

MATERIAL AND EQUIPMENT STANDARD

FOR

VINYL PAINT (BLACK)

AS

INTERMEDIATE AND TOP COAT (FINISH)

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1. SCOPE

This Standard Specification which is generated from SSPC-Paint No. 106 covers the minimum requirements for the composition, analysis, properties, storage life and packaging, inspection and labeling of vinyl paint (Black) to be used as intermediate and top coat (Finish).

2. REFERENCES

Throughout this Standard the following standards and codes are referred to. The editions of these standards and codes that are in effect at the time of publication of this Standard shall, to the extent specified herein, form a part of this Standard. The applicability of changes in standards and codes that occur after the date of this Standard shall be mutually agreed upon by the Company and the Vendor.

SSPC (STEEL STRUCTURES PAINTING COUNCIL) VOL. 2

SSPC No. 106-1991	"Black Vinyl Paint"
SSPC-PA Guide 3-1991	"A Guide to Safety in Paint Application"

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

(Specifications for Ingredients)

D362	"Industrial Grade Toluene"
D561	"Carbon Black"
D1153	"Methyl Isobutyl Ketone"

(Specification for Packaging)

D3951 (88)	"Standard Practice for Commercial Packaging"
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(Test Methods for properties)

D185	"Coarse Particles in Pigments, Pastes and Paints"
D562	"Consistency of Paints using the Stormer Viscometer"
D1208	"Common Properties of Certain Pigments"
D1210	"Fineness of Dispersion of Pigment-Vehicle Systems"
D1243	"Dilute Solution Viscosity of Vinyl Chloride Polymers"
D1296	"Odors Volatile Solvents and Diluents"
D1475	"Density of Paint, Varnish, Lacquer and Related Products"
D1640	"Drying, Curing, or Film Formation of Organic Coatings at Rooms Temperature"
D2369	"Volatile Content of Paints"

USFS (US FEDERAL STANDARDS)**(Standard Specifications for Ingredients)**

MIL-P-15328	"Primer (Wash) Pretreatment"
MIL-P-15929	"Primer Coating, Shipboard, Vinyl-Red Lead (for Hot Spray)"

(Federal Test Method Standard No. 141)

Method 3011	"Condition in Container"
Method 4021	"Pigment Content (Centrifuge)"
Method 4053	"Nonvolatile Vehicle Content"
Method 4061	"Drying Time"
Method 4081	"Water Content (Reflux Method)"
Method 4203	"Reducibility and Dilution Stability"
Method 4331	"Spraying Properties"
Method 4541	"Working Properties and Appearance of Dried Film"

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)

ANSI Z129.1	"Precautionary Labeling of Hazardous Industrial Chemicals"
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IPS (IRANIAN PETROLEUM STANDARDS)

IPS-E-TP-100	"Paints"
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3. UNITS

International System of Units (SI) in accordance with IPS-E-GN-100 shall be used.

4. COMPOSITION**4.1 Ingredients and Proportions**

Ingredients and proportions shall be as specified in Table 1.

The paint based on the specified ingredients shall be uniform, stable in storage, and free from grit and coarse particles. Beneficial additives such as anti-skinning agents, suspending agents, or wetting aids may be added.

4.2 Percentage

This paint contains approximately 13% by volume of nonvolatile filmforming solids (pigment and binder).

TABLE 1 - COMPOSITION

INGREDIENTS	TYPICAL COMPOSITION		INGREDIENT STANDARDS ASTM
	Wt. %	Vol. %	
PIGMENT: (1.0 - 1.5%) CARBON BLACK	1.0	0.5	D 561
VEHICLE: (98.5 - 99.%)			
VINYL RESIN A ¹	7.5	4.8	---
VINYL RESIN C ²	7.5	4.8	---
DIOCTYL PHTHALATE ³	3.0	2.7	---
METHYL ISOBUTYL KETONE ⁴	40.5	45.4	D 1153
TOLUENE	40.5	41.8	D 362
TOTALS	100.0	100.0	
<p>1 Vinyl Rosin A shall be a hydroxyl containing vinyl chloride acetate copolymer. It shall contain 89.5% to 91.5% vinyl chloride, 5.3% to 7.0% vinyl alcohol, and 2.0% to 5.5% vinyl acetate. The inherent viscosity of the rosin (ASTM Standard D1243, Method A) at 20°C shall not be less than 0.5.</p> <p>2 Vinyl Rosin C shall be a vinyl chloride-acetate copolymer. It shall contain 85% to 88% vinyl chloride, 12% to 15% vinyl acetate, by weight. The inherent viscosity of the resin (ASTM Standard D 1243, Method A) at 20°C shall not be less than 0.48.</p> <p>3 Dioctyl phthalate (di-2-ethylhexyl phthalate) shall be commercial material which conforms to the following requirements:</p> <p style="padding-left: 40px;">Specific Gravity @ 25°C 0.980-0.9861 Refractive index @ 25°C 1.4830-1.6859</p> <p>4 When specified in the procurement documents, suitable high boiling vinyl solvent may be substituted for a portion of the methyl isobutyl ketone to make the paint more amenable to application in hot weather or by brush.</p>			

5. ANALYSIS

The paint shall conform to the composition (analysis) requirements of Table 2.

TABLE 2 - ANALYSIS

CHARACTERISTICS	REQUIREMENTS		ASTM METHOD	US FEDERAL STD. No. 141
	Min. Wt. %	Max. Wt. %		
PIGMENT	1.0	1.5	D 1208	4021*
VOLATILES	78.0	81.0	D 2369	---
NONVOLATILE VEHICLE CALCULATED BY DIFFERENCE	18.0	20.5	---	4053
UNCOMBINED WATER	---	0.5	D 1208	4081
COARSE PARTICLES AND SKINS, AS RETAINED ON STANDARD 0.44 mm SIEVE OPENING (325 MESH SCREEN)	---	0.25	D 185	4092

* Using extraction mixture "C" (1:1 toluene and acetone).

6. PROPERTIES

6.1 The paint shall meet the requirements of Table 3 and Sections 6.2 through 6.6.

6.2 Odor

The odor Shall be normal for the materials permitted (ASTM D 1296).

6.3 Color

The color shall be black.

6.4 Compatibility

There shall be no evidence of incompatibility of any of the ingredients of the paint when two volumes of the paint are slowly mixed with one volume of thinner consisting of 85% toluene and 15% methyl isobutyl ketone by volume (US Federal Standard No. 141, Method 4203).

6.5 Working Properties

The paint shall be easily applied when tested in accordance with US Federal Standard No. 141, Methods 4331 and 4541. The paint shall show no streaking, running, or sagging after drying.

6.6 Adhesion

The paint under test shall show good adhesion when tested as follows: Apply one coat 25 microns dry film thickness of the mixed paint to a panel pretreated with wash primer MIL-P-15328, "Primer (Wash) pretreatment", or SSPC-Paint 27, "Basic Zinc Chromate-Vinyl Butyral Wash Primer" (12.5 microns, dry film thickness), and to a panel similar to the preceding one but over which has also been applied one coat of MIL-P-15929, "Primer Coating, Shipboard, Vinyl-Red Lead (for Hot Spray)" (25 microns, dry film thickness). After a 24 hour dry, the film under test on each panel shall be subjected to a knife test to determine whether the paint exhibits good adhesion to the undercoats.

TABLE 3 - PROPERTIES

CHARACTERISTICS	REQUIREMENTS		ASTM METHOD	US FEDERAL STD. No. 141
	Min.	Max.		
VISCOSITY* SHEAR RATE 200 rpm				
GRAMS	100	150	D 562	---
KREB UNITS	60	72	D 562	
DENSITY Kg/Lit	0.88	0.95	D 1475	
FINENESS OF GRIND, MICRONS	15	---	D 1210	
FINENESS OF GRIND, HEGMAN UNITS	7	---	D 1210	
DRYING TIME, MINUTES:				
TACK FREE	---	15	D 1640	4061
DRY HARD	---	30	D 1640	4061

* Viscosity 48 hours or more after manufacture.

7. STORAGE LIFE AND PACKAGING

7.1 Condition in Container

The paint shall show no thickening, curdling, gelling, or hard caking when tested as specified in US Federal Standard No. 141, Method 3011, after storage for 24 months from the date of delivery, in a full, tightly covered container.

7.2 Packaging

The packaging shall meet the relevant requirements of ASTM D3951 (88).

8. INSPECTION

8.1 All materials supplied under this specification shall be subject to timely inspection by the purchaser or his authorized representative. The purchaser shall have the right to reject any material(s) supplied which is (are) found to be defective under this specification. In case of dispute, the arbitration or settlement procedure established in the procurement documents shall be followed.

8.2 Samples of any or all ingredients used in the manufacture of this paint may be requested by the purchaser and shall be supplied upon request, along with the supplier's name and identification for the materials.

8.3 Unless otherwise specified, the methods of sampling and testing should be in accordance with US Federal Test Method Standard No. 141, or applicable methods of the American Society for Testing and Materials (ASTM).

9. LABELING

9.1 Refer to ANSI Standard Z 129.1 "Precautionary Labeling of Hazardous Industrial Chemicals".

9.2 Marking of Containers

Each container shall be legibly marked with the following information:

- Name: Vinyl Paint (Black) as Intermediate and Top coat (finish)**
- Specification: IPS-M-TP-170**
- MESC No. :**
- No. of components**
- Maximum temperature resistance**
- Type of spray**
- Kind and size of spray nozzletip**
- Cleaning material**
- Flash point °C**.....
- Pot life (hours)**
- Drying time for overcoating**
- Kind of thinner**
- Color: Black**
- Lot Number:**
- Stock Number:**
- Date of Manufacture:**
- Quantity of Paint in Container:**
- Information and Warnings, if needed,**
- Manufacturer's Name and Address:**
- Design Guide: For guidance on the usage of this paint for various application/environment and temperature range reference shall be made to IPS-E-TP-100.**

9.3 Directions for Use

The following directions for use shall be supplied with each container of paint:

Directions for Use of Vinyl Paint (Black)*

- This paint is intended for use as an intermediate or finish coat over vinyl butyral wash primer or vinyl rosin paint. Mix thoroughly before use.
 - The paint shall be thinned as necessary with solvent containing not more than 85% toluene and 15% methyl isobutyl ketone or methyl ethyl ketone. The amount of thinning will depend upon application methods and conditions, and may be as high as 25% to 33% by volume of the paint.
 - Apply by conventional air spray. Brushing may be used in small areas. The surface to be painted shall be dry and above 2°C, not less than 3°C above the dew point. Do not paint outdoors in rainy weather.
- Apply so as to obtain a minimum dry film thickness of 25 microns.
- A wet film of paint shall be deposited on the surface when spraying; the spray gun should be adjusted so that proper atomization is obtained but no dry powder is deposited on the surface; the nozzle should be held about 152 mm from the surface during application.
 - If application is to be made by brush, apply with a brush heavily loaded with paint; apply quickly and smoothly; avoid excessive brushing and do not go back over the surface until thoroughly dry.

- At temperatures between 16 and 27°C dry at least one hour between coats and 72 hours before immersion. Varying atmospheric conditions and degrees of ventilation in confined spaces may allow shorter or require longer drying times.

*** This paint is not to be used as a priming coat next to bare steel.**

9.4 Directions for Safety

The following directions for safety shall be supplied with each container of paint:

- Paints are hazardous because of their flammability and potential toxicity. Proper safety precautions shall be observed to protect against these recognized hazards. Safe handling practices are required and should include, but not be limited to, the provisions of SSPC-PA Guide 3, "A Guide to Safety in Paint Application", and to the followings:
- Keep paints away from heat, sparks, and open flame during storage, mixing, and application. Provide sufficient ventilation to maintain vapor concentration at less than 25% of the lower explosive limit.
- Avoid prolonged or repeated breathing of vapors or spray mists, and prevent contact of the paint with the eyes or skin.
- Clean hands thoroughly after handling paints and before eating or smoking.
- Provide sufficient ventilation to insure that vapor concentrations do not exceed the published permissible exposure limits. When necessary, supply appropriate personal protective equipment and enforce its use.
- This paint may not comply with some air pollution regulations because of its hydrocarbon solvent content.
- Ingredients in this paint which may pose a hazard include hydrocarbon solvents. Applicable regulations governing safe handling practices shall apply to the use of this paint.