COATING SPECIFICATION

THERMOSTATICALLY APPLIED POLYESTER POWDER COATING

COATING SPECIFICATION: G1 ISSUE:3 DATE: OCTOBER 2023

1.0 SCOPE

This document summarises the procedure for the application of thermostatically applied Polyester powder coating to aluminium, mild steel or galvanised steel surfaces. Powder coating is currently used in few Water Corporation's assets, including aluminium electrical kiosks/cabinets and steel security fences.

Refer to Design Standard, DS 95 (Standard for the Selection, Preparation, Application, Inspection and Testing of Protective Coatings on Water Corporation Assets) for additional information or clarification.

For more information, references shall be made to the following Australian Standards:

- AS 3715 Metal Finishing - Thermoset powder coatings for architectural applications of aluminium and aluminium alloys.
- AS 4506 Metal Finishing – Thermoset powder coatings.
- AS 1627 Metal Finishing - Preparation and Pretreatment of Surfaces.

2.0 PURPOSE

The purpose of this Specification is to provide technical specification for application of powder coating on selected substrates, depending on exposure atmospheric conditions (i.e., C1 to C5). The atmospheric corrosivity categories are as described in AS 4312 and AS 2312.

3.0 DEFINITIONS

ACA means Australasian Corrosion Association.

Contractor means the service provider or its sub-contractor who will undertake the works.

Corporation means the Water Corporation and/or the Principal for the purposes of externally contracted asset delivery.

DFT means Dry Film Thickness.

ITP means the detailed Inspection and Test Plan(s) for the Works.

NACE means National Association of Corrosion Engineers.

Superintendent means the Superintendent for the contract, as defined in the conditions of the contract, who is appointed by the Corporation to manage/oversee the work under the contract on behalf of the Corporation.

Works means the surface preparation, coating application and inspection to be undertaken by the contractor to which this coating specification applies.

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4.0 GENERAL INFORMATION

4.1 All manufactured metal products should have all fabrication work completed prior to pre-treatment, i.e., all holes, slots, brackets and accessories should be in installed correctly and in place. Any additional installation after corrosion treatment is expected to compromise its corrosion protection performance, hence not permitted.

4.2 For electrical kiosks/cabinets, all external surfaces shall be coated and the coating terminated under the door sealing strip. The external surface of the door shall be coated and continued onto the internal surface of the door returning to terminate inside the door sealing strip.

5.0 SURFACE PREPARATION

5.1 All substrate surface preparation shall follow Table 1 and comply with the requirements of AS 3715 and AS 4506.

Table 1. Substrate Surface Preparation

Material	Surface Preparation
Aluminium	Carry out dipping of Multiple 7-stage submerged treatment using chemical Metal Etching and Chromate solution. The mill finished Aluminum is submerged in a first tank which contains chemical Metal Etching solution. (First Tank) It is then to be submerged in a clean water rinse tank or/and spray rinsed. (Second tank) It is then to be submerged in a clean water rinse tank or/and spray rinsed. (Third tank) It is then to be submerged in a tank that contains chromate solution. (Fourth tank) It is then to be rinsed in another clean water rinse tank and again spray rinsed. (Fifth tank) It is then to be second rinsed in another clean water rinse tank and again spray rinsed. (Sixth Tank) Last rinse with deionised water. (Seventh tank)
Mild Steel	Abrasive blast to Class 2.5 (provided the material is thick enough not to warp under the blasting forces).

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Galvanised steel	Whip blast the galvanised surface by hand sanding, to break up the gavalnaised surface. Care must be taken during the surface preparation to ensure minimal removal of the zinc coating from the metal. Refer to AS 4506 and AS 1627 for surface preparation requirements. Dip components in acid to remove HDG quenching fluid. Oven outgassing, with temperature 20% higher than the powder cure temperatures.

5.3 Coating shall not be applied to surfaces that have become contaminated or deteriorated after preparation. Coating application shall be carried out within 24 hours after surface preparation completed, or as per manufacturer's specifications.

6.0 COATING MATERIALS

6.1 Coating specifications inclusive of datasheets, coating application, method statements and ITP shall be submitted to the Principal for approval at least 10 working days prior to the commencement of the work.

6.2 Application, coating thickness and curing of powder coatings shall be carried out in accordance with the manufacturer's recommended practice for specific site conditions.

7.0 COATING THICKNESS

7.1 Application of coating materials shall be in accordance with the coating manufacturer's recommended specifications and practices. Typical coating thickness of two suggested coating brands are outlined in Table 2 below.

Table 2. Coating thickness

Material	**Atmospheric Categories**	**Brand**	**Coating system**	**DFT (µm)**
Aluminium*	C1 to C3	Interpon	**Two-coat system**	
			Meta Primer	60
			Topcoat DS2525	60 to 80
			Total DFT: 120 to 140	
		Dulux	E -Primer	80
			Topcoat	60 to120
			Total DFT: 140 -200	
	C4 & C5	Interpon	**Two-coat system**	
			Meta Primer	60
			Topcoat DS2525	60 to 80

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Material	Atmospheric Categories	Brand	Coating system	DFT (µm)
			Total DFT: 120 to 140	
		Dulux	**Two-coat system**	
			E-Primer	80
			Topcoat	60 to120
			Total DFT: 120 to 140	
Mild Steel	C1 to C3	Interpon	**Two-coat system**	
			Primer PZ790 Epoxy Zinc	120
			Topcoat D2525 Ultra Durable	75
			Total DFT: 195	
		Dulux	**Two-coat system**	
			Zinc Primer- Zinc Shield	80 to 110
			Topcoat- DURATEC	50 to 80
			Total DFT: 130 to 190	
	C4 & C5	Interpon	**Three–coat system**	
			Zinc primer - PZ790 Epoxy Polyester Zinc	120
			Primer Meta Prep Grey	80
			Topcoat - D2525 Super Durable Polyester	75
			Total DFT: 275	
		Dulux	**Three–coat system**	
			Zinc Primer Zinc Shield	80 to110
			E-Primer	60 to 120
			Topcoat DURATEC	60 to 120
			Total DFT: 200 to 350	
Galvanised (HDG)	C1 to C5	Interpon	**Two-coat system**	
			Primer Metaprep	70
			Topcoat - D2525	60
			Total DFT: 130	
		Dulux	**Two-coat system**	
			E -Primer	60 to 100
			Topcoat: DURATEC	60 to120
			Total DFT: 120 to 220	

*Note: For any Water Corporation Standard Outdoor aluminium switchboard enclosures and/or cubicles, the coating shall be DULUX “Armourspray® Gloss White AG” ref #91019143.

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8.0 COATING FINISH

8.1 The finished coating shall be of uniform thickness, colour, appearance and gloss. It shall be fully cured, insoluble, adherent, coherent and free from holidays, laps, sags, blistering, checking, wrinkling, overspray, patchiness and any other defects that may impair the performance and/or appearance of the coating.

9.0 COATING APPLICATOR/PERSONNEL QUALIFICATION

9.1 Work shall only be carried out by a competent and experienced person.

9.2 The contractor shall nominate a certified coating inspector to perform inspections and maintain appropriate records for the work performed. The coating Inspector engaged in testing, monitoring, and verification of surface preparation and coating application shall hold relevant inspection qualifications and current certifications (e.g., NACE or ACA) or be approved by the Principal. The coating inspector shall conduct the following:

- Prepare Quality Assurance documentation to meet the specified standards given herein and the required acceptance criteria.
- Perform inspections and maintain appropriate records for work performed.
- Testing, monitoring, and verification of surface preparation and coating application.

10.0 INSPECTION AND TESTING OF COATING

10.1 Coatings shall be visually examined for surface defects and any discontinuity arising after curing shall be recorded.

10.2 Finished coating thickness shall be determined using suitable instruments standardised (zeroed) on a smooth uncoated non-ferrous plate in accordance with AS 3894.

11.0 REPAIR OF A DEFECTIVE COATING AND RETESTING

11.1 Coatings with defective areas equal to 20% or more of the total coated surface will be rejected outright.

11.2 Defects such as pinholes, cracks, blisters, voids, foreign inclusions and irregular profile peaks shall be marked for repair and retested upon full cure of the repaired coating.

12.0 RECORDING AND REPORTING

12.1 Following testing a report shall be submitted by the Contractor. The Contractor shall keep detailed records and reports, which include:

- Surface preparation
- Coating application
- Coating testing
- General failure

12.2 Record batch numbers of all products used.

13.0 CONTRACTOR'S RESPONSIBILITY

13.1 The Contractor shall supply all necessary plant, equipment, materials and labour, prepare the surface and apply and maintain the protective coating in accordance with this specification.

13.2 The preceding inspection clauses shall not relieve the Contractor of their responsibility to supply materials and perform work in accordance with the requirements of any overriding contract documentation.

Document Revision History					
Sect	**Issue**	**Date**	**Revision Description**	**RVWD**	**APROV**
1	**3**	**6/10/2023**	**Amend scope**	**AO**	**SS**
2	**3**	**6/10/2023**	**Amend purpose**	**AO**	**SS**
5	**3**	**6/10/2023**	**Amend surface preparation**	**AO**	**SS**
7	**3**	**6/10/2023**	**Amend coating thickness**	**AO**	**SS**
8	**3**	**6/10/2023**	**Amend coating finish**	**AO**	**SS**
9	**3**	**6/10/2023**	**Amend coating applicator/personnel qualification**	**AO**	**SS**

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