



# Protective & Marine Coatings

# ZINC CLAD® II PLUS INORGANIC ZINC-RICH COATING

PART A  
PART B  
PART F

B69VZ12  
B69VZ15  
B69D11

BASE  
ACCELERATOR  
ZINC DUST

Revised: October 28, 2013

## PRODUCT INFORMATION

6.13

### PRODUCT DESCRIPTION

**ZINC CLAD II PLUS** is a solvent-based, three component, inorganic ethyl silicate, zinc rich coating. This is fast drying, high solids, low VOC coating with 83%, by weight, of zinc dust in the dry film.

- Coating self-heals to resume protection if damaged
- Provides cathodic/sacrificial protection by the same mechanism as galvanizing
- Forms an inorganic barrier to moisture and solvents
- Meets Class B requirements for Slip Coefficient and Creep Resistance, 0.67
- Meets AASHTO M-300 specification

### PRODUCT CHARACTERISTICS

<b>Finish:</b>	Flat
<b>Color:</b>	Gray-Green
<b>Volume Solid:</b>	76% ± 2%, mixed
<b>Weight Solid:</b>	90% ± 2%, mixed
<b>VOC (EPA Method 24):</b>	Unreduced: <320 g/L; 2.67 lb/gal (mixed) Reduced 4%: <340 g/L; 2.8 lb/gal
<b>Zinc Content in Dry Film:</b>	83% ± 2% by weight
<b>Mix Ratio:</b>	3 components, premeasured 3.66 gallons (13.8L) mixed

### Recommended Spreading Rate per coat:

	Minimum	Maximum
<b>Wet mils (microns)</b>	<b>3.0</b> (75)	<b>6.0</b> (150)
<b>Dry mils (microns)</b>	<b>2.0</b> (50)	<b>4.0</b> (100)
<b>~Coverage sq ft/gal (m<sup>2</sup>/L)</b>	<b>305</b> (7.5)	<b>610</b> (15.0)
<b>Theoretical coverage sq ft/gal (m<sup>2</sup>/L) @ 1 mil / 25 microns dft</b>	<b>1219</b> (28.2)	
Dry film thickness in excess of 6.0 mils (150 microns) per coat is not recommended.		

### Drying Schedule @ 4.0 mils wet (100 microns):

	@ 40°F/4.5°C	@ 77°F/25°C	@ 100°F/38°C
		<b>50% RH</b>	
<b>To touch:</b>	25 minutes	20 minutes	5 minutes
<b>To handle:</b>	1 hour	20 minutes	15 minutes
<b>To topcoat:</b>	7 days	24 hours	8 hours
<b>To cure:</b>	7 days	36 hours	24 hours
<b>To stack:</b>	6 hours	2 hours	1 hour
<i>Drying time is temperature, humidity, and film thickness dependent.</i>			
<b>Pot Life:</b>	8 hours @ 77°F (25°C)		
High humidity will shorten pot life.			
<b>Sweat-in-Time:</b>	None required, but material should be mixed for at least 5 minutes before use.		

<b>Shelf Life:</b>	Part A: 12 months, unopened Part B: 24 months, unopened Part F: 24 months, unopened Store indoors at 40°F (4.5°C) to 100°F (38°C)
<b>Flash Point:</b>	55°F (13°C)
<b>Reducer/Clean Up:</b>	R7K111, R2K5, R2KT4, High Flash Naphtha 150
	Below 70°F (21°C): R2K4, R7K111, R6K9, R2K5, High Flash Naphtha 150

### RECOMMENDED USES

For use over prepared blasted steel in areas such as:

- Bridges
- Shop or field application
- Nuclear Power Plants
- Nuclear fabrication shops
- As a one-coat maintenance coating or as a permanent primer for severe corrosive environments (pH range 5-9)
- Ideal for application at low temperatures or service at high temperatures and/or humidity conditions
- Fresh and demineralized water immersion service (non-potable)
- Compliance with Class B Slip Coefficient rating when used alone or as part of a system with Steel Spec Epoxy Primer as a topcoat
- This product meets specific design requirements for non-safety related nuclear plant applications in Level II, III and Balance of Plant, and DOE nuclear facilities\*.

\* Nuclear qualifications are NRC license specific to the facility.

### PERFORMANCE CHARACTERISTICS

**Substrate\*:** Steel

**Surface Preparation\*:** SSPC-SP10

**System Tested\*:**

1 ct. Zinc Clad II Plus @ 3.0 mils (75 microns) dft

\*unless otherwise noted below

Test Name	Test Method	Results
<b>Adhesion</b>	ASTM D4541	12.1 MPa = 1754 lb psi
<b>Direct Impact Resistance</b>	ASTM D2794-92	60 in lbs.
<b>Dry Heat Resistance</b>	ASTM D2485	750°F (399°C)
<b>Flexibility</b>	ASTM D522, 180° bend, 1" mandrel	Passes
<b>Pencil Hardness</b>	ASTM D3363	3H
<b>Radiation Tolerance</b>	ASTM D4082 / ANSI 5.12	Pass at 3.1 mils (77.5 microns) & 6.8 mils (170 microns)
<b>Salt Fog Resistance</b>	ASTM B117, 7000 hours	Rating 9 per ASTM D714 for Blistering; Rating 9 per ASTM D610 for Rusting
<b>Slip Coefficient* (zinc only)</b>	AISC Specifications for Structural Joints using ASTM A325 or ASTM A490 Bolts	Class B, 0.67
<b>Slip Coefficient1*</b>	AISC Specification for Structural Joints using ASTM A325 or ASTM A490 Bolts	Passes Class B, 0.56

Provides performance comparable to products formulated to specifications Mil-P-38336, Mil-P-46105, SSPC Paint 20, and SSPC Paint 29.

#### Footnotes:

<sup>1</sup> 1 ct. Zinc Clad II Plus @ 2.0-4.0 mils (50-100 microns) dft

1 ct. Steel Spec Epoxy Primer @ 4.0-6.0 mils (100-150 microns) dft

\*Refer to Slip Certification document



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### RECOMMENDED SYSTEMS

		Dry Film Thickness / ct.	
		Mils	(Microns)
<b>Steel, High Performance Acrylic Topcoat, Atmospheric:</b>			
1 ct.	Zinc Clad II Plus	2.0-4.0	(50-100)
1 ct.	Fast Clad HB Acrylic	5.0-8.0	(125-200)
<b>Steel, Immersion:</b>			
1 ct.	Zinc Clad II Plus	2.0-4.0	(50-100)
<b>Steel, Epoxy Topcoat, Atmospheric:</b>			
1 ct.	Zinc Clad II Plus	2.0-4.0	(50-100)
1 ct.	Macropoxy 646	5.0-10.0	(125-250)
<b>Steel, Polyurethane Topcoat, Atmospheric:</b>			
1 ct.	Zinc Clad II Plus	2.0-4.0	(50-100)
1 ct.	Macropoxy 646	5.0-10.0	(125-250)
1 ct.	Acrolon 218 HS	3.0-6.0	(75-150)
<b>Steel, Polyurethane Topcoat, Atmospheric:</b>			
1 ct.	Zinc Clad II Plus	2.0-4.0	(50-100)
1 ct.	Macropoxy 646	5.0-10.0	(125-250)
1 ct.	Hi-Solids Polyurethane	3.0-5.0	(75-125)
<b>Steel, Epoxy Siloxane Topcoat, Atmospheric</b>			
1 ct.	Zinc Clad II Plus	2.0-4.0	(50-100)
1-2 cts.	Polysiloxane XLE-80	3.0-7.0	(75-175)

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

#### Steel (Class B Compliant System):

1 ct.	Zinc Clad II Plus	2.0-4.0	(50-100)
1 ct.	Steel Spec Epoxy Primer, red	4.0-6.0	(100-150)

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

### DISCLAIMER

The information and recommendations set forth in this Product Data Sheet are based upon tests conducted by or on behalf of The Sherwin-Williams Company. Such information and recommendations set forth herein are subject to change and pertain to the product offered at the time of publication. Consult your Sherwin-Williams representative to obtain the most recent Product Data Information and Application Bulletin.

### 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

#### 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	C St 2	C St 2	SP 2	-
Pitted & Rusty	D St 2	D St 2	SP 3	-
Power Tool Cleaning	Rusted	C St 3	SP 3	-
Pitted & Rusty	D St 3	D St 3	SP 3	-

### TINTING

Do not tint.

### APPLICATION CONDITIONS

Temperature:

Material: 20°F (-7°C) minimum, 95°F (35°C) maximum  
Air: 20°F (-7°C) minimum, 115°F (46°C) maximum  
Surface: 20°F (-7°C) minimum, 130°F (54°C) maximum

At least 5°F (2.8°C) above dew point

Relative humidity:

95% maximum  
Water misting may be required at humidities below 50%

Refer to product Application Bulletin for detailed application information.

### ORDERING INFORMATION

Packaging:	3.66 gallons (13.8L) total, mixed
Part A:	2.21 gallon (8.3L) kit
Part B:	0.20 gallon (0.75L)
Part F:	73 lbs (33.1 Kg) zinc dust

Weight: 26.83 ± 0.2 lb/gal ; 3.2 Kg/L, mixed

### SAFETY PRECAUTIONS

Refer to the MSDS 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.

### 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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Revised: October 28, 2013

## 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/NACE 2. 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 / 50 microns). 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.

**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	C St 2	C St 2	SP 2	-
Pitted & Rusted	D St 2	D St 2	SP 2	-
Rusted	C St 3	C St 3	SP 3	-
Power Tool Cleaning	D St 3	D St 3	SP 3	-

### APPLICATION CONDITIONS

Temperature:	
Material:	20°F (-7°C) minimum, 95°F (35°C) maximum
Air:	20°F (-7°C) minimum, 115°F (46°C) maximum
Surface:	20°F (-7°C) minimum, 130°F (54°C) maximum At least 5°F (2.8°C) above dew point
Relative humidity:	95% maximum Water misting may be required at humidities below 50%

### 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

Above 70°F (21°C).....	R7K111, R2K5, R2KT4, High Flash Naphtha 150
Below 70°F (21°C).....	R2K4, R7K111, R6K9, R2K5, High Flash Naphtha 150

#### Airless Spray

(use Teflon packings and continuous agitation)

Unit.....	Graco 30:1
Pressure.....	2700 psi
Hose.....	3/8" ID
Tip.....	.019" - .021"
Filter.....	30 mesh
Reduction.....	As needed up to 4% by volume*

For continuous operation in larger areas, use Speeflo Airless Commander Zinc Pump. Set ball checks to maximum travel for viscous material.

#### Conventional Spray

(continuous agitation required)

Gun.....	Binks 95
Fluid Nozzle.....	66
Fluid Hose.....	1/2" ID, 50 ft maximum
Air Nozzle.....	63PB
Air Hose.....	1/2" ID, 50 ft maximum
Atomization Pressure.....	25 psi
Fluid Pressure.....	10-20 psi
Reduction.....	As needed up to 4% by volume*

\*4% maximum for 340 g/L VOC compliance. Acceptable up to 15% reduction, however it will not be compliant for class B slip and creep.

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** ..... For touch up in small areas only

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 II Plus comes in premeasured containers, which when mixed provides ready-to-apply material.

#### Mixing Instructions:

Thoroughly agitate Binder, Part A, using low speed continuous air driven agitation. Slowly mix all of Zinc Dust, Part F, into all of Binder Part A until mixture is completely uniform. Continue agitation and add Part B. After mixing, pour mixture through 30-mesh screen. Mixed material must be used within 8 hours. Do not mix previously mixed material with new. No "sweat-in" period is required.

If reducer solvent is used, add only after components have been thoroughly mixed.

Continuous agitation of mixture during application is required, otherwise zinc dust will quickly settle out.

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 <sup>2</sup> /L)	305 (7.5)	610 (15.0)
Theoretical coverage sq ft/gal (m <sup>2</sup> /L) @ 1 mil / 25 microns dft	1219 (28.2)	

Dry film thickness in excess of 6.0 mils (150 microns) per coat is not recommended.

#### Drying Schedule @ 4.0 mils wet (100 microns):

	@ 40°F/4.5°C	@ 77°F/25°C 50% RH	@ 100°F/38°C
To touch:	25 minutes	20 minutes	5 minutes
To handle:	1 hour	20 minutes	15 minutes
To topcoat:	7 days	24 hours	8 hours
To cure:	7 days	36 hours	24 hours
To stack:	6 hours	2 hours	1 hour

*Drying time is temperature, humidity, and film thickness dependent.*

**Pot Life:** 8 hours @ 77°F (25°C)

High humidity will shorten pot life.

**Sweat-in-Time:** None required, but material should be mixed for at least 5 minutes before use.

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 Reducer R2KT4, 150 Flash Naphtha or R2K4, Xylene. Clean hands and tools immediately after use with Reducer R2KT4, 150 Flash Naphtha or R2K4, Xylene. Follow manufacturer's safety recommendations when using any solvent.

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### PERFORMANCE TIPS

**Topcoating:** Note minimum cure times at normal conditions before topcoating. Longer drying periods are required if primer cannot be water mist sprayed when humidity is low. Water misting may be required at humidities below 50% to enhance cure rate.

Occasionally topcoats will pinhole or delaminate from zinc-rich coatings. This is usually due to poor ambient conditions or faulty application of topcoats. This can be minimized by:

- Provide adequate ventilation and suitable application and substrate temperature.
- If pinholing develops during topcoating, apply a mist coat of the topcoat, reduced up to 50%. Allow 10 minutes flash off and follow with a full coat.

Excessive film build, poor ventilation, and cool temperatures may cause solvent entrapment and premature coating failure.

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

An intermediate coat is recommended to provide uniform appearance of the topcoat.

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.

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 Reducer R2KT4, 150 Flash Naphtha.

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 and poor topcoat appearance.

During the early stages of drying, the coating is sensitive to rain, dew, high humidity, and moisture condensation. If possible, plan painting schedules to avoid these influences during the first 16-24 hours of curing.

Topcoats may be applied once 50 MEK double rubs are achieved, per ASTM D4752, Rating 4. No zinc or only slight traces should be visible. Coin hardness test can also be used.

Cured films of inorganic zinc coatings contain no appreciable amounts of combustible materials. Both Fire and Smoke Indices would be expected to approach 0.

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

### SAFETY PRECAUTIONS

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