

Australian/New Zealand Standard™

Paints for steel structures

Part 1: Epoxy mastic (two-pack)—For rusted steel



AS/NZS 3750.1:2008

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CH-003, Paints and Related Materials. It was approved on behalf of the Council of Standards Australia on 19 March 2007 and on behalf of the Council of Standards New Zealand on 3 March 2007.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CH-003, Paints and Related Materials to supersede AS 3750.1—1994. It forms part of a series of product Standards for paint systems referred to in AS/NZS 2312, *Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings*.

See AS/NZS 3750.0 for other published Standards in this series.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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Australian/New Zealand Standard
Paints for steel structures**Part 1: Epoxy mastic (two-pack)—For rusted steel**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for a two-component, high-build, high-solids, epoxy mastic for the protection of iron and steel against exterior atmospheric corrosion in a severe industrial or coastal marine environment. It is intended primarily for use on imperfectly prepared surfaces, i.e., surfaces where residual rust and some previously applied paint of any type are still present. These coatings are also suitable for applications over blast cleaned surfaces where extended service life may be achieved.

Paint specified in this Standard is described in AS/NZS 2312 as Paint Reference C32. Commonly known as surface tolerant epoxy, this product may be pigmented with aluminium or micaceous iron oxide. It may also be produced in a limited range of colours and is designed primarily for use as a single coat, high-build, self priming finish.

NOTES:

- 1 This paint may be used as detailed for systems EPMI and EPM2 in AS/NZS 2312.
- 2 Appendix A contains recommendations and advice on information which should be provided by the purchaser at the time of enquiry or order.
- 3 Additional information on the use and application of epoxy paints is contained in Appendix B.

1.2 REFERENCED DOCUMENTS

A list of the documents referred to in this Standard is contained in Appendix C.

1.3 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 2310 and those below apply.

1.3.1 Epoxy mastic

A high-build paint consisting essentially of epoxy resin base, polyamide or amine adduct or other hardener, together with various agents to improve wetting, adhesion and flexibility, with appropriate pigments and solvents mixed together in the proportions recommended by the manufacturer.

NOTE: Anti-settling and anti-sag agents may be necessary to provide high-build and prevent sagging during application.

1.4 SAFETY PRECAUTIONS

Health and safety aspects referenced in Section 13 of AS/NZS 2312 should be followed in conjunction with the manufacturer's safety data sheets (MSDSs).

SECTION 2 MATERIALS REQUIREMENTS

2.1 GENERAL

The paint shall comply with the requirements detailed in Clauses 2.3 to 2.5 inclusive. These properties and requirements are summarized in Table 1.

2.2 CONDITIONS OF TEST

Unless otherwise specified in this Standard, the following test conditions shall apply:

- (a) The test panel material and its preparation shall be in accordance with Appendix D.
- (b) The size of test panels shall be as specified in Table 1.
- (c) Conditions for testing shall be in accordance with AS/NZS 1580.101.5.
- (d) The spreading rate of paint shall be such that when applied by spraying it shall result in a dry film thickness of 125 μm to 150 μm per coat as determined by either AS/NZS 1580.108.1 or AS/NZS 1580.108.2.
- (e) Conditions for air-drying shall be in accordance with AS/NZS 1580.101.1.

2.3 LIQUID PAINT

2.3.1 Condition in container

When each component is tested in accordance with AS/NZS 1580.103.1 at the time of delivery from the manufacturer/supplier, it shall be free from gel, coarse particles, skins and foreign matter.

2.3.2 Volume solids

When determined in accordance with AS 1580.301.2, utilizing air-drying conditions of 7 days under routine conditions of AS/NZS 1580.101.1 in lieu of a 3 h drying period at 105°C, the volume solids of the mixed paint shall be greater than 70 percent.

2.3.3 Storage properties

2.3.3.1 Degree of settling

When stored at 23 $\pm$ 3°C in sealed, unopened containers for 12 months from the date of manufacture, the degree of settling of either component, when determined in accordance with AS/NZS 1580.211.1, shall be not less than 6.

2.3.3.2 Re-incorporation after storage

When stored at 23 $\pm$ 3°C in sealed, unopened containers for up to 12 months from the date of manufacture, and tested in accordance with AS/NZS 1580.211.2, the components shall be readily re-incorporated and, when mixed in the recommended proportions, shall produce a paint of uniform consistency free from lumps, gel and other defects.

2.4 SPRAY APPLICATION PROPERTIES

2.4.1 General

Spray application properties shall be assessed using vertical steel panels prepared by abrasive blast cleaning to the Class Sa 2½ requirements of AS 1627.4, using fresh garnet abrasive blast material.

2.4.2 Thinning

If required, thinning shall be done in accordance with the manufacturer's instructions.

2.4.3 Spraying technique

The spraying technique shall be in accordance with manufacturer's recommendations.

2.4.4 Pot-life assessment

When initially mixed and thinned as appropriate to the method of application, and again at the end of a 2 h standing period, a 4 L volume of the paint shall be tested in accordance with AS/NZS 1580.205.2 or AS/NZS 1580.205.4. When applied at the manufacturer's maximum recommended thickness, it shall exhibit satisfactory spraying properties.

When dry, the film shall be free from sags, runs, pinholes, craters and any other film defect. A slight 'orange peel' effect is characteristic.

NOTE: The panel should be retained for assessment of finish (see Clause 2.5.4).

2.5 APPLIED FILM

NOTE: The results of tests in Clauses 2.5.6, 2.5.7 and 2.5.8 should only be used as a guide to performance. These tests are considered to provide an accelerated test of resistance to conditions which are not expected to be encountered by the product during its useful service life. The tests are included to demonstrate that the paint contains sufficient properly cross-linked resin to provide long-term protection.

2.5.1 Curing and hard-dry properties

When a test panel is prepared and tested in accordance with Appendix E, it shall withstand a load of 1.5 kg.

2.5.2 Colour

When a tinplate test panel is coated with test paint, the colour of the paint film shall be an approximate match to that of the specified reference sample.

2.5.3 Recoating properties

When one coat of paint is applied to a steel test panel and allowed to air-dry for 48 h and a second coat of the paint is applied and dried in the same manner, when tested in accordance with AS/NZS 1580.404.1 the recoated panel shall not show any evidence of wrinkling, patchiness or lifting from the previous coat and, when tested in accordance with AS 1580.408.2, the intercoat adhesion rating shall be ≥ 4 .

2.5.4 Finish

When a coat of paint is applied to a steel test panel, air-dried for 7 days and examined in accordance with AS 1580.603.1, the film shall be of uniform colour and appearance, and be free of film defects.

2.5.5 Flexibility

When one coat of paint is applied to a tinplate test panel, allowed to air-dry for 7 days and tested in accordance with AS 1580.402.1 using a 12 mm diameter mandrel, the paint shall show no cracking or detachment.

NOTE: Damage in the form of stretch marks should not be cause for rejection.

2.5.6 Resistance to distilled water

When a steel test panel is prepared and tested in accordance with Appendix F, it shall meet the following requirements after the 30-day immersion period:

Property of coating	Method of test	Requirements
Blistering and wrinkling	—	None
Adhesion rating	AS 1580.408.2	≤1
Colour	AS/NZS 1580.601.1	Rating ≥4
Gloss of immersed part	AS/NZS 1580.602.2	≥80% of unimmersed part
Scratch resistance	AS/NZS 1580.403.1	≥1.5 kg
Corrosion of substrate	—	None

2.5.7 Resistance to oil

When a steel test panel is prepared and tested in accordance with Appendix G, it shall meet the following requirements after the 24-hour immersion period:

Property of coating	Method of test	Requirements
Blistering and wrinkling	AS/NZS 1580.481.1.9	None
Adhesion rating	AS 1580.408.2	≤1
Colour	AS/NZS 1580.601.1	Rating ≥4
Gloss of immersed part	AS/NZS 1580.602.2	≥80% of unimmersed part
Scratch resistance	AS/NZS 1580.403.1	≥1.5 kg

2.5.8 Resistance to alkali/acid

When a steel test panel is prepared and tested in accordance with Appendix H, it shall meet the following requirements after the 7-day immersion in each reagent:

Property of coating	Method of test	Requirements
Blistering and wrinkling	AS/NZS 1580.481.1.9	None
Adhesion rating	AS 1580.408.2	≤1
Scratch resistance	AS/NZS 1580.403.1	≥1.5 kg
Corrosion of substrate	AS 1580.481.3	None

NOTE: This test should not be carried out on aluminium pigmented paints.

2.5.9 Durability of the paint system

When the paint system is prepared, exposed for 24 months and tested in accordance with Appendix I, its durability shall comply with the following ratings:

Property of coating	Method of test	Rating
Erosion	AS/NZS 1580.481.1.6	≤10%
Cracking	AS/NZS 1580.481.1.8	0
Blistering	AS/NZS 1580.481.1.9	0
Flaking	AS/NZS 1580.481.1.10	0
Corrosion	AS 1580.481.3	0
Creep from score	AS 1580.481.3	≤5 mm

2.6 MIXING RATIO

The two components shall be supplied in separate containers in such concentrations that the mixing ratio of the base and the hardener shall be a simple ratio such as 1:1, 2:1, 3:1 or 4:1 by volume.

2.7 ADDITIONAL TESTS

NOTE: Appendix J gives information on consistency and gloss tests that may be included in a product specification.

TABLE 1
SUMMARY OF PROPERTIES OF EPOXY MASTIC (2-PACK)

Clause number	Property	Requirement	Test method	Test panel material	Minimum test panel size mm
2.3.1	Condition in container	Free from gel, particles, skin	AS/NZS 1580.103.1	N/A	—
2.3.2	Volume solids	>70%	AS 1580.301.2	N/A	—
2.3.3.1	Degree of settling (12 months)	Settlement rating ≥ 6	AS/NZS 1580.211.1	N/A	—
2.3.3.2	Re-incorporation after storage (12 months)	Readily re-incorporated; uniform; consistency free from lumps and gel	AS/NZS 1580.211.2	N/A	—
2.4	Spray application properties and pot-life	Good spraying properties Free from sag, run, pinholes, craters	AS/NZS 1580.205.2 AS/NZS 1580.205.4	Steel	1000 × 1000
2.5.1	Curing and hard-dry properties	Withstand a scratch load of 1.5 kg Appendix E	AS/NZS 1580.403.1	Tinplate	125 × 125
2.5.2	Colour	Approximate match	AS/NZS 1580.601.1	Tinplate	50 × 100
2.5.3	Recoating properties	No wrinkling, lifting, patchiness Intercoat adhesion ≥ 4	AS/NZS 1580.404.1 AS 1580.408.2	Steel	500 × 500
2.5.4	Finish	Uniform colour, free from wrinkling and defects	AS 1580.603.1	Steel	500 × 500
2.5.5	Flexibility	No cracking, damage or detachment	AS 1580.402.1	Tinplate	100 × 50
2.5.6	Resistance to water	See Clause 2.5.6 (and Appendix F)	AS 1580.408.2 AS/NZS 1580.601.2 AS/NZS 1580.403.1 AS/NZS 1580.601.1	Steel	150 × 100
2.5.7	Resistance to mineral oil	See Clause 2.5.7 (and Appendix G)	AS 1580.408.2 AS/NZS 1580.602.2 AS/NZS 1580.403.1 AS/NZS 1580.601.1	Steel	150 × 100
2.5.8	Resistance to alkali and acid	See Clause 2.5.8 (and Appendix H)	AS 1580.408.2 AS/NZS 1580.403.1	Steel	150 × 100
2.5.9	Durability of paint system	See Clause 2.5.9 (and Appendix I)	AS/NZS 1580.457.1 AS/NZS 1580.481.1.6 AS/NZS 1580.481.1.8 AS/NZS 1580.481.1.9 AS/NZS 1580.481.1.10 AS 1580.481.3	Steel	150 × 300

N/A = Not applicable