MATERIAL STANDARD

FOR

PRIMER TO BE USED WITH HAND-APPLIED LAMINATED TAPE

SUITABLE FOR COLD-APPLIED TAPE COATING SYSTEM

ORIGINAL EDITION

JULY 1995

This standard specification is reviewed and updated by the relevant technical committee on Feb. 1999(1) and Dec. 2012(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 primer to be used in conjunction with hand-applied laminated tape (IPS-M-TP-313) for coating special sections, connections, fittings, cable to pipe connections, and field repairs of buried steel pipes protected with cold-applied tape coating system.

Note 1:

This standard specification is reviewed and updated by the relevant technical committee on Feb. 1999. The approved modifications by T.C. were sent to IPS users as amendment No. 1 by circular No. 156 on Feb. 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. 2012. The approved modifications by T.C. were sent to IPS users as amendment No. 2 by circular No. 380 on Dec. 2012. 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)

Z 400.1/Z 129.1-2010	"Hazard Evaluation and Safety Data Sheet and Precautionary Labeling Preparation"

ASTM (AMERICAN SOCIETY FOR TESTING AND MATERIALS)

D 1000	"Standard Test Method for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications"
D 1200	"Standard Test Method for Viscosity by Ford Viscosity Cup"
D 1296	"Standard Test Method for Odor of Volatile Solvents and Diluents"
D 1475	"Density of Liquid Coatings, Inks, and Related Products"
D 2369	"Standard Test Method for Volatile Content of Coatings"
D 56	"Standard Test Method for Flash Point by Tag Closed Cup-Tester"
G 8	"Standard Test Method for Cathodic Disbonding of Pipeline Coatings"

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-E-GN-100	"Engineering standard for Units"
IPS-C-TP-101	"Construction Standard for Surface Preparation" (Not Applicable for Procurement)
IPS-E-TP-270	"Engineering Standard for Protective Coatings for Buried and Submerged Steel Structures"

IPS-M-TP-313 "Hand-Applied Laminated Tape Suitable for Cold-Applied Tape Coating Systems"

ISO (INTERNATIONAL ORGANIZATION FOR STANDARDIZATION)

ISO 8501-1 "Visual Assessment Of Surface Cleanliness"

SSPC (STEEL STRUCTURES PAINTING COUNCIL)

PA Guide 3 "A Guide to Safety in Paint Application"

US FEDERAL STANDARD

Federal Test Method Standard No. 141-Paint, Varnish, Lacquer, and Related materials: Methods of Inspection, Sampling, and Testing.

Method 3011 "Condition in Container"

Method 4061 "Drying Time"

Method 4203 "Reducibility and Dilution Stability"

Method 4321 "Brushing Properties"

Method 4541 "Working Properties and Appearance of Dried Film" (Canceled)

3. DEFINITIONS & TERMINOLOGY

Butyl Rubber

Butyl rubber is a designation for a series of rubber-like products made by polymerization a high percentage of a mono olefin like isobutylene, and a small amount of a di-olefin like butadiene. The resulting products have only a fraction of the unsaturation present in natural rubber, and after volcanization the product is essentially a cross-linked saturated hydrocarbon.

Butyl rubber is essentially a paraffinic hydrocarbon.

Density

The mass of a unit volume of the liquid at a specified temperature. The units shall be stated, such as grams per milliliter or grams per cubic centimeter.

Flash Point

The minimum temperature (corrected to a barometric pressure of 760 mm Hg) at which a liquid gives off a vapor in sufficient concentration to ignite under specified conditions of test.

Flammable Liquid

Any liquid having a flash point below 37.8°C, except any liquid mixture having one or more components with a flash point at or above the upper limit which make up 99% or more of the total volume of the mixture.

Inhibitor

A material used, normally in small proportions, to arrest or retard a chemical reaction, especially corrosion.

Lot or Batch

The lot or batch shall consist of an indefinite amount of materials manufactured by a single plant run through the same processing equipment, with no change in ingredient materials which offered for acceptance.

Nominal Parameters

The nominal parameters are the parameters (e.g., weight, thickness, density, etc.) specified on product labels, invoices, sales literature, and the like. The actual parameters shall not be less than 95% of nominal parameters.

Primer

Primer as a thin film over a prepared metal surface and the adjacent pipe coating in order to ensure maximum adherence to the metal surface and the inner-layer tape.

Resin

A solid or semi-solid organic compound which is thermoplastic, does not crystallize, is not a conductor of electricity, has no sharp melting point and is soluble in organic solvents but not in water. It originates, in the case of natural resins, from the secretions of certain plants or insects; or, in the case of synthetic resins, through chemical reaction of numerous substances producing complex compounds of higher molecular weight than the original materials.

Solvent

A volatile liquid, which is used in the manufacture of primer to dissolve or disperse the film-forming constituents, and which evaporates during drying and therefore does not become a part of the dried film.

Solvents are used to control the consistency and character of the primer and to regulate application properties.

Aliphatic solvents are mild solvents derived from petroleum, such as mineral spirit.

Aromatic solvents are strong solvents derived from coal-tar and certain petroleum types, such as toluene, xylene, and solvent naphtha.

Thinner

Volatile liquid added to primer to facilitate application and to aid penetration by lowering the viscosity.

Total Solid

The non-volatile matter in a coating composition, i.e., the ingredients of a coating composition which, after drying, are left behind and constitute the dry film.

Stabilizer

Substances added, usually in small proportions, to retard undesirable chemical or physical changes.

4. UNITS

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

5. COMPOSITION

The primer shall compose of synthetic resin and rubber, anti-corrosion inhibitor, stabilizer, etc., blended with proper type and amount of volatile organic solvent to produce a free-flowing liquid coating that can be readily applied without heat by brushing.

The primer shall be uniform, stable in storage, and free from grit and coarse particles. It must contain additives that resist fungus and bacterial growth.

6. PROPERTIES

The primer shall comply with the requirements of Table 1, and when dry shall provide a highly effective bonding medium between surface to be protected and adhesive layer of the subsequently applied tape, comply with IPS-M-TP-313, to perform the requirements given in Table 2.

The primer shall also meet the requirements of 6.1 to 6.10 inclusive.

6.1 Odor

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

6.2 Color

The color of the primer shall be black.

6.3 Compatibility

There shall be no evidence of incompatibility of any of the ingredients of the primer when one volume of the primer is slowly mixed with one volume of its own thinner (US Federal Standard No. 141, Method 4203). The thinner shall be defined by the manufacturer.

6.4 Application Properties

The primer shall have satisfactory brushing properties with a minimum tendency to produce bubbles during application. The primer shall not pull nor have a quick set under the brush. The test method shall be in accordance with US Federal Standard No. 141, Method 4321.

6.5 Surface Appearance

The brushed film of primer shall dry to a smooth film of uniform appearance free from grit, seeds, streaks, blisters, or other surface defects when tested in accordance with US Federal Standard No. 141, Method 4541.

6.6 Condition in Container

Primer shall not settle in the container forming a cake that can not be mixed easily by hand stirring (US Federal Standard No. 141, Method 3011).

6.7 Covering Capacity

The covering capacity of primer for surface with roughness of 50 microns (Arithmetical average)

and cleanliness of Sa 2½ shall not be less than 8 square meters per one liter of primer with regards to specified adhesion strength of coating system (see Table 2).

6.8 Toxic Ingredients

The primer shall contain no benzene (benzol), chlorinated solvents, hydrolyzable chlorine derivatives, or other materials of highly toxic nature.

6.9 Safety and Environmental Regulation

The Solvent portion of the primer shall be certified by the manufacturer to comply with the air pollution control rules and regulations and all safety rules and regulations in effect where the coating is used.

Note:

The primer and tape (IPS-M-TP-313) should be from the same manufacturer.

TABLE 1 – PROPERTIES

PROPERTY	UNIT	REQUIREMENT	TEST METHOD
TOTAL SOLID CONTENT (MIN.)	% BY WEIGHT	27	D 2369
DENSITY (AT 25°C)	g/cm^3	0.8 ± 0.03	D 1475
VISCOSITY (FLOW TIME; FORD CUP No. 4) AT 25°C	SECOND	35 - 60	D 1200
Drying Time (AT 23°C)	MINUTE	3 - 10	US Federal Standard No. 141, Method 4061
TEMPERATURE RANGE OF: APPLICATION OPERATION	°C	-20 TO +60 -20 TO +60	

TABLE 2 - PERFORMANCE REQUIREMENTS OF PRIMER IN CONJUNCTION WITH HAND-APPLIED LAMINATED TAPE (IPS-M-TP-313)

PROPERTY	UNIT	REQUIREMENT	TEST METHOD ASTM
ADHESION STRENGTH (MIN.)	kg/cm	1.5	D 1000 (METHOD A)
DIELECTRIC STRENGTH BREAKDOWN (MIN.)	kV/mm	40	D 1000
CATHODIC DISBONDING (MAX.)	mm DIAMETER	50	G 8 (METHOD A)

7. STORAGE LIFE, PACKAGING AND SAMPLING

7.1 Storage Life

The primer shall show no thickening, curdling, skinning, gelling, or hard caking after storage for 24

months, at normal condition, from date of delivery in a full, tightly covered container when tested in accordance with US Federal Standard No. 141, Method 3011.

7.2 Packaging

The primer shall be packaged in containers which shall be perfectly tight in order to prevent solvent from evaporating and being polluted with dust, water and foreign materials.

All containers shall be of a suitable shape, with a sufficiently large aperture to allow adequate stirring and mixing.

The primer shall be furnished in 3.8 liters (1-US gal.) new steel cans, in 20 liters new steel pails or other suitable containers as specified by the purchaser.

7.3 Sampling

Unless otherwise specified by the purchaser, the number of samples for testing shall consist of 10 percent of the lot (see 3), but in no case shall be less than one or more than 10 samples. The result of the tests on at least 2 specimens made from each sample shall be averaged for each test specified in Clause 6 to determine conformance with the specified requirements. The numbers and types of test specimens shall be in accordance with the ASTM test method for the specific properties to be determined.

8. INSPECTION AND TESTING

8.1 All materials supplied under this Standard Specification and it's related Standard (IPS-M-TP-313) 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 and/or manufacturer shall be responsible for the performance and costs for all laboratory test requirements as specified in this Standard.

The manufacturer 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 Samples of any or all ingredients used in the manufacture of this material may be requested by the purchaser and shall be supplied upon request, along with the supplier's name and identification for the sample.

8.4 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 tests, checking of conformity of materials with this Standard requirements, checking of marking and packing and temporary acceptance of materials.

8.5 Samples of primer (and tape) submitted to the purchaser and/or collected by the purchaser will be tested in the purchaser's laboratory or in a responsible commercial laboratory including manufacturer's laboratory designated by the purchaser.

8.6 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 (see 3) 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.

8.7 Prior to acceptance of the supplier's and/or manufacturer's materials, samples of material submitted by the supplier, or collected by the purchaser, will be tested by the purchaser. If any of the samples (see 7.3) is found not to conform to this Standard, materials represented by such sample will be rejected. If samples of the supplier's and/or manufacturer's material that have been previously accepted are found not to conform to this Standard, all such material will be rejected.

8.8 Unless otherwise specified in this Standard Specification, the methods of sampling and testing shall be in accordance with applicable methods of International organization for standardization (ISO), British Standards Institution (BSI) and German Standard (DIN).

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: Primer for use with hand-applied laminated tape (IPS-M-TP-313)

Specification: IPS-M-TP-322

Order No.: .....

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

Type and trade name of primer: .....

Application temperature: .....

Kind of thinner: .....

Cleaning material: .....

Flash point (°C): .....

Drying time (minute); for tape application: .....

Color: Black.....

Batch or Lot No.: .....

Stock No.: .....

Date of manufacture: .....

Quantity of primer in container: .....

Method of application: .....

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

Manufacturer's name and Address: .....

Design guide: For guidance on the usage of this primer reference shall be made to IPS-E-TP-270

Date of inspection: .....

Date of Exp.: .....

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

Storage temperature: .....

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 prepared steel surfaces. The surface of steel shall be prepared in accordance with IPS-C-TP-101 or ISO 8501-7 before applying the primer. (as specified by user)

This primer is intended to be followed by hand-applied laminated tape conforming to IPS-M-TP-313. Mix primer thoroughly before use.

9.4 Direction for Safety

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. 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 primer 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.