



Certified Coatings Inspector (Level 2) Exam

Exam Preparation Guide

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Introduction

The AMPP Certified Coatings Inspector (Level 2) Exam is designed to assess whether a candidate possesses the knowledge and skills required of a minimally qualified Certified Coatings Inspector. The exam consists of 120 multiple-choice questions based on the Certified Coatings Inspector exam blueprint. Candidates are expected to apply knowledge on the exam from the Certified Coatings Inspector (CIP Level 2) course, along with applicable standards, references, and best practices.

Test Name	AMPP Certified Coatings Inspector (Level 2) Exam
Test Code	CertifiedCtgsIn
Total Seat Time*	3 hours
Number of Exam Items†	120
Format	Computer Based Testing (CBT)

* Total Seat Time includes 10 minutes for a Tutorial and Non-Disclosure Agreement and 2 hours 50 minutes for the Exam.

† Number of Exam Items includes 100 scored items and 20 unscored items.

Candidates receive a Pass/Fail result after completing the exam, and performance results are reported by major content domains.

Target Audience

Candidates for the Certified Coatings Inspector (Level 2) credential are individuals who hold an active Basic Coatings Inspector (Level 1) certification and have gained at least two years of verifiable coatings inspection–related work experience following that certification. This credential is intended for inspectors who have progressed beyond entry-level inspection activities and are qualified to perform inspection work with reduced levels of supervision, depending on project type and risk.

Certified Coatings Inspectors typically perform and document inspections of liquid and non-liquid coatings on a variety of substrates, including concrete, in accordance with applicable standards. They may perform inspection activities under indirect supervision on simple and moderate-risk projects and under direct supervision of a Senior Certified Coatings Inspector (Level 3) on more complex or critical-risk projects, as required by the project owner, agency requirements, and AMPP Coating Inspector Program recommended supervision guidelines.

Prerequisites

Prerequisites to take the exam

Prerequisites

- Certification: Active Basic Coatings Inspector (Level 1) certification
- Work Experience: Two years (minimum) verifiable coatings-related work experience

Requirements

Requirements to earn the certification

Course Requirements

- Successful completion of the Certified Coatings Inspector (CIP 2) course

Core Exam Requirements

- Pass the Certified Coatings Inspector Practical (Level 2) exam
- Pass the Certified Coatings Inspector Theory (Level 2) exam

Ethics Course

Successful completion of **either**:

- AMPP Ethics for the Corrosion Professional course
- OR**
- Submit a third-party ethics training program for review and approval as an equivalent

Upon successful completion of **all** requirements, candidates will be awarded the **Certified Coatings Inspector** (Level 2) certification.

Certification Renewal Requirements

- Recertification application required every 3 years, subject to approval
- 18 months of coatings-related work experience since last renewal
- 8 hours per year (24 hours total for the 3-year cycle) of ongoing professional development hours (PDHs) since last renewal

Exam Blueprint

1. Safety

4%

Process Safety

- Apply intermediate level job- and equipment-specific safety and security rules (e.g., bulging blast line, non-intrinsic safe equipment)
- Evaluate and determine safety issues particular to specialized coatings and specialized prep methods

Safety Standards

- Understand the importance of the environmental safety regulations of the established applicable organizations local or international
- Recognize local, state, federal, and international job-specific regulations related to the safe use of the equipment and their applications

2. Inspection Process

15%

Inspection Planning

- Evaluate and apply the client's written expectations
- Create inspection and test plans
- Evaluate and justify the purpose of the inspection including the cost
- Support job specifications
- Recognize the difference between de facto, national, and international standards

Inspection Activities

- Understand the scope and the responsibilities of CIP level 2 regarding CIP level 1
- Demonstrate how to verify CIP level 1 work in a shop environment
- Interpret and apply a standard, including NACE and AMPP International standards

3. Corrosion

9%

Cause

- Classify the types of corrosion: general, localized, crevice, flow-assisted corrosion
- Categorize the general electrochemical processes of corrosion and determine the components of the corrosion cell
- Illustrate galvanic corrosion and dissimilar metals

Effect Control

- Recognize the different corrosion rates of various substrates (e.g., ferrous, non-ferrous, duplex)
- Recognize the two different cathodic protection systems: galvanic and impressed current
- Understand the basic principles of cathodic protection and its effects on coatings
- Identify factors that influence corrosion rates and the types of mitigation

4. Environmental Conditions and Inspection

7%

- Analyze the environmental requirements for various coatings
- Analyze inspection concerns related to environmental conditions
- Identify the effects of humidity on corrosion rates
- Understand dehumidification and its benefits (e.g., desiccant, heater, and refrigerant)
- Understand lighting, ventilation, filtration, and air movement (changes) in enclosures
- Demonstrate the process of using advanced environmental testing equipment and how to use data loggers

5. Surface Preparation & Inspection

18%

Methods

- Demonstrate the usage of the different surface preparation methods used for various substrates - nonferrous alloys and metals, wood, concrete, and polymeric materials
- Illustrate the importance of the removal of surface contaminants, acid, residuals, and passivation
- Explain surface preparation processes using chemical materials such as acid, pickling, passivation, etc.

Pre/Post Inspection

- Evaluate how waterjetting is used for surface preparation
- Understand how concrete surfaces are prepared for coating

Preparation Equipment/Materials

- Understand and identify inspection considerations of the abrasive types of mixes
- Identify the type of materials that can be effectively removed by waterjetting
- Evaluate centrifugal blast cleaning as a surface preparation method
- Understand the purpose and usage of portable and remote-operated systems

Standards

- Describe the waterjetting standards and their requirements
- Describe standards that address centrifugal blast cleaning and their requirements
- Identify the standards for special substrates
- Describe the concrete preparation standards and their requirements
- Describe standards that address the blast media AB-1/2/3 and field verification method

6. Coatings and Coating Application

13%

Application Equipment

- Describe the processes of thermal, electrostatic, and polyester spray applications
- Understand how specialty coatings are applied
- Understand how a plural-component spray system works

Coating Processes

- Analyze how fusion-bonded epoxy (FBE) can be used to coat pipelines
- Analyze how multi-layer polyolefin coatings are applied on pipelines
- Understand the application of tape as a standalone coating material
- Analyze the application processes of hot-dip galvanizing
- Recognize all standards and guidelines for concrete coating and lining installations
- Analyze the requirements for concrete coating
- Classify the curing mechanisms including polymerization and solvent-evaporation
- Analyze how coal-tar enamel (CTE) and asphalt coatings are used
- Analyze the considerations of maintenance coating

Products

- Distinguish the difference between non-convertible and convertible curing mechanisms
- Understand the purpose and use of powder coatings
- Recognize the types of specialized coatings
- Recognize the various types of thick-barrier linings and how they are installed and used
- Understand concrete curing time and how to perform tests for cure
- Understand how concrete is used on pipelines
- Determine the importance of coatings on pipeline interior/exterior surfaces
- Evaluate the consequences of pipeline integrity failure
- Recognize the coating types for pipeline field joints
- Recognize the different types of mainline coating repair products

7. Coating Inspection

16%

Assessing

- Evaluate existing coating systems during the coating survey
- Evaluate the types of coating defects, failures, and common issues
- Classify the inspection criteria used to detect coatings failure
- Differentiate adhesion testing methods
- Identify the defects in hot-dip galvanizing
- Evaluate the inspection procedures for nonferrous and concrete coating
- Recognize thick-barrier lining and curing mechanisms

Verification

- Perform basic and intermediate inspections with instruments
- Demonstrate the difference between verification and calibration of test equipment
- Demonstrate how to test concrete coating thickness
- Perform and evaluate destructive tests (e.g., hardness and adhesion testing)
- Perform and evaluate specialized tests (e.g., Eddy current, ultrasonic DFT)
- Analyze and interpret specialized lab testing (e.g., cathodic disbondment)

8. Documentation

10%

Reporting Documentation

- Analyze and evaluate Level 1 inspection reports
- Understand the purpose and usage of coating surveys for the maintenance of the painting systems
- Demonstrate how to document inspection of specialty coatings and linings work in accordance with standards
- Develop all reports about preparation, application, and inspection, and understand the importance of timely submission and record retention
- Create electronic reporting processes
- Demonstrate the importance of data collection and storage
- Develop appropriate documentation of coatings failure for Level 3 action

Technical Documentation

- Demonstrate the importance of job-specific standards (e.g., NACE, SSPC, AMPP, ASTM, and ISO) and the differences among them
- Interpret Product Data Sheets (PDS)
- Recognize hot-dip galvanizing standards

9. Communications/Teamwork

4%

- Understand the role and responsibilities of a certified inspector
- Understand the scope and limitations of CIP 2 and the role of the senior certified inspector
- Demonstrate and promote the importance of the pre-job conference
- Illustrate the responsibilities between the owner, the contractor, and the inspector
- Justify the role of the coating condition assessment surveyor
- Recognize what defensive behavior is and how to avoid critical or judgmental attitudes
- Understand how to use effective communication to resolve conflict for problem-solving

10. Ethics

4%

- Evaluate the ethics required of an AMPP-certified inspector and what it means to sign an attestation
- Demonstrate how to address ethical dilemmas reported by Level 1 inspectors
- Analyze and evaluate situations that may contribute to ethical dilemmas
- Possess the ability to make positive suggestions to improve job flow and quality when facing ethical challenges

Exam Format and Preparation

Overview

The exam consists of 120 multiple-choice items. Of these, 100 items are scored and count toward the Pass/Fail result. The remaining 20 items are unscored and are included to gather statistical data for future exam development. Candidates will not be able to distinguish scored from unscored items.

Some items are presented as direct questions, while others use a complete-the-sentence format. In all cases, there is only one best answer. Items are randomized for each candidate.

Exam content is based on the Certified Coatings Inspector (Level 2) exam blueprint and draws from material covered in the Certified Coatings Inspector (CIP Level 2) course, as well as from resources listed in the *Study Resources and Reference Materials* section of this guide. Candidates are expected to meet the program requirements, including relevant coatings-related experience, prior to attempting the exam.

Sample Items (Questions)

The following sample items are included to illustrate the formats and item types that will appear on the exam. Your performance on the sample items should not be considered as a predictor of your performance on the actual exam.

1. During inspection of a newly hot-dip galvanized structural steel beam in an atmospheric exposure environment, a coatings inspector observes several irregular, uncoated areas scattered along the surface. The surrounding zinc coating appears continuous and meets minimum thickness requirements, but the bare areas expose the underlying steel. No mechanical damage is evident. Which of the following is the most likely cause of this condition?
 - A. Localized zinc consumption
 - B. Failure of zinc to metallurgically bond
 - C. Formation of zinc patina
 - D. Intermetallic layer growth variation
2. The Tooke gauge is used to measure:
 - A. abrasion resistance.
 - B. dry-film thickness (DFT).
 - C. scratch resistance.
 - D. cure.
3. If silica gel becomes contaminated, it will:
 - A. collect excessive moisture.
 - B. lower the dew point.
 - C. no longer hold moisture.
 - D. raise the substrate temperature.
4. Which of the following forms of corrosion occurs at discrete sites on a metal surface?
 - A. Localized
 - B. General
 - C. Galvanic
 - D. Sacrificial

Answer Key

1. B
Reference: Hot-Dip Galvanizing for Corrosion Protection
2. B
Reference: CIP Level 2 Course Manual, Chapter 5
3. C
Reference: CIP Level 2 Course Manual, Chapter 2
4. A
Reference: CIP Level 2 Course Manual, Chapter 16

Study Resources and Reference Materials

Training

- Certified Coatings Inspector (Level 2) course

Course Material

- Certified Coatings Inspector (Level 2) course manual

Books

- Corrosion prevention by protective coatings by Charles Munger
- Practical Math for the Protective Coatings Industry by Raymond Weaver
- SSPC Painting Manual Volume 1- Good Painting Practices
- Hot-Dip Galvanizing for Corrosion Protection, a Specifier's Guide by American Galvanizers Association

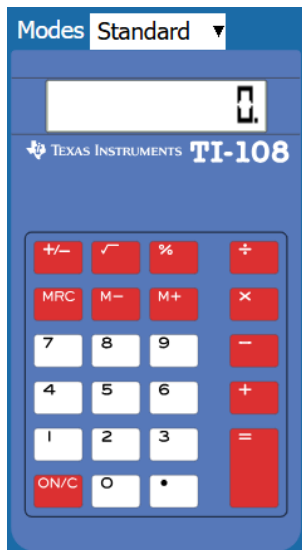
Standards

- ASTM Volume 06.01 Paint- Tests for Chemical, Physical, and Optical Properties; Appearance
- ASTM Volume 06.02 Paint- Products and Applications; Protective Coatings; Pipeline Coatings

Calculators

CBT exams contain a built-in calculator. Students will have access to either a TI Standard or TI Scientific calculator for use during the CBT Exam.

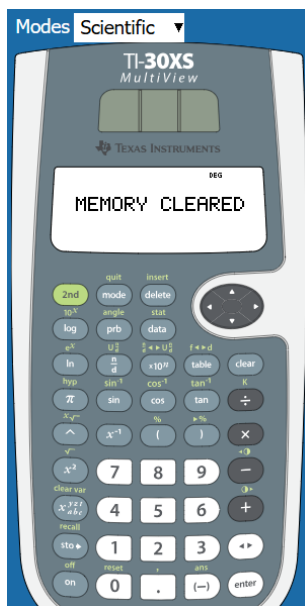
Standard Calculator



Standard Mode Functions

Add	$+$	
Subtract	$-$	
Multiply	\times	
Divide	\div	
Negative	$(-)$	
Percentage	$\%$	
Square Root	$\sqrt{\quad}$	Example: $4\sqrt{\quad}$
Reciprocal (Inverse)	x^{-1}	Example: $1\div 2 =$
Store value to variable	$M+$	Example: $3\times 5 = M+$
Access variable	MRC	Example: $7 + MRC =$
Clear variable	$M- MRC$	

Scientific Calculator



Scientific Mode Functions

Add	$+$	
Subtract	$-$	
Multiply	\times	
Divide	\div	
Negative	$(-)$	
Percentage	$2nd$ $\%$	
Square Root	$\sqrt{\quad}$	Example: $2nd \sqrt{\quad} 4 enter$
Reciprocal (Inverse)	X^{-1}	Example: $2 X^{-1} enter$
Store value to variable	$sto \blacktriangleright X^{yzt}$	Example: $3 \times 5 enter sto \blacktriangleright X^{yzt} enter$
Access variable	X^{yzt} or $2nd [recall]$	Example: $7 + 2nd [recall] enter enter$

Numeric Notation

Standard (Floating Decimal) Notation (digits to the left and right of decimal)	mode menu options NORM SCI ENG e.g. 123456.78 FLOAT 0 1 2 3 4 5 ... e.g. 123456.7800
Scientific Notation (1 digit to the left of decimal and appropriate power of 10)	mode menu options NORM SCI ENG e.g. 1.2345678*10 ⁵
Engineering Notation (number from 1 to 999 times 10 to an integer power that is a multiple of 3)	mode menu options NORM SCI ENG e.g. 123.45678*10 ³

Fractions

Simple fractions	$\boxed{n/d}$
Mixed numbers	$\boxed{2nd} [Un/d]$
Conversion b/w simple fraction and mixed number	$\boxed{2nd} [n/d \leftarrow \rightarrow Un/d]$
Conversion b/w fraction and decimal	$\boxed{2nd} [f \leftarrow \rightarrow d]$

Powers, roots, and inverses

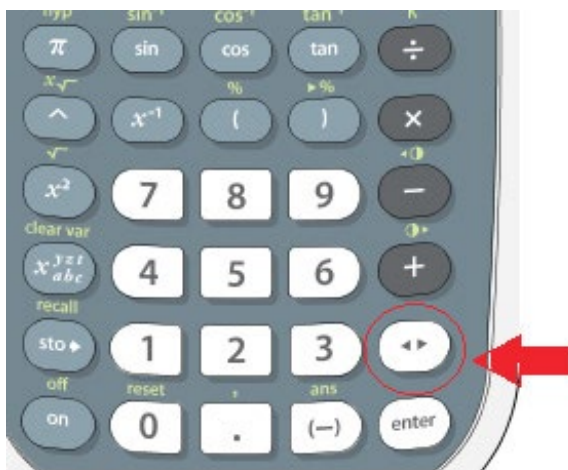
Square a value	$\boxed{x^2}$	
Cube a value	$\boxed{\wedge}$	
Raise value to specified power	$\boxed{\wedge}$	Example (2^4) $2 \boxed{\wedge} 4$
Square root	$\boxed{2nd} [\sqrt{\quad}]$	Example ($\sqrt{16}$): $\boxed{2nd} [\sqrt{\quad}] 16$
Reciprocal	$\boxed{x^{-1}}$	Example (n^{th} root): 5 th root of 8: 5 $\boxed{2nd} [x^{\sqrt{\quad}}] 8$

Pi

PI (π)	$\boxed{\pi}$
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Toggle

The scientific calculator might show the results of certain calculations as a fraction - possibly involving pi or a square root. To convert this kind of result to a single number with a decimal point, you will need to use the “toggle answer” button circled in the picture below. Pressing this button will change the display from a fractional to a decimal format.




Answer toggle



Press the  key to toggle the display result between fraction and decimal answers, exact square root and decimal, and exact pi and decimal.

Example

Answer toggle	$\boxed{2nd} [\sqrt{\quad}] 8 \text{ enter}$	$\sqrt{8}$ $2\sqrt{2}$
		$\sqrt{8}$ $2\sqrt{2}$ 2.828427125

If you find this onscreen calculator difficult to use, raise your hand and ask the TA to provide you with a hand-held calculator. If available, you will be provided with a scientific or non-scientific calculator. Candidates are not permitted to bring their own calculator into the testing room.