# PROTECTIVE COATINGS

DIPL Roadworks Master – March 2022

## Standards, Publications, Legislation, and Codes

All materials and work shall comply with the latest issue of the relevant codes and standards. Some standards and codes are listed below.

When conflict arises between the requirements in the manufacturer’s data sheets or recommendations and the specification, the highest standard shall be adopted as directed by the Superintendent.

### Standards

AS 1580 Paints and related materials - Methods of test.

AS/NZS 1580.108.1 - Determination of dry film thickness on metallic substrates - Non- destructive methods.

AS 1627 Metal finishing - Preparation and pretreatment of surfaces. (Code of Practice for Preparation and Pretreatment of Metal Surfaces prior to Protective Coating).

AS 1627.1 - Removal of oil, grease and related contamination.

AS 1627.2 - Power tool cleaning.

AS 1627.4 - Abrasive blast cleaning of steel.

AS 1627.9 - Pictorial surface preparation standards for painting steel surfaces.

AS 1678 Emergency Procedures Guide – Transport.

AS 1678.3A1 - Group Text EPGs for Class 3 substances – Flammable Liquids.

AS 1940 The Storage and Handling of Flammable and Combustible Liquids.

AS/NZS 2311 Guide to the Painting of Buildings.

AS 2312 Guide to the Protection of Structural Steel against atmospheric corrosion by the use of protective coatings.

AS 2312.1 - Paint coatings.

AS 2700 Colours for General Purposes.

AS 2865 Confined Spaces.

AS 3894 Site Testing of Protective Coatings.

AS 3894.3 - Determination of dry film thickness.

AS 3894.5 - Determination of surface profile.

AS 3894.10 - Inspection Report – Daily surface and ambient conditions.

AS 3894.11 - Equipment Report.

AS 3894.12 - Inspection Report – Coating.

AS 3894.13 - Inspection Report – Daily blast and paint.

AS 3894.14 - Inspection Report – Daily painting

AS/NZS ISO 9000 Quality management systems - Fundamentals and vocabulary.

### APAS

APAS Specification 2908 Inorganic zinc coating for protection of steel

APAS Specification 2971 Epoxy two-pack durable primer for protection of steel in atmosphere

### ASTM

ASTM D5064 Standard Practice for Conducting a Patch Test to Assess Coating Compatibility.

### Legislation

Work Health and Safety (NUL) Act.

Work Health and Safety (NUL) Regulations.

### Codes

Code of Practice, Abrasive Blasting, Safe Work Australia.

Code of Practice, Managing the Risk of Falls at Workplaces, NT WorkSafe.

## Abbreviations

| **Table - Abbreviations – Protective Coatings** | |
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| **ABBREVIATION** | **MEANING** |
| **ACA** | Australasian Corrosion Association |
| **DFT** | Dry Film Thickness |
| **EPA** | Environment Protection Authority |
| **EPG** | Emergency Procedure Guide to AS 1678 |
| **ICorr** | Institute of Corrosion, UK |
| **ITPs** | Inspection and Testing Plans |
| **JSA** | Job Safety Analysis |
| **NACE** | National Association of Corrosion Engineers, USA |
| **NCR** | Non-Conformance Report |
| **NTCZ** | NORTHERN TERRITORY CLIMATE ZONES TABLE |
| **PCCP** | Painting Contractors Certification Program |
| **ppm** | Parts per million |
| **QA** | Quality Assurance |
| **SDS** | Safety Data Sheets – formerly known as Material Safety Data Sheets |
| **SWMS** | Safe Work Method Statement |
| **TDS** | Total Dissolved Solids |

## Protective Coatings - Hold Point

**Hold Point:** Surface Preparation: To AS 1627. Provide a copy of the proposed specification for surface preparation as detailed in AS 1627.0 before commencing surface preparation works.

Remove loose millscale, rust, oil, grease, dirt, globules of weld metal, weld slag and other foreign matter.

Priming: Apply the primer coat to the structural steel before delivery to the site and protect from damage during handling and transport.

**Hold Point:** Complete and submitSite testing of protective coatings: To AS 3894.10 and AS 3894.11 and AS 3894.12

Required or not required: ***[enter data]***.

### Single pack zinc phosphate

Thoroughly wire brush steelwork to AS 1627.2 and prime with one coat of single pack zinc phosphate to APAS specification 0162/1 with a dry film thickness of 40 microns.

### Epoxy zinc phosphate

Blast clean to the recommendations of AS 1627.4 to grade Sa of AS 1627.9 and prime with one coat of epoxy zinc phosphate to APAS specification 2971with a dry film thickness of 45 microns.

### Inorganic zinc silicate

Blast clean to recommendations of AS 1627.4 to grade Sa of AS 1627.9 and prime with one coat of inorganic zinc silicate to APAS specification 2908 with a dry film thickness of 75 microns.

Site work: After erection, repair any damage to the shop coating and apply the coating, if any, omitted at site connections.

Time delay: Prime the steel surface as soon as possible after surface preparation and prior to any deterioration of the surface. If the surface is contaminated or rust bloomed, repeat the surface preparation before applying the primer.

## Protective Coating Specifications - Systems and Approved Products

Refer to Clause **TABLES - PROTECTIVE COATING SPECIFICATIONS - SYSTEMS AND APPROVED PRODUCTS** in this worksection.

[If inorganic zinc silicates are required specify them here.]

## Contractor’s Responsibilities - WITNESS POINT

Applicators must be PCCP accredited in the category appropriate to the works.

**Witness point:** Provide documentary evidence of PCCP accreditation before commencing protective coatings work.

Provide all protective coating materials, abrasives, labour, supervision, equipment and materials required to complete all work as specified.

Submit:

* Written details of plant and equipment to be used for the work,
* Written details of experience in similar projects,
* ITPs (Inspection & Test Plans) detailing all procedures and test plans to be undertaken to complete the project.
* Details of Environmental Policy. Contractor must present details of procedures to protect the environment.
* Details of warranties outlining the responsibilities of the Coating Manufacturer and the Contractors period of warranty.

### Pre Job Meeting

Attend a pre job meeting with the Superintendent and the coating applicator, to review this specification and the coating contractors ITPs. Any variation proposed shall be discussed at this meeting. No variation shall be allowed unless agreed at this meeting and formally signed off.

### Standard Of Workmanship

Follow the protective coating manufacturer’s instructions pertaining to mixing, application, drying time etc. Produce a satisfactory end result acceptable to the superintendent.

Compliance with the protective coating manufacturer’s instructions shall not absolve the Contractor of responsibility to rectify unacceptable work. Perform all work in a safe and workmanlike manner.

All phases of the work shall be available for observation by a representative of the coatings manufacturer as well as by the Superintendent or their appointed Inspector.

Use personnel experienced in their particular field to carry out all work on surface preparation, protective coatings application and inspection.

The Superintendent may require the Contractor to produce proof of the tradesmen’s qualifications.

## Safety

Comply with Work Health and Safety (NUL) Act, Regulations, Codes of Practice, Policies and Procedures applicable to the works at all times during the execution of the works.

Abrasive blasting and protective coatings application must include safety precautions necessitated by the presence of air-hydrocarbon mixtures or other flammable materials.

### Thinners, Solvents And Coating Material Safety

All thinners, solvents, primers and coating materials shall be regarded as hazardous materials and their use and storage shall comply with AS 1940, the coating manufacturer’s recommendations and Dangerous Goods Regulations. All caution notices on the product containers and material labels shall be strictly observed.

The SDS for all chemicals, including paints and solvents, used and stored on site must be registered with the site manager prior to the product arriving on site.

A copy of the SDS and the applicable Emergency Procedure Guide (EPG) as per AS 1678 must accompany all chemicals during transport.

Keep SDS for all paints as reference.

## Traffic Management

Comply with the Traffic Management requirements in PROVISION FOR TRAFFIC.

Obtain a Permit to Work in a Road Reserve and comply with any conditions imposed in the Permit.

Provide a Traffic Management Plan that caters for vehicular traffic. Include provisions in the Traffic Management Plan for pedestrians, cyclists and water transport if pedestrians, cyclists or water craft might be affected by the works.

## Barriers

Install barriers and warning signs for fire hazards, dust, abrasive blasting operations, dangerous fumes and the like, during blasting and coating activities.

Protect adjacent areas and equipment from abrasive blasting grit, water, and detritus and overspray by the erection of screens, hoardings, or drop sheets.

Remove all materials used to mask areas requiring protection during blasting and painting operations upon completion.

## Equipment

Use equipment including, but not necessarily limited to, ladders, scaffold, compressors and electrical and pneumatic equipment conforming to the requirements in force by the appropriate statutory Acts, Regulations and By-laws. Maintain and use this equipment in strict accordance with any safety regulations or requirements pertaining to them.

Do not use ladders as work platforms.

All equipment including dust collectors, air compressors, lifting devices etc. shall conform to the relevant Standards for safety and performance.

Use air supply hoses and couplings of the anti-static type which are safety wired.

Note: Compliance to site safety instructions will be in addition to regulatory requirements.

### Personal Air Supply

Where personal breathing equipment is used, the operator’s hood or headgear shall be ventilated by clean, cool, oil free air served through a regulator filter. Air supply must be of respiratory quality.

### Equipment – Witness Point

Use compressors used for blasting, cleaning and spray painting which have oil and moisture separators with properly maintained filters in the airlines. Perform oil carry-over tests prior to the start of blasting and coating application and on a weekly basis thereafter. Record the results.

**Witness Point** – Give notice so that the oil carry-over tests may be witnessed by the Superintendent or their nominated representative.

## Environmental Conditions

Comply with coating manufacturers’ specifications, particularly with reference to ambient environmental conditions, such as temperature, relative humidity and substrate temperature, prevailing at the location where surface preparation and coating system application is to take place.

Provide copies of Environmental Test Reports to AS 3894, Parts 10, 11, and 12.

In addition provide Reports to AS 3894 Parts 13 and 14 for structural steel.

## Work in or near bodies of water

Consider the movements of the tide for work to be conducted on components located in tidal waters.

Consider variations to water depth for all work in or near bodies of water.

Refer to **Diving Work** and **Work Near Waters Where Crocodiles May Be Present** clauses in MISCELLANEOUS PROVISIONS.

## Surface Preparation

Remove all substrate surface defects including weld spatter, slag, burrs, fins, sharp edges and corrosion product.

Remove all surface contaminants such as oil, grease and dirt in accordance with AS 1627.1 using a suitable solvent, oil emulsifier, alkaline degreaser or other approved product.

Assess compatibility and substrate and inter-coat adhesion between the original and new coating systems during maintenance activities by coating a test patch and assessing compatibility and adhesion by ASTM D5064.

Plan and execute all works so as to minimize the possibility of pollution of the Site and adjoining areas from chemicals, dangerous goods and potential contaminants such as dust from abrasive blasting.

### Preparation Of Surfaces Prior To Blast Cleaning

Permanent welds shall be smooth and shall merge evenly with joining surfaces.

All edges, including drilled or punched holes shall be de-burred and rounded where practical to a minimum of 2mm radius.

### Abrasive Blasting – Hold Point

Abrasives shall conform to AS 1627.4 and shall be free from oil, grease, and moisture. The abrasive shall contain no more than 50 ppm soluble salts (TDS) and free from greater than 100 ppm lead.

Do not use silica sand and other potentially silica containing materials. Do not use zinc or copper slag.

Abrasive shall be capable of providing the specified profile.

Do not carry out abrasive blasting if:

* The relative humidity is above 85%.
* The metal temperature is less than 3ºC above the dew point.

Blow down blasted surfaces with clean, dry compressed air, or vacuum, or wipe free of dust and spent abrasive media, before any coatings are applied.

**Hold Point** - At the completion of the final blast and prior to coating application, the surface profile of each item shall be measured according to Method A, Profile Replicating Tape, of AS 3894.5. Provide documentary confirmation that the surface is suitable for the application of the specified coatings. This shall be identified as a Hold Point in the contractor’s ITP.

### Spot And Whip Abrasive Blasting

Use spot blasting of localised corrosion or coating breakdown to provide a profile suitable for the coating system being applied during maintenance coating activities.

Feather the perimeter of the spot blasted area over a 50mm width from where the original coating system is sound.

Whip blast the generally sound coating surface after spot blasting to provide an adequate key for the coating system being applied.

Where whip blasting is not possible, gloss on sound coating may be removed by power tool or hand sanding.

### Alternate Surface Preparation – Hold Point

**Hold Point** - Do not use forms of surface preparation other than abrasive blasting, such as bristle blaster, needle guns, power tool cleaning and hand tool cleaning, without written permission from the Superintendent. Alternate methods of surface preparation must be included in the Contractor’s ITP.

### Water Washing and Jetting

**Low pressure water washing**

Low pressure water washing operates at pressures up to 35 MPa (up to 5000 psi).

Used to remove loose millscale, rust, paint chalking and soluble salts.

**High pressure water washing**

For effective high pressure water washing 35 MPa to 70 MPa (5000 to 10,000 psi).

Used to remove light to moderate rust scale, concrete splashes, severe marine fouling and loose coatings.

**High pressure water jetting**

High pressure water jetting operates at 70 MPa to 210 MPa (10 000 to 30 000 psi).

Used to remove some rust, intact paints and contaminants.

**Ultra high pressure water jetting**

Ultra high pressure water jetting, equipment needs to operate above 210 MPa (30 000 psi).

Used to remove rust and coatings and to prepare steel to a cleanliness level close to near white metal.

**Alternate methods**

Alternate methods of surface preparation must be included in the Contractor’s ITP.

**Final rinse**

To avoid flash rusting use only demineralised water for the final rinse.

## Application Of Protective Coatings

### Atmospheric Conditions

The atmospheric conditions which prevail during the application of coatings shall be such that the surface being coated is completely free of moisture.

Do not apply coatings if:

* The ambient temperature is below 5ºC, unless otherwise permitted by the material supplier’s data sheet or
* The relative humidity is above 85% or
* The metal temperature is less than 3ºC above the dew point or
* The ambient temperature is above 35ºC, unless otherwise permitted by the material supplier’s data sheet or
* Any combination of the above.

Record the ambient conditions both before and at the completion of each day's coating and at three hourly intervals during coating. Submit this information with other daily records specified. Refer to Contractor Records in Inspection And Testing.

### Coating – Witness Point – Hold Point

**Witness Point** – Provide copies of specifications for application of protective coatings from the manufacturers of the products used. Provide copies of manufacturers’ product technical data sheets for all products used.

Have all coating materials delivered to the factory, workshop or site in the manufacturers’ original containers with the labels intact and seals unbroken.

All materials which have been stored for longer than the specified shelf life or exposed to conditions outside the permissible storage conditions shall be discarded and replaced.

Stored, mix, thin, apply and use all paints strictly in accordance with the coating manufacturers’ recommendations.

**Hold Point** - Provide coating manufacturers’ written approval for use before using any other additives (eg promoters, accelerators etc).

Do not mix or use coating materials which have livered, gelled or otherwise deteriorated.

Do not exceed the pot life of catalysed materials corresponding to the working temperature. When the pot life limit is reached, the spray pot shall be emptied, remaining material discarded, the equipment cleaned, material line shall be emptied and flushed out with nominated solvent/cleaner, and new material mixed and catalysed.

### Thinners

Use only thinners and dilutents from the same manufacturer as the specified coating for that coating. Use these only at the rate recommended by the coating manufacturer for the specific application.

### Stripe Coating

Stripe coat all metal with edges (100mm either side of the weld or edge), where practical, prior to applying the remainder of the protective coating.

Apply the stripe coating by brush or spray. Use the specified coating materials. Ensure the correct DFT for each coat is achieved.

### Multiple Coats

Where multiple coats of paint of the same type are specified, each successive coat of paint shall show, where possible, a distinguishable difference in colour to the one over which it is applied.

Comply with coating manufacturer's recommended recoating times for the ambient conditions and temperatures prevailing at the time of coating. If this cannot be achieved and the recoat period is exceeded submit a Non Conformance Report and Corrective Action Report.

### Alternate Coating – Hold Point

**Hold Point** - Do not use coating materials other than specified, without written permission from the Superintendent. Alternate coating materials must be included in the Contractor’s ITP.

### Coating Defects – Hold Point – Witness Point

Adhesion of coatings shall be sound throughout. All coatings shall be free of sagging, pinholes, dry overspray and other defects.

**Hold Point** – Provide details of repairs required and procedures and processes proposed for making the repairs to the Superintendent prior to making any repairs. Any requirements for the repair of protective coatings shall be identified as a Hold Point in the contractor's ITP.

Marking of defective areas shall be made using a marker compatible with the coating over which it is applied. Crayons and paint pens shall not be used.

**Witness Point -** This compatibility between marker and coating is to be confirmed by the coating manufacturer. Provide written evidence of this compatibility if requested by the Superintendent.

Sand, or whip blast, and recoat surfaces contaminated by embedded dust to the specified DFT using the full system selected. If the defects cannot be rectified through the above means, then the Contractor is required to submit a Non Conformance Report and a Corrective Action Report.

### Transit And Erection Damage And Field Weld Margins

Spot abrasive blast all coating damaged during transit and erection, including field weld margins, such that it is thoroughly cleaned. Restore the area according to the coating manufacturer's recommendations with a material compatible with, and providing at least the same performance as, the parent coating.

### Surfaces Not To Be Coated

Do not blast or coat the following surfaces and materials unless specifically directed by the Superintendent:

* Stainless Steel
* Other surfaces nominated by the Superintendent.

### Inspection And Testing

All work performed may be subject to inspection by the Superintendent or a nominated representative.

Ensure all necessary inspections are carried out.

## Quality Assurance And Traceability

The Superintendent will give preference to Protective Coating System manufacturers and applicators certified to AS/NZS ISO 9000 Series or equivalent, or holding approval from the Paint Contractors' Certification Program (Class 4).

## ITP, JSA And SWMs – Hold Point

**Hold Point** – Provide ITPs, JSAs, a SWMS and other quality control procedures and documents to be used during protective coating systems application. These must be approved prior to commencement of work.

## Contractor Records – Witness Point – hold point

Maintain written records of the work so that complete traceability of all work and materials provided under this Specification is maintained. Use the relevant sections of AS 3894.10, AS 3894.11 & AS 3894.12 QA report forms as a basis of this record keeping format for all protective coating work under this contract. Use AS 3894.13 and AS 3894.14, in addition to the preceding Australian Standards, for structural steel work coated under this contract.

**Witness Point** - Maintain these reports on a daily basis. Submit them to the Superintendent when requested, or, if not specifically requested, at least weekly.

**Hold Point** - Provide copies of all NCRs (Non Conformance Reports) immediately they are completed or received. The NCRs must detail the non-conformance and be accompanied by a Corrective Action Report (CAR) which is to detail the action proposed to be undertaken to rectify the non-conformance.

### Film Thickness – Hold Point – Witness Point

The film thickness is the minimum average dry film thickness, with an exception criteria as defined in AS 3894.3, including primer coats specified in the painting system.

**Hold Point** - Final acceptance of each increment of work will not be made until the dry film thickness meets or exceeds the specified thickness. Regardless of the number of coats specified, additional coats shall be applied as may be necessary to achieve the specified thickness, at the contractor's expense.

**Witness Point** - Provide and operate wet film and dry film thickness gauges of approved types to ensure the correct thickness of each coat and the full system is achieved. Provide details of the gauges proposed for use.

Use an electronic thickness gauge to determine the total dry film thickness on metallic substrates.

Calibrate the gauges in accordance with AS 3894.3 (dry film thickness) or AS/NZS 1580.108.1 (wet film thickness).

### Inspector – Hold Point

Appoint an inspector of coatings, qualified or certified under ACA, NACE, or ICorr, for inspection and testing of substrate preparation and protective coating systems applied under this contract.

**Hold Point** – Provide the name and qualifications of the inspector prior to commencement of work.

All work may be subject to inspection by the Superintendent. This shall not relieve the Contractor of their own Quality Assurance/Quality Control responsibilities.

## Handling Of Finish Coated Items

Handle with care all metalwork that has been coated to preserve the coating in the best practicable condition.

Do not handle coated metalwork until the coating has dried hard.

Use web slings or slings covered with a rubber hose or similar soft material for the handling of finish coated items.

Protect finish coated items with soft material such as cloth, carpet or rubber sheeting on areas of contact (eg. wooden supports and holding down chains or slings) during transport and storage.

Repair and make good any damage to finish coated items.

Items with any damage caused by insufficient care are to have the entire coating removed and be recoated in accordance with this specification at the Contractor’s expense.

## NOTES

Coating systems are to be compatible with level of surface preparation available or proposed.

Refer to NT CLIMATE ZONES TABLE.

## TABLES - PROTECTIVE COATING SPECIFICATIONS - SYSTEMS AND APPROVED PRODUCTS

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| **Table - Corrosivity Categories of Areas of the NT** | |
| **ARID REGIONS: Corrosivity Category C2 Low** | Areas south of, and including, Tennant Creek. (NTCZ01) |
| **INLAND REGIONS: Corrosivity Category C3 Medium** | Areas north of Tennant Creek and south of, and including, Katherine and areas more than 50 km  from the coast or tidal estuaries. (NTCZ02) |
| **COASTAL / TROPICAL: Corrosivity Category C5-M Very High and T (Inland Tropical)** | Areas north of Katherine and areas up to 50 km from the coast or tidal estuaries. (NTCZ03 & NTCZ04) |

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| **Table - Protective Coating Specification # PS1** | | | | | | | |
| **General** | | | | | | | |
| Coating Specification for Steel – Arid Regions Corrosivity Category C2 Low | | | | | | | |
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| **Areas** | | | | | | | |
| Coating system for Steel where Abrasive Blasting cannot be undertaken.  Typical Exposure: Atmospheric exposure for arid regions including areas of Alice Springs, Tennant Creek and all central Australian locations. Areas south of, and including, Tennant Creek. (NTCZ01) | | | | | | | |
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| **Surface Preparation** | | | | | | | |
| Surfaces to be clean, free of oil and grease and all contaminants and salts. All loose and flaking coating to be removed. All edges to be feathered back to a sound tightly adhered surface. All corrosion to be removed by power or hand tool cleaning to AS 1627.2 and AS 1627.9 Class St 3 standard. | | | | | | | |
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| **Protective Coating System as per AS 2312** | | | | | | | |
|  | **DFT in µm** | **Int’l Paints** | **Dulux** | **Jotun** | **PPG Industries** | **Hempel** | **Wattyl** |
| **1st Coat** | | | | | | | |
| Epoxy Mastic | 100-150 | Interplus 1180 | Durebild STE | Jotamastic 90 | Amerlock 400 | Hempadur Quattro 17634 | Epinamel DTM 985 |
| **Optional 2nd Coat** | | | | | | | |
| Finish Coat  Polyurethane | 75 | Interthane 990 | Weathermax HBR | Hardtop Flexi | Amershield | Hempathane HS 55610 | Poly U750 |
| **Total DFT in µm** | 175-225 |  |  |  |  |  |  |
| Notes:  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | |

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| **Table - Protective Coating Specification # PS2** | | | | | | | |
| **General** | | | | | | | |
| Coating Specification for Steel – Arid Regions Corrosivity Category C2 Low | | | | | | | |
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| **Areas** | | | | | | | |
| Coating system for Steel where Abrasive Blasting can be undertaken.  Typical Exposure: Atmospheric exposure for arid regions including areas of Alice Springs, Tennant Creek and all central Australian locations. Areas south of, and including, Tennant Creek. (NTCZ01) | | | | | | | |
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| **Surface Preparation** | | | | | | | |
| Surfaces to be clean, free of oil and grease and all contaminants and salts  Abrasive blast to AS 1627.4 & AS 1627.9 Sa 2½ , near white metal with angular surface profile 40 – 75 microns. | | | | | | | |
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| **Protective Coating System as per AS 2312** | | | | | | | |
|  | **DFT in µm** | **Int’l Paints** | **Dulux** | **Jotun** | **PPG Industries** | **Hempel** | **Wattyl** |
| **1st Coat** | | | | | | | |
| Zinc Rich Epoxy Primer | 75 | Interzinc 52 | Zincanode 402 | Barrier Plus | Sigmazinc 471 | Hempadur Zinc 17360 | Galvit EP100 |
| **2nd Coat** | | | | | | | |
| Finish Coat  Polyurethane | 75 | Interthane 990 | Weathermax HBR | Hardtop Flexi | Amershield | Hempathane HS 55610 | Poly U750 |
| **Total DFT in µm** | 150 |  |  |  |  |  |  |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | |

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| **Table - Protective Coating Specification # PS3** | | | | | | | |
| **General** | | | | | | | |
| Coating Specification for Steel – Inland Regions Corrosivity Category C3 Medium | | | | | | | |
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| **Areas** | | | | | | | |
| Coating system for Steel where Abrasive Blasting cannot be undertaken.  Typical Exposure: Atmospheric exposure for inland regions including Katherine and other inland regions. Areas north of Tennant Creek and south of, and including, Katherine and areas more than 50 km from the coast or tidal estuaries. (NTCZ02) | | | | | | | |
|  | | | | | | | |
| **Surface Preparation** | | | | | | | |
| Surfaces to be clean, free of oil and grease and all contaminants and salts. All loose and flaking coating to be removed. All edges to be feathered back to a sound tightly adhered surface. All corrosion to be removed by power or hand tool cleaning to AS 1627.2 and AS 1627.9 Class St 3 standard. | | | | | | | |
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| **Protective Coating System as per AS 2312** | | | | | | | |
|  | **DFT in µm** | **Int’l Paints** | **Dulux** | **Jotun** | **PPG Industries** | **Hempel** | **Wattyl** |
| **1st Coat** | | | | | | | |
| Epoxy Mastic | 75-100 | Interplus 356 | Durebild STE | Jotamastic 90 | Amerlock 400 | Hempadur Quattro 17364 | Epinamel DTS 680 |
| **2nd Coat** | | | | | | | |
| Intermediate  Epoxy Mastic | 75-100 | Interplus 356 | Durebild STE | Jotamastic 90 | Amerlock 400 | Hempadur Quattro 17364 | Epinamel DTS 680 |
| **Optional Top Coat** | | | | | | | |
| Finish Coat  Polyurethane | 75 | Interthane 990 | Weathermax HBR | Hardtop Flexi | Amershield | Hempathane HS 55610 | Poly U 750 |
| **Total DFT in µm** | 225-275 |  |  |  |  |  |  |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | |

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| **Table - Protective Coating Specification # PS4** | | | | | | | |
| **General** | | | | | | | |
| Coating Specification for Steel – Inland Regions Corrosivity Category C3 Medium | | | | | | | |
|  | | | | | | | |
| **Areas** | | | | | | | |
| Coating system for Steel where Abrasive Blasting can be undertaken.  Typical Exposure: Atmospheric exposure for inland regions including Katherine and other inland regions. Areas north of Tennant Creek and south of, and including, Katherine and areas more than 50 km from the coast or tidal estuaries. (NTCZ02) | | | | | | | |
|  | | | | | | | |
| **Surface Preparation** | | | | | | | |
| Surfaces to be clean, free of oil and grease and all contaminants and salts. Abrasive blast to AS 1627.4 & AS 1627.9 Sa 2½ , near white metal with angular surface profile 40 – 75 microns. | | | | | | | |
|  | | | | | | | |
| **Protective Coating System as per AS 2312** | | | | | | | |
|  | **DFT in µm** | **Int’l Paints** | **Dulux** | **Jotun** | **PPG Industries** | **Hempel** | **Wattyl** |
| **1st Coat** | | | | | | | |
| PRIMER  Zinc Rich Epoxy | 50-75 | Interzinc 52 | Zincanode 402 | Barrier Plus | Sigmazinc 471 | Hempadur Zinc 17360 | Epinamel PR360ZPS |
| **2nd Coat** | | | | | | | |
| Intermediate  High Build Epoxy | 100-150 | Interplus 1180 | Duremax GPE | Jotacote Universal | Amerlock 400 | Hempadur Quattro 17364 | Epinamel DTM 985 |
| **Optional Top Coat** | | | | | | | |
| Finish Coat  Polyurethane | 75 | Interthane 990 | Weathermax HBR | Hardtop Flexi | Amershield | Hempathane HS 55610 | Poly U750 |
| **Total DFT in µm** | 225-300 |  |  |  |  |  |  |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | |

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| **Table - Protective Coating Specification # PS5** | | | | | | | |
| **General** | | | | | | | |
| Coating Specification for Steel – Coastal Regions Corrosivity Category C5M Very High and T (Inland Tropical) | | | | | | | |
|  | | | | | | | |
| **Areas** | | | | | | | |
| Coating system for Steel where Abrasive Blasting cannot be undertaken.  Typical Exposure: Atmospheric exposure for coastal regions including Darwin and other coastal establishments. Areas north of Katherine and areas up to 50 km from the coast or tidal estuaries. (NTCZ03 & NTCZ04) | | | | | | | |
|  | | | | | | | |
| **Surface Preparation** | | | | | | | |
| Surfaces to be clean, free of oil and grease and all contaminants and salts. All loose and flaking coating to be removed. All edges to be feathered back to a sound tightly adhered surface. All corrosion to be removed by power or hand tool cleaning to AS 1627.2 and AS 1627.9 Class St 3 standard. | | | | | | | |
|  | | | | | | | |
| **Protective Coating System as per AS 2312** | | | | | | | |
|  | **DFT in µm** | **Int’l Paints** | **Dulux** | **Jotun** | **PPG Industries** | **Hempel** | **Wattyl** |
| **1st Coat** | | | | | | | |
| Epoxy Mastic MIO | 125-150 | Interplus 356 | Durebild STE MIO | Jotacote 605 MIO | Amerlock 400 MIO | Hempadur Mastic 45881 | Epinamel DTM 985 MIO |
| **2nd Coat** | | | | | | | |
| Intermediate  High Build Epoxy | 100-150 | Interplus 1180 | Duremax GPE | Jotacote Universal | Amerlock 400 | Hempadur Quattro 17364 | Epinamel DTM 985 |
| **Optional Top Coat** | | | | | | | |
| Finish Coat  Polyurethane | 75 | Interthane 990 | Weathermax HBR | Hardtop Flexi | Amershield | Hempathane HS 55610 | Poly U750 |
| **Total DFT in µm** | 325-375 |  |  |  |  |  |  |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | |

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| **Table - Protective Coating Specification # PS6** | | | | | | | |
| **General** | | | | | | | |
| Coating Specification for Steel – Coastal Regions Corrosivity Category C5M Very High and T (Inland Tropical) | | | | | | | |
|  | | | | | | | |
| **Areas** | | | | | | | |
| Coating system for Steel where Abrasive Blasting can be undertaken.  Typical Exposure: Atmospheric exposure for coastal regions including Darwin and other coastal establishments. Areas north of Katherine and areas up to 50 km from the coast or tidal estuaries. (NTCZ03 & NTCZ04) | | | | | | | |
|  | | | | | | | |
| **Surface Preparation** | | | | | | | |
| Surfaces to be clean, free of oil and grease and all contaminants and salts. Abrasive blast to AS 1627.4 & AS 1627.9 Sa 2½ , near white metal with angular surface profile 40 – 75 microns. | | | | | | | |
|  | | | | | | | |
| **Protective Coating System as per AS 2312** | | | | | | | |
|  | **DFT in µm** | **Int’l Paints** | **Dulux** | **Jotun** | **PPG Industries** | **Hempel** | **Wattyl** |
| **1st Coat** | | | | | | | |
| PRIMER  Zinc Rich Epoxy | 50-75 | Interzinc 52 | Zincanode 402 | Barrier Plus | Sigmazinc 471 | Hempadur Zinc 17360 | Galvit EP100 |
| **2nd Coat** | | | | | | | |
| Intermediate  High Build MIO Epoxy | 150-200 | Interplus 1180 | Duremax GPE MIO | Penguard Express MIO | Amerlock 400 MIO | Hempadur Mastic 45881 | Epinamel DTM 985 MIO |
| **Optional Top Coat** | | | | | | | |
| Finish Coat  Polyurethane | 75 | Interthane 990 | Weathermax HBR | Hardtop Flexi | Amershield | Hempathane HS 55610 | Poly U 750 |
| **Total DFT in µm** | 275-350 |  |  |  |  |  |  |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | |

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| **Table - Protective Coating Specification # PS7** | | | | | | | |
| **General** | | | | | | | |
| Existing Hot Dipped Galvanised Steel Subject to Severe - Atmospheric Exposure – New and Maintenance | | | | | | | |
|  | | | | | | | |
| **Areas** | | | | | | | |
| Coating system for galvanized steel. | | | | | | | |
|  | | | | | | | |
| **Surface Preparation** | | | | | | | |
| Surfaces to be clean, free of oil and grease, salts and all other contaminants.  Abrasive Sweep (brush) blast to AS 1627.4 Appendix ‘D’ to achieve an angular surface profile using garnet to 25-40 microns. Rust affected areas to be spot blasted to AS 1627.4 & AS 1627.9 Sa 2½ with an angular surface profile of 40-75 microns. | | | | | | | |
|  | | | | | | | |
| **Protective Coating System as per AS 2312** | | | | | | | |
|  | **DFT in µm** | **Int’l Paints** | **Dulux** | **Jotun** | **PPG Industries** | **Hempel** | **Wattyl** |
| **1st Coat** | | | | | | | |
| Primer  Zinc Phosphate Epoxy Primer | 50 - 75 | Intergard 251 | Durepon P14 | Pengard Special Grey | Sigmacover 280LT | Hempadur 15590 | Epinamel PR 250 |
| **2nd Coat** | | | | | | | |
| Finish Coat  High Build Epoxy | 300 - 350 | Interzone 505GF | Durebild STE GF | Jotamastic 87 GF | Sigmashield 825 LT (Amerlock 2K Glass Flake) | Hempadur Multi-Strength 45540 | Epinamel DTM 985 |
| **Total DFT**  **In µm** | 350 - 475 |  |  |  |  |  |  |
| Allowance should be made for the galvanizing approximately 85 microns. | | | | | | | |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | |

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| **Table - Protective Coating Specification # PS8** | | | | | | | | | | | | |
| **General** | | | | | | | | | | | | |
| Repair specification for wharf structures, steel piling, ship loading facilities, oil spill clean up equipment and plant piping operating at <40°C. | | | | | | | | | | | | |
|  | | | | | | | | | | | | |
| **Areas** | | | | | | | | | | | | |
| Marine environment : onshore and offshore | | | | | | | | | | | | |
|  | | | | | | | | | | | | |
| **Surface Preparation** | | | | | | | | | | | | |
| Abrasive blast clean to remove all previous coatings and corrosion products. Bevel all edges.  Surface shall be high pressure water blasted at a minimum pressure of 3,000 psi then tested to ensure free from soluble salts (see Clause 6).  Abrasive blast clean to AS 1627.4 Class 2½ Surface profile 30-60µm | | | | | | | | | | | | |
|  | | | | | | | | | | | | |
| **Protective Coating System as per AS 2312** | | | | | | | | | | | | |
| **Protective Coating – PS8.1 Steel with light to minimal pitting** | | | | | | | | | | | | |
|  | **DFT in µ** | **Int’l Paints** | **Dulux** | | **Jotun** | | **PPG** | | **Hempel** | | **Wattyl** | |
| **1st Coat** | | | | | | | | | | | | |
| High build  epoxy | 200-250 | Interzone  954 | Durebild STE Glass Flake | | Marathon 500 | | Sigmashield 880 | | Hempadur Quattro 17634 | | Epinamel  DTM 985 | |
| **2nd Coat** | | | | | | | | | | | | |
| High build  epoxy | 200-250 | Interzone  954 | Durebild STE Glass Flake | | Marathon 500 | | Sigmashield 880 | | Hempadur Quattro 17634 | | Epinamel  DTM 985 | |
| **Total DFT** | 400-500 |  |  | |  | |  | |  | |  | |
|  | | | | | | | | | | | | |
| **Protective Coating System as per AS 2312** | | | | | | | | | | | | |
| **Protective Coating – PS8.2 Heavily pitted steel** | | | | | | | | | | | | |
|  | **DFT in µ** | **Int’l Paints** | | **Dulux** | | **Jotun** | | **PPG** | | **Hempel** | | **Wattyl** |
| **1st Coat** | | | | | | | | | | | | |
| High build  epoxy | 450-500 | Interzone  954 | | Durebild STE Glass Flake | | Marathon 500 | | Sigmashield 880 | | Hempadur Quattro 17634 | | Epinamel  DTM 985 |
| **2nd Coat** | | | | | | | | | | | | |
| High build epoxy | 450-5000 | Interzone  954 | | Durebild STE Glass Flake | | Marathon 500 | | Sigmashield 880 | | Hempadur Quattro 17634 | | Epinamel  DTM 985 |
| **Total DFT** | 900-1000 |  | |  | |  | |  | |  | |  |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | | | | | | |

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| **Table - Protective Coating Specification # PS9** | | | | | | | |
| **General** | | | | | | | |
| Ultra high build epoxy for coating new piles, and other surfaces in underwater or splash zone environment. | | | | | | | |
|  | | | | | | | |
| **Areas** | | | | | | | |
| Underwater & splash zone | | | | | | | |
|  | | | | | | | |
| **Surface Preparation** | | | | | | | |
| Abrasive blast clean to remove all corrosion products and/or previous coatings. Bevel all edges.  Surface shall be high pressure water blasted at a minimum pressure of 3,000 psi then tested to ensure free from soluble salts (see Clause 6).  Abrasive blast clean to AS 1627.4 Class 2½ 75-100µm (angular profile) | | | | | | | |
|  | | | | | | | |
| **Protective Coating System as per AS 2312** | | | | | | | |
|  | **DFT in µ** | **Int’l Paints** | **Dulux** | **Jotun** | **PPG** | **Hempel** | **Wattyl** |
| **1st Coat** | | | | | | | |
| Primer Holding Primer (if required) | 30-50 | Interline  982 | Luxepoxy  66 | N/A | Sigmacover  280LT | Hempadur  15590 | Epinamel  PR 250 (thinned) |
| **2nd Coat** | | | | | | | |
| Ultra High Build Epoxy | 1000-1500 | Interzone  485 | Luxepoxy UHB | Jotacote UHB | Sigmashield 880 | Hempadur Multi Strength 45540 (2 coats of 500 um) | Epinamel  UHB 1000 |
| **Total DFT** | 1030 - 1550 |  |  |  |  |  |  |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | | | | | | | |

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| **Table - Protective Coating Specification # PS10** | |
| **General** | |
| Repair coating for cylindrical piling using petrolatum tape system, for use in very exposed sites and harsh environments. | |
|  | |
| **Areas** | |
| Very exposed sites and harsh environments. | |
|  | |
| **Surface Preparation** | |
| Remove all loose rust, original coating, marine growth etc, by scraping, chipping, water blast cleaning or ship’s hull scrubber.  Close examination, after preparation, to ensure thoroughly clean surface without growth, sharp or protruding edges. | |
|  | |
| **System** | |
| **Primer** | Denso Seashield Primer (or equal approved) |
| **Tape** | Denso Seashield Tape (or equal approved)  Overlap of 55% |
| **Outer Cover** | Denso Seashield 2000 FD Outer Cover (or equal approved)  Fixed with 316 stainless bolts |
| **Note:** Inspection points as per Denso Seashield published instructions. | |
| **Notes:**  Apply all coatings in strict accordance with the manufacturers’ technical data sheets.  Provide coatings manufacturers’ recommendations prior to commencing work.  The coating systems in these tables form part of, and should be read in conjunction with, the other clauses in this work section. | |