

TECHNICAL STANDARD**SURFACE PREPARATION AND PROTECTION
OF STEELWORK USING AN
INORGANIC ZINC SILICATE COATING**

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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 SEPTEMBER 2004 EDITION

The following lists the major changes to the March 2004 edition and published in the September 2004 edition of TS 12:

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).

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REFERENCED DOCUMENTS

AS 1627:	Metal finishing - Preparation and pretreatment of surfaces
AS/NZS 3750:	Paints for steel structures
AS 3894:	Site testing of protective coatings
APAS Document D - 184:	Guidelines to Specification, Supply and Quality Assurance (www.apas.gov.au) APAS 2908A

SECTION 1: SCOPE

This Technical Standard (TS) details the surface preparation, application and repair of inorganic zinc silicate used for the protection of steelwork, including above ground pipework. This standard shall be read in conjunction with the Manufacturer's Specifications and technical bulletins. The products shall be applied in accordance with the Manufacturer's written instructions where details are not included in this standard.

SECTION 2: CONTRACT 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 'Manufacturer's 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 to 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 1.5 mm and that all weld spatter and irregularities are removed.

The coating applicator shall, before commencing surface preparation, inspect the surfaces to be coated and, if the Contractor considers that there are any imperfections that 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 solvents or alkaline solutions".

5.3 Abrasive Blast Cleaning

5.3.1 Surface Preparation

All surfaces to be coated shall be wet or 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 fine profile grade with maximum profile height of 44 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.

5.3.2 Abrasive Materials

Abrasive materials used shall be in accordance with AS 1627.4, be free from contamination and contain less than 100 ppm chlorides and contain less than 0.3% copper.

5.3.3 Cleaning solutions

Water used during the cleaning process shall be potable and shall not contain more than 500 mg/litre of total dissolved solids.

If wet abrasive blast cleaning is used soluble polyphosphate corrosion inhibitor approved by the coating manufacturer shall be added to the water. The inhibitor shall be added in accordance with the manufacturer's written instructions using accurate dosing equipment and in the minimum concentration which prevents rusting. Toxic inhibitors such as chromate, nitrate and nitrite shall not be used (OHS&W Regulation).

5.3.4 Coating

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.

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 by SA Water's Representative 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 performed in accordance with AS 3894.6 "Part 6: Determination of residual contaminants". The maximum permissible level of chlorides shall be 50 milligrams per square metre. This equates to 8.3 micrograms per square centimetre of sodium chloride. (Refer to Clause 7.2)

SECTION 6: APPLICATION OF COATING

6.1 Material

This product shall comply to AS/NZS 3750.15 Type 3 or 6 (waterborne) and be approved by the Australian Paint Approvals Scheme in accordance with APAS 2908A. AS/NZS 3750.15 "Part 15: Inorganic zinc silicate paint" - Type 4 (solvent based) approved in accordance with APAS 2908A may be used only as a prime coat as part of a coating system (ie: with epoxy topcoat). Products shall be approved by SA Water's Representative after reference to the Materials Sciences Unit.

Application shall be by spray. Under special circumstances SA Water's Representative may approve brush application for small areas.

Coating materials shall be mixed and applied in accordance with 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.

Coating material shall be thoroughly agitated during spraying using a compressed air driven agitator.

The finish shall be generally smooth and free from protuberances and dry spray.

6.2 Thickness

The dry paint film thickness shall not be less than 100 micrometres. However, when the inorganic zinc silicate is the primer in a coating system (ie it is overcoated) the dry paint film thickness shall not be less than 75 microns. Excessive film thickness resulting in mud cracking shall be removed and reapplied.

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. Calibration of instruments shall take account of surface profile height and shall be adjusted in accordance with this test method.

6.3 Application Conditions

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 with a temperature less than 10°C during the cure period. Type 4 (solvent based) shall not be applied if the relative humidity is less than 50% or is likely to fall below 50% during curing. Actual product curing profile should be obtained from supplier prior to application.

Coating shall be applied as soon as the surface preparation has been approved by SA Water's Representative.

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 SA Water. For surface preparation and coating, SA Water's Representative 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 cleaning or application of coating. Subsequently SA Water's Representative shall be kept informed with at least 48 hours notice of future work schedules for cleaning and painting.

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 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 SA Water's Representative as soon as practicable after completion for compliance with the specification.

Areas which have been inadequately or unsatisfactorily coated shall be treated in accordance with Clause 6 or Clause 8 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 mud-cracked areas shall be abraded by blast cleaning or as approved by SA Water's Representative. Coating shall be reapplied in accordance with Clause 6.