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Application of Internal Plastic Coatings for Oilfield Tubular Goods and Accessories

ABSTRACT

This standard presents guidelines for the proper application of plastic coatings to the internal surfaces of oilfield tubular goods and accessories. This standard addresses initial inspection of the tubular goods and accessories prior to coating, surface preparation, coating application, coating inspection, coupling/connection make-up, quality control, handling, storage, shipping, and marking. This standard is maintained by Task Group 487.

KEYWORDS

oil and gas, internal plastic coatings.

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Foreword

In NACE standards, the terms shall, must, should, and may are used in accordance with the definitions of these terms in the NACE Publications Style Manual. The terms shall and must are used to state a requirement, and are considered mandatory. The term should is used to state something good and is recommended, but is not considered mandatory. The term may is used to state something considered optional.

This standard practice was prepared to serve as an industry guideline for the proper application of internal plastic coatings on oilfield tubular goods and accessories. It is intended for users, applicators, and manufacturers.

Premature failures of coatings on oilfield tubular goods and accessories often occur when the surface has not been properly prepared or the coating has not been properly applied. This standard presents proper procedures to be followed to ensure appropriate application of the coating to give the anticipated extended life to oilfield tubular goods and accessories.

This standard was originally prepared in 1991 by NACE Task Group T-1G-4, a component of Unit Committee T-1G on Protective Coatings, Elastomers, and Other Nonmetallic Materials for Oilfield Use. It was reviewed by T-1G and reaffirmed in 1996. It was reaffirmed in 2002 and 2008 by Specific Technology Group (STG) 33—Oil and Gas Production: Nonmetallics and Wear Coatings (Metallics). It was revised in 2017 by Task Group (TG) 487, Review and Revise as Necessary SP0191-2008 (formerly RP0191). This standard is issued by NACE International under the auspices of STG 33.

Application of Internal Plastic Coatings for Oilfield Tubular Goods and Accessories

Section 1: General

1.1 This standard presents requirements for the proper application of internal plastic coatings (IPC) to the internal surfaces of oilfield tubular goods and accessories.

1.2 The functions of the internal plastic coating system may be, but are not limited to the following:

1.2.1 Serve as an impermeable barrier that prevents corrosive service environment (transported gas, fluids, and/or introduced chemicals) from accessing the bare steel surface of the pipe bore.

1.2.2 Enhancing flow efficiency of transported products by reduction of friction coefficient.

1.2.3 Improving hydraulic properties and flow-assurance of the pipe by reducing of formation of blockages by dropped out solids, attachment of harmful bacteria to the pipe bore surface, bonding of hydrates to the pipe wall, etc.

1.2.4 Reduction of erosion and wear of steel internal surfaces by transported solids.

1.3 Properly applied IPC significantly reduces the risk of internal corrosion and premature failure. Additional benefits may be realized by the improved flow efficiency and flow assurance.

1.4 This standard addresses initial inspection of the tubular goods and accessories prior to coating, surface preparation, coating application, coating inspection, coupling/connection make-up, quality control, handling, storage, shipping, and marking.

Section 2: Definitions

Applicator: An individual or company that performs the IPC application.

IPC material: Internally plastic-coated tubular goods (tubing, casing, line pipe, or drill pipe) and accessories (couplings, fittings, valves, mandrels, packers, etc.)

Manufacturer: An individual or company that manufactures the IPC.

Plastic coating: A polymeric film applied to oilfield tubular goods (tubing, casing, line pipe, or drill pipe) and accessories (couplings, fittings, valves, mandrels, packers, etc.) to form a protective barrier between the metal surface and the environment to minimize corrosion, contamination, deposit formation, improve flow efficiency and/or flow assurance.

Thick-film coating: An IPC that has a final dry film thickness of 250 to 760 µm (10 to 30 mil).

Thin-film coating: An IPC that has a final dry film thickness of less than 250 µm (10 mil).

User: An individual or company, or its authorized representative(s), who makes use of the internally plastic-coated (IPC) tubular goods and accessories. The user is responsible for selection of the IPC for the intended service.

Section 3: Preliminary Requirements

3.1 The Applicator shall furnish all labor, coating, inspection service, and equipment to coat tubular goods and accessories internally and inspect in accordance with this standard.

3.1.1 The applicator shall use the coating selected, approved, or agreed to by the user.

3.2 In cases in which this standard is in conflict with the coating applicator's specifications, the applicator must review conflicts with the user prior to the job startup.

3.3 The user reserves the right to inspect all IPC materials and activities at any time and to reject any work that does not meet the requirements of this standard.

3.4 The applicator shall notify the user a minimum of 72 hours prior to the startup of coating operations, unless otherwise agreed between the user and applicator.

3.5 The user shall ensure that all tubular goods and accessories supplied by the user meet applicable NACE and industry standards, including API,[1] ANSI,[2] ASTM,[3], ISO,[4] and SSPC.[5]

3.6 The applicator shall provide the user with specifications addressing the application procedures for the coating being applied.

3.7 The user shall specify the level of holiday inspection of IPC tubular goods to be performed on all specified coated surfaces in accordance with one of the following levels:

Level I: The tube body.
Level II: The tube body and pin-end chamfer.
Level III: The tube body, pin-end chamfer, and couplings.

3.8 The user shall specify the holiday allowance for each thickness of IPC material.

3.9 The user shall take all practical measures to provide material suitable for coating to the applicator. The pin ends on API 8-round[11] connections shall be bullet-nosed (rounded), leaving no sharp surfaces. Appendix A (mandatory) specifies dimensions for API 8-round bullet-nosed pin ends.

3.10 The applicator shall take all practical measures to identify unsuitable material prior to processing.

3.11 Appendix B (mandatory) lists inspection equipment which shall be used to perform inspection procedures.

Section 4: Initial Inspection

4.1 The applicator shall inventory all tubular goods and accessories received, noting the following applicable information:

(a) Number of pieces.
(b) Approximate total length.

[1] American Petroleum Institute (API), 1220 L St. NW, Washington, DC 20005-4070.
[2] American National Standards Institute (ANSI), 25 West 43rd St., 4th Floor, New York, NY 10036.
[3] ASTM International (ASTM), 100 Barr Harbor Dr., PO Box C700, West Conshohocken, PA 19428-2959.
[4] ISO, BIBC II, Chemin de Blandonnet 8, CP401, 1214 Vernier, Geneva, Switzerland.
[5] SSPC, 800 Trumbull Dr., Pittsburgh, PA 15205.