Atmospheric Corrosion & Achieving Durability

Resene
Engineered Coating Systems

Presented by:

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Your Presenter:

Current Position/s:

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Certifications/Qualifications:

CBIP - Certified Coatings Inspector

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ACA - Certified Corrosion Technologist

ACA - Certified HDG Inspector

35+ Years in the Paint Industry

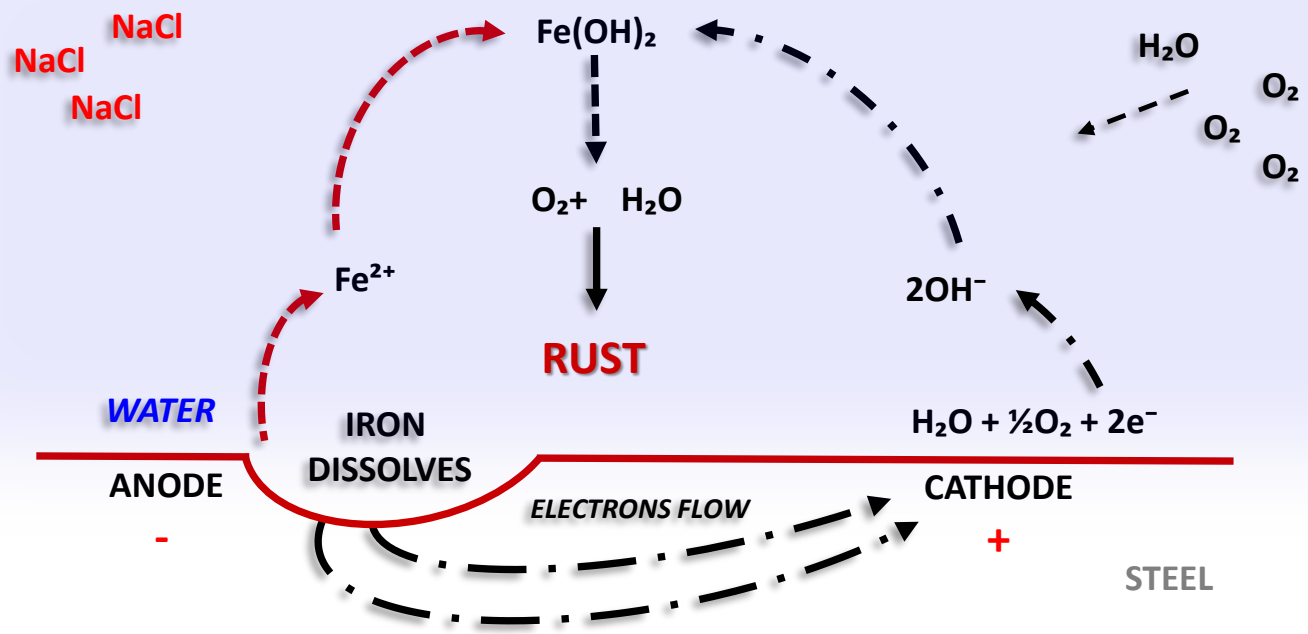
The purpose of this presentation is….

……to overview the basics of steel protection buy use of paints and look into issues, that can commonly be seen, during the construction phase.

Subjects to cover

- Very Basics of Corrosion
- Environment Corrosivity
- Macro / Micro Environments
- Design Implications
- Preparation of Steel
- Paints and Systems Standards
- Painting Conditions
- Common Defects / Issues
- QA Documents
- Durability / Maintenance

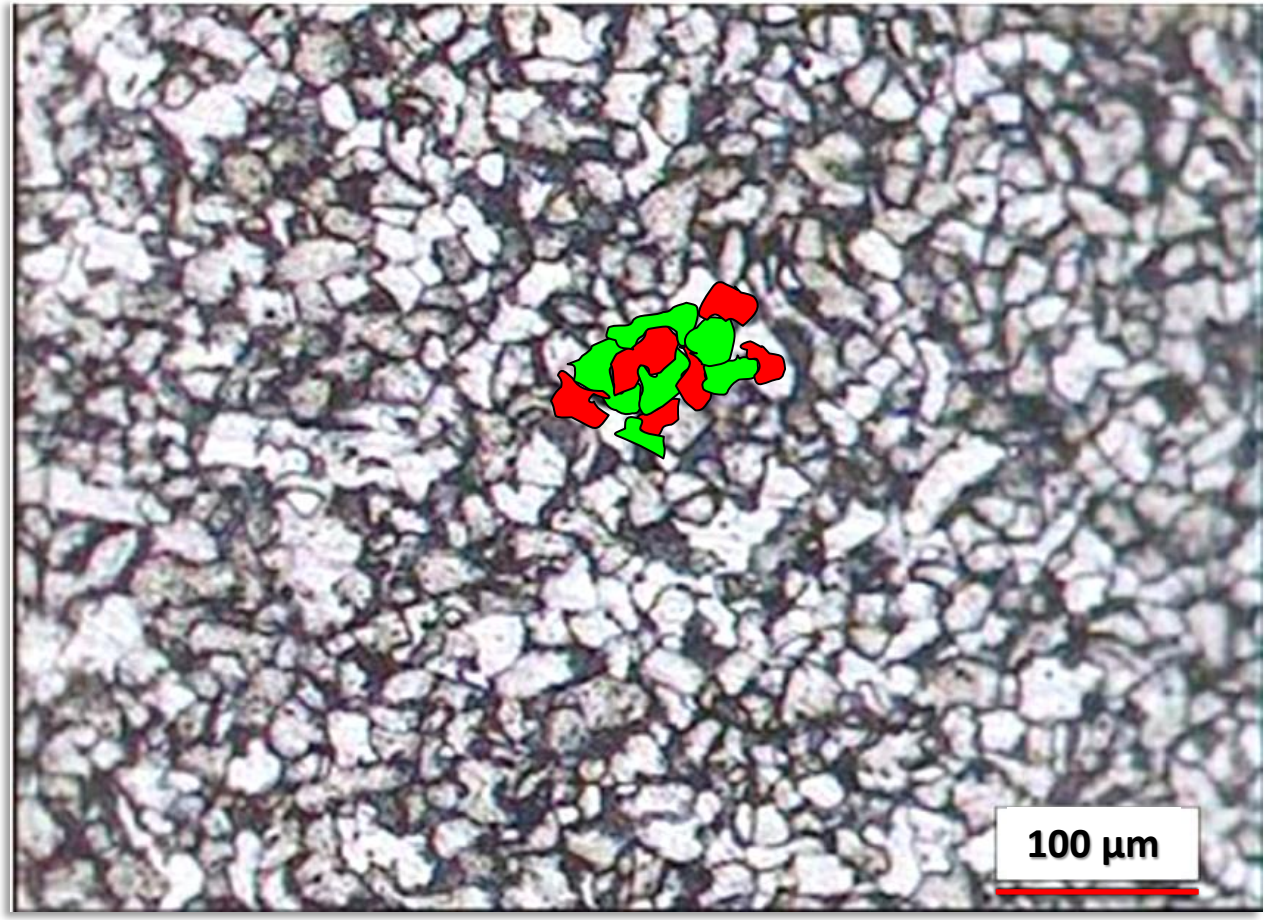
Corrosion of Steel



Negative and Positive areas of Steel

ANODE —

CATHODE +



Steel Grain Structure

Corrosion of Steel

Corrosion is;

“the deterioration of a substance (usually a metal) or its properties because of a reaction with its environment”.

There are 4 conditions required for corrosion to occur……and unless all 4 conditions are present, corrosion will not occur.

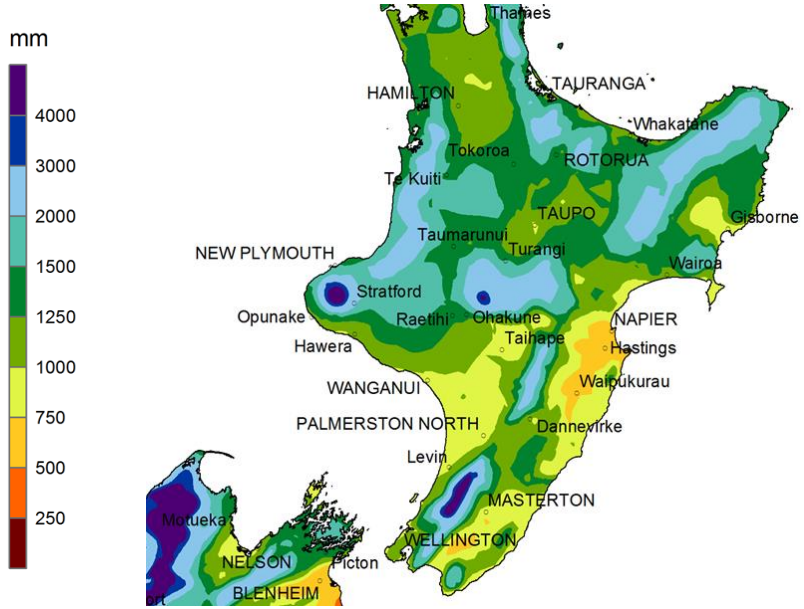
These 4 conditions are:

1. Positive Pole - Cathode ☑
2. Negative Pole - Anode ☑
3. Electrical Conductor - Metal ☑
4. Electrolyte & O^2

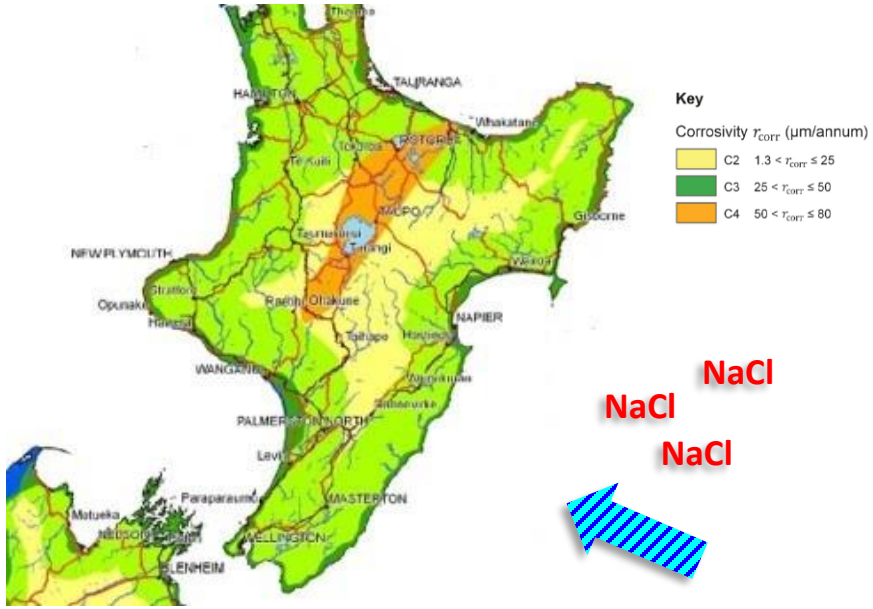
Rain, Mist, Fog, Sea Spray, Relative Humidity, Condensation…..

Electrolyte & O_2

Rain Fall Map



Corrosivity Zone Map



Establishing the Corrosivity

Table 1 – First-year corrosion rates of steel in different atmospheric corrosivity environments

Corrosion rates (μm/annum)	Atmospheric corrosivity category					
	C1	C2	C3	C4	C5-M[a] or C5-I[a]	CX (M or I)[b]
	Very low	Low	Medium	High	Very high	Extreme
Steel	≤ 1.3	$1.3 < r_{corr} \leq 25$	$25 < r_{corr} \leq 50$	$50 < r_{corr} \leq 80$	$80 < r_{corr} \leq 200$	$200 < r_{corr} \leq 700$

NOTE – Based on Table 1, indicative first-year steel macroclimate corrosion rates for New Zealand are given in Figure 1 and Figure 2, or the relevant city maps given in Figure 3 to Figure 7.

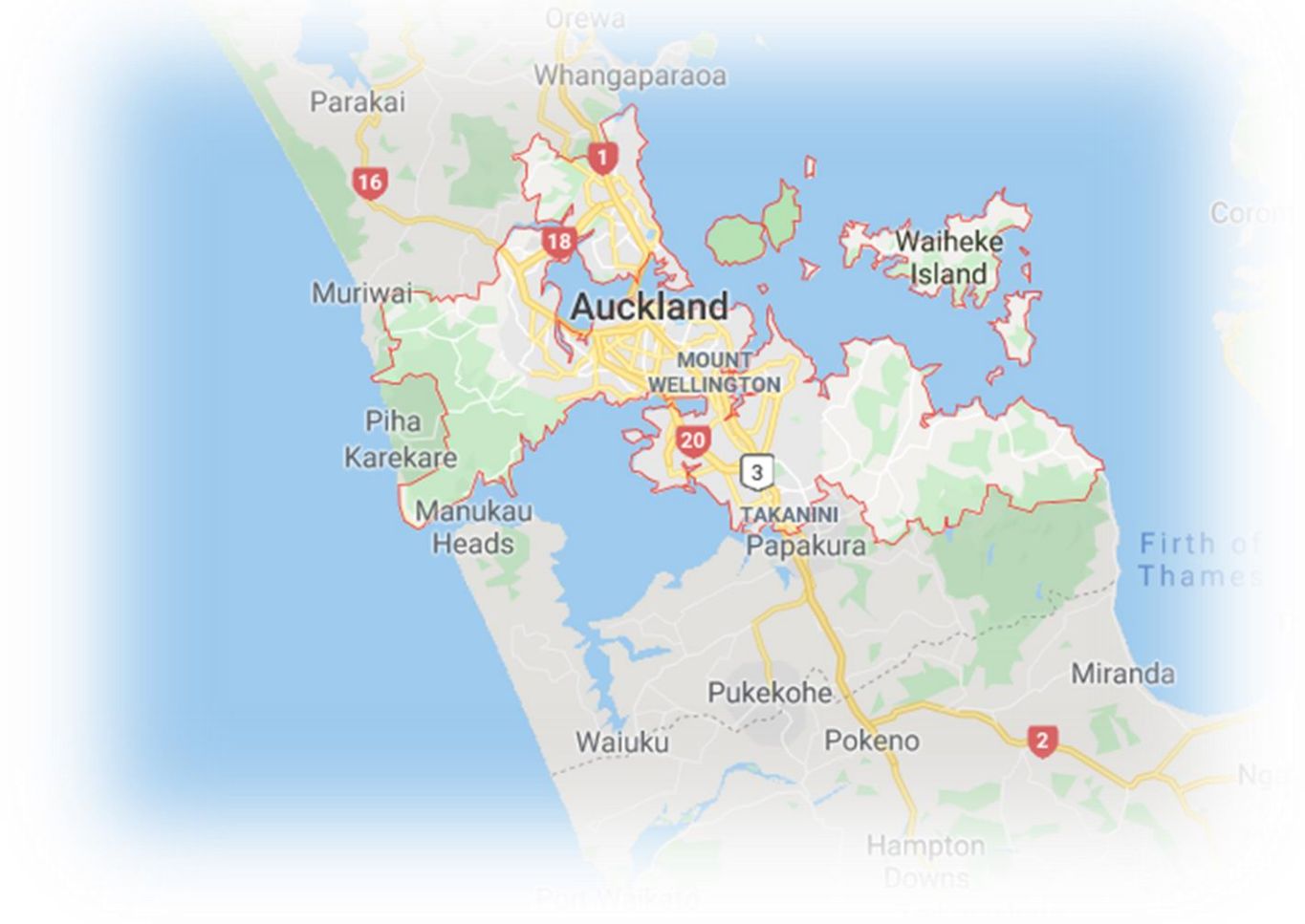
a Category C5 is subdivided into Marine (M) or Industrial (I). Marine is for immediately adjacent to seashore except open surf. Industrial is for within industrial facilities with corrosive processes and typically requires site-specific determination. It also applies to geothermal areas in accordance with note 3 of both Table 2 and Table 3.

b Category CX is subdivided into marine or industrial. Marine is for the most exposed open surf beaches; industrial is typically for the most severe geothermal exposure

SNZ TS 3404:2018

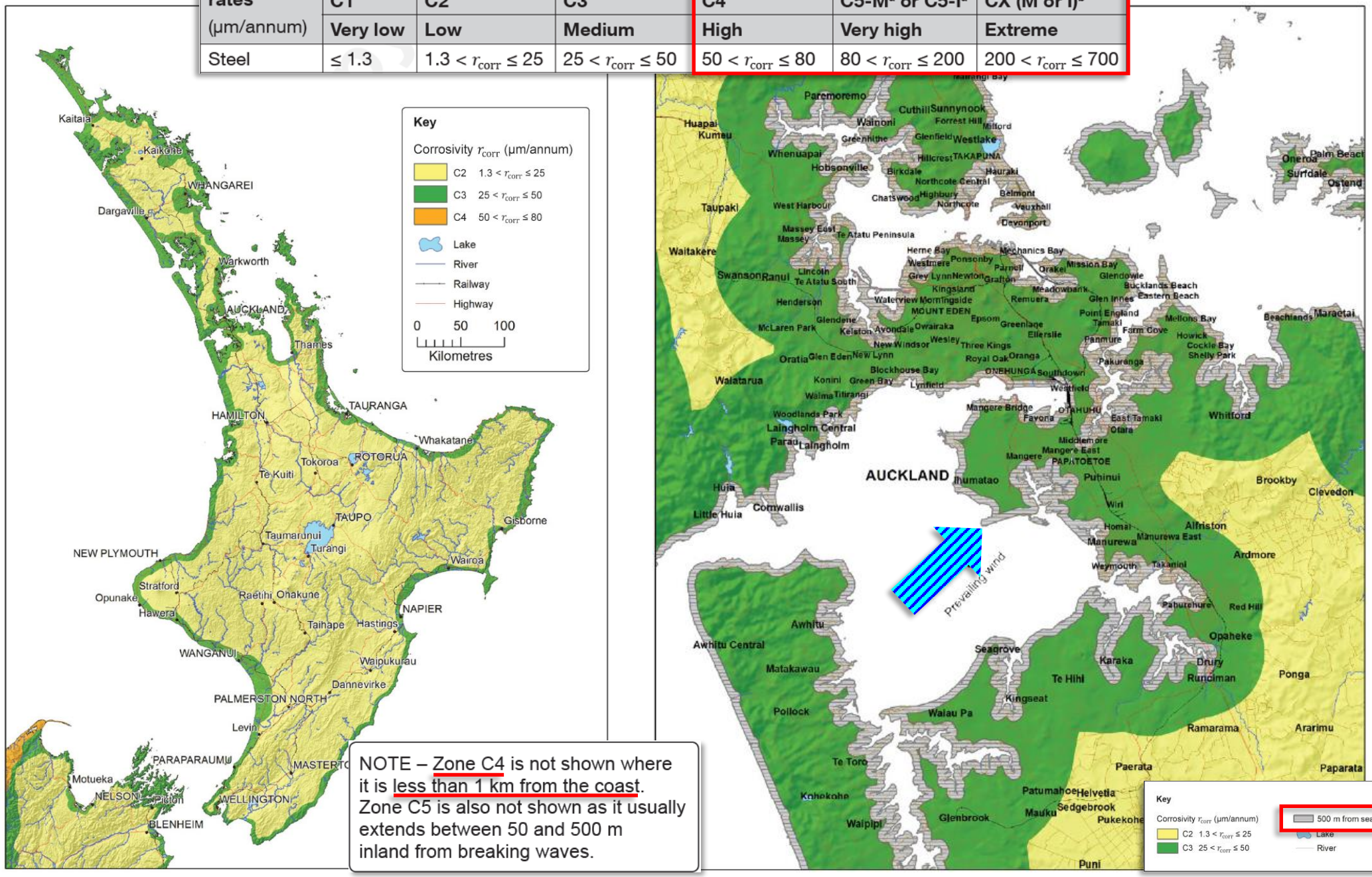
Macroclimates

The overall climate to which the structure is to be exposed to



Maps & Information from SNZ TS 3404:2018

Corrosion rates (μm/annum)	Atmospheric corrosivity category					
	C1	C2	C3	C4	C5-M[a] or C5-I[a]	CX (M or I)[b]
	Very low	Low	Medium	High	Very high	Extreme
Steel	≤ 1.3	1.3 < r_{corr} ≤ 25	25 < r_{corr} ≤ 50	50 < r_{corr} ≤ 80	80 < r_{corr} ≤ 200	200 < r_{corr} ≤ 700



NOTE – Zone C4 is not shown where it is less than 1 km from the coast. Zone C5 is also not shown as it usually extends between 50 and 500 m inland from breaking waves.

ISO 9223 - Environments

TABLE 2.1

ATMOSPHERIC CORROSIVITY CATEGORIES

Corrosivity categories	Former AS/NZS 2312 Category	Corrosion rate for steel µm/year	Corrosion rate for zinc µm/year	Typical exterior environment	Examples of interior environments
C1: Very low	A	<1.3	<0.1	Few alpine areas	Offices, shops
C2: Low	B	1.3 to 25	0.1 to 0.7	Arid/rural/urban	Warehouses, sports halls
C3: Medium	C	25 to 50	0.7 to 2.1	Coastal	Food processing plants, breweries, dairies
C4: High	D	50 to 80	2.1 to 4.2	Sea-shore (calm)	Swimming pools, livestock, buildings
C5-I: Very high (Industrial)	E-I	80 to 200	4.2 to 8.4	Within chemical plants	Plating shops, chemical sites
C5-M: very high (Marine)	E-M	80 to 200	4.2 to 8.4	Sea-shore (surf)/ offshore	—
CX	—	200 to 700	8.4 to 25	Shoreline (severe surf)	Adjacent to acidic processes
T: Inland Tropical	F	—		Non-coastal tropics	

AS/NZS 2312.1:2014 - page 15

Microclimates

Areas within the macroclimate that may create additional breakdown, make the environment more harsh, these include:

- Damp locations, not dried out by sunlight
- Protection from rain washing
- Exposure to industrial pollution
- Hot or Cold surfaces
- Abrasion or impact
- Wind direction effects
- Topographical effects

Sheltered from Rain Wash affect – Canopy Corrosion

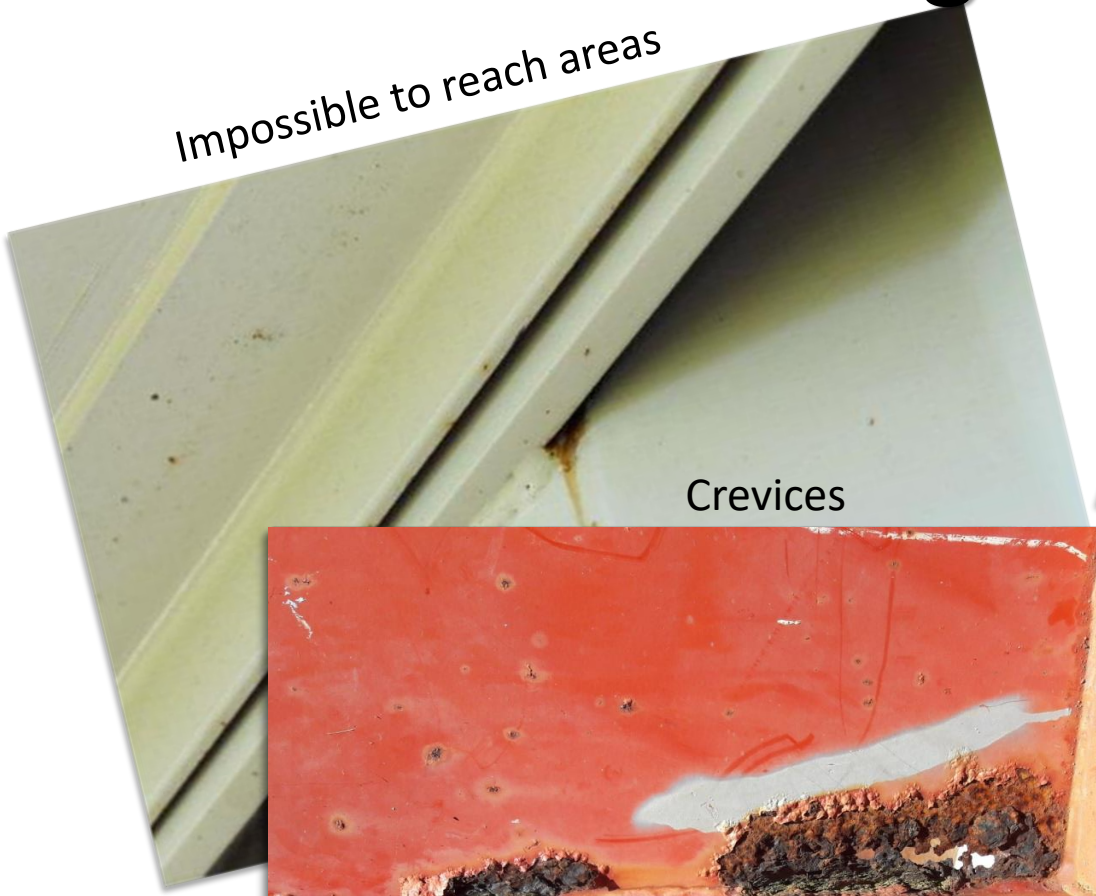
Affect of angle of exposure – an example of differential weathering

Sheltered or Internal

Macroclimate corrosion category (from AS/NZS 2312.1:2014)	Typically	Location	Characterised by	Surface-specific atmospheric corrosivity				
				External			Internal	
				Exposed	Sheltered	Wet	Dry	Damp
C5-M	Within 200 metres of breaking surf on the west and south coasts of the South Island Within 100 metres of breaking surf on west and south coasts of the North Island Within 50 metres of breaking surf on all other coasts This environment may be extended inland by prevailing winds and local conditions	All coasts	Heavy salt deposits Almost constant smell of salt sea spray in the air	C5-M				C4
C4	Within 500 metres inland of breaking surf Within 50 metres of calm salt water such as harbour foreshores This environment may be extended inland by prevailing winds and local conditions	All coasts	Medium salt deposits Frequent smell of salt sea spray in the air	C4	C5-M		C1	C3
C3	Within 20 km of breaking surf	West and south coasts of South Island	Minor salt deposits Occasional smell of salt in the air	C3	C5-M			
	Within 5 km of salt water	East coast of both islands, west and south coasts of North Island, and all harbours			C4	C5-M		

Design implications

Impossible to reach areas



Poor drainage

Crevices

Crevices, sharp edges & dissimilar metals

Impossible to reach areas

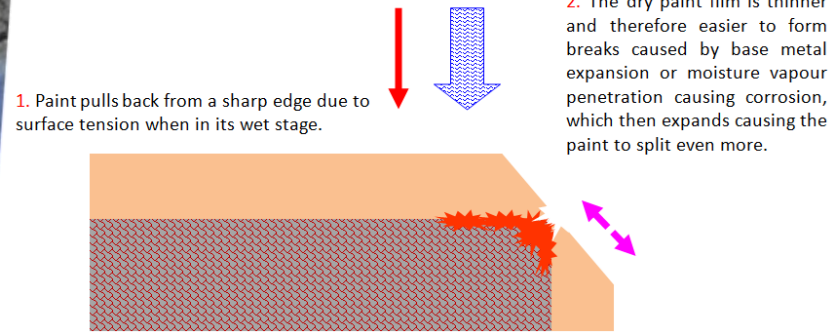
Preparation of Steel

Rough steel and gas cut edges

Mill Scale

Sharp edges

Rough weld and weld spatter



Mill Scale

A type of iron oxide that is formed on the surface of steel during the hot rolling process at steel mills.

Mill Scale is brittle, expands less than the iron from which it is formed and cracks on cooling. It is not uniform in composition and is cathodic to the steel !

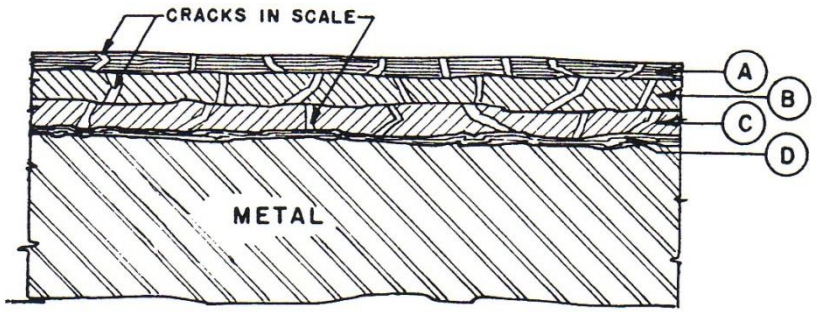
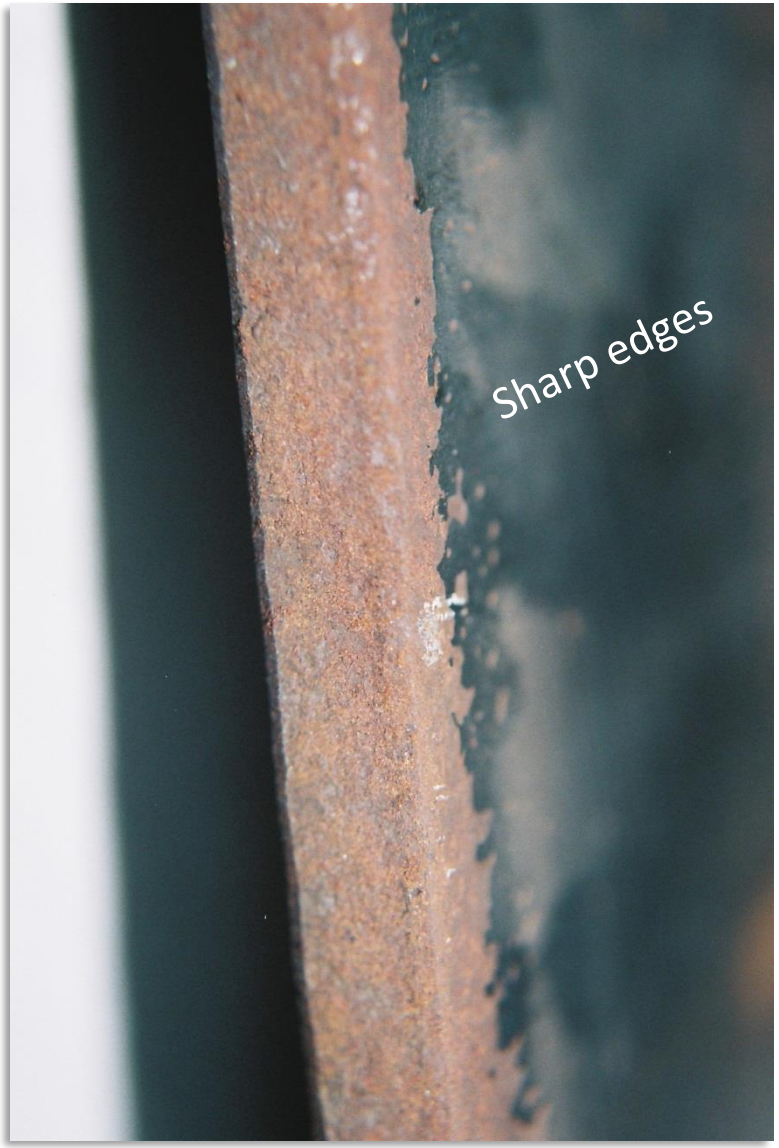
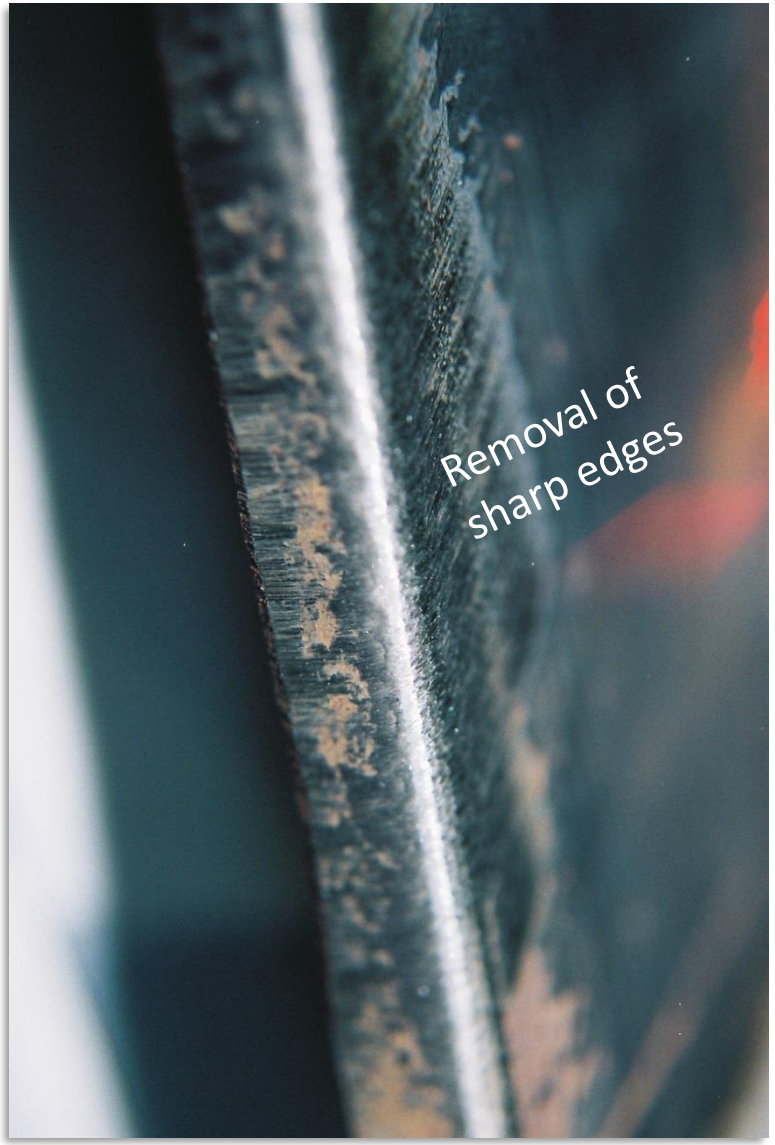


FIGURE 1
Mill scale is composed of several layers: A. Fe_2O_3 B. Fe_3O_4 C. FeO D. FeO + Fe.

Mill Scale

Mill Scale Paint Failure – Exterior



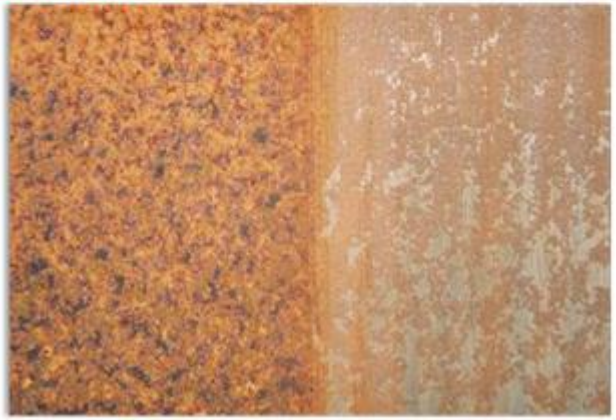


Hand & Power

Hand Tool Cleaned to SSPC-SP2 Standard

General steel corrosion

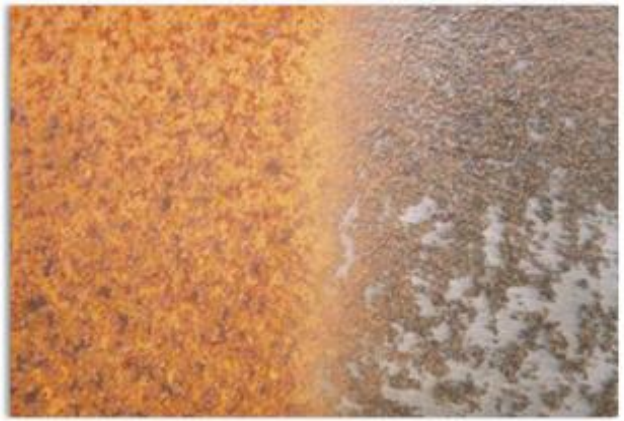
Pitting steel corrosion



Power Tool Cleaned to SSPC-SP3 Standard

General steel corrosion

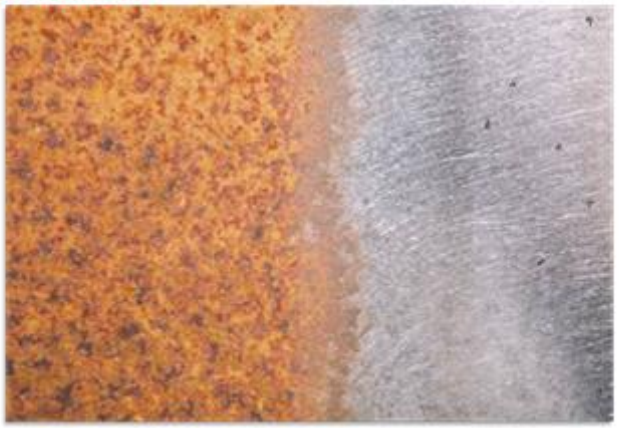
Pitting steel corrosion



Power Tool Cleaned to SSPC-SP11 Standard

General steel corrosion

Pitting steel corrosion



Surface Preparation Grad es of Blast Cleaned Steel

Assessment of degree of removal of rust, mill scale and other visual contaminants (inspected without magnification).

Important Note: Surface cleanliness is not a measure of surface profile – see the following pages for notes on surface profile.

Explanatory Details

Rust Grade A
Steel with the millscale layer intact and very minor, or no rusting.

Rust Grade B
Steel with spreading surface rust, and the millscale commenced flaking.

Rust Grade C
Rusty Steel with the millscale layer flaked and loose, or lost, but only minor occurrence of pitting.

Rust Grade D
Very rusty steel with the millscale layer all rusted and extensive occurrence of pitting.

Blast Class 1 (SP-7/N4)
Very light, whip over blast clean with removal of loose surface contaminants.

Blast Class 2 (SP-6/N3)
Substantial blast clean with wide spread, visible contaminant removal and base metal color appearing.

Blast Class 2 ½ (SP-10/N2)
Intense blast clean leaving shaded grey metal with only tiny, isolated flecks or strips of visible contaminants.

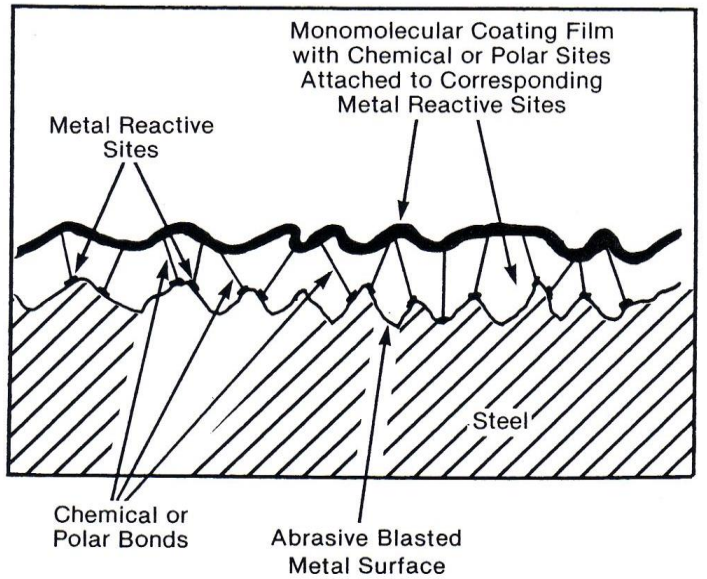
Blast Class 3 (SP-5/N1)
Complete blast clean with consistent, metal color all over and no visible contaminants.

NOTE: All blasting preparation grades must be free of oil, grease and dirt.

Blasting Profile

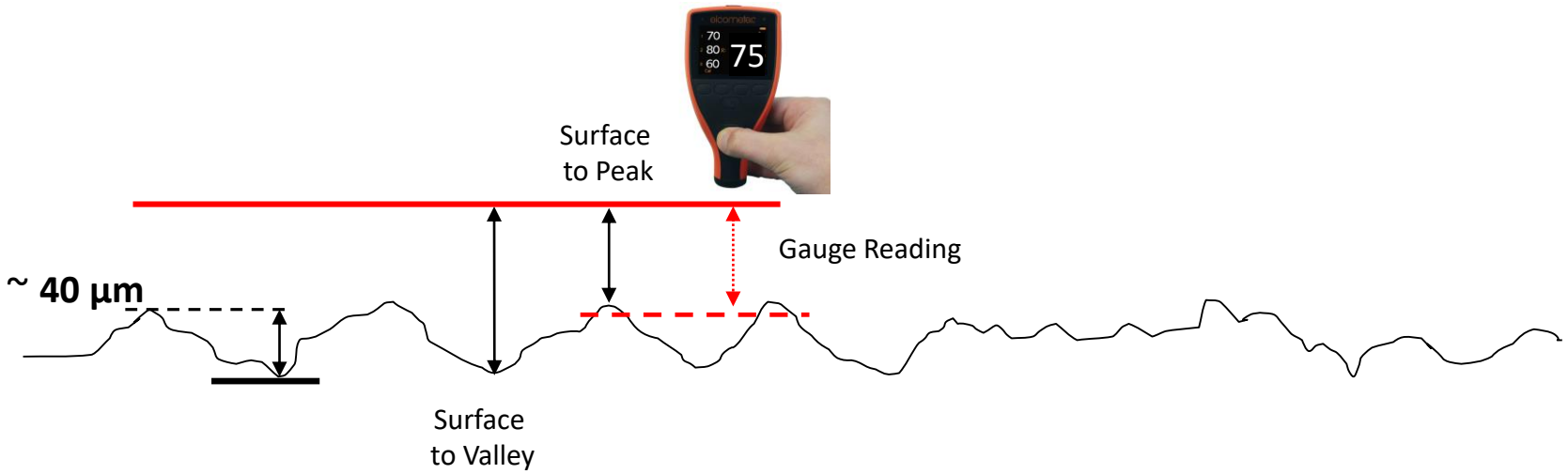
Clean of rust & mill scale and

a profile is created to help with “mechanical” adhesion

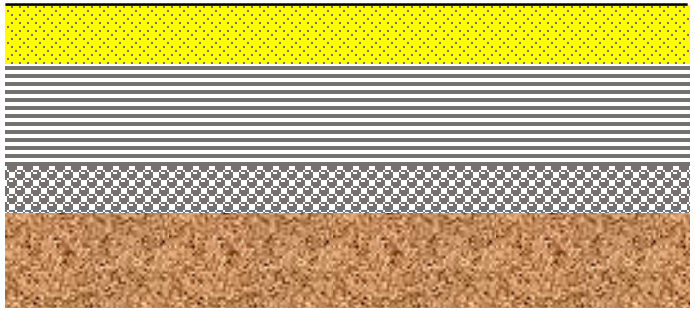


…but what about “chemical” adhesion?

Blasting Profile Height

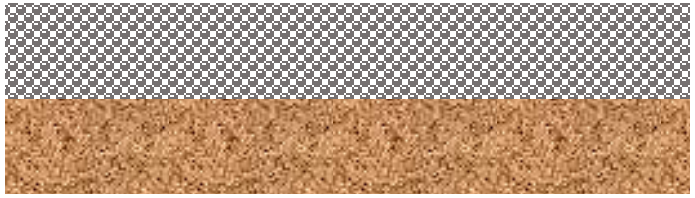


Protection Options for Steel



Paint System

Zinc's – HDG / Arc / Paint

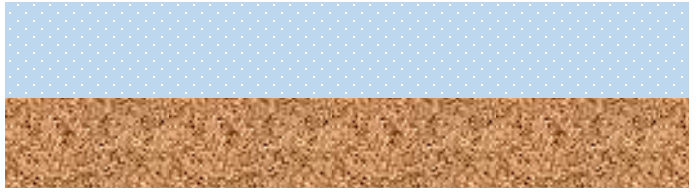


Sacrificial

Tape Wrapping

Barrier

Enclosure and Air Conditioning

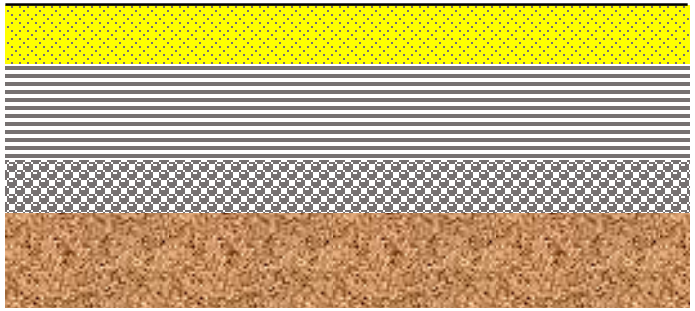


Atmosphere

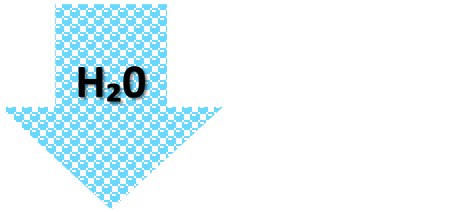
How paints protect steel

The type / function & thickness of each coat is very important !

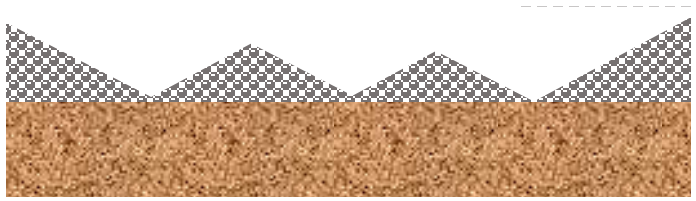
Each layer protects the underlying



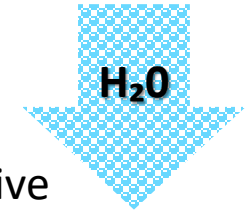
Paint System



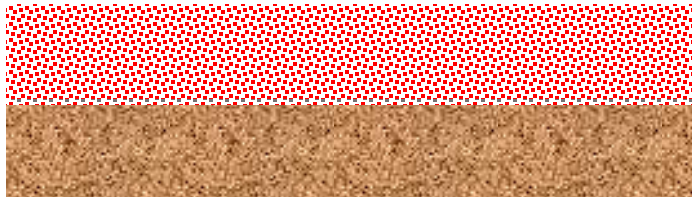
Zinc's



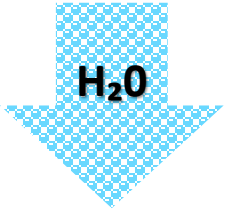
Sacrificial



Anti-Corrosive



Inhibitive



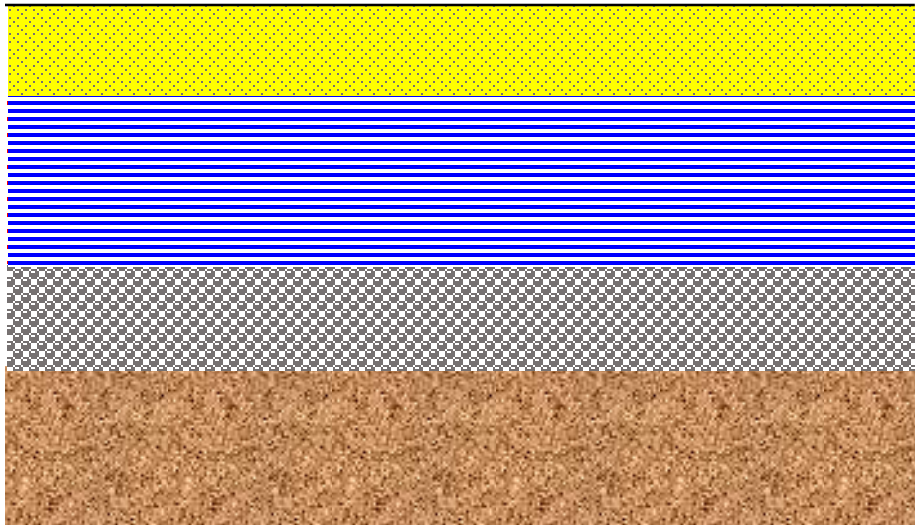
Epoxies

Barrier

Film Thickness of each coat

The type / function & thickness of each coat is very important !

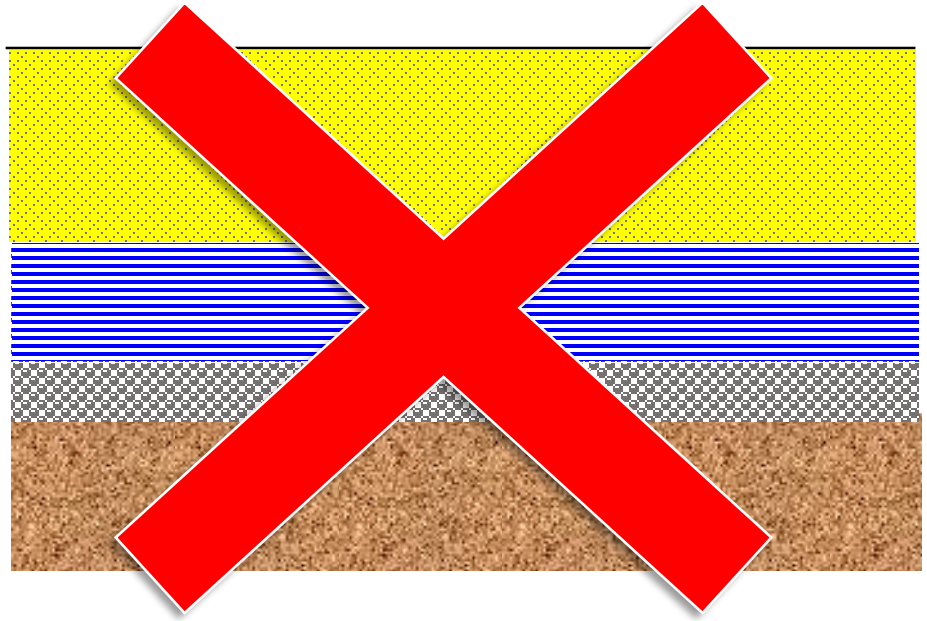
System Total Dry Film Thickness (DFT) 275 um



50 um

150 um

75 um



130 um

100 um

45 um

Properties of paint resins

PRODUCT TYPE PPOPERTIES	Acrylic cross linked	Alkyd	Chlorinated Rubber	General Epoxies	Acrylic Epoxies	Polyester Urethanes	Acrylic Urethanes	MC Urethanes
Curing Agent	n/a	Oxygen	n/a	Chemical	Chemical	Chemical	Chemical	Water / Chemical
Drying Mechanism	SE Coalescence	SE Oxidation	SE	SE Chemical	SE Chemical	SE Chemical	SE Chemical	SE Chemical
Chalk Resistance	Very Good	Average	Poor	Poor	Very Good	Good	Very Good	Very Good
Temperature Resistance	≤ 50 °C	≤ 90 °C	≤ 28 °C immersed	≤ 90 °C	≤ 90 °C	≤ 150 °C	≤ 90°C	≤ 90°C
Acid Resistance	Poor	Fairly Good	Fairly Good	Average	Average	Very Good	Fairly Good	Good
Alkali Resistance	Very Good	Poor	Very Good	Very Good	Very Good	Excellent	Very Good	Good
Solvent Resistance	Poor	Fairly Good	Poor	Very Good	Very Good	Excellent	Good	Excellent
Flexibility	Good	Poor when aged	Poor	Poor	Good	Good	Good	Good
Vapour Transfer Resistance	Poor	Fairly Good	Excellent	Excellent	Good	Very Good	Good	Very Good
Recoat Adhesion	Very Good	Fairly Good	Excellent	Poor	Fairly Good	Poor	Very Good	Poor
Mechanical Damage Resistance	Fairly Good	Good	Good	Good	Good	Good	Fairly Good	Good

Properties of paints

As different paints have different properties then problems can occur if used in the wrong place…..

e.g.

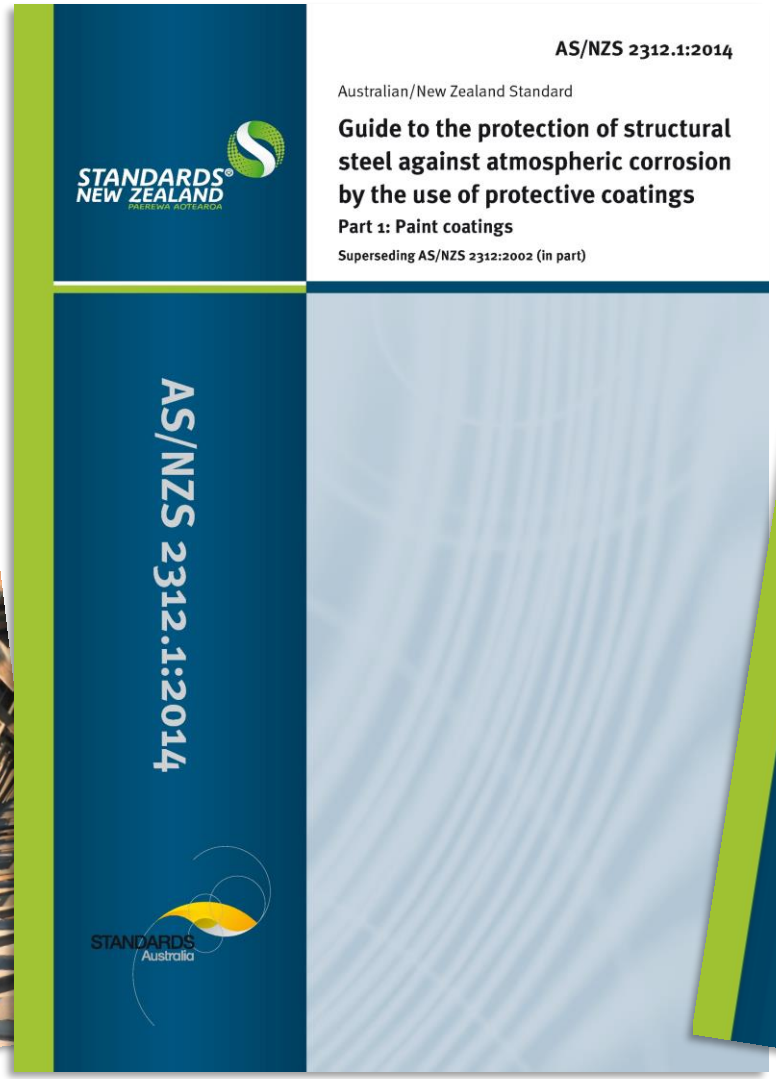
If steel fabricator has primed the steel with an ALKYD general purpose primer, however the Specification issued (or changed) after the Tender has been won, calls for a ZINC, then there is a major difference in durability and overcoating etc.

Another example, what if a wall should be coated with a Sealer Undercoat and then to be tiled, however the contractor has top-coated the area with an ACRYLIC wall paint, ….but now the tile glue wont stick correctly.

Paints are specified for a reason, and the specification needs to be followed.

Standards


STANDARDS NEW ZEALAND
PAEREWA AOTEAROA
SNZ TS 3404:2018
Standards New Zealand Technical Specification
Durability requirements for steel structures and components
Superseding in part NZS 3404.1:2009
SNZ TS 3404:2018


STANDARDS NEW ZEALAND
PAEREWA AOTEAROA
AS/NZS 2312.1:2014
Australian/New Zealand Standard
Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
Part 1: Paint coatings
Superseding AS/NZS 2312:2002 (in part)
AS/NZS 2312.1:2014
STANDARDS Australia


STANDARDS NEW ZEALAND
PAEREWA AOTEAROA
AS/NZS 2312.2:2014
Australian/New Zealand Standard
Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings
Part 2: Hot dip galvanizing
Superseding AS/NZS 2312:2002 (in part)
AS/NZS 2312.2:2014
STANDARDS Australia

5.0 Steel

5.1 NZS 3404: Part 1 subject to the following modifications:

5.1.9A Appendix C

Replace Appendix C Corrosion Protection with the following:

"Appendix C Corrosion Protection

Corrosion protection shall be in accordance with SNZ TS 3404."

Common Paint Systems

Equivalent to AS/NZS 2312.1

PAINTING SYSTEMS FOR STEEL

Coating System Details									Durability - Years to first maintenance					
		1st Coat		2nd Coat		3rd Coat			Atmospheric corrosivity category					
System Designation	Surface Preparation	Product	Nom DFT µm	Product	Nom DFT µm	Product	Nom DFT µm	Total Nom DFT µm	C1 Very Low	C2 Low	C3 Med.	C4 High	Very High	
													C5-I Ind	C5-M Mar
ALK3	St3 / Sa 2	Armourcote 210	75	Super Gloss	40	-	-	115	15+	5-15	2-5	-	-	-
IZS1	Sa 2½	Zincilate 11	75	-	-	-	-	75	25+	25+	15-25	10-15	2-5	5-10
PUR2	Sa 2½	Armourcote 220	75	Uracryl 403	50	-	-	125	25+	10-25	5-10	2-5	-	-
PUR5	Sa 2½	Zincilate 11 or ArmourZinc 120	75	Armourcote 510	200	Uracryl 403	50	325	*	25+	25+	25+	15-25	15-25

Table 4 – Internal steelwork – Coating required only for appearance, surface-specific corrosivity category C1 and temporary protection during construction

System designation[a]	Surface preparation	Number of coats	Typical colour	Initial gloss	Allowable surface-specific corrosivity during construction[b]
ALK6	Sa 2½	3	Wide range	Flat to full gloss	C4
IZS1		1		Flat	
PUR1	St 3	2		Semi-gloss to full gloss	C4
ALK1[c]	St 3/Sa 2	1	Limited range	Flat to full gloss	C2[d]
ALK3		2	Wide range		C3

NOTE – All galvanized coatings are suitable for internal steelwork.

a Based on AS/NZS 2312.1:2014.

b Based on a maximum of 1 year's exposure during construction.

c The alkyd primer system ALK1 should not be used in grey colour because the breakdown of the system will be highly visible. Red oxide colour is preferred to reduce the visual impact of minor and structurally acceptable rusting that may occur on the ALK1 system in a few years.

d Based on a maximum of 4 weeks' exposure during construction.

When can I paint?

Paint shall not be applied when any one of the following conditions exists:

a) The surface is less than 10 °C

b) The ambient air temperature is below 10 °C

c) The relative humidity exceeds 85% (unless precautions are taken to ensure that the surface is at least 3 °C above the temperature of the surrounding air).

d) There is moisture or ice visible on the surface of the steel.

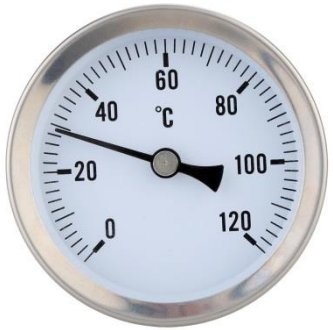
e) Any condition stipulated by the paint manufacturer, which is more restrictive than ‘a)’ to ‘d)’ above.

The engineer or representative may order painting to cease if, despite all conditions being met, there is a likelihood of frost. The contractor may propose protective measures against frost and these measures will be subject to the approval of the engineer.

Relative Humidity & Surface Temperature

It is important that the paint coating is not applied to a cold surface that may have surface moisture on it or that the air is too high in moisture.

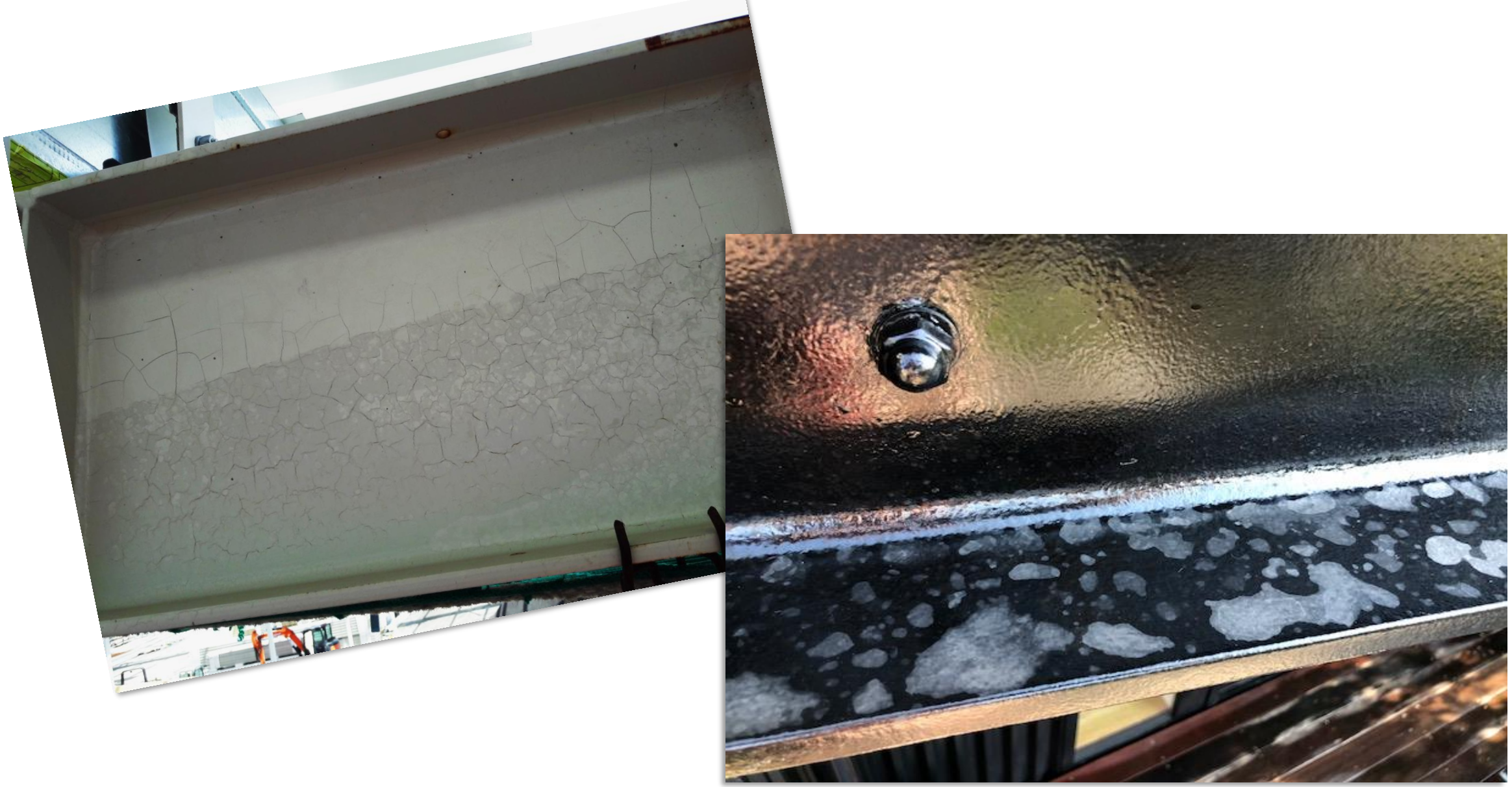
This can be easily measured using a Magnetic Surface Thermometer and a Sling Psychrometer



The surface must be at least 3 °C above the dewpoint before paint can be applied

AMBIENT / SURFACE CONDITIONS

TIME	AIR/DRY BULB Deg. C	WET BULB Deg. C	HUMIDITY %	SUBSTRATE TEMP. Deg. C	DEW POINT Deg. C	SUBSTRATE TEMP. (minus) Dew Point	OK TO PAINT [✓]
6.00 am or start							
9.00 am							
12 noon							
3.00 pm							
6.00 pm or finish							
Other							

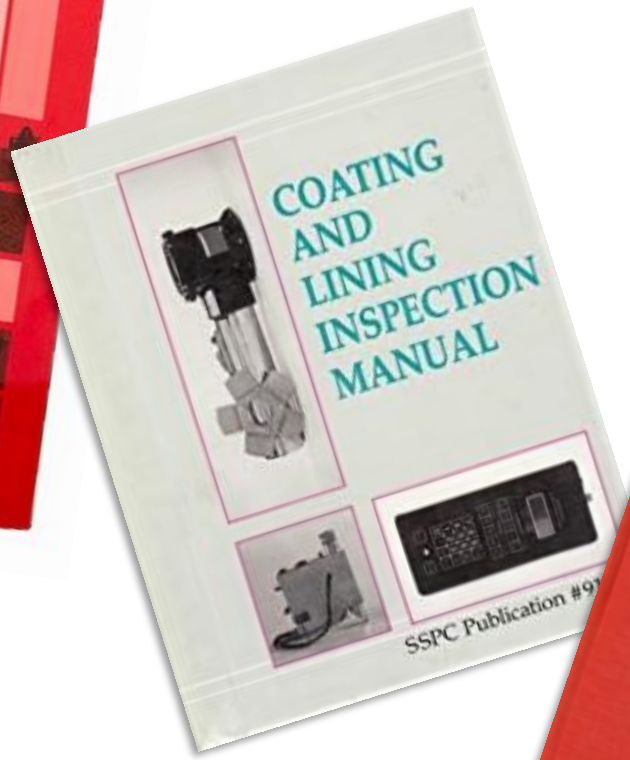


Effects of moisture / water on the surface of drying / curing paint

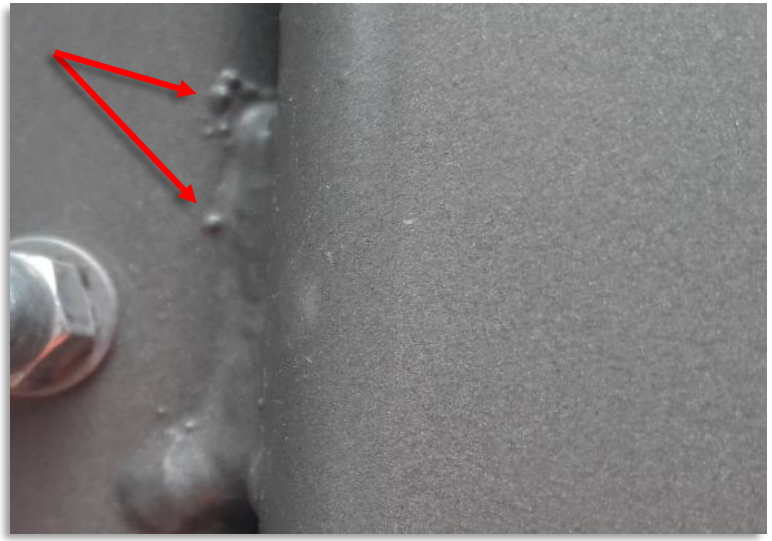
Paint and Substrate Defects


Fitz's Atlas 2
of coating defects


The INSPECTION of COATINGS and LININGS
A Handbook of Basic Practice for Inspectors, Owners, and Specifiers
SSPC 83-14
SSPC
SECOND EDITION

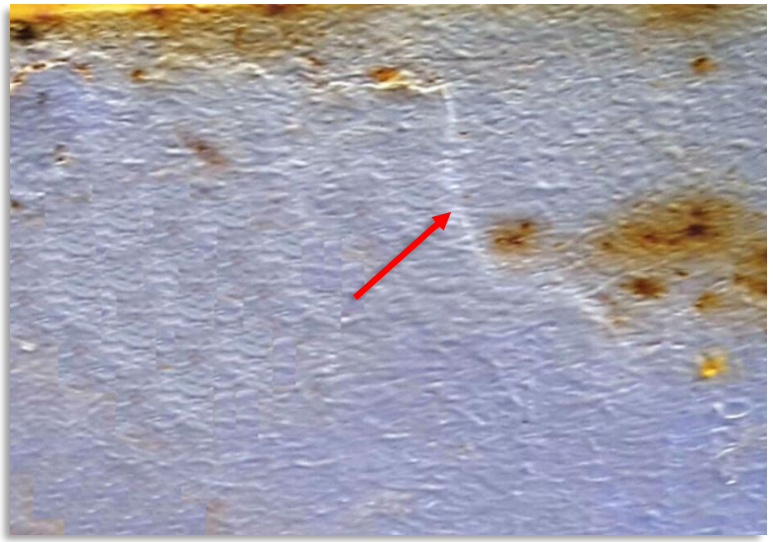

COATING AND LINING INSPECTION MANUAL
SSPC Publication #91


Good Painting Practice
SSPC Painting Manual Volume 1
Fourth Edition
SSPC
the society for protective coatings



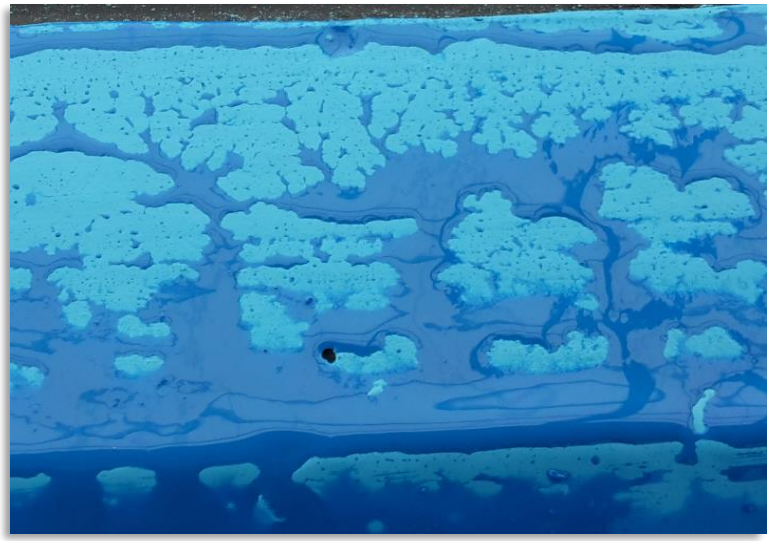
Weld Spatter

Weld preparation



Telegraphing

Paint preparation,
Feathering edges
Low film thickness

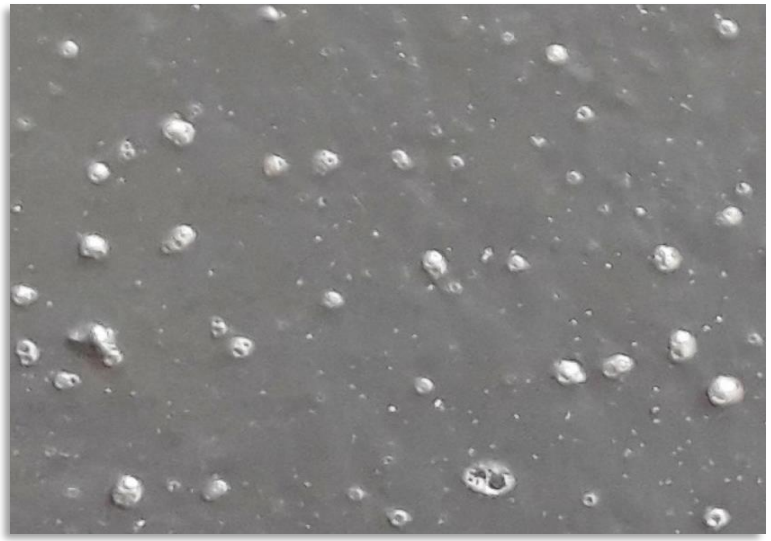


Cissing

Paint preparation,
Surface oils
Oil in spray fan
Wrong thinners

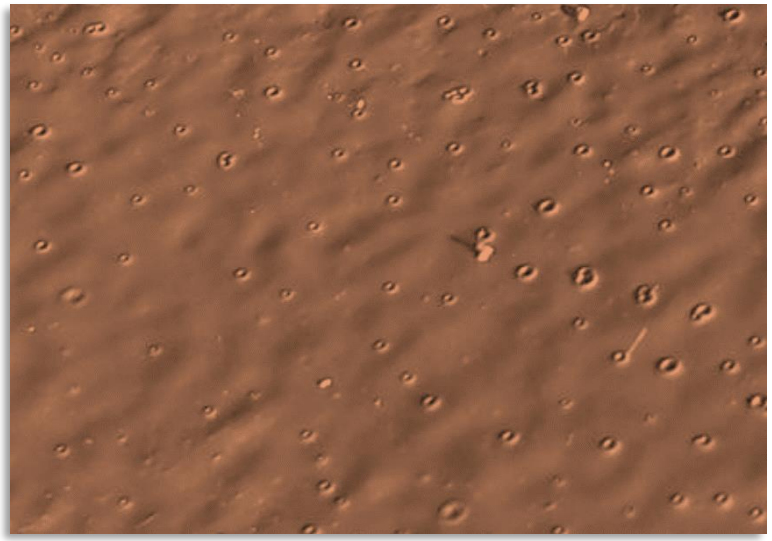
Rust Spotting

High blast profile
Low film thickness



Hot weather
Direct sun
Strong wind
Fast solvents

Solvent Popping



Porous surface
Lack of Seal coat
Slow drying paint
Slow solvents

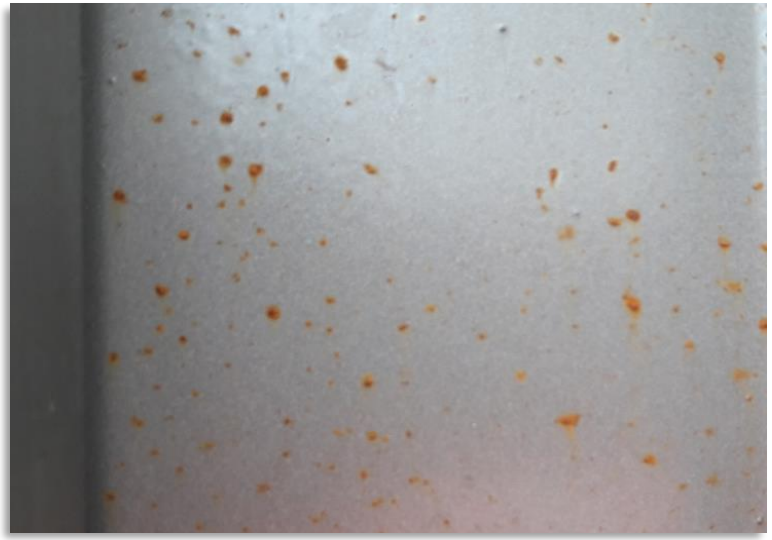
Bubbling

Porous surface
Lack of Seal coat
Voids
Spot damage

Pin Holes / Holidays

High spray pressure
Too far from surface
Hot weather
Direct sun
Strong wind
Fast solvents

Dry Spray

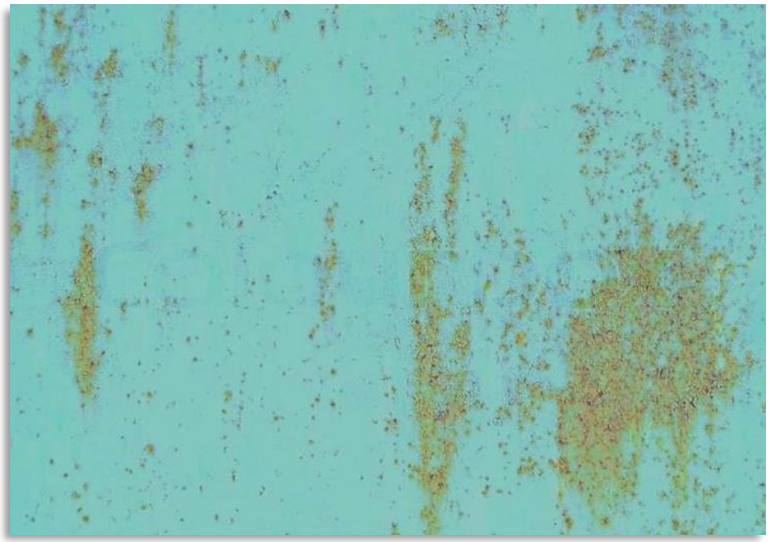


Iron Fall Out

Iron fallout from grinding or welding

Delamination

Lack of preparation
Overcoating past the recoat window

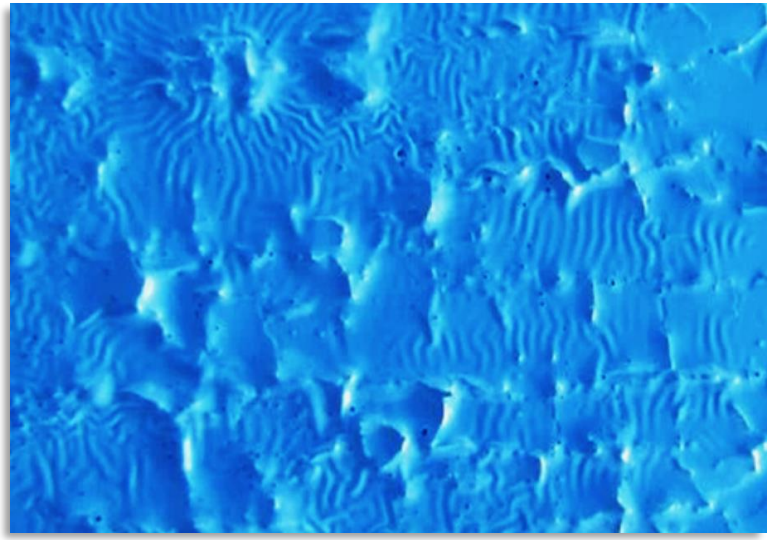


Uneven Application

Uneven application
Lack of overlapping
Low film thickness

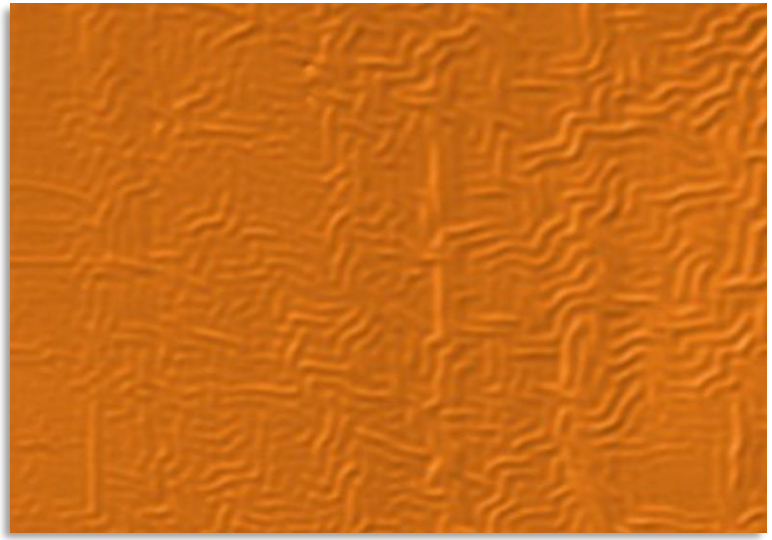
Runs / Sags

Poor application
Applied to thick
Too much thinning



Overcoat too early
Wrong paint type
Solvent spillage
Wrong thinner used

Solvent Attack



Poor drying conditions
Wrong thinner used
Too thick

Wrinkling

Too thick
High PVC coating
Stress related
Generally seen next day

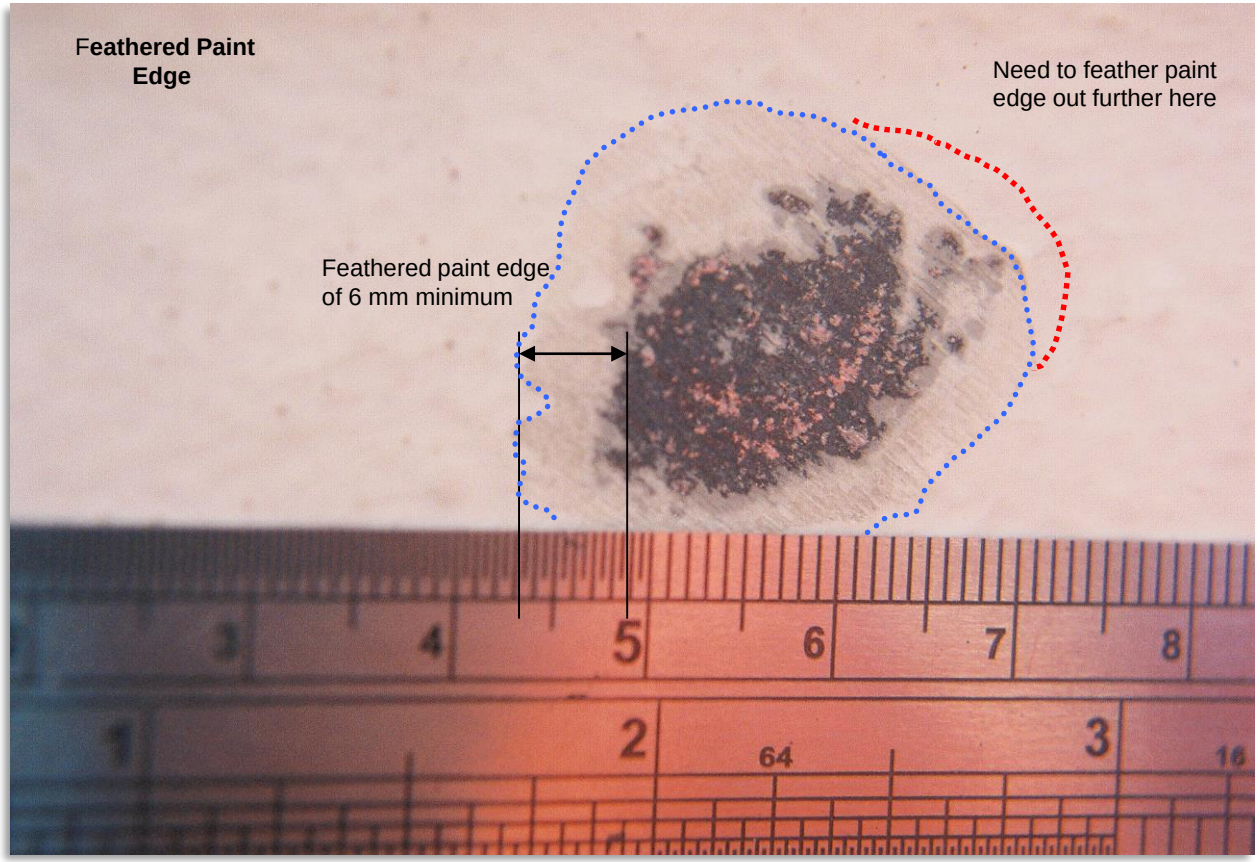
Mud Cracking

Too thick for resin type
Stress build up over time
Can take weeks to see

Crazing / Splitting

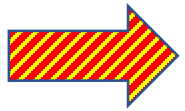
Feather Paint Edges

Regardless of method used, feather edges of remaining old paint so that the repainted surface can have a reasonably smooth appearance.



6.4 DRY FILM THICKNESS

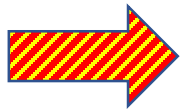
The film thicknesses indicated in Table 6.3 are nominal dry film thicknesses. Dry film thicknesses are generally checked on the priming coat and the complete paint system. Where judged appropriate, the dry film thickness of other parts of the paint system may be measured separately.



The method and procedure for checking the thicknesses of dry films on abrasively blasted surfaces is described in AS 3894.3. The following acceptance criteria as stated in AS 3894.3, applies for systems in Table 6.3:

(a) The arithmetic mean of all the individual dry film thicknesses is equal to or greater than the nominal dry film thickness (NDFT).

(b) All individual dry film thicknesses are equal to or above 80% of the NDFT. However, to ensure optimum performance of the two-pack acrylic (ACC) and polyurethane (PUR) coating systems, the dry film thickness given in the Table 6.3 for finish coats should be considered as the minimum.



Avoid areas of excessive thickness and, in cases when the dry film thickness is greater than any maximum allowable, parties should find agreement. For some products or systems, there is a critical maximum dry film thickness. Information given in the paint manufacturer's technical data sheet applies to such products or systems.

The number of coats and the nominal dry film thicknesses quoted are based on the use of airless spray application. Application by roller, brush or conventional spraying equipment will normally produce lower film thicknesses, and more coats will be needed to produce the same dry film thickness for the system.

Consult the paint manufacturer for more information.

What does Resene specify ?

Note 17: **Paint Film Thickness**

The film thickness and dry film thicknesses quoted are the minimum to be achieved. Do not exceed these thicknesses by more than 20% of that specified. The specified film thickness for each coat / application shall be achieved prior to the application of the subsequent coat. Measurement shall be as per AS/NZS 3894.3 standard (SSPC-PA2) and agreed on before commencement of paint application.

How can Resene help you?

We supply paint which needs to be suitable and fit for purpose.

It is then the responsibility, under contract, of the painter to prepare the surface and then apply the paint under suitable conditions (application, drying and curing) at the correct Wet Film Thickness to achieve the correct Dry Film Thickness that has been specified and accepted/approved by the paint company and also the specification.

If there is an issue with the applied paint, then this now becomes contractual. The end owner needs to contact the MAIN contractor who then needs to talk with the Sub-Contractor / Painter to resolve issues. The painter then, if he/she believes it is a paint issue and not an application issue, then needs to talk to the Paint supplier e.g. Resene.

Site Assistance

Resene Representatives will visit specific job sites as required to assist with advice on adequacy of preparation; special mixing requirements; standard of application etc. However this should not be regarded as 'supervision', but simply 'site assistance'.

However it is not our job to inspect the steel, e.g. QA reports, this is for the contractor to complete.

Re: Coatings Inspection - Paint Company Conflict of Interest.

With regard to Resene being required to carry out Coatings Inspection,

We cannot carry out **detailed inspection** of paint coatings, ambient conditions, surface preparation standards, application, dry film thickness measurement and reporting for painting projects, We can and do offer *site assistance*, however this is very different from detailed inspection and report writing. Site assistance can and dose involve spot checks of film thickness and general advice, but not full inspection for the following reason.

Detailed inspection (as detailed above) buy the **Supplier** (of paint), is not only very time consuming but creates a **Conflict of Interest** and therefore can cause major issues both with the **Contractor** and the **Principle**, as both parties are clients of the Supplier, that being the paint company. For this reason there are **Independent Inspectors** that can carry out this type of work and this then avoids any and all Conflict of Interest, therefore serving all parties in a fit and proper manner.

Paper Work

AS 3894.10

SITE TESTING OF PROTECTIVE COATINGS

INSPECTION REPORT—DAILY

PROJECT ..... DATE .....
ITEM ..... ID NUMBER .....
APPLICATOR ..... SUPERVISOR ..... TEL .....

WEATHER CONDITIONS [✓]

TIME	CLEAR/ SUNNY	OVER-CAST	FOG	DEW	RAIN				WIND		
					LIGHT	MOD.	HEAVY	SHOWERS	LIGHT	MOD.	STRONG
6.00 am or start											
9.00 am											
12 noon											
3.00 pm											
6.00 pm or finish											
Other											

AMBIENT / SURFACE CONDITIONS

TIME	AIR/DRY BULB Deg. C	WET BULB Deg. C	HUMIDITY %	SUBSTRATE TEMP. Deg. C	DEW POINT Deg. C	SUBSTRATE TEMP. (minus) Dew Point	OK TO PAINT [✓]
6.00 am or start							
9.00 am							
12 noon							
3.00 pm							
6.00 pm or finish							
Other							

SURFACE PREPARATION (AS 1627) [✓]

ABRASIVE BLAST CLEANING (AS 1627.4) CHAMBER [ ] COVERED [ ] OPEN [ ] INTERNAL [ ]

GRADE OF SURFACE RUST [✓]	A	B	C	D	COMMENTS	OK TO PAINT [✓]
Sa 1 Light blast						
Sa 2 Commercial (68% clean)						
Sa 2.5 Near white (95% clean)						
Sa 3 White metal (100% clean)						

TYPE OF ABRASIVE ..... GRADE ..... DRY STORAGE [ ]

SURFACE PROFILE/ANCHOR PATTERN [✓]

12 µm [ ] 25 µm [ ] 38 µm [ ] 50 µm [ ] 62 µm [ ] 75 µm [ ] >75 µm [ ]

OTHER SURFACE PREPARATION METHODS ..... OK TO PAINT [ ]

SURFACE CONDITION AT TIME OF APPLICATION [✓]

FREE OF DUST AND SPENT ABRASIVE [ ]
FREE OF OIL AND CONTAMINANTS [ ]
FREE OF FLASH RUSTING [ ]
FREE OF WELD SLAG [ ]
FREE OF WELD POROSITY [ ]
FREE OF WELD SPATTER [ ]
FREE OF SHARP EDGES [ ]
FREE OF LAMINATIONS [ ]
FREE OF BURRS [ ]

REMARKS .....
.....
.....

Signed .....
On behalf of .....
Date .....

AS 3894.11

SITE TESTING OF PROTECTIVE COATINGS

EQUIPMENT REPORT

PROJECT ..... DATE .....

SITE CONDITIONS [✓]

WORK AREA:		Totally enclosed	[ ]	Roofed	[ ]	Fully exposed	[ ]
Clean	[ ]	Dusty	[ ]	Sealed floor	[ ]	Well ventilated	[ ]
Cramped access	[ ]	Clear access	[ ]	Marine, on-shore	[ ]	Marine, off-shore	[ ]
Ground level	[ ]	Height [metres]		Scaffold required	[ ]	Hazardous	[ ]

TEST EQUIPMENT

TEST REQUIREMENT	TYPE / MODEL	DATE CALIBRATED
ABRASIVE BLAST STANDARD		
PROFILE		
WET FILM THICKNESS		
DRY FILM THICKNESS		
DEW POINT/HUMIDITY		
ADHESION TESTING		
HARDNESS		
CONTINUITY TESTING		
OTHER		

METHOD OF APPLICATION [✓]

Brush [ ] Roller [ ] Conventional spray [ ] Airless spray [ ] Plural spray [ ]

SPRAY EQUIPMENT

Airless pump [ ] Pressure pot [ ] Continuous agitator [ ] Water trap [ ]

Model .....

Gun ..... Tipsize ..... Needle ..... Aircap .....

AIR SUPPLY	ABRASIVE BLAST CLEANING	SPRAY APPLICATION
COMPRESSOR BRAND/MODEL		
CAPACITY		
AIR PRESSURE	Single pot ..... Double pot ..... Blast nozzle	Pressure pot ..... Airless pump ..... Gun .....
AIR QUALITY [✓] Clean [ ]	Contaminated [ ]	Filter fitted [ ] Filter operational [ ]

REMARKS .....
.....
.....

Signed .....
On behalf of .....
Date .....

AS 3894.12

SITE TESTING OF PROTECTIVE COATINGS

INSPECTION REPORT — COATING

PROJECT..... **DATE**.....

ITEM NAME			**ID NUMBER**	
SKETCH/LOCATION/DESCRIPTION				
SUBSTRATE MATERIAL				
COATING IDENTIFICATION	**1ST COAT**	**2ND COAT**	**3RD COAT**	**4TH COAT**
Generic Type				
Brand Name				
Batch Number Base				
Batch Number Hardener				
Colour				
Thinner Used (Reference Number)				
% Thinner Used				
APPLICATION [✓] Date Applied / Time				
Brush [ ] Roller [ ] Spray Conventional [ ] Airless [ ] Plural [ ]	[ ] [ ] [ ]	[ ] [ ] [ ]	[ ] [ ] [ ]	[ ] [ ] [ ]
COATING THICKNESS				
Wet Film Thickness (μm)				
Dry Film Thickness (μm)				
Specified (μm)				
Average (μm)				
Maximum (μm)				
Minimum (μm)				
Number of Readings Taken				
ADHESION [✓] Full Cure / Dry Method	[ ]	[ ]	[ ]	[ ]
HARDNESS [✓] Full Cure / Dry Method				
CURE / FULL DRY [✓] Method AS 3894.4 [ ]	PASS [ ] FAIL [ ]			
CONTINUITY TESTING [✓] Method AS 3894.1 [ ] AS 3894.2 [ ]	PASS [ ] FAIL [ ] VOLTAGE:			
OTHER TESTS				

REMARKS .....

.....

Signed ..... PASSED [ ]

On behalf of ..... REJECTED [ ]

Date ..... REWORK [ ]

Durability

It is very important to understand the durability of a coating system and also the environment to which it is to be exposed. It is also just as important to have in place a maintenance system with a plan on when to recoat to keep the entire system in good condition.

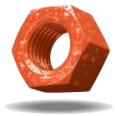
The topcoat is designed to protect the underlying coats and the underlying coats are designed to protect the substrate.

Note that coating type is only one factor in determining the durability of a protective coating system. Surface preparation, application, procedures, design, local variations in environment and other factors will all influence the durability of coatings.

Overview

- Very Basics of Corrosion
- Environment Corrosivity
- Macro / Micro Environments
- Design Implications
- Preparation of Steel
- Paints and Systems Standards
- Painting Conditions
- Common Defects / Issues
- QA Documents
- Durability / Maintenance

That’s the end
&
thanks for your attendance.



Resene
Engineered Coating Systems