



**American Water Works
Association**

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ANSI/AWWA C217-16
(Revision of ANSI/AWWA C217-09)

AWWA Standard

Microcrystalline Wax and Petrolatum Tape Coating Systems for Steel Water Pipe and Fittings

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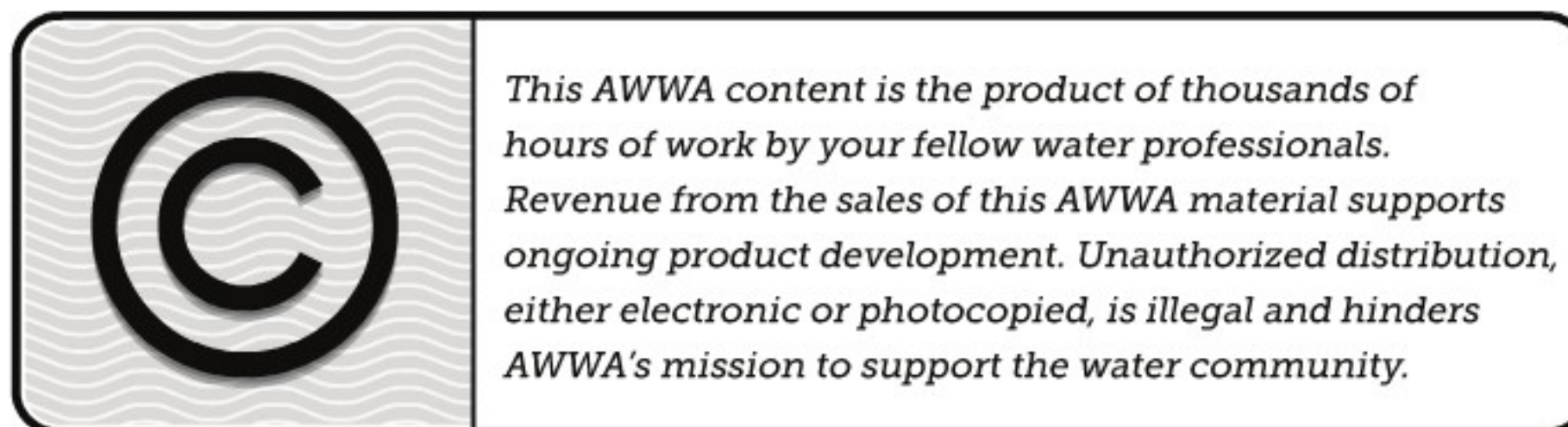
AWWA Standard

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Foreword

This foreword is for information only and is not a part of ANSI/AWWA C217.*

I. Introduction.

I.A. *Background.* This standard was developed to provide information on cold-applied petrolatum tape coatings and petroleum wax tape coatings for external use on special sections, connections, and fittings for buried or submerged steel water pipelines. The latest edition of the standard (2016) was updated to provide a more accurate description of the tape made with microcrystalline wax and petrolatum.

I.B. *History.* Development of this standard was authorized by the American Water Works Association (AWWA) Standards Council on Nov. 3, 1986. The first edition was approved by the AWWA Board of Directors on June 21, 1990. Subsequent revisions to ANSI/AWWA C217 were prepared by the AWWA Standards Committee and approved on June 17, 1995; Jan. 24, 1999; Jan. 18, 2004; and Jan. 25, 2009. This edition was approved on Jan. 16, 2016.

II. Special Issues.

II.A. *Advisory Information on Product Application.* This standard defines the performance of cold-applied petrolatum tape and petroleum wax tape coatings establishing the quality desired for long-term protection and prevention of corrosion. It applies to the exterior coating of steel water pipelines for underground and underwater installation under normal conditions. It is based on previous experience but is not designed for unqualified use under all conditions. The advisability of its use for any installation must be reviewed by the purchaser. If an extended period of aboveground storage of coated pipe is anticipated, the material's ability to resist degradation by ultra-violet light and other atmospheric and environmental conditions should be considered.

III. Use of This Standard. It is the responsibility of the user of an AWWA standard to determine that the products described in that standard are suitable for use in the particular application being considered.

III.A. *Purchaser Options and Alternatives.* The following items should be provided by the purchaser.

1. Standard used that is, ANSI/AWWA C217, Microcrystalline Wax and Petrolatum Tape Coating Systems for Steel Water Pipe and Fittings, of latest revision.
2. Any exceptions to the standard that may be required.

* American National Standards Institute, 25 West 43rd Street, Fourth Floor, New York, NY 10036.

3. Expected aboveground exposure time (foreword, Section II.A).
4. Description and dimensions of each type of special section for each type of exterior protection.
 - a. Normal or average conditions.
 - b. Unusual conditions (Sec. 1.1.1).
5. Physical properties of primer and coating (Table 1).
6. Coating-system thickness (Sec. 4.3.3.4).
7. Surface preparation (Sec. 4.4.1).
8. Tape coating repair (Sec. 4.4.4).
9. Inspection (Sec. 5.4).
10. Testing (Sec. 5.2).
11. Packaging and shipping (Sec. 6.2).
12. Affidavit of compliance, if required (Sec. 6.3).

III.B. *Modification to Standard.* Any modification to the provisions, definitions, or terminology in this standard must be provided by the purchaser.

IV. Major Revisions. Major revisions made to the standard in this edition include the following:

1. The title and scope of the standard were changed to add an additional wax type and expand the intended usage to include steel fittings.
2. The definition for petrolatum was revised and a new definition for micro-crystalline wax was added in place of petroleum wax (Section 3).
3. Section 4 was modified to be consistent with the formatting and section numbers of other AWWA coating standards.
4. Table 1 was modified and new Tables 2, 3, and 4 were added to include information and requirements consistent with changes made to other AWWA coating standards.
5. The minimum breaking strength in Table 3 was modified to more accurately reflect the industry-accepted minimum.
6. Minimum thickness of primer listed in Table 4 was modified to require complete coverage to more accurately reflect industry practice.
7. Sec. 4.3 was modified to include the option of using a wax-based filler material in the coating system.
8. Portions of Sec. 4.5, Field Procedures, language were deleted and the reader is referred to AWWA C604 to be consistent with changes in other AWWA coating standards.

9. Section 5, Verification, was modified to be consistent with the new language and format being used in other AWWA coating standards.

10. New requirements and sections for dielectric strength (Sec. 5.2.2.4), cathodic disbondment testing (Table 3 and Sec. 5.2.2.5), breaking strength (Sec. 5.2.2.6), and elongation (Sec. 5.2.2.7) were added for consistency with other AWWA coating standards.

11. A new Sec. 5.3, Quality Assurance and Records, was added.

12. A new Sec. 5.4, Inspection and Testing by the Purchaser, was added.

13. Under new Sec. 5.5, Quality Control Requirements of Applied Coating System, new requirements for coating appearance (Sec. 5.5.1) and primer thickness (Sec. 5.5.2) were added.

14. The Electrical Continuity Inspection section was updated (Sec. 5.5.3).

15. Previous Sec. 5.3, Notice of Nonconformance, was renamed Rejection (new Sec. 5.6) and revised.

16. Section 6, Delivery, was modified to be consistent with other AWWA coating standards.

17. A new Sec. 6.2.1.4 was added under Packaging and Shipping to include wax-based filler.

18. The information in Sec. 6.2.2, Shipping, Handling, and Storage, was updated.

19. Sec. 6.3, Affidavit of Compliance, was modified to include an affidavit for workmanship.

V. Comments. If you have any comments or questions about this standard, please call AWWA Engineering and Technical Services at 303.794.7711, FAX at 303.795.7603; write to the department at 6666 West Quincy Avenue, Denver, CO 80235-3098; or email at standards@awwa.org.

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AWWA Standard

Microcrystalline Wax and Petrolatum Tape Coating Systems for Steel Water Pipe and Fittings

SECTION 1: GENERAL

Sec. 1.1 Scope

This standard establishes minimum requirements for microcrystalline wax and petrolatum tape coating systems for steel water pipe and fittings.

This standard describes exterior coatings that consist of cold-applied microcrystalline wax or petrolatum primers and tapes and their applications to special sections, connections, and fittings to be used with buried, submerged, and above-ground steel water pipelines. The primers and tapes are not intended for use with steel joints or sections of steel pipe where coatings of cement mortar or concrete are applied directly onto the bare steel pipe. These coatings may be field- or shop-applied according to the provisions of this standard.

1.1.1 *Conditions not described in this standard.* This standard does not describe the additional materials and procedures that may be required for difficult conditions, such as those encountered in building some submarine lines, casing pipe, river crossings, and lines that are in rocky areas or in severe soil stress. Consult the manufacturer for the additional materials and procedures that may be required for these conditions. These materials may not be described in this standard.

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1.1.2 *Maximum temperatures.* AWWA pipe coating standards are written for and based on the service temperature of potable water. Consult the coating manufacturer for conditions and limitations.

Sec. 1.2 Purpose

The purpose of this standard is to provide the minimum performance requirements for cold-applied tape coatings made with microcrystalline wax and petrolatum, including material, application, inspection, testing, marking, and packaging requirements.

Sec. 1.3 Application

This standard can be used as a guide for specifying, applying, inspecting, and testing cold-applied microcrystalline wax and petrolatum conforming to ANSI/AWWA C217 for the exterior of special sections, connections, and fittings for steel water pipelines. The stipulations of this standard apply when this document has been referenced and then only to cold-applied tape coatings made with microcrystalline wax and petrolatum.

SECTION 2: REFERENCES

This standard references the following documents. In their latest editions, they form a part of this standard to the extent specified within the standard. In any case of conflict, the requirements of this standard shall prevail.

ANSI/AWWA C604—Installation of Buried Steel Water Pipe—4 In. (100 mm) and Larger.

ASTM* D70—Standard Test Method for Density of Semi-Solid Bituminous Materials, Pycnometer Method.

ASTM D92-126—Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester.

ASTM D127—Standard Test Method for Drop Melting Point of Petroleum Wax, Including Petrolatum.

ASTM D149—Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies.

ASTM D937—Standard Test Method for Cone Penetration of Petrolatum.

* ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

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ASTM D1000—Standard Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications.

ASTM E96/E96M—Standard Test Methods for Water Vapor Transmission of Materials.

ASTM G8—Standard Test Methods for Cathodic Disbonding of Pipeline Coatings

NACE SP0274—High-Voltage Electrical Inspection of Pipeline Coatings.

SSPC*-SP 1—Solvent Cleaning.

SSPC-SP 2—Hand Tool Cleaning.

SECTION 3: DEFINITIONS

The following definitions shall apply in this standard:

1. *Constructor*: The party that provides the work and materials for placement or installation.
2. *Manufacturer*: The party that manufactures, fabricates, or produces materials or products.
3. *Microcrystalline wax*: A refined mixture of solid, saturated aliphatic hydrocarbons produced by de-oiling petrolatum.
4. *Petrolatum*: A complex semisolid mixture of microcrystalline wax and white mineral oil distilled from petroleum wax.
5. *Purchaser*: The person, company, or organization that purchases any materials or work to be performed.

SECTION 4: REQUIREMENTS

Sec. 4.1 Equipment

Equipment and supplies for cleaning and coating application shall be designed, manufactured, and maintained to comply with the procedures and to obtain the results prescribed in this standard.

* SSPC: The Society for Protective Coatings, 40 24th Street, 6th Floor, Pittsburgh, PA 15222.

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Sec. 4.2 Materials and Workmanship

Materials provided shall meet the provisions of this standard. The entire operation of applying the coating shall be performed by personnel trained in the application of the coating.

Sec. 4.3 Coating System

4.3.1 General. The tape coating system consists of a cold-applied microcrystalline wax or petrolatum primer and tape applied to the exterior surface of buried or submerged steel water pipe. When construction or soil conditions exist where mechanical damage may occur, the use of an overwrap of an extra thickness of tape, a suitable outerwrap, reinforcements, or special backfill provisions may be required (Sec. 4.5). If these conditions exist, consult the manufacturer. Where voids or other surface irregularities are encountered, a microcrystalline wax or petrolatum-based filler material may be required where the tape will not be in full contact with the steel surface.

4.3.2 Primer. The primer shall be a compound of microcrystalline wax or petrolatum and may contain suitable inhibitors. The primer used shall be supplied by the tape manufacturer and shall conform to the requirements given in Tables 1 and 2. The primer shall protect the metal surface before application of the tape and promote adhesion of the tape to the surface.

Table 1 Properties of primer and coating

Property	Requirements		Test Method
	Minimum	Maximum	
Primer			
Flash point	150°F (65°C)		ASTM D92
Specific gravity at 77°F (25°C)	0.90	1.25	ASTM D70
Drop melting point	133°F (56°C)		ASTM D127
Cone penetration at 77°F (25°C), 102.5 g wt, 5 seconds	0.29 in. (7.4 mm)	0.98 in. (25 mm)	ASTM D937
Tape Coating			
Flash point	140°F (60°C)		ASTM D92
Microcrystalline wax or petrolatum components applied to fabric carrier, by weight	50%		Sec. 5.2.1.1
Drop melting point of saturant	140°F (60°C)		ASTM D127
Cone penetration of saturant at 77°F (25°C) 102.5 g wt, 5 seconds	0.24 in. (6.1 mm)	0.67 in. (17.0 mm)	ASTM D937

Table 2 Prequalification requirements of primer

Property	Requirements		Test Method
	Minimum	Maximum	
Microcrystalline wax or petrolatum content, by weight	70%		Sec. 5.2.1.1

4.3.3 *Tape coating.* The tape coating shall conform to the following requirements.

4.3.3.1 *Materials.* The tape coating shall be a cold-applied saturant tape made from either microcrystalline wax or petrolatum and a noncellulosic synthetic fiber fabric. The fabric shall be encapsulated and coated on both sides with the microcrystalline wax or petrolatum. Inert materials may be added to improve applications, and thermal extenders may be added for temperature resistance. If exposure conditions require it, the tape shall be UV stable per the manufacturer's recommendation.

The tape coating shall be applied after the primer has been applied. The main function of the tape coating is to serve as a corrosion barrier. The tape coating shall conform to the appropriate values in Table 1.

4.3.3.2 *Form.* The microcrystalline wax or petrolatum shall be supplied in sheets, pads, or rolls.

4.3.3.3 *Dimensions.* Typical tape roll widths are 2, 3, 4, 6, 8, 9, and 12 in. (50, 75, 100, 150, 200, 225, and 300 mm). Typical standard lengths are 9, 18, and 33 ft (2.75, 5.5, and 10 m). Pads and sheets shall be sized to fit the area that is to be covered, allowing for overlap as specified in Sec. 4.4.3.

4.3.3.4 *Thickness.* The total minimum applied thickness shall be a sum total of the minimum primer and tape thicknesses in accordance with Table 3. Thicker coating application may be required for certain soil or service conditions. The purchaser should consult the manufacturer for thickness limitations.

Sec. 4.4 Coating Applications

4.4.1 *Surface preparation.*

4.4.1.1 *Surface cleaning.* Bare surfaces shall be free from mud, loose mill scale, lacquer, wax, paint, coal tar, asphalt, oil, grease, and other foreign matter. Surfaces shall be inspected and, if required, precleaned according to SSPC-SP 1. Preheating to remove oil, grease, mill scale, water, and ice may be used, provided

Table 3 Prequalification requirements of tape

Property	Requirements		Test Method
	Minimum	Maximum	
Width deviation		−5% to +10%	Sec. 5.2.2.1
Thickness	40 mil (1,016 μm)		Sec. 5.2.2.2
Water vapor transmission rate		0.10 g/(h·m ²)	Sec. 5.2.2.3
Dielectric strength	170 V/mil		Sec. 5.2.2.4
Cathodic disbondment		20 mm (0.78 in.)	Sec. 5.2.2.5
Breaking strength, width	18 lbf/in. (3,152 N/m)		Sec. 5.2.2.6
Elongation at break	6%		Sec. 5.2.2.7

Table 4 Quality-control properties of primer

Property	Requirements		Test Method
	Minimum	Maximum	
Thickness	Complete coverage	—	Sec. 5.5.2

surfaces are heated in a uniform manner to avoid distortion. Surface moisture shall be removed as recommended by the coating manufacturer.

Welds shall be cleaned of welding slag, spatter, and scale and shall be allowed to cool before the coating is applied. Sharp edges or burrs that could puncture or cut the tape shall be removed by grinding or filing. Bare surfaces to be coated shall be cleaned in accordance with SSPC-SP 2 immediately before applying the primer and tape.

4.4.2 Priming. Primer shall be applied by brush, hand, glove, or roller. A uniform and continuous coat (Table 4) shall be manually rubbed on, thereby wetting the metal surface sufficiently so as to not be easily removed after the application. If moisture is present, the primer shall be rubbed and pressed onto the surface until it adheres to the surface. Drying or curing of the primer is not required. Application of tape shall begin immediately after the primer and filler (if necessary) are applied.

4.4.3 Coating and wrapping. The tape coating system shall be applied as recommended by the manufacturer and shall not exhibit defects, such as folds and bridging.

Apply tape using a spiral wrap, cigarette wrap, or precut pieces formed over irregular surfaces with a minimum 1.0-in. (25-mm) overlap. The tape shall be

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applied by hand-pressing and molding the tape into conformity with the surface so that it does not bridge over irregular surface configurations. Wrapping shall begin approximately 3.0 in. (76 mm) behind the cutback area to be wrapped. On straight piping, the tape shall be spiral-wrapped around the pipe with a minimum 1.0-in. (25-mm) overlap at the seam. If starting or finishing at a straight edge, the tape shall be wrapped entirely around the pipe (360°) while touching the end edge before starting at an angle to begin the spiral. If the previous roll is headed in a downward direction, the next roll shall be tucked under the previous roll. Each roll shall be stretched tightly to prevent air bubbles.

4.4.3.1 *After application.* The overlap seams of the tape shall be sealed by tapering and pressing the seam by hand, creating a continuous coating surface. The tape shall have full contact with the substrate or applied filler material.

4.4.3.2 *Vertical sections.* On sections such as pipe soil-to-air transitions, the pipe must be wrapped from the bottom to the top to ensure that downward-flowing water and backfill do not penetrate into a seam. These vertical sections shall be wrapped with a 50 percent overlap. The tapes used for pipe soil-to-air areas shall be ultraviolet (UV) light stable if subject to sunlight exposure.

4.4.4 *Tape coating repair.* All damage, visual holidays, or unsatisfactory laps shall be repaired by removing any frayed or damaged tape and any contaminants at the affected area. Primer shall be applied to the area, followed by the application of additional tape coating, to completely cover the area. Each repair shall begin and end on sound, undamaged tape coating.

Sec. 4.5 Field Procedures

4.5.1 *General.* The methods and practices found in ANSI/AWWA C604 shall be followed for the handling, shipping, storage, and installation of pipe coated with this material.

4.5.2 *Special requirements.* Trenches shall be backfilled in a way that prevents abrasion or other damage to the tape coating.

Unless otherwise specified, the following requirements shall be met. Where the trench traverses rocky ground containing hard objects that could penetrate the protective coating, the pipe shall be bedded on a 6-in. (150-mm) thick (minimum) layer of screened earth or sand. Other acceptable bedding material may be used in place of the earth or sand.

Backfill shall be placed around the exterior of the coated pipe only after the final inspection has been made and the exterior coating has been approved. If rocks or other hard objects occur in the backfill material along any section of the pipeline,

backfill material void of damaging edges shall be placed around the coated pipe to a minimum depth of 6 in. (150 mm) above the pipe before backfilling the remainder of the trench. Bedding and backfill shall be compacted in the trench according to the purchaser's specification. Rodding with metal rods or other metal tools that could come into contact with and damage the tape coating shall not be permitted.

SECTION 5: VERIFICATION

Sec. 5.1 Coating Materials Prequalification

Prequalification of the coating materials shall be the manufacturer's certified test reports or one of the following as specified by the purchaser: (1) the testing of samples of the coating materials submitted by the constructor with testing conducted at an independent accredited laboratory, or (2) acceptance on another specified basis.

Sec. 5.2 Requirements of Coating System

5.2.1 *Properties of primer.*

5.2.1.1 Wax content, determining solvent-extractable material in the tape.

In this test procedure, a known weight of material shall be supplied with a continuous flow of hot solvent until the solvent no longer becomes discolored. The solvent-extractable material is calculated after weighing the dried residue.

1. Apparatus.
 - a. Soxhlet extraction apparatus with reflux condenser.
 - b. A 250-mL flask containing approximately 150 mL of solvent (use 1,1,1 trichloroethane or other suitable solvent).
 - c. Electric heating mantle.
 - d. Cellulose extraction thimbles (22-mm inside diameter [ID] × 88 mm).
 - e. Filter paper (700-mm slow or medium).
2. Procedure. The test shall be performed in triplicate. A thimble and filter paper shall be dried in an oven at 105°C for at least 30 minutes. The thimble and filter paper shall then be cooled in a desiccator for 30 minutes and weighed with the weight recorded as *A*, in grams, carried to two decimal places. The weighing must be done as quickly as possible to avoid moisture absorption. Thereafter, approximately 5 g of a representative sample of the petrolatum or petroleum wax shall be introduced into the thimble. The filter paper, folded into a thimble shape,

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shall be placed on top of the sample compound. (The purpose of the filter paper is to ensure that no insoluble matter is washed out with the solvent.)

The thimble with sample and filter paper shall then be reweighed, with the total weight recorded as B , in grams, carried to two decimal places.

The thimble shall be placed in a Soxhlet apparatus. The rate of heating the solvent and the cooling in a condenser shall be adjusted to ensure there is a regular flow of solvent through the Soxhlet and thimble. The solvent shall then flow continuously until it is no longer discolored. The heat source shall be removed and the thimble allowed to cool slightly before it is removed from the apparatus. The thimble shall be dried for 1 hour in a current of air. The thimble shall be placed in an oven at 105°C for 30 minutes, and then cooled in the desiccator for 30 minutes. The thimble shall then be reweighed, with the total weight recorded as C , in grams, to the nearest 0.2 mg.

3. The percent of solvent-extractable material is calculated as the following:

$$\% \text{ solvent-extractable material} = 100 \times (B - C)/(B - A) \quad (\text{Eq 1})$$

5.2.2 *Prequalification requirements of coating system.*

5.2.2.1 Tape width. Remove a specimen of tape at least 3 ft (0.9 m) long from each of three randomly selected rolls or select three sheets or pads of tape specimens at random from each lot and place on a smooth, flat surface. The width of the specimen shall be measured at several points along the length of the sample to the nearest $\frac{1}{16}$ in. (1 mm). Any width deviation from the limits shown in Table 3 shall constitute failure to meet the requirements.

5.2.2.2 Tape thickness. The thickness of the tape shall be measured at not less than 10 locations on each of the three sheets, pads, or roll specimens used in Sec. 5.2.2.1. The measurement shall be made with a micrometer calibrated to read in thousandths of an inch (millimeters) and having contact feet of not less than $\frac{1}{4}$ in. (6 mm) in diameter. Remove remaining wax residue from the feet of the micrometer between measurements. Do not allow the micrometer to press into the tape such that the tape thickness is reduced. Any thickness measurement below the value listed in Table 3 shall constitute failure to meet the requirements.

5.2.2.3 Water vapor transmission. The tape coating shall be tested for water vapor transmission according to ASTM E96, Procedure A. A value in excess of the limits shown in Table 3 shall constitute failure of the tape to meet the requirements.

5.2.2.4 Dielectric strength. The minimum dielectric strength shall be determined in accordance with ASTM D149. A value less than that listed in Table 3 shall constitute failure to meet the requirement.

5.2.2.5 Cathodic disbondment. The cathodic disbondment of the coating system shall be determined in accordance with ASTM G8. The test shall run for 30 days. Each specimen shall be a minimum 2 in. (50 mm) in diameter laboratory coated steel pipe prepared per Sec. 4.4.1.1. A single intentional holiday 0.25 in. (6.35 mm) in diameter shall be made in each specimen. The disbondment shall be measured from the edge of the initial holiday along each radial cut. The average of these measurements shall be the result of the sample. Three specimens shall be tested and the results averaged. An average value greater than that listed in Table 3 shall constitute failure to meet the requirement.

5.2.2.6 Breaking strength. The tape shall be tested for breaking strength in accordance with ASTM D1000. An average value below the limits given in Table 3 shall constitute failure of the tape to meet the requirements.

5.2.2.7 Elongation. The tape shall be tested for elongation in accordance with ASTM D1000. An average value below the limits given in Table 3 shall constitute failure of the tape to meet the requirements.

Sec. 5.3 Quality Assurance and Records

The constructor shall use a quality assurance program or system to ensure the quality controls in this section are followed. Completed records of inspection work shall be made available upon the purchaser's request.

Sec. 5.4 Inspection and Testing by the Purchaser

5.4.1 *Inspection.* The entire procedure of applying the coating materials as described in this standard may be inspected by the purchaser from surface preparation to completion of coating. Such inspection shall not relieve the constructor of responsibility to provide materials and perform work in accordance with this standard.

5.4.2 *Access of purchaser.* The purchaser shall have access to all areas used to perform the work according to the provisions of this standard.

5.4.3 *Facilities for purchaser.* In accordance with conditions agreed to by the purchaser and the constructor, the purchaser shall be provided with facilities and space for inspection, testing, and information-gathering purposes.

Sec. 5.5 Quality Control Requirements of Applied Coating System

5.5.1 *Coating appearance.* All coated pipe shall be visually inspected. The coating shall appear continuous with the overlap seams sealed by pressing, molding, and tapering. There shall be no air pockets underneath the tape and it shall have direct, intimate contact with the metal surface.

5.5.2 *Primer thickness.* A thin film of primer applied to the entire metal surface shall be visually inspected for complete coverage.

5.5.3 *Electrical continuity inspection.* The coated pipe may, at the purchaser's option, be inspected in accordance with NACE SP0274 with a holiday detector that does not damage the coating and does not insulate the inspection electrode. It may be necessary to use saturant-free outerwraps that can be applied over the tape coating, thereby preventing insulation of the inspection electrode that could block the electrical signal (making the detector inoperative).

Sec. 5.6 Rejection

5.6.1 *Surface preparation.* The purchaser may reject any pipe or fitting if the surface condition does not comply with the requirements of Sec. 4.4.1. Pipe or fittings rejected due to inadequate cleaning shall be recleaned.

5.6.2 *Coating materials.* If any sample of coating material does not comply with this standard, the coating materials represented by the sample shall be rejected.

5.6.3 *Coating work.* The coating work shall be performed by applicators trained in the application of the coating process. If, at any time, it is determined that the procedure of applying the coating material is not according to this standard, the coating shall be rejected on the affected pipe and fittings.

5.6.4 *Coated pipe and fittings.* Coated pipe or fittings not meeting the minimum requirements of this standard shall be repaired or rejected.

SECTION 6: DELIVERY

Sec. 6.1 Marking

Containers shall be plainly marked with the name of the manufacturer, type of material, batch or lot number, date of manufacture, and information as required by federal, state, or provincial laws.

Sec. 6.2 Packaging and Shipping

6.2.1 *Packaging.* All primers, fillers, and tape coatings purchased or used according to this standard shall be packaged in containers that ensure acceptance, safe delivery to their destination, and protection while in storage. Preference for individual or multiple packaging of tape coating and size of primer container may be specified. All primers, fillers, and tapes shall be stored in the original packaging until the time of use.

6.2.1.1 Individual items. Each sheet, pad, or roll of tape shall be packaged to prevent it from adhering to the packaging material or the container.

6.2.1.2 Multiple items. Multiple sheets, pads, or rolls shall be packaged in quantities not to exceed the weight limitations of the container specification. Each sheet, pad, or roll of tape shall be protected from adhering to other sheets, pads, or rolls of tape coating, to the container, or to the packaging material itself, using separators. See Sec. 4.3.3.3 for tape roll width dimensions.

6.2.1.3 Primer. Primer shall be packaged in pails or other containers that comply with the applicable federal, state, provincial, or local regulations.

6.2.1.4 Filler. Wax paste, gel, multiple blocks, strips, or blankets shall be packaged in quantities not to exceed the weight limitations of the container specification. Each block, strip, or blanket of filler shall be protected from adhering to other blocks, strips, or blankets of filler material, to the container, or to the packaging material itself, using separators.

6.2.2 *Shipping, handling, and storage.* Materials shall be stored and protected from the elements as required by current applicable federal, state or provincial, and local regulations. Temperature ranges in the storage area shall be maintained within the limits recommended by the manufacturer.

Sec. 6.3 Affidavit of Compliance

6.3.1 *Materials affidavit.* The purchaser may require an affidavit affirming that all materials provided and work performed comply with the applicable requirements of this standard.

6.3.2 *Workmanship affidavit.* The purchaser may require an affidavit from the applicator that the work furnished complies with all applicable requirements of this standard.

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