Powder. Mix thoroughly for approximately two minutes. During application, stir the mixed components frequently to avoid settlement of the carbon powder.

**1-1/2-Gallon Unit or 1.4-Gallon (5.1 liters)**

**Batch Size:** Add 36 oz. (1.0 kg.) or approximately 42 fluid ounces (1.2 liters) of ATLAS Carbon Powder. Mix thoroughly for approximately two minutes. During application, stir the mixed components frequently to avoid settlement of the carbon powder.

**MIX RATIO OF THE CONDUCTIVE PRIMER**

	by Weight	by Volume
CHEMPRUF E PRIMER Resin	100	100
CHEMPRUF E PRIMER Hardener	35	40
ATLAS Carbon Powder	25	34

**MIXING OF THE CHEMPRUF 2211 (Basecoat / Topcoat)**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be with a KOL type mixer with a 5-gallon capacity. Mixing speed should be between 60 and 75 RPM.

The following mixing instructions are for a batch size of 37 lb. 11 oz. (17.1 kg.) or 0.33 ft<sup>3</sup> (9.4 liters). Estimated coverage of the batch size is 63 ft<sup>2</sup> (5.9 m<sup>2</sup>) @ 1/16" (1.6 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Evenly divide the contents of one of the 54 lb. (24.5 kg.) bags of ChemPruf 2000 S Powder into two equal parts by volume using two clean, dry 5-gallon pails. Each pail should contain 27 lb.

(12.2 kg.) or approximately 301 fluid ounces (8.9 liters) of powder.

- Combine 101 fluid ounces (3.0 liters) of ChemPruf 2211 Resin with 44 fluid ounces (1.3 liters) ChemPruf 2211 Hardener in the 5-gallon capacity mechanical mixer. Mix thoroughly for approximately two minutes.
- Slowly add a 1/2 bag of ChemPruf 2000 S Powder, 27 lb. (12.2 kg.), as prepared in Step (a.).
- Mix the combined components for approximately two minutes or until all the powder is thoroughly dispersed.

The amount of the powder may be varied slightly to obtain the desired consistency. Decreasing the powder component will decrease the estimated unit coverage. The amount of powder must be within 5%, by weight, of the suggested amount.

**MIX RATIO OF THE CHEMPRUF 2211 (Basecoat / Topcoat)**

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43
CHEMPRUF 2000 S Powder	350	298

**MIXING OF THE CHEMPRUF 2211 (Saturant)**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components may be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

The following mixing instructions are for a batch size of 1.1 gallons (4.3 liters) or 10 lb. 11 oz. (4.8 kg.). Estimated coverage of the batch size is 182 ft<sup>2</sup> (16.9 m<sup>2</sup>). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 101 fluid ounces (3.0 liters) of ChemPruf 2211 Resin with 44 fluid ounces (1.3 liters) ChemPruf 2211 Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

**MIX RATIO OF THE CHEMPRUF 2211 (Saturant)**

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43

**MIXING OF THE CHEMPRUF 211 (Optional Finisher)**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components may be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

**1-1/2-Gallon Unit:**

- a. Combine the contents of the cans of ChemPruf 211 Resin and Hardener in a suitable mixing container.
- b. Mix thoroughly for two minutes as described above.

**7-Gallon Unit:**

The following mixing instructions are for a batch size of 1.2 gallons (4.6 liters) or 15 lb. 10 oz. (7.1 kg.). Estimated coverage of the batch size is 391 ft<sup>2</sup> (36.3 m<sup>2</sup>) @ 5 mils (0.13 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- a. Combine 126 fluid ounces (3.7 liters) of ChemPruf 211 Resin with 54 fluid ounces (1.6 liters) ChemPruf 211 Hardener in a suitable mixing container.
- b. Mix thoroughly for two minutes as described above.

**MIX RATIO OF THE CHEMPRUF 211**

	by Weight	by Volume
CHEMPRUF 211 Resin	100	100
CHEMPRUF 211 Hardener	30	43

**CLEANING OF TOOLS AND EQUIPMENT**

Steel wool, soap and warm water will remove the materials referred to in this Data Sheet from mixing tools and equipment if cleaning is done immediately after use. Solvents, such as methyl ethyl ketone, toluene or xylene, will have to be used after the material has begun to harden. Fully hardened material will have to be removed by mechanical means.

Dispose of residues and wastes in accordance with the directions in the Safety Data Sheets and government regulations.

**STORAGE AND SHELF LIFE**

ChemPruf 2211 Resin must be stored at temperatures above 50°F (10°C) to prevent crystallization. Uncrystallized resin is a clear, amber-colored liquid while crystallized resin has a milky, translucent appearance. If crystals form, heat slowly to 120°F (49°C) and stir until crystals dissolve. Cool before using. This will not affect the chemical or physical properties of the finished product. ChemPruf 2211 Resin has a shelf life of approximately one year. Store all materials in a cool, dry environment. Keep all materials out of direct sunlight and temperatures above 86°F (30°C). Protect from freezing. In unopened original containers, ChemPruf E Primer Resin and Hardener, ChemPruf 2211 Hardener and ChemPruf 211 Resin and Hardener have a shelf life of approximately one year. ChemPruf 2000 S Powder, ATLAS Carbon Powder, ChemPruf E Smoothing Liquid and ChemPruf 10 oz. Reinforcing Fabric can be stored indefinitely.

**MAINTENANCE**

Should the lining be damaged in any way, it can be repaired by thoroughly cleaning and reapplying the ChemPruf 2211 Lining System. Mix and apply in accordance with the instructions provided in this Installation Instructions sheet.

1. Determine all areas that have been damaged.
2. Grind or sand to expose the substrate 1" (25.4 mm.) to 2" (50.8 mm.) beyond the damaged area.
3. Grind or sand the surface of the ChemPruf 2211 Lining System. Taper the ChemPruf Lining to expose 2" (50.8 mm.) to 4" (101.6 mm.) of each layer of the ChemPruf 2211 Lining System.
4. Clean and remove all debris from Step (2.) and Step (3.).
5. Apply ChemPruf E Primer to the substrate and exposed tapered edges of the ChemPruf 2211 Lining System.
6. Apply the ChemPruf 2211 basecoat, ChemPruf 10 oz. Reinforcing Fabric and ChemPruf 2211 saturant. Allow to harden.
7. Apply the ChemPruf 2211 topcoat.
8. Apply ChemPruf 211 or ChemPruf 121 if specified.

Rezklad<sup>®</sup> E-Concrete Primer is a substitute for ChemPruf E Primer. Rezklad E-Hi Build 110 is a substitute for ChemPruf 211.

**PRECAUTIONS**

The materials referred to in this Data Sheet are for Industrial Use Only. They contain materials that present handling and potential health hazards. Consult Safety Data Sheets and the container labels for complete precautionary information.

**TECHNICAL SERVICES**

ATLAS maintains a staff of Technical Service Representatives who are available to assist you with the use of ATLAS products. In the event of difficulties with the application of ATLAS materials, the installation should be stopped immediately and ATLAS' Technical Service Department consulted for assistance.

**WARRANTY**

ATLAS warrants that its products will be free from defects in workmanship and materials under normal use for a period of one (1) year from the date of shipment by ATLAS (provided the products are installed before the expiration of the shelf life). THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR THE PURPOSE FOR THIS PRODUCT WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. ATLAS' LIABILITY FOR ALLEGED BREACH OF THIS WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT (BUT NOT INCLUDING REMOVAL OF THE DEFECTIVE PRODUCT OR INSTALLATION OF REPLACEMENT PRODUCTS). ATLAS SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES DURING THE WARRANTY PERIOD OR THEREAFTER. **ATLAS' WARRANTY IS VOIDED IF PAYMENT FOR PRODUCT IS NOT RECEIVED IN FULL.**



# atlas Installation Instructions

Atlas Minerals & Chemicals, Inc.



I-4-2211AO (7-15)  
Supersedes I-4-2211AO (10-12)

## CHEMPRUF® 2211 AO Lining System

### DESCRIPTION

CHEMPRUF 2211 AO Lining System consists of a 1/16" (1.6 mm.) trowel applied basecoat of ChemPruf 2211, an intermediate layer of fiberglass fabric reinforcement saturated with ChemPruf 2211 saturant and a 1/16" (1.6 mm.) trowel applied topcoat of ChemPruf 2211 AO.

If specified, roll apply an optional finisher of ChemPruf 211 or ChemPruf 121, Installation Instructions (I-4-121).

### ESTIMATED COVERAGE

#### CHEMPRUF E PRIMER

1/2-Gallon Unit .....	100 ft <sup>2</sup> (9.29 m <sup>2</sup> )
1-1/2-Gallon Unit.....	350 ft <sup>2</sup> (32.5 m <sup>2</sup> )
15-Gallon Unit.....	3,800 ft <sup>2</sup> (353 m <sup>2</sup> )

#### CHEMPRUF E CONDUCTIVE PRIMER

1/2-Gallon Unit .....	60 ft <sup>2</sup> (5.57 m <sup>2</sup> )
1-1/2-Gallon Unit.....	210 ft <sup>2</sup> (19.5 m <sup>2</sup> )
15-Gallon Unit.....	2,800 ft <sup>2</sup> (212 m <sup>2</sup> )
ATLAS Carbon Powder* .....	3,550 ft <sup>2</sup> (330 m <sup>2</sup> )

\*Per pail for Conductive Primer

#### CHEMPRUF 2211 (Basecoat)

5-Gallon Unit	
Basecoat @ 1/16" (1.6 mm.) .....	379 ft <sup>2</sup> (35.2 m <sup>2</sup> )

#### CHEMPRUF 2211 AO (Topcoat)

5-Gallon Unit	
Topcoat @ 1/16" (1.6 mm.) .....	394 ft <sup>2</sup> (36.6 m <sup>2</sup> )

#### CHEMPRUF 2211 (Saturant)

5-Gallon Unit.....	1,084 ft <sup>2</sup> (101 m <sup>2</sup> )
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#### CHEMPRUF 10 oz. REINFORCING FABRIC

1.1 ft<sup>2</sup> (0.1 m<sup>2</sup>) per ft<sup>2</sup> (0.09 m<sup>2</sup>)

#### CHEMPRUF E SMOOTHING LIQUID

1-Gallon .....	200 ft <sup>2</sup> (18.6 m <sup>2</sup> )
5-Gallon .....	1,000 ft <sup>2</sup> (92.9 m <sup>2</sup> )

#### CHEMPRUF 211 (Optional Finisher)

1-1/2-Gal. Unit @ 5 mils (0.13 mm.)..	391 ft <sup>2</sup> (36.3 m <sup>2</sup> )
7-Gal. Unit @ 5 mils (0.13 mm.)...	1,959 ft <sup>2</sup> (182.0 m <sup>2</sup> )

**Note:** All references to application thickness and coverage per unit in this Installation Instructions are WFT (wet film thickness). Material estimating quantities may vary depending on project conditions and application techniques. Material quantities are theoretical and do not include a safety factor.

### PACKAGING

#### CHEMPRUF E PRIMER

##### 1/2-Gal. Unit (3 lb. 7 oz. [1.6 kg.]) Consisting of:

- One - 1/2-gal. can ChemPruf E Primer Resin (2 lb. 8 oz. [1.1 kg.])
- One - 1-pt. can ChemPruf E Primer Hardener (15 oz. [425 g.])

##### 1-1/2-Gal. Unit (12 lb. 2 oz. [5.5 kg.]) Consisting of:

- One - 1-gal. can ChemPruf E Primer Resin (9 lb. [4.1 kg.])
- One - 1/2-gal. can ChemPruf E Primer Hardener (3 lb. 2 oz. [1.4 kg.])

##### 15-Gal. Unit (128 lb. 4 oz. [58.2 kg.]) Consisting of:

- Two - 5-gal. pails ChemPruf E Primer Resin (47 lb. 8 oz. [21.5 kg.]) ea.
- One - 5-gal. pail ChemPruf E Primer Hardener (33 lb. 4 oz. [15.1 kg.])

#### ATLAS Carbon Powder (for Conductive Primer)

5-gal. pail (38 lb. [17.2 kg.])

#### CHEMPRUF 2211 (Basecoat)

##### 5-Gal. Unit (225 lb. 11 oz. [102.4 kg.]) Consisting of:

- One - 5-gal. pail ChemPruf 2211 Resin (46 lb. 4 oz. [21.0 kg.])
- One - 5-gal. pail ChemPruf 2211 Hardener (17 lb. 7 oz. [7.9 kg.]) ea.
- Three - bags ChemPruf 2000 S Powder (54 lb. [24.5 kg.]) ea.

#### CHEMPRUF 2211 AO (Topcoat)

##### 5-Gal. Unit (279 lb. 11 oz. [126.8 kg.]) Consisting of:

- One - 5-gal. pail ChemPruf 2211 Resin (46 lb. 4 oz. [21.0 kg.])
- One - 5-gal. pail ChemPruf 2211 Hardener (17 lb. 7 oz. [7.9 kg.]) ea.
- Four - bags ChemPruf 2000 AO Powder (54 lb. [24.5 kg.]) ea.

**NOTE:** ATLAS makes it a practice to continuously update and enhance our CCM (Corrosion Resistant Construction Materials) products. For the most recent version of any Data Sheet, please visit our Web site at [www.atlasmin.com](http://www.atlasmin.com).

**CHEMPRUF 2211 (Saturant)****5-Gal. Unit (63 lb. 11 oz. [28.9 kg.]) Consisting of:**

One - 5-gal. pail ChemPruf 2211 Resin  
(46 lb. 4 oz. [21.0 kg.])

One - 5-gal. pail ChemPruf 2211 Hardener  
(17 lb. 7 oz. [7.9 kg.]) ea.

**CHEMPRUF 10 OZ. REINFORCING FABRIC**

10 oz./yd.2 (339 g./m<sup>2</sup>) fabric (38" [97 cm.] wide roll)

**CHEMPRUF E SMOOTHING LIQUID**

1-gal. can (6 lb. 8 oz. [2.9 kg.])

5-gal. pail (32 lb. 8 oz. [14.7 kg.])

**CHEMPRUF 211 (Optional Finisher)****1-1/2-Gal. Unit (15 lb. 10 oz. [7.1 kg.]) Consisting of:**

One - 1-gal. can ChemPruf 211 Resin  
(12 lb. [5.4 kg.])

One - 1/2-gal. can ChemPruf 211 Hardener  
(3 lb. 10 oz. [1.6 kg.])

**7-Gal. Unit (78 lb. 2 oz. [35.4 kg.]) Consisting of:**

One - 5-gal. pail ChemPruf 211 Resin  
(60 lb. [27.2 kg.])

Five – 1/2-gal. cans ChemPruf 211 Hardener  
(3 lb. 10 oz. [1.6 kg.]) ea.

**AVAILABLE COLORS**

**ChemPruf 2211** is available in natural and gray.

**ChemPruf 2211 AO** is available in brown.

**ChemPruf 211** is available in white and gray.

**SURFACE PREPARATION**

ChemPruf 2211 AO Lining System can be applied to concrete and steel surfaces. The substrate must be structurally sound, clean, dry and free of all contaminants, such as sealers, curing compounds, coatings, oil, dirt, dust and water. Previously applied coatings or paint must be removed.

**Concrete:** Finished concrete must be free of ridges, protrusions, fins, mortar splatter and have a tight laitance-free steel trowel finish. Abrasive grit blasting is recommended. Where impractical, chemical preparation by acid washing is acceptable. A finish similar to the profile of 100 to 120 grit sandpaper is suggested.

The prepared concrete substrate shall have a minimum tensile strength of 250 psi. (1.72 MPa).

Concrete surface must be sufficiently cured and comply with moisture testing as prescribed by ACI Test Method 515 R-16 "Dryness of Surface".

**Carbon steel:** Metal surfaces should be grit blasted to a SSPC-SP5 or NACE #1 white metal blast cleaned surface finish. Profile height must be 3 (0.076 mm.) to 4 mils (0.102 mm.).

The primer will hold the finish on carbon steel for approximately two weeks at relative humidity of 75%. Should flash rusting occur at any time before ChemPruf 2211 basecoat is applied, the surface must be grit blasted again and reprimed.

For additional information, refer to Surface Preparation, Data Sheet PS-30.

**TEMPERATURE / HUMIDITY DURING APPLICATION**

Store all materials referred to in this Installation Instructions at 70°F (21°C) to 80°F (27°C) for 24 hours prior to use. The best working characteristics of the materials will be attained when the temperature of the substrate, air and ChemPruf 2211 AO Lining System components are between 65°F (18°C) and 85°F (29°C).

Minimum temperature for installation is 65°F (18°C). At temperatures below 65°F (18°C), the product may not set or cure properly.

Do not apply when the relative humidity is greater than 75% or the substrate temperature is less than 5°F (3°C) above the dew point.

**CONSTRUCTION DETAILS**

For additional information on Construction Details, refer to the following ATLAS literature:

- Surface Preparation Data Sheet (PS-30)
- Horizontal / Vertical Transition Drawing (4-3004DG)
- Structural Crack Drawing (4-3006DG)
- Control Joint Drawing (4-3003DG)
- Lining System Termination Drawing (4-3000DG)
- Termination at Drain Drawing (4-3001DG)
- Pipe Outlets Drawing (4-3005DG)

Protect uncured primer, basecoat, saturant, topcoat and optional finisher coat(s) from moisture contamination until minimum cure time is attained.

Do not apply the ChemPruf 2211 AO Lining System to substrates that flex.

**INSTALLATION EQUIPMENT AND SUPPLIES\***

- KOL type mixer & Jiffy type mixer
- 5-gallon (18.9 liter) plastic or metal containers
- Cement finishing, margin & pointing trowels
- Short (3/16" to 1/4") & medium (3/8") nap paint rollers
- Paint brushes
- Rubber & cotton gloves
- Organic respirator, Safety goggles
- Electric grinder
- Scissors, measuring tape, chalk line, felt tip marker

\*The safety equipment listed above is the minimum required to install the ChemPruf 2211 AO Lining System. The installer must provide any equipment necessary to comply with existing federal, state, local and customer safety regulations.

**APPLICATION OF THE CHEMPRUF 2211 AO LINING SYSTEM**

1. **Primer:** All substrates must be primed with ChemPruf E Primer. Apply ChemPruf E Primer with a brush or medium nap roller. Do not allow puddling. Work ChemPruf E Primer into the pores of concrete substrates.

The primed surface should be tacky or dry before applying ChemPruf 2211 basecoat. If the primer is allowed to dry for longer than the maximum drying time, the surface must be sanded and the area reprimed before proceeding.

**Conductive Primer:** When the ChemPruf 2211 AO Lining System is applied to concrete substrates, spark testing of the lining may be specified or required. Apply ChemPruf E Primer with ATLAS Carbon Powder. Stir the mixed components frequently during the application to avoid settlement of the carbon powder. Apply as described above.

Temperature	CHEMPRUF E PRIMER		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	40 min.	12 hours	30 hours
75°F (24°C)	30 min.	8 hours	24 hours
85°F (29°C)	20 min.	6 hours	20 hours

2a. **Basecoat:** Trowel apply a basecoat of ChemPruf 2211 at a thickness of 1/16" (1.6 mm.) with a plaster's or concrete finishing trowel.

2b. **Fabric:** Immediately apply the ChemPruf 10 oz. Reinforcing Fabric into the wet basecoat. Roll the ChemPruf 10 oz. Reinforcing Fabric with a medium nap roller to imbed the fabric into the ChemPruf 2211 basecoat. Roll the fabric from the center to the edges to smooth the surface and remove entrapped air.

2c. **Saturant:** Immediately apply a mixture of ChemPruf 2211 Resin and Hardener as a saturant over the fabric. Apply the mixed saturant to the fabric from the center toward the edges with a medium nap roller. Use only enough saturant to remove the whiteness and produce a uniform darker appearance to the fabric. A brush may be used to apply saturant in corners and around appurtenances.

Allow saturant coat to harden sufficiently so that the fabric will not be disturbed before continuing with the topcoat application.

If the saturant is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying the ChemPruf 2211 AO topcoat.

Temperature	CHEMPRUF 2211 (Saturant)		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	35 min.	16 hours	30 hours
75°F (24°C)	30 min.	16 hours	24 hours
85°F (29°C)	20 min.	12 hours	20 hours

3. **Inspection:** Inspect lining for imperfections after basecoat, fabric and saturant have hardened. Repair defects and imperfections prior to application of the topcoat.

When specified or required, spark test for pinholes using 100 volts per mil (0.025 mm.) of lining thickness. Spark testing of ChemPruf 2211 AO Lining System applied to concrete substrates requires ChemPruf E Primer with ATLAS Carbon Powder.

4. **Topcoat:** Trowel apply a topcoat of ChemPruf 2211 AO at a thickness of 1/16" (1.6 mm.) with a plaster's or concrete finishing trowel.

Smooth trowel marks with a short nap roller lightly wetted with ChemPruf E Smoothing Liquid. Before rolling, shake the wet roller to remove excess ChemPruf E Smoothing Liquid. Use only enough smoothing liquid to prevent picking up of the topcoat. Excess smoothing liquid may cause the lining to remain soft.

Allow the ChemPruf 2211 AO topcoat to harden sufficiently so that the surface will not be disturbed before continuing with the optional finisher application, if specified.

If the ChemPruf 2211 AO topcoat is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed if applying the optional finisher.

Temperature	CHEMPRUF 2211 AND CHEMPRUF 2211 AO (Basecoat / Topcoat)		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	35 min.	16 hours	30 hours
75°F (24°C)	30 min.	16 hours	24 hours
85°F (29°C)	20 min.	12 hours	20 hours

5. **Optional Finisher:** If specified, apply a 5 mil (0.13 mm.) coat of ChemPruf 211 with a short nap roller. If ChemPruf 121 is specified, refer to Installation Instructions, I-4-121. Depending on service conditions, two coats may be required.

If the ChemPruf 211 is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying a second finisher coat.

Temperature	CHEMPRUF 211		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	40 min.	18 hours	48 hours
75°F (24°C)	30 min.	10 hours	36 hours
85°F (29°C)	20 min.	8 hours	24 hours

## MEMBRANE

When applying a masonry sheathing over the ChemPruf 2211 AO Lining System, a release agent must be applied to the surface of the lining system. The use of a release agent allows the masonry sheathing to move independent of the lining system. Silicone or paste wax can be applied after the maximum drying time.

**MIXING OF THE CHEMPRUF E PRIMER**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

**1/2-Gallon and 1-1/2-Gallon Units:**

- Combine the contents of the cans of ChemPruf E Primer Resin and Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

**15-Gallon Unit:**

The following mixing instructions are for a batch size of 1.4 gallons (5.1 liters) or 12 lb. 2 oz. (5.5 kg.). Estimated coverage of the batch size is 350 ft<sup>2</sup> (32.5 m<sup>2</sup>). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 125 fluid ounces (3.7 liters) of ChemPruf E Primer Resin with 49 fluid ounces (1.5 liters) ChemPruf E Primer Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

**MIX RATIO OF THE CHEMPRUF E PRIMER**

	by Weight	by Volume
CHEMPRUF E PRIMER Resin	100	100
CHEMPRUF E PRIMER Hardener	35	40

**Conductive Primer**

- Mix the ChemPruf E Primer Resin and Hardener as described above.
- 1/2-Gallon Unit:** Add 10 oz. (284 g.) or approximately 12 fluid ounces (0.36 liters) of ATLAS Carbon Powder. Mix thoroughly for approximately two minutes. During application, stir the mixed components frequently to avoid settlement of the carbon powder.

**1-1/2-Gallon Unit or 1.4-Gallon (5.1 liters)**

**Batch Size:** Add 36 oz. (1.0 kg.) or approximately 42 fluid ounces (1.2 liters) of ATLAS Carbon Powder. Mix thoroughly for approximately two minutes. During application, stir the mixed components frequently to avoid settlement of the carbon powder.

**MIX RATIO OF THE CONDUCTIVE PRIMER**

	by Weight	by Volume
CHEMPRUF E PRIMER Resin	100	100
CHEMPRUF E PRIMER Hardener	35	40
ATLAS Carbon Powder	25	34

**MIXING OF THE CHEMPRUF 2211 (Basecoat)**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be with a KOL type mixer with a 5-gallon capacity. Mixing speed should be between 60 and 75 RPM.

The following mixing instructions are for a batch size of 37 lb. 11 oz. (17.1 kg.) or 0.33 ft<sup>3</sup> (9.4 liters). Estimated coverage of the batch size is 63 ft<sup>2</sup> (5.9 m<sup>2</sup>) @ 1/16" (1.6 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Evenly divide the contents of one of the 54 lb. (24.5 kg.) bags of ChemPruf 2000 S Powder into two equal parts by volume using two clean, dry 5-gallon pails. Each pail should contain 27 lb. (12.2 kg.) or approximately 301 fluid ounces (8.9 liters) of powder.
- Combine 101 fluid ounces (3.0 liters) of ChemPruf 2211 Resin with 44 fluid ounces (1.3 liters) ChemPruf 2211 Hardener in the 5-gallon capacity mechanical mixer. Mix thoroughly for approximately two minutes.
- Slowly add a 1/2 bag of ChemPruf 2000 S Powder, 27 lb. (12.2 kg.), as prepared in Step (a.).
- Mix the combined components for approximately two minutes or until all the powder is thoroughly dispersed.

The amount of the powder may be varied slightly to obtain the desired consistency. Decreasing the powder component will decrease the estimated unit coverage. The amount of powder must be within 5%, by weight, of the suggested amount.

**MIX RATIO OF THE CHEMPRUF 2211 (Basecoat)**

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43
CHEMPRUF 2000 S Powder	350	298

**MIXING OF THE CHEMPRUF 2211 (Saturant)**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components may be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

The following mixing instructions are for a batch size of 1.1 gallons (4.3 liters) or 10 lb. 11 oz. (4.8 kg.). Estimated coverage of the batch size is 182 ft<sup>2</sup> (16.9 m<sup>2</sup>). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 101 fluid ounces (3.0 liters) of ChemPruf 2211 Resin with 44 fluid ounces (1.3 liters) ChemPruf 2211 Hardener in a suitable mixing container.

- b. Mix thoroughly for two minutes as described above.

#### MIX RATIO OF THE CHEMPRUF 2211 (Saturant)

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43

#### MIXING OF THE CHEMPRUF 2211 AO (Topcoat)

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be with a KOL type mixer with a 5-gallon capacity. Mixing speed should be between 60 and 75 RPM.

The following mixing instructions are for a batch size of 35 lb. 4 oz. (16.0 kg.) or 0.26 ft<sup>3</sup> (7.3 liters). Estimated coverage of the batch size is 53 ft<sup>2</sup> (4.9 m<sup>2</sup>) @ 1/16" (1.6 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Evenly divide the contents of one of the 54 lb. (24.5 kg.) bags of ChemPruf 2000 AO Powder into two equal parts by volume using two clean, dry 5-gallon pails. Each pail should contain 27 lb. (12.2 kg.) or approximately 232 fluid ounces (6.9 liters) of powder.
- Combine 78 fluid ounces (2.3 liters) of ChemPruf 2211 Resin with 34 fluid ounces (1.0 liters) ChemPruf 2211 Hardener in the 5-gallon capacity mechanical mixer. Mix thoroughly for approximately two minutes.
- Slowly add a 1/2 bag of ChemPruf 2000 AO Powder, 27 lb. (12.2 kg.), as prepared in Step (a.).
- Mix the combined components for approximately two minutes or until all the powder is thoroughly dispersed.

The amount of the powder may be varied slightly to obtain the desired consistency. Decreasing the powder component will decrease the estimated unit coverage. The amount of powder must be within 5%, by weight, of the suggested amount.

#### MIX RATIO OF THE CHEMPRUF 2211 AO (Topcoat)

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43
CHEMPRUF 2000 AO Powder	450	295

#### MIXING OF THE CHEMPRUF 211 (Optional Finisher)

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components may be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

#### 1-1/2-Gallon Unit:

- Combine the contents of the cans of ChemPruf 211 Resin and Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

#### 7-Gallon Unit:

The following mixing instructions are for a batch size of 1.2 gallons (4.6 liters) or 15 lb. 10 oz. (7.1 kg.). Estimated coverage of the batch size is 391 ft<sup>2</sup> (36.3 m<sup>2</sup>) @ 5 mils (0.13 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 126 fluid ounces (3.7 liters) of ChemPruf 211 Resin with 54 fluid ounces (1.6 liters) ChemPruf 211 Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

#### MIX RATIO OF THE CHEMPRUF 211

	by Weight	by Volume
CHEMPRUF 211 Resin	100	100
CHEMPRUF 211 Hardener	30	43

#### CLEANING OF TOOLS AND EQUIPMENT

Steel wool, soap and warm water will remove the materials referred to in this Data Sheet from mixing tools and equipment if cleaning is done immediately after use. Solvents, such as methyl ethyl ketone, toluene or xylene, will have to be used after the material has begun to harden. Fully hardened material will have to be removed by mechanical means.

Dispose of residues and wastes in accordance with the directions in the Safety Data Sheets and government regulations.

#### STORAGE AND SHELF LIFE

ChemPruf 2211 Resin must be stored at temperatures above 50°F (10°C) to prevent crystallization. Uncrystallized resin is a clear, amber-colored liquid while crystallized resin has a milky, translucent appearance. If crystals form, heat slowly to 120°F (49°C) and stir until crystals dissolve. Cool before using. This will not affect the chemical or physical properties of the finished product. ChemPruf 2211 Resin has a shelf life of approximately one year. Store all materials in a cool, dry environment. Keep all materials out of direct sunlight and temperatures above 86°F (30°C). Protect from freezing. In unopened original containers, ChemPruf E Primer Resin and Hardener, ChemPruf 2211 Hardener and ChemPruf 211 Resin and Hardener have a shelf life of approximately one year. ChemPruf 2000 S Powder, ChemPruf 2000 AO Powder, ATLAS Carbon Powder, ChemPruf E Smoothing Liquid and ChemPruf 10 oz. Reinforcing Fabric can be stored indefinitely.

**MAINTENANCE**

Should the lining be damaged in any way, it can be repaired by thoroughly cleaning and reapplying the ChemPruf 2211 AO Lining System. Mix and apply in accordance with the instructions provided in this Installation Instructions sheet.

1. Determine all areas that have been damaged.
2. Grind or sand to expose the substrate 1" (25.4 mm.) to 2" (50.8 mm.) beyond the damaged area.
3. Grind or sand the surface of the ChemPruf 2211 AO Lining System. Taper the ChemPruf Lining to expose 2" (50.8 mm.) to 4" (101.6 mm.) of each layer of the ChemPruf 2211 AO Lining System.
4. Clean and remove all debris from Step (2.) and Step (3.).
5. Apply ChemPruf E Primer to the substrate and exposed tapered edges of the ChemPruf 2211 AO Lining System.
6. Apply the ChemPruf 2211 basecoat, ChemPruf 10 oz. Reinforcing Fabric and ChemPruf 2211 saturant. Allow to harden.
7. Apply the ChemPruf 2211 AO topcoat.
8. Apply ChemPruf 211 or ChemPruf 121 if specified.

Rezklad® E-Concrete Primer is a substitute for ChemPruf E Primer. Rezklad E-Hi Build 110 is a substitute for ChemPruf 211.

**PRECAUTIONS**

The materials referred to in this Data Sheet are for Industrial Use Only. They contain materials that present handling and potential health hazards. Consult Safety Data Sheets and the container labels for complete precautionary information.

**TECHNICAL SERVICES**

ATLAS maintains a staff of Technical Service Representatives who are available to assist you with the use of ATLAS products. In the event of difficulties with the application of ATLAS materials, the installation should be stopped immediately and ATLAS' Technical Service Department consulted for assistance.

**WARRANTY**

ATLAS warrants that its products will be free from defects in workmanship and materials under normal use for a period of one (1) year from the date of shipment by ATLAS (provided the products are installed before the expiration of the shelf life). THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR THE PURPOSE FOR THIS PRODUCT WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. ATLAS' LIABILITY FOR ALLEGED BREACH OF THIS WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT (BUT NOT INCLUDING REMOVAL OF THE DEFECTIVE PRODUCT OR INSTALLATION OF REPLACEMENT PRODUCTS). ATLAS SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES DURING THE WARRANTY PERIOD OR THEREAFTER. **ATLAS' WARRANTY IS VOIDED IF PAYMENT FOR PRODUCT IS NOT RECEIVED IN FULL.**

# atlas Installation Instructions

Atlas Minerals & Chemicals, Inc.



I-4-2211C (7-15)  
Supersedes I-4-2211C (10-12)

## CHEMPRUF® 2211 C Lining System

### DESCRIPTION

CHEMPRUF 2211 C Lining System consists of a 1/16" (1.6 mm.) trowel applied basecoat of ChemPruf 2211 C, an intermediate layer of carbon fabric reinforcement saturated with ChemPruf 2211 saturant and a 1/16" (1.6 mm.) trowel applied topcoat of ChemPruf 2211 C.

If specified, roll apply an optional finisher of ChemPruf 211.

### ESTIMATED COVERAGE

#### CHEMPRUF E PRIMER

1/2-Gallon Unit.....	100 ft <sup>2</sup> (9.29 m <sup>2</sup> )
1-1/2-Gallon Unit.....	350 ft <sup>2</sup> (32.5 m <sup>2</sup> )
15-Gallon Unit.....	3,800 ft <sup>2</sup> (353 m <sup>2</sup> )

#### CHEMPRUF 2211 C (Basecoat / Topcoat)

5-Gallon Unit	
Total System @ 1/8" (3.2 mm.) .....	207 ft <sup>2</sup> (19.2 m <sup>2</sup> )
Basecoat @ 1/16" (1.6 mm.) .....	414 ft <sup>2</sup> (38.5 m <sup>2</sup> )
Topcoat @ 1/16" (1.6 mm.) .....	414 ft <sup>2</sup> (38.5 m <sup>2</sup> )

#### CHEMPRUF 2211 (Saturant)

5-Gallon Unit.....	2,169 ft <sup>2</sup> (202 m <sup>2</sup> )
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#### CHEMPRUF CARBON FABRIC

1.1 ft<sup>2</sup> (0.1 m<sup>2</sup>) per ft<sup>2</sup> (0.09 m<sup>2</sup>)

#### CHEMPRUF E SMOOTHING LIQUID

1-Gallon .....	200 ft <sup>2</sup> (18.6 m <sup>2</sup> )
5-Gallon .....	1,000 ft <sup>2</sup> (92.9 m <sup>2</sup> )

#### CHEMPRUF 211 (Optional Finisher)

1-1/2-Gal. Unit @ 5 mils (0.13 mm.)..	391 ft <sup>2</sup> (36.3 m <sup>2</sup> )
7-Gal. Unit @ 5 mils (0.13 mm.)...	1,959 ft <sup>2</sup> (182.0 m <sup>2</sup> )

**Note:** All references to application thickness and coverage per unit in this Installation Instructions are WFT (wet film thickness). Material estimating quantities may vary depending on project conditions and application techniques. Material quantities are theoretical and do not include a safety factor.

## PACKAGING

### CHEMPRUF E PRIMER

#### 1/2-Gal. Unit (3 lb. 7 oz. [1.6 kg.]) Consisting of:

One - 1/2-gal. can ChemPruf E Primer Resin  
(2 lb. 8 oz. [1.1 kg.])

One - 1-pt. can ChemPruf E Primer Hardener  
(15 oz. [425 g.])

#### 1-1/2-Gal. Unit (12 lb. 2 oz. [5.5 kg.]) Consisting of:

One - 1-gal. can ChemPruf E Primer Resin  
(9 lb. [4.1 kg.])

One - 1/2-gal. can ChemPruf E Primer Hardener  
(3 lb. 2 oz. [1.4 kg.])

#### 15-Gal. Unit (128 lb. 4 oz. [58.2 kg.]) Consisting of:

Two - 5-gal. pails ChemPruf E Primer Resin  
(47 lb. 8 oz. [21.5 kg.]) ea.

One - 5-gal. pail ChemPruf E Primer Hardener  
(33 lb. 4 oz. [15.1 kg.])

### CHEMPRUF 2211 C (Basecoat / Topcoat)

#### 5-Gal. Unit (179 lb. 3 oz. [81.3 kg.]) Consisting of:

One - 5-gal. pail ChemPruf 2211 Resin  
(46 lb. 4 oz. [21.0 kg.])

One - 5-gal. pail ChemPruf 2211 Hardener  
(17 lb. 7 oz. [7.9 kg.]) ea.

Three - bags ChemPruf 2211 C Powder  
(38 lb. 8 oz. [17.5 kg.]) ea.

### CHEMPRUF 2211 (Saturant)

#### 5-Gal. Unit (63 lb. 11 oz. [28.9 kg.]) Consisting of:

One - 5-gal. pail ChemPruf 2211 Resin  
(46 lb. 4 oz. [21.0 kg.])

One - 5-gal. pail ChemPruf 2211 Hardener  
(17 lb. 7 oz. [7.9 kg.]) ea.

### CHEMPRUF CARBON FABRIC

5.6 oz./yd.<sup>2</sup> (159 g./m<sup>2</sup>) fabric (50" [127 cm.] wide roll)

### CHEMPRUF E SMOOTHING LIQUID

1-gal. can (6 lb. 8 oz. [2.9 kg.])

5-gal. pail (32 lb. 8 oz. [14.7 kg.])

**NOTE:** ATLAS makes it a practice to continuously update and enhance our CCM (Corrosion Resistant Construction Materials) products. For the most recent version of any Data Sheet, please visit our Web site at [www.atlasmin.com](http://www.atlasmin.com).

**CHEMPRUF 211 (Optional Finisher)****1-1/2-Gal. Unit (15 lb. 10 oz. [7.1 kg.]) Consisting of:**

One - 1-gal. can ChemPruf 211 Resin  
(12 lb. [5.4 kg.])

One - 1/2-gal. can ChemPruf 211 Hardener  
(3 lb. 10 oz. [1.6 kg.])

**7-Gal. Unit (78 lb. 2 oz. [35.4 kg.]) Consisting of:**

One - 5-gal. pail ChemPruf 211 Resin  
(60 lb. [27.2 kg.])

Five – 1/2-gal. cans ChemPruf 211 Hardener  
(3 lb. 10 oz. [1.6 kg.]) ea.

**AVAILABLE COLORS**

**ChemPruf 2211 C** is black.

**ChemPruf 211** is available in white and gray.

**SURFACE PREPARATION**

ChemPruf 2211 C Lining System can be applied to concrete and steel surfaces. The substrate must be structurally sound, clean, dry and free of all contaminants, such as sealers, curing compounds, coatings, oil, dirt, dust and water. Previously applied coatings or paint must be removed.

**Concrete:** Finished concrete must be free of ridges, protrusions, fins, mortar splatter and have a tight laitance-free steel trowel finish. Abrasive grit blasting is recommended. Where impractical, chemical preparation by acid washing is acceptable. A finish similar to the profile of 100 to 120 grit sandpaper is suggested.

The prepared concrete substrate shall have a minimum tensile strength of 250 psi. (1.72 MPa).

Concrete surface must be sufficiently cured and comply with moisture testing as prescribed by ACI Test Method 515 R-16 "Dryness of Surface".

**Carbon steel:** Metal surfaces should be grit blasted to a SSPC-SP5 or NACE #1 white metal blast cleaned surface finish. Profile height must be 3 (0.076 mm.) to 4 mils (0.102 mm.).

The primer will hold the finish on carbon steel for approximately two weeks at relative humidity of 75%. Should flash rusting occur at any time before ChemPruf 2211 C basecoat is applied, the surface must be grit blasted again and reprimed.

For additional information, refer to Surface Preparation, Data Sheet PS-30.

**TEMPERATURE / HUMIDITY DURING APPLICATION**

Store all materials referred to in this Installation Instructions at 70°F (21°C) to 80°F (27°C) for 24 hours prior to use. The best working characteristics of the materials will be attained when the temperature of the substrate, air and ChemPruf 2211 C Lining System components are between 65°F (18°C) and 85°F (29°C).

Minimum temperature for installation is 65°F (18°C). At temperatures below 65°F (18°C), the product may not set or cure properly.

Do not apply when the relative humidity is greater than 75% or the substrate temperature is less than 5°F (3°C) above the dew point.

**CONSTRUCTION DETAILS**

For additional information on Construction Details, refer to the following ATLAS literature:

- Surface Preparation Data Sheet (PS-30)
- Horizontal / Vertical Transition Drawing (4-3004DG)
- Structural Crack Drawing (4-3006DG)
- Control Joint Drawing (4-3003DG)
- Lining System Termination Drawing (4-3000DG)
- Termination at Drain Drawing (4-3001DG)
- Pipe Outlets Drawing (4-3005DG)

Protect uncured primer, basecoat, saturant, topcoat and finisher coat(s) from moisture contamination until minimum cure time is attained.

Do not apply the ChemPruf 2211 C Lining System to substrates that flex.

**INSTALLATION EQUIPMENT AND SUPPLIES\***

- KOL type mixer & Jiffy type mixer
- 5-gallon (18.9 liter) plastic or metal containers
- Cement finishing, margin & pointing trowels
- Short (3/16" to 1/4") & medium (3/8") nap paint rollers
- Paint brushes
- Rubber & cotton gloves
- Organic respirator, Safety goggles
- Electric grinder
- Scissors, measuring tape, chalk line, felt tip marker

\*The safety equipment listed above is the minimum required to install the ChemPruf 2211 C Lining System. The installer must provide any equipment necessary to comply with existing federal, state, local and customer safety regulations.

**APPLICATION OF THE CHEMPRUF 2211 C LINING SYSTEM**

1. **Primer:** All substrates must be primed with ChemPruf E Primer. Apply ChemPruf E Primer with a brush or medium nap roller. Do not allow puddling. Work ChemPruf E Primer into the pores of concrete substrates.

The primed surface should be tacky or dry before applying ChemPruf 2211 C basecoat. If the primer is allowed to dry for longer than the maximum drying time, the surface must be sanded and the area reprimed before proceeding.

Temperature	CHEMPRUF E PRIMER		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	40 min.	12 hours	30 hours
75°F (24°C)	30 min.	8 hours	24 hours
85°F (29°C)	20 min.	6 hours	20 hours



2a. **Basecoat:** Trowel apply a basecoat of ChemPruf 2211 C at a thickness of 1/16" (1.6 mm.) with a plaster's or concrete finishing trowel.

2b. **Fabric:** Immediately apply the ChemPruf Carbon Fabric into the wet basecoat. Roll the ChemPruf Carbon Fabric with a medium nap roller to imbed the fabric into the ChemPruf 2211 C basecoat. Roll the fabric from the center to the edges to smooth the surface and remove entrapped air.

2c. **Saturant:** Immediately apply a mixture of ChemPruf 2211 Resin and Hardener as a saturant over the fabric. Apply the mixed saturant to the fabric from the center toward the edges with a medium nap roller. Use only enough saturant to remove the whiteness and produce a uniform darker appearance to the fabric. A brush may be used to apply saturant in corners and around appurtenances.

Allow saturant coat to harden sufficiently so that the fabric will not be disturbed before continuing with the topcoat application.

If the saturant is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying the ChemPruf 2211 C topcoat.

Temperature	CHEMPRUF 2211 (Saturant)		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	35 min.	16 hours	30 hours
75°F (24°C)	30 min.	16 hours	24 hours
85°F (29°C)	20 min.	12 hours	20 hours

3. **Inspection:** Inspect lining for imperfections after basecoat, fabric and saturant have hardened. Repair defects and imperfections prior to application of the topcoat.

4. **Topcoat:** Trowel apply a topcoat of ChemPruf 2211 C at a thickness of 1/16" (1.6 mm.) with a plaster's or concrete finishing trowel.

Smooth trowel marks with a short nap roller lightly wetted with ChemPruf E Smoothing Liquid. Before rolling, shake the wet roller to remove excess ChemPruf E Smoothing Liquid. Use only enough smoothing liquid to prevent picking up of the topcoat. Excess smoothing liquid may cause the lining to remain soft.

Allow the ChemPruf 2211 C topcoat to harden sufficiently so that the surface will not be disturbed before continuing with the optional finisher application, if specified.

If the ChemPruf 2211 C topcoat is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying the finisher.

#### CHEMPRUF 2211 C (Basecoat / Topcoat)

Temperature	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	35 min.	16 hours	30 hours
75°F (24°C)	30 min.	16 hours	24 hours
85°F (29°C)	20 min.	12 hours	20 hours

5. **Optional Finisher:** If specified, apply a 5 mil (0.13 mm.) coat of ChemPruf 211 with a short nap roller. Depending on service conditions, two coats may be required.

If the ChemPruf 211 is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying a second finisher coat.

#### CHEMPRUF 211

Temperature	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	40 min.	18 hours	48 hours
75°F (24°C)	30 min.	10 hours	36 hours
85°F (29°C)	20 min.	8 hours	24 hours

#### MEMBRANE

When applying a masonry sheathing over the ChemPruf 2211 C Lining System, a release agent must be applied to the surface of the lining system. The use of a release agent allows the masonry sheathing to move independent of the lining system. Silicone or paste wax can be applied after the maximum drying time.

#### MIXING OF THE CHEMPRUF E PRIMER

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

#### 1/2-Gallon and 1-1/2-Gallon Units:

- Combine the contents of the cans of ChemPruf E Primer Resin and Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

#### 15-Gallon Unit:

The following mixing instructions are for a batch size of 1.4 gallons (5.1 liters) or 12 lb. 2 oz. (5.5 kg.). Estimated coverage of the batch size is 350 ft<sup>2</sup> (32.6 m<sup>2</sup>). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 125 fluid ounces (3.7 liters) of ChemPruf E Primer Resin with 49 fluid ounces (1.5 liters) ChemPruf E Primer Hardener in a suitable mixing container.

- b. Mix thoroughly for two minutes as described above.

#### MIX RATIO OF THE CHEMPRUF E PRIMER

	by Weight	by Volume
CHEMPRUF E PRIMER Resin	100	100
CHEMPRUF E PRIMER Hardener	35	40

#### MIXING OF THE CHEMPRUF 2211 C (Basecoat / Topcoat)

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be with a KOL type mixer with a 5-gallon capacity. Mixing speed should be between 60 and 75 RPM.

The following mixing instructions are for a batch size of 29 lb. 15 oz. (13.6 kg.) or 0.36 ft<sup>3</sup> (10.2 liters). Estimated coverage of the batch size is 69 ft<sup>2</sup> (6.4 m<sup>2</sup>) @ 1/16" (1.6 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Evenly divide the contents of one of the 38 lb. 8 oz. (17.5 kg.) bags of ChemPruf 2211 C Powder into two equal parts by volume using two clean, dry 5-gallon pails. Each pail should contain 19 lb. 4 oz. (8.7 kg.) or approximately 286 fluid ounces (8.5 liters) of powder.
- Combine 101 fluid ounces (3.0 liters) of ChemPruf 2211 Resin with 44 fluid ounces (1.3 liters) ChemPruf 2211 Hardener in the 5-gallon capacity mechanical mixer. Mix thoroughly for approximately two minutes.
- Slowly add a 1/2 bag of ChemPruf 2211 C Powder, 19 lb. 4 oz. (8.7 kg.), as prepared in Step (a.).
- Mix the combined components for approximately two minutes or until all the powder is thoroughly dispersed.

The amount of the powder may be varied slightly to obtain the desired consistency. Decreasing the powder component will decrease the estimated unit coverage. The amount of powder must be within 5%, by weight, of the suggested amount.

#### MIX RATIO OF THE CHEMPRUF 2211 C (Basecoat / Topcoat)

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43
CHEMPRUF 2211 C Powder	250	282

#### MIXING OF THE CHEMPRUF 2211 (Saturant)

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components may be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

The following mixing instructions are for a batch size of 1.1 gallons (4.3 liters) or 10 lb. 11 oz. (4.8 kg.).

Estimated coverage of the batch size is 362 ft<sup>2</sup> (33.6 m<sup>2</sup>). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 101 fluid ounces (3.0 liters) of ChemPruf 2211 Resin with 44 fluid ounces (1.3 liters) ChemPruf 2211 Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

#### MIX RATIO OF THE CHEMPRUF 2211 (Saturant)

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43

#### MIXING OF THE CHEMPRUF 211 (Optional Finisher)

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components may be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

#### 1-1/2-Gallon Unit:

- Combine the contents of the cans of ChemPruf 211 Resin and Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

#### 7-Gallon Unit:

The following mixing instructions are for a batch size of 1.2 gallons (4.6 liters) or 15 lb. 10 oz. (7.1 kg.). Estimated coverage of the batch size is 391 ft<sup>2</sup> (36.3 m<sup>2</sup>) @ 5 mils (0.13 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 126 fluid ounces (3.7 liters) of ChemPruf 211 Resin with 54 fluid ounces (1.6 liters) ChemPruf 211 Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

#### MIX RATIO OF THE CHEMPRUF 211

	by Weight	by Volume
CHEMPRUF 211 Resin	100	100
CHEMPRUF 211 Hardener	30	43

#### CLEANING OF TOOLS AND EQUIPMENT

Steel wool, soap and warm water will remove the materials referred to in this Data Sheet from mixing tools and equipment if cleaning is done immediately after use. Solvents, such as methyl ethyl ketone, toluene or xylene, will have to be used after the material has begun to harden. Fully hardened

material will have to be removed by mechanical means.

Dispose of residues and wastes in accordance with the directions in the Safety Data Sheets and government regulations.

### STORAGE AND SHELF LIFE

ChemPruf 2211 Resin must be stored at temperatures above 50°F (10°C) to prevent crystallization. Uncrystallized resin is a clear, amber-colored liquid while crystallized resin has a milky, translucent appearance. If crystals form, heat slowly to 120°F (49°C) and stir until crystals dissolve. Cool before using. This will not affect the chemical or physical properties of the finished product. ChemPruf 2211 Resin has a shelf life of approximately one year. Store all materials in a cool, dry environment. Keep all materials out of direct sunlight and temperatures above 86°F (30°C). Protect from freezing. In unopened original containers, ChemPruf E Primer Resin and Hardener, ChemPruf 2211 Hardener and ChemPruf 211 Resin and Hardener have a shelf life of approximately one year. ChemPruf 2211 C Powder, ChemPruf E Smoothing Liquid and ChemPruf Carbon Fabric can be stored indefinitely.

### MAINTENANCE

Should the lining be damaged in any way, it can be repaired by thoroughly cleaning and reapplying the ChemPruf 2211 C Lining System. Mix and apply in accordance with the instructions provided in this Installation Instructions sheet.

1. Determine all areas that have been damaged.
2. Grind or sand to expose the substrate 1" (25.4 mm.) to 2" (50.8 mm.) beyond the damaged area.
3. Grind or sand the surface of the ChemPruf 2211 C Lining System. Taper the ChemPruf Lining to expose 2" (50.8 mm.) to 4" (101.6 mm.) of each layer of the ChemPruf 2211 C Lining System.
4. Clean and remove all debris from Step (2.) and Step (3.).
5. Apply ChemPruf E Primer to the substrate and exposed tapered edges of the ChemPruf 2211 C Lining System.
6. Apply the ChemPruf 2211 C basecoat, ChemPruf Carbon Fabric and ChemPruf 2211 saturant. Allow to harden.
7. Apply the ChemPruf 2211 C topcoat.
8. Apply ChemPruf 211 if specified.

Rezklad® E-Concrete Primer is a substitute for ChemPruf E Primer. Rezklad E-Hi Build 110 is a substitute for ChemPruf 211.

### PRECAUTIONS

The materials referred to in this Data Sheet are for Industrial Use Only. They contain materials that present handling and potential health hazards.

Consult Safety Data Sheets and the container labels for complete precautionary information.

### TECHNICAL SERVICES

ATLAS maintains a staff of Technical Service Representatives who are available to assist you with the use of ATLAS products. In the event of difficulties with the application of ATLAS materials, the installation should be stopped immediately and ATLAS' Technical Service Department consulted for assistance.

### WARRANTY

ATLAS warrants that its products will be free from defects in workmanship and materials under normal use for a period of one (1) year from the date of shipment by ATLAS (provided the products are installed before the expiration of the shelf life). THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR THE PURPOSE FOR THIS PRODUCT WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. ATLAS' LIABILITY FOR ALLEGED BREACH OF THIS WARRANTY SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT (BUT NOT INCLUDING REMOVAL OF THE DEFECTIVE PRODUCT OR INSTALLATION OF REPLACEMENT PRODUCTS). ATLAS SHALL NOT BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES DURING THE WARRANTY PERIOD OR THEREAFTER. **ATLAS' WARRANTY IS VOIDED IF PAYMENT FOR PRODUCT IS NOT RECEIVED IN FULL.**



Atlas Minerals & Chemicals, Inc.



# Installation Instructions

I-4-2211HB (7-15)  
Supersedes I-4-2211HB (3-13)

## CHEMPRUF® 2211 HB Lining System

### DESCRIPTION

CHEMPRUF 2211 HB Lining System consists of a 1/16" (1.6 mm.) trowel applied basecoat of CHEMPRUF 2211, an intermediate layer of fiberglass fabric reinforcement saturated with CHEMPRUF 2211 saturant and a brush or roller applied topcoat(s) of REZKLAD® E-HI BUILD 110.

### ESTIMATED COVERAGE

#### CHEMPRUF E PRIMER

1/2-Gallon Unit .....	100 ft <sup>2</sup> (9.29 m <sup>2</sup> )
1-1/2-Gallon Unit.....	350 ft <sup>2</sup> (32.5 m <sup>2</sup> )
15-Gallon Unit.....	3,800 ft <sup>2</sup> (353 m <sup>2</sup> )

#### CHEMPRUF E CONDUCTIVE PRIMER

1/2-Gallon Unit .....	60 ft <sup>2</sup> (5.57 m <sup>2</sup> )
1-1/2-Gallon Unit.....	210 ft <sup>2</sup> (19.5 m <sup>2</sup> )
15-Gallon Unit.....	2,800 ft <sup>2</sup> (212 m <sup>2</sup> )
ATLAS® CARBON Powder*.....	3,550 ft <sup>2</sup> (330 m <sup>2</sup> )

\*Per pail for Conductive Primer

#### CHEMPRUF 2211 (Basecoat)

5-Gallon Unit	
Basecoat @ 1/16" (1.6 mm.) .....	379 ft <sup>2</sup> (35.2 m <sup>2</sup> )

#### CHEMPRUF 2211 (Saturant)

5-Gallon Unit.....	1,084 ft <sup>2</sup> (101 m <sup>2</sup> )
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#### CHEMPRUF 10 OZ. REINFORCING FABRIC

1.1 ft<sup>2</sup> (0.1 m<sup>2</sup>) per ft<sup>2</sup> (0.09 m<sup>2</sup>)

#### REZKLAD E-HI BUILD 110 (Topcoat)

1-1/2-Gal. Unit @ 5 mils (0.13 mm.)..	390 ft <sup>2</sup> (36.2 m <sup>2</sup> )
7-Gal. Unit @ 5 mils (0.13 mm.)...	1,950 ft <sup>2</sup> (182.0 m <sup>2</sup> )

**Note:** All references to application thickness and coverage per unit in this installation Instructions are WFT (wet film thickness). Material estimating quantities may vary depending on project conditions and application techniques. Material quantities are theoretical and do not include a safety factor.

## PACKAGING

### CHEMPRUF E PRIMER

#### 1/2-Gal. Unit (3 lb. 7 oz. [1.6 kg.]) Consisting of:

- One - 1/2-gal. can CHEMPRUF E PRIMER Resin (2 lb. 8 oz. [1.1 kg.])
- One - 1-pt. can CHEMPRUF E PRIMER Hardener (15 oz. [425 g.])

#### 1-1/2-Gal. Unit (12 lb. 2 oz. [5.5 kg.]) Consisting of:

- One - 1-gal. can CHEMPRUF E PRIMER Resin (9 lb. [4.1 kg.])
- One - 1/2-gal. can CHEMPRUF E PRIMER Hardener (3 lb. 2 oz. [1.4 kg.])

#### 15-Gal. Unit (128 lb. 4 oz. [58.2 kg.]) Consisting of:

- Two - 5-gal. pails CHEMPRUF E PRIMER Resin (47 lb. 8 oz. [21.5 kg.]) ea.
- One - 5-gal. pail CHEMPRUF E PRIMER Hardener (33 lb. 4 oz. [15.1 kg.])

#### ATLAS CARBON POWDER (for Conductive Primer)

5-gal. pail (38 lb. [17.2 kg.])

#### CHEMPRUF 2211 (Basecoat)

#### 5-Gal. Unit (225 lb. 11 oz. [102.4 kg.]) Consisting of:

- One - 5-gal. pail CHEMPRUF 2211 Resin (46 lb. 4 oz. [21.0 kg.])
- One - 5-gal. pail CHEMPRUF 2211 Hardener (17 lb. 7 oz. [7.9 kg.]) ea.
- Three - bags CHEMPRUF 2000 S Powder (54 lb. [24.5 kg.]) ea.

#### CHEMPRUF 2211 (Saturant)

#### 5-Gal. Unit (63 lb. 11 oz. [28.9 kg.]) Consisting of:

- One - 5-gal. pail CHEMPRUF 2211 Resin (46 lb. 4 oz. [21.0 kg.])
- One - 5-gal. pail CHEMPRUF 2211 Hardener (17 lb. 7 oz. [7.9 kg.]) ea.

#### CHEMPRUF 10 OZ. REINFORCING FABRIC

10 oz./yd.<sup>2</sup> (339 g./m<sup>2</sup>) fabric (38" [97 cm.] wide roll)

#### CHEMPRUF E SMOOTHING LIQUID

- 1-gal. can (6 lb. 8 oz. [2.9 kg.])
- 5-gal. pail (32 lb. 8 oz. [14.7 kg.])

**NOTE:** ATLAS makes it a practice to continuously update and enhance our CCM (Corrosion Resistant Construction Materials) products. For the most recent version of any Data Sheet, please visit our Web site at [www.atlasmin.com](http://www.atlasmin.com).

**REZKLAD E-HI BUILD 110 (Topcoat)****1-1/2-Gal. Unit (15 lb. 10 oz. [7.1 kg.]) Consisting of:**

One - 1-gal. can REZKLAD E-HI BUILD 110 Resin  
(12 lb. [5.4 kg.])

One - 1/2-gal. can REZKLAD E-HI BUILD 110 Hardener  
(3 lb. 10 oz. [1.6 kg.])

**7-Gal. Unit (78 lb. 2 oz. [35.4 kg.]) Consisting of:**

One - 5-gal. pail REZKLAD E-HI BUILD 110 Resin  
(60 lb. [27.2 kg.])

Five – 1/2-gal. cans REZKLAD E-HI BUILD 110  
Hardener (3 lb. 10 oz. [1.6 kg.]) ea.

**15-Gallon Unit (160 lb. [72.6 kg.]) Consisting of:**

Two - 5-gal. pails of Resin (60 lb. [27.2 kg.]) ea.

One - 5-gal. pail of Hardener (40 lb. [18.1 kg.])

**AVAILABLE COLORS**

**CHEMPRUF 2211** is available in natural and gray.

**REZKLAD E-HI BUILD 110** is available in white and gray.

**SURFACE PREPARATION**

CHEMPRUF 2211 HB Lining System can be applied to concrete and steel surfaces. The substrate must be structurally sound, clean, dry and free of all contaminants, such as sealers, curing compounds, coatings, oil, dirt, dust and water. Previously applied coatings or paint must be removed.

**Concrete:** Finished concrete must be free of ridges, protrusions, fins, mortar splatter and have a tight laitance-free steel trowel finish. Abrasive grit blasting is recommended. Where impractical, chemical preparation by acid washing is acceptable. A finish similar to the profile of 100 to 120 grit sandpaper is suggested.

The prepared concrete substrate shall have a minimum tensile strength of 250 psi. (1.72 MPa).

Concrete surface must be sufficiently cured and comply with moisture testing as prescribed by ACI Test Method 515 R-16 "Dryness of Surface".

**Carbon steel:** Metal surfaces should be grit blasted to a SSPC-SP5 or NACE #1 white metal blast cleaned surface finish. Profile height must be 3 (0.076 mm.) to 4 mils (0.102 mm.).

The primer will hold the finish on carbon steel for approximately two weeks at relative humidity of 75%. Should flash rusting occur at any time before CHEMPRUF 2211 basecoat is applied, the surface must be grit blasted again and reprimed.

For additional information, refer to Surface Preparation, Data Sheet PS-30.

**TEMPERATURE / HUMIDITY DURING APPLICATION**

Store all materials referred to in this Installation Instructions at 70°F (21°C) to 80°F (27°C) for 24 hours prior to use. The best working characteristics of the materials will be attained when the temperature of the substrate, air and CHEMPRUF 2211 HB Lining System components are between 65°F (18°C) and 85°F (29°C).

Minimum temperature for installation is 65°F (18°C). At temperatures below 65°F (18°C), the product may not set or cure properly.

Do not apply when the relative humidity is greater than 75% or the substrate temperature is less than 5°F (3°C) above the dew point.

**CONSTRUCTION DETAILS**

For additional information on Construction Details, refer to the following ATLAS literature:

- Surface Preparation Data Sheet (PS-30)
- Horizontal / Vertical Transition Drawing (4-3004DG)
- Structural Crack Drawing (4-3006DG)
- Control Joint Drawing (4-3003DG)
- Lining System Termination Drawing (4-3000DG)
- Termination at Drain Drawing (4-3001DG)
- Pipe Outlets Drawing (4-3005DG)

Protect uncured primer, basecoat, saturant, topcoat and optional finisher coat(s) from moisture contamination until minimum cure time is attained.

Do not apply the CHEMPRUF 2211 HB Lining System to substrates that flex.

**INSTALLATION EQUIPMENT AND SUPPLIES\***

- KOL type mixer & Jiffy type mixer
- 5-gallon (18.9 liter) plastic or metal containers
- Cement finishing, margin & pointing trowels
- Short (3/16" to 1/4") & medium (3/8") nap paint rollers
- Paint brushes
- Rubber & cotton gloves
- Organic respirator, Safety goggles
- Electric grinder
- Scissors, measuring tape, chalk line, felt tip marker

\*The safety equipment listed above is the minimum required to install the CHEMPRUF 2211 HB Lining System. The installer must provide any equipment necessary to comply with existing federal, state, local and customer safety regulations.

**APPLICATION OF THE CHEMPRUF 2211 HB LINING SYSTEM**

1. **Primer:** All substrates must be primed with CHEMPRUF E PRIMER. Apply CHEMPRUF E PRIMER with a brush or medium nap roller. Do not allow puddling. Work CHEMPRUF E PRIMER into the pores of concrete substrates.

The primed surface should be tacky or dry before applying CHEMPRUF 2211 basecoat. If the primer is allowed to dry for longer than the maximum drying time, the surface must be sanded and the area reprimed before proceeding.

**Conductive Primer:** When the CHEMPRUF 2211 HB Lining System is applied to concrete substrates, spark testing of the lining may be specified or required. Apply CHEMPRUF E PRIMER with ATLAS CARBON Powder. Stir the

mixed components frequently during the application to avoid settlement of the carbon powder. Apply as described above.

Temperature	CHEMPRUF E PRIMER		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	40 min.	12 hours	30 hours
75°F (24°C)	30 min.	8 hours	24 hours
85°F (29°C)	20 min.	6 hours	20 hours

2a. **Basecoat:** Trowel apply a basecoat of CHEMPRUF 2211 at a thickness of 1/16" (1.6 mm.) with a plaster's or concrete finishing trowel.

Temperature	CHEMPRUF 2211 (Basecoat / Topcoat)		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	35 min.	16 hours	30 hours
75°F (24°C)	30 min.	16 hours	24 hours
85°F (29°C)	20 min.	12 hours	20 hours

2b. **Fabric:** Immediately apply the CHEMPRUF 10 oz. REINFORCING FABRIC into the wet basecoat. Roll the CHEMPRUF 10 oz. REINFORCING FABRIC with a medium nap roller to imbed the fabric into the CHEMPRUF 2211 basecoat. Roll the fabric from the center to the edges to smooth the surface and remove entrapped air.

2c. **Saturant:** Immediately apply a mixture of CHEMPRUF 2211 Resin and Hardener as a saturant over the fabric. Apply the mixed saturant to the fabric from the center toward the edges with a medium nap roller. Use only enough saturant to remove the whiteness and produce a uniform darker appearance to the fabric. A brush may be used to apply saturant in corners and around appurtenances.

Allow saturant coat to harden sufficiently so that the fabric will not be disturbed before continuing with the topcoat application.

If the saturant is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying the CHEMPRUF 2211 topcoat.

Temperature	CHEMPRUF 2211 (Saturant)		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	35 min.	16 hours	30 hours
75°F (24°C)	30 min.	16 hours	24 hours
85°F (29°C)	20 min.	12 hours	20 hours

3. **Inspection:** Inspect lining for imperfections after basecoat, fabric and saturant have hardened. Repair defects and imperfections prior to application of the topcoat.

When specified or required, spark test for pinholes using 100 volts per mil (0.025 mm.) of lining thickness. Spark testing of CHEMPRUF

2211 HB Lining System applied to concrete substrates requires CHEMPRUF E PRIMER with ATLAS CARBON Powder.

4. **Topcoat:** Apply a 5 mil (0.13 mm.) coat of REZKLAD E-HI BUILD 110 with a short nap roller. Depending on service conditions, two coats may be required.

If the REZKLAD E-HI BUILD 110 is allowed to dry for longer than the maximum drying time, the surface must be sanded, cleaned and reprimed before applying a second finisher coat.

Temperature	REZKLAD E-HI BUILD 110		
	Working Time	Minimum Drying Time	Maximum Drying Time
65°F (18°C)	40 min.	18 hours	48 hours
75°F (24°C)	30 min.	10 hours	36 hours
85°F (29°C)	20 min.	8 hours	24 hours

#### MIXING OF THE CHEMPRUF E PRIMER

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

#### 1/2-Gallon and 1-1/2-Gallon Units:

- Combine the contents of the cans of CHEMPRUF E PRIMER Resin and Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

#### 15-Gallon Unit:

The following mixing instructions are for a batch size of 1.4 gallons (5.1 liters) or 12 lb. 2 oz. (5.5 kg.). Estimated coverage of the batch size is 350 ft<sup>2</sup> (32.5 m<sup>2</sup>). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 125 fluid ounces (3.7 liters) of CHEMPRUF E PRIMER Resin with 49 fluid ounces (1.5 liters) CHEMPRUF E PRIMER Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

#### MIX RATIO OF THE CHEMPRUF E PRIMER

	by Weight	by Volume
CHEMPRUF E PRIMER Resin	100	100
CHEMPRUF E PRIMER Hardener	35	40

#### Conductive Primer

- Mix the CHEMPRUF E PRIMER Resin and Hardener as described above.
- 1/2-Gallon Unit:** Add 10 oz. (284 g.) or approximately 12 fluid ounces (0.36 liters) of

ATLAS CARBON Powder. Mix thoroughly for approximately two minutes. During application, stir the mixed components frequently to avoid settlement of the carbon powder.

**1-1/2-Gallon Unit or 1.4-Gallon (5.1 liters)**

**Batch Size:** Add 36 oz. (1.0 kg.) or approximately 42 fluid ounces (1.2 liters) of ATLAS CARBON Powder. Mix thoroughly for approximately two minutes. During application, stir the mixed components frequently to avoid settlement of the carbon powder.

**MIX RATIO OF THE CONDUCTIVE PRIMER**

	by Weight	by Volume
CHEMPRUF E PRIMER Resin	100	100
CHEMPRUF E PRIMER Hardener	35	40
ATLAS Carbon Powder	25	34

**MIXING OF THE CHEMPRUF 2211 (Basecoat)**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components should be with a KOL type mixer with a 5-gallon capacity. Mixing speed should be between 60 and 75 RPM.

The following mixing instructions are for a batch size of 37 lb. 11 oz. (17.1 kg.) or 0.33 ft<sup>3</sup> (9.4 liters). Estimated coverage of the batch size is 63 ft<sup>2</sup> (5.9 m<sup>2</sup>) @ 1/16" (1.6 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Evenly divide the contents of one of the 54 lb. (24.5 kg.) bags of CHEMPRUF 2000 S Powder into two equal parts by volume using two clean, dry 5-gallon pails. Each pail should contain 27 lb. (12.2 kg.) or approximately 301 fluid ounces (8.9 liters) of powder.
- Combine 101 fluid ounces (3.0 liters) of CHEMPRUF 2211 Resin with 44 fluid ounces (1.3 liters) CHEMPRUF 2211 Hardener in the 5-gallon capacity mechanical mixer. Mix thoroughly for approximately two minutes.
- Slowly add a 1/2 bag of CHEMPRUF 2000 S Powder, 27 lb. (12.2 kg.), as prepared in Step (a).
- Mix the combined components for approximately two minutes or until all the powder is thoroughly dispersed.

The amount of the powder may be varied slightly to obtain the desired consistency. Decreasing the powder component will decrease the estimated unit coverage. The amount of powder must be within 5%, by weight, of the suggested amount.

**MIX RATIO OF THE CHEMPRUF 2211 (Basecoat)**

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43
CHEMPRUF 2000 S Powder	350	298

**MIXING OF THE CHEMPRUF 2211 (Saturant)**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components may be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

The following mixing instructions are for a batch size of 1.1 gallons (4.3 liters) or 10 lb. 11 oz. (4.8 kg.). Estimated coverage of the batch size is 182 ft<sup>2</sup> (16.9 m<sup>2</sup>). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 101 fluid ounces (3.0 liters) of CHEMPRUF 2211 Resin with 44 fluid ounces (1.3 liters) CHEMPRUF 2211 Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

**MIX RATIO OF THE CHEMPRUF 2211 (Saturant)**

	by Weight	by Volume
CHEMPRUF 2211 Resin	100	100
CHEMPRUF 2211 Hardener	37.8	43

**MIXING OF THE REZKLAD E-HI BUILD 110 (Topcoat)**

Stir the contents of the individual resin and hardener containers prior to blending. Mixing of the components may be done with a hand drill equipped with a "Jiffy" type mixer at a mixing speed between 300 and 500 RPM. During mixing, move the mixing blade in circular and up and down motions scraping all sides and the bottom of the mixing container.

**1-1/2-Gallon Unit:**

- Combine the contents of the cans of REZKLAD E-HI BUILD 110 Resin and Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

**7-Gallon Unit**

**15-Gallon Unit (160 lb. [72.6 kg.]):**

The following mixing instructions are for a batch size of 1.4 gallons (5.3 liters) or 15 lb. 10 oz. (7.1 kg.). Estimated coverage of the batch size is 390 ft<sup>2</sup> (36.2 m<sup>2</sup>) @ 5 mils (0.13 mm.). Proportionally increase or decrease component quantities to attain larger or smaller batch sizes.

- Combine 126 fluid ounces (3.7 liters) of REZKLAD E-HI BUILD 110 Resin with 55 fluid ounces (1.6 liters) REZKLAD E-HI BUILD 110 Hardener in a suitable mixing container.
- Mix thoroughly for two minutes as described above.

**MIX RATIO OF THE REZKLAD E-HI BUILD 110**

	by Weight	by Volume
REZKLAD E-Hi Build 110 Resin	100	100
REZKLAD E-Hi Build 110 Hardener	30	43

**CLEANING OF TOOLS AND EQUIPMENT**

Steel wool, soap and warm water will remove the materials referred to in this Data Sheet from mixing tools and equipment if cleaning is done immediately after use. Solvents, such as methyl ethyl ketone, toluene or xylene, will have to be used after the material has begun to harden. Fully hardened material will have to be removed by mechanical means.

Dispose of residues and wastes in accordance with the directions in the Safety Data Sheets and government regulations.

**STORAGE AND SHELF LIFE**

CHEMPRUF 2211 Resin must be stored at temperatures above 50°F (10°C) to prevent crystallization. Uncrystallized resin is a clear, amber-colored liquid while crystallized resin has a milky, translucent appearance. If crystals form, heat slowly to 120°F (49°C) and stir until crystals dissolve. Cool before using. This will not affect the chemical or physical properties of the finished product. CHEMPRUF 2211 Resin has a shelf life of approximately one year.

Store all materials in a cool, dry environment. Keep all materials out of direct sunlight and temperatures above 86°F (30°C). Protect from freezing. In unopened original containers, CHEMPRUF E PRIMER Resin and Hardener, CHEMPRUF 2211 Hardener and REZKLAD E-HI BUILD 110 Resin and Hardener have a shelf life of approximately one year. CHEMPRUF 2000 S Powder, ATLAS CARBON Powder, CHEMPRUF E SMOOTHING LIQUID and CHEMPRUF 10 oz. REINFORCING FABRIC can be stored indefinitely.

**MAINTENANCE**

Should the lining be damaged in any way, it can be repaired by thoroughly cleaning and reapplying the CHEMPRUF 2211 HB Lining System. Mix and apply in accordance with the instructions provided in this Installation Instructions sheet.

1. Determine all areas that have been damaged.
2. Grind or sand to expose the substrate 1" (25.4 mm.) to 2" (50.8 mm.) beyond the damaged area.
3. Grind or sand the surface of the CHEMPRUF 2211 HB Lining System. Taper the CHEMPRUF Lining to expose 2" (50.8 mm.) to 4" (101.6 mm.) of each layer of the CHEMPRUF 2211 HB Lining System.
4. Clean and remove all debris from Step (2.) and Step (3.).
5. Apply CHEMPRUF E PRIMER to the substrate and exposed tapered edges of the CHEMPRUF 2211 HB Lining System.

6. Apply the CHEMPRUF 2211 basecoat, CHEMPRUF 10 oz. REINFORCING FABRIC and CHEMPRUF 2211 saturant. Allow to harden.
7. Apply REZKLAD E-HI BUILD 110 topcoat(s) as specified.

REZKLAD E-CONCRETE PRIMER and REZKLAD E-CONCRETE PRIMER MT are substitutes for CHEMPRUF E PRIMER.

**PRECAUTIONS**

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**TECHNICAL SERVICES**

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**WARRANTY**

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