

MATERIAL AND EQUIPMENT STANDARD
FOR
ALKYD PAINT (HIGH-BUILD THIXOTROPIC LEAFING
ALUMINUM) AS TOP COAT FINISH

CONTENTS :

PAGE No.

1. SCOPE	2
2. REFERENCES	2
3. UNITS	3
4. COMPOSITION	4
5. ANALYSIS	4
6. PROPERTIES.....	6
7. STORAGE LIFE AND PACKAGING.....	7
8. INSPECTION.....	7
9. LABELING.....	8

1. SCOPE

1.1 This Standard Specification which is generated from SSPC paint 108 covers the minimum requirements for the composition, analysis, properties, storage life and packaging ,inspection and labeling of alkyd paint (high build thixotropic leafing aluminum) as top coat (Finish).

1.2 This paint contains leafing aluminum pigment and a thixotropic long oil alkyd in a single package. Thixotropic paint appears to possess a high viscosity, which is altered because of a reversible gel structure when the paint is agitated. When the paint is stirred, sprayed, brushed, or rolled, the level of viscosity falls rapidly and the paint becomes liquefied. During application, the appearance is similar to other coatings. However, the liquid state will not remain for long. If undisturbed, the paint will re-gel within a short time.

2. REFERENCES

Throughout this Standard the following standards and codes are referred to. The edition 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)

SSPC 108	"High-Build Thixotropic Leafing Aluminum Paint"
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)"
D600	"Liquid Paint Driers"
D962	"Aluminum Pigments, Powder and Paste, for Paints"

(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"
D1296	"Odors of Volatile Solvents and Diluents"
D1475	"Density of Paint, Varnish, Lacquer and Related Products"
D1542	"Quantitative Test for Rosin in Varnishes"
D1640	"Drying, Curing, or Film Formation of Organic Coatings at Room Temperature"

D2369	"Volatile Content of 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)

TT-P-320	"Pigment, Aluminum: Powder and Paste, for Paint"
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 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	"Sage Test (Multinotch Blade)"
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. No rosin or rosin derivatives may be used. Beneficial additives such as antiskinning agents, suspending agents, or wetting aids may be added.

4.2 Percentage

This paint contains approximately 49% by volume of nonvolatile film forming solids (pigment and binder).

TABLE 1 - COMPOSITION

INGREDIENT	REQUIRED		INGREDIENT ASTM	STANDARDS US FEDERAL
	Min. Wt. %	Max. Wt. %		
PIGMENT(26.2% min.)				
ALUMINUM PASTE, 65% NON-VOLATILE	100	-	D962, TYPE 2 CLASS B	TT-P-320 TYPE II CLASS 2
VEHICLE(73.8% Max.)				
THIXOTROPIC ALKYD SOLIDS ¹	55.6	-	-	-
MINERAL SPIRIT THINNER	-	44.5	D235	TT-T-291 GRADE 1
DRIERS	-	-	D600 CLASS B	
ADDITIVES	-	-	-	-

1) See Table 2 for analysis of the thixotropic alkyd resin.

5. ANALYSIS

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

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

TABLE 2 - ANALYSIS OF THIXOTROPIC ALKYD RESIN

CHARACTERISTICS	REQUIREMENTS		ASTM
	Min.	Max.	
NONVOLATILE RESIN, % BY WEIGHT OF SOLUTION	59	61	D1208
DRYING OIL ACIDS, % BY WEIGHT OF SOLUTION 65 -			D1398
PHTHALIC ANHYDRIDE, % BY WEIGHT OF NONVOLATILE	9	-	D1306
VOLATILE RESIN			
ACID NUMBER OF NONVOLATILE RESIN	-	8	D1639
COLOR, GARDNER COLOR STANDARDS OF 1953 - 13			D1544
POLYAMIDE RESIN, % WEIGHT OF NONVOLATILE RESIN ¹	2.5	-	-
ROSIN OR ROSIN DERIVATIVES	-	0	D1542

1) Polyamide Resin :

Softening Point 105-115°C

Amine Value-2-7

Acids number-10 maximum

Specific gravity-0.95-0.98

TABLE 3 - ANALYSIS OF PAINT

CHARACTERISTICS	REQUIREMENTS		Max. METHOD	ASTM STD. No. 141
	Min. Wt. %	Wt. %		
PIGMENT	17	-	D1208	4021
VOLATILES	-	92	D2369	-
NONVOLATILE VEHICLE CALCULATED BY DIFFERENCE	41	-	-	4053
UNCOMBINED WATER	-	1.0	D1208	4081
COARSE PARTICLES AND SKINS, AS RETAINED ON STANDARD 0.044 mm. SIEVE OPENING (325 MESH SCREEN)	-	0.5	D185	-
ROSIN OR ROSIN DERIVATIVES	-	0	D1542	-

6. PROPERTIES

6.1 The paint shall meet the requirements of Table 4 and Section 6.2 through 6.7.

6.2 Odor

The odor shall be normal for the materials permitted (ASTM Standard D1296).

6.3 Color

A dried film of the paint shall show good leafing as indicated by a bright aluminum surface.

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 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 Federal Standard No. 141, Methods 4321, 4331, and 4541. The paint shall show no streaking, running, or sagging after drying.

6.7 Flexibility

Apply paint with a 4 cm brush to a 10 cm × 30 cm 0.8 mm, thick cold rolled steel panel with the panel horizontal. Apply paint quickly obtaining a wet film thickness of 175-200 microns on as much of the panel as possible. Final brush stroke shall be in the 30 cm direction, air dried for 72 hours at 21-24°C and baked five hours at 99°C. This panel shall show no cracking on the radius of the bend when bent over a 3.2 cm, mandrel. The film on the bent part shall show satisfactory adhesion.

TABLE 4 - PROPERTIES OF PAINT

CHARACTERISTICS	REQUIREMENTS Min.	ASTM Max.	US FEDERAL METHOD
PAINT CONSISTENCY :			
VISCOSITY* SHEAR RATE 200 rpm			
GRAMS	255	300	
KREB UNITS 90	95	D562	-
DENSITY Kg/LIT	1.0	1.05	D1475 -
DRYING TIME, HOURS :			
SET TO TOUCH	-	4	D1640 4061
TACK FREE 10	16	D1640	
FLASH POINT, DEGREES °C	40.6	-	D3278 -
SAG RESISTANCE, mm	0.254	-	D2801 4494

* Viscosity 48 hours or more after manufacture.

7. STORAGE LIFE AND PACKAGING

7.1 Condition in Container

The paint shall show no thickening, gas evolution, 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

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 Sample 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 (High-Build Thixotropic Leafing Aluminum) as top coat (Finish)

Specification: IPS-M-TP-160

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: Bright 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 this paint for various application/environment 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 supplied with each container of paint:

Directions for Use Alkyd Paint (High-Build Thixotropic Leafing Aluminum as Top coat (Finish))

- This paint is intended for use as a finish coat over rust inhibitive primers on structural steel, over itself, or over other oleoresinous paints. It is suitable for outdoor exposure in rural, industrial, and marine environments and for interior use. 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.

- Mix paint thoroughly before use. This thixotropic paint settles only slightly and moderate hand stirring should be sufficient.

- Thin paint only if necessary, using only mineral spirits with a minimum flash point at 60°C and a boiling range of 182-215°C. Under normal conditions, no thinning should be necessary. Add up to one liter of thinner per 15 liters of paint when necessary.

- Apply by brush or spray to the specified film thickness or, if none is specified, to at least 75 microns dry or approximately 175 microns wet. The surface to be painted shall be dry, the surface temperature shall be 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 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 hydrocarbon solvent. Applicable regulations governing safe handling practices shall apply to the use of this paint.