SIGNATURE CONTROL		
DEVELOPED	**REVISED**	**AUTHORIZED**
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CHANGE CONTROL		
DESCRIPTION OF THE CHANGE	**REVISION**	**DATE**
Update of PCC-07/F-01 Surface Preparation Report and Application of Anti-corrosion Protection and PCC-07/F-03 Anti-corrosion Coating Inspection is considered a third coating and Holliday tests, respectively.	05	20.MAY.23
The translation of this PCC-07 procedure is included in the IMS, and the English version is integrated with the same control data as the Spanish document. Modification of associated formats for handling the English-Spanish version.	04	06.MAR.23
The name of the format Anticorrosive Protection Application Report (PCC-07/F-01) is changed to Surface Preparation Report and Application of Anticorrosive Protection	03	18.JAN.23
PCC-07/F-04 Format Integration Corrosion Protection Application Report (Bond-Finish) changes are made to PCC-07/F-01, 02, 03	02	17.NOV.22
Integration of the Reference Documents, Definitions, and Responsibilities sections.	01	13.AUG.22
Issuance of the Procedure.	00	28.JUN.21

PURPOSE OF THE PROCEDURE

Establish guidelines for the selection and application of coating based on corrosion protection for steel surfaces exposed to different environments. To prevent the corrosion process, providing functionality promptly with the required quality in the application of anti-corrosive coating.

SCOPE OF THE PROCEDURE

This procedure is used for any application of anticorrosive protection based on the different systems, specifications, and regulations applicable to the execution of projects so that the technical staff can evaluate with greater objectivity and clarity the activities that are required.

REFERENCES

- International Standard Environmental Management Systems ISO 14001:2015
- International Quality Management Systems ISO 9001:2015 Standard
- **NACE** (National Association of Corrosion Engineers).
- **SSPC** (Steel Structures Painting Council).
- **ASTM-G12** (Standard Test Method for Nondestructive Measurement of Film Thickness of Pipeline Coatings on Steel).

- **SSPC-VIS 1-89** Visual standard for abrasive blast cleaning steel.
- **SSPC SP 1** Solvent cleaning.
- **NACE No.1/SSPC SP 5** White metal Blast Cleaning.
- **NACE No.2/SSPC SP 10** Near-white Blast Cleaning.
- **NACE No.3/SSPC SP 6** Commercial Blast Cleaning.
- **NACE No.4/SSPC SP 7** Brush-off Blast Cleaning.
- **SSPC-PA** Guide 3 A Guide to Safety in Paint Application.
- **SSPC** Paint 20 Zinc-Rich Coating Inorganic and Organic.
- **ISO 8502-3** Preparation of steel substrates before application of paints and related products. Tests for the assessment of surface cleanliness. Part 3: Assessment of dust on steel surfaces prepared for painting (pressure-sensitive tape method).
- **ASTM D 4414** Standard Practice for Measurement of Wet Film Thickness by Notch Gages.
- **ASTM D 4541** Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
- **ASTM D 4285** Standard Test Method for Indicating Oil or Water in Compressed Air.
- **ASTM D 3359** Standard Test Methods for Rating Adhesion by Tape Test.
- **SSPC-PA 2** "Procedure for Determining Conformance to Dry Coating Thickness Requirements."
- **NRF-053-PEMEX 2014** Anticorrosive Protection Systems Based on Coatings for Surface Installations.

DEFINITIONS

Environment. These are the conditions of exposure to which the surfaces to be coated are subjected.

Adhesion. It is the tendency of a coating to remain attached to a surface.

Anchor profile. It is the texture of a surface (usually metallic) resulting from cleaning with abrasive sandblasts or metal grits for the correct anchoring of the paint.

Corrosion. It is the deterioration of a material (usually a metal) or its properties due to interaction with its environment through an electrochemical reaction.

Tes-tex replica tape. It works as a surface profile gauge to measure the surface profiles of sandblasted surface finished parts.

RESPONSIBILITIES

Quality Control Inspector:

- Inspect each process of the corrosion protection application system.
- Release each stage of the process
- Carry out the documentary record according to this procedure.
- Promote proper waste management.
- Use measurement tools properly.
- Submit their documentary reports to the Quality Department for integration into the Dossier.
- Notify the Construction Supervisor of any detected finding.
- Check the product data sheets.

Painters.

- Carry out the work and application of anti-corrosion protection.
- Make proper use of materials
- Carry out the proper management of waste.

Site Supervisor:

- Inspect each process of the system to ensure that they are complied with according to requirements.
- Check the productivity of painters
- Promotes proper waste management
- Verify that the appropriate habitat is established for the activities.

DEVELOPMENT OF THE PROCEDURE		
Responsible	**Activity**	**Records**
Quality Control	**1. INTRODUCTION** The main objective of the processes of application of anticorrosive protection is to reduce the speed of corrosion that humidity and environmental contamination can cause on steel. The sequence that will be carried out to carry out the Abrasive Cleaning Process and application of Anticorrosive Coating is carried out in 3 stages, according to established standards and customer specifications: ➢ Stage 1: Surface preparation plus primer application ➢ Stage 2: Link ➢ Stage 3: Finishing	
Quality Control Inspector	**2. INSPECTIONS AND TESTING** The Quality Control department, during the entire process of the application of anti-corrosion protection, must carry out the inspections, tests, and measurements required to establish the quality assurance of the project, detecting deviations or defects promptly, along with its timely records of the results of these. The construction supervisor must be notified at all times of any irregularity found, as well as the results of the tests, to carry out the repairs promptly.	
Quality Control Inspector	**3. ANCHOR PROFILE MEASUREMENT** The measurement of the Anchor Profile will be carried out with the Positector SPG equipment to determine the roughness index on the surface, considering the Anchor Profile indicated in the customer's specifications. Otherwise, the product data sheets are taken as a parameter. Subsequently, the samples will be taken with the Tes-Tex tape, which consists of foam with a non-compressible backing. The foam side is pressed against the surface, providing a permanent pattern of the peak-to-valley profile, which can then be measured using the thickness gauge, measurements should be recorded in the *Anchor Profile Measurement format (PIP-07/F-02*). The Test-Tex tape is available in four profile ranges. The type of tape chosen must reflect the profile being measured. ✓ For profiles between 12 and 25µm (0.5 and 1.0mils): Coarse Minus Tape ✓ For profiles between 20 and 38µm (0.8 and 1.5mils): Thick Tape ✓ For profiles between 38 and 64µm (1.5 and 2.5mils): Average thick tape and thick X ✓ For profiles between 64 and 115µm (2.5 and 4.5mils): X-Thick Tape ✓ For profiles over 115µm (4.5mils): X-Thick Plus Tape.	Anchor Profile Measurement (PIP-07/F-02).

Quality Control Inspector	**4. WET FILM THICKNESS MEASUREMENT** During the coating application, wet film thickness measurement is used to ensure the required dry film thickness in compliance with the specifications stipulated for the system, and this must be done immediately after application, firmly adjusting the manual gun on the surface to monitor the thickness of the coating deposited on the substrate and thus ensure the required dry film thickness by the customer. Before starting the measurement process, you should know: ✓ The specification of the coating application process. ✓ Technical data sheets of the products used. ✓ Type of coating to be applied. ✓ Thickness (minimum and maximum) of wet film required for each layer.	
Quality Control Inspector	**5. DRY FILM THICKNESS MEASUREMENT** This control can be performed using an electronic dry film gauge type POSITECTOR 6000 with the range for the thicknesses assigned by specifications required for the customer. The number of measurements, frequency, and acceptance criteria shall be by the **SSPC-PA 2 specification.** The measurements will be carried out by the Paint Inspector of the Quality Control department after each coating layer, and the thickness must be verified by placing the equipment on a clean surface where the coating has been applied, which will reflect the thickness data on the cover or screen of the inspection equipment, the thickness must be according to the customer's specification and the selected system and the readings must be recorded in the *Anticorrosive Coatings Inspections (PIP-07/F-03) format.*	Inspections of Anticorrosive Coatings (PIP-07/F-03).
Quality Control Inspector	**6. ADHESION TEST** Testing will be performed as indicated in Customer Specifications or following ASTM D3359 and/or ASTM D4541. I. **ASTM D 4541** The adhesion of a projective coating is a critical attribute related to performance. D 4541, Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers. The test involves attaching a load tester to the surface of the coating with an adhesive. A device is attached to the tester and aligned so that it can be pulled perpendicularly. The strength is gradually increased until the tester is detached The user reports the peel strength (in psi or MPa) and the location of the break in the coating system, e.g., the adhesive between primer and substrate, adhesive between other layers, cohesive within a given coating layer, etc. At the same time, this method maximizes tensile strength over a coating.	

II. **ASTM D 3359**

The tape adhesion test (described in ASTM D 3359, Test Methods for Measuring Adhesion by Tape Test). The detachment method, in its current form, does not distinguish between tests on steel substrates.

The peeling method is widely used by manufacturers, specifiers, inspectors, and coating specialists. Some coating manufacturers report peel strength in their product monographs, and some specifiers require a minimum peel strength to grade coatings.
Resistance tests are also often required as part of project implementation and can be carried out by inspectors. Coating specialists can use the method to evaluate the adhesion characteristics of an existing coating during a coating condition inspection or in a failure investigation.

This Test will be carried out after the total cure of the coating in the paint applied to the substrate, and the Adhesion Test will be carried out on Core Plates, according to what is requested by the client, these tests will be carried out with a groove comb marking two straight horizontal and vertical cuts, then the sample will be taken with the Permacel tape and must be indicated in the *Anticorrosive Coatings Inspections (PIP-07/F-03) format.*

Inspections of Anticorrosive Coatings (PIP-07/F-03). Surface Preparation and Application of Anti-corrosion Protection Report (PCC-07/F-01)

Anti-corrosion protection application report (PCC-07/F-04)

7. DOCUMENTATION

The Quality Inspector must fill out the following forms according to the stages of the process:

- Stage 1: Surface preparation plus primer application. (PCC-01/F-01, PCC-01/F-02, PCC-01/F-03)
- Stage 2: Link. (PCC-01/F-04, PCC-01/F-03)
- Stage 3: Finishing. (PCC-01/F-04, PCC-01/F-03)

Quality Control Inspector

The Quality Department must safeguard the evidence of each project.

8. DEFECT DETECTION

During the Visual Inspection process, defects are identified, and they must be qualified according to the common unacceptable defects listed in the following table:

Typical Defects of Anticorrosive Coatings

DEFECT	DESCRIPTION	CAUSES
Cushioning	The paint already applied has cracks that resemble crocodile skin.	It is the effect of poor drying of the film before subsequent coat application, high-temperature curing, thickness above permissible limits, physical impact, or incompatibility between layers.
Imperceptible cracking	Irregular and narrow fractures in the last layer usually do not reach the substrate.	

Quality Control Inspector

Blisters	Small, deformed, blister-like areas.	The presence of rust, oil, and grease underneath the applied film; The existence of moisture in the line of the sprinkler or coating was applied to a hot surface.
Discoloration	The finish has a lack of color on the surface.	Due to the presence of condensation of humidity from the environment, solvent evaporated in a humid environment or condensation on a cold surface (service at low temperatures).
Bubble	Small uniform marks on the film.	Air trapped during paint application.
Delamination	Lack of adhesion between layers of paint or between the paint and the substrate.	Poor surface preparation application outside the specified time.
Desiccation crack	It is a cracking that occurs during the drying of the coating, similar to cracked dry mud. It usually occurs in zinc inorganics.	Film thickness above the permissible limit or surface contamination by oil or water.
Orange peel	Cavities on the surface appear similar to orange peel.	Incorrect application because the atomization is done with little pressure; rapid evaporation of the solvent.
Pores	Cavities are large enough to pass through one or more layers and are located on the surface.	Overcoating application, trapped solvent or coating is applied on hot surfaces.

When these defects are detected, they must be registered in the Coating Repairs section in the *Anticorrosive Coatings Inspections format (PIP-07/F-02), and then the* Non-Conforming Output Report (PCC-14/F-01) *must be made*, to establish the type of repairs to be carried out and who will be responsible for carrying them out, as well as the execution time, together with the coating defects. When the anchorage or the thickness of the films does not meet the requirements, a non-conformity must also be lifted as established by the *Non-Conforming Outputs procedure (PCC-14).*

Anti-Corrosion Coatings Inspections (PIP-07/F-02)

Report of Non-Compliant Departure (PCC-14/F-01)

FORMATS ASSOCIATED WITH THE PROCEDURE

CODE	REGISTRATION	REVIEW LEVEL	RETENTION TIME
PCC-07/F-01	*Surface preparation report and application of corrosion protection*	04	1 year physical/digital with no expiration date
PCC-07/F-02	*Anchor profile measurement*	02	1 year physical/digital with no expiration date

FORMATS ASSOCIATED WITH THE PROCEDURE			
CODE	**REGISTRATION**	**REVIEW LEVEL**	**RETENTION TIME**
PCC-07/F-03	*Anti-corrosion coating inspection*	03	1 year physical/digital with no expiration date
PCC-07/F-04	*Anti-corrosion protection application report*	01	1 year physical/digital with no expiration date