TS 03358:1.0

Specification

Supply of Paint for Steelwork

(ATS 5451, Ed 1.0 MOD)

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1.0	25/06/2024	First issue

Preface

This document is the first issue as TS 03358, which adopts and modifies Austroads Technical Specification ATS 5451. It sets out the requirements for the supply of paints for the protective coating of steel bridges and other steel structures.

For the purposes of this document, where TfNSW has identically adopted, or adopted and modified, an ATS document as a Transport Standard, the corresponding Transport Standard should be applied.

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1. Scope

1.1 This Specification sets out the requirements for the supply of paints for the protective coating of steel bridges and other steel structures.

2. Referenced documents

2.1 The following documents are referenced in this Specification:

Australian / New Zealand Standards

AS 1580	Paints and related materials – Methods of test
AS 2700	Colour standards for general purposes
AS 2855	Paints and related materials – Micaceous iron oxide pigment
AS/NZS 3750	Paints for steel structures
AS/NZS 3750.1	Epoxy mastic (two-pack) – For rusted steel
AS/NZS 3750.2	Ultra high-build paint
AS/NZS 3750.6	Full gloss polyurethane (two-pack)
AS/NZS 3750.9	Organic zinc-rich primer
AS/NZS 3750.13	Epoxy primer (two-pack)
AS/NZS 3750.14	High-build epoxy (two-pack)
AS/NZS 3750.15	Inorganic zinc silicate paint
AS 3750.18	Moisture cure urethane (single-pack) systems
AS/NZS ISO 9001	Quality management systems – Requirements

Australian Paint Approval Scheme (APAS)

APAS AP-S0156	Epoxy Mastic High Build Two-pack Coating for Rusted Steel
APAS AP-S2908	Inorganic zinc silicate coating for the long-term protection of steel
APAS AP-S2911	Polyurethane coating or the protection of steel in atmosphere
APAS AP-S2916	Organic zinc rich coating for protection of steel
APAS AP-S2920	Siloxane and polysiloxane coatings for the long-term protection of steel
APAS AP-S2930	Single pack moisture cure urethane coating for the long-term protection of steel
APAS AP-S2971	Durable two-pack epoxy primer for the long-term protection of steel
APAS AP-S2973	Durable two-pack epoxy primer for the long-term protection of steel
APAS AP-S2974	Medium build solventless two-pack epoxy coating for the long-term protection of steel
APAS AP-S2975	Ultra high build two-pack epoxy coating for the long-term protection of steel in atmosphere
APAS AP-S2977	Slow drying / high volume solids two-pack epoxy mastic coating for the long-term protection of steel

International / European Standards

ISO 8501-1	Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.

TfNSW Standards

TS 01746	Protection of Steelwork by the Use of Paint Coatings (ATS 5450, Ed 1 MOD)

3. Definitions

3.1 The following definitions apply to this Specification:

DFT:	Dry film thickness
MIO:	Micaceous iron oxide

4. Quality System Requirements

4.1 The paint must be manufactured and supplied under a Quality Management System complying with AS/NZS ISO 9001 as a means of ensuring that the product conforms to this Specification.

5. Approval of the Paint

5.1 The paint must be approved under the Australian Paint Approval Scheme (APAS).

5.2 The Contractor may submit a proposal to the Principal to use a paint which has not been approved under APAS, provided that the paint is manufactured by an APAS Recognised Manufacturing Unit. The Principal is under no obligation to accept any such proposal.

5.3 The following information must be submitted to the Principal at least 10 working days prior to placing orders for supply of the paint:

a. Name of the manufacturer, and a copy of the current certificate of APAS Registration;

b. Whether the paints are approved to the appropriate APAS Specification for colours other than those specified;

c. Status of any current application for APAS approval of the paint;

d. Details of any previous use of the paint on contracts for Australian and / or New Zealand road agencies;

e. Case histories supplied by the manufacturer; and

f. Evidence that the paint has been manufactured and supplied under a Quality Management System complying with AS/NZS ISO 9001.

HOLD POINT 1	
Process Held	Placing an order for supply of the paint.
Submission Details	The above information must be submitted to the Principal at least 10 working days prior to placing an order for the paint.

5.4 Paint which has not been approved under either Clause 5.1 or Clause 5.2 must not be used.

5.5 If the Principal has a paint approval / registration scheme in place, the paint must also be approved or registered under that scheme.

6. Requirements for Each Paint Type

6.1 Each paint type must comply with the requirements specified in the relevant table included in this Clause 6.

Table 6.1: Inorganic zinc silicate paint

Specification:	A two-pack, moisture cured, zinc-rich silicate primer meeting the requirements of AS/NZS 3750.15 Type 3 or Type 4 or Type 6 and approved to APAS Specification AP-S2908. Pre-disperse the zinc component.
Colour:	Must have sufficient colour difference as a wet film to provide an easy visual difference to blasted steel in low-light situations. If no other colour is specified, the colour when dry is green.
Application Properties:	Suitable for application by spray to DFT of 75 microns without loss of cohesion or cure properties.

Table 6.2: Organic zinc-rich primer

Specification:	A two-pack, polyamide cured, zinc-rich epoxy primer paint meeting the general requirements of AS/NZS 3750.9 Type 2 and approved to APAS Specification AP-S2916/1. Pre-disperse the zinc component.
Colour:	Must have sufficient colour difference as a wet film to provide an easy visual difference to blasted steel in low-light situations. If no other colour is specified, the colour when dry is green.
Application Properties:	Suitable for application by spray to DFT of 75 microns without loss of cohesion or cure properties. Suitable for application by conventional, airless and air-assisted airless spray equipment and also for application by brush/roller for small areas and touch-up.

Table 6.3: Epoxy primer (two-pack) – Zinc Phosphate

Specification:	A two-pack, polyamide cured, zinc phosphate pigmented epoxy primer paint meeting the general requirements of AS/NZS 3750.13 and approved to APAS Specification AP-S2971.
Application Properties:	Suitable for application by spray to DFT of 75 microns without loss of cohesion or cure properties. Suitable for application by conventional, airless and air-assisted airless spray equipment and also application by brush/roller for small areas and touch-up.

Table 6.4: Epoxy mastic (two-pack) – For rusted steel

Specification:	A two-pack surface tolerant epoxy paint meeting the general requirements of AS/NZS 3750.1 with respect to constitution, cure rate and pot life, and approved to either APAS Specification AP-S2977 or APAS Specification AP-S0156. Must use a polyamide, or similar, as curing agent.
Compatibility with Other Coatings:	Tolerant of being applied over sound zinc-rich epoxy coatings and be physically and chemically compatible with later coatings in the system.
Application:	Suitable for application by airless and air-assisted airless spray equipment and by brush and roller to DFT of 125 microns.

Table 6.5: High-build epoxy (two-pack)

Specification:	A two-pack, high-build epoxy paint meeting the general requirements of AS/NZS 3750.14 with respect to constitution, cure rate and pot life, and approved to APAS Specification AP-S2973. Must use a polyamide, or similar, as curing agent.
Compatibility with Other Coatings:	Tolerant of being applied over sound zinc-rich epoxy coatings and be physically and chemically compatible with later coatings in the system.
Application:	Suitable for application by airless and air-assisted airless spray equipment and by brush and roller to DFT of 125 microns.

Table 6.6: High-build epoxy (two-pack) – with MIO

Specification:	A two-pack MIO pigmented, high build, epoxy paint meeting the general requirements of AS/NZS 3750.14 with respect to constitution, cure rate and pot life, and approved to APAS Specification AP-S2973.
Compatibility with Other Coatings:	Suitable for application to sound zinc-rich epoxy coatings and stripe coats of high-solids epoxy stripe coating and be physically and chemically compatible with later coatings in the system.
Colour:	Supply in a factory batched colour. Unless specified otherwise, the colour must be an approximate match to ‘N44 Bridge Grey’ to AS 2700.

Specification:	A two-pack MIO pigmented, high build, epoxy paint meeting the general requirements of AS/NZS 3750.14 with respect to constitution, cure rate and pot life, and approved to APAS Specification AP-S2973.
Main Pigment:	Natural MIO that: a) meets the requirements of AS 2855 with a lamellar content of at least 60%; b) retains its lamellar appearance into the dry film (excessive high speed dispersion and fragmentation of the MIO must be avoided); c) comprises at least 80% by mass of the total pigment, taken to be the pigments that could impart colour to the product, that is, excluding extender pigments.
Application:	Suitable for application by spray to DFT of 200 microns as a single coat by airless and air-assisted airless spray equipment. Suitable for application by brush/roller for small areas and touch-up.

Table 6.7: Full gloss polyurethane (two-pack)

Specification:	A two-pack MIO pigmented, high build, recoatable, acrylic modified polyurethane topcoat paint that meets the general requirements of AS/NZS 3750.6 with respect to constitution, cure rate and pot life, except where modified herein with respect to gloss level, film build, gloss change and colour.
Compatibility with Other Coatings:	Tolerant of being applied over sound zinc-rich epoxy coatings; high solids epoxy coatings, surface tolerant epoxy coatings and MIO epoxy coatings.
Colour and Gloss:	Supply in a factory batched colour. Unless specified otherwise, the colour must be an approximate match to ‘N44 Bridge Grey’ to AS 2700. Finished gloss level, when applied by airless or air-assisted airless spray, of between 10 and 20 gloss units, when measured with a 60° head in accordance with AS 1580, Method 602.2. Have a high exterior durability with respect to weathering and UV resistance when cured, with minimum colour shift in full light, part light and full shadow situations.

Specification:	A two-pack MIO pigmented, high build, recoatable, acrylic modified polyurethane topcoat paint that meets the general requirements of AS/NZS 3750.6 with respect to constitution, cure rate and pot life, except where modified herein with respect to gloss level, film build, gloss change and colour.
Pigments:	The main pigment of MIO polyurethane paint - natural MIO that: (a) meets the requirements of AS 2855 with a lamellar content of at least 60%; (b) retains its lamellar appearance into the dry film (excessive high speed dispersion and fragmentation of the MIO during manufacture of the paint must be avoided); and (c) comprises at least 90% by mass of the total pigment, taken to be the pigments that could impart colour to the product, that is, excluding extender pigments. MIO loading: between 40 and 50 grams per square metre when applied at a dry film thickness of 75 microns. Add non-leafing aluminium as a secondary pigment (colourant) to achieve the specified colour. MIO polyurethane paint must not contain titanium dioxide as a pigment or lightening agent. Use tinters for minor colour adjustments only.
Curing agent:	An aliphatic polyisocyanate curing agent. Curing agent must comprise at least 17% of the total binder solids by weight.
Application Properties:	Volume solids and rheology so that the mixed coating can be satisfactorily applied by spray to DFT of 75 microns as a single coat. Suitable for application by airless and air-assisted airless spray equipment and also application by brush/roller for small areas and touch-up.

Table 6.8: Polysiloxane Paint – Solid Colour

Specification:	A two-pack pigmented, high build, recoatable, polysiloxane topcoat paint approved to APAS Specification AP-S2920.
Compatibility with Other Coatings:	Tolerant of being applied over sound zinc-rich epoxy coatings; high solids epoxy coatings, surface tolerant epoxy coatings and MIO epoxy coatings.
Colour and Gloss:	Supply in a factory batched colour to match the specified colour. Finished gloss level, when applied by airless or air-assisted airless spray, of between 10 and 20 gloss units when measured with a 60° head in accordance with AS 1580, Method 602.2. Have a high exterior durability with respect to weathering and UV resistance when cured, with minimum colour shift in full light, part light and full shadow situations.
Pigments	Lead based pigments are not permitted.
Curing Agent:	A siloxane curing agent containing at least 60% siloxane by weight.

Specification:	A two-pack pigmented, high build, recoatable, polysiloxane topcoat paint approved to APAS Specification AP-S2920.
Application Properties:	Volume solids and rheology such that the mixed coating can be satisfactorily applied by spray to DFT of 75 microns as a single coat. Suitable for application by airless and air-assisted airless spray equipment and also application by brush/roller for small areas and touch-up.

Table 6.9: Ultra high build paint

Specification:	A two-pack, high-build epoxy paint meeting the general requirements of AS/NZS 3750.2 with respect to constitution, cure rate and pot life, and approved to APAS Specification AP-S2975.
Compatibility with Other Coatings:	Tolerant of being applied over properly prepared steel or sound zinc-rich epoxy coatings or other suitable primers and be physically and chemically compatible with later coatings in the system.
Colour:	Black, unless specified otherwise,
Curing Agent:	A polyamide or similar curing agent.
Application Properties:	Suitable for application by airless and air-assisted airless spray equipment to DFT of 500 microns. Suitable for touch up by brush and roller.

Table 6.10: Epoxy primer (two-pack) – Low Viscosity Primer

Specification:	A two-pack low viscosity epoxy paint meeting the general requirements of AS/NZS 3750.13 with respect to constitution, cure rate and pot life and approved to APAS Specification 2971. Must use a polyamide or similar curing agent.
Compatibility with Other Coatings:	Tolerant of being applied over sound zinc hot metal spray and zinc/aluminium hot metal spray and be physically and chemically compatible with later coatings in the system. Capable of penetrating porous substrates.
Colour:	Pink when used as primer, grey when used as a build coat.
Volume Solids/Application Properties:	Suitable for application by airless and air-assisted airless spray equipment to DFT of 150 microns. Suitable for touch up by brush and roller.

Table 6.11: Full gloss polyurethane (two-pack)

Specification:	A two-pack pigmented, high build, recoatable, acrylic modified polyurethane topcoat paint that meets the general requirements of AS/NZS 3750.6 with respect to constitution, cure rate and pot life, except where as modified herein with respect to gloss level, film build, gloss change and colour.
Compatibility with Other Coatings:	Tolerant of being applied over sound zinc-rich epoxy coatings; high solids epoxy coatings, surface tolerant epoxy coatings and MIO epoxy coatings.

Specification:	A two-pack pigmented, high build, recoatable, acrylic modified polyurethane topcoat paint that meets the general requirements of AS/NZS 3750.6 with respect to constitution, cure rate and pot life, except where as modified herein with respect to gloss level, film build, gloss change and colour.
Colour and Gloss:	Supply in a factory batched to match the specified colour. Finished gloss level, when applied by airless or air-assisted airless spray, of between 10 and 20 gloss units when measured with a 60° head in accordance with AS 1580, Method 602.2. Have a high exterior durability with respect to weathering and UV resistance when cured, with minimum colour shift in full light, part light and full shadow situations.
Pigments:	Lead based pigments are not permitted.
Curing Agent:	An aliphatic polyisocyanate curing agent. Curing agent must comprise at least 17% of the total binder solids by weight.
Volume Solids/ Application Properties:	Volume solids and rheology so that the mixed coating can be satisfactorily applied by spray to DFT of 75 microns as a single coat. Suitable for application by airless and air-assisted airless spray equipment and also application by brush/roller for small areas and touch-up.

Table 6.12: Moisture-cure urethane (single-pack) systems

Specification:	A two-pack pigmented, high build, recoatable, acrylic modified polyurethane topcoat paint that meets the general requirements of AS/NZS 3750.18 with respect to constitution, cure rate and pot life, except where as modified herein with respect to gloss level, film build, gloss change and colour, and approved to APAS Specification AP-S2930.
Compatibility with Other Coatings:	Tolerant of being applied over adherent and sound coatings after pressure washing. Tolerant of application to damp surfaces. For new works, MCU paint is normally applied over MCU coats such as zinc-pigmented primer, MIO intermediate and finish coat paint,
Colour and Gloss:	Supply in a factory batch to match the specified colour. Finished gloss level to meet the level selected for the topcoat, when measured with a 60° head in accordance with AS 1580, Method 602.2. Have a high exterior durability with respect to weathering and UV resistance when cured, with minimum colour shift in full light, part light and full shadow situations.
Pigments:	Lead based pigments are not permitted.
Curing Agent:	An aromatic or aliphatic prepolymer curing agent.
Volume Solids/ Application Properties:	Volume solids and rheology so that the mixed coating can be satisfactorily applied by spray to DFT of 75 microns as a single coat. Suitable for application by airless and air-assisted airless spray equipment and also application by brush/roller for small areas and touch-up.

7. Delivery

7.1 Each container must be clearly and durably marked with the following information:

a. Manufacturer's name;

b. Product Name or Trade Name;

c. Product Reference Number or Identification Number; and

d. Batch Number or date of manufacture.

7.2 If requested, the Contractor must submit a record of the above information to the Principal.

Annexure A Summary of Hold Points, Witness Points and Record

Refer to TS 01746 for details of the Witness Points and Hold Points that apply prior to the Application of the paint.

The following is a summary of the Records that the Contractor must submit to the Principal to demonstrate compliance with this Specification.

Clause	Hold point	Witness point	Identified Records
5.3	Placing an order for supply of the paint.		Paint details and evidence of AS/NZS ISO 9001 compliance
7.1			Delivery Information