Item No. 21099

Joint Standard

NACE No. 11/SSPC-PA 8
Thin-Film Organic Linings Applied in New Carbon Steel Process Vessels

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Foreword

This standard recommended practice specifies procedures to design, install, and inspect thin-film organic linings applied to new carbon steel process vessels to prevent corrosion and other forms of degradation, such as hydrogen-induced cracking, or to prevent product contamination. It is also useful for lining applications in existing process vessels and equipment. There is a recognized need for such a standard in order to achieve long-term durability in such applications. The standard is based on applications of organic linings 500 µm (20 mils) or less. Its concepts can be employed in the application of thicker linings but the specified procedures may be modified or not required. This recommended practice is useful for lining vessels in many industries including, but not limited to, refining, chemical, water-treating, and food. The intended users are owners, contractors, inspectors, applicators, vessel designers, protective coatings specialists, and others concerned with the lining of process vessels.

This joint standard was prepared by the NACE/SSPC Task Group 246 on Thin-Film Organic Linings Applied in Process Vessels and Tankage. This task group is administered by NACE Specific Technology Group (STG) 03 on Protective Coatings and Linings—Immersion/Buried. It is also sponsored by STG 02 on Protective Coatings and Linings—Atmospheric, STG 04 on Protective Coatings and Linings—Surface Preparation, STG 34 on Petroleum Refining and Gas Processing, and STG 43 on Land Transportation. This standard is published by NACE under the auspices of STG 03, and by SSPC.

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Contents

Section 1: General

1.1 Procedures detailed in this recommended practice shall be followed during the design, installation, and inspection of a thin-film (500 µm [20 mils] or less) organic lining in process vessels to maximize the service life of the process vessel.

1.2 A thin-film lining material must be carefully evaluated for use within a process vessel. The evaluation must be based upon consideration of the process stream constituents, temperature, pressure, and other factors. An important consideration is the end use for the process-vessel lining—a corrosive or noncorrosive service. Usually, a lining that has long-term service and experience in similar process conditions is selected.

1.3 Fabrication of the vessel must be suitable for lining application including surface preparation, application, and curing. Fabrication details are influenced by the service—corrosive or noncorrosive.

1.4 Dehumidification is desirable during the entire installation process because it achieves climate control during surface preparation and lining application. When dehumidification is employed, the lining application can be carried out without interruption, avoiding possible contamination by blasting debris.

1.5 The lining may be cured at ambient temperature or heat cured at an elevated temperature. It can be applied in the shop or at the work site. The lining must be applied according to the lining manufacturer's instructions, unless superseded by the direction of the owner.

1.6 When heat cured, instrumentation must be installed to determine the time and external metal temperature during the lining curing cycle. When applied and heat cured at the work site, the vessel shall be thermally insulated to provide uniform heat retention. Particular attention should be paid to heat sinks, such as vessel supports, ladders, and other attachments.

1.7 If piping, nozzles, or other appurtenances are to be abrasive blast cleaned and lined, proper equipment must be available.

1.8 All applicable safety regulations shall be followed during all phases of surface preparation, application, inspection, and curing.

1.9 Thin-film organic linings are not generally used when the process operating temperature exceeds 120°C (250°F). Also, if exposed in environments that cause excessive corrosion, the vessel's corrosion allowance, or internal inspection frequency, may require reevaluation. (See Paragraph 3.6.)

1.10 Appendix A contains a listing of all documents and standards used in conjunction with this recommended practice.

1.10.1 The lining manufacturer's technical data sheet, material safety data sheets (MSDS), and application and curing instructions shall be used in conjunction with the documents listed in Appendix A and the requirements contained within this recommended practice.

1.10.2 Any conflict between documents shall be resolved by the owner.

1.11 During all phases of the vessel lining installation, inspection shall be conducted by the lining applicator and, when appropriate, by the owner's inspector. (See Section 8.)

1.12 The applicator shall record all pertinent information concerning the vessel lining installation within the *NACE Coating Inspector's Logbook*[1] or equivalent, as approved by the owner. This logbook shall be available to the owner's inspector at all times.

Section 2: Definitions[(1)]

Abrasive Blast Cleaning: Also called *abrasive blasting*; a surface preparation method that uses an abrasive propelled by air pressure, centrifugal force, or water pressure to clean and usually to add a profile to a surface.

Anchor Pattern: Contour of a blast-cleaned surface; it is classified by depth and texture (rounded, angular).

Coating: A liquid, liquefiable, or mastic composition that, after application to a surface, is converted into a solid, protective, decorative, or functional adherent film.

Corrosion Allowance: Additional metal thickness added to the vessel design thickness to offset the effect of corrosion metal loss during service.

[(1)] Some definitions are extracted from *Inspection of Coatings and Linings*,[2] SSPC, 1997, Appendix B—Glossary; *SSPC Protective Coatings Glossary* (SSPC-00-07);[3] and *NACE Glossary of Corrosion-Related Terms*,[4] NACE, 2002.