Protective & Marine Coatings

ZINC CLAD® XI

WATER BASED INORGANIC ZINC-RICH COATING

PART E	B69V11	SILICATE VEHICLE
PART F	B69D11	ZINC DUST

Revised: November 16, 2020

PRODUCT INFORMATION

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PRODUCT DESCRIPTION

ZINC CLAD XI WATER BASED INORGANIC ZINC SILICATE COATING is a 2 package, high ratio, high zinc content coating for steel surfaces. It is designed for use in severely corrosive environments in the pH range of 5-9. It prevents corrosion of the underlying steel surface by providing cathodic sacrificial protection much the same as galvanizing. In addition, it forms an effective barrier against moisture, and self-heals to resume protection when damaged. The waterborne potassium silicate formula has no VOC and no flash point, which contributes to a user-friendly application environment. Meets Class B requirements for Slip Coefficient and Creep Resistance, .72.

PRODUCT CHARACTERISTICS

Finish:	Flat
Color:	Gray
Volume Solids:	68% ± 2%, mixed
Weight Solids:	79% ± 2%, mixed
VOC (calculated):	<50 g/L ; 0.42 lb/gal, mixed
Zinc Content in Dry Film:	90% by weight
Mix Ratio:	2 component, premeasured 4 gallon (15.1L) mix

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	**3.0** (75)	**6.0** (150)
Dry mils (microns)	**2.0** (50)	**4.0** (100)
~Coverage sq ft/gal (m^2/L)	**272** (6.6)	**544** (13.3)
Theoretical coverage **sq ft/gal** (m^2/L) @ 1 mil / 25 microns dft	**1095** (26.6)	

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 4.5 mils wet (112 microns):

	@ 40°F/4.5°C	@ 77°F/25°C *50% RH*	@ 100°F/38°C
To touch:	2 hours	15 minutes	2 minutes
To handle:	20 minutes	30 minutes	5 minutes
To recoat:	4 hours	2 hours	30 minutes
To cure:	7 days	2 hours	2 hours

This film must be dry before placing into service or topcoating.
Drying time is temperature, humidity, and film thickness dependent.

Pot Life:	8 hours	4 hours	2 hours
Sweat-in-Time:		None	

Shelf Life:	Part E: 12 months, unopened Part F: 24 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C)
Flash Point:	None
Reducer/Clean Up:	Water

RECOMMENDED USES

For use over properly prepared ductile iron pipe and blasted steel.

- As a one-coat system or as a primer for severely corrosive environments (pH range 5-9).
- Economical replacement for galvanizing with similar performance.
- Where abrasion resistance and hardness are required.
- Areas exposed to fresh and salt water.
- Areas exposed to brackish water.

PERFORMANCE CHARACTERISTICS

Substrate*: Steel
Surface Preparation*: SSPC-SP10
System Tested*:
1 ct. Zinc Clad XI @ 4.0 mils (100 microns) dft
*unless otherwise noted below

Test Name	Test Method	Results
Adhesion	ASTM D4541	6.525 MPa = 946 lb psi
Corrosion Weathering	ASTM D5894, 15 cycles, 5040 hours	Rating 10 per ASTM D714 for Blistering; Rating 10 per ASTM D610 for Rusting
Direct Impact Resistance	ASTM D2794-92	80-in. lbs.
Dry Heat Resistance	ASTM D2485	750°F (399°C)
Flexibility	ASTM D522, 180° bend, 1" mandrel	Passes
Moisture Condensation Resistance	ASTM D4585, 100°F (38°C), 2000 hours	Rating 10 per ASTM D714 for Blistering; Rating 10 per ASTM D610 for Rusting
Pencil Hardness	ASTM D3363	7H
Salt Fog Resistance	ASTM B117, 5000 hours	Rating 10 per ASTM D714 for Blistering; Rating 10 per ASTM D610 for Rusting
Slip Coefficient* (zinc only)	AISC Specification for Structural Joints using ASTM A325 or ASTM A490 Bolts	Class B, 0.72

Conforms to performance requirements of DOD-PRF-24648.

*Consult your Sherwin-Williams Representative regarding this product's Slip Certification document

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RECOMMENDED SYSTEMS

		Dry Film Thickness / ct. Mils	(Microns)
Steel, Untopcoated (pH 5-9)			
1 ct.	Zinc Clad XI	2.0-4.0	(50-100)
Steel, Acrylic Topcoat			
1 ct.	Zinc Clad XI	2.0-4.0	(50-100)
2 cts.	Pro Industrial DTM Acrylic Coating	2.5-4.0	(63-100)
or	Sher-Cryl HPA	2.5-4.0	(63-100)
1 ct.	Fast Clad HB Acrylic	5.0-8.0	(125-200)
Steel, Water Based Epoxy Topcoat			
1 ct.	Zinc Clad XI	2.0-4.0	(50-100)
2 cts.	Water Based Catalyzed Epoxy	2.5-4.0	(63-100)
Steel, Catalyzed Epoxy Topcoat			
1 ct.	Zinc Clad XI	2.0-4.0	(50-100)
1-2 cts.	Macropoxy HS	3.0-6.0	(75-150)
Steel, Polyurethane Topcoat			
1 ct.	Zinc Clad XI	2.0-4.0	(50-100)
1 ct.	Macropoxy HS	3.0-6.0	(75-150)
1 ct.	Acrolon 218 HS Polyurethane	3.0-6.0	(75-150)
Ductile iron, primer only			
1 ct.	Zinc Clad XI	2.0-4.0	(50-100)

NOTE: 1 ct. of DTM Wash Primer can be used as an intermediate coat under recommended topcoats to prevent pinholing.

The systems listed above are representative of the product's use, other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel
Atmospheric: SSPC-SP6/NACE 3, 2 mil (50 micron) profile
Immersion: SSPC-SP10/NACE 2, 2 mil (50 micron) profile

Ductile Iron Pipe:
Atmospheric: NAPF 500-03-03 Power Tool Cleaning
Buried & Immersion: NAPF 500-03-04 Abrasive Blast Cleaning

Cast Ductile Iron Fittings: NAPF 500-03-05 Abrasive Blast Cleaning

Surface Preparation Standards

	Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	-
	Pitted & Rusted	D St 2	D St 2	SP 2	-
Power Tool Cleaning	Rusted	C St 3	C St 3	SP 3	-
	Pitted & Rusted	D St 3	D St 3	SP 3	-

TINTING

Do not tint.

APPLICATION CONDITIONS

Temperature: 40°F (4.5°C) minimum, 100°F (38°C) maximum (air, surface, and material)
At least 5°F (2.8°C) above dew point

Relative humidity: 85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging: 4 gallons (15.1L) mixed
Part E: 2.75 gallons (10.4L) in a 5 gallon (18.9L) can
Part F: 73 lbs. (33.1 Kg) zinc dust

Weight: 25.06 ± 0.5 lb/gal ; 3.0 Kg/L, mixed

SAFETY PRECAUTIONS

Refer to the SDS sheet before use.
Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

DISCLAIMER

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WARRANTY

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

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APPLICATION BULLETIN

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SURFACE PREPARATIONS

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Zinc rich coatings require direct contact between the zinc pigment in the coating and the metal substrate for optimum performance.

Iron & Steel (atmospheric service)
Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Commercial Blast Cleaning per SSPC-SP6/NACE 3. For better performance, use Near White Metal Blast Cleaning per SSPC-SP10/NACE2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils / 50 microns). Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Iron & Steel (immersion service)
Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1. Minimum surface preparation is Near White Metal Blast Cleaning per SSPC-SP10/NACE 2. Blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel the same day as it is cleaned or before flash rusting occurs.

Ductile Iron Pipe, Atmospheric Service:
Minimum surface preparation is Power Tool Clean per NAPF 500-03-03. Remove all oil and grease from surface by Solvent Cleaning per NAPF 500-03-01.

Ductile Iron Pipe, Buried and Immersion Service:
Minimum surface preparation is Abrasive Blast Cleaning per NAPF 500-03-04. Ductile iron pipe external surfaces, in some cases, can be damaged by excessive abrasive blast cleaning beyond this standard. Remove all oil and grease from surface by Solvent Cleaning per NAPF 500-03-01.

Ductile Iron Fittings:
Minimum surface preparation is Abrasive Blast Cleaning of Cast Ductile Iron Fittings per NAPF 500-03-05. Remove all oil and grease from surface by Solvent Cleaning per NAPF 500-03-01.

Note: If blast cleaning with steel media is used, an appropriate amount of steel grit blast media may be incorporated into the work mix to render a dense, angular 1.5-2.0 mil (38-50 micron) surface profile. This method may result in improved adhesion and performance.

Surface Preparation Standards

	Condition of Surface	ISO 8501-1 BS7079:A1	Swedish Std. SIS055900	SSPC	NACE
White Metal		Sa 3	Sa 3	SP 5	1
Near White Metal		Sa 2.5	Sa 2.5	SP 10	2
Commercial Blast		Sa 2	Sa 2	SP 6	3
Brush-Off Blast		Sa 1	Sa 1	SP 7	4
Hand Tool Cleaning	Rusted	C St 2	C St 2	SP 2	-
	Pitted & Rusted	D St 2	D St 2	SP 2	-
Power Tool Cleaning	Rusted	C St 3	C St 3	SP 3	-
	Pitted & Rusted	D St 3	D St 3	SP 3	-

APPLICATION CONDITIONS

Temperature:	40°F (4.5°C) minimum, 100°F (38°C) maximum (air, surface, and material) At least 5°F (2.8°C) above dew point
Relative humidity:	85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compliant with existing VOC regulations and compatible with the existing environmental and application conditions.

Reducer/Clean Up .....Water

Airless Spray .....Not recommended

Conventional Spray
(continuous agitation required)

Gun/Set up	AccuSpray 12SZ-1976, Delrin Fluid Gun
Nozzle	072
Needle	072
Atomization Pressure	55-80 psi
Fluid Pressure	15-30 psi
Fluid Line	¼" ID
Reduction	8-32 ounces of water as needed to a 4 gallon (15.1L) kit depending on temperature

Keep pressure pot at level of applicator to avoid blocking of fluid line due to weight of material. Blow back coating in fluid line at intermittent shutdowns, but continue agitation at pressure pot.

Brush

Brush	Small areas only; nylon/polyester
Reduction	8-32 ounces of water as needed to a 4 gallon (15.1L) kit depending on temperature

If specific application equipment is not listed above, equivalent equipment may be substituted.

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APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Zinc Clad XI comes in 2 premeasured containers which when mixed provides 4 gallons (15.1L) of read-to-apply material.

Mixing Instructions: While mixing silicate vehicle, Part E, with low speed power agitation, add zinc dust, Part F. Do not add vehicle to zinc dust. For smaller amounts, the weight ratio per gallon is 6.87 pounds of Silicate vehicle, Part E, to 18 pounds of Zinc Dust, Part F. After mixing, pour through a 40 mesh screen.
Continuous agitation of mixture during application is required, otherwise zinc dust will quickly settle out.
If reducer solvent is used, add only after both components have been thoroughly mixed together.

Apply paint at the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

	Minimum	Maximum
Wet mils (microns)	**3.0** (75)	**6.0** (150)
Dry mils (microns)	**2.0** (50)	**4.0** (100)
~Coverage sq ft/gal (m^2/L)	**272** (6.6)	**544** (13.3)
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NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 4.5 mils wet (112 microns):

	@ 40°F/4.5°C	@ 77°F/25°C *50% RH*	@ 100°F/38°C
To touch:	2 hours	15 minutes	2 minutes
To handle:	20 minutes	30 minutes	5 minutes
To recoat:	4 hours	2 hours	30 minutes
To cure:	7 days	2 hours	2 hours
This film must be dry before placing into service or topcoating.			
Drying time is temperature, humidity, and film thickness dependent.			
Pot Life:	8 hours	4 hours	2 hours
Sweat-in-Time:		None	

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with soap and warm water. Clean hands and tools immediately after use with soap and warm water. After cleaning, flush spray equipment with Mineral Spirits, R1K4, to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using any solvent.

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PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle.

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and performance.

Any salting on the zinc surface due to weathering exposure must be removed prior to topcoating.

Do not mix previously catalyzed material with new.

Do not apply the material beyond recommended pot life.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with warm, soapy water.

Keep pressure pot at level of applicator to avoid blocking of fluid line due to weight of material. Blow back coating in fluid line at intermittent shutdowns, but continue agitation at pressure pot.

Application above recommended film thickness may result in mud cracking.

Trace amounts of alkalinity may remain in the cured film, which could be detrimental to coating performance if water is allowed to puddle on the surface. Use only steel storage, shipping and structural design configurations that prevent the puddling of water on the coating. Trace amounts of alkaline residue may concentrate in a drying puddle and result in high pH values that dissolve the coating film. Thorough rinsing will reduce the propensity for this type of occurrence.

Refer to Product Information sheet for additional performance characteristics and properties.

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