

The
S
of Tank and Coatings Care



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Note: This presentation is based on real stories, and best experienced live.
Please contact MBA at (302) 322-2000 to schedule.

Help!





AWWA D100 Foreward



- DI00** Welded Carbon Steel Tanks
- DI02** Coating Steel Water-Storage Tanks
- DI03** Factory Coated Bolted Carbon Steel
- DI07** Composite Elevated Tanks
- DI08** Aluminum Dome Roofs
- DI10** Wire- and Strand-Wound, Circular, Prestressed Concrete Water Tanks
- DI15** Tendon-Prestressed Concrete Water Tanks
- C652** Disinfection of Water Storage Facilities



Standards vs. Codes



OSHA 1910.27



29CFR 1910

Occupational Safety & Health Standards

- **1910.23** Guarding Floor & Wall Openings & Holes
- **1910.27** Fixed Ladders
- **1910.1025** Lead



[Regulations \(Standards - 29 CFR\) - Table of Contents](#)

- **Part Number:** 1910
- **Part Title:** Occupational Safety and Health Standards
- **Subpart:** D
- **Subpart Title:** Walking-Working Surfaces
- **Standard Number:** 1910.23
- **Title:** Guarding floor and wall openings and holes.
- **GPO Source:** [6-CFR](#)

1910.23(a)

"Protection for floor openings."

[1910.23\(a\)\(1\)](#)

Every stairway floor opening shall be guarded by a standard railing constructed in accordance with paragraph (e) of this section. The railing shall be provided on all exposed sides (except at entrance to stairway). For infrequently used stairways where traffic across the opening prevents the use of fixed standard railing (as when located in aisle spaces, etc.), the guard shall consist of a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at entrance to stairway).

[1910.23\(a\)\(2\)](#)

Every ladderway floor opening or platform shall be guarded by a standard railing with standard toeboard on all exposed sides (except at entrance to opening), with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into the opening.



OSHA



OSHA QuickTakes

Newsletter

RSS Feeds

Occupational Safety & Health Administration

We Can Help

Home

Workers

Regulations

Enforcement

Data & Statistics

Training

Publications

Newsroom

Small Business

Standard Interpretations

- 1 [2009 - 09/29/2009 - Guarding of Access Openings to Fixed Ladders.](#)
- 2 [2005 - 05/23/2005 - Fall protection requirements when working from ladders in the telecommunications industry.](#)



ICRI

International Concrete Repair Institute





Product Data Sheets (PDS)



Protective & Marine Coatings



MACROPOXY® 646 PW POTABLE WATER EPOXY

PART A	B58WX610	MILL WHITE
PART A	B58LX600	LIGHT BLUE
PART A	B58RX610	RED
PART A	B58HX610	BUFF
PART B	B58VX600	HARDENER
PART B	B58VX605	OAP HARDENER

Revised: July 29, 2014

PRODUCT INFORMATION

4.56

PRODUCT DESCRIPTION

MACROPOXY 646 PW EPOXY is a high solids, high build, fast drying, polyamide epoxy classified by UL to ANSI/NSF 61 as a tank lining for potable water storage tanks. The high solids content ensures adequate protection of sharp edges, corners, and welds. B58VX605 Hardener contains Opti-Check OAP pigment technology for rapid holiday detection with safe blue light inspection lamps.

- Low VOC
- Low odor
- Outstanding application properties

PRODUCT CHARACTERISTICS

Finish:	Semi-Gloss	
Color:	Mill White, Light Blue, Buff, and Red	
Volume Solids:	72% ± 2%, mixed	
Weight Solids:	85% ± 2%, mixed	
VOC (EPA Method 24):	Unreduced:	<250 g/L; 2.08 lb/gal
	mixed	Reduced 10%: <300 g/L; 2.50 lb/gal
Mix Ratio:	1:1 by volume	

Recommended Spreading Rate per coat:

	Standard		AWWA	
	Min.	Max.	Min.	Max.
Wet mils (microns)	7.0	175	13.5	340
Dry mils (microns)	5.0	125	10*	250*
~Coverage sq ft/gal (m ² /L)	116	2.8	232	5.6
			192	4.7
			384	9.4

RECOMMENDED USES

Potable Water Tank Restrictions

Water Contact Temp: 23°C
 7 Day Cure; Tanks ≥ 1,500 gallons: 2-3 cts
 Maximum DFT: 20.0 mils (up to 10 mils/ct)
 21 Day Cure; Pipes ≥ 15", 2 cts
 Maximum DFT: 8 mils/ct

- Conforms to AWWA D102 ICS #1, #2, and #5, and OCS #5***

***Refer to respective systems

PERFORMANCE CHARACTERISTICS

Substrate*: Steel

Surface Preparation*: SSPC-SP10/NACE 2

System Tested*:

1 ct. Macropoxy 646 PW Fast Cure @ 6.0 mils (150 microns) dft

*unless otherwise noted below

Test Name	Test Method	Results
Abrasion Resistance	ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load	84 mg loss
Adhesion	ASTM D4541	1,037 psi
Corrosion Weathering¹	ASTM D5894, 36 cycles, 12,000 hours	Rating 10 per ASTM D714 for blistering; Rating 9 per ASTM D610 per rusting

Mix Ratio:

1:1 by volume

Recommended Spreading Rate per coat:

	Standard		AWWA	
	Min.	Max.	Min.	Max.
Wet mils (microns)	7.0 175	13.5 340	4.2 105	8.3 208
Dry mils (microns)	5.0 125	10* 250*	3.0 75	6.0* 150*
~Coverage sq ft/gal (m ² /L)	116 2.8	232 5.6	192 4.7	384 9.4
Theoretical coverage sq ft/gal (m ² /L) @ 1 mil/25 micron dft	1152 (28.2)			

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

* See Recommended Systems on reverse side

Drying Schedule @ 7.0 mils wet (175 microns):

	@ 40°F/4.5°C	@ 77°F/25°C 50% RH	@ 100°F/38°C
To touch:	4-5 hours	2 hours	1.5 hours
To handle:	48 hours	8 hours	4.5 hours
To recoat:			
minimum:	48 hours	8 hours	4.5 hours
maximum:	1 year	1 year	1 year
Cure for			
immersion:	14 days	7 days	4 days

Test Na

Abrasi
Resista

Adhesi

Corrosi
Weathe

Direct I
Resista

Dry Hea
Resista

Flexibil

Humidi
Resista

Immers

Immers

... achieve maximum film thickness and uniformity of appearance.

* See Recommended Systems on reverse side

Drying Schedule @ 7.0 mils wet (175 microns):

	@ 40°F/4.5°C	@ 77°F/25°C <i>50% RH</i>	@ 100°F/38°C
To touch:	4-5 hours	2 hours	1.5 hours
To handle:	48 hours	8 hours	4.5 hours
To recoat:			
minimum:	48 hours	8 hours	4.5 hours
maximum:	1 year	1 year	1 year
Cure for immersion:	14 days	7 days	4 days

If maximum recoat time is exceeded, abrade surface before recoating.

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

Pot Life: 10 hours 4 hours 2 hours

Sweat-in-Time: 30 minutes 30 minutes 15 minutes

For **Potable Water Service**, allow a minimum cure time of 7 days at 77°F (25°C) prior to placing in service. Sterilize and rinse per AWWA C652.

Shelf Life: 36 months, unopened
Store indoors at 40°F (4.5°C) to 100°F (38°C).

Flash Point: 91°F (33°C), TCC, mixed

Reducer/Clean Up: Reducer R7K15

Resist

Flexib

Humid
Resist

Immer

Immer

Pencil

Water
Perme

Epoxy

Footno

¹ Zinc C

² Galva



NACE Inspector



National Association of Corrosion Engineers

Since 1943

- Level 1
- Level 2
- Level 3 (Peer Review)





SSPC SPI 0 Blast



Society for Protective Coatings (was Steel Structures Painting Council)

Since 1950

- **SP 2** Hand Tool Cleaning
- **SP 3** Power Tool Cleaning
- **SP 6** Commercial Blast Cleaning
- **SP 10** Near-White Metal Blast Cleaning
- **SP 13** Surface Preparation of Concrete
- **VIS 1** Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning



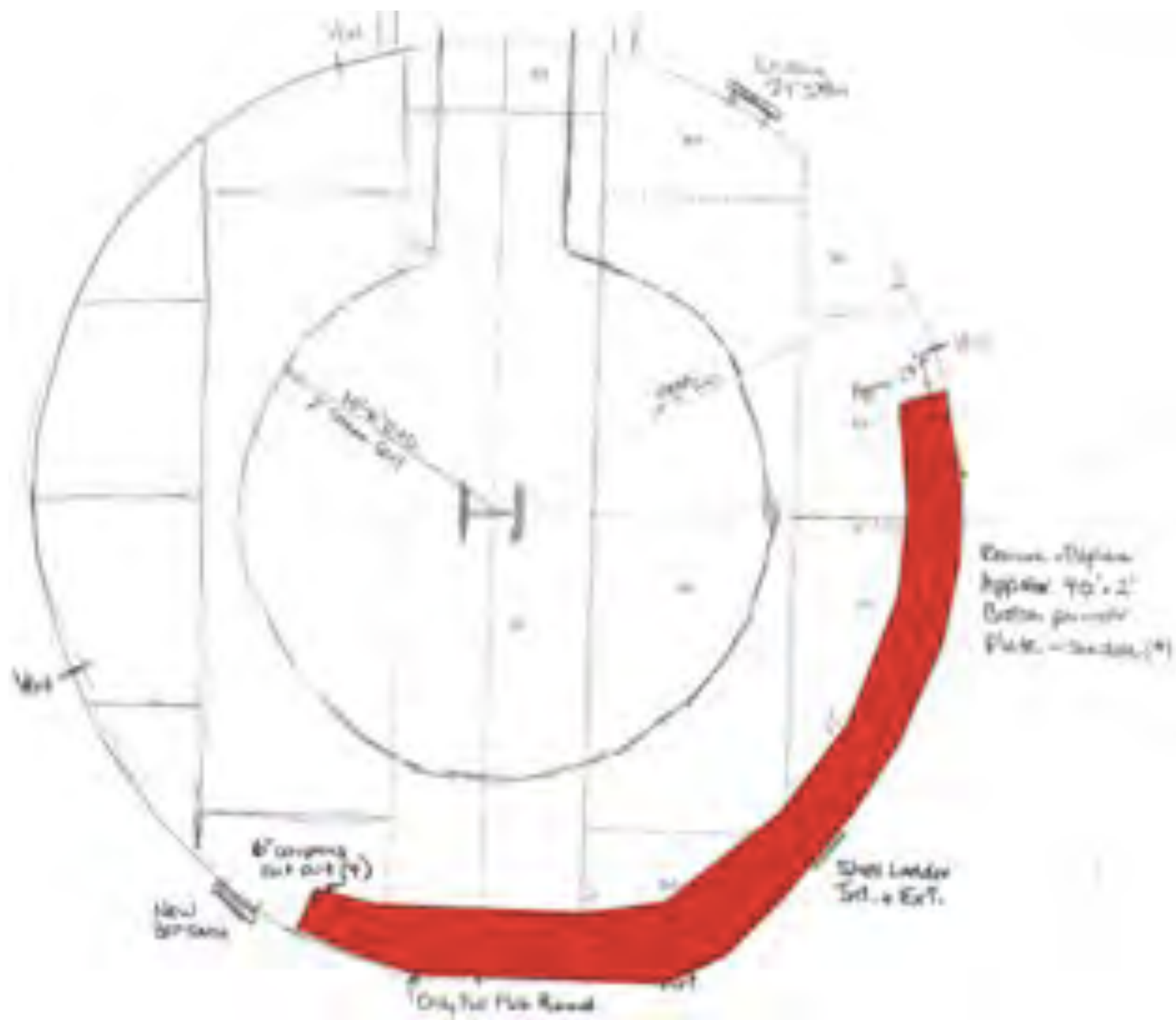
Addendum #1

Question: Specification calls for **full blast and paint** on the exterior. But page 3 specifies an **overcoat**. What's required?

Response: The specification calls for **Class 2A Containment (abrasive blast cleaning)** on rusted areas. Type and amount of containment depends on the amount of surface cleaned before **overcoating**.



API-653





AMERICAN PETROLEUM INSTITUTE

API-653 Standard

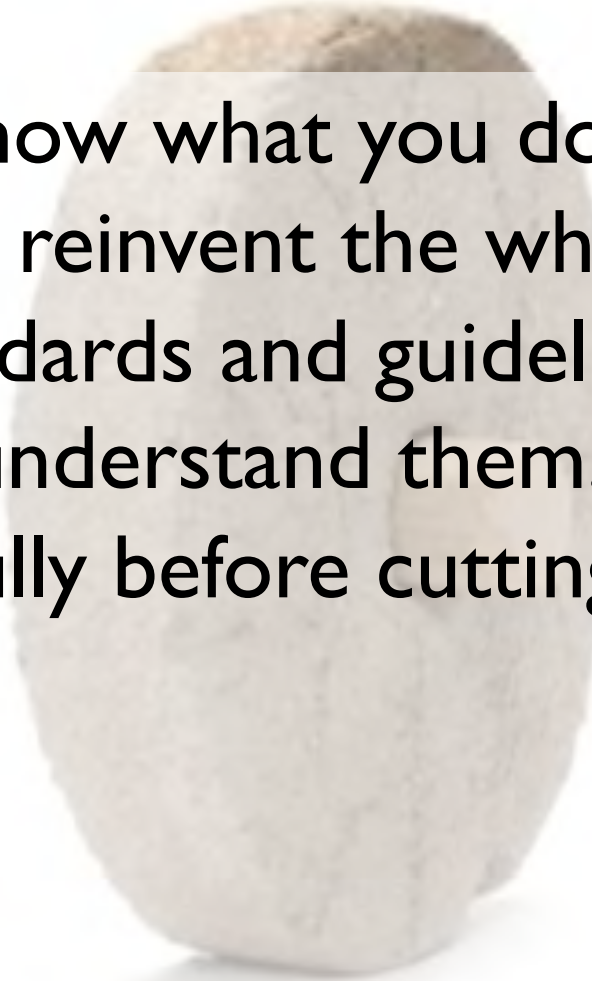
- Tank Inspection, Repair, Alteration & Reconstruction.
- For aboveground petroleum & chemical tanks.
- AWWA has **no** repair guidelines.



AWWA D100 A.5.6



Lessons Learned

- You don't know what you don't know.
 - No need to reinvent the wheel.
 - Lots of standards and guidelines to help.
 - Critical to understand them.
 - Think carefully before cutting and pasting.
- 

Questions?



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Proud sponsor of the Tank Building Contest
5:30pm TODAY!