

SSPC: The Society for Protective Coatings

HOW TO USE SSPC STANDARDS, SPECIFICATIONS, AND GUIDES

1. Scope of Volume 2

This volume contains both mandatory documents (standards, standard procedures, methods, or specifications) to be used in preparation of procurement documents for painting work, and non-mandatory documents (guides, technology updates, technology reports, and technology guides) that provide guidance in current good practice. It is the product of many years of broad open consensus work by the SSPC staff and by the leading specialists in each field of protective coatings technology.

The aims of the 2005 edition of Volume 2 are:

- To incorporate by means of composition/performance oriented specifications the best current technology on protective coatings;
- To update SSPC standards and specifications based upon results of many years of experience with the existing ones;
- To present an association between “environmental zones” of exposure and the selection of painting system specifications;
- To facilitate the incorporation of SSPC standards and specifications into procurement documents by reference.

2. Definitions

The functional parts of this volume use terms such as specification, commentary, guide, or notes as indicated below:

Standard: A specification, practice, or test method that has been formally adopted. SSPC standards include specifications and guides, each of which may refer to other standards.

Specification: A detailed description of requirements of a product or process that can be incorporated into a procurement document.

Method: A form of standard describing a precise procedure or technique used for performing a specific task.

Painting System: A term intended to include, with equal emphasis, not only the well accepted components of a system such as surface preparation and paint materials, but also the application, inspection, and safety functions.

Painting System Materials Specification: A specification that covers only the paint in a multi-coat system without specifying surface preparation, film thickness, and application.

Coating System: A term which refers to the applied and cured multi-layer film or to the components of a system based on non-paint type coating such as thermal spray coatings.

Commentary: Explanatory remarks at the beginning of a chapter, describing the background and proper use of the specifications and guides. (This is not a part of the specifications and guides, but often is important in their selection and use.)

Guide: A set of instructions or organized information based on a consensus of “best industry practice.” Material contained in a non-mandatory guide may be extracted and used in preparation of procurement documents, although the guide itself is not suitable for reference in procurement documents because it does not contain mandatory language. Painting System Guides are coded SSPC-PS Guide 1.00, 2.00, 3.00, 4.00, etc. and are to be used to select painting system specifications. The guides to safety in paint application (SSPC-PA Guide 3) and maintenance (SSPC-PA Guides 4 and 5) aid in establishing standard practices, procedures, and specifications for coating application and maintenance.

Notes: Additional information at the end of a specification that is not considered a mandatory requirement.

Qualification Procedure: A procedure that defines a sequence of actions or functions an individual or organization must meet to establish or verify a specified level of competence.

Joint Technology Report: A report issued by an SSPC/NACE technical committee to address the state of the art of a particular technology.

Technology Update: A consensus SSPC document prepared by a committee that describes and assesses a new material, procedure, concept, method, or other area of technology. Technology Updates are considered “fast track” documents and skip some steps in the standards approval process. A Technology Update is not suitable for referencing in a specification or procurement document because it does not contain mandatory language, although information from a Technology Update may be extracted and referenced in a contract. It differs from a technical article in a journal in that it represents a consensus of balanced interests, not a single author’s viewpoint.

Other terms sometimes used in the industry include: practice—A form of standard that is a procedure, guide, or service that may or may not be auxiliary to a test method or a specification; test method—A form of standard that covers sampling and subsequent testing procedures used in determining the properties, composition, or performance for materials,

products, systems, or services that may be specified. A test method does not include the kind of numerical limits for the properties, composition, or performance that should normally be included in a specification. Other terms are covered in the Glossary section of Volume 1 of the SSPC Painting Manual and in the SSPC Protective Coatings Glossary (SSPC 00-07).

4. Identification Numbers Used for SSPC Standards, Specifications, and Guides

Designations for the SSPC standards, specifications, technology reports, technology updates, and their abbreviations are listed below. The term "Paint," used as the designation for SSPC Paint Specifications, is the only term not abbreviated.

PS	=	Painting System
CS	=	Coating System
Paint	=	Paint (or Coating)
SP	=	Surface Preparation
AB	=	Abrasive
PA	=	Paint Application
QP	=	Qualification Procedure
ME	=	Method (of preparing test panels)
TR	=	Technology Report
TU	=	Technology Update

The word "Guide" is placed before the number portion of the identification for those documents that are Guides; for example, PA-Guide 3.

The latest issue of the document is to be used unless otherwise specified.

5. Methods of Using SSPC Painting System Specifications

Using Specifications Without Modifications or Amendments. Each painting system specification may be used in its entirety, by proper reference in the procurement documents, to cover all usual requirements for the intended use. To do this, simply specify that the steel or structure shall be painted "in accordance with SSPC-PS ____." Used without modification, these SSPC painting systems cover many of the normal painting problems that are encountered. Since each painting system describes the minimum requirement for the intended service, it follows that better methods or materials may be substituted without prejudice, provided the practical value of the improvement is judged to be commensurate with the added cost.

Modifications of Specifications. Modifications to reflect the needs of an individual project may be made by the preparer by reviewing each item of the applicable specification and then including his decisions on variations as mandatory requirements in the procurement documents. To do so, modify a standard specification by adding, deleting, or changing requirements.

Use of Painting System Guides. The preparer may use the Painting System Guides SSPC-PS Guide 1.00, 2.00, 3.00, etc. to prepare his/her own modified painting systems for special cases not covered by the standard systems. Recommendations for special conditions are shown in Table 1.

6. Selection of Painting Systems by Environmental Zone

General Considerations. Because of the wide diversity of available systems, the adverse conditions under which they must sometimes be applied, environmental restrictions, and the need for minimizing maintenance, the choice of a suitable painting system is not always an easy one. There is, of course, no one "best" painting system, but rather a dynamic competition among alternative materials and methods whose choice often depends upon both technological factors and policy considerations.

Since environmental factors are often the dominant ones, they will be considered first, followed by other important considerations such as cost, appearance, and design.

Effects of Environment on Corrosion Rates. Among the technological factors in the choice of a painting system, environment is usually the controlling one. For example, one rule of thumb advocates that steel need not be painted at all when the corrosion rate is uniform and below a certain level; on the other hand, alternative materials of construction should be considered instead of painting when the environment is too severe.

Table 2 illustrates the wide range of atmospheric corrosiveness as measured by ASTM. In some areas, increased atmospheric contamination has resulted in acid rain waters, but many industrial locations have become less contaminated than in the recent past.

Environmental Zones: A concise description of each SSPC "environmental zone" is given in Table 3, while Table 4 indicates typical painting system(s) recommended for minimum performance in each zone. These zones cover rural, urban, commercial, and marine environments and several special exposures. Use of the term "environmental zone" in this context is not meant to parallel the common meaning of the term, which implies geographical location but, rather, defines the type of environment (atmosphere) to which the coated steel will be exposed. As an example of this more specialized meaning of environmental zone, consider a steel framed building, part of which is devoted to office space, and another part of which is devoted to chemical laboratory and pilot plant space where acidic fumes are frequently generated. Each of these areas is exposed to a significantly different environment. Another example is the roadway and superstructure of a bridge located in a geographical area where freezing and road salt use are common. The upper portions of such a bridge have to be protected only against weather exposure, whereas the roadway steel and adjacent structural components must also be protected against de-icing salt in solution.

TABLE 1
TYPICAL RECOMMENDATIONS FOR SPECIAL SERVICE CONDITIONS

Type of Service	Discussion and Recommendations
Abrasion Resistance	Urethane coatings probably have more abrasion resistance per mil than any other organic generic class. These are available as proprietary materials. Epoxies such as modified SSPC-PS 13 can be specially formulated so that removal, even by blast cleaning, is difficult, especially when they are sand-filled. Zinc-rich coatings, such as SSPC-PS 12, especially the inorganic types, tend to "polish" and not abrade off steel surfaces. Coal tar epoxy paints, such as SSPC-PS 11, or selected proprietary products, especially when filled with garnet or other hard 30 to 70 mesh materials. SSPC-PS 2, 3, 4, 10, 11, or 13 when sand-filled. Gravel, sand, slate granules in SSPC-PS 9 or 10.
Anti-Sweat	Preformed plastic and foam spray have superseded paints for most anti-sweat functions.
Anti-Fouling	These paints are covered in SSPC-PS 19 and in Chapters 6.11 and 9.3 of the SSPC Painting Manual, Vol. 1.
Protection from Graffiti	See SSPC-PS 17 and polyester urethane guides with recommended ratios of polyol, isocyanate, and NCO.
Skid Resistance	Any type of paint that is suitable for application on floors can be converted to a specifically skid resistant paint by incorporation of a finely divided material such as silica, aluminum oxide, or ground shells.
Mildew Resistance	1. Wash with phosphate-free detergent. 2. Rinse with a solution of one part sodium hypochlorite (Hilex, Clorox, Purex, etc.) and three parts water. Allow some dwell time before a final rinse. 3. Use a paint suitable for specific surface and exposure.
Piping	Color codes for identifying piping are given in ANSI A13.1, "Identification of Piping."
Safety Colors	Standards for safety colors are given in ANSI Z53.1, "Color Coding."
Wet Surfaces	Some epoxies and urethanes have been successfully applied to wet surfaces.
Cold Surfaces	Some urethanes can be applied to cold surfaces. Cycloaliphatic amine-cured epoxies can be used.
Underwater	Epoxies have been developed for underwater application. (Some urethanes will cure underwater but cannot be applied underwater.)
Rebar Protection	Fusion bonded epoxies or hot dip galvanizing.

For purposes of classifying environmental exposures according to their severity, they have been divided into environmental zones from essentially non-corrosive dry interiors (Zone 0) to severe chemical exposures (Zone 3). Special conditions are listed in Table 1. Exposure conditions may be such as to require little or no protection by painting; conversely, they may indicate the need for elaborate surface preparation, pretreatment, and properly selected primer, intermediate, and finish coats. Although Table 4 may indicate several different generic painting systems suitable for use in a particular zone, some systems are more durable than others and will achieve better performance or longer coating life.

This classification of environment is probably the most useful type of designation, since most available data on paint exposures is defined in these broad terms. Factors such as time-of-wetness, chloride level, sulfur dioxide content, pH, conductivity, surface contamination, etc. should also be considered when choosing a painting system.

In Table 4, Painting System numbers have been rounded off to show the generic class of systems that are satisfactory. For example, SSPC-PS 15 includes Painting System Guide 15.00 and Painting System Specifications SSPC-PS 15.01 through 15.04.