

MATERIAL AND EQUIPMENT STANDARD**FOR****CHLORINATED RUBBER PAINT****FOR INTERMEDIATE COAT****ORIGINAL EDITION****AUG. 1993**

This standard specification is reviewed and updated by the relevant technical committee on Dec. 1998(1) and June 2014(2). The approved modifications are included in the present issue of IPS.

FOREWORD

The Iranian Petroleum Standards (IPS) reflect the views of the Iranian Ministry of Petroleum and are intended for use in the oil and gas production facilities, oil refineries, chemical and petrochemical plants, gas handling and processing installations and other such facilities.

IPS is based on internationally acceptable standards and includes selections from the items stipulated in the referenced standards. They are also supplemented by additional requirements and/or modifications based on the experience acquired by the Iranian Petroleum Industry and the local market availability. The options which are not specified in the text of the standards are itemized in data sheet/s, so that, the user can select his appropriate preferences therein

The IPS standards are therefore expected to be sufficiently flexible so that the users can adapt these standards to their requirements. However, they may not cover every requirement of each project. For such cases, an addendum to IPS Standard shall be prepared by the user which elaborates the particular requirements of the user. This addendum together with the relevant IPS shall form the job specification for the specific project or work.

The IPS is reviewed and up-dated approximately every five years. Each standards are subject to amendment or withdrawal, if required, thus the latest edition of IPS shall be applicable

The users of IPS are therefore requested to send their views and comments, including any addendum prepared for particular cases to the following address. These comments and recommendations will be reviewed by the relevant technical committee and in case of approval will be incorporated in the next revision of the standard.

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GENERAL DEFINITIONS:

Throughout this Standard the following definitions shall apply.

COMPANY:

Refers to one of the related and/or affiliated companies of the Iranian Ministry of Petroleum such as National Iranian Oil Company, National Iranian Gas Company, National Petrochemical Company and National Iranian Oil Refinery And Distribution Company.

PURCHASER:

Means the "Company" where this standard is a part of direct purchaser order by the "Company", and the "Contractor" where this Standard is a part of contract documents.

VENDOR AND SUPPLIER:

Refers to firm or person who will supply and/or fabricate the equipment or material.

CONTRACTOR:

Refers to the persons, firm or company whose tender has been accepted by the company.

EXECUTOR:

Executor is the party which carries out all or part of construction and/or commissioning for the project.

INSPECTOR:

The Inspector referred to in this Standard is a person/persons or a body appointed in writing by the company for the inspection of fabrication and installation work.

SHALL:

Is used where a provision is mandatory.

SHOULD:

Is used where a provision is advisory only.

WILL:

Is normally used in connection with the action by the "Company" rather than by a contractor, supplier or vendor.

MAY:

Is used where a provision is completely discretionary.

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1. SCOPE

This Standard Specification which is mainly generated from SSPC-Paint No. 18 covers the minimum requirements for the composition, analysis, properties storage life and packaging, inspection and labeling of chlorinated rubber intermediate coat paint.

Note 1:

This standard specification is reviewed and updated by the relevant technical committee on Dec. 1998. The approved modifications by T.C. were sent to IPS users as amendment No. 1 by circular No. 60 on Dec. 1998. These modifications are included in the present issue of IPS.

Note 2:

This standard specification is reviewed and updated by the relevant technical committee on Jun. 2014. The approved modifications by T.C. were sent to IPS users as amendment No. 2 by circular No. 421 on Jun. 2014. These modifications are included in the present issue of IPS.

2. REFERENCES

Throughout this Standard the following dated and undated standards/codes are referred to. These referenced documents shall, to the extent specified herein, form a part of this standard. For dated references, the edition cited applies. The applicability of changes in dated references that occur after the cited date shall be mutually agreed upon by the Company and the Vendor. For undated references, the latest edition of the referenced documents (including any supplements and amendments) applies.

SSPC(STEEL STRUCTURES PAINTING COUNCIL) VOL. 2

SSPC-Paint 18	"Chlorinated Rubber Intermediate Coat Paint"
SSPC-PA Guide 3	"A Guide to Safety in Paint Application"

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

(Specifications for Ingredients)

D13	"Spirits of Turpentine"
D476	"Dry Pigmentary Titanium Dioxide Products"
D605	"Magnesium silicate pigments (talc)"
D607	"Wet Ground Mica Pigment"

(Specifications for Packaging)

D3951	"Standard Practice for Commercial Packaging"
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(Test Methods for Properties)

D185	"Coarse Particles in Pigments"
D445	"Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)"
D562	"Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer"

D1208	"Common Properties of Certain Pigments"
D1210	"Fineness of Dispersion of Pigment-Vehicle Systems by Hegman-Type Gage"
D1296	"Odors of Volatile Solvents and Diluents"
D1475	"Density of Liquid Coatings, Inks, and Related Products"
D1542	"Quantitative Test for Rosin in Varnishes"
D3278	"Flash Point of Liquids by Small Scale Closed-Cup Apparatus"
D2371	"Pigment Content of Solvent-Reducible Paints"

UFS (US FEDERAL STANDARDS)

(Standard Specifications for Ingredients)

MIL-C-429	"Chlorinated Paraffin, Technical"
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(US Federal Test Method Standard No. 141)

Method 3011	"Condition in Container"
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 4541 (Canceled)	"Working Properties and Appearance of Dried Film"

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)

ANSI Z400.1/Z129.1	"Safety Data Sheet and Hazard Evaluation and Precautionary Labeling Preparation"
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IPS (IRANIAN PETROLEUM STANDARDS)

IPS-E-TP-100	"Paints"
IPS-E-GN-100	"Units"

3. UNITS

This Standard is based on International System of Units (SI), as per [IPS-E-GN-100](#) except where otherwise specified.

4. COMPOSITION

4.1 Ingredient 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 anti-skinning, suspending agents, or wetting aids may be added.

4.2 Percentage

This paint shall contain approximately 35% by volume of nonvolatile film forming solids.

TABLE 1 - COMPOSITION

INGREDIENTS	TYPICAL COMPOSITION		INGREDIENT ASTM	STANDARDS US FEDERAL
	Wt. %	Vol. %		
PIGMENT:				
TITANIUM DIOXIDE	4.0	1.3	D476 TYPE IV	---
TINTING PIGMENTS ¹	0.4	0.3	---	---
EXTENDER PIGMENTS				
MAGNESIUM SILICATE	15.6	7.3	D606	---
MICA	6.4	2.9	D607	
VEHICLE:				
CHLORINATED RUBBER ²	20.1	15.5	---	---
CHLORINATED HARD RESINS	5.0	4.0	---	MIL-C-429, TYPE II
CHLORINATED PLASTICIZERS	10.0	11.0	---	MIL-C-429, TYPE I
PLASTICIZER ³	---	---	---	---
SOLVENTS ⁴	37.0	55.2	---	---
VEHICLE STABILIZER ⁵	0.6	0.7	---	---
VAPOR PHASE STABILIZERS ⁶	0.2	0.3	---	---
SUSPENDING AIDS ⁷	0.7	1.5	---	---
TOTALS	100.0	100.0	---	---

1) Lampblack or lightfast and compatible, chemically resistant colored pigments shall be used to provide a tint or color when desired.

Note:

When this paint is to be used in a paint system to the interior of potable water vessels, the ingredients used shall not be deemed objectionable for such use by the U.S. Environmental Protection Agency or any agency that would have jurisdiction over such matters.

2) The chlorinated rubber shall contain approximately 66% by weight chlorine. The viscosity (based on solution of 20% by weight concentration in toluene at 20°C) shall fall in the range of 9 to 14 centipoise, when measured according to ASTM Standard D445. Up to 50% by weight of the amount of chlorinated rubber could be of the viscosity range of 17 to 25 centipoises, but spray application is more difficult.

3) Alternative plasticizers can be used, provided they are compatible, high quality, and chemically resistant.

4) The solvent shall consist of aromatic or a blend of aromatic and aliphatic hydrocarbons, with the aliphatic portion limited to 25% by weight, and shall have a minimum kauri butanol value of 75. Up to 10% by weight of turpentine (ASTM Standard D13) or other high boiling aromatic type solvents may be added to improve application properties.

5) The vehicle stabilizer shall be a mixture of four parts zinc oxide and one part pentaerythritol. Other suitable chloride acceptors, such as an epoxidized vegetable oil, may be used.

6) A vapor-phase stabilizer, such as propylene oxide, can also be used. It must be a high-grade commercial material suitable for the intended purpose.

7) The suspending aid shall be hydrogenated castor oil or montmorillonite mineral.

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 AND EXTENDER	16.0	30.0	D1208	D2371
VOLATILES	---	54.6	D1208	---
NONVOLATILE VEHICLE	22.0	---	---	4053
UNCOMBINED WATER	---	0.25	D1208	4081
COARSE PARTICLES AND SKINS, AS RETAINED ON 0.045 mm SIEVE OPENING (STANDARD 325 MESH SCREEN)	---	0.05	D185	---
ROSIN OR ROSIN DERIVATIVES	---	0	D1542	---

6. PROPERTIES

6.1 Requirement

The paint shall meet the requirements of Table 3 and Sections 6.2 through 6.5.

6.2 Odor

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

6.3 Color

The color, or contrasting shade, shall be obtained by using compatible, chemically resistant tinting pigments.

6.4 Compatibility

There shall be no evidence of incompatibility of any of the ingredients of the paint when one volume of paint is slowly mixed with one volume of xylene (US Federal Standard No. 141, Method 4203) Solvent blends shall be checked in an unpigmented film deposited on glass. The dried film must be clear and bright. The flexibility and permeability of the trial film shall also be compared with that obtained from the "typical formulation" Paint.

6.5 Working Properties

The paint shall be easily applied by all three methods (Brush, Spray, Roller) 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

CHARACTERISTICS.	REQUIREMENTS		ASTM METHOD	US FEDERAL STD. No. 141
	Min.	Max.		
PAINT CONSISTENCY				
VISCOSITY SHEAR				
RATE 200 rpm				
GRAMS	165	350	---	---
KREB UNITS	75	100	D562	---
DENSITY Kg/Li	1.2	1.4	D1475	---
FINENESS OF GRIND, MICRONS	40	---	D1210	---
DRYING TIME:				
SET TO TOUCH, MINUTES	15	---	---	4061
DRY HARD HOURS	1	---	---	4061
FLASH POINT °C	26.7	---	D3278	---

* 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 Federal Standard No. 141, Method 3011, after storage for 12 months from the date of delivery unless other wise specified by company, in a full, tightly covered container.

7.2 Packaging

The packaging shall meet the relevant requirement of ASTM D3951.

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 Labeling Standard

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: Chlorinated Rubber Paint for Intermediate Coat

Specification: [IPS-M-TP-140](#)

MESC No.:

No. of components:

Maximum temperature resistance:

Type of spray:.....

Kind and size of spray nozzle tip:

Cleaning material:

Flash point °C:

Drying time for overcoating:

Kind of thinner:

Color:

Lot Number:

Shelf life MSDS:.....

Stock Number:

Storage temp:.....

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 / 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 supplied with each container of paint:

Directions for Use of Chlorinated Rubber Intermediate Coat Paint

- This paint is intended for use as an intermediate coat or topcoat over rust inhibitive chlorinated rubber primer or other suitable primers on structural steel. Before applying, remove all moisture, oil grease, dirt, and loose or nonadhering paint. Sound old coatings that are compatible with this chlorinated rubber paint may remain but damaged areas or areas of poor adhesion must be spot cleaned and spot primed.

- Preferred primers are chlorinated rubber, modified chlorinated rubber, chemically cured epoxy, zinc-rich and others specifically recommended by the manufacturer where a zinc rich primer is used and the system is considered for water immersion service, a seal-coat between the primer and this intermediate or topcoat paint may be required to eliminate blistering . Contaminated prime coats shall be cleaned by appropriate methods before application of succeeding coats.

- Mix paint thoroughly before use. If simple stirring is inadequate 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 transfer-ring 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.

- Generally, thinners are not used for brush application. For spray application, the coating may be thinned with xylene up to 1.5 liter per 8 liters of unthinned paint. A by volume blend of 80% minimum of xylene and 20% maximum of an aliphatic solvent having an evaporation rate faster than that of xylene may be used instead of straight xylene.

- Apply by brush or spray to the specified film thickness or, if none is specified, to at least 75 microns dry or approximately 225 microns wet. When application is by spraying, the

equipment and operator technique should be properly adjusted to prevent dry spray and to deposit a wet film of paint on the substrate. Clean the equipment with xylene or the reducing thinner both before and after use.

- The surface to be painted shall be dry and the surface temperature shall be at least 3°C above the dew point.
- Do not paint outdoors if precipitation, dew, or condensation is expected before the paint dries.
- At temperatures of 15-27°C and relative humidities of 40% to 60% allow at least three hours drying time between coats. Allow at least 48 hours of drying time after the last coat is applied before placing in water immersion service. If the temperature is below 16°C or if the relative humidity is above 60%, allow 4 to 7 days before placing in water immersion service.

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, if so formulated, and which may pose a hazard include lead and chromate pigments, hydrocarbon solvent, and plasticizers. Applicable regulations governing safe handling practices shall apply to the use of this paint.