



Painting Contractor Certification Program (PCCP)

QP3 Audit Checklist

Revised 10/11

Shop: _____

Shop Location: _____

Date: _____

Audit Performed By: _____

Date Completed: _____

Key Auditee Contact(s): _____

Name/Title: _____

Email Address: _____

Phone Number: _____

Recent Changes in Personnel

QCS: _____

Production Manager: _____

Ownership: _____

Paint Shop Supervisors & Foremen _____

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
NA	NA	Rating of 1 = Major Deficiency Rating of 2 = Minor Deficiency Rating of 3 = Compliant	NA	
NA	NA	<p>Enclosed Shop: An enclosed shop is a facility, enclosure, or building (four continuous walls or partitions to grade or floor with a roof).</p> <p>Covered Shop: is located at a site at the firm's location for certification with a roof but is not required to have walls, heating, or humidity control.</p> <p>Open (Exposed) Shop: An open shop is a permanent or semi-permanent site at the firm's location for certification open to all ambient conditions. The area is exposed to outdoor weather conditions and airborne contaminants. The site provides no controls of temperature, humidity, or ventilation in the blast or coating areas. Drying and curing of coated items takes place under ambient conditions.</p>	Rating NA (Auditor must select one only)	
1 (Critical Item)	3	<p>References The Firm shall have the reference documents and standards necessary to provide personnel with the requirements of the work. The following references shall be readily available to those who have coating program responsibilities. Firms shall possess the current edition of these references and references consistent with the requirements of existing contracts.</p> <ul style="list-style-type: none"> • SSPC-PA 1, " Shop, Field and Maintenance Painting of Steel" • SSPC-PA 2, "Measurement of Dry Coating Thickness with Magnetic Gages" • SSPC-VIS 1, "Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning" • Product data sheets, technical bulletins, recommendations for material in use • ASTM D 3276, "Standard Guide for Painting Inspectors (Metal Substrates)" • Documents required by contract and references within required documents 	1 2 3	
2	5	<p>Management Responsibility: Management maintains a quality management system (QMS) that assures all specific contract requirements for industrial/marine complex steel structure surface preparation/coating application (SP/CA) are met.</p>	1 2 3	
3	5.1	<p>Policy: Executive management has adopted and documented quality goals for coating work. QMS goals:</p> <ul style="list-style-type: none"> • Commit to meeting contract requirements. • Are communicated to all levels of SP/CA operations personnel. • Identify, document, measure, and assess progress toward meeting one specific SP/CA goal <p>There is a plan to work toward the goal stated above.</p>	<p>1 2 3</p> <p>1 2 3</p> <p>1 2 3</p>	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
4 (Critical Item)	5.2	<p>Direction and Leadership: There is evidence that Management Review of the coating QMS is conducted at least annually. Records from management reviews shall be maintained and include:</p> <ul style="list-style-type: none"> • Results of internal and external audits. • Opportunities for improvement of product quality. • Need for changes to the quality management system. • Customer feedback, for example: surveys, letters of recognition, personal interviews, requests for corrective action, and complaints resolution. • The levels of qualification and training of personnel. • Most recent and historical review of shop operations (Effectiveness of SP/CA, shipping, handling of non-conformities, external audit corrective actions, and management operational reviews) • Management takes action (implements QMS modifications) as a result of its reviews 	1 2 3	
5	5.3	<p>Resources: The Firm has the resources needed to achieve conformity to contract specifications (e.g. interactions with coating consultants, technical societies, coating manufacturers technical departments, etc.).</p>	1 2 3	
6	5.3.1	<p>Personnel: Executive Management has assigned a person to be the top coatings individual. Responsibilities include:</p> <ul style="list-style-type: none"> • Determining inspection requirements • Overseeing inspection activities, acceptance criteria, and disposition of nonconformities • The top coatings person has a minimum of 1 year of SP/CA experience <p>Personnel responsible for SP/CA are identified (by roster or list)</p>	1 2 3 1 2 3 1 2 3	
7 (Critical Item)	5.3.2	<p>Buildings, Workspace and Associated Utilities:</p> <ul style="list-style-type: none"> • Verify that the shop has distinct physical locations for SP/CA, coatings curing, and storage prior to shipment • SP/CA supplies are protected from damage. • Ambient conditions in these areas are such to prevent surface contamination during SP/CA, coating curing, and pre-delivery storage <p>There is evidence that items are properly cured upon shipment to the client</p>	1 2 3 1 2 3 1 2 3	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
8 (Critical Item)	5.3.3	<p>Process Equipment</p> <ul style="list-style-type: none"> The company controls or owns SP/CA equipment (i.e. nozzle and/or centrifugal blast machine, hand and power tools, compressors, line driers, moisture and oil separators, conventional or airless spray equipment, power agitators, lifting equipment, provisions for loading and blocking) needed to install complex industrial/marine coating systems. The required equipment is present and operable and there is evidence that it has been used for SP/CA 	<p>1 2 3</p> <p>1 2 3</p>	
9 (Critical Item)	5.3.4	<p>Inspection, Measuring, and Test Equipment: The Firm controls and has located at its facility operable, calibrated equipment for inspecting, measuring, and testing:</p> <ul style="list-style-type: none"> Surface profile Surface cleanliness (written and visual standards) Surface temperature Ambient conditions (air temperature, wet bulb, relative humidity, dew point) Wind direction/speed (if coating in an area exposed to the wind) Coating temperature Wet film thickness Dry film thickness Other conditions or properties specified (e.g. adhesion) 	<p>1 2 3</p>	
10	5.4	Document Requirements:		
11	5.4.1	<p>Organizational Chart: Must show:</p> <ul style="list-style-type: none"> Lines of authority within the organization. Positions and reporting relationships (At a minimum, the positions that are responsible for SP/CA, coating inspection, purchasing, inventory, storage, and pre-delivery steel management). 	<p>1 2 3</p> <p>1 2 3</p>	
12	5.4.2	<p>Job Descriptions/Qualifications Information:</p> <ul style="list-style-type: none"> The Firm documents and maintains job descriptions and qualifications and a brief summary of relevant experience for key personnel. Key personnel shall include, at a minimum, the following functions: management, purchasing, quality control, surface preparation, and application and inspection. Key qualification information shall include: name, title, years of experience, internal or external training, professional certifications, and registrations 	<p>1 2 3</p> <p>1 2 3</p> <p>1 2 3</p>	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
13	5.4.3	Facility Plan: The shop can provide a facility map (a diagram detailing the general layout of the SP/CA/Curing areas and location of production equipment). A walk-through of the facility confirms that the “map” corresponds with the actual layout of the shop.	1 2 3	
14	5.4.4	Equipment List: The shop maintains a list of equipment used for SP/CA, material storage, handling, and mixing.	1 2 3	
15	5.4.5	Project List: The firm can provide a representative sample of new steel painting projects performed by the paint shop over the most recent 3-year period for initial applicants and during the previous one-year period since the last SSPC audit for maintenance audit. The list includes: <ul style="list-style-type: none"> • Project name • Project size (e.g., tons, square feet, etc.) • Dates work was performed • SP/CA performed (e.g. SSPC-SP5, SP10, three coat epoxy or two coat urethane). Note for the auditor: Use this job list to take historical audit samples to confirm conformance with the QP 3 standard.	1 2 3	
16 (Critical Item)	6	Contract and Project Specification Review / Communication: <ul style="list-style-type: none"> • There are documented procedures for project specification and contract review. • The review identifies and records key contract requirements, plans to accomplish the requirements and assurance that the plan is distributed to responsible personnel. • All affected personnel (management, purchasing, production, inspection, quality assurance and quality control) are involved in the contract review process • There are procedures/methods for steel owner approved changes/modifications to specification and contract documents, methods for review of the original contract documents, obtaining steel owner approval of revised contract documents, • Conflicts between the contract requirements and product data sheet instructions are documented by the company and presented to the steel owner in writing stating that unless otherwise directed by the steel owner, the contract will prevail and should be revised accordingly by the steel owner • Other conflicts, errors, omissions or ambiguities are communicated to the steel owner in writing for resolution 	1 2 3	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
17	7	<p>Coating System Communication: Written documents (e.g., drawings, travelers, or quality plans) are used to communicate the following contract requirements to appropriate personnel within the organization:</p> <ul style="list-style-type: none"> • Surface preparation requirement • Coating type • Dry Film thickness (DFT) requirements • Step backs • Masking • Areas not-to-be-coated or reduced DFT zones 	1 2 3	
18 (Critical Item)	8	<p>Documents and Data Control: Shop must maintain a written Quality Control Manual (procedures) that includes:</p> <ul style="list-style-type: none"> • Contract documents, drawings and changes • Other documents affecting coating quality. This procedure shall address the following elements of control: 	1 2 3 1 2 3	
19	8.1	<p>Review and Approval: Documents affecting coating quality are reviewed and approved by management. Revisions to these documents are reviewed for adequacy, and approved by the same function and level that authorized the original document</p>	1 2 3	
20	8.2	<p>Revision Control:</p> <ul style="list-style-type: none"> • The revision status and results are clearly identifiable. • There is a method for monitoring and identifying the latest revision, location and changes from the previous revision 	1 2 3 1 2 3	
21	8.3	<p>Access: Foremen and craft workers and others responsible for coating work have access to all written and current customer SP/CA instructions.</p>	1 2 3	
22	8.4	<p>Obsolescence: Controlled obsolete documents are marked, segregated, destroyed, or otherwise prevented from inadvertent use.</p>	1 2 3	
23	8.5	<p>Transmittal: A system exists to track distribution of drawings, documents, and specifications to owners, customers, suppliers and subcontractors</p>	1 2 3	
24	8.6	<p>Customer Requirements: All change orders are approved by the steel structure owner, documented, with documented distribution to craft workers</p>	1 2 3	
25	9	<p>Control of Quality Records: Quality Control record maintenance procedures must be available and include the following:</p>		
26	9.1	<p>Storage: Quality records are stored and retained in a way that enables retrieval and provides a suitable environment to prevent damage, deterioration, or loss</p>	1 2 3	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
27	9.2	Retention: Record retention times are established per internal policy and contract requirements. Quality records are made available for customer and owner review during retention period.	1 2 3	
28	9.3	Minimum Quality Records Maintained include: <ul style="list-style-type: none"> • Contract document review • Contract clarifications (RFIs) • Training • Internal audit record • Certificates of Conformance for system components • Qualification and ongoing evaluation of any subcontractors • Qualification and ongoing evaluation of suppliers • Requests (and responses to requests) for deviation from contract requirements • Daily SP/CA records • Documentation of nonconformities • Waivers from the owner for nonconforming product • Corrective action re: SP/CA operations and management. • Management Reviews • Final Inspection 	1 2 3	
29	10	Purchasing Documents:		
30	10.1	Purchasing: Documents are maintained that verify all products and services purchased (including any and all Sub-contracted work used to perform SP/CA) conform to contract requirements.	1 2 3	
31	10.2	Purchasing Data includes: <ul style="list-style-type: none"> • Subcontracted work • Purchased products, materials and services ordered specifications, drawings, process requirements, inspection instructions, hold points, delivery instructions, certificates of Compliance/Conformance/Analysis, Coating manufacturers' product data sheets, and testing requirements. 	1 2 3 1 2 3	
32	10.3	Evaluation of Subcontractors: The Firm evaluates and selects subcontractors on the basis of their ability to meet: <ul style="list-style-type: none"> • Subcontract requirements and project requirements. • Specific inspection requirements. • When the QP 3/420-10 certification is required by the contract documents, the firm assures that the coating subcontractor is also certified in good standing. 	1 2 3 1 2 3 1 2 3	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
33	10.4	<p>Qualification and Evaluation of Suppliers There is evidence that suppliers are evaluated according to their ability to:</p> <ul style="list-style-type: none"> • Meet Contract documents. • Provide Consistent ease of application (applies to suppliers of coating) • Provide products with adequate curing time (applies to suppliers of coating) • Deliver products in a timely manner. • Deliver quality products. • Deliver products that conform to customer or owner preferences. • Have available suitable technical support staff. <p>Records of the evaluation of suppliers and subcontractors are maintained.</p>	1 2 3	
34 (Critical Item)	11	Material:		
35	11.1	<p>Containers: Coatings containers are labeled to identify the manufacturer, batch number, and shelf life (QC must be able to deduce shelf life by interpreting the batch number if the expiration date is not part of the coating container labeling information).</p>	1 2 3	
36	11.2	<p>Storage: Materials are stored in protected areas under conditions (including temperature) per manufacturers' recommendations. Coating with expired shelf life is segregated from current material or specifically marked as "expired."</p>	1 2 3	
37	11.3	<p>Certificates of Conformance (COC) for Coating Requirements: Shop can produce all contract-required SP/CA certificates of conformance (abrasives, coatings, thinners, and all products in direct contact with the steel (coated or uncoated). At a minimum, COC contain:</p> <ul style="list-style-type: none"> • Name of manufacturer • Product name • Batch number • Date of manufacture • Statement that product complies with specifications contained in the PDS <p>COC are retained as a "quality record"</p>	1 2 3	
38 (Critical Item)	12	<p>Process Control: The facility must document and utilize QC procedures for SP/CA, curing operations and equipment maintenance that will allow for continuous improvement of operations.</p>	1 2 3	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
39	12.1	<p>Surface Preparation: Procedures exist to ensure that surface preparation is performed in accordance with contract documents, coating manufacturer's recommendations and industry (e.g. SSPC standards and guidelines)</p> <p>Facility steel transportation, storage, pre-surface preparation, SP/CA/Curing areas are designed and managed to eliminate cross contamination of dirt, debris, abrasive, coatings, or ambient conditions that would be detrimental to uniform continuous cure and maintenance of the coating. Steel areas are masked to protect non-coated areas of steel per the specification/contract</p>	<p>1 2 3</p> <p>1 2 3</p>	
40	12.2	Coating Mixing and Application:		
41	12.2.1	<p>Application Records: QC or designated persons document the following steel SP/CA parameters for each coat</p> <ul style="list-style-type: none"> • Surface initial condition. • Surface and coating temperature. • Coating applied (e.g., name, identification, color). • Shelf life expiration date. • Coating and thinner batch numbers. • Ambient temperature at times of SP/CA. • Verification that the coating (prior to application) is free from visually evident defects. • Coatings mixing. • Thinner/reducer added (quantity and type). • Induction (sweat-in) time period (beginning and ending) where applicable. • Verification that the coating was mixed and applied within the manufacturer's specified pot life. • Coating application equipment used, including pressure, coating spray gun type, and tip-size. • Actual and specified re-coat times. • SP/CA start and finish times. • Dry film thickness (DFT); actual versus specified. • SP/CA Piece marks, heat numbers if specified. 	<p>1 2 3</p>	
42	12.2.2	<p>Equipment: A documented preventative maintenance procedure shall be implemented for major equipment, including but not limited to:</p> <ul style="list-style-type: none"> • Blast cleaning equipment (nozzle blast equipment, centrifugal blast equipment, and dust collectors). • Air compressors, line driers, and oil separators • Conventional and airless spray equipment • Facility steel handling and transportation equipment 	<p>1 2 3</p>	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
43 (Critical Item)	13	Inspection and Testing:		
44	13.1	Assignment of Inspection of Surface Preparation and Application of Coatings: <ul style="list-style-type: none"> • Verify that Inspectors are trained and qualified by the Firm to perform assigned inspection duties • Inspectors are given before adequate time to perform inspections • Production personnel performing inspections only perform in-process vs. final inspections. • Production personnel inspection work is monitored by QC or QC management 	1 2 3	
45	13.2	Inspection Records: Records include contract specified: <ul style="list-style-type: none"> • SP/CA inspection test performed. • Who performed the inspection testing • Date of inspection • Steel piece numbers that were inspected (if available). • Disposition of any nonconformities. • Records must be kept for the contract specified time, or 5 years minimum when not specified. Minimum testing: <ul style="list-style-type: none"> • Surface Preparation (degree of cleanliness achieved, surface profile achieved; condition of surface immediately prior to beginning coating application) • Dry film thickness (DFT) including any specific data required by SSPC-PA2 or contract documents. • Visual inspection of each piece for visible coating defects • DFT gage calibration accuracy verification in accordance with SSPC-PA2. 	1 2 3	
46 (Critical Item)	14	Verification of Accuracy of Inspection, Measuring, and Test Equipment: <ul style="list-style-type: none"> • Verification of calibration accuracy is performed for dry film thickness (DFT) gages only. The verification of calibration accuracy of the DFT gage is determined according to SSPC-PA2 by using standards (shims or test blocks) that are traceable to a national standard. • Verify through questioning or demonstration that those performing dry film thickness measurements have a complete understanding of SSPC-PA2 	1 2 3 1 2 3	
47 (Critical Item)	15	Control of Nonconformities: SP/CA contract non-conformities are identified by piece mark (when available or otherwise identified) and documented so that steel owner approved disposition of nonconforming products is achieved (i.e. reworked, repaired, accepted as is, owner approved non-conforming product or scrapped).	1 2 3	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
47 (Critical Item Cont.)	15	There is evidence that repaired or reworked product is approved by the Firm's QC Non-conforming material is identified, reported to the owner and disposed of in accordance with owner's mandate	1 2 3 1 2 3	
48 (Critical Item)	16	Corrective Action: SP/CA operations and QC personnel utilize corrective action procedures to identify recurring and/or significant operating errors and omissions that interfere with the quality of end products and services provided to/for the steel owner. The procedures shall incorporate: <ul style="list-style-type: none"> • Identification of root cause. • Correction of and revision to operating procedure designed to eliminate recurrence of undesirable system results. • Provisions for documentation of customer complaints and their timely resolutions. • Provisions for responses to Corrective Action Requests (CARs) when due Verify that management follows up to ensure ongoing implementation of system changes on the shop floor	1 2 3	
49 (Critical Item)	17	Handling, Storage, and Delivery of Product and Materials: The owner's steel must travel/be handled/stored/loaded/prepared for shipment in a manner that will prevent damage or deterioration through the entire SP/CA process	1 2 3	
50 (Critical Item)	18	Training:		
51	18.1	Qualification and Training of Production Personnel: Qualification and Training of Production Personnel SP /CA Craft-workers must receive training adequate for their job responsibilities and include: <ul style="list-style-type: none"> • Curriculum of material covered • Dates of training • Testing of comprehension • Identification of individuals trained Craft-workers must be annually assessed by a trained and experienced Supervisor; capable of recommending training to executive management	1 2 3	
52	18.2	Qualification and Training of Inspection Personnel: Quality Control Inspectors must be formally trained Note: It is recognized that those performing final inspection may have received training prior to the requirement for documentation of training that is now part of this standard. To comply, the Firm's management shall document a review of the qualifications of current inspection personnel for implementation of the quality management system	1 2 3	

Checklist Number	QP Standard Number	Audit Criteria	Rating	Auditor Comments
53 (Critical Item)	19	Internal Audit: <ul style="list-style-type: none"> • Annual Internal Audits of the SP/CA operations are performed and documented • Internal audits are performed by an individual qualified by the Firm, • Internal audits and their results are recorded and include any corrective actions identified. 	1 2 3 1 2 3 1 2 3	

Attached for your reference is a copy of Certification Standard for Shop Application of Complex Protective Coating Systems SPE/QP 3 420-10

Certification Standard for Shop Application of Complex Protective Coating Systems



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by
American Institute of Steel Construction

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by
SSPC: The Society for Protective Coatings

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CERTIFICATION STANDARD FOR SHOP APPLICATION OF COMPLEX PROTECTIVE COATING SYSTEMS

The information presented in this joint AISC/SSPC standard has been prepared by the Certification Committee of the American Institute of Steel Construction (AISC) and the SSPC technical committee on shop painting (QP 3). The document is the specific responsibility of the AISC/SSPC Joint Committee on Shop Certification. The standard has been prepared within the scope and for the purposes stated in the body of this document, and for no other purpose.

The standard has been developed by a balanced committee of participants in the industry who have particular experience and expertise in the topics addressed in the standard. Participation from a broad cross section of the fabrication and coating industry has been sought.

AISC and SSPC accept responsibility for only those interpretations of this standard that are issued in writing and in accordance with governing AISC or SSPC procedures and policies. Issuances of informal interpretations are not necessarily the official interpretation of AISC or SSPC or their respective Certification Committees. This standard is subject to revision at any time by AISC and SSPC.

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Caution must be exercised when relying upon other specifications or codes developed by other bodies and incorporated by reference herein. Such material may be modified or amended from time to time by such other bodies subsequent to the printing of this standard. AISC and SSPC bear no responsibility for changes in such material other than to refer to a specific or the current edition as being applicable to this standard at the time of its publication.

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1. Purpose

The purpose of this Standard is to confirm to owners, the design community, and the construction industry that a Firm certified to this Standard has knowledgeable personnel and the organization, experience, procedures, and equipment to provide surface preparation and application of complex painting systems in a shop facility in accordance with contract specifications.

Independent of the quality-focused purpose that is uniformly applicable to all Firms certified to this Standard, Firms will be labeled with one of three shop descriptors to communicate the basic description of their facilities. Owners, the design community, and the construction industry requiring certification to this Standard may choose to use the shop description label as part of qualification criteria for shop painting facilities. The shop descriptors are defined descending inclusive but not ascending inclusive. For example, a Firm described as Enclosed also meets the description for Covered and Open. A Firm described as Covered also meets the description for Open, but does not meet the description for Enclosed. Firms in any shop descriptor shall provide evidence of proper operating procedures and maintenance records of equipment, and evidence of proper coating storage and handling. All contract requirements shall be met, regardless of shop description. Specifiers who require certification to this Standard should evaluate the Firm's capacity to complete a specific project independently.

Enclosed Shop

An enclosed shop is a facility, enclosure or building (four continuous walls or partitions to grade or floor with a roof) at the firm's location for certification where surface preparation, coating, curing, and coating storage are conducted in a controlled environment with fixed or portable ventilation systems. Ambient conditions such as temperature, humidity, dew point and airborne contaminants are controlled and maintained to meet contract requirements. The work environment is protected from adverse outdoor weather conditions and outdoor airborne contaminants, so that the surface preparation, coating, and curing activities are not jeopardized.

Covered Shop

A covered shop is located at a site at the firm's location for certification with a roof but is not required to have walls, heating, or humidity control. Surface preparation, coating, and curing activities are performed under ambient conditions with fixed or portable ventilation systems. The structure provides limited protection from exposure to outdoor weather and airborne contaminants. Coating storage areas have either fixed or portable heating or cooling equipment. A method of control for this shop descrip-

tor may be to suspend coating operations until ambient conditions are acceptable.

Open (Exposed) Shop

An open shop is a permanent or semi-permanent site at the firm's location for certification open to all ambient conditions. The area is exposed to outdoor weather conditions and airborne contaminants. The site provides no controls of temperature, humidity, or ventilation in the blast or coating areas. Drying and curing of coated items takes place under ambient conditions. Coating storage areas have either fixed or portable heating or cooling equipment. A method of control for this shop descriptor may be to suspend coating operations until conditions are acceptable.

2. Scope

This Standard describes requirements for certification of firms that apply complex painting systems as defined in this Standard.

The requirements of this Standard are applied to the quality management system of a certified Firm independent of individual project requirement for Certification to this Standard. The coating quality management system of a Firm, not its products, is certified. Certification to this Standard is neither an inspection nor an endorsement of product, surface preparation, or coating application. The Standard includes all functions and responsibilities that apply to surface preparation and coating in a shop environment for new steel or for steel which has been previously coated and blast-cleaned and is free of hazardous paint (lead, etc.) when it arrives at the shop. The scope of this Standard does not include design, fabrication, manufacture, erection, surface preparation and application of coating in the field, metallizing or galvanizing, powder coating, anodizing, or compliance with safety (OSHA) and environmental (EPA) regulations. The re-painting (including surface preparation) of previously coated items returned to the Firm's coating facility for rework is included in the scope of this Standard; however, removal of previously existing coatings is not included in the scope.¹

Certification to this Standard cannot be shared or transferred to another company or facility without the written approval of AISC or SSPC. The Firm shall have the capability to meet all the requirements of this Standard.

3. References

The Firm shall have the reference documents and standards necessary to provide personnel with the requirements of the work. The following references shall be readily available to those who have coating program responsibilities. Firms shall possess the current edition of these references

¹ Removal of previously existing coatings may fall under the scope of SSPC-QP 2.

and references consistent with the requirements of existing contracts.

- SSPC-PA 1, “Shop, Field and Maintenance Painting of Steel”
- SSPC-PA 2, “Measurement of Dry Coating Thickness with Magnetic Gages”
- SSPC-VIS 1, “Guide and Reference Photographs for Steel Surfaces Prepared by Dry Abrasive Blast Cleaning”
- Manufacturer’s product data sheets, technical bulletins, and other recommendations for materials in use.
- ASTM D 3276, “Standard Guide for Painting Inspectors (Metal Substrates)”

4. Definitions

As used in this Standard, the word *shall* or *will* denotes a mandatory requirement. The word *should* denotes a guideline or recommendation. The word *may* denotes an obligation to make a choice.

AISC. The American Institute of Steel Construction — one of the two certifying bodies

ASTM. American Society for Testing and Materials

Complex Coating System. Complex coating systems are defined, for the purpose of this standard, as those that require special care in surface preparation, coating component preparation, application control, curing, and in-process inspection. These systems include materials such as zinc-rich, epoxy, and urethane coatings. These are typically multiple-coat systems, although only one or two coats of a multi-coat system may be shop-applied.

Contract Documents. The documents that define the responsibilities of the parties that are involved in surface preparation and coating. These documents typically include the design drawings, the specifications, special provisions, and the contract.

Corrective Action (CA). The action or actions undertaken to identify and eliminate the root cause of a product or process nonconformance to prevent its recurrence. Corrective action is not the repair or rework of identified nonconforming product or process to meet specified requirements.

Customer. Entity (e.g., the general contractor, owner, or specifier) contracting with the Firm for surface preparation and coating application.

Design Drawings. The graphic and pictorial portions of the contract documents showing the design and dimensions of the work. These documents generally include general notes, pay item quantities, fabricated item and

coating details, and notes associated with specific items or required methods.

Documented Procedure. A procedure that is documented in writing or other graphical format. It can include written procedures or instructions, drawings, diagrams, charts, specifications and excerpts of, or references to, appropriate technical standards or codes. Documentation shall:

- Provide the purpose of the procedure
- Describe the sequence of steps taken to carry out a particular course of action.
- Assign responsibilities for completion
- Identify management responsibility for review of the procedure
- Identify quality records that are generated.

Where the term “documented procedure” appears within this Standard, it indicates that the procedure is established, documented, implemented and maintained.

Element. A primary section of this standard as shown in the Table of Contents.

Executive Management. Executive management is defined as the top company officers responsible for the management and operation of the Certified Firm. Executive management may be defined by the Firm to include this top officer and a management team with these responsibilities.

Fabrication or Manufacture. The process of preparation and assembly of individual parts into a shipping piece.

Firm. The entity that is responsible for surface preparation and coating application in the shop environment. The Firm referenced in this document is the entity being certified.

Nonconformities. Attributes of materials, consumables, surface preparation and coating application (in-process or final) that do not meet contract requirements or the requirements of the Firm’s procedure for control of nonconformities (see Section 15).

Objective Evidence. Objective evidence is the data supporting the existence or verification of something. In this context, it is evidence that the quality management system is functioning properly. Evidence can be an observation of the performance of a task or creation of physical products; a record, document or procedure; or the result of an interview with one or more employees that demonstrates their understanding of their duties and proper performance of tasks.

Owner. The entity or its authorized representative who has authority to define or accept changes to contract requirements and who will be or represents the ultimate owner of the finished/completed product.

Procedure. The sequence of steps taken to carry out a particular course of action.

Quality Assurance. The planned system of procedures and organizational requirements developed and implemented for the purpose of measuring and assuring compliance with customer requirements and providing confidence that quality goals are achieved. Quality Assurance encompasses such areas as compliance with project specification technical requirements, compliance with referenced standards and achievement of customer service goals. Specific functions included in quality assurance are: determination of quality criteria, establishment of a plan to monitor quality including assignment of quality control (inspection), determination of acceptance criteria, determination of QC personnel qualifications, oversight (periodic monitoring) of QC activities, summarizing and reporting quality conformance measurements to management.

Quality Control (QC). Quality control is the inspection of work. Inspection includes but is not limited to confirming that procedures are met; personnel performing the work are properly qualified; equipment is appropriate and in acceptable working order; and the proper materials are used as well as in compliance with inspection criteria.

Quality Management System. A system to establish policy and objectives to direct and control an organization with regard to quality.

Quality Record. A specific type of quality document that provides objective evidence of activities performed or results achieved.

Specifications. The portion of the Contract Documents that consists of the written requirements for materials, standards and workmanship.

Specifier. The entity defining the requirements for surface preparation and coating application.

SSPC. The Society for Protective Coatings—one of the two certifying bodies.

Subcontractor. A coating, fabrication or manufacturing contractor that performs a portion of the Firm's contract work for surface preparation or coating application.

Supplier. A manufacturer, direct supplier or distributor that supplies materials (including but not limited to: blast-cleaning abrasives, coatings, and additives) or that provides equipment (including but not limited to: blast-cleaning equipment, coating equipment and proprietary buy-out items) needed to fulfill the Firm's contract requirements.

Visible Coating Defects. Imperfections that may be detected without any magnification. These include but are not limited to runs, sags, lifting, chipping, cracking, spalling, flaking, mud cracking, pinholing and checking.

5. Management Responsibility

The Firm's executive management is responsible for developing and maintaining a quality management system to meet the specific requirements of this Standard and to assure that contract requirements are met.

5.1 Policy

Executive management shall adopt and document a policy defining the Firm's quality goals related to coating operations. The policy shall include the commitment to meeting contract requirements. Executive management shall ensure that the policy is understood, implemented and maintained at appropriate levels of the Firm's organization. The Firm shall document a minimum of one specific measurable goal related to coating application process quality. Executive management shall record and know the current level of that goal. There shall be a plan to work to the achievement of the goal.

5.2 Direction and Leadership

The Firm's executive management shall review the Firm's quality management system at planned intervals, but not less than annually.

Records from management reviews shall be maintained. Management review requirements shall be defined by the Firm and include a specific method to obtain, appropriately assess and analyze, and then report the following:

- Results of internal and external audits
- Opportunities for improvement of product quality
- Need for changes to the quality management system
- Customer feedback, for example: surveys, letters of recognition, personal interviews, requests for corrective action and complaints
- The level of qualification and training of personnel
- Channels for communication to address and resolve all quality issues including customer complaints
- Effectiveness of means, methods, and practices. Performance measures may include surface preparation and coating process errors, shipping delays, improper treatment of nonconformances, external audit corrective action reports not closed in time, or failure to conduct management review or other meetings in accordance with established procedures
- Product nonconformance
- Results from previous management reviews

The output from the management review shall include the record and implementation of any decisions and actions related to:

- Improvement of the effectiveness of the quality management system and its processes
- Improvement of product quality
- Resource needs

5.3 Resources

The Firm shall have the resources needed to achieve conformity to contract specifications. Resources shall include, but not be limited to, those described in the sub-articles of this section. Resources can include coating consultants, technical societies, trade associations, and researchers.

5.3.1 Personnel

Personnel responsible for determining inspection requirements, oversight of inspection activities, acceptance criteria and disposition of nonconformities shall be identified. Personnel responsible for coating preparation and application, surface preparation and coating inspection shall also be identified.

Executive management identifies and records the top individual at the facility with technical knowledge of the coating process. This individual shall have a minimum of one year experience in surface preparation and application of complex coating systems or their components.

5.3.2 Buildings, Workspace, and Associated Utilities

The Firm shall have a location at which surface preparation, coating, and curing is conducted. The Firm shall also provide protection of stored coating materials, blast-cleaning products, and curing products from deterioration or damage.

Regardless of whether the Firm has two distinct areas for cleaning and coating operations, or one single area for the entire coating process, the Firm shall be able to demonstrate methods used to control the ambient conditions in these areas, and prevent surface contamination during the cleaning, application and curing processes.

5.3.3 Process Equipment

The Firm shall own or control coating and blast-cleaning equipment suitable for applying complex coating systems. The required equipment shall be present at the facility and must be operable during the onsite audit at the facility that holds the certification.

Equipment shall include, but not be limited to:

- Blast cleaning equipment, which includes conventional abrasive blast equipment
- Power tools or hand tools for surface preparation
- Compressors, line driers and oil separators
- Conventional or airless spray equipment

- Power agitators
- Lifting equipment
- Provisions for loading and blocking

5.3.4 Inspection, Measuring, and Test Equipment

The Firm shall control and have located at their facility operable equipment for inspecting, measuring and testing for surface preparation, coating application and curing, and for verifying the calibration of measuring equipment in accordance with Section 14.

Surface preparation and application measuring or evaluation equipment shall include equipment in good working order that provides a means to measure:

- Surface profile
- Surface cleanliness (conformance to specified surface preparation standards)
- Surface temperature
- Ambient conditions (air temperature, relative humidity, dew point)
- Wind direction/speed (if coating in an area exposed to the wind)
- Coating temperature
- Wet film thickness
- Dry film thickness

5.4 Document Requirements

The following is a list of required documents for the Firm's quality management system. These documents shall be maintained within a quality manual or within other appropriate systems in the Firm.

5.4.1 Organizational Chart

The organizational chart shall show lines of authority within the organization as well as define positions and reporting relationships. At a minimum, the positions that are responsible for coating preparation and application, surface preparation, coating inspection, purchasing, inventory and the management of those functions shall be identified.

5.4.2 Job Descriptions, Qualifications, and Biographical Information

The Firm shall document and maintain job descriptions and qualifications and a brief summary of relevant experience for key personnel. Key personnel shall include, at a minimum, the following functions: management, purchasing, quality control, surface preparation, application and inspection. Responsibilities and authorities for positions that manage these functions shall be defined.

Qualifications and biographical information for key positions shall include, at a minimum: name, titles, years of experience performing complex coating operations, internal or external training, and professional certifications and registrations.

5.4.3 Facility Plan

A facility plan detailing the general layout of the surface preparation, application and curing areas as well as general location of equipment critical to production shall be documented and maintained.

5.4.4 Equipment List

An equipment list showing the Firm's equipment used for cleaning, surface preparation, coating mixing and application, and material handling shall be documented and maintained.

5.4.5 Project List

An up to date project listing that shows a representative sampling of the most current projects within the last three years shall be documented and maintained. This list shall demonstrate the knowledge level of the Firm by listing the:

- Project name
- Project size (e.g., tons, square feet, etc.)
- Dates work was performed
- Surface preparation (e.g., SSPC-SP 5, SP 6, SP 7, SP 10)
- Coating system information (e.g., three-coat epoxy or two-coat urethane).

Firms seeking initial certification (or re-certification after a lapse in certification) to this Standard shall demonstrate an acceptable level of compliance to the Standard during the audit on existing work in-house, on a test panel similar to that detailed in ASTM D 4228, or on a demonstration piece or pieces that appropriately reflect the nature of the proposed work as approved by the qualifying agency.

6. Contract and Project Specification Review and Communication

The Firm shall document and implement a procedure for contract and project specification review. The review shall identify and record the specific project requirements, determine and plan shop actions to accomplish them, and distribute information to the responsible individuals throughout the organization. This review shall consider all issues that affect the Firm's capability to perform the work.

The procedure shall define the method for review of the original contract documents, revised contract documents, and changes received through clarification (e.g., requests for information or other sources) to assure that the Firm fully understands and can satisfy the contract requirements.

The procedure shall also define how the Firm documents, communicates, and resolves identified need for additional contract information and conflict between contract documents and manufacturers' recommendations. The procedure should direct that in the event of a conflict between

contract documents and manufacturers' recommendations, the owner shall be notified in writing and, unless directed otherwise in writing, the requirements of the contract documents shall prevail.

The record of contract review can include technical summaries, signoffs, change orders, schedules and allocation of adequate resources. The record shall show the consideration by management, purchasing, coating process control, inspection, quality assurance, and quality control functions. The record will also show other critical project requirements to consider that, if missed, would have a major impact on project quality.

7. Coating System Communication

Written documents (e.g., drawings, travelers, or quality plans) shall be used to communicate throughout the organization:

- Surface preparation (including specification of surface finish),
- Coating type
- Dry film thickness requirements
- Step backs
- Masking
- No-coating or reduced-DFT zones

8. Document and Data Control

The Firm shall document a procedure to control the Quality Manual; contract documents, drawings and changes; documented procedures required by this Standard; and other documents affecting coating quality. This procedure shall address the following elements of control:

8.1 Review and Approval

Documents affecting coating quality shall be reviewed and approved by authorized management. Revisions to these documents shall be reviewed for adequacy and approved by the same function and level that authorized the original document. At a minimum, the result shall be agreement between the documents and the actual methods, procedures and work practiced by the Firm. Management shall establish the frequency and requirements for review and the updating of these documents.

8.2 Revision Control

The revision status of the document shall be clearly identifiable. There shall be a method for monitoring and identifying the latest revision, location, and how changes are identified from the previous revision.

8.3 Access

Procedures and documents pertinent to an area of operation or management shall be available and readily accessible to all personnel responsible for performing work affecting coating quality.

8.4 Obsolescence

Controlled documents that are obsolete shall be marked, segregated, destroyed or otherwise prevented from inadvertent use.

8.5 Transmittal

A system shall be established to track the distribution of drawings, documents and specifications affecting the quality of surface preparation and coating to owners, customers, subcontractors and suppliers.

8.6 Customer Requirements

The Firm shall document a procedure to receive and document customer requirements as well as changes originated by the Firm as they occur throughout the surface preparation and coatings application process. The system shall include records (e.g., logs, files or master lists) that show receipt, incorporation, issue and distribution of contract drawings, specifications, technical requirements and other pertinent data by the firm as well as the distribution to all necessary departments and personnel at the Firm's facility and necessary external organizations, subcontractors or suppliers.

9. Control of Quality Records

The Firm shall establish and maintain a documented procedure for identification, collection, storage, maintenance and disposition of quality records that indicate the quality of coating (as described in the sub-elements of this element.) Contract documents and records of clarifications or variations in contract technical documents shall be maintained. Procedures for protecting the integrity of contract documents and quality records shall be in place.

9.1 Storage

Quality records shall be stored and retained in a way that enables retrieval and provides a suitable environment to prevent damage, deterioration or loss.

9.2 Retention

Retention times shall be established and recorded for records retained for any purpose related to the quality of surface preparation and coating application. The retention periods shall be at least long enough to permit evaluation of the records and until final acceptance by the owner, or longer if stipulated by the contract documents. The Firm shall make quality records available for the customer's and/or owner's review and evaluation during the retention period.

9.3 Minimum Required Quality Records

- Contract document review
- Contract clarifications (RFIs)
- Documented training
- Internal audit record

- Certificate of Conformance for system components
- Qualification and ongoing evaluation of subcontractors
- Qualification and ongoing evaluation of suppliers
- Requests (and responses to requests) for deviation from contract requirements (DFSs)
- Surface preparation records
- Application records
- Documentation of nonconformities
- Waivers from the owner for nonconforming product
- Corrective action as defined in 4.5
- Final inspection
- Management Review records

10. Purchasing Documents

10.1 Purchasing

The Firm shall document a procedure to ensure that coating subcontractors, purchased products, materials and services conform to contract requirements (as described in the sub-elements of this element). The responsibility for quality of the subcontracted product remains with the certified Firm. Purchase orders, manufacturers' product data sheets, and records of the initial qualification and subsequent periodic evaluation of subcontractors and suppliers shall be maintained.

10.2 Purchasing Data

The Firm shall clearly describe subcontracted work and the purchased products, materials and services ordered in purchasing documents. This shall include, but not be limited to:

- The type of service, material and other unique identification
- The applicable specifications, drawings, process requirements, inspection instructions and any witness points
- Delivery instructions
- Certificates of Compliance, Conformance, or Analysis
- Coating manufacturers' product data sheets (for coating products)
- Testing requirements as applicable

10.3 Evaluation of Subcontractors

The Firm shall evaluate and select subcontractors on the basis of their ability to meet:

- Subcontract requirements
- Project requirements
- Specific inspection requirements.

When this Standard is required by the contract documents, the selected subcontractor shall have this certification as well.

10.4 Qualification and Evaluation of Suppliers

Firms shall qualify and evaluate suppliers using a suitable method defined by the Firm. The method employed should include consideration of these qualification and evaluations means:

- Contract documents
- Consistent ease of application (applies to suppliers of coating)
- Curing time (applies to suppliers of coating)
- Delivery
- Product quality
- Customer or owner preference
- Availability and suitability of the supplier's technical support staff

The frequency of periodic evaluation shall be established in the purchasing procedure. Records of the evaluation of suppliers and subcontractors shall be maintained.

11. Material

11.1 Container

Material identification on the coating container shall be identified as a minimum by color (pigment description and federal standard number, or manufacturer's number), lot/batch number, ID/stock number, and quantity of coating in container, date of manufacture and manufacturer's name and address.

11.2 Storage

Materials shall be stored in protected areas under conditions (including temperature) per manufacturers' recommendations. Coating with expired shelf life shall be segregated from current material or specifically marked as "expired" by the Firm. Materials with expired shelf life are nonconforming and treatment is defined in the Procedure for Control of Nonconformities required by this Standard.

11.3 Certificate of Conformance for Coating - Requirements

This quality record shall validate that the specific batches of coating and thinner or reducers satisfy the contract documents and recommendations on the manufacturer's product data sheets. This includes the components provided by the coating manufacturer such as the vehicle, catalyst/activator, and zinc dust, and those supplied by the shop such as thinner. Certificates of Conformance shall address requirements established by the coating manufacturer and applicable contract

documents including composition and testing for the specific coating.

At a minimum, the Certificate of Conformance issued by the manufacturer on the manufacturer's stationery shall contain:

- The name of the manufacturer
- The product name
- The batch number
- The date of the manufacture
- A statement that the product complies with the specifications contained in the manufacturer's product data sheet based on applicable test methods

The Certificate of Conformance shall be retained by the Firm as part of its quality records.

12. Process Control

The Firm shall document and follow procedures necessary to produce a consistent acceptable level of quality of the required coating process, including surface preparation, coating application, curing, and equipment maintenance.

12.1 Surface Preparation

Surfaces to be coated shall be prepared and cleaned in accordance with contract documents, coating manufacturer recommendations, and other nationally or internationally recognized standards or guidelines.

Procedures shall be effective in controlling open-nozzle abrasive blast-cleaning and other airborne materials to the degree that the quality of other coating application or curing operations is not affected. (Also see Section 5.3.2.)

12.2 Coating Mixing and Application

The mixing and application of coating shall be in accordance with contract documents and the coating manufacturer's recommendations. The procedure shall be effective in demonstrating that:

- Required conditions are maintained during mixing and application;
- Coating areas are free of air-blown dust, blast media, or other debris that can be detrimental to the quality of the coating during application;
- Required areas are masked to protect no-coating areas.

12.2.1 Application Records

As part of the application process for complex coating systems, the following shall be recorded for each coat at a minimum:

- Verification of conforming surface condition
- Verification of required surface and coating temperature

- Coating product applied (e.g., name, number, color)
- Shelf life expiration date
- Coating batch numbers from base and any mixed components
- Ambient temperature, relative humidity and dew point at time of application
- Verification that the coating (prior to application) is free from visually evident defects
- Verification that the paint was properly proportioned, thoroughly mixed and properly agitated (if required) prior to application
- Thinner/reducer added (quantity and type)
- Induction (sweat-in) time period (beginning and ending) where applicable
- Verification that the coating was mixed and applied within the manufacturer's specified pot life
- Coating application equipment used, including pressure, coating spray gun type and tip size as applicable
- Period of time elapsed since application of previous coat in multi coat systems.
- Start time and finish time
- Dry film thickness (DFT)

Pertinent piece marks shall be properly transferred, and heat numbers shall be transferred when required by contract documents.

12.2.2 Equipment

A documented preventative maintenance procedure shall be implemented for major equipment, including but not limited to:

- Blast cleaning equipment, which includes nozzle blast equipment, centrifugal blast equipment, and dust collectors
- Compressors, line driers, and oil separators
- Conventional or airless spray equipment
- Lifting equipment

13. Inspection and Testing

The Firm shall document a procedure for inspection and testing activities in order to verify that the product quality meets the requirements of the contract documents. The Firm shall establish in the procedure an inspection plan to assure contract requirements are met. This plan shall be adjusted at any time when the required quality level is not met. The inspection procedure shall include assignments of inspection duties, showing the required inspection and testing, and the required records to meet the contract requirements.

The Firm shall conduct 100% inspection for visible coating defects. At a minimum, the Firm shall conduct dry film

thickness measurement in accordance with SSPC-PA 2, unless otherwise specified in the contract documents. The sampling plan should identify the unique problem areas created by the part or piece geometry. The Firm shall enforce its procedures for control of nonconformities (see Section 15) when product is found nonconforming.

13.1 Assignment of Inspection of Surface Preparation and Application of Coating

Inspectors shall be assigned on the basis of their qualifications to perform inspection of coating systems.

Production personnel can be assigned to inspection duties under the following conditions:

- They are trained both in knowledge and practice of proper inspection methods and acceptance criteria specified for the material they are inspecting. This capability can be demonstrated by their knowledge of the acceptance criteria for the part of the process for which they have inspection responsibility.
- They are aware of and have adequate time to perform their inspection responsibilities.
- Production personnel shall be capable of inspecting their own work as an in-process inspection, however, that inspection cannot be accepted as the final inspection for product conformity.
- Their inspections are monitored by qualified personnel. Production personnel can perform final inspection of the work of others, provided they are properly trained, and their work is monitored by QC (another QC-qualified inspector or QC management.)

13.2 Inspection Records

Records shall be maintained for complex coating systems showing what parameters were inspected, who performed the inspections, the date of inspections, what pieces were inspected and disposition of any nonconformances. The Firm shall document every final complex coating inspection that is conducted. Documentation requires retrievable records that are retained for an appropriate period related to contract requirements (see Section 9). The scope of the final coating inspection is per the Firm's plan for meeting the minimum requirements (see Section 13), and which may be dictated by contract requirements. Inspection reports and test results shall be consistent with customer and owner requirements. At a minimum, the following inspections shall be recorded:

- Surface Preparation (degree of cleanliness achieved; surface profile achieved; condition of surface immediately prior to beginning coating application)

- Dry film thickness (DFT) including any specific data required by SSPC-PA 2 or contract documents.
- Visual inspection for visible coating defects (recording by exception only does not meet this requirement)
- DFT gage accuracy verification record (in accordance with SSPC-PA 2)

14. Verification of Accuracy of Inspection, Measuring, and Test Equipment

Verification of accuracy shall be per manufacturer's recommendation or contract documents. The verification method shall be documented and shall address the acceptance criteria used to verify that gages are reading accurately, and what happens when a gage is found not to be reading accurately. The Firm shall describe what measures and evaluations are in question for items that were inspected with the gage determined not to be reading accurately.

The only equipment for which verification of accuracy is required for this Standard is the gage used to measure dry film thickness (DFT). The gage to measure wet film thickness shall be included if any of the Firm's contracts or product manufacturers recommendations use this measurement option as the final acceptance of the coated surfaces. The verification of accuracy of the DFT gage shall be determined according to Section 3 of SSPC-PA 2 using standards (shims or test blocks) that are traceable to a national standard.

15. Control of Nonconformities

The Firm shall document a procedure to provide for disposition of nonconforming surface preparation and coated product, including identification, segregation, evaluation, repair or disposal, and notification to the functions concerned. This procedure shall ensure that coated product that does not conform to contract requirements is prevented from reaching the customer.

The procedure shall define responsibility for review and disposition of nonconforming product and shall identify qualifications required for that responsibility. The disposition of nonconforming product may be:

- Reworked
- Repaired
- Used as is (after more detailed analysis or acceptance by the Firm's engineering or management, provided contract requirements are met)
- Owner-approved nonconforming product
- Scrapped.

Repaired or reworked product shall be re-inspected in accordance with the drawings, specifications and project requirements. Where owner approval is required, it shall be documented.

Materials with expired shelf life are nonconforming. Such materials may be "used as is" with authorization from the manufacturer as described in Section 5.1.5 of SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel." The manufacturer's extension of the shelf life is evidenced by a replacement Certificate of Conformance. Alternatively, materials with expired shelf life may be used as "owner-approved nonconforming product" with documentation of approval from the Owner. Records shall be kept of the nonconforming materials and pieces affected, the nature of the nonconformance, the disposition selection, authorization and inspection results.

16. Corrective Action

The Firm shall develop a documented procedure for corrective action. Any corrective action taken shall be to the degree appropriate to the magnitude of problems and commensurate with the risks to product quality.

The corrective action procedure shall include periodic review of records or summaries of nonconformities and of internal and external quality audit reports for determination and initiation of corrective actions. Corrective action shall be applied when:

- There is a nonconformity that is repetitive in nature. This can be identified by periodically reviewing nonconformance reports or summaries for negative trends.
- Process nonconformities are found during the internal and external quality audits indicating that the quality management system may not be implemented and functioning as stated in the quality manual.
- Nonconformance with the quality management system is found during the day-to-day execution of the system.
- Nonconformance is unacceptable due to cost or severity.
- A customer complaint has been received

The corrective action procedure shall address these steps:

1. Document a corrective action request (CAR) that includes the nonconformity to be addressed by the Corrective Action and the requirement that has not been met. The corrective action procedure shall define the functional positions authorized to issue a CAR and initiate the corrective action process.
2. Assign responsibility and establish a timeframe for the response to a CAR
3. Investigate and document the scope of the nonconformity, root causes, and measures taken to bring a nonconforming product or process into conformance with specified requirements, and list the actions to be taken to prevent recurrence.

4. Communicate the CAR and resolution to the management team and appropriate members of the organization.
5. Follow up the corrective action taken with periodic monitoring to assure the corrective action is implemented and is effective.

17. Handling, Storage, and Delivery of Product and Materials

Coated product shall be handled, stored, loaded and prepared for shipment to prevent damage and deterioration.

18. Training

Personnel involved in application and surface preparation shall receive initial and continuing (as defined by the Firm) documented training appropriate for their job functions as well as in inspection methods and quality acceptance criteria. Training shall be conducted by a qualified external source or delivered in-house by a qualified internal person. Qualification of trainers shall be documented.

Training shall cover the key issues of the subject and be documented with a record of the topics discussed, the course administrator, trainees in attendance, measurement of trainee comprehension and the training dates. The course curricula shall relate to the subject and cover the key issues of the subject.

18.1 Qualification and Training of Production Personnel

Production personnel shall demonstrate and be capable of inspecting their own work as an in-process inspection. The Firm shall implement a written program to:

- Assess the skills and general training needs of newly hired craft workers and qualify them for their assigned tasks
- Verify the qualifications of existing craft workers
- Train inexperienced craft workers (trainees) as necessary
- Evaluate the performance of craft workers at least once per calendar year and provide additional training as necessary
- Ensure compliance with contract specific worker training/qualification requirements.

18.2 Qualification and Training of Inspection Personnel

Personnel involved in inspection of surface preparation and coating application and curing shall be qualified by training and experience as defined by the Firm. Experience shall include the inspection of complex coating systems applied on a variety of projects. Personnel shall be familiar and proficient with their

responsibilities, the use of inspection equipment and the inspection procedures. The basis for qualification of inspectors for coating processes shall be documented and shall include experience and training in surface preparation and coating application and in inspection and testing of these processes. The competency of inspectors shall be assessed and then documented.² The competency of inspectors without experience or inspectors at new Firms shall be documented. Qualification standards and certifications granted by recognized industry organizations can be used to establish the basis for qualification.

Training for inspectors may be provided and documented by qualified in-house instructors or by external sources. At a minimum, the training shall include the “body of knowledge” items described in ASTM D 3276:

- Surface Preparation (mill scale; surface profile; chemical cleaning; solvent vapor cleaning; hand and power tool cleaning; abrasive blast cleaning; pressurized water cleaning; steel surfaces, galvanized surfaces)
- Coating Storage and Handling (storage of coating and thinner; mixing; thinning; initial samples of coating and thinner; heating of coating)
- Weather Considerations (drying; low temperature; high temperature, moisture; wind)
- Coating Application (residual contaminants; quality assurance; film defects; brush application; roller application; spray application; miscellaneous methods; rate of application)
- Additional Considerations (ventilation; shop coat repair; coating schedule; recoat time; coating system failure)
- Inspection Equipment (general; surface profile gage; adhesion of existing coating; portable pull off adhesion; drying and curing times; thermometers; relative humidity and dew point; coating consistency cups; weight per gallon cup; wet film thickness; interchemical gage; notched gage; dry film thickness gages; non-destructive film thickness gages; magnetic type gages; current type gages; holiday detectors; Tooke gage;
- Comparison of Surface Preparation (specifications)
- Inspection Checklist

² It is recognized that those performing final inspection may have received training prior to the requirement for documentation of training that is now part of this standard. To comply, the Firm’s management shall document a review of the qualifications of current inspection personnel for implementation of the quality management system. Subsequent required periodic training shall be documented.

19. Internal Audit

The Firm shall perform an internal audit of the coating process, procedures and all the elements of this Standard at least once a year. A qualified individual, independent of the function being audited, shall perform the audit. Internal audits and their results shall be recorded and include any corrective actions that are realized as a result of the audits. Internal audits shall be effective at identifying issues requiring corrective action.