



SSPC: The Society for Protective Coatings

Applicator Certification Standard No. 1

INDUSTRIAL COATING AND LINING APPLICATION SPECIALIST QUALIFICATION AND CERTIFICATION

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Foreword

This standard sets forth the requirements for qualification and certification of an industrial coating and lining application specialist, referred to hereafter as an Application Specialist. The qualification and certification process is a stepwise achievement process that includes all aspects of surface preparation and coating application for steel and concrete surfaces of complex industrial structures. The intended audience includes persons involved in developing education and certification programs for the training and assessment of the skills and knowledge of an Application Specialist or assessing the training and certification programs available either on the open market or from an in-house source.

The body of the standard provides the requirements for qualification and certification of an Application Specialist.

Appendix A (mandatory) defines the competency requirements or the minimum "Body of Knowledge" for each qualification level that provides a basis to allow applicants to achieve qualification in a Certified Application Specialist Program. Appendix A provides requirements for Section 5.

Appendix B (mandatory) describes the level of cognition required for each qualification level. Appendix B provides required information for use with Appendix A when developing a learning skills program associated with the Body of Knowledge in Appendix A.

Appendix C (nonmandatory) provides information on desirable workplace skills (reading text, document use, and numeracy) that should be considered when attempting to both nurture and assess a candidate's overall skills level.

This standard could be used to validate or assess a candidate's (e.g., an employee or potential employee) knowledge and skills level based on qualification in a certification program operated under this standard. One of the goals of this standard is to recognize and record in an outline format the minimum, overarching elements in the Body of Knowledge as these elements relate to a candidate's cognitive levels of learning and skills.

Government and industry are striving for long-term reliability of equipment and operations. Corrosion mitigation of steel and concrete structures by coatings and linings is germane to achieving that goal. Coating application also combines corrosion mitigation with aesthetic appeal in both the public and private sectors. The success of coatings and linings is heavily dependent on the qualifications of the Application Specialist. The study "Corrosion Costs and Preventive Strategies in the United States"¹ identified an annual expenditure of \$108.6 billion US on protective coatings and linings. As much as 71% of that annual expenditure may be affected by work performed by an Application Specialist.

This standard is designed to qualify the Application Specialist through a broad range of classroom instruction and associated work experiences.

This standard was developed by the joint Task Group (TG) 320 on Coating and Lining Applicator Qualification. TG 320 is administered by Specific Technology Group (STG) 04 on

Coatings and Linings, Protective: Surface Preparation, and is composed of representatives from The Society for Protective Coatings (SSPC), NACE International, and the International Union of Paint and Allied Trades (IUPAT).⁽¹⁾ This standard is published under the auspices of SSPC's Coating Applicator Qualification Committee and NACE STG 04.

In SSPC/NACE standards, the terms *shall*, *must*, *should*, and *may* are used in accordance with Paragraph 2.2.1.8 of the Agreement Between SSPC: The Society for Protective Coatings and NACE International. The terms *shall* and *must* are used to state mandatory requirements. The term *should* is used to state something considered good and is recommended but is not mandatory. The term *may* is used to state something considered optional.

Section 1: General

1.1 Scope

1.1.1 This standard provides criteria for the education, training, experience, knowledge, and skills required by an Application Specialist to prepare and apply protective coatings to steel and concrete surfaces of complex industrial structures. This standard may be used for certification of Application Specialists for other substrates or conditions, as considered appropriate by facility owners, contractors, or certifying agencies.

1.1.2 This standard applies to qualification of an Application Specialist for work on new construction and maintenance of complex industrial structures.

Section 2: Definitions

Application Specialist: An individual who engages in surface preparation and application of protective coatings and linings to steel and concrete surfaces of complex industrial structures.

Section 3: Body of Knowledge

3.1 The basis for the qualification of an Application Specialist shall consist of:

3.1.1 Body of Knowledge; and

3.1.2 Test requirements.

3.2 The Body of Knowledge shall consist of:

3.2.1 A list of required areas of knowledge and skills; and

3.2.2 Required level of cognition for each area of knowledge and skill.

3.3 The core areas of the Body of Knowledge include:

3.3.1 Environmental, safety, and health;

⁽¹⁾ International Union of Painters and Allied Trades (IUPAT), 1750 New York Avenue, NW Washington, DC 20006



Table 1
Qualification Levels for Application Specialist

Qualification Level	Requirements
Level I	Basic knowledge of industrial coatings and linings
Level II	Detailed knowledge and skills of industrial coatings and linings
Specialty	Level II plus detailed knowledge and skills of specialty areas as identified herein
Level III	Level II plus: • Basic supervisory knowledge and skills • Basic training knowledge and skills • Basic communication knowledge and skills

3.3.2 Process control: specifications, codes and standards, quality assurance, and quality control;

3.3.3 Materials: consumables; surface preparation materials; coating materials; material properties, characteristics, and use; material safety data sheets (MSDSs);

3.3.4 Surface preparation: the purpose of surface preparation, chemical cleaning, hand and power tools, waterjetting (WJ), abrasive blasting, surface preparation standards, environmental controls, substrate repairs, and surface contaminants; and

3.3.5 Application: storage, mixing, environmental conditions and controls, conventional spray, airless spray, thermal spray, trowel, brush, roller, tapes, heat-shrinkable coatings, powder coatings, plural component spray, curing, recoat and overcoat, defects and repairs.

3.4 The specialty areas of the Body of Knowledge include:

3.4.1 Installation of polymer coatings and linings on concrete floors and secondary containment;_

3.4.2 High pressure water cleaning (HPWC) and ultrahigh-pressure waterjetting (UHPWJ);

3.4.3 Electrostatic spray;

3.4.4 Plural component spray;

3.4.5 Powder coatings;

3.4.6 Specialty pipeline coatings; and

3.4.7 Thermal spray coatings.

Section 4: Qualification Levels for Application Specialist

4.1 This standard sets forth requirements for three basic qualification levels – Level I, Level II, and Level III – for an Application Specialist. In addition, requirements are set forth to attain specialty qualifications for Level II. These qualification levels are summarized in Table 1.

4.2 The requirements associated with each qualification level include prerequisites, experience, and an appropriate

degree of knowledge and skills as they relate to the Body of Knowledge elements in Appendix A. Table A1 in Appendix A provides the Body of Knowledge that is used to establish each qualification level based on appropriate competency requirements for each knowledge and skill element.

Level I qualification is intended for entry-level Application Specialists. Level I Application Specialists customarily work with and under the supervision of Level II and Level III Application Specialists.

Level II qualification is intended for experienced Application Specialists able to work independently.

Level III qualification is intended for Application Specialists responsible for planning, oversight, evaluation, and supervision of industrial coating and lining of complex industrial structures.

Section 5: Requirements for Each Qualification Level

5.1 Application Specialist Qualification Requirements – Level I

5.1.1 Successful completion of a skills assessment program measuring essential employability skills: text reading, document use, and numeracy (see Appendix C);

5.1.2 Successful completion of examinations and skills test on the Body of Knowledge (see Appendix A); and

5.1.3 Successful demonstration of the ability to read, write, and communicate in the language of the workplace location (e.g., English in the United States, United Kingdom, and Canada; French in Quebec; Spanish in Mexico).

5.2 Application Specialist Qualification Requirements – Level II

5.2.1 Successful completion of all Level I requirements;

5.2.2 Qualify to take Level II examinations by one of following methods:

5.2.2.1 Successful completion of a three-year appren-

Table 2: Level II Core and Specialty Qualification Examination Requirements

	Level II Core Qualification ^(A)			Specialty (Add-on) Qualification (optional)	
	Written Examination	Practical Examination		Written Examination	Practical Examination
		Surface Preparation	Application		
Core area of Body of Knowledge	√	√	√		
Coating of concrete floors and secondary containment	√			√	√
HPWC & UHPWJ	√			√	√
Electrostatic spray	√			√	√
Plural component spray	√			√	√
Powder coatings	√			√	√
Specialty pipeline coatings	√			√	√
Thermal spray coatings	√			√	√

^(A) Level II core qualification assesses knowledge and skills in the core areas of the Body of Knowledge, and general knowledge of the specialty areas of the Body of Knowledge.

ticeship program that includes a minimum of 3,000 hours of verifiable work experience and a minimum of 450 hours of coating-related technical training (training to be dispersed evenly throughout the experience phase); or

5.2.2.2 Five years (minimum) of related work experience that includes a minimum of 5,000 hours of verifiable work experience and a minimum of 450 hours of coating-related technical training (training to be dispersed evenly throughout the experience phase); or

5.2.2.3 Eight years (minimum) of related work experience that includes a minimum of 8,000 hours of verifiable work experience; and

5.2.3 Successful completion of Level II examinations (refer to Section 6 for details of Level II core and specialty qualifications).

5.3 Application Specialist Qualification Requirements – Level III

5.3.1 Qualify to take Level III examinations by one of the following methods:

5.3.1.1 Five years (minimum) of related work experience after achieving qualification to Level II; or

5.3.1.2 Five years (minimum) of verifiable work experience in inspection or supervision of coating-related work for complex industrial structures after completion of the requirements included in Paragraph 5.2.2; and

5.3.2 Successful completion of Level III examination.

Section 6: Examination Requirements for Level II Core and Specialty Qualifications

Level II core and specialty qualification requirements shall consist of a combination of written examinations to assess knowledge and practical examinations to assess knowledge and skills. Table 2 shows the various examination requirements for Level II core and specialty (add-on) qualifications.

7: Certification Program Requirements

7.1 Certification programs operated under this standard shall be developed and operated in accordance with ISO⁽²⁾ 17024.²

7.2 Certification examinations shall be based on the competency requirements in the Body of Knowledge for the qualification level that the candidate is striving to achieve.

7.3 Practical examinations for Level II shall require the candidate to prepare and coat a test panel or test apparatus that mimics the efforts required to prepare and coat complex industrial structures. The examination and test panel or test apparatus shall test the candidate on his/her ability to:

⁽²⁾ International Organization for Standardization (ISO), 1 rue de Varembe, Case Postale 56, CH-1121 Geneva 20, Switzerland

- 7.3.1 Plan steps and procedures;
- 7.3.2 Set up and start abrasive blasting equipment;
- 7.3.3 Abrasive blast the test panel or test apparatus to a specific level of cleanliness and surface profile;
- 7.3.4 Inspect, assess, measure, and document the specified surface preparation;
- 7.3.5 Mix and thin liquid coating materials;
- 7.3.6 Set up and start coating application equipment;
- 7.3.7 Set up and start spray, brush, or roller application as appropriate;
- 7.3.8 Brush, roll, and/or spray coat the test panel or test apparatus;
- 7.3.9 Inspect, assess, measure, and document the coating application (each coat and total coating system); and
- 7.3.10 Clean up and dispose of waste.

7.4 The test panel shall be in accordance with ASTM⁽³⁾ D 4228³ or appropriate equivalent.

7.5 The coating systems shall be specified at time of testing. A variety of coating materials, surface preparation methods, and means of application shall be used to test the candidate's ability to handle various types of coatings and their surface preparation and application issues.

7.6 Inspection and documentation of surface preparation and coating application shall be in accordance with ASTM D 5161.⁴

Section 8: Requirements for Maintaining Qualification

8.1 Qualifications shall be valid for no more than three years. Qualifications shall be maintained by one of the following methods:

8.1.1 Successful completion of a minimum of 40 hours per year of training; or

8.1.2 Successful completion of the qualification examination(s) for the qualification level (core or specialty) being maintained.

References

1. "Corrosion Costs and Preventive Strategies in the United States," Report FHWA-RD-01-156 (Springfield, VA: National Technical Information Service⁽⁴⁾).
2. ISO 17024—ISO/IEC 17024 (latest revision), "Conformity assessment—General requirements for bodies operating certification of persons" (Geneva, Switzerland: ISO).
3. ASTM D 4228 (latest revision), "Standard Practice for Qualification of Coating Applicators for Application of Cto Steel Surfaces" (West Conshohocken, PA: ASTM).

⁽³⁾ ASTM International (ASTM), 100 Barr Harbor Dr., West Conshohocken, PA 19428-2959.

⁽⁴⁾ National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

4. ASTM D 5161 (latest revision), "Standard Guide for Specifying Inspection Requirements for Coating and Lining Work (Metal Substrates)" (West Conshohocken, PA: ASTM).
5. B.S. Bloom, B.B. Mesia, D.R. Krathwohl, "Levels of Cognition," in Taxonomy of Educational Objectives, Vol. 1: The Affective Domain, and Vol. 2: The Cognitive Domain (New York, NY: David McKay, 1964).
6. R.H. Dave, in R.J. Armstrong et al., Developing and Writing Behavioral Objectives (Tucson, AZ: Educational Innovators Press, 1970).
7. Test of Workplace Essential Skills (TOWES). Bow Valley College, 332 - 6th Avenue SE, Calgary, AB T2G 4S6 Canada.

Appendix A
Body of Knowledge for Application Specialist Qualification
(Mandatory)

NOTE: The N1 through N6 designations for the competency requirements indicate levels of cognition and psychomotor skills in accordance with Appendix B. The N designation in each block applies to the entire associated section, not just the line item with which it is aligned.

Table A1

Body of Knowledge—Application Specialist Qualification				
	Competency Requirements			
	Level I	Level II	Level III	Specialty
Knowledge and Skills Elements				
A1 Environmental, Safety, and Health				
A1.1 Local and Other Applicable Safety Codes, Practices, Standards, and Regulations A1.1.1 Rigging and hoisting A1.1.2 Scaffolding and ladders A1.1.3 Fall protection A1.1.4 Confined space A1.1.5 Lock out/tag out A1.1.6 Aerial lifts A1.1.7 Hazard communication (Hazcom) A1.1.8 First aid/cardiopulmonary resuscitation (CPR) A1.1.9 Legal and regulatory requirements and compliance A1.1.10 Health A1.1.11 Electrical grounding requirements A1.1.12 Hand and power tool cleaning A1.1.13 Fire protection programs A1.1.14 Personal protective equipment (PPE) A1.1.15 Respiratory protection A1.2 Safety Related Directly to Specific Materials/Equipment A1.2.1 Abrasive cleaning (both wet and dry methods) A1.2.2 WJ A1.2.3 Ventilation A1.2.4 Toxic metal abatement A1.2.5 Hydrocarbon solvent exposure, use, and disposal A1.3 Ventilation A1.3.1 Lower explosive limit (LEL)/upper explosive limit (UEL) A1.3.2 Threshold limit value (TLV)/permissible exposure limit (PEL) A1.3.3 Dilution A1.3.4 Air flow A1.3.5 Protection factors—internal and external A1.4 Environmental A1.4.1 Waste minimization A1.4.2 Handling and disposal of hazardous materials A1.5 Health A1.5.1 Hearing conservation A1.5.2 Asbestos A1.5.3 Personal protection – eyes, hearing, shoes	N1	N3	N6	

