

MATERIAL AND EQUIPMENT STANDARD

FOR

ALKYD PAINT (ALUMINUM) NON - LEAFING

AS

INTERMEDIATE

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1. SCOPE

This Standard specification which is generated from SSPC paint 101 covers the minimum requirements for the composition analysis, properties, storage life and packaging, inspection and labeling of Alkyd Paint (Aluminum) non-leafing as intermediate.

This paint employs non-leafing aluminum, and is furnished in a single compartment container.

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 101 | "Aluminum Alkyd Paint (No-leafing)" |
| SSPC-PA Guide 3, | "A Guide to Safety in Paint Application" |

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

(Specification for Ingredients)

| | |
|------|--|
| D235 | "Petroleum Spirits (Mineral Spirits)" |
| D480 | "Aluminum Powder and Paste" |
| D600 | "Liquid Paint Driers" |
| A962 | "Aluminum Pigments, Powder and Paste for Paints" |

(Specification for Packaging)

| | |
|-----------|--|
| D3951(88) | "Standard Practice for Commercial Packaging" |
|-----------|--|

(Test Methods for Properties)

| | |
|-------|---|
| D154 | "Varnishes" |
| D185 | "Coarse Particles in Pigments, Pastes and Paints" |
| D1296 | "Odors of Volatile Solvents and Diluents" |
| D1475 | "Density of Paint, Varnish, Lacquer and Related Products" |
| D1542 | "Quantitative Test for Rosin in Varnishes" |
| D1545 | "Viscosity of Transparent Liquids by Bubble Time Method" |
| D2369 | "Volatile Content of Paints" |
| D3278 | "Flash Point of Liquids by Setaflash Closed Tester" |

UFS (US FEDERAL STANDARDS)

(Standard Specifications for Ingredients)

| | |
|----------|---|
| TT-P-320 | "Pigment, Aluminum powder and Paste, for Paint" |
| TT-R-266 | "Resin, Alkyd Solutions" |
| TT-T-291 | "Thinner, Paint, Mineral Spirits, Regular and Odorless" |

(US Federal Test Method Standard No. 141)

| | |
|-------------|---|
| Method 3011 | "Condition in Container" |
| Method 3021 | "Skinning (Partially Filled Container)" |
| Method 4053 | "Nonvolatile Vehicle Content" |
| Method 4061 | "Drying Time" |
| Method 4203 | "Reducibility and Dilution Stability" |
| Method 4321 | "Brushing Properties" |
| Method 4331 | "Spraying Properties" |
| Method 4541 | "Working Properties and Appearance of Dried Film" |

ANSI(AMERICAN NATIONAL STANDARDS INSTITUTE)

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|-------------|--|
| ANSI Z129.1 | "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 of the paint shall be as specified in Table 1.

4.2 Percentage

This intermediate paint contains approximately 40% by volume of nonvolatile film forming solids (pigment and binder).

The paint 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 antiskinning agents, suspending agents, or wetting aids may be added.

TABLE 1 - COMPOSITION

| INGREDIENTS | REQUIRED | | INGREDIENT ASTM | STANDARDS US FEDERAL |
|---|---------------|---------------|--------------------|-------------------------------|
| | Min. Wt. % | Max. Wt. % | | |
| PIGMENT (20.3 ± 0.5 wt. %) ALUMINUM PASTE: | 100 | ---- | ---- | ---- |
| VEHICLE (79.7 ± 0.5 wt. %) ALKYD VARNISH SOLIDS ² | 50 | ---- | ---- | TT-R-266 TYPE I CLASS A |
| MINERAL SPIRIT THINNER | ---- | 50 | D235 | TT-T-291 GRADE I |
| DRIERS | ---- | ---- | D600 CLASS B | ---- |

1) See Sections 6.11 through 6.15.

2) See Tables 2 and 4 for analysis and properties of alkyd varnish.

5. ANALYSIS

5.1 The alkyd varnish shall conform to the composition (analysis) requirements of Table 2.

5.2 The pigment shall conform to the composition (analysis) requirements of Table 3 .

TABLE 2 - ANALYSIS OF ALKYD VARNISH

| CHARACTERISTICS | REQUIREMENTS | | ASTM METHOD | US FEDERAL STD. No. 141 |
|--|---------------|---------------|----------------|----------------------------|
| | Min. Wt. % | Max. Wt. % | | |
| VOLATILES | --- | 50 | D2369 | ---- |
| NONVOLATILE VEHICLE CALCULATED BY DIFFERENCE | 50 | --- | --- | 4053 |
| ROSIN OR ROSIN DERIVATIVES | ---- | 0 | D1542 | ---- |

TABLE 3 - ANALYSIS OF PIGMENT (Aluminum Paste)

| CHARACTERISTICS | REQUIREMENTS | | ASTM METHOD |
|---|--------------|------------|-------------|
| | Min. Wt. % | Max. Wt. % | |
| NONVOLATILE MATTER AT 105 - 110°C | 65 | --- | --- |
| EASILY EXTRACTED FATTY OIL MATTER (LUBRICANTS) | --- | 3.0 | --- |
| TOTAL IMPURITIES OTHER FATTY AND OILY MATTER | --- | 0.7 | --- |
| COARSE PARTICLES AND SKINS AS RETAINED ON STANDARD 0.044 mm SIEVE OPENING (325 MESH SCREEN) | --- | 1.0 | D185 |
| LEAFING | --- | None | --- |

6. PROPERTIES

6.1 Requirements

The paint shall meet the requirements of Table 4 and Sections 6.2 through 6.15.

6.2 Odor

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

6.3 Color

The color shall be less than 11 on the Gardner 1933 Scale. (ASTM Standard D 1544).

6.4 Compatibility

There shall be no evidence of incompatibility of any of the ingredients of the paint when two volumes of the ready mixed paint 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 (Brush, Roller, Spray) 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.

6.7 Appearance of Dried Film

A dried film of the varnish shall be clear, smooth, and glossy.

6.8 Flexibility

A dried film (25.5 microns thickness) of the varnish shall show no cracking when bent over 3.2 mm mandrel after 17 hours air dry, plus 24 hours bake at (102-107°C).

6.9 Water Resistance

Dried films, prepared as in Section 6.8 shall resist boiling water for ten minutes and shall withstand immersion in distilled water for 24 hours. Upon removal after two hours drying, the film shall show no whitening, blistering, or loss of adhesion, but slight dulling is permissible.

6.10 Gasoline Resistance

After airdrying for 17 hours, plus a 24 hour bake at 104°C the paint shall show no detrimental film effects after a painted panel is immersed in Gasoline for 4 hours.

6.11 Aluminum paste for this intermediate paint shall be equivalent in fineness to the standard lining grade as defined by ASTM Standard D962, Type 4, Class B. In addition it shall meet the composition and properties requirements of Table 3 and Sections 6.12 through 6.15.

6.12 The aluminum pigment paste shall consist of commercially pure aluminum in the form of fine, polished flakes, and a suitable fatty lubricant or metallic soap lubricant combined with a volatile thinner. It shall contain no fillers or adulterants. There shall be no appreciable settling out of the metallic portion of the paste in the container i.e., no free liquid shall be present.

6.13 The test methods are those given in ASTM Standard D480 or US Federal Specification TT-P-320.

6.14 The aluminum paste shall be non-leafing. Two grams of the paste mixed with 25 ml of Leaf-Testing Vehicle (ASTM Standard D480) in a 250 cc beaker shall show no more than a trace of leafing on the surface of the vehicle. In doubtful cases, absence of leafing shall be confirmed by Section 6.15.

6.15 General Applicability and Appearance

The sample of aluminum paste to be tested may be compared with a sample mutually agreed upon by the Purchaser and the Vendor .

TABLE 4 - PROPERTIES OF ALKYD VARNISH

| CHARACTERISTICS | REQUIREMENTS | | ASTM METHOD | US FEDERAL STD. No. 141 |
|---|--------------|------|-------------|-------------------------|
| | Min. | Max. | | |
| *VISCOSITY GARDNER AIRBUBBLE VISCOMETER | C | E | D1545 | ---- |
| DENSITY Kg/Lit | 0.91 | 0.97 | D1475 | ---- |
| DRYING TIME, HOURS SET TO TOUCH | ---- | 4 | ---- | 4061 |
| DRY HARD | ---- | 10 | D154 | 4061 |
| FLASH POINT, DEGREES C | 30 | ---- | D3278 | ---- |

* VISCOSITY 48 HOURS OR MORE AFTER MANUFACTURE

7. STORAGE LIFE AND PACKAGING

7.1 Condition in Container

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

7.2 Packaging

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 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 Refer to ANSI Standard Z129.1 "Precautionary Labeling of Hazardous Industrial Chemicals".

9.2 Marking of Containers

Each container shall be legibly marked with the following information:

- Name: Alkyd paint (Aluminum) Non-leafig as intermediate**
- Specification: IPS-M -TP-155**
- 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: Aluminum:**
- 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 the 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 Alkyd Paint (Aluminum) as Intermediate

This paint is intended for use as an intermediate on structural steel or over other oleoresinous paints. All oil, grease, dust, 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. If the undercoat is damaged, the steel shall be spot cleaned and spot primed with rust inhibitive primer.

If the pigment has settled, pour off most of the liquid. Thoroughly mix the pigment with the remaining liquid, taking care to scrape all the pigment off the bottom of the container.

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 paint 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 or turpentine. For brush application under normal conditions, no thinning should be necessary. For spray applications add up to one litre of thinner per 8 liters of paint when necessary.

Apply by brush or spray to the specified film thickness or, if none is specified, to at least 38 microns dry or approximately 100 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 paint at least a drying time of 24 hours in good weather before recoating.

Note:

This paint is not intended 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 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 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 solvent. Applicable regulations governing safe handling practices shall apply to the use of this paint.