

SECTION 708 - PAINTS

708.01 Bridge Paints. The Contractor shall furnish paints in substantial *| containers. The Contractor shall mark the container plainly with the name *| and address of manufacturer, shipping point, trademark or trade name, kind of paint or formula, volume of paint in the container, date and lot number.

Paints shall conform to the following specifications: *

- | | |
|--|--|
| (1) Red Primer Paint | California Specification PB-201, PB-202 or Steel Structures Painting Council Paint Specs. No. 25 |
| (2) White and Tinted Ready-Mixed Paint | Federal Specification TT-P-102, Type II |
| (3) Aluminum Ready-Mix Paint | Federal Specification TT-P-38 or AASHTO M69, Type II |
| (4) Black Bridge Paint | Federal Specification TT-E-489, Type I, Class A |

708.02 Zinc Paints. Zinc paints and primers shall conform to the following specifications:

- | | |
|----------------------------------|------------------------------------|
| (1) Zinc Dust-Zinc Oxide Primer | Federal Specifications TT-P-641 |
| (2) Zinc Oxide-Zinc Dust Paint | Federal Specifications MIL-E-15145 |
| (3) Zinc Dust Primer Coating | Federal Specifications MIL-P-26915 |
| (4) High Zinc Dust Content Paint | Federal Specifications MIL-P-21035 |

708.03 Dark Green Enamel Paint.

(A) Composition.

PIGMENT INGREDIENTS		
Pigment	Federal Specifications	Lbs/100 gals.
Titanium Dioxide	TT-P-442, Type III	29.3
Phthalocyanine Green, Yellow Shade ¹	-	17.0
Chrome Oxide Green	TT-P-347	137.1

¹ Specific gravity 1.95 + 0.95; contract ratio (5 mil wet film thickness. 15% PVC in a medium length "Soya" type alkyd resin with enamel viscosity adjusted to 70 KU with mineral spirits) 0.95 minimum; trichromatic coefficients (when 5% of the pigment type blended with 95% titanium dioxide in a medium length "Soya" type alkyd resin at 20% PVC). $x = 0.266 + 0.003$; $y = 0.347 + 0.003$; $Y = 0.29 + 0.003$

VEHICLE INGREDIENTS		
Alkyd Resin Solution ¹	See Subsection 708.03(C) Alkyd Resin Solution	525.4
Mineral Spirits, Grade ¹	TT-T-291E ²	
Driers	TT-D-643	174.5
Antiskinning agent	-	-
¹ This quantity based on fifty (50) percent non-volatile. ² The Contractor may replace less than ten (10) percent of the mineral spirits by Xylene, TT-X-916b, Grade A, to meet viscosity requirements.		

(B) Characteristic of Finished Paint.

Weight per gallon in pounds (minimum)	8.8
Pigment by weight of paint, percent (minimum)	20.8
Grind (minimum)	7.0
Viscosity, KU at 77°F	60-70 ³
³ The Contractor shall maintain in storage	
Drying Time:	
Set to touch, hours at 77°F (maximum)	2
Set for recoating, hours at 77°F (maximum)	8
Volatile; percent by weight (maximum)	49.3
Skinning, 3/4-filled sealed container after 48 hours	None
Color: Match color chip on file with the Department	

(C) Alkyd Resin Solution. This specification covers an Alkyd Resin Solution *| having a one hundred (100) percent content of linseed oil drying alkyd. The *| Contractor shall use the Alkyd Resin Solution to formulate synthetic enamels. *|

CHARACTERISTICS OF SOLUTION	
Non-volatile, percent	49 - 51
Viscosity (Gardner Holdt)	W - Y
Color (Gardner) (maximum)	10
Non-volatile portion:	
Phthalic Anhydride, percent	29 - 34
Oil Acids, percent	50 - 57
Refraction index of acids	1.473 - 1.485
Acid Number	3 - 14
Iodine number (minimum)	145
Polyhydric Alcohols ¹	
Weight per gallon, pounds	7.58 - 7.75
Thinner, Pounds per gallon,	9.1 -9.3
Compatibility with pigments	excellent
Miscibility with Linseed Oil	complete
Resin	None
Phenolic resin modifiers	None
Gas Check (Federal Standard 141 with drier)	Pass
¹ The polyols in this resin shall be equal parts by weight of glycerol and pentaerythritol	

(D) **Dark Green Enamel Paint.** The Contractor shall have the option of furnishing dark green enamel paint of Federal Specification TT-E-489F. The color shall match color chip 14062 of Federal Standard 595.

708.04 Paint Thinner. If the Contractor requires thinning alone, the Contractor shall use a petroleum thinner. The Contractor shall not use paint thinner in paints requiring thinners of high solvency such as lacquers and vinyl resin products. The Contractor may use paint thinner to thin paints when the Contractor uses TT-T-291 (Mineral Spirits) in the original formulation. This thinner is equal to the "mineral spirits" and "paint thinner" that are sold for general use. *

Characteristics	Typical Tests
Color Saybolt	+25
API Gravity	44
Flash, TCC, °F	110
Aniline Paint, °F	120
Kauri Butanol value	45
Aromatics, percent	18
Doctor Test	Negative
Corrosion Test	Negative
Distillation, °F	
IBP	315
50	345
90	365
End Point	390

708.04

This material shall have no objectionable odor.

708.05 Asphalt Paint. Asphalt paint for protective coating shall be a ready-mixed paint conforming to the following requirements:

Test	Method	Requirement
Asphalt Content by weight	AASHTO T 78	52% Minimum
Test on Residue:		
Melting Point	AASHTO T 53	140 - 175° F
Penetration at 77°F	AASHTO T 49	20 - 40
Volatile Matter & Petroleum		
Naphtha by weight	AASHTO T 78	48% Maximum
Test on Solvent		
Initial boil	ASTM D 86	250 - 350°F
End Point	ASTM D 86	300 - 500°F
Viscosity of Paint		
at 77°F	AASHTO T 72	600 seconds
Flash Point of paint	AASHTO T 79	80°F Minimum

708.06 White and Yellow Traffic Paint

(A) **General.** The white paint shall be pure white and free from tint. The yellow paint shall be within the green and red tolerance limits when compared with the U.S. FHWA's "Standard Color Chips for Highway Signs".

The pre-mixed reflectorized white and yellow traffic paint includes a pigment binder and glass spheres. They shall be suitable for use as traffic markings on concrete, bituminous macadam and asphalt concrete pavements. These paints shall be ready for use without addition of glass spheres or solvent.

"Pre-mixed reflectorized" is the finished mixture of pigmented binder and glass spheres. "Pre-mixed compound" and "compound" shall mean the same thing. "Binder" is the pigment and vehicle alone (not including glass spheres). "Spheres" is the glass spheres incorporated in the compound.

The Contractor shall mix the white and yellow traffic paints at the factory ready for immediate application using spray machines without thinning at the spreading rate shown below. *

The Contractor shall ground and mix the traffic paints well. The paints shall not exhibit skinning, settling, thickening, or livering. The Contractor shall mix the paints to a uniform consistency applying through the spray machine without clogging or causing other difficulties. The Contractor shall mix the paint according to the contract. *

The spreading rate for a four (4) inch wide stripe:

Pre-Mixed	17 gallons/mile
Instant Dry Pre-Mixed	16 gallons/mile plus 2 pounds drop on beads/gallon
Instant Dry	14 gallons/mile plus 6 pounds drop on beads/gallon

The Contractor shall dry the paints to an elastic adherent finish. *
The paints shall not show appreciable discoloration with age. *
The volatile material shall have a minimum solvent action on asphalt. *
Gums and nonvolatile components of the vehicle will entirely dissolve in the *
volatile material. The volatile material shall not precipitate from the *
solution on standing. A dry film of paint will not darken or discolor *
when exposed to sunlight. *

(B) Tests. Also, the white and yellow traffic paints shall conform to *
the following: *

(1) Composition. The paint's composition, formulation, and milling *
shall be identical with to the sample and manufacture's certificate *
of formulation submitted and according to the contract. *

TABLE 708-I - TRAFFIC PAINT COMPOSITION			
	Premixed Reflectorized	Instant Dry Pre-Mixed Reflectorized	Instant Dry With Drop-On Beads
¹ Wet Hiding Power	Completely Hides Black	Completely Hides Black	Completely Hides Black
² Weight per Gallons (lbs.)	\pm 0.5 lbs of Orig. Submittal	\pm 0.5 lbs of Orig. Submittal	\pm 0.5 lbs of Orig. Submittal
³ No Pick-Up Time, minutes	2-30	0-3	0-3
⁴ Consistency, K.U.	75-90	70-90	69-85
Glass Sphere Content Premix Paint, lbs/gal	4.0 minimum	3.0 minimum	-
⁵ Spec. Gravity of Drop-On Beads	-	2.40 - 2.60	2.40-2.60

- ¹ **Wet Hiding Power.** The Contractor shall apply the paint binder with a 0.008 inch Bird Film Application on a Wet Hiding Power Chart No. 10H, as supplied by the Leneta Company, P.O. Box 86, Ho-ho-kus, New Jersey 07423. *|
- ² **Weight Per Gallon.** The paint supplied by the successful bidder shall be within +0.5 pound of the weight of the sample that the Contractor submitted for prequalification. *|
- ³ **No Pickup Time.** The Contractor shall test the paint according to ASTM D 711 except the Contractor shall apply the wet film to the glass with a 0.005" Bird Film Applicator. *|
- ⁴ **Consistency.** The Contractor shall do this test according to ASTM D 562. The paint shall have a consistency determined by the Stormer Viscosimeter and expressed as Krebs unit at 77 degrees Fahrenheit. *|
- ⁵ **Specific Gravity of Drop-On Beads.** The specific gravity of the beads shall be in the range of 2.40-2.60 when tested according to the following procedures:
- (a) Place 100 grams of beads in an oven at 110 degrees Centigrade for one (1) hour.
- (b) Remove beads and place in a desiccator until the sample is cool.
- (c) Remove about 60 grams of beads from the desiccator and weigh the sample accurately.
- (d) Pour the beads slowly in a clean 100 ml graduated cylinder containing 50 ml of isopropyl alcohol. Make certain that air is not entrapped among the beads.
- (e) The volume of the beads minus 50 is the total volume.
- (f) Calculate the specific gravity as follows:
- $$\text{Specific Gravity} = \frac{\text{Weight of Sample}}{\text{Volume of the Sample}}$$

TABLE 708-II - GLASS SPHERES ¹							
Pre-Mixed ReflectORIZED Paint		Instant Dry Pre-Mixed ReflectORIZED With Drop-On Beads				Instant Dry With Drop-On Beads	
		Pre-Mixed		Drop-On			
Seive Size	Percent Passing	Seive Size	Percent Passing	Seive Size	Percent Passing	Seive Size	Percent Passing
#70	100	#70	100	#16	100	#16	100
#80	85-100	#80	85-100	#20	90-100	#20	90-100
#140	15-55	#140	15-55	#40	10-35	#40	10-35
#230	0-10	#230	0-10	#50	0-10	#50	0-10
				#100	0-5	#100	0-5

¹ The glass spheres used in the compound shall be colorless, clean and transparent, free from milkiness and air bubbles. Less than 20 percent of the glass spheres shall be irregular or fused-spheroids when tested in the State Laboratory. The beads shall have an index of refraction of at least 1.50 when tested by the liquid immersion method at 25 degrees Centigrade. Glass spheres shall meet the following gradation when tested with U.S. Standard Sieves and according to ASTM D 1214.

(2) **Chemical Analysis.** The Department shall have the option to do a chemical analysis of said paints. (The Department retains the right to check formulation by an accepted method.) *

(C) **Packing, Marking and Batching.** The Contractor shall deliver the paints in clean open-head steel drums. Each container shall bear a label with the following information shown: *

- (1) name and address of the manufacturer, *
- (2) shipping point, *
- (3) trademark or trade name, *
- (4) kind of paint, *
- (5) formula, *
- (6) number of gallons, *
- (7) date of manufacture and *
- (8) batch number. *

Paint pails shall have a positive and permanent seal. |

(D) **Sampling and Testing.** The Contractor shall furnish paint samples |
from each paint batch to the Engineer. The Engineer will use at least |
two (2) samples from each batch of one (1) quart each in sealed |
containers for testing. |

The Engineer will not use or pay for the paint until the Engineer *|
completes the laboratory tests or if the paint fails according to the *|
contract. *|

(E) **Qualification of Traffic Paint.** The Engineer will permit only those *|
traffic paint that have qualified in the latest prequalification tests *|
scores at the completion of the road test for use. The Engineer will *|
establish the qualified paint list. *|

The phrase "latest completed prequalification tests" shall mean: |

(1) The Engineer has prequalified the traffic paints at the time *|
this contract becomes effective; or

(2) The Engineer has listed the traffic paints as meeting the *|
prequalification tests at the time the Contractor is doing pavement |
striping.

The Engineer will furnish a list of prequalified traffic paints *|
upon the request of the Contractor. |

The Contractor may use other materials designed for pavement |
striping such as adhesive striping on temporary detours with the |
acceptance of the Engineer. Such materials shall meet the color and |
reflection requirements for traffic paints. |