

STATE OF CALIFORNIA
Department of Transportation
Red Primer, High Solids Phenolic Type
(Specification PB 201B)

Scope

This specification covers a pre-mixed, solvent borne paint formulated for use as a prime coat on properly prepared metal surfaces. This primer has a volatile organic content (VOC) that exceeds the maximum limit in some air quality management districts.

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. 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.

Description

This specification covers a red, ready-mixed, air-drying, high solids, corrosion resistant, phenolic resin/tung oil primer. This coating is intended for spray application to blast-cleaned steel surfaces exposed to the air.

Composition

<u>Component</u>	PIGMENT		
	<u>Weight percent</u>	<u>(LB/100 gallons)</u>	
Magnesium Silicate	(1)	16.60	194
Zinc Phosphate	(2)	14.63	171
Red Iron Oxide	(3)	16.25	190
Silica	(4)	0.26	3
VEHICLE			
Phenolic Resin/Tung Oil Varnish	(5)	43.80	512
Aliphatic Thinner, MIL-PRF-680A (I), Type 1		7.01	82
Xylene, A-A-59760		0.26	3
Zirconium Drier, ASTM Designation: D 600, Class A	(6%)		0.42 4.9
Cobalt Drier, ASTM Designation: D 600, Class B	(6%)		0.21 2.5
Calcium Drier, ASTM Designation: D 600, Class B	(5%)		0.16 1.9
Anti-skinning Agent, Oxime Type		0.40	4.7

Characteristics of Mixed Paint:

Volatile Organic Content, g/L, ASTM Designation: D 3960	262
Density, g/ml, ASTM Designation: D 1475	1.39 to 1.41
Pigment by weight of paint, percent, ASTM Designation: D 2371	47.0 to 49.0
Nonvolatile content, weight percent, ASTM Designation: D 2369	80.0 to 82.5
Nonvolatile content, volume percent, ASTM Designation: D 2697	66.5 to 68.0
Fineness of grind, Hegman, ASTM Designation: D 1210	4 to 5
Consistency, ASTM Designation: D 562, grams (Equivalent KU)	170 to 230 (76 to 86)
Drying time, 3-mil wet film, ASTM Designation: D 1640	
set to touch, hours	2.5 max.
dry-hard, hours	8 max.

Color to essentially match Color Chip No. 197 on file at the Transportation Laboratory.

- (1) Magnesium Silicate, platy shape, specific gravity 2.7 ± 0.1 , oil absorption* 50 ± 3 , pH $8.8 \pm .3$, Hegman fineness +6.0, 100% passing US Standard No. 325 sieve, CaO content 0.5% max., water soluble matter 1.0% max.
- (2) Essentially $Zn_3(PO_4)_2 \cdot 2H_2O$, specific gravity 3.4 ± 0.1 , oil absorption* 20 ± 3 , average particle size less than 10 μm . Water soluble matter less than 0.2%.
- (3) Synthetic iron oxide, spheroidal particle shape, Fe_2O_3 98% minimum, oil absorption* 20 ± 3 , specific gravity 5.2 ± 0.1 , 99.9% passing a US Standard No. 325 sieve. Water soluble matter 0.15% maximum, easy dispersible type recommended.
- (4) Precipitated hydrophobic silica, surface area N_2 B.E.T. 120 ± 15 m^2/g , mean particle diameter 3 μm , drying loss at 150°C 1-2%, ignition loss (2 hours at 1000°C) 5-6%, SiO₂ content 98% minimum based on substance ignited for two hours at 1000°C.
- (5) Phenolic resin/tung oil varnish shall be a 75% non-volatile solution composed of the following:

<u>Component</u>	<u>**Weight percent of varnish</u>	<u>(LB/100 gallons of finished paint)</u>
Georgia Pacific CK-2500 Resin	24.41	125
Aliphatic Thinner, MIL-PRF-680A (I), Type 1	21.09	108
Xylene, A-A-59760	3.71	19
Tung Oil, ASTM Designation: D 12	50.78	260

Dissolve CK-2500 in xylene and aliphatic thinner. Add tung oil slowly while stirring.

* Oil absorption values determined according to ASTM Designation: D 281.

♣♣ Varnish comprises 43.80 percent of the paint by weight.

Application

PB 201B shall be applied at a dry film thickness of not less than 2 mils nor more than 3 mils per coat. This primer will wrinkle as it dries if it is applied at greater than 5 mils wet film thickness. Dry times are greatly increased if applied at greater than the recommended film thickness.