MATERIAL AND EQUIPMENT STANDARD

FOR

FAST DRYING SYNTHETIC PRIMER

TO BE USED

WITH HOT APPLIED COAL TAR OR BITUMEN

(ASPHALT) ENAMEL

ORIGINAL EDITION

OCT. 1996

This standard specification is reviewed and updated by the relevant technical committee on July 2000(1) and Oct. 2015(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 are based on internationally acceptable standards and include 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.

Standards and Research department

No.17, Street14, North kheradmand

Karimkhan Avenue, Tehran, Iran .

Postal Code- 1585886851

Tel: 88810459-60 & 66153055

Fax: 88810462

Email: Standards@ nioc.ir

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 document.

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.

CONTENTS: **PAGE No.**

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

1. SCOPE

This standard specification covers the minimum requirements for the composition, properties, storage life and packaging, inspection and labeling of fast drying synthetic primer for use with hot applied coal tar and bitumen (asphalt) enamels.

Note 1:

This standard specification is reviewed and updated by the relevant technical committee on July 2000. The approved modifications by T.C. were sent to IPS users as amendment No. 1 by circular No. 121 on July 2000. 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 Oct. 2015. The approved modifications by T.C. were sent to IPS users as amendment No. 2 by circular No. 464 on Oct. 2015. 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.

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)

ANSI Z400.1/ Z129.1	"Safety Data Sheet and Hazard Evaluation and Precautionary Labeling Preparation"
ANSI/AWWA C 203	"Coal-Tar Protective Coatings and Linings for Steel Water Pipelines-Enamel and Tape-Hot-Applied"

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

D 445	"Kinematics Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity)"
D 1296	"Odors of Volatile Solvent and Diluents"

BSI (BRITISH STANDARDS INSTITUTION)

BS EN 13736	"Determination of Flash Point - Abel Closed-Cup Method"
Part 170	
BS 4164 (Canceled)	"Specification for Coal-Tar-Based Hot Applied Coating Materials for Protecting Iron and Steel Including a Suitable Primer"
BS EN 10300	"Steel Tubes and Fittings for Onshore and Offshore Pipelines - Bituminous Hot Applied Materials for External Coating"
BS EN ISO 2431	"Paints and Varnishes -Determination of Flow Time By Use of Flow Cups"

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-E-GN-100	"Engineering Standard for Units"
IPS-C-TP-101	"Construction Standard for Surface Preparation"
IPS-C-TP-274	"Construction Standard for Protective Coatings"
IPS-E-TP-100	"Engineering Standard for Paints"
IPS-M-TP-290	"Material and Equipment Standard for Coal Tar Enamel (Hot Applied)"
IPS-M-TP-295	"Material and Equipment Standard for Bitumen Enamel (Hot Applied)"

SSPC (STEEL STRUCTURES PAINTING COUNCIL)

SSPC Paint 17(Discontinued) "Chlorinated Rubber Inhibitive Primer"

USF (US FEDERAL STANDARDS)

Federal 141D Standard	"Test Method for Paint, Varnish…. "
Method 3011	"Condition in Container"
Method 4203	"Reducibility and Dilution Stability"
Method 4551	
Method 4331	
Method 4321	

3. DEFINITION

3.1 Centipoise

The metric unit of viscosity

3.2 Chlorinated Rubber

Resin formed by the reaction of rubber with chlorine. Unlike rubber, the resulting product is soluble in organic solvents and yields solutions of low viscosity. It is sold as white powder, fibers, or as blocks. The use of chlorinated rubber coatings is currently greatly restricted because of their high VOC content.

3.3 Plasticizer

A substance added to paint, varnish, or lacquer to impart flexibility.

4. UNITS

This standard is based on international system of units (SI), as per IPS-E-GN-100 except where otherwise specified.

5. COMPOSITION

The synthetic primer for cold application shall consist of chlorinated rubber and plasticizer and coloring matter, together with solvents needed to give a consistency suitable for application by

spray, brush or other approved method.

The chlorinated rubber shall contain approximately 66% by weight chlorine. The viscosity (based on a 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 D 445 Up to 50% by weight of the amount of chlorinated rubber could be of the viscosity range of 17 to 25 centipoises (See also SSPC Paint 17). The plasticizer shall be a chlorinated plasticizer.

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

6. PROPERTIES

6.1 The primer shall comply with the requirements of table 1, and when dry, shall provide an effective bond between the metal and the subsequent coating, in accordance with the appropriate performance requirements given in Tables 2 and 3. The primer shall also meet the requirements of subclauses 5.2 through 5.5.

6.2 Odor

The odor shall be normal for the materials permitted (ASTM Standard 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 primer when one volume of primer is slowly mixed with one volume of xylene (US Federal Standard No. 141, method 4203).

6.5 Working Properties

The primer 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 primer shall show no streaking, running or sagging after drying.

TABLE 1 – PROPERTIES

CHARACTERISTICS	REQUIREMENTS Min.	Max.	TEST METHOD
Flow time (4 mm flow cup) at 23°C seconds	35	60	BS EN ISO 2431
Flash point (able closed cup)°C	23	---	BS EN 13736
Volatile matter (105°C to 110°C) loss by mass	---	75%	BS 4164 Annex A

TABLE 2 - PERFORMANCE REQUIREMENTS OF PRIMER IN CONJUNCTION WITH COAL TAR ENAMEL (IPS-M-TP-290)

TEST	GRADE 105/15	GRADE 105/8	GRADE 120/5	METHOD	
				AWWA	BS 4164
SAG. maximum, mm 70°C 24h 80°C 24h	1.5 —	1.5 —	— 1.5	AWWA C203	Annex B
Low temperature cracking and disbonding -30°C -25°C -20°C	None — —	— None —	— — None	AWWA C203	Annex C
Bend at 0°C first crack, minimum, mm initial After heating Disbonded area, maximum, mm² initial After heating	20 15 2000 3000	15 10 3000 5000	— — — —	—	Annex D
Impact* Disbonded area, maximum mm² 0°C 25°C	15000 —	— 10000	— —	AWWA C203	Annex E
Peel, initial and delayed, maximum, mm 30°C 40°C 50°C 60°C 70°C	3.0 3.0 3.0 — —	— 3.0 3.0 3.0 —	— — — 3.0 3.0		Annex F
Cathodic disbonding in 28 days maximum, mm	5	5	5	—	Annex G

***: Impact tests**

If the specimen fails the impact test (see Table 2) at 0 °C when tested in accordance with Annex E, two Further test specimens shall be prepared from the same sample as the failed test specimen and tested at 0 °C The material shall be deemed to have passed the impact test provided both the additional test specimens pass the test.

TABLE 3 - PERFORMANCE REQUIREMENTS OF PRIMER IN CONJUNCTION WITH BITUMEN ENAMEL (IPS-M-TP-295)

TEST	GRADE A	GRADE B	GRADE C	METHOD
				BS EN 10300
SAG. max., mm. 60°C, 24 h 75°C, 24 h	 1.5 —	 — 1.5	 — 1.5	Annex D
Bend at 0°C min., mm.	20	15	10	Annex G
Impact disbonded area, max., mm^2 0°C 25°C	 15000 —	 6500 —	 — 6500	Annex E
Peel, initial and delayed, max, mm. 30°C 40°C 50°C 60°C	 3.0 3.0 3.0 3.0	 3.0 3.0 3.0 3.0	 — 3.0 3.0 3.0	Annex F
Cathodic disbanding, disbanded radius after 28 d, maximum, mm	10	10	10	Annex I

7. STORAGE LIFE AND PACKAGING

7.1 Storage Life

The product shall show no thickening, curdling, gelling or hard caking when tested as specified in us federal standard No. 141 method 3011 and shall meet the requirements of Clause 5 after storage of at least 24 months from the date of delivery in a full tightly covered container at normal temperature.

7.2 Packaging

The primer shall be packaged in new steel drums containing not more than 200 liters.

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 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

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: Fast Dring Synthetic Primer for use with hot applied coal tar or bitumen enamel

Specification: IPS-M-TP-275 .....

MESC No.: .....

Maximum temperature resistance: .....

Type of spray: .....

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

Cleaning material: .....

Flash point °C: .....

Kind of thinner: .....

Color: Black: .....

Lot Number: .....

Stock Number: .....

Date of Manufacture: .....

Quantity of primer in Container: .....

Information and Warnings, (if needed): .....

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

Storage Conditions: .....

Design Guide: For guidance on the usage of this primer for various application, reference shall be made to IPS-C-TP-274.

9.3 Direction for Use

In addition to the manufacturer's instructions for use, the following directions shall also be supplied with each container of primer.

This primer is intended for use as a prime coat on structural steel. The surface of steel shall be prepared in accordance with IPS-C-TP-101 before applying the primer.

This primer is intended to be followed by hot applied coal tar or bitumen enamel conforming to IPS-M-TP-290 or IPS-M-TP-295. Mix primer thoroughly before use.

Apply by brush or spray to the specified film thickness or, if none is specified, to approximately 40 microns dry or 125 microns wet. When application is by spraying, the equipment and operating technique should be properly adjusted to prevent dry spray and to deposit a wet film of primer 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.

In addition to the manufacturer's instructions for safety, the following directions shall also be supplied with each container of primer:

- This primer is hazardous because of its flammability and potential toxicity. Proper safety precautions shall be observed to protect against these recognized hazards.

- Keep primer 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 primer 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 primer may not comply with some air pollution regulations because of its hydrocarbon solvent content.