

Australian/New Zealand Standard™

Paints for steel structures

Part 7: Aluminium paint



AS/NZS 3750.7:2009

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 22 May 2009 and on behalf of the Council of Standards New Zealand on 12 June 2009.

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Australian/New Zealand Standard™

Paints for steel structures

Part 7: Aluminium paint

Originated as AS/NZS 3750.7:1994.
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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Standards Committee CH-003, Paints and Related Materials to supersede AS/NZS 3750.7:1994.

The objective of this Standard is to specify requirements for aluminium paint used on steel structures. It forms part of a series of product standards for paints referred to in AS/NZS 2312, *Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings*.

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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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Paints for steel structures**

Part 7: Aluminium paint

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for a single pack bright aluminium finish paint intended to protect iron and steel against corrosion. It may be suitable for application by brush, roller or spray. This paint will provide heat reflectance and medium-term protection from corrosion to suitably primed steelwork located in an industrial atmospheric environment.

NOTES:

- 1 Appendix A contains recommendations and advice on information that should be provided by the purchaser at the time of enquiry or order.
- 2 Care should be taken that aluminium paint is not used in an acidic or caustic environment. Additional information on the use and application of aluminium paint is provided in Appendix B.
- 3 Alternative methods for determining compliance with this Standard are contained in Appendix C.

1.2 REFERENCED DOCUMENTS

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

1.3 DEFINITIONS

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

1.3.1 Aluminium paint

A finish coating designed to provide corrosion protection to suitably primed steel when applied to a dry film thickness of 25–35 µm per coat.

1.4 SAFETY PRECAUTIONS

As this paint is intended for industrial use, reference to the appropriate regulatory requirements is necessary, particularly for the packing and labelling of the product.

NOTE: Appendix B provides additional information on safety precautions.

SECTION 2 MATERIAL REQUIREMENTS

2.1 GENERAL

The paint shall comply with the requirements detailed in Clauses 2.2 to 2.6 inclusive. These properties and requirements are summarized in Table 1.

2.2 COMPOSITION

The paint shall principally consist of appropriate leafing grade aluminium pigment, resin binder and solvent.

2.3 CONDITIONS OF TEST

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

- (a) The test panel material is steel complying with AS/NZS 1580.104.1. Where reference panels are required, they should be made from the same material and be prepared by identical methods as the test panels.
- (b) The size and type of test panels shall be as specified in Table 1.
- (c) The dry film thickness shall be 25 μm to 35 μm .
- (d) Conditions for testing shall be in accordance with AS/NZS 1580.101.5.
- (e) Conditions for air-drying shall be in accordance with AS/NZS 1580.101.1.

2.4 LIQUID PAINT

2.4.1 Condition in container

When examined in accordance with AS/NZS 1580.103.1 at the time of delivery from the manufacturer or supplier, the paint shall be free from gel, coarse particles, skins and foreign matter. The product shall be readily re-incorporated when tested in accordance with AS/NZS 1580.211.2.

2.4.2 Volume solids

When determined in accordance with AS 1580.301.2, the volume solids shall be within 5 percent of the product specification.

2.4.3 Storage properties

2.4.3.1 *Degree of settling*

When stored at $23 \pm 3^\circ\text{C}$ in sealed, unopened containers for 12 months from the date of manufacture, the rating for the settling when determined in accordance with AS/NZS 1580.211.1 shall be not less than 6.

2.4.3.2 *Re-incorporation after storage*

When stored at $23 \pm 3^\circ\text{C}$ in sealed, unopened containers for 12 months from the date of manufacture, and tested in accordance with AS/NZS 1580.211.2, the paint shall be readily re-incorporated and be of uniform consistency free from lumps, gel and other defects.

2.5 APPLICATION PROPERTIES

2.5.1 General

When applied in accordance with the manufacturer's recommended methods of application, the applied film shall be free from defects and show good leafing and brightness, when tested by the appropriate method (see Clauses 2.5.2 to 2.5.4).

2.5.2 Brushing

When applied to a vertical test panel (see Clause 2.3) in accordance with AS/NZS 1580.205.1, the test paint shall exhibit satisfactory brushing properties and be free from visible defects.

2.5.3 Rolling

When applied to a vertical test panel (see Clause 2.3) in accordance with AS/NZS 1580.205.3, the test paint shall exhibit satisfactory rolling properties and be free from visible defects.

2.5.4 Spraying

When thinned in accordance with the manufacturer's instructions, and applied to a vertical test panel (see Clause 2.3) in accordance with AS/NZS 1580.205.2, the test paint shall exhibit good spraying properties.

2.6 APPLIED FILM

2.6.1 Surface-dry time

When the test paint has been applied to a steel test panel at the appropriate spreading rate and is tested in accordance with AS/NZS 1580.401.1, it shall have a surface-dry time not exceeding 6 h.

2.6.2 Hard-dry time

When the test paint has been applied to a steel test panel at the appropriate spreading rate and is tested in accordance with AS 1580.401.5, it shall have a hard-dry time not exceeding 16 h.

2.6.3 Recoating properties

When a single-coated steel test panel is recoated after 24 h drying, and is examined in accordance with AS/NZS 1580.404.1, there shall be no defects in the underlying test film during or after overcoating. When examined, after drying for 24 h, the film shall be of uniform appearance and colour and shall be free from defects.

2.6.4 Resistance to weathering

When test panels coated in accordance with Appendix E are continuously exposed for 48 months, at a 45° angle on an exposure rack complying with AS/NZS 1580.457.1, at a test site with climatic conditions that comply with AS/NZS 2312 for a Category C: Medium environment, the paint system shall meet the acceptance rating requirements of Table 2.

2.6.5 Resistance to water

When a panel coated as described in Appendix E is tested in accordance with AS/NZS 1580.455.1 using an immersion time of 24 h, the test panel shall exhibit no sign of blistering, wrinkling or other defects. The test panel shall produce a scratch resistance of not less than 600 g as determined using AS/NZS 1580.403.1 and an approximate colour match between the immersed and unimmersed areas of the panel.

2.6.6 Colour

When the test paint applied to a steel test panel is allowed to dry for 16 h and is assessed in accordance with AS/NZS 1580.601.1, it shall show an approximate colour match to the aluminium colour specified.

TABLE 1
SUMMARY OF PROPERTIES OF ALUMINIUM PAINT

Clause number	Property assessed	Acceptable performance	Test method	Typical test panel	
				Material	Minimum dimensions (mm)
2.4.1	Condition in container	Free from gel, coarse particles, skin and foreign matter Uniform consistency after manual re-incorporation	AS/NZS 1580.103.1 AS/NZS 1580.211.2	N/A	—
2.4.2	Volume solids	Within $\pm 5\%$ of product specification value	AS 1580.301.2	N/A	—
2.4.3	Storage properties (12 months)	Settlement ≥ 6 Uniform consistency free of lumps, gel and other defects	AS/NZS 1580.211.1 AS/NZS 1580.211.2	N/A	—
2.5	Application properties	No runs, sags, streaks or excessive roughness, or grittiness	AS/NZS 1580.205.1 AS/NZS 1580.205.2 AS/NZS 1580.205.3	Steel	500 × 500
2.6.1	Surface-dry time	≤ 6 h	AS/NZS 1580.401.1	Steel	150 × 100
2.6.2	Hard-dry time	≤ 16 h	AS 1580.401.5	Steel	150 × 100
2.6.3	Recoating	Uniform appearance and no defects	AS/NZS 1580.404.1 (modified)	Steel	300 × 150
2.6.4	Resistance to weathering (48-month exposure)	See Table 2	AS/NZS 1580.457.1 AS/NZS 2312	Steel	300 × 150
2.6.5	Resistance to water	Free of defects Approximate match Scratch resistance ≥ 600 g	AS/NZS 1580.455.1 AS/NZS 1580.403.1	Steel	100 × 50
2.6.6	Colour	Approximate match	AS/NZS 1580.601.1	Steel	150 × 100

TABLE 2
ACCEPTABILITY OF DEFECT IN A PAINT SYSTEM AFTER WEATHERING

Property	Methods of test	Acceptance rating after 48 months
Checking	AS/NZS 1580.481.1.7	0
Cracking	AS/NZS 1580.481.1.8	0
Blistering	AS/NZS 1580.481.1.9	0
Flaking and peeling	AS/NZS 1580.481.1.10	0
Visible corrosion of substrate metal	AS 1580.481.3	0

SECTION 3 PACKAGING AND LABELLING

3.1 PACKAGING

The product shall be packaged in sound, clean and dry containers constructed of a material that is inert to the contents and sufficiently robust to withstand normal conditions of handling and storage without rupture or leakage. The container shall be capable of being readily resealed so as to be gastight.

Containers shall comply with statutory requirements relevant to the transport and storage of flammable liquids as specified in the current edition of the Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code).

NOTES:

- 1 AS 2854 and AS 2905 refer to suitable containers for these products.
- 2 In New Zealand the ADG Code does not apply. In New Zealand, refer to NZS 5433.

3.2 LABELLING

The following information shall be legibly and durably marked on each container or on a label fixed securely to each container:

- (a) The name or registered mark of the manufacturer.
- (b) The words 'Aluminium paint' or other wording to this effect.
- (c) The contents of the container by volume, in litres.
- (d) The production or batch number that can be traced to the date of manufacture.
- (e) Any information required by statutory regulations.
- (f) Guidance on the use of the paint.
- (g) A warning that pressure build-up is possible with this paint and that care is required when opening the can.

NOTE: Manufacturers making a statement of compliance with this Joint Australian/New Zealand Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

APPENDIX A
PURCHASING GUIDELINES
(Informative)

A1 GENERAL

Australian/New Zealand Standards are intended to include the technical requirements for relevant products referred to in a particular Standard, but do not purport to comprise all the necessary provisions of a contract. This Appendix contains advice and recommendations on information to be supplied by the purchaser at the time of enquiry or order.

A2 INFORMATION TO BE SUPPLIED WITH THE ENQUIRY OR ORDER

At the time of enquiry or order, the following information should be supplied by the purchaser:

- (a) Reference number and title of the Standard, i.e., AS/NZS 3750.7, Paints for steel structures—Aluminium paint.
- (b) Intended method of application.
- (c) Quantity to be delivered.
- (d) Capacity of individual packs.
- (e) Any special packaging and marking requirements.
- (f) Delivery information.
- (g) Whether a certificate of compliance is required.

APPENDIX B
INFORMATION ON THE USE AND APPLICATION OF ALUMINIUM PAINT
(Informative)

B1 SCOPE

This Appendix provides information on the use and application of aluminium paints for steel structures.

B2 MANUFACTURER'S TECHNICAL DATA

The manufacturer's technical data sheets and labelling instructions should be studied before the product is used.

B3 SAFETY PRECAUTIONS

Aluminium paints may contain volatile flammable solvents. It is necessary to:

- (a) Read and follow the manufacturer's material safety data sheets for the product.
- (b) Protect the eyes and skin from contact with these paints by wearing suitable protective clothing and equipment.
- (c) Provide respiratory protection in confined spaces.
- (d) Ensure that proper procedures are observed in relation to the handling and storage of this flammable material.
- (e) Exercise caution when opening the can because of the possibility of pressure build-up.

NOTE: All relevant statutory regulations need to be observed.

B4 APPLICATION AND USE

Paint covered by this specification is intended for use as a finish coat on suitably prepared steel exposed to industrial or marine environments. It is primarily intended for spray application to ensure good leafing and brightness.

This paint is often specified as the top coat for conventionally primed tank farm, silo and roofing steelwork because the aluminium flake pigment does not chalk or significantly change colour.

Some paints may also show heat resistance to 200°C, thus they are also used on suitably primed steam pipes, boiler fronts and furnace structures.

B5 STORAGE CONDITIONS

When stored under cover in unopened containers in industrial situations, the paints or components should have a storage life of at least 12 months from date of manufacture.

Containers should preferably be stored out of direct sunlight away from heat and water.

Because the paints may contain flammable solvents, they should not be stored near naked flame or other sources of ignition.

APPENDIX C

MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS STANDARD

(Informative)

C1 SCOPE

This Appendix sets out the following different means by which compliance with this Standard can be demonstrated by the manufacturer or supplier:

- (a) Assessment by means of statistical sampling.
- (b) The use of a product certification scheme.
- (c) Assurance using the acceptability of the supplier's quality system.
- (d) Other such means proposed by the manufacturer or supplier and acceptable to the customer.

C2 STATISTICAL SAMPLING

Statistical sampling is a procedure that enables decisions to be made about the quality of batches of items after inspecting or testing only a portion of those items. This procedure will only be valid if the sampling plan has been determined on a statistical basis and the following requirements are met:

- (a) The sample must be drawn randomly from a population of product of known history. The history must enable verification that the product was made from known materials at essentially the same time by essentially the same processes and under essentially the same system of control.
- (b) For each different situation, a suitable sampling plan needs to be defined. A sampling plan for one manufacturer of given capability and product throughput may not be relevant to another manufacturer producing the same items.

In order for statistical sampling to be meaningful to the customer, the manufacturer or supplier needs to demonstrate how the above conditions have been satisfied. Sampling and the establishment of a sampling plan should be carried out in accordance with AS 1199.1 guidance to which is given in AS 1199.0.

C3 PRODUCT CERTIFICATION

The purpose of product certification is to provide independent assurance of the claim by the manufacturer that products comply with the stated Australian, New Zealand or international Standard.

The certification scheme should meet the criteria of an ISO Type 5 scheme as specified by HB 18.44 (SANZ HB18.44) in that, as well as full type testing from independently sampled production and subsequent verification of conformance, it requires the manufacturer to maintain an effective quality plan to control production to ensure conformance with the relevant Standard.

The certification scheme serves to indicate that the products consistently conform to the requirements of the Standard.

C4 SUPPLIER'S QUALITY SYSTEM

Where the manufacturer or supplier can demonstrate an audited and registered quality management system complying with the requirements of the appropriate or stipulated Australian or international Standard for a supplier's quality system(s), this may provide the necessary confidence that the specified requirements will be met. The quality assurance requirements need to be agreed between the customer and supplier and should include a quality or inspection and test plan to ensure product conformity.

Guidance in determining the appropriate quality management system is given in AS/NZS ISO 9000 and AS/NZS ISO 9004.

C5 OTHER MEANS OF ASSESSMENT

If the above methods are considered inappropriate, determination of compliance with the requirements of this Standard may be assessed based on the results of testing coupled with the manufacturer's guarantee of product conformance.

Irrespective of acceptable quality levels (AQLs) or test frequencies, the responsibility remains with the manufacturer or supplier to supply products that conform to the full requirements of the Standard.

Table 1 summarizes mandatory requirements for the product specified by this Standard; however, because of the unduly long duration of some tests, e.g., natural weathering and the storage tests, not all tests are performed on each batch.

To ensure performance levels are maintained between batches, a schedule of tests, such as the following, should always be carried out:

AS/NZS 1580.103.1: Examination and preparation of samples for testing

AS/NZS 1580.205.2: Application properties—Conventional spraying

AS 1580.401.5: Hard dry condition—Sanding test

AS/NZS 1580.601.1: Colour—Visual comparison

AS 1580.603.1: Finish—General appearance

NOTE: Laboratories certified under an accreditation scheme registered by the Joint Accreditation System for Australia and New Zealand are equipped to conduct the tests referred to in this Standard.

APPENDIX D
REFERENCED DOCUMENTS
(Normative)

AS

1199	Sampling procedures for inspection by attributes
1199.0	Part 0: Introduction to the ISO 2859 attribute sampling system
1199.1	Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
1580	Paints and related materials—Methods of test
1580.301.2	Method 301.2: Non-volatile content by volume (volume solids)
1580.401.5	Method 401.5: Hard dry condition—Sanding test
1580.481.3	Method 481.3: Exposed to weathering—Degree of corrosion of coated metal substrates
1580.603.1	Method 603.1: Finish—General appearance
1627	Metal finishing—Preparation and pretreatment of surfaces
1627.4	Part 4: Abrasive blast cleaning of steel
2854	Tinplate cans for general use
2905	Steel drums
HB 18.44	Guidelines for third-party certification and accreditation
	Guide 44: General rules for ISO or IEC international third-party certification schemes for products

AS/NZS

1580	Paints and related materials—Methods of test
1580.101.1	Method 101.1: Conditions of tests—Temperature, humidity and airflow control
1580.101.5	Method 101.5: Conditions of test—Temperature and humidity controlled
1580.103.1	Method 103.1: Examination and preparation of samples for testing
1580.104.1	Method 104.1: Recommended materials for test panels
1580.205.1	Method 205.1: Application properties—Brushing
1580.205.2	Method 205.2: Application properties—Conventional spraying
1580.205.3	Method 205.3: Application properties—Roller coating
1580.211.1	Method 211.1: Degree of settling
1580.211.2	Method 211.2: Ease of manual re-incorporation
1580.401.1	Method 401.1: Surface dry condition
1580.403.1	Method 403.1: Scratch resistance
1580.404.1	Method 404.1: Recoating properties
1580.455.1	Method 455.1: Resistance to water at room temperature
1580.457.1	Method 457.1: Resistance to natural weathering
1580.481.1.7	Method 481.1.7: Coatings—Exposed to weathering—Degree of checking
1580.481.1.8	Method 481.1.8: Coatings—Exposed to weathering—Degree of cracking
1580.481.1.9	Method 481.1.9: Coatings—Exposed to weathering—Degree of blistering
1580.481.1.10	Method 481.1.10: Coatings—Exposed to weathering—Degree of flaking and peeling
1580.601.1	Method 601.1: Colour—Visual comparison
2310	Glossary of paint and painting terms
2312	Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings

3750	Paints for steel structures
3750.19	Part 19: Metal primer—General purpose
AS/NZS ISO	
9000	Quality management systems—Fundamentals and vocabulary
9004	Quality management systems—Guidelines for performance improvement
ADG Code	Australian code for the transport of dangerous goods by road and rail
NZS	
5433	Transport of Dangerous Goods on Land

APPENDIX E

PREPARATION OF PANELS FOR TESTING RESISTANCE TO WATER AND WEATHERING

(Normative)

E1 SCOPE

This Appendix sets out the procedure for the preparation of panels for testing resistance of aluminium paints to water and weathering.

E2 TEST PANEL MATERIAL

Test panels shall be of low carbon steel complying with AS/NZS 1580.104.1 and be of 1.2 mm minimum thickness.

E3 COATING OF PANELS

The procedure shall be as follows:

- (a) Blast clean both sides of each panel to the Class 21/2 requirements of AS 1627.4 using fresh garnet abrasive blast material.
- (b) Prepare the test panel in accordance with the general requirements of AS/NZS 1580.457.1. Spray one coat of primer, according to AS/NZS 3750.19, to a dry film thickness of 35–50 µm.
- (c) Allow to air-dry in accordance with AS/NZS 1580.101.1 for 24 h.
- (d) Apply a coat of aluminium paint to a dry film thickness of 25–35 µm.
- (e) Allow to air-dry in accordance with AS/NZS 1580.101.1 for 24 h.
- (f) Apply a second coat of aluminium paint to a dry film thickness of 25–35 µm and allow to dry for 7 d in accordance with AS/NZS 1580.101.1 before testing.

NOTES

Standards Australia

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Standards New Zealand

The first national Standards organization was created in New Zealand in 1932. The Standards Council of New Zealand is the national authority responsible for the production of Standards. Standards New Zealand is the trading arm of the Standards Council established under the Standards Act 1988.

Australian/New Zealand Standards

Under a Memorandum of Understanding between Standards Australia and Standards New Zealand, Australian/New Zealand Standards are prepared by committees of experts from industry, governments, consumers and other sectors. The requirements or recommendations contained in published Standards are a consensus of the views of representative interests and also take account of comments received from other sources. They reflect the latest scientific and industry experience. Australian/New Zealand Standards are kept under continuous review after publication and are updated regularly to take account of changing technology.

International Involvement

Standards Australia and Standards New Zealand are responsible for ensuring that the Australian and New Zealand viewpoints are considered in the formulation of international Standards and that the latest international experience is incorporated in national and Joint Standards. This role is vital in assisting local industry to compete in international markets. Both organizations are the national members of ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission).

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GPO Box 476 Sydney NSW 2001
Phone (02) 9237 6000
Fax (02) 9237 6010
Email mail@standards.org.au
Internet www.standards.org.au
SAI Global Customer Service
Phone 13 12 42
Fax 1300 65 49 49
Email sales@sai-global.com



Level 10 Radio New Zealand House
155 The Terrace Wellington 6001
(Private Bag 2439 Wellington 6020)
Phone (04) 498 5990
Fax (04) 498 5994
Customer Services (04) 498 5991
Information Service (04) 498 5992
Email snz@standards.co.nz
Internet www.standards.co.nz

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