SA Water

SOUTH AUSTRALIAN WATER CORPORATION

TS 98

TECHNICAL STANDARD

SURFACE PREPARATION AND PROTECTION OF CAST IRON USING POTABLE WATER APPROVED CERAMIC FILLED SOLVENTLESS HIGH BUILD EPOXY

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Government of South Australia

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Approval may be granted by the Asset Owner to deviate from the requirements as stipulated in this Standard if the functional requirements (e.g. Asset Life) for the asset differs from those stated in the Standard, but is assessed as still being acceptable by the Asset Owner's nominated representative.

Any approval to deviate from the stated requirements of this Standard will not be seen as creating a precedent for future like project. Any request to deviate from this Standard must be carried out on a project by project basis where each alternate proposal will be individually assessed on its own merit.

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REFERENCED DOCUMENTS

AS 1627: Metal finishing - Preparation and pretreatment of surfaces

AS 3894: Site testing of protective coatings

AS/NZS4020: Products for use in contact with drinking water

SECTION 1: SCOPE

This Technical Standard (TS) details the surface preparation, application and repair of ceramic high build solventless epoxy coating systems used for protection of cast iron and ductile cast iron pump bodies exposed to potable water.

This Technical Standard shall be read in conjunction with the Manufacturer's Specifications and Technical Bulletins and the products shall be applied in accordance with the Manufacturer's instructions where details are not included in this standard.

SECTION 2: COATING CONTRACTOR AND QUALITY ASSURANCE

The Contractor shall submit, to SA Water's Representative, documentation in accordance with their Quality Assurance Plan. However the minimum requirement for Quality Assurance shall be completion of AS 3894.10, AS 3894.11 and AS 3894.12, "Site testing of protective coatings" equipment and inspection reports. All quality control records shall be available for inspection by SA Water's Representative and the authorised coating inspector.

2.1 SA Water's Representative

SA Water's Representative for this Technical Standard will be nominated by the SA Water Project manager and may be the authorised Coating Inspector.

SECTION 3: INSTRUCTIONS ON SUPPLY OF MATERIALS

All products shall comply with AS/NZS 4020 "Products for use in contact with drinking water."

Products shall contain ceramic or alternative highly abrasion resistant fillers to produce a coating with a high level of abrasion and erosion resistance. Systems containing products offered in two different colours are preferred.

All products shall be approved by the Project Manager or SA Water's Representative prior to application of the coating system.

SECTION 4: SAFETY AND ENVIRONMENT

The Contractor shall conduct the operations (including blast cleaning and coating applications) in accordance with the standards of safety laid down in the *South Australian Occupational Health, Safety & Welfare Act* and all regulations there under.

All operations shall be conducted in accordance with the *Environmental Protection Act*.

All operations conducted outside the state of South Australia shall meet all local safety and environmental requirements.

SECTION 5: SURFACE PREPARATION

5.1 General

The coating contractor shall ensure that sharp edges and corners are ground off to a radius not less than 1.5 mm and that all irregularities that may affect pump or coating performance are removed.

The coating Contractor shall inspect the surfaces to be coated before commencing coating application. If the coating Contractor considers that there are any imperfections that may render the coating unsatisfactory, the Contractor shall notify the coating inspector. Commencement of work on the coating shall indicate unconditional acceptance of the surface to be coated.

All surfaces shall be free from mill scale, rust, oil, grease, soil, moisture and any other matter likely to impair the adhesion of the coating.

5.2 Removal of Oil and Grease

Oil and grease shall be removed from all surfaces to be coated using an alkali degreasing process or solvent washing in accordance with AS 1627.1 “Part 1: Cleaning using liquid solvent and alkaline solutions”.

5.3 Abrasive Blast Cleaning

All surfaces to be coated shall be dry abrasive blast cleaned to class Sa 3 finish in accordance with AS 1627.4 “Part 4: Abrasive Blast Cleaning”. The surface profile shall be a medium profile grade with profile height between 45 and 70 microns in accordance with Table A of AS 3894.5 “Method 5: Determination of surface profiles" and shall be determined in accordance with this standard. Abrasive materials used shall be in accordance with AS 1627.4, be free from contamination, contain less than 100 milligrams per kilogram sodium chloride and contain less than 30 milligrams per kilogram copper.

All work shall be coated on the same day as it is cleaned and while the surface remains Class Sa3 finish. Coatings shall not be applied if the steel temperature is less than 3°C above dew point.

The Contractor shall not apply the coating until the surface preparation has been inspected and approved by the authorised coating inspector.

SECTION 6: APPLICATION OF COATING

6.1 Material

Coating materials shall be mixed and applied in accordance with manufacturer's written instructions. Proportioning and mixing of part cans is not permitted. Strict attention shall be paid to the shelf life and onsite storage conditions, which must meet the manufacturer's recommendations.

6.2 Application

The surface temperature of the steel to be painted shall be at least 3°C above dew point. Coating shall not be applied to any surface which will have a temperature less than 10°C or more than 55°C during the cure period. The mixed material must remain between 13°C and 32°C during application.

The first coat shall be applied as soon as the authorised coating inspector has approved the surface preparation. Application of subsequent coats shall not exceed the recoat times indicated on the manufactures technical data sheet. If the coating has been allowed to cure beyond the recommended limits the area shall be whip blasted with fine silica free grit before the application of subsequent coats.

Application shall be in accordance with the manufacturer's technical data sheet. Thinning of coatings will not be permitted.

The finish shall be generally smooth and free from protuberances.

6.3 Thickness and Continuity

The minimum dry paint film thickness shall be 500 microns applied in two or more coats.

The dry film thickness shall be measured in accordance with AS 3894.3 "Method 3: Determination of dry film thickness" or as approved by the authorised coating inspector.

High voltage continuity testing shall be conducted in accordance with AS3894.1 "Method 1: Non-conductive coatings - Continuity testing - High voltage ('brush') method." The maximum test voltage shall be as specified by the coating manufacturer.

SECTION 7: INSPECTION

7.1 General

The work shall be monitored and inspected by an Australasian Corrosion Association or NACE (National Association of Corrosion Engineers) Accredited Coating Inspector engaged by SA Water. To allow for inspection, 48 hours notice shall be given to the coating inspector prior to commencement of any surface preparation or application of coating.

7.2 Before Coating

The Contractor shall not apply any coating until the surface preparation has been inspected and approved by the authorised coating inspector. The inspector may, at his/her discretion, perform any tests relating to surface preparation or contamination. If testing is required, the test areas shall be prepared again in accordance with Clause 5.3 after the testing is complete.

7.3 After Completion of Coating

The coating will be inspected by the authorised coating inspector as soon as practicable after completion to ensure compliance with the specification.

Areas that have been inadequately or unsatisfactorily coated shall be treated in accordance with Section 5 and 6 or Section 8 as directed by, and to the satisfaction of the coating inspector.

SECTION 8: REINSTATEMENT OF CURED COATING

Damaged and defective areas shall be abraded by dry abrasive blast cleaning, power disk sanding till bright steel is exposed or as approved by the authorised coating inspector. Edges of the coating shall be feathered back by the same means for approximately 20 millimetres. Coating shall be re-applied in accordance with Section 6; however no coating shall extend beyond the edge of the prepared area.