

COATING SPECIFICATION

THERMAL BONDED POLYMERIC COATINGS ON STEEL AND CAST IRON VALVES AND FITTINGS

COATING SPECIFICATION: G2

ISSUE: 4

DATE: SEPTEMBER 2023

1.0 SCOPE

This document summarises the procedure for the application of a factory applied Thermal Bonded Polymer coating also known as Fusion Bonded Epoxy (FBE) to Steel or Cast Iron Valves and Fittings in accordance with AS 4158.

Refer 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.

It shall be read in conjunction with Water Corporation surface preparation specification **A1 - Surface Preparation for the application of Protective Coatings on Steel or Cast Iron.**

2.0 PURPOSE

FBE coating is widely used for valves, pipe elbows, joints etc. in potable water and wastewater applications. For potable water applications the coating shall also have AS 4020 (Testing of products for use in contact with drinking water) approval. This specification can be used for atmospheric corrosivity categories C1 to C5 as described in AS 2312.

3.0 DEFINITIONS

ACA: Australasian Corrosion Association.

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

Corporation: The Water Corporation and the Principal for the purposes of externally contracted asset delivery.

DFT: Dry Film Thickness.

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

NACE: National Association of Corrosion Engineers.

Spark Testing: Testing of the continuity of a fully-cured coating film for evidence of defects, pin holes, holidays (misses) or damage.

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

TDFT: Total Dry Film Thickness.

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

4.0 SURFACE PREPARATION

- 4.1 Blast cleaning of the surfaces shall be carried out to produce a uniform metallic appearance, a surface profile which provides satisfactory anchorage for the coating, as per paint manufacturer's recommendation and be otherwise compatible with the coating to be applied.

5.0 COATING MATERIALS

- 5.1 Coating specifications inclusive of datasheets, coating application, method statements and ITP's shall be submitted to the Principal for approval at least 10 working days prior to commencement of the work.
- 5.2 Application and curing of protective coatings shall be carried out in accordance with the coating manufacturer's recommended practice for the on-site conditions.

6.0 ATMOSPHERIC CONDITIONS

- 6.1 Prior to and during coating application, the contractor shall record details pertaining to environmental conditions including ambient and surface temperature, relative humidity and dew point.

7.0 COATING APPLICATION

- 7.1 After the casting has been heated to the coating manufacturers recommended temperature, the coating powder is applied directly to the casting surface by either automatic dipping of the component or hand spraying.
- 7.2 The coated components are allowed to cool, baking the coating on the substrate to produce a hard, tough coating surface.

8.0 COATING THICKNESS

- 8.1 The minimum coating thicknesses for the thermoset coating on the internal surface (in contact with water) is 350 microns and external surface is 300 microns in accordance with AS4158 Appendix D - Table D1.
- 8.2 The minimum coating thicknesses for the thermoplastic coating on the internal surface (in contact with water) is 250 microns and external surface is 200 microns in accordance with AS4158 Appendix D - Table D1.

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9.0 COATING FINISH

9.1 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.

10.0 COATING APPLICATOR/PERSONNEL QUALIFICATION

10.1 Work shall only be carried out by a competent person.

10.2 The work shall be undertaken by an approved Water Corporation Protective Coating and Concrete Repair Services panel member unless approved otherwise by the Principal.

10.3 The contractor shall nominate a certified coating inspector to perform inspections and maintain appropriate records for the work performed. 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 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.

11.0 INSPECTION AND TESTING OF COATING

11.1 **Visual Testing** - Coatings shall be visually examined for surface defects and any discontinuity arising after curing shall be recorded.

11.2 **Spark Testing** - The finished, fully cured coating subjected to buried or immersed conditions shall be holiday tested in accordance with AS 4158 Table 3.3, and there must be no holidays detected.

11.3 **Adhesion Testing** - Adhesion testing is only required on the Valves. Testing shall be carried out in accordance with AS 4158 Section 3.0.

11.3.1 The results of all adhesion tests shall be submitted to the Superintendent as part of the overall quality control documentation.

11.3.2 Finished coating thickness shall be determined using suitable instruments standardised (zeroed) on a smooth uncoated metal plate in accordance with AS 3894.3.

12.0 REPAIR OF A DEFECTIVE COATING AND RETESTING

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- 12.1 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.
- 12.2 Defective coatings shall be repaired with limitations in accordance with Table 3.3 of AS 4158. If repair is outside the allowable limitations, the applied coating must be removed re-applied.

13.0 RECORDING AND REPORTING

- 13.1 Following testing a report shall be submitted by the Contractor. The Contractor shall keep detailed records and reports including the following:
 - Environmental conditions (relative humidity, dew point etc.);
 - Surface preparation;
 - Surface profile;
 - Coating application;
 - Coating testing; and
 - General failure.
- 13.2 To supplement these records, prior to any works commencing, an Inspection Test Plan (ITP) shall be forwarded to the Water Corporation for review a minimum of 10 working days prior to the commencement of work.

14.0 CONTRACTOR'S RESPONSIBILITY

- 14.1 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.
- 14.2 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
5	4	28/09/2023	Amend coating materials	AO	SS
10	4	28/09/2023	Amend coating applicator/personnel qualification	AO	SS

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