**STATE OF CALIFORNIA**
**Department of Transportation**

# Light and Dark Blue Finish Paint (Specification PWB 165B)

## 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. The dark blue color matches the color on the Coronado Bridge.

## REQUIREMENTS

General:

This specification is intended to specify paint that will meet service requirements for bridge construction and maintenance. 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 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 Mixed 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.

Composition
Paint shall be mixed in the following proportions and sequence:

| Component | | Weight percent |
|---|---|---|
| Water | | 5.9 |
| Dispersant | (1) | 0.64 |
| Surfactant | (2) | 0.21 |
| Thickener | (3) | 0.16 to 0.20 |
| Defoamer | (4) | 0.11 |
| Hold back part of water initially to get good grind viscosity. Do not exceed 37°C during this operation. Add remainder of water after grind is achieved. | | |
| Titanium Dioxide | (5) | 4.2 to 4.3 |
| Calcium Carbonate | (6) | 7.5 to 10.5 |
| Predispersed Colorant | | 1.0 to 5.0 |
| Colorants selected shall be compatible, light fast, glycol-free, and alkali resistant. They shall be carefully selected so as to not adversely affect the coating formulation. Colorants shall not contain lead, chromium or zinc. | | |
| Let down paste slowly: | | |
| Styrenated Acrylic Emulsion | (7) | 60 to 61 |
| Coalescing Solvent | (8) | 7.0 |
| Ammonium Hydroxide (28%) (add as necessary to adjust pH) | | ≅ 0.2 |
| Water (add as necessary to adjust nonvolatile content and viscosity) | | 9 to 9.5 |

Characteristics of Mixed Paint

| | |
|---|---|
| Volatile Organic Content, g/L, ASTM Designation: D 6886 | 210 |
| Density, grams per milliliter, ASTM Designation: D 1475 | 1.11 to 1.15 |
| Pigment by weight of paint, percent, ASTM Designation: D 3723 | 12.5 to 15.5 |
| Nonvolatile content, weight percent, ASTM Designation: D 2369, Procedure B | 42.0 to 45.5 |
| Nonvolatile content, volume percent, ASTM Designation: D 2697 | 35.0 to 37.0 |
| Fineness of grind, Hegman, ASTM Designation: D 1210 | 6 minimum |
| Contrast ratio, ASTM Designation: D 2805, use a 6 mil clearance applicator blade | 0.98 minimum |
| pH | 8.0 to 9.0 |
| Consistency, ASTM Designation: D 562, g<br>(Equivalent KU) | 175 to 225<br>(77 to 86) |
| High-shear viscosity, ASTM Designation: D 4287, 0 to 5-P cone, shear rate 12 000 $s^{-1}$ | 0.5 P maximum |
| Drying time, 4 mil-wet film, ASTM Designation: D 1640 | |
| set to touch, hours | 1 maximum |
| dry through, hours | 2 maximum |

Light blue color to match Caltrans color chip number PWB-110. Dark blue color to match Caltrans color chip number PWB-111. Color chips are available from the Transportation Laboratory in Sacramento.

(1) Tamol® 681 (Rohm and Haas Company)

(2) Surfÿnol® 104A (Rohm and Haas Company)

(3) Acrysol® RM-825 (Rohm and Haas Company)

(4) Bubble Breaker 3056A (Witco)

(5) ASTM Designation: D 476, Type IV

(6) 98% minimum $CaCO_3$ having an average particle size of 5 μm or less, a maximum particle size of 25 μm and containing no less than 80% particle size of less than 10 μm. Oil absorption (ASTM Designation: D-281) shall be less than 22.

(7) Aquamac 700 (McWhorter, Inc.) or EPS 2504 (Engineered Polymer Solutions, Inc.)

(8) 2,2,4-Trimethylpentanediol-1,3-monoisobutyrate

**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 38°C or below 10°C, when the relative humidity exceeds 75 percent, or when the surface temperature is less than 3°C above the dew point.

**Clean-up:**

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