

Joint Technology Report SSPC-TR 4/NACE 80200

Preparation of Protective Coating Specifications for Atmospheric Service

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Foreword

The purpose of this SSPC/NACE technical committee report is to describe current practices for the preparation of a protective coating specification for atmospheric service. It provides a general description of a specification; as well as a review of the contents of a specification; the typical selection of protective coatings; and the establishment of job and inspection requirements. Format and writing style are stressed. There is also discussion of commercial aspects of the work that have not typically been contained in the technical specification. This report is intended for facility owners, engineering/erection contractors, in-plant

protective coating specialists, inspectors, and others responsible for protective coating work.

This joint technical committee report was prepared by the SSPC/NACE Task Group 004 on Coating Specifications. This joint task group is administered by NACE Specific Technology Group (STG) 80 on Intersociety Joint Coatings Activities. It is also sponsored by STG 03 on Protective Coatings and Linings – Immersion/Buried. This report is published by SSPC and by NACE under the auspices of STG 80.

Definition of a Specification

A coating specification is a document that details the mandatory technical requirements of work involving the use of protective coatings. It includes requirements for the quality of materials to be used during a protective coating application and the work to be accomplished. The general objective of the coating specification is to ensure that the owner or purchaser receives the finished work product that is desired. This is accomplished by providing a detailed definition of work to be done in a well-designed specification.

Without a well-designed protective coating specification, problems such as unrealistic bidding, disputes of specific requirements, inappropriate materials or workmanship, delays in completing the work, costly change orders, and increased costs, are likely to occur. Specifications are concise and specific, and contain essential information and requirements.

There are several objectives for preparing a protective coating specification. These include, but are not limited to, the following:

- To obtain specific protective coating products or their equals;
- To assure quality materials and workmanship;
- To determine inspection requirements;
- To assure timely completion of work;
- To avoid disputes;
- To obtain reasonable costs that reflect the specification requirements;
- To avoid costly change orders and claims;
- To meet safety, environmental, and regulatory requirements of the protective coating operation; and
- To assure suitable coating systems are applied to the correct equipment.

General Specification Characteristics

The following topics are frequently included in the first part of a protective coating specification, not necessarily in the order as discussed in subsequent paragraphs.

- **Scope of Work:** A summary is used at the beginning of a specification to state the scope and purpose of the work. It provides general information and not specific items that are described elsewhere in other specifications. A title is sometimes adequate for this purpose.
- **Reference Section:** The reference section lists all documents to be used in conjunction with the specifi-

cation. No reference is made to standards or technical specifications that are not part of the specification requirements. Generally, only one standard method is referenced for each requirement, although alternative methods are often available. These documents might include, but are not limited to, those of AISC,⁽¹⁾ ASTM,⁽²⁾ AWS,⁽³⁾ AWWA,⁽⁴⁾ ISO,⁽⁵⁾ SSPC, NACE, ACI,⁽⁶⁾ ICRI,⁽⁷⁾ PDCA,⁽⁸⁾ and coating manufacturers' materials safety data sheets (MSDS) and product data sheets.

⁽¹⁾ American Institute of Steel Construction (AISC), 1 E Wacker Drive, Suite 3100, Chicago, IL 60601-2001.

⁽²⁾ American Society for Testing and Materials (ASTM), 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

⁽³⁾ American Welding Society Inc. (AWS), 550 N W Le Jeune Road, Miami, FL 33126.

⁽⁴⁾ American Water Works Association (AWWA), 6666 W Quincy Avenue, Denver, CO 80235.

⁽⁵⁾ International Organization for Standardization (ISO), Case Postale 56, Geneva CH-1211, Switzerland.

⁽⁶⁾ American Concrete Institute (ACI), P.O. Box 9094, Farmington Hills, MI 48333.

⁽⁷⁾ International Concrete Repair Institute (ICRI), 1323 Shepard Drive, Suite D, Sterling, VA 21064.

⁽⁸⁾ Painting and Decorating Contractors of America (PDCA), 3913 Old Lee Highway, Suite 33B, Fairfax, VA 22030.

- **Definition Section:** Terms that could be subject to interpretation are defined in this section.
- **Submittals Section:** Documents or samples to be supplied by the coating contractor are normally specified in this section. These might include the following:
 - Samples of coatings to be used;
 - Drawdown films of these coatings;
 - Coated reference panels;
 - Certificates of conformance or performance;
 - Manufacturer's product data sheets and application instructions;
 - Material safety data sheets;
 - Contractor's projected schedule or work plan;
 - Contractor certification (such as SSPC¹, ², ³ or equivalent)
 - Contractor's QC program and procedures; and
 - Contractor's inspector training and certification.

The submittals are usually kept to a minimum and are not always utilized unless specified by the owner or purchaser in order to accomplish the work.

- **Quality Assurance Section:** This section details all items deemed necessary for quality assurance. This can include requesting qualifications of the contractor and his personnel, certification of the contractor and personnel, and field sampling. It frequently includes a

proposed inspection plan as a submittal, because the contractor might be responsible for inspection as well as for quality of the work. Normally, the contractor is also responsible for meeting all applicable regulations as well as the owner's working rules and safety standards.

- **Prejob Visit and Conference:** Many specifications require a jobsite visit and conference to review work procedures and standards.
- **Delivery, Storage, Handling, and Disposal Section:** Detailed in this section are requirements concerning delivery, storage, and handling of products to be used. Collection, storage, and disposal of waste materials and abrasive debris are also detailed.
- **Site Conditions Section:** Conditions at the job site that can affect the work are defined in this section or in other contract documents. These conditions can include utility availability, safety, environmental, and personnel considerations. Any potentially hazardous materials or operations are normally noted. Failure to note site conditions in the specification can result in costly change orders.
- **Resolution of Conflicts:** A procedure for resolving conflicts in the specification, references, or product manufacturer's instructions is normally stated.

Product Specification

This portion of the specification defines the requirements for protective coating products to be employed in the work. Protective coating products can be specified by brand name, performance criteria, or qualified products list. When specific brand names are listed, it is common

practice to provide the coating contractor with a choice by specifying two or more products.

All protective coatings in a single system are usually supplied by the same manufacturer. Color requirements are typically specified in this section.

Project Execution

The execution section details surface preparation and application of protective coatings. Surface preparation is a vital factor in achieving long-term durability of the coating system. Surface preparation is defined by industry standards and can include hand/power tool cleaning, abrasive blasting, and hydroblasting, among others, or a combination of different techniques. If an abrasive is used, the owner generally specifies the type. However, depth of anchor pattern is usually specified in the coating manufacturer's data sheets. The owner also specifies any limiting conditions such as requirements for dust, debris, and overspray control, limiting schedules for abrasive blast cleaning or coating application, and any other limitations affecting the work.

The protective coating systems to be used for carbon steel piping, vessels, tankage, or other equipment exposed to the atmosphere are typically specified, along with the level of surface preparation, coating material, number of coats, dry film thickness, and finish color.

Other protective coating systems for use under insulation or fireproofing, at elevated equipment operating temperatures, for safety identification, below grade, or water, and other environments or situations are also specified. Protective coating systems are frequently listed in tabular form within or at the end of the specification.

At times, the owner specifies that hot-dip galvanizing be substituted for protective coating systems, especially for hand rails, stairs, ladders, safety cages, or other structures. As appropriate, galvanizing is sometimes specified for beams and columns. The standards that are to be used for galvanizing applications are usually included in the reference section of the specification and can include ASTM A 123⁴ and ASTM A 780.⁵