MATERIAL AND EQUIPMENT STANDARD

FOR

BITUMEN PRIMER (COLD APPLIED)

FOR USE WITH

HOT APPLIED BITUMEN ENAMEL (IPS-M-TP-295)

ORIGINAL EDITION

JULY 1994

This standard specification is reviewed and updated by the relevant technical committee on Aug. 1999(1) and Dec. 2013(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.

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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 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.

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1. SCOPE

This Standard Specification covers the minimum requirements for the composition, properties, storage life and packaging, inspection and labeling of bitumen primers grades “a” and “b” (cold applied) for use with bitumen enamels grade “a” or “b” or “c” of IPS-M-TP-295. Primer grade “a” is intended for use with enamel grade “a” and primer grade “b” is intended for use with enamel grades “b” and “c” of IPS-M-TP-295, therefore the primer shall be selected according to the grade of enamel.

Note 1:

This standard specification is reviewed and updated by the relevant technical committee on Aug. 1999. The approved modifications by T.C. were sent to IPS users as amendment No. 1 by circular No. 90 on Aug. 1999. 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 Dec. 2013. The approved modifications by T.C. were sent to IPS users as amendment No. 2 by circular No. 379 on Dec. 2013. 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/Z129.1-2010	“Hazard Evaluation and safety Data Sheet and Precautionary Labeling Preparation”

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

Test Methods for Properties

D 1296	“Odors of Volatile Solvent and Diluents”

BSI (BRITISH STANDARD INSTITUTION)

BS 2000 Part 170	“Flash Point by the ABEI Apparatus”(Non Statutory Method)
BS 2000 Part 47	“Solubility of Bitumen Benders”
BS 2000 Part 49	“Penetration of Bituminous Materials”
BS 2000 Part 58	“Softening Point of Bitumen (Ring and Ball)”
BS 2000 Part 72	“Method for determining settling Points of Bitumen”
BS EN ISO 2431	“Paints and Varnishes Determination of Flow Time by use of Flow Cups”
BS EN 10300	“Steel Tubes and Fittings for Onshore and Offshore Pipelines Bituminous Hot Applied Materials for External Coating”

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-C-TP-101	"Construction Standard for Surface Preparation"
IPS-E-GN-100	"Engineering Standard for Units"
IPS-E-TP-270	"Engineering Standard for Coatings"
IPS-M-TP-295	"Material and Equipment Standard for Bitumen Enamel (Hot Applied)"

ISO (INTERNATIONAL ORGANIZATION FOR STANDARDIZATION)

ISO 5256	"Steel Pipes and Fittings for Buried or Submerged Pipelines-External and Internal Coating by Bitumen or Coal-tar Derived Materials"

SSPC (STEEL STRUCTURES PAINTING COUNCIL)

SSPC	"Paint No. 15 type II, Asphalt Coating"
SSPC-PA Guide 3	"A Guide to Safety in Paint Application"

US FEDERAL STANDARDS

	"US Federal Test Method Standard 141D"
Method 4321	"Brushing Properties"
Method 4331	"Spraying Properties Method"

3. UNITS

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

4. DEFINITIONS

ADDITIVE

A suitable substance which, when added to a petroleum product, confers on it special properties or enhances its natural properties.

BITUMEN

A viscous liquid, or a solid, consisting essentially of hydrocarbons and their derivatives, which is soluble in carbon disulfide or trichloroethylene and is substantially non-volatile and softens gradually when heated. It is black or brown in color and possesses water-proofing and adhesive properties. It is obtained by refinery processes from petroleum, and is also found as a natural deposit or as a component of naturally occurring asphalt in which it is associated with mineral matter.

COATING (PROCESS)

The process of applying a thin layer of a material in the form of a fluid upon a substance.

COATING (PRODUCT)

A thin layer of a material applied by a coating process.

PENETRATION

The depth, expressed in units of 0.1 mm, to which a standard needle placed vertically on the surface of the sample of bitumen enamel, and loaded with a 100 g weight under the specified conditions of temperature (25°C) and time (5 s) will enter.

PETROLEUM BITUMEN

A mixture of high molecular weight hydrocarbons derived from petroleum by oxidation of suitable selected bases to a varying extent, possibly by adding fillers, in order to produce a base material conforming to one of the grades a or b of table 1.

PRIMER

A liquid material applied as an undercoat directly to the metal, in order to assist the bonding of a subsequent coating of bitumen enamel.

SOFTENING POINT (RING AND BALL)

The temperature at which a disc of the material, contained in a ring, undergoes a standard deformation caused by the weight of a ball under standardized test conditions.

5. COMPOSITION

Bitumen primer for cold application shall consist of a homogeneous solution of bitumen in hydrocarbon usually paraffinic hydrocarbon or other suitable solvent having a consistency suitable for application by brush or other approved method.

6. PROPERTIES

6.1 The bitumen primer shall comply with the requirements given in table 1 when tested by the methods specified and, when dry, shall provide an effective bond between the metal and the subsequent coating, in accordance with the appropriate performance requirements given in table 2. The primer shall also meet the requirements of clauses 6.2 through 6.4.

TABLE 1 - PROPERTIES OF PRIMER

CHARACTERISTICS	UNIT	REQUIREMENTS		TEST METHOD	
		GRADE a	GRADE b	BSI	ISO 5256 (E) 1985
ASH CONTENT (Max.) (MASS ON DRY EXTRACT)	W t%	0.5	0.5		A → M
SOFTENING POINT OF BITUMEN USED (RING AND BALL)	°C	80-100	100-120	BS 2000 PART 58	A → D
VISCOSITY (No. 4 FLOW CUP AT 23°C)	SECOND	30-200	30-200	BS EN ISO 2431	—
FLASH POINT (ABEL CLOSED CUP) (Min.)	°C	23	23	BS 2000 Part 170	—
PENETRATION (OF BITUMEN USED) AT 25°C , 5 S, 100 gr	10^{-1} mm	20-30	10-20	BS 2000 Part 49	A → E
SOLUBILITY (OF BITUMEN USED) IN CARBON DISULFIDE OR TRICHLOROETHYLENE	min.% BY MASS	99	99	BS 2000 Part 58	—

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 Working Properties

The primer shall be capable of application by brush and spray when tested in accordance with US Federal Standard No. 141, method 4321, 4331 and 4541. The primer shall show no streaking, running or sagging after drying.

TABLE 2 - PERFORMANCE REQUIREMENTS OF PRIMER IN CONJUNCTION WITH BITUMEN ENAMEL OF SUITABLE GRADE OF IPS-M-TP-295

TEST	UNIT	GRADE a	GRADE b	GRADE c	METHODS	
					ISO 5256	BS EN 10300
COLD BENDING[1]	mm	≥ 20	≥ 15	≥ 10	METHOD F	---
FLOW[2] (70°C 45°C: 20 h)	mm	≤ 6	≤ 2	≤ 2	METHOD H	---
PEEL, INITIAL AND DELAYED (max.) 30°C 40°C 50°C 60°C	mm	 3.0 3.0 3.0 3.0	 3.0 3.0 3.0 3.0	 --- 3.0 3.0 3.0	---	APPENDIX F
IMPACT, DISBONDED AREA (max.) 0°C[3] 25°C	mm^2	 15000 ---	 6500	 6500		APPENDIX E (REVISION A)
CATHODIC DISBONDING IN 28 DAYS max.	mm	10	10	10	---	---
Sag, Max. 60 °C 24 h 75 °C 24 h	mm	1.5 ---	--- 1.5	 1.5	---	APPENDIX D

Note:

Apply the enamel not less than 16 hours and not more than 72 hours after the primer has been applied.

1) The test consists of verifying the flexibility at low temperature of bitumen used as a coating on steel pipes and under conditions simulating the bending of coated pipes.

2) The test consists of measuring the displacement of the surface of a coating of a bitumen by its own weight under specified conditions of temperature and time.

3) If the test specimen fails the impact test at 0°C, two further test specimens shall be prepared from the same sample as the failed test specimen and both shall be tested at O°C. The material shall be deemed to comply with the requirements of the impact test provided both of the test specimens pass the test.

7. STORAGE LIFE, PACKAGING, SAMPLING

7.1 Storage Life

The product shall meet the requirements of clause 6 after storage of at least 12 months from date of delivery, in a full tightly covered container.

7.2 Packaging

The primer shall be packaged in not contaminated steel drums containing not more than 210 liters.

7.3 Sampling

When samples of coating material are required for testing, the purchaser shall specify on the number of packages to be sampled and the procedure to be adopted. The samples so taken shall be identified by the supplier and one-half retained by the purchaser for the purpose of making such tests as he may require.

In coating materials, the filler will settle during storage. In order to ensure that test samples of these materials are representative, they shall be made up of equal increments taken from the top, middle and bottom of the package.

Preparation of samples for testing shall be in accordance with Method C of ISO 5256.

8. INSPECTION AND TESTING

8.1 All materials supplied under this Standard 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 The supplier shall be responsible for the performance and costs for all laboratory test requirements as specified in this standard.

The supplier shall set up and maintain such quality assurance and inspection systems as are necessary to ensure that the materials comply in all respects with the requirements of this standard specification.

8.3 Purchaser's inspector(s) shall have free access to the supplier's work to follow up the progress of the materials covered by this standard and to check the quality of materials.

The supplier shall place free of charge at the disposal of the purchaser's inspector(s) all means necessary for carrying out their inspection: Results of test, checking of conformity of materials with this standard requirements, checking of marking and packing and temporary acceptance of materials.

8.4 Samples submitted to the purchaser will be tested in the purchaser's laboratory or in a responsible commercial laboratory designated by the purchaser.

8.5 The supplier shall furnish the purchaser with a certified copy of results of tests made by the manufacturer covering physical and performance characteristics of each batch of product to be supplied under this Standard specification. The supplier shall furnish, or allow the purchaser to collect samples of the material representative of each batch of product.

Certified test reports and samples furnished by the supplier shall be properly identified with each batch of product.

8.6 Prior to acceptance of the supplier's material, samples of material submitted by the supplier will be tested by the purchaser.

If any sample is found not to conform to this standard, material represented by such sample will be rejected.

If samples of the supplier's material that have been previously accepted are found not to conform to this standard, all such material will be rejected .

8.7 After the supplier has obtained approval from the purchaser for the bitumen primer proposed to be furnished, the supplier shall submit the coating manufacturer's detailed specifications for the bitumen primer supplied, with instructions for the handling and application of the material.

8.8 Unless otherwise specified in this Standard specification the methods of sampling and testing shall be in accordance with applicable methods of the American Society for Testing and Materials and/or BS 4147.

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 and permanently marked with the following information:

Name: Bitumen (Asphalt) Primer (Cold Applied) for use with Bitumen Enamel (IPS-M-TP-295)

Specification: (IPS-M-TP-285) .....

Grade of primer: .....

Grade of enamel of IPS-M-TP-295 which primer shall be used with: .....

M.E.S.C. No.: .....

Order No.: .....

Maximum temperature resistance: .....

Flash point °C: .....

Drying time for over coating: .....

Kind of thinner: .....

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

Cleaning material: .....

Color: Black .....

Batch No.: .....

Stock No.: .....

Date of manufacture: .....

Quantity of primer in container: .....

Information and warning, if required: .....

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

Date of inspection: .....

Date of Exp.: .....

UPC bar code part No.: .....

Design guide: For the guidance on the usage of this primer for various applications/environments reference shall be made to IPS-E-TP-270.

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 (mainly steel pipes). The surface of steel shall be prepared in accordance with IPS-C-TP-101 (surface preparation) before applying the primer.

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

Apply by brush to the specified film thickness or, if none is specified, to at least 100 microns dry.

The surface to be coated shall be dry and the surface temperature shall be at least 3°C above the dew point.

9.4 Direction for Safety

In addition to the manufacturer's instructions for safety MS DS, 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. Safe handling practices are required and shall 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 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.