



CERTIFICATION BOARD FOR INSPECTION PERSONNEL

**Standard of Proficiency
for the Certification of
Protective Coatings Inspectors**

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References:

Extractives Industry Training Industry Organisation (EXITO) Training Modules 1 –
17. Certification of Protective Coating Inspectors

AS/NZS 2312:2002 Guide to the protection of structural steel against atmospheric
corrosion by use protective coatings.

SSPC Best Painting Practice Volume 1

STANDARD OF PROFICIENCY FOR THE CERTIFICATION OF PROTECTIVE COATINGS INSPECTORS

FOREWORD

This Standard of Proficiency defines the requirements for the issue of a certificate of competence to inspectors performing the surface treatment of new construction, on site maintenance, or project supervision.

A certificate of competence provides a basis for International Accreditation New Zealand to approve inspectors as signatories of inspection bodies.

Certification and re-certification in accordance with this standard confirms the qualifications, training, and experience of protective coatings inspectors.

The qualifications described by this Standard of Proficiency have been prepared for registration at level 5, on the NZQA framework.

This standard of proficiency must be read in conjunction with the General Section - Standards of Proficiency for the Certification of Inspectors.

1. SCOPE AND GENERAL

1.1. Scope

This Standard of Proficiency covers the certification of inspectors performing inspection of new construction and maintenance painting or, who have responsibility for the supervision of painting projects.

1.2. Types of Certificates

The certificate of competence which may be granted is the Protective Coatings Inspector (PCI).

2. CERTIFICATION PROCESS FOR PROTECTIVE COATINGS INSPECTORS

Candidates seeking certification shall satisfy the requirements of the *General Section – Standards of Proficiency for the Certification of Inspectors*, by completing:

- (a) The pre-requisite training, qualifications and experience in Section 3 below, and
- (b) The examinations in Section 4 below.

Candidate's documentation covering pre-requisite training, qualifications and experience shall be certified by both Exito and their employer(s).

3. PRE-REQUISITE TRAINING QUALIFICATIONS AND EXPERIENCE

Candidates shall complete the following training, qualifications and experience and include with their Application for Certification the documentation described in Section 5 of the General Section - Standards of Proficiency for the Certification of Inspectors.

3.1. Training and Qualifications

Candidates shall have:

- (a) Completed and passed the seventeen modules of the relevant EXITO Protective Coating Inspection home study course.
- (b) Completed and passed a practical examination in the safe use of protective coating inspection equipment.

3.2. Experience

Candidates shall have a minimum of three years experience in the protective coatings industry.

Working in the abrasive blast cleaning and industrial coatings application industry.

- Protective Coating sales and marketing industries.
- Related industries such as hot dip galvanising industry or pipe wrapping industries
- And or by special application to the board, such as: A candidate with a qualification such as NACE Level 2 or ACA may be granted cross recognition or may be asked to sit the practical exam, providing they meet the requirements set out in Appendix B.

4. EXAMINATIONS

A candidate will become eligible to sit a CBIP PCI examination once having completed the necessary home study modules from Extractives Industry Training Organisation (Exito) Protective Coatings Inspection Home Study Course recognised by CBIP. Once the examination has been passed to the satisfaction of the board and a certificate issued, the candidate may then apply to Exito for unit standard 13444 (Level 5) Certificate of Competence and have this registered with NZQA.

4.1. PCI certificate of competence

The examinations for a PCI certificate of competence are comprised of the following papers (CBIP PCI Examination), which should be taken in the order shown;

- (a) Section 1 – Multi Choice Questions
- (b) Section 2 – Short Answer Questions
- (c) Section 3 – Written Project
- (d) A practical examination and peer review covering the use of testing and inspection equipment and general knowledge of abrasive blasting and painting applications.

The examinations cover inspection of protective coating systems for both new construction and in-service plant.

They will examine a candidate's knowledge relevant to the selection of, preparation, application, inspection and testing of protective coating systems for:

- (a) Carbon steels and austenitic stainless steels
- (b) Galvanising systems and procedures
- (c) Pipe Wrapping on site and in shop environments.
- (d) AS/NZS2312 Protective Coating Systems.

And will include:

- (a) Testing and Inspection equipment
- (b) Preparation and approval of inspection procedures
- (c) Preparation and approval of inspection and test plans

4.2. Sample questions

Sample questions for the examination papers are given in Appendix A.

4.3. Knowledge requirements

The knowledge requirements applicable to the examination papers for a PCI certificate of competence are described in Appendix B.

4.4. Recognition of other qualifications and exemptions

CBIP will consider applications for exemptions from the examination for a PCI certificate of competence.

Application for recognition of other qualifications and exemptions from examination papers shall be made in accordance with the *General Section – Certification of Inspectors*.

4.5. Recertification

4.5.1. PCI

The recertification exam will be an appropriate re-certification examination based on ongoing learning, evidence of courses attended, evidence of additional industry related training attended.

APPENDIX A
Sample examination questions
(Informative)

Examination Format:

1. The site where corrosion takes place on a metal is called the:
 - a anode
 - b cathode
 - c electrolyte
 - d conducting path

2. If the anode of a corrosion cell is much larger than the cathode, then corrosion is generally:
 - a increased
 - b reduced
 - c remain much the same
 - d increase or reduce depending on which metal is the anode and which the cathode

3. A piece of zinc is joined to a piece of copper and both are placed in a salt water solution. Corrosion takes place at:
 - a the copper
 - b the zinc
 - c both the zinc and copper
 - d neither, both are immune from corrosion

4. In crevices and under dirt or mill scale on a piece of steel:
 - a corrosion does not occur
 - b corrosion continues exactly the same as in the exposed areas
 - c corrosion is accelerated
 - d any of the above depending on what metal the steel is connected to

5. Which of the following is *not* a good design feature to help minimise corrosion:
 - a a structure with good ventilation
 - b a structure which allows easy painting
 - c a structure with drain holes
 - d a structure with crevices and cavities

6. Zinc anodes on a ship provide corrosion protection by:
 - a dissolving and reacting with the coating to form a zinc-rich coating
 - b altering the flow of water over the hull so that it is less corrosive
 - c sacrificially corroding instead of the steel
 - d dissolving and putting a corrosion inhibitor in the sea water

Section 2 Short Answers

7. You are measuring humidity using a sling psychrometer on a clear day and find that the wet bulb reading and dry bulb readings are consistently the same. Describe two things you would check on the instrument. (4 marks)

8. The wet bulb reads 23 deg C, the dry bulb 27 deg C, the steel temperature 22 deg C .

(a) Calculate the relative humidity? (2 marks)

(b) Calculate the dew point (to nearest 0.5 deg)? (2 marks)

(c) Calculate the safe temperature for painting? Should painting proceed?
(2 marks)

9. Briefly describe how you would test for oil and water contamination in compressed air. (3 marks)

(Informative)

B.1 Introduction

Protective coatings Inspectors

It is essential that the inspectors who perform the inspection functions have the necessary knowledge to be competent in the inspections that they perform in order to provide value to the client and recommend to the Inspection Body that a certificate of inspection be issued.

B2.1 Introduction

The following sub-sections define the core requirements to guide candidates on the extent of knowledge required in order to be prepared for both the examinations and their future work.

It is essential that the inspector understands the protective coatings operational process in order to identify where and what corrosion/degradation mechanisms are expected and consequently where to concentrate the Inspection effort.

B2.3 Material and corrosion degradation mechanisms

The inspector must understand the protective coatings operational conditions and underlying reasons that dictate materials selection and the interpretation of the relevant standards and codes of practice in respect to material selection.

B2.5 Inspection techniques and NDT

The Inspector must recognise the limitations of the various methods and techniques and take this into account when deciding on the values of that employed (i.e. it may be necessary to supplement the method or techniques used with another one to increase confidence). His knowledge of this subject should be such that he can converse with specialists in the field and evaluate the results of their examinations.

B2.7 Design codes and standards, and methods of, inspection and repair.

The inspector must have sound detailed knowledge and experience in the use of the codes and standards covering, application, condition assessment and testing and inspection procedures. Familiarisation with the full range of standards relevant to protective coatings and piping wrapping and galvanising systems. Understand the fundamental principles within the standards sufficiently to resolve any conflict between them and to advise their client of their applicability.

It is essential that the inspectors are fully aware with the requirements for the development, review and implementation of Inspection and Test Plans (ITP's).

B2.8 Special tools

The inspector must be aware all of tools available to determine “fitness for purpose” of protective coatings He must recognise the limitations of the various tools and take this into account when deciding on the values of the methods and techniques employed (i.e. it may be necessary to supplement the method used with another one to increase confidence).

B2.9 I Inspection methodologies

The inspector must be knowledgeable about corrosion and selective risk-based inspection methodologies and any other reliability methodology to optimise protective coatings inspection intervals. He shall be capable of participating in multi-disciplinary teams to develop, implement or maintain this methodology for the relevant plant.

B2.10 Quality Assurance Systems

The inspector must be aware of Quality Assurance and Quality Control concepts/systems e.g. ISO 9000 standards.

B2.11 Record keeping and report writing

The inspector must be capable of preparing and maintaining accurate and proper records and reports of all relevant inspections to build up the necessary historic data to maintain the reliability of the protective coatings and also meet statutory requirements.