

Guide To Adopting Paint Systems for Galvanized Steel in Atmospheric Service



Introduction

The painting of hot dip galvanized steel is an orthodox and well-proven practice in outdoor environments, both in Australia (AS/NZS 4680¹) and internationally². However, there are examples of early failures of paints over galvanizing due to incorrect specifications and poor practice. This Guide aims to avoid such failures by directing specifiers and applicators to the paint systems, surface preparation and application practices that will provide a durable paint finish over galvanizing in a broad range of service conditions.

While good painting practices and generic products for the various exposure conditions have been nominated, this does not preclude the possibility of other paints and methodologies also performing satisfactorily. However, in selecting alternative products, specifiers are urged to select products only from those with verified records of satisfactory long-term performance in equivalent or more severe service conditions.

This document is a general guide only and requires strict compliance with the individual paint manufacturers detailed application instructions for each proprietary product.

Painting Objectives

Reasons for painting galvanized steel are primarily:

- Decorative - to create an aesthetic colour and gloss or provide an identifying colour.
- Enhanced durability - to increase service life.
- Wider chemical resistance – in a situation where galvanizing alone may be vulnerable, such as outside the pH range of 6 to 12.

Decorative Painting

In outdoor service, remote from the coastal fringe and isolated from areas of severe industrial pollution, hot dip galvanizing is inherently durable. This contrasts with paints and other organic materials, which are degraded by solar radiation. Therefore, in most conditions of atmospheric exposure, little is to be gained from painting galvanizing with a coating thickness more than 300 g/m² (42 µm) unless aesthetic or colour considerations are important.

In benign internal situations, and particularly conditions of extreme impact or hard wear, unless a change in colour or gloss is considered necessary, galvanizing is usually best left unpainted.

A great deal of galvanizing is painted on a casual basis, with conventional latex or suitably primed solvent-based alkyd paint³. Choice of this primer is crucial and requires a clear recommendation from the paint manufacturer. In particular, the use of an alkyd primer in direct contact with the galvanizing risks delamination of the paint due to its saponification.



Reverie - Dandenong, Victoria

It is important to note that because these paint systems are quite thin, typically 70 to 120 μm for a three coat system, the zinc profile and localised areas of increased zinc thickness, such as at edges, may be visible in the finish, much in the same way as the grain is visible in painted timber. While this would rarely be a problem higher build paints can be used as part of the painting specification.

While acknowledging the lesser user requirements of conventional (DIY) decorative paints, strict adherence to the appropriate surface preparation and prime coat specification are a key to reliability in all situations when painting over galvanizing.

The paint systems detailed under Service Conditions 1 and 2, on page 8, are essentially decorative paint systems.

Painting for Enhanced Durability

Hot dip galvanizing is inherently very durable, so there will rarely be a need to paint over it to achieve the intended service life. Indeed, in higher corrosivity zones (C3 to C5) painting galvanized steel can actually accelerate corrosion of the zinc substrate and reduce the overall service life of the article from the expected galvanized-only life ***unless a judiciously selected, uniformly applied, high build paint system is applied and the integrity of that paint system is maintained through its service life.***



Desalination plant, Sydney during construction – the lower section of the uprights are painted to protect the surface from salt splash

Nevertheless, in circumstances where the galvanized coating is slowly being attacked by a corrosive environment, the application of a suitable coating which insulates the zinc from that environment can prolong the life of the galvanized coating. Therefore, in severe coastal and industrial service environments, the painting of galvanizing can significantly extend service life. Even in quite benign outdoor service conditions where galvanizing might last for many decades, it can be prudent to paint areas

which are sheltered from the cleansing influence of rain to extend the service life of the structure even further.

The paint systems detailed under Service Requirements 3 to 5 (see pages 9 to 10) are essentially paint systems intended to provide enhanced durability performance, resistance to wear and trafficking and more aggressive atmospheric service conditions. The paints range from two-pack epoxies and polyurethanes to powder coatings. Most paints have specific restrictions for how they are to be applied and cured and these restrictions need to be strictly enforced. For example, below about 8°C, latex paints will not usually dry and many two-pack coatings have a limited recoating time. Powder coatings, because they are hard cured

as soon as they are stoved, can offer logistical benefits. In addition, because they can be applied electrostatically, more uniform coverage can be achieved with intricate shapes than is possible with conventional paints. However, judicious selection of pretreatment and application by competent operators is critical to performance.

For effective protective coatings over galvanizing the thickness of the paint system must be increased as the environment becomes more corrosive. For painting in a high corrosivity locale where the coating thickness and integrity is difficult to guarantee, galvanizing may need to be avoided and an alternative corrosion protection system sought.

The selection of a suitable corrosion inhibitive primer is another prerequisite. Indeed, many failures of paint systems over galvanizing can be traced to either an inappropriate primer or an inadequate total paint thickness⁶.

The paint systems detailed under Service Requirements 3 to 5 also provide options for situations where an aesthetic finish is also needed.

The Effect of Microclimates

Where the surface is protected from the cleansing influence of rainwater, which would otherwise wash pollutants (particularly coastal and other salts) from the surface, uncoated steel and galvanizing are more susceptible to corrosion than other corrodible metals. The corrosion in these protected locations, for example under verandahs and open roofed areas, can be typically 3 to 5 times greater than that for surfaces exposed to rain. In such cases, the appropriate paint systems detailed under Service Requirements 3 to 5 should be considered and the paint system would need to extend beyond the microclimate by at least 150 mm.

Even in quite benign locations, where maximised service life is required, the application of one coat of a two pack epoxy primer at 75 µm DFT to non-rain-washed surfaces, after cleaning and degreasing the surface, can significantly extend the service life of the structure. This added coat insulates the galvanizing from the accumulated pollutants. As this coat will not be exposed directly to sunlight, a two-pack epoxy primer (refer to AS 3730.13 or APAS 2971) will be quite durable.

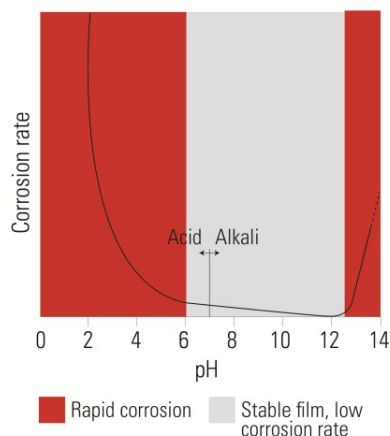
In a similar vein, while a galvanized structure might be essentially exposed to the atmosphere, at some points it may be in contact with the ground, buried in soil or may be exposed to intermittent or continuous ponding of rainwater. In such situations localised painting or the application of a protective tape or wrap may be needed to avoid premature corrosion in these areas. Again, the protective coating would need to extend well beyond the microclimate. AS/NZS 4680 provides some commentary on this issue and the GAA can provide further advice.

Painting for Enhanced Chemical Resistance

Galvanizing is recommended to be used within the pH range of 6 to 12. Outside this range, its service life is likely to be unacceptable. This includes exposure to strong acids and alkalis as well as salts of strong acids and weak bases and vice versa. Galvanizing may also catalyse the deterioration of certain organic chemicals that are exposed to it. This phenomenon is rare and causes no damage to the galvanizing.

Just as coatings provide enhanced protection in corrosive atmospheric service environments, judiciously selected paint systems can also protect galvanizing from aggressive chemicals. Such approaches are usually only taken where the chemical exposure is low or moderate. Otherwise, the safe principle to adopt in extreme exposure situations is the use of a substrate material which is inherently inert. In such situations, stainless steels and plastic composites often find advantage.

In specific chemicals exposure, the recommendations of an expert or an established successful case history should always be sought⁷.



Surface Preparation

When painting galvanizing, as when painting any other surface, the cleanliness and condition of the surface are of critical importance and a high proportion of paint failures on galvanized steel can be attributed to inappropriate or inadequate surface preparation.

In preparing galvanizing for painting, the basic requirements are largely the same as for other surfaces. Namely, anything that prevents the paint wetting out or adhering to the surface needs to be removed. Therefore oils, dirt, dust, salts, corrosion products and other friable material and soluble salts must be removed as a precursor to any subsequent treatment. Refer to AS/NZS 2312⁸ Section 4 and AS 1627¹¹. The difficulty of removing some contaminants should not be underestimated and for severely corroded galvanizing, in particular, reinstatement may be impractical, because of the extensive preparation required.

For the removal of oil and grease, water based emulsifiers, alkaline cleaners of pH less than 12 or organic solvents are variously appropriate. Where oils and grease are removed by solvent soaked cloths, these need to be changed frequently as oil contaminated cloths only serve to spread the contamination. Usually this method is only practical over small areas.

Apart from the removal of dirt, dust and grease, which are common to all substrates, it is important to recognise all sophisticated coatings intended for extended durability service require high standards of surface preparation for maximised performance.

One important issue for galvanized surfaces is the time lapse between galvanizing and painting. The best advice is to paint galvanizing as soon as possible, for the sooner it is painted the less likely it is to be contaminated by dust, salts and corrosion products. Conversely, the longer the time lapse and the more severe the conditions of exposure prior

to painting, the more difficult and costly the preparation will be. In extreme cases, such as where surfaces have been close packed in humid or damp conditions and suffered wet storage staining, brushing with 1 to 2% ammonia, or in extreme cases one part citric or acetic acid to 25 parts water, may be required¹².

A second consideration is the smooth, glossy surface that emerges from the galvanizing bath. This can inhibit paint adhesion. In the past, two methods of dealing with this problem were to etch the surface with an aggressive salt solution or mineral acid or allow the zinc to weather for some time before painting. These techniques have long been discredited.

For painting unweathered galvanizing with conventional low build paints (see Service Requirements 1 and 2) cleaning and degreasing is normally adequate, although light scuffing with sandpaper will invariably enhance paint adhesion. For higher build paints and under conditions of more arduous wear, brush (whip) abrasive blasting is favoured (see Service Requirements 3 to 6)



Primer being applied over galvanizing to EG Whitlam Pool frame structure in preparation for decorative coat

This process lightly roughens the surface without removing a significant amount of galvanizing and provides a key to promote adhesion of the paint film. This procedure should be carried out using a soft abrasive, by impacting the surface at a glancing angle and operating at low air pressure. The following criteria included in both AS/NZS 4680¹ and AS1627.4¹¹ are recommended:

- Blast pressure 275 kPa (40 psi)
- Abrasive Grade 0.2 – 0.5 mm (clean ilmenite)
- Angle of blasting to surface no greater than 45°
- Distance from surface 350 – 400 mm
- Nozzle orifice diameter 10 – 13 mm of venturi type

It is important that this procedure be performed carefully to ensure that no more than 10 µm of zinc is removed. Organic paint coatings should be applied as soon as possible after abrasive blasting.

Newly galvanized coatings are normally quenched in an aqueous solution by the galvanizer to impede early onset of white rust. If a HDG article is to be painted, it is usually best to exclude this step from the galvanizing process to minimise contamination. To ensure the best possible surface for painting, advise the galvanizer of your needs prior to galvanizing.

Selecting the Right Paint

There are three main steps required to select the right paint to apply over any fabricated, hot dip galvanized structural steel article, once it has been determined the design lends itself to painting in a manner which can achieve uniform paint application. They are:

1. Identify the environment (*see page 14 – Corrosivity Environment – A Quick Guide*)
2. Determine the service life required for the painted structure (*see page 7 – Painting Systems*)
3. Select the appropriate painting system from the Service Requirement Guide (*see pages 8 – 10*)

If there is any doubt, you should always choose the more aggressive corrosivity environment.

Choosing the service life is often a matter of cost. If the paint system does not last long enough, rectification could be expensive. In the same manner; as the effectiveness of paint systems increase, the materials and application costs rise. AS/NZS 2312 Appendix E provides guidelines on the economics of corrosion protection and the specifier is urged to consider not only the initial cost but also the lifetime cost of any chosen corrosion protection system.



Painting Systems

The following pages provide guidance on paint systems suitable for use in industrial and commercial situations under six different "service requirements" as follows:

Service Requirement 1	Low corrosivity conditions & medium term service
Service Requirement 2	Low corrosivity conditions & high resistance to wear & trafficking/long term service.
Service Requirement 3	Medium corrosivity conditions & high resistance to wear & trafficking/long term service.
Service Requirement 4	High corrosivity conditions & high resistance to wear & trafficking/long term service.
Service Requirement 5	Very high corrosivity conditions & high resistance to wear & trafficking/long term service.
Service Requirement 6	Specific industrial chemical or solvent exposure

Notes

- **Service life:** The paint systems listed in this guide provide for either medium or long term service lives, which are typically 5 to 10 years or 10 to 15 years respectively, for a maintenance repainting cycle to retain aesthetic performance.
- **The corrosivity condition assessment** is based upon the guidelines of ISO 9223⁹, which essentially relate corrosivity in terms of distance from the seacoast and need careful interpretation. "Corrosivity Environment – A Quick Guide" (page 14) provides assistance on choosing the corrosivity environment.

ISO 9223 is preferred over AS/NZS 2312⁸ for reference to corrosivity categories as AS/NZS 2312 is under review at the time of writing and ISO 9223 includes the new extreme corrosivity category CX.

AS 4312¹⁰ provides excellent guidance for the determination of the general Australian macro environment with respect to corrosivity zones, but care should be taken when dealing with very high to extreme corrosivity locations (CX) because AS 4312 has not yet been modified to take the extreme zone into account. Otherwise, the corrosivity zones are the same as listed in ISO 9223.

The GAA has no paint system recommendation for category CX at the time of preparation of this guide.

- **Application** should be strictly in accordance with the paint manufacturer's written instructions and the relevant recommendations of AS/NZS 2311 in the case of Service Requirement 1 and to AS/NZS 2312 in the case of Service Requirements 2 to 6.
- For all but Very Low and Low Corrosivity Service Requirements it is recommended that a **brush applied stripe coat** be applied to corners, welds and other sharp edges to ensure full thickness coverage. Indeed, for High and Very High Corrosivity Conditions it is critical. This is because, unlike galvanizing, paint tends to shrink away from sharp edges.

Service Requirement 1						
C1 very low & C2 low corrosivity conditions (note 1) Medium term service (note 2)						
Decorative finish						
Clean Degrease	→	1 coat of Latex Primer (to AS 3730.15 or APAS 00134)	→	1 coat of 100% Acrylic Gloss Latex (to AS 3730.10 or APAS 0280/1)	→	1 coat of 100% Acrylic Gloss Latex (to AS 3730.10 or APAS 0280/1)
<p>Note 1 ISO 9223 Corrosion Categories C1 (Very Low) and C2 (Low). These locations range from more than 50km from a surf beach down to about 1 km from quiescent seawater. It also includes Category C (Medium) locations, provided the structure is totally exposed to the cleansing influence of rainwater or is subject to an appropriate regular hosing with fresh water, as unwashed areas in Category C can be quite corrosive.</p> <p>Note 2 Typically 5 to 10 years maintenance repainting cycle to retain aesthetic performance.</p> <p>Note 3 For enhanced resistance to wear and trafficking and staining adopt "Service Requirement 3".</p> <p>Note 4 Flat, Low Gloss and Semi-Gloss 100% acrylic latex finishes may be also options, as aesthetics demand.</p> <p>Note 5 Application should be strictly in accordance with the paint manufacturer's written instructions and consistent with the relevant recommendations of AS/NZS 2311 "Guide to the painting of buildings"</p>						

Service Requirement 2						
C1 very low & C2 low corrosivity conditions (note 1) Long term service (note 2)						
Decorative finish						
Minimum System DFT 175 µm						
Clean Degrease	→	1 coat of 2 pack inhibitive epoxy primer – minimum DFT 75 µm	→	2 coats of 2 pack polyurethane or 2 pack acrylic – minimum DFT 50 µm/coat		
<p>Note 1 ISO 9223 Corrosion Categories C1 (Very Low) and C2 (Low). These locations range from more than 50km from a surf beach down to about 1km from quiescent seawater. It also includes Category C3 (Medium) locations, provided the structure is totally exposed to the cleansing influence of rainwater or is subject to an appropriate, regular hosing with fresh water, as unwashed areas in Category C3 can be quite corrosive.</p> <p>Note 2 Typically 10 to 15 years maintenance repainting cycle to retain aesthetic performance.</p> <p>Note 3 For enhanced resistance to wear and trafficking or staining adopt "Service Requirement 3".</p> <p>Note 4 Powder Coatings covered under Service Requirement 3 are also appropriate.</p>						

Service Requirement 3						
C3 medium corrosivity conditions (note 1) High resistance to wear & trafficking/long term service (note 2 & 3)						
Decorative finish						
Paint						
Minimum System DFT 175 µm						
Clean Degrease	→	Brush Blast	→	1 coat of 2 pack inhibitive epoxy primer – minimum DFT 75 µm	→	2 coats of 2 pack polyurethane or 2 pack acrylic – minimum DFT 50 µm/coat
Powder coating						
Clean, coat and cure in accordance with the powder coating manufacturers written instructions using the appropriate polyester powder coating to a cured thickness of not less than 70 µm.						
Industrial finish						
Minimum System DFT 225 µm						
Clean Degrease	→	Brush Blast	→	1 coat of 2 pack inhibitive epoxy primer – minimum DFT 75 µm	→	1 coat of high build 2 pack epoxy – minimum DFT 150 µm
<p>Note 1 ISO 9223 Corrosion Category C3 (Medium). These locations range from more than 1 km from a surf beach and down to about 100 metres from quiescent seawater, except in tropical locations where Service Requirement 4 is more appropriate. It also includes Category C4 (High) locations, provided the structure is totally exposed to the cleansing influence of rainwater or is subject to an appropriate, regular hosing with fresh water, as unwashed areas in Category C4 can be very highly corrosive.</p> <p>Note 2 Wear & trafficking is defined as surfaces subject to mild abrasion and scuffing, such as occurring in public thoroughfares, kitchens and other work areas.</p> <p>Note 3 Typically 10 to 15 years maintenance repainting cycle to retain aesthetic performance.</p> <p>Note 4 For enhanced performance or in the more corrosive areas within the Category C3 zone a higher minimum total cured film thickness may be required.</p>						

Service Requirement 4						
C4 high corrosivity conditions (note 1) High resistance to wear & trafficking/long term service (note 2 & 3)						
Decorative finish						
Minimum System DFT 350 µm						
Clean Degrease	→	Brush Blast	→	2 coats of high build of 2 pack epoxy – minimum DFT 250 µm	→	2 coats of 2 pack polyurethane or 2 pack acrylic – minimum DFT 50 µm/coat
Industrial finish						
Minimum System DFT 350 µm						
Clean Degrease	→	Brush Blast	→	3 coats 2 pack high build MIO epoxy		
Note 1 ISO 9223 Corrosion Category C4 (High). These include locations more than 300 metres from surf and down to the seashore in quiescent seawater, tropical coastal service and indoor swimming pools						
Note 2 Wear & Trafficking is defined as surfaces subject to mild abrasion and scuffing, such as occurring in public thoroughfares, kitchens and other work areas.						
Note 3 Typically 10 to 15 years maintenance repainting cycle to retain aesthetic performance.						
Note 4 Where decorative finish is not required polyurethane or acrylic may be replaced by a further coat of high build 2 pack epoxy of equivalent thickness						

Service Requirement 5								
C5 very high corrosivity conditions (note 1) High resistance to wear & trafficking/long term service (note 2 & 3)								
Decorative finish								
Minimum System DFT 400 µm								
Clean Degrease	→	Brush Blast	→	1 coat of inhibitive 2 pack epoxy primer – minimum DFT 75 µm	→	1 or more coats of high build 2 pack epoxy – minimum DFT 225 µm	→	2 coats of 2 pack polyurethane or acrylic – minimum DFT 50 µm/coat
Industrial finish								
Minimum System DFT 400 µm								
Clean Degrease	→	Brush Blast	→	1 coat of inhibitive 2 pack epoxy primer – minimum DFT 75 µm	→	3 or more coats 2 pack high build MIO epoxy		
<p>Note 1 ISO 9223 Corrosion Categories C5 (Very High). These locations are offshore and on the beachfront in regions of rough seas and surf. It also applies in a few aggressive industrial areas.</p> <p>Note 2 Wear & Trafficking is defined as surfaces subject to mild abrasion and scuffing, such as occurring in public thoroughfares, kitchens and other work areas.</p> <p>Note 3 Typically 10 to 15 years maintenance repainting cycle to retain aesthetic performance.</p> <p>Note 4 Polyurethane finish preferred unless OH&S considerations prohibit isocyanates.</p> <p>Note 5 Alternatives to galvanizing should be considered, particularly in wear and tear conditions.</p>								

Service Requirement 6							
Specific industrial chemical or solvent exposure (note 1)							
Typical Minimum System DFT 400 µm							
Clean Degrease	→	Brush Blast	→	1 coat of inhibitive 2 pack epoxy primer – minimum DFT 75 µm	→	Finish coat subject to manufacturer's technical advice	
<p>Note 1 While the requirements for surface cleaning and brush blasting are mandatory, the specific paint system and its total system thickness are dependent upon the type and concentration of the chemical/solvents exposure and the manufacturer's advice.</p> <p>Note 2 Typically 10 to 15 years maintenance repainting cycle to retain aesthetic performance.</p> <p>Note 3 Typically polyurethanes are specified for resistance to acids and organic solvents and epoxies for resistance to alkalis. Where strong acid or alkali contact is envisaged, alternative construction materials should be considered.</p> <p>Note 4 Alternatives to galvanizing should be considered, particularly in acid or alkali conditions.</p>							

Typical Paints

Several paint suppliers are able to offer solutions to the Service Requirements. Unlike Edition 1, the GAA has not offered a listing of suitable paints/suppliers due to regular formula, brand and ownership changes in the paint industry. The GAA recommend direct contact with the paint companies for information on current product availability and suitability. In particular, it is important to establish that the manufacturer provides examples that the particular formulation has been used successfully on galvanized steel.

Sample Specification

The following provides guidelines for preparing an appropriate specification for painting galvanizing. Specific projects may need to encompass additional requirements not included in this generalised specification and Section 12 of AS/NZS 2312 provides additional advice.

Note: For powder coating, while the general specification format would be appropriate, the technical requirements, notably surface preparation and application and cure conditions will be considerably different and need to be consistent with the guidelines of the specific powder coating manufacturer.

1. INTRODUCTION

1.1 Purpose

This Specification defines the technical requirements for surface preparation and application of protective coatings that have been hot-dip galvanized in accordance with AS/NZS 4680. It does not cover powder coatings, which requires specific recommendations regarding surface preparation and coating system selection, application and cure.

(accurately describe location and scope of items to be painted)

1.2 Definitions/Glossary of Terms

For a glossary of paint and painting terms, refer to AS 2310.

2. REFERENCE DOCUMENTS

The following documents have been referred to in this Specification:

2.1 Standards/Codes

AS 1627	Metal finishing - Preparation and pre-treatment of steel surfaces
AS 1627.4	Part 4: Abrasive blast cleaning (Note: Not relevant for Service Requirement 1)
AS 2310	Glossary of paint & painting terms
AS 3894	Site testing of protective coatings
AS/NZS 2311	Guide to the painting of buildings (Note: Not relevant for Service Requirements 2 to 6)
AS/NZS 2312	Guide to the protection of iron and steel against exterior atmospheric corrosion
AS/NZS 4680	Hot-dip galvanized (zinc) coatings on fabricated articles

3. TECHNICAL REQUIREMENTS - COATINGS

3.1 General

- (i) Surface preparation treatments, inspection and testing and health and safety shall comply with statutory requirements and the guidelines of AS/NZS 2311 or AS/NZS 2312 as appropriate.
- (ii) All cutting, welding and other physical working of the metal shall be completed before surface preparation and these shall be completed off-site, except for repairs made necessary because of damage during transport, storage and construction.
- (iii) All paint forming part of the one paint system shall be from the same paint manufacturer.
- (iv) No paint shall be used after the expiration of its shelf life or its pot life and all paint shall be mixed, thinned as appropriate and applied in strict accordance with the manufacturer's written instructions.
- (v) Apply the first (prime) coat to the clean, dry surface as soon as practicable after it has been prepared for coating.
- (vi) Coating application shall only proceed when the surface temperature is greater than 15°C and at least 3°C above the dew point of the surrounding air.
- (vii) Coating application procedures and the time elapsed between coats shall be consistent with this specification and strictly in accordance with the manufacturer's written recommendations.
- (viii) Where repairs to the coated finish are necessary and permitted by the Project Manager, they shall be carried out using the system approved by the manufacturers of the original system, and to a standard which will not compromise the protective performance of the overall coating system.
- (ix) The Project Manager reserves the right to check each and every stage of the coating process to determine the cleanliness of surfaces, degree of cure, adhesion, time between application and coating thickness, colour gloss and finish. When tested in accordance with AS 3894.3 each coat and the total coating thickness shall be not less than the specified minimum.
- (x) After the completion of all painting works, all equipment and materials used in painting activities and all paint debris shall be removed from the site, which shall be restored to its original condition.

3.2 Surface Preparation

- (i) Remove any oil, grease or wax in accordance with the relevant method described in AS 1627 Part 1.
- (ii) Remove all dirt, dust, water-soluble salts and other contaminants by appropriate methods consistent with the requirements of AS 1627.
- (iii) Remove or smooth out all sharp edges, dags, weld spatter and laminations in a manner that such physical imperfections in the galvanized surface shall not thwart the even build up of the subsequent paint system.
- (iv) **(Service Requirements 3 to 6 only)** Lightly (brush or whip) blast all galvanized steel using a soft abrasive, such as limestone or aluminium magnesium silicate in a manner that profiles the surface without removing a significant amount of zinc from the surface.

3.3 Painting

- (i) The first coat of paint shall be applied to the clean, dry prepared surface as soon as practicable after it has been prepared for coating and at least within 4 hours. Immediately prior to coating, the surface shall be air blasted or dusted off to remove any surface dust.
- (ii) For Corrosivity Zones C5 and CX, or where otherwise nominated by the Project Manager, all edges and corners shall be first stripe coated with prime coat, prior to application of one full prime coat.
- (iii) The prime coat shall be

Refer systems detailed in Section 4.

(Detail at least product name and minimum dry film thickness)

- (iv) As soon as practicable after the minimum recoat time for the primer, apply

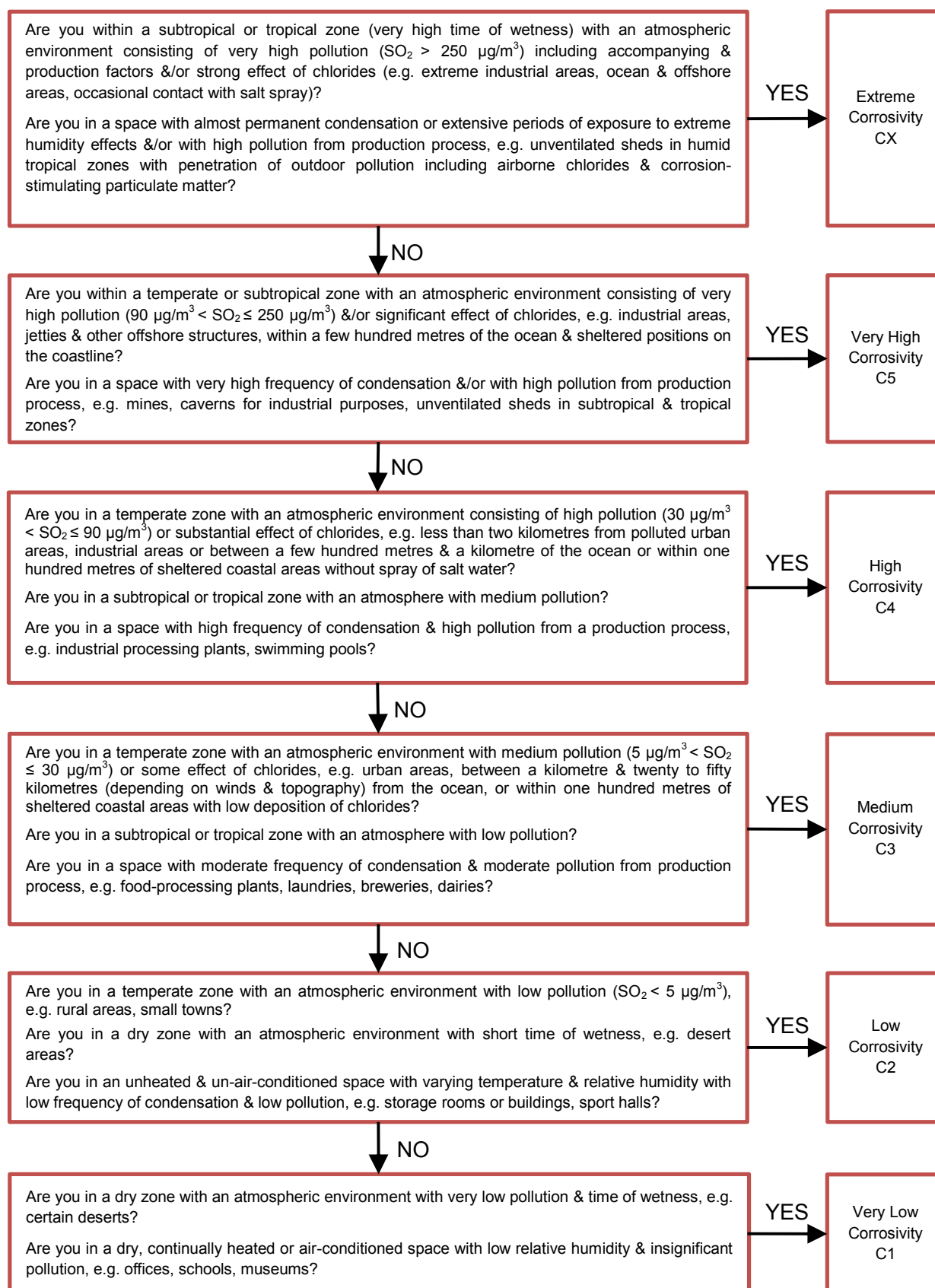
Refer systems detailed in Section 4.

(Detail at least the product name, the minimum dry film thickness for each coat to be applied and the minimum total dry film thickness of the paint system and colour/ gloss of final finish)

The final finish shall be smooth and uniform in colour and gloss consistent with best industry practice for the products specified.

- (v) Damage or other defects in the coating system shall be feathered back to a smooth transition and patch repaired with the same products to not less than the specified dry film thickness.

Corrosivity Environment – A Quick Guide



Bibliography

1. Australian/New Zealand Standard AS/NZS 4680:2006 Hot-dip galvanized (zinc) coatings on fabricated articles.
2. ISO 1461-2009 Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods
3. Australian/New Zealand Standard AS/NZS 2311:2000 Guide to the painting of buildings.
4. Thomson G., "Paint over Galvanizing" Galvanizers Association of Australia, Melbourne 2001.
5. ISO 14713-1-2009 Zinc coatings - Guidelines and recommendations for the protection against corrosion of iron
6. Bartlett D J "Paint Finishes over Galvanizing, Why Do They Fail?" Presented to ACA Conference, Melb. Nov. 2003.
7. Slunder C. J. and W.K. Boyd "Zinc and its Corrosion resistance", Int. Lead Zinc Research NY 2nd Edn. 1983.
8. Australia/New Zealand Standard AS/NZS 2312:2002 "Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings.
9. ISO 9223-2012 Corrosion of metals and alloys — Corrosivity of atmospheres — Classification, determination and estimation.
10. AS 4312-2008 Atmospheric corrosivity zones in Australia
11. Australian Standard AS 1627 Metal Finishing - Preparation and pre-treatment of surfaces.
12. Smith L. M. "Cleaning and Painting Galvanized Steel", 51-55, JPCL 18, April 2001.
13. "Sweep Blasting Hot Dip Galvanizing" Galvanizers Association of Australia, Advisory Note GEN/1/1, March 2012.