

# STATE OF CALIFORNIA

## Department of Transportation Specification

### Light Green Finish Paint Waterborne Acrylic Latex Vehicle (Formula PWB-171B)

#### SCOPE

This specification covers a pre-mixed waterborne paint formulated for use as a finish coat on properly prepared metal surfaces. This coating is intended for spray application. Limited application can be made by brushing and rolling.

#### REQUIREMENTS

##### General:

This specification is intended to specify paint that will meet service requirements for bridge construction and maintenance. Application and use of this coating shall be in conformance with the provisions in Section 59-2, "Painting Structural Steel", or Section 59-3, "Painting Galvanized Surfaces", whichever is applicable, and Section 91, "Paint", of the *State of California Department of Transportation Standard Specifications*. All properties listed shall be maintained for a minimum of one year after acceptance. If the vendor is making this paint for the first time, the Transportation Laboratory in Sacramento must be consulted.

##### Materials:

The raw materials for use in the paint formula shall conform to the specifications designated.

#### QUALITY ASSURANCE

All paint intended for use by the California Department of Transportation (Department) must be sampled, tested and approved by the Transportation Laboratory **before** shipment.

The manufacturer shall take a representative one-quart sample of each batch of paint and ship the samples to the Transportation Laboratory for approval, unless other arrangements have been made. Raw materials and copies of batch records used in the manufacture of the paint shall be submitted if requested.

Transportation Laboratory, Chemical Testing Branch, 5900 Folsom Blvd., Sacramento, CA 95819, attn.: Lisa Dobeck, Fax (916) 227-7168.

A batch shall be that amount of paint that was manufactured and packaged in a single operation. The paint container shall be labeled with, but not limited to, the State Specification number, date of manufacture and batch number. The Department also reserves the right to retest any batch after delivery. Results from such retesting shall prevail over all other tests and will be the basis of rejection. Material not meeting the

Cancels and Supersedes PWB-171A and PWB 163C.

specification shall be removed and replaced by the supplier at their expense, including all costs for handling, retesting and shipping.

All tests shall be conducted in accordance with the appropriate ASTM test methods referenced under the “Characteristics of Paint” section of this document and methods used by the Transportation Laboratory.

Patents:

The contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work, and agrees to indemnify and save harmless the State of California, and its duly authorized representatives from all suits at law or action of every nature for, or on account of, the use of any patented materials, equipment, devices, or processes.

Description:

This specification covers a pre-mixed waterborne paint formulated for use as a finish coat on properly prepared metal surfaces. This coating is intended for spray application. Limited application can be made by brushing or rolling. This paint is an industrial maintenance coating colored light green and is not for residential use.

Predispersed colorants:

Degussa Aqua-Chem® 895 colorants were used in the development of this formulation. Minor adjustments of the amounts used may be necessary to match the colors specified due to manufacturing variations. Predispersed colorants from other manufacturers may not be compatible with this formulation. Colorants selected shall be zero VOC, light fast, glycol-free and chemically resistant. They shall not contain lead, chrome or zinc.

Composition:

Paint shall be mixed in the following proportions and sequence. Hold back part of the water initially to get a good grind viscosity. Do not exceed 100 °F during this operation. Add remainder of water after the grind is achieved.

<u>Grind Ingredients:</u>		<u>Weight percent</u>	<u>Lbs./ 100gal</u>
Water	(1)	3.78	36.5
Dispersant	(2)	0.12	1.2
Surfactant	(3)	0.27	2.6
Defoamer	(4)	0.21	2.0
Ammonium hydroxide (28%)	(5)	0.21	2.0
Titanium dioxide	(6)	5.60	54.08

Calcium carbonate	(7)	7.25	70.0
Flash rust inhibitor	(8)	0.21	2.0
Preservative	(9)	0.10	1.0

<b><u>Let Down Ingredients:</u></b>		<b><u>Weight percent</u></b>	<b><u>Lbs./ 100gal</u></b>
(Coalescent)	(10)	3.70	35.7
(Coalescent)	(11)	0.52	5.0
TEG-EH (plasticizer)	(12)	0.41	4.0
Styrenated acrylic latex	(13)	67.83	655
Lamp Black	(14)	0.21	2.02
Phthalogreen	(15)	2.96	28.57
Yellow Oxide	(16)	6.04	58.34
Thickener	(17)	0.21	2.0
Defoamer	(4)	0.21	2.0
Ammonium hydroxide (28%)	(5)	0.17	1.6

**Characteristics of Paint:**

VOC, grams per liter, ASTM Designation: D 6886	100 Maximum
Flash Point, °F, ASTM D 3828	>215
Density, grams per milliliter, ASTM Designation: D 1475	1.14 to 1.17
Nonvolatile content, percent, ASTM Designation: D 2369	49-51
Pigment content, percent, ASTM Designation: D 3723	14.5-16.5
Consistency, ASTM Designation: D562, g (Equivalent KU)	150-175 70-74
High-shear viscosity, poise, ASTM Designation: D 4278 0 to 5-P cone, shear rate 12 000 s <sup>-1</sup>	0.3 to 0.5
pH	8.3-8.8
Fineness of grind, Hegman, ASTM Designation: D 1210	6 Minimum

Specular Gloss, ASTM Designation: D 523

@ 20°

5.0 - 7.0

@ 60°

29 - 33

Color to match Federal Standard 595B color number 14223 unless otherwise specified.

Color Tolerance, ASTM Designation: D2244,  
CIE 1976 L\*a\*b\*, 10° Standard observer, Illuminant D 65

2 ΔE Maximum

Color Tolerance after 300 hours of UV-exposure,  
ASTM Designation: D 4587, Cycle-2, UVA-340 bulbs

4 ΔE Maximum

Film hardness by pencil test, ASTM Designation: D 3363

3B Minimum

Salt Fog Exposure, 100 hours, ASTM Designation: B 117

Rust rating, ASTM Designation: D 610

10 minimum

Blistering, ASTM Designation: D 714

No more than 8F

Dry time at 25°C, 4 mils wet film, ASTM Designation: D1640

Set to touch, hours

½ maximum

Dry through, hours

1 maximum

**Material Ingredients of Paint:**

- 1) Water
- 2) Tamol® 165A (Rohm & Haas)
- 3) Surfynol® CT-111 (Air Products)
- 4) Foamaster® 111 (Henkel)
- 5) Ammonium Hydroxide (28%)
- 6) Ti-Pure® R-706 (Du Pont)
- 7) Vicron 15-15 (Specialty Minerals Inc.)
- 8) Sodium Nitrite (15% solution)
- 9) PROXEL® BD20 (Avecia Inc.)
- 10) (Dowanol® DPnB) Di (propylene glycol) butyl ether, (Dow Chemical Co.)
- 11) (Texanol®) 2,2,4-Trimethylpentanediol-1, 3-monoisobutyrate, (Eastman Chemical Co.)
- 12) TEG-EH (Eastman Chemical Co.)
- 13) Aquamac 440 (Hexion Specialty Chemicals)
- 14) Lamp Black 895-9901 (Degussa Corporation)
- 15) Phthalogreen 895-5505 (Degussa Corporation)
- 16) Yellow Oxide 895-1806 (Degussa Corporation)

## 17) Acrysol® RM-12W (Rohm and Haas)

Packaging:

The containers shall be new, round and of no more than five-gallon capacity. Pails larger than three gallons shall be standard, full open head. One gallon and larger containers shall have ears and bails. All containers shall be suitably lined or constructed so as to prevent any reaction between the container and contents and also must comply with U.S. Department of Transportation or I.C.C. Regulations as applicable.

Labels must be marked with the volatile organic compound (VOC) content, mixing instructions and the following provision in addition to any other labeling required:

Application:

The paint shall be applied to a total dry film thickness of 1.5 mil minimum and 3 mil maximum. This coating is intended for spray application, however limited application can be made by brush. Paint should not be applied when the ambient or surface temperature is above 100°F or below 50 °F, when the relative humidity exceeds 75 percent, or when the surface temperature is less than 5 °F above the dew point.

Clean-up:

Use tap water for clean up. 10% ammonia, acetone or other suitable solvent may be used to remove dried paint from spray guns and other equipment.