

MATERIAL STANDARD

FOR

PRIMER FOR USE WITH HAND-APPLIED LAMINATED TAPE

SUITABLE FOR COLD-APPLIED TAPE COATING SYSTEM

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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.

2. REFERENCES

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

ANSI (AMERICAN NATIONAL STANDARDS INSTITUTE)

Z 129.1 "Precautionary Labeling of Hazardous Industrial Chemicals"

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 "Standard Test Method for Density of Paint, Varnish, Lacquer, and Related Products"

D 2369 "Standard Test Method for Volatile Content of Coatings"

G 8 "Standard Test Method for Cathodic Disbonding of Pipeline Coatings"

IPS (IRANIAN PETROLEUM STANDARDS)

IPS-C-TP-101 "Construction Standard for Surface Preparation" (Not Applicable for Procurement)

IPS-E-TP-270 "Coatings"(Not Applicable for Procurement)

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

SIS (SWEDISH STANDARDS INSTITUTION)

05 5900 "Rust Levels of Steel Structure and Quality Levels for Preparation of Steel Surface for Rust Protect Paints"

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"

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 vulcanization 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.

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), except where otherwise is 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 bucterial 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 Drying Time

The primer shall be quick drying type (3-10 minutes) even at low application temperatures. The test method shall be in accordance with US Federal Standard No. 141, Method 4061.

6.8 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).

6.9 Toxic Ingredients

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

6.10 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	<u>TEST METHOD</u> ASTM
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
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	<u>TEST METHOD</u> ASTM
ADHESION STRENGTH (MIN.)	kg/cm	1.5	D 1000(METHOD A)
DIELECTRIC STRENGTH BREAKDOWN (MIN.)	V/μm (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 its 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

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 before applying the primer.

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.