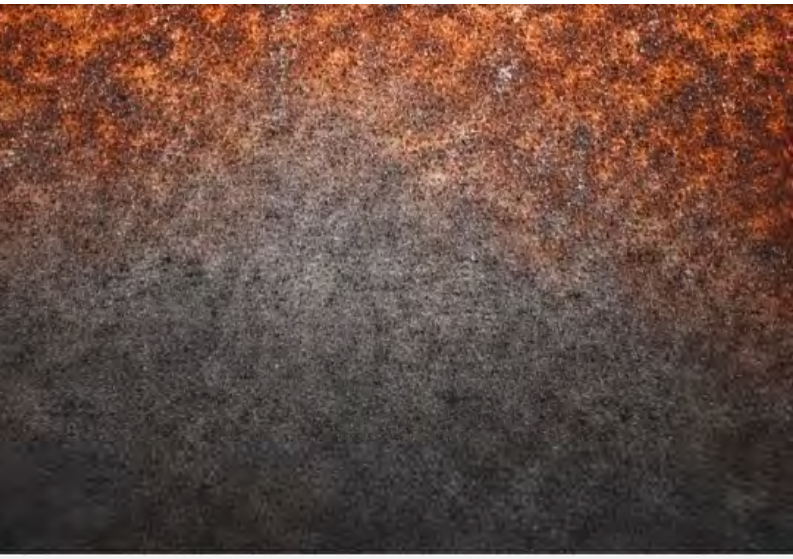
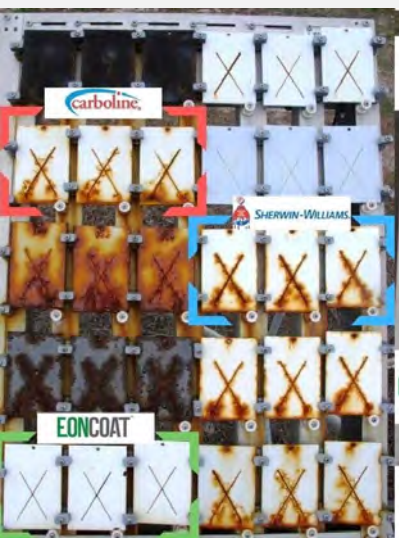
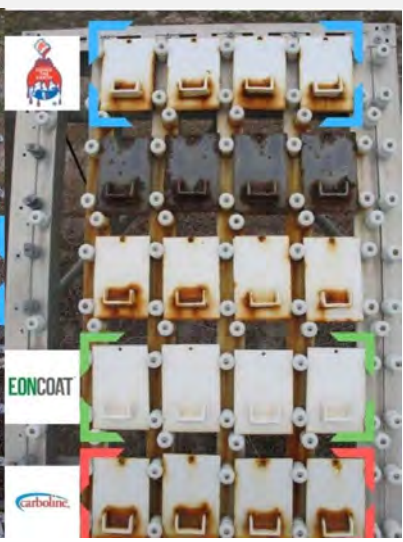


EONCOAT - VIS 10

Guide and Reference Photographs for Steel Surfaces Prepared by Low Pressure Water Washing





Foreword

The method of surface preparation suggested herein on aged, corroded steel was proposed and implemented by Dr. Benjamin Chaloner-Gill back in 2016 on ten (10) above ground storage tanks on the coast of Texas.

Comparisons for cost analysis also included doing other tanks within that tank farm with a traditional three (3) coat system after dry abrasive blasting.

The return to service time realised substantial costs savings beside the reduced environmental impact. In fact, the tank done in EonCoat was completed whist the traditional three (3) coat system tank was only 15% the way through.

In Western Australia, Santos and other mining companies have invested in laboratory testing of EonCoat over number of years. Results compared with side-by-side testing of traditional coatings like what was done by NASA also revealed the superior results of Chemically Bonded Phosphate Ceramics (CBPC's) which is the only coating technology to be awarded a perfect score of 10.

Notably, Santos completed a large storage tank on Varanus Island in 2025 using EonCoat as per our forerunner, Dr Benjamin Chaloner-Gill.

Variations of this corrosion protection strategy also includes abrasive blasting and water jetting in some situations. You may need to remove large amounts of rust scale followed by abrasive blasting or water jetting to verify your structural steel integrity.

Structural integrity of your asset and the health and safety of your personnel is our prime concern.

We would like to acknowledge EonCoats CEO and Founder Mr Tony Collins whose visionary....

INITIAL RUST GRADES

Reference photographs refer to rust grade D only (ISO 8501 & SSPC) as this is the most common rust grade for EonCoats' Preservation Strategy.

Rust grades A & B steel would require dry abrasive blasting. Rust Grade C implies limited pitting thus metal loss concerns are unlikely.

Rust grade D involves visible pitting which can lead to severe metal loss and loss of structural integrity.

In saline conditions you cannot quantify the level of residual salts in the pitted surface. Epoxies would require several UHPWJ and dry blasting applications.





STAGE 1: PRE-CLEANING OIL AND GREASE REMOVAL

SOLVENT CLEANING

Rubbing the chosen solvent with a medium-stiff brush or broom is required to dislodge grease and oil. Low-pressure water washing (cleaning) at ~4900 PSI is required to dislodged and rinse all solubilised grease and oil, away.

WATERJETTING

Ultra-high pressure water jetting can remove oil and grease, but caution is needed as to where that oil and grease residues are directed too or end up.

WET ABRASIVE BLASTING

(With alkali solvent)

Wet abrasive blasting with an alkali solvent can assist in scouring the surface to remove oil and grease within the substrate's surface profile.

SURFACE PREPARATION VERIFICATION

1. *A water-break test is required.*
2. *Visual assessment of pooling water on horizontal surfaces is required.*
3. *Wiping a white rag over the substrate is required. This can be subjective, as oil and grease can sit within the existing surface profile, or the corroded surface profile. Oil and grease residue can be embedded in the profile if not identified prior to abrasive blasting.*

   ***Note:** If any other colour other than yellow/orange, orange/brown, or red/brown is seen, the surface is contaminated. No grey or black appearance is allowed.*

STAGE 1: CONTINUED



Floor Plate: Any black or grey contamination will not allow the iron magnesium phosphate reaction to occur.



Beam: Note the flange section that is not flash rusting.



Beam: Note the top of the web section that is not flash rusting.



Offshore Tank: Note a strip on the side of this tank that hasn't rusted like the adjacent areas.

STAGE 2:
SURFACE PREPARATION

DRY ABRASIVE BLASTING
*CREATING SURFACE PROFILE ≥75µm**

SSPC-SP6 / NACE No. 3 – Dry blasting of Rust Grades A to D. *See SSPC-VIS 1 Guide.*

Requires low-pressure water washing at ≥4900 PSI prior to Eoncoat application.

WET ABRASIVE BLASTING
*CREATING SURFACE PROFILE ≥75µm**

SSPC-SP 6 (WAB) RUST GRADE C/D
Removal of all paint and millscale. *See SSPC-5 / NACE VIS 9.*

A modification to SSPC/NACE cleanliness standards is that 'tightly adherent' corrosion products are acceptable to 100% of the surface. i.e. Includes flash rust, rustback and aged, corroded surfaces.

WATERJETTING
*EXPOSING ORIGINAL SURFACE PROFILE ≥75µm**

NACE/SSPC WJ-1
Removal of all coating and millscale. *See SSPC-VIS 4 / NACE VIS 7.*

A modification to SSPC/NACE cleanliness standards is that 'tightly adherent' corrosion products are acceptable to 100% of the surface. i.e. Includes flash rust, rustback and aged, rusted surfaces.

NACE/SSPC WJ-4
For aged, corroded steel substrates never coated.

.

LOW PRESSURE WATER WASHING
*USING EXISTING AGED CORROSION PROFILE, MINIMUM ≥100µm**

TIGHTLY ADHERENT RUST
Aged, corroded steel.

For structural steel that has never been coated and has been subjected to a minimum pressure of 4500 PSI using a fanjet nozzle at ~150mm (6 in) at a right angle to the surface.

STAGE 3: DETERMINAING TIGHTLY ADHERENT COROSSION

Note: *Determine tightly adherent rust—whether flash rust, rust back, or existing aged corrosion ion steel never painted by rubbing a white rag and observing the colour staining transferred onto it. Wrap a white rag around a medium-stiffness scrubbing brush and make three (3) rubs in one direction, pulling toward oneself.*



Grade D:	Low Pressure Water Washing.
Visual Test:	Not Acceptable.
Root Cause:	Inconsistent overlaps when pressure washing. Fanjet nozzle not used.



Grade D:	Low Pressure Water Washing.
Visual Test:	Acceptable.

STEP 3(a): CONTINUED



Grade D: Low Pressure Water Washing.
Rag Test: Not Acceptable. Heavy flash rust.
Root Cause: Insufficient water pressure.



Rust Grade D: Low Pressure Water Washing ~4500 PSI.
Rag Test: White rag around scrubbing brush.



Rust Grade D: Low Pressure Water Washing ~4500 PSI.
Flash Rust Degree: Light. Acceptable.

STEP 3(b): TAPE TEST - SPRING-LOADED ROLLER.



Tape Test Examples



Grade D: Low Pressure Water Washing
Dust Test: Tests A, C & D, Not Acceptable
Cause: Insufficient water pressure

STEP 3(c): DULL PUTTY KNIFE TEST (DPKT)



Grade D: Low pressure water washing.
DPKT: Not tightly adherent.
Root Cause: Insufficient water pressure



STEP 4: MEASURING SURFACE PROFILE

STEP 5: EONCOAT APPLICATION

MATERIAL TEMPERATURES

Warm Part A & B to a minimum 18c for 24 hours before use. Maintain the minimum material temperature for Part A & B at the work front.

SUBSTRATE TEMPERATURE PARAMETERS

10c – 49c*

WATER MISTING*

Maximum substrate temperature range: 40c – 49c.

Wind conditions >13 Km/h requires water misting.

Sufficient water misting can cool the substrate below 40c and maintain hydration in limited wind conditions.

Alternatively, EonCoat application could occur in the evening, early morning hours, or less windy conditions.

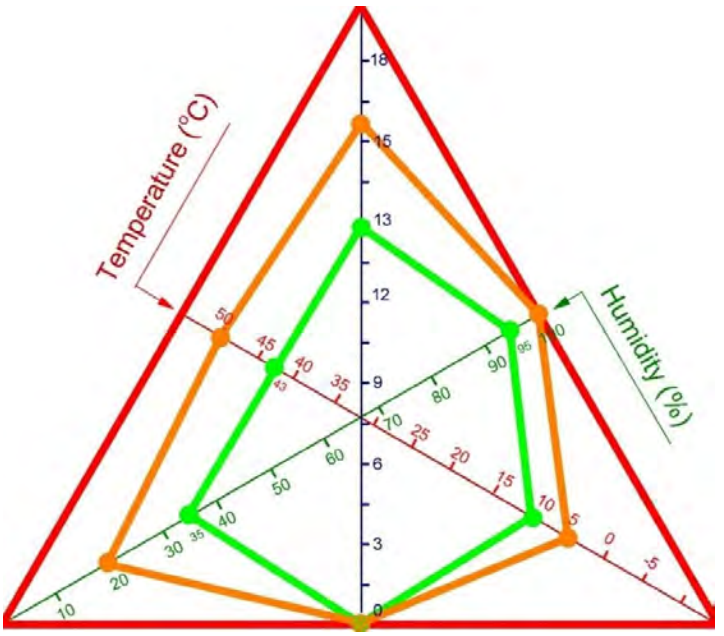
HYDRATION BETWEEN EONCOAT APPLCIATIONS

Sufficient water misting should maintain hydration of the freshly applied EonCoat if substrate temperatures are within the range of 40c – 49c. Consider substrates in direct sunlight and shaded areas.

Wind conditions greater than 13 km/h also require water misting.

Alternatively, EonCoat application could occur in the evening, early morning hours, or in lesser windy conditions.

Wind velocity (km/h)



STEP 6: POST APPLICATION TESTING

Low Pressure Water Washing:

Minimum pressure washing shall be at 3500 – 4500 PSI, with a fanjet nozzle. Maintain nozzle distance at 200-300mm at a right angle to the substrate.

Pressure washing of the applied Eoncoat verifies several things.

1. Overall adherence of the applied Eoncoat.
2. Exposes application errors such as application over overspray, or other contamination.
3. Removal of the weak outer layer for top coating.

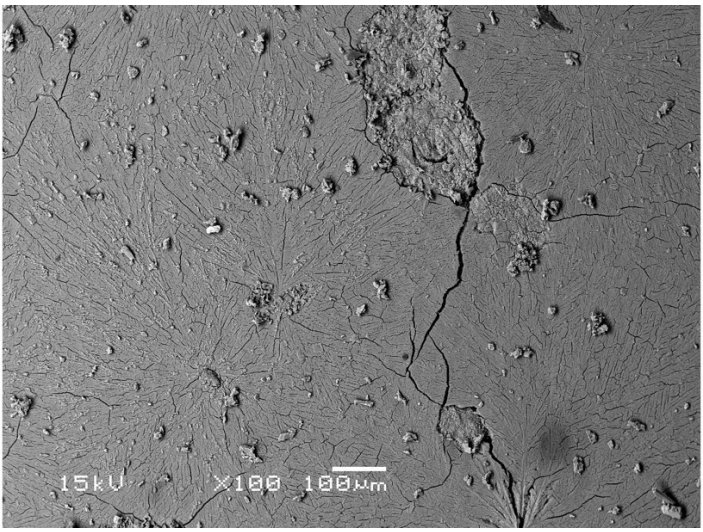
Scrape Test: Every 30m2 perform a scrape test. Then apply a 50/50 mix of vinegar/potable water, over the scraped area. **This will reveal that the phosphating reaction has occurred.**



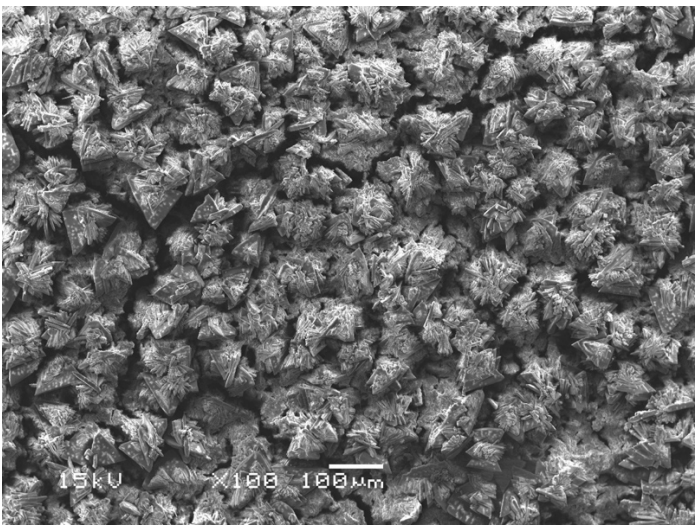
Scrape test example

STEP 5: CONTINUED

The following SEM images (Scanning Electron Microscope) show a smooth EonCoat surface after application, versus a rough appearance after washing.



Unwashed Eoncoat surface above
Washed Eoncoat surface below



ALWAYS CONSULT THE FOLLOWING

1. Eoncoat Application Guide.
2. Eoncoat Technical Data Sheet.
3. Eoncoat Safety Data Sheet.
4. Eoncoat VIS 10 Guide.
5. A Eoncoat Australia approved subject matter expert (SME).
6. SSPC VIS Guides

