

# TRANSPORT FOR NSW (TfNSW)

## QA SPECIFICATION 3651

### PAINTS AND THINNERS FOR STEELWORK

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#### REVISION REGISTER

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QA SPECIFICATION 3651

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# PAINTS AND THINNERS FOR STEELWORK

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VERSION FOR: DATE:
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## CONTENTS

CLAUSE	PAGE
FOREWORD .....	ii
TfNSW Copyright and Use of this Document .....	ii
Revisions to Previous Version .....	ii
Project Specific Changes .....	ii
1 SCOPE.....	1
2 STRUCTURE OF THE SPECIFICATION.....	1
2.1 (Not Used) .....	1
2.2 (Not Used) .....	1
2.3 (Not Used) .....	1
2.4 Referenced Documents.....	1
3 DEFINITIONS AND ABBREVIATIONS .....	1
4 SUPPLIER’S QUALITY MANAGEMENT SYSTEM .....	1
5 APAS APPROVAL.....	2
6 PAINT TYPE REQUIREMENTS.....	2
6.1 Zinc Silicate Primer .....	2
6.2 Zinc-Rich Epoxy Primer.....	3
6.3 Zinc Phosphate Epoxy Primer .....	3
6.4 Surface Tolerant Epoxy Paint.....	3
6.5 High-Build Epoxy Paint .....	3
6.6 MIO Epoxy Paint.....	4
6.7 MIO Polyurethane Paint .....	4
6.8 Polysiloxane Paint – Solid Colour.....	5
6.9 Ultra-High-Build Epoxy Paint.....	6
6.10 Low Viscosity Epoxy Sealer .....	6
6.11 Polyurethane Paint – Solid Colour .....	6
7 DELIVERY.....	7
7.1 Identification of Containers .....	7
ANNEXURES 3651/A TO 3651/L – (NOT USED).....	8
ANNEXURE 3651/M – REFERENCED DOCUMENTS .....	8
LAST PAGE OF THIS DOCUMENT IS.....	8

## FOREWORD

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### REVISIONS TO PREVIOUS VERSION

This document has been revised from Specification TfNSW 3651 Edition 1 Revision 1.

All revisions to the previous version (other than minor editorial and project specific changes) are indicated by a vertical line in the margin as shown here, except when it is a new edition and the text has been extensively rewritten.

### PROJECT SPECIFIC CHANGES

Any project specific changes are indicated in the following manner:

- (a) Text which is additional to the base document and which is included in the Specification is shown in bold italics e.g. ***Additional Text***.
- (b) Text which has been deleted from the base document and which is not included in the Specification is shown struck out e.g. ~~Deleted Text~~.

# **TfNSW QA SPECIFICATION 3651**

## **PAINTS AND THINNERS FOR STEELWORK**

### **1 SCOPE**

This Specification sets out the details and requirements for the supply of paints and thinners for the painting of steel bridges and other steel structures.

### **2 STRUCTURE OF THE SPECIFICATION**

This Specification includes a series of annexures that detail additional requirements.

**2.1 (NOT USED)**

**2.2 (NOT USED)**

**2.3 (NOT USED)**

#### **2.4 REFERENCED DOCUMENTS**

Unless specified otherwise, the applicable issue of a referenced document, other than a TfNSW Specification, must be the issue current at the date one week before the closing date for tenders, or where no issue is current at that date, the most recent issue.

Standards, specifications and test methods are referred to in abbreviated form (e.g. AS 1234). For convenience, the full titles are given in Annexure 3651/M.

### **3 DEFINITIONS AND ABBREVIATIONS**

The following abbreviations apply to this Specification:

**DFT:** Dry film thickness

**MIO:** Micaceous iron oxide

The term “the Supplier” means the supplier of the product covered by the scope of this Specification.

### **4 SUPPLIER’S QUALITY MANAGEMENT SYSTEM**

The Supplier must establish and maintain a Quality Management System complying with AS/NZS ISO 9001 as a means of ensuring that the product conforms to this Specification.

Provide evidence verifying compliance with this Clause.

## 5 APAS APPROVAL

Supply only paints which are either approved under Australian Paint Approval Scheme (APAS), or manufactured by an APAS Recognised Manufacturing Unit and accepted by the Principal as suitable for the specified purpose.

For acceptance of a paint by the Principal, submit the following information for the Principal's consideration, at least 20 working days prior to placing orders for supply of the paint:

- (a) Name of the manufacturer, and evidence that the manufacturer is an APAS Recognised Manufacturing Unit;
- (b) Which specifications of the APAS 2900 series, if any, to which the paints comply;
- (c) Whether the paints are approved to the appropriate APAS Specification for colours other than those specified;
- (d) Status of any current application for APAS approval of the paint;
- (e) Details of any previous use of the paint on TfNSW contracts;
- (f) Case histories supplied by the manufacturer;
- (g) Evidence from the manufacturer that the paints are superior, with respect to application characteristics or long term performance, to other of the manufacturer's paints that are approved under the specified or other relevant APAS Specifications.

The Principal has absolute discretion to accept or reject a paint not approved under APAS.

Do not use paint that is neither approved nor accepted.

## 6 PAINT TYPE REQUIREMENTS

### 6.1 ZINC SILICATE PRIMER

**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 2908. Pre-disperse the zinc component.

**Colour:** Green when dry and with sufficient colour difference as a wet film, so that it will provide an easy visual difference to blasted steel in low-light situations.

**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.



## 6.2 ZINC-RICH EPOXY 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 2916/1. Pre-disperse the zinc component.
- Colour:** Green when dry and with sufficient colour difference as a wet film, so that it will provide an easy visual difference to blasted steel in low-light situations.
- 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.

## 6.3 ZINC PHOSPHATE EPOXY PRIMER

- 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 2971.
- 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.

## 6.4 SURFACE TOLERANT EPOXY PAINT

- 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 2975, or APAS Specification 2977, or APAS Specification 0156.  
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.
- Volume Solids:** Volume Solids greater than 70%.
- Application:** Suitable for application by airless and air-assisted airless spray equipment and by brush and roller to DFT of 125 microns.

## 6.5 HIGH-BUILD EPOXY PAINT

- 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 2973.  
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.
- Volume Solids:** Volume Solids greater than 70%.

**Application:** Suitable for application by airless and air-assisted airless spray equipment and by brush and roller to DFT of 125 microns.

## 6.6 MIO EPOXY PAINT

**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 2973.

**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 as an approximate match to the APAS colour “Natural Steel Grey”.

**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.

**Volume Solids:** Volume Solids greater than 70%.

**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.

## 6.7 MIO POLYURETHANE PAINT

**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 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.

**Colour and Gloss:** Supply in a factory batched colour to match “TfNSW Bridge Grey”, using the TfNSW 2002 MIO polyurethane colour/finish standard.

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:** 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 “TfNSW Bridge Grey” 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.

## 6.8 POLYSILOXANE PAINT – SOLID COLOUR

- Specification:** A two-pack pigmented, high build, recoatable, polysiloxane 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.
- 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.

**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.

## 6.9 ULTRA-HIGH-BUILD EPOXY 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 2975.

**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,

**Volume Solids:** Volume Solids greater than 70%.

**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.

## 6.10 LOW VISCOSITY EPOXY SEALER

**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.

## 6.11 POLYURETHANE PAINT – SOLID COLOUR

**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.

- 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.

## **7 DELIVERY**

### **7.1 IDENTIFICATION OF CONTAINERS**

Mark each container clearly and durably with the following information:

- (a) Manufacturer's name;
- (b) Product Name or Trade Name;
- (c) Product Reference Number or Identification Number;
- (d) Batch Number or date of manufacture.

## ANNEXURES 3651/A TO 3651/L – (NOT USED)

## ANNEXURE 3651/M – REFERENCED DOCUMENTS

### Australian 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/NZS ISO 9001	Quality management systems – Requirements

### ISO 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.
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### APAS Specifications

Specification 0156	Epoxy Mastic High Build 2-pack Coating for Rusted Steel
Specification 2908	Inorganic zinc coating for protection of steel
Specification 2916	Organic zinc rich coating for protection of steel
Specification 2971	Epoxy two-pack durable premier for protection of steel in atmosphere
Specification 2973	Solvent borne epoxy enamel or epoxy system to 400 um
Specification 2975	Ultra high build epoxy two-pack coating for the long term protection of steel in atmosphere
Specification 2977	Slow drying/high volume solids two-pack epoxy mastic coating for the long term protection of steel