

TECHNICAL STANDARD**SURFACE PREPARATION AND PROTECTION
OF STEELWORK USING MINERAL FLAKE
FILLED EPOXY HIGH BUILD, 2-PACK**

Issued by: Manager Engineering

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APPROVAL TO DEVIATE FROM THIS STANDARD

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.

NO CHANGES REQUIRED IN THE JANUARY 2007 EDITION

The following lists the major changes to the May 2000 edition and published in the September 2004 edition of TS 84:

1. Reformatted from DS to TS (Departmental Standard to Technical Standard), and updated referenced Australian Standards.
2. Conversion to a technical standard by removal of contractual conditions (to be included in the contract that references this standard).
3. August 2004-Complete review of document resulted in a number of minor changes. No significant change was made to the overall content.

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REFERENCED DOCUMENTS

AS 1627:	Metal finishing - Preparation and pretreatment of surfaces
AS 3894:	Site testing of protective coatings
APAS Document D - 184:	Guidelines to Specification, Supply and Quality Assurance (www.apas.gov.au)

SECTION 1: SCOPE

This Technical Standard (TS) details the surface preparation, application and repair of:-

- Jotun Jotacote 910 MIO (Natural Steel Grey) epoxy high build, 2-pack coating system used primarily for protection of steelwork exposed to a combination of water and atmospheric conditions ie steelwork for river structures.
- Jotun Marathon (white) glass flake reinforced epoxy high build, 2-pack coating system used primarily for the protection of steelwork exposed to water and sewage or where very high abrasion resistance is required.

This 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 written instructions where details are not included in this standard.

SECTION 2: COATING CONTRACTOR AND QUALITY ASSURANCE

The Contractor shall be certified under the 'Painting Contractor Certification Program' for the appropriate class of work or an approved equivalent. 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.

2.1 SA Water's Representative

SA Water's Representative in this Technical Standard will be nominated by SA Water.

SECTION 3: INSTRUCTIONS ON SUPPLY OF MATERIALS

An Australian Paint Approvals Scheme (APAS) 'APAS Record of Supply' shall be obtained when the product is purchased. The purchaser shall request an 'APAS Record of Supply' from the manufacturer at the time paint is ordered.

A 'Certificate of Test' can then be obtained if problems in the application of the coating subsequently occur. Information and procedures concerning Records of Supply and Certificate of Test are set out in APAS Document D-184 'Guidelines on Specification, Supply and Quality Assurance' (www.apas.gov.au).

Returns as required by APAS Document D-184 instructions shall be completed by the manufacturer and submitted to SA Water's Representative by the Contractor for forwarding to the Material Sciences Unit.

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. Contractors are responsible for obtaining all necessary approvals and disposal of all waste.

SECTION 5: SURFACE PREPARATION

5.1 General

The fabricator shall ensure that all joints are fully welded and sealed, that sharp edges and corners are ground off to a radius not less than 2 mm and that all weld spatter and irregularities are removed.

The coating Contractor shall inspect the surfaces to be coated before commencing coating application. If the Contractor considers that there are any imperfections which may render the coating unsatisfactory the Contractor shall notify SA Water's Representative. 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, weld-spatter, 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 steelwork using an alkali degreasing process or solvent washing as approved by SA Water's Representative and 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 and shall be determined in accordance with AS 3894.5 "Method 5: Determination of surface profiles". 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 grams per kilogram of copper.

All surfaces may be initially wet blasted or ultra high pressure water blasted followed with final dry blasting after all moisture has dissipated. Water used during the cleaning process shall be potable and shall not contain more than 500 mg/litre of total dissolved salts.

All work shall be coated on the same day as it is cleaned and while the surface remains class Sa 3 finish. Coatings shall not be applied if the steel temperature is less than 3°C above dew point. Use of dehumidification or other equipment that alter the atmospheric conditions, particularly in enclosed tanks, may be acceptable to SA Water's Representative.

The Contractor shall not apply the coating until the surface preparation has been inspected and approved by SA Water's Representative. If rust-producing salts, chlorides or any other surface contamination judged to be detrimental to coating performance are detected, surfaces shall be further prepared to remove all such contamination to the satisfaction of SA Water's Representative. Testing for such contamination shall be conducted in accordance with AS/NZS 3894.6 "Determination of residual contaminants". The maximum permissible level of chloride is 21 milligrams per square metre (which equates to 3.5 micrograms per square centimetre of sodium chloride.)

SECTION 6: APPLICATION OF COATING

6.1 Material

SA Water's Representative will specify which coating is to be used. Jotun Jotacote 910 MIO in Natural Steel Grey or Jotun Marathon in White (unless specified otherwise) shall be used. Coating materials shall be mixed and applied in accordance with the manufacturer's written instructions. Proportioning and mixing of part cans is not permitted without the approval of SA Water's Representative. Strict attention shall be paid to the shelf life and onsite storage conditions, which shall meet the manufacturers 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 45°C during the cure period.

The first coat shall be applied as soon as the surface preparation has been approved by SA Water's Representative. Application of subsequent coats shall not exceed the recoat times indicated on the manufacturer's technical data sheet. If the coating has been allowed to cure beyond the recommended limits the area shall be whip blasted with a fine silica free abrasive before the application of subsequent coats.

A stripe coat shall be applied by brush to all welds and edges. Application shall be by airless spray. Thinning of the product, if required, up to a maximum of 15% may be permitted and only Jotun Thinner No. 17 shall be used for this purpose. Under special circumstances SA Water's Representative may approve application by conventional spray for small structures or where airless spray is not suitable. SA Water's Representative may also approve brush and roller application for small areas.

The finish shall be generally smooth and free from protuberances.

6.3 Thickness and Continuity

The minimum dry paint film thickness shall be:-

- 400 microns for Jotacote 910 MIO applied in two or three coats of equal thickness or
- 500 microns for Marathon applied in two coats of equal thickness.

The dry film thickness shall be measured in accordance with AS 3894.3 "Method 3: Determination of Dry Film Thickness" or as approved by SA Water's Representative.

High voltage continuity testing shall be conducted in accordance with AS 3894.1 "Method 1: Non-conductive coatings - Continuity Testing - High Voltage (brush) method".

SECTION 7: INSPECTION

7.1 General

The work shall be monitored and inspected by an Australasian Corrosion Association Accredited Coating Inspector who will be engaged by the South Australian Water Corporation. SA Water's Representative for surface preparation and coating would usually be the Coating Inspector. To allow for inspection, 48 hours notice shall be given to SA Water's Representative prior to commencement of any surface preparation or application of coating. Subsequently SA Water's Representative shall be kept informed with at least 48 hours notice of future work schedules for surface preparation and painting.

Inspectors will not be available outside of normal accepted industry working hours, unless specifically agreed to by the inspector.

7.2 Before Coating

The Contractor shall not apply any coating until the surface preparation has been inspected and approved by SA Water's Representative. SA Water's Representative may, at his/her discretion, perform any tests relating to surface preparation or contamination. If testing is required, the testing 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 SA Water's Representative as soon as practicable after completion to ensure compliance with the specification.

Areas which have been inadequately or unsatisfactorily coated shall be treated in accordance with Section 5 and 6 as directed by, and to the satisfaction of SA Water's Representative.

7.4 Re-Inspection

Should surface preparation or applied coating prove to be unsatisfactory in the view of SA Water's Representative and require rework and subsequent inspection, the cost of such inspection will be charged to the Contractor and such costs will be deducted from the contract price.

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 SA Water's Representative. 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.