

**MATERIAL AND EQUIPMENT STANDARD**

**FOR**

**RED LEAD, IRON OXIDE, RAW LINSEED OIL**

**AND**

**ALKYD PRIMER**

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**1. SCOPE**

This Standard specification which is generated from SSPC-paint 2 covers the minimum requirements for the composition, analysis, properties, packaging, inspection and labeling of red lead, iron oxide, raw linseed oil and alkyd primers.

**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/consultant.

**SSPC (STEEL STRUCTURES PAINTING COUNCIL) Vol. 2**

SSPC 2 "Red Lead, Iron Oxide, Raw Linseed Oil and Alkyd Primer"

**ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)**

**(Specifications for Ingredients)**

D83 "Red Lead"  
 D234 "Raw Linseed Oil"  
 D235 "Petroleum Spirits (Mineral Spirits)"  
 D600 "Liquid Paint Driers"  
 D3722 "Natural Red and Brown Iron Oxides"  
 D3951 "Standard Practice for Commercial Packaging"

**(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"  
 D1296 "Odors of Volatile Solvents and Diluents"  
 D1475 "Density of Paint, Varnish, Lacquer and Related Products"  
 D1542 "Quantitative Test for Rosin in Varnishes"  
 D2369 "Volatile Content of Paints"  
 D2371 "Pigment Content of Solvent Type Paints"  
 D2801 "Leveling Characteristics of Paints by Draw Down Method"  
 D3278 "Flash Point of Liquids by Setaflash Closed Tester"

**UFS (US FEDERAL STANDARDS)**

**(Standard Specifications for Ingredients)**

MIL-A-15206 "Aluminum Stearate, Technical"  
 TT-L-215 "Linseed Oil, Raw (for Use in Organic Coatings)"  
 TT-R-266 "Resin, Alkyd: Solutions"  
 TT-T-291 "Thinner, Paint, Mineral Spirits, Regular and Odorless"

**(Federal Test Method Standard No. 141)**

Method 3011	"Condition in Container"
Method 3021	"Skinning (Partially Filled 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 4321	"Brushing Properties"
Method 4331	"Spraying Properties"
Method 4494	"Sag Test (Multinotch Blade)"
Method 4541	"Working Properties and Appearance of Dried Film"

**ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)**

ANSI Z 129.1 "Precautionary Labeling of Hazardous Industrial Chemicals"

**IPS (IRANIAN PETROLEUM STANDARDS)**

IPS-E-TP-100 "Paints"

**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 primer based on the specified ingredients shall be uniform, stable in storage, and free from grit and coarse particles. No rosin or rosin derivatives may be used. Beneficial additives such as anti skinning agents, suspending agents, or wetting aids may be added.

**4.2 Percentage**

This primer shall contain approximately 82% by volume of nonvolatile film forming solid.

**TABLE 1 - COMPOSITION**

INGREDIENTS	TYPICAL COMPOSITION		INGREDIENT STANDARD	
	Wt.%	VOL.%	ASTM	US FEDERAL
Pigment (77.5 Wt.% Min.)				
Red lead (97% Pb <sub>3</sub> O <sub>4</sub> )	56.3	16.8	D 83	
Red or brown iron oxide (85% Fe <sub>2</sub> O <sub>3</sub> )	18.4	11.0	D 3722*	-
Aluminum stearate	0.3	0.8	-	MIL-A-15206
Vehicle (25 Wt.% Max.)				
Raw linseed oil	14.0	39.8	D 234	TT-L-215
Alkyd resin solids	5.2	12.9	-	TT-R-266, GRADE II
Mineral spirit thinner	5.8	18.7	D 235	TT-T-291 GRADE I
Driers	-	-	D 600 CLASS B	-
Total	100.0	100.0		

\* Either red or brown oxide (natural) shall also comply with the following:

Water solubles	0.3% Max.
Coarse particles on 0.044 mm sieve opening (325 mesh screen)	0.1% Max.
Moisture and other volatile matter	0.2% Max.
Organic matter	None

**5. ANALYSIS**

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

**TABLE 2 - ANALYSIS**

<b>REQUIREMENTS</b>				
<b>CHARACTERISTICS</b>	<b>Min. Wt.%</b>	<b>Max. Wt.%</b>	<b>ASTM METHOD</b>	<b>US FEDERAL Std. No. 141</b>
Pigment	75	-	D 2371	4021
Volatiles	-	6	D 2369	-
Nonvolatile vehicle calculated by difference	19	-	-	4053
Uncombined water	-	0.5	D 1208	4081
Coarse particles and skins, as retained on standard 0.044 mm sieve opening (325 mesh, screen)	-	1.0	D 185	-
Rosin or rosin derivatives	-	0	D 1542	-

**6. PROPERTIES**

**6.1 Requirements**

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 Standard D 1296).

**6.3 Color**

The color shall be typical of the specified mixture of red lead and red iron oxide.

**6.4 Compatibility**

There shall be no evidence of incompatibility of any of the ingredients of the primer when two volumes of the primers are slowly mixed with one volume of mineral spirits US Federal Standard No. 141, Method 4203.

**6.5 Skinning**

There shall be no skinning in a three quarters filled closed container after 48 hours when tested in the standard manner specified in US Federal standard No. 141, Method 3021.

**6.6 Working Properties**

The paint shall be easily applied by all three methods when tested in accordance with US Federal standard No. 141, methods 4321, 4331, and 4541. The paint shall show no streaking, running, or sagging after drying.

**TABLE 3 - PROPERTIES**

<b>REQUIREMENTS</b>				
<b>CHARACTERISTICS</b>	<b>Min.</b>	<b>Max.</b>	<b>ASTM METHOD</b>	<b>US FEDERAL STD. No. 141</b>
Viscosity* shear rate 200 rpm.				
Grams	190	230	D 562	-
Krebs	80	87	D 562	-
Density Kg/Lit	2.64	-	D 1475	-
Fineness of grind, hegman units	5.0 (40 Mic.)	-	D 1210	-
Drying time, hours	-	24		4061
Flash point °C	38	-	D 3278	-
Sag resistance, microns	150	-	D 2801	4494

\* Viscosity 48 hours or more after manufacture.

## 7. STORAGE LIFE AND PACKAGING

### 7.1 Condition in Container

The primer 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 (unless otherwise specified by the Company), in a full, tightly covered container.

### 7.2 Packaging

The packaging shall also 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 Standard 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 primer may be requested by the purchaser and shall be supplied upon request, along with the supplier's name and identification for the material.

**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 Labeling Standard**

Labeling shall be in accordance with ANSI 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: Red Lead, Iron oxide, and Raw Linseed Oil and Alkyd Primer:**

**Specification: IPS-M-TP-115**

**MESC No. :** .....

**No of components** .....

**Maximum temperature resistance** .....

**Type of spray** .....

**Kind and size of spray nozzle tip** .....

**Cleaning material** .....

**Flash point °C** .....

**Pot life (hours)** .....

**Drying time for overcoating** .....

**Kind of thinner** .....

**Color: Red Lead** .....

**Lot Number:** .....

**Stock Number:** .....

**Date of Manufacture:** .....

**Quantity of Primer in Container:** .....

**Information and Warnings as may be required by procurement** .....

**documents** .....

**Manufacturer's Name and Address:** .....

**Design Guide: For guidance on the usage of this Paint for Various application/environments and temperature range reference shall be made to IPS-E-TP-100 "Paints"**

**9.3 Directions for Use**

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

**Directions for Use of Red Lead, Iron Oxide, Raw Linseed Oil and Alkyd Primer**

This paint is intended for use as a primer over hand cleaned steel in atmospheric exposure; it will perform better if the steel is power tool cleaned, blast cleaned or pickled. All rust scale, loose rust, loose mill scale, and loose or nonadherent paint shall be removed. Oil and grease shall be removed to the fullest extent practical, as residues of oil and grease remaining on the surface will result in decreased paint performance.

Mix paint thoroughly before use. If the pigment has settled, pour off most of the liquid into a clean container, thoroughly mix the pigment with the remaining liquid, taking care to scrape all the pigment off the bottom of the can. Gradually add the poured off liquid and mix thoroughly. Mixing may be made easier by transferring contents to a larger container or by pouring the primer to and from another container. Examine bottom of container for unmixed pigment, screen paint before applying.

Thin paint only if necessary, using only mineral spirits. For brush application under normal conditions, no thinning should be necessary. For spray application, add up to one liter of thinner per eight liters of primer when necessary.

Apply by brush or spray to the specified film thickness or, if none is specified, to at least 50 microns dry or approximately 75 microns wet. The surface to be painted shall be dry; the surface temperature shall be at least 3°C above the

dew point; and the temperature of the air shall be over 4°C. Do not paint outdoors in rainy weather or if freezing temperatures are expected before the paint dries.

Allow primer at least 24 hours drying time in good weather before recoating.

#### **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 following:
- 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 Red Lead, hydrocarbon solvent, and lead drier. Applicable regulations governing safe handling practices shall apply to the use of this paint.