



Adhesives—For bonding gypsum plaster linings to wood and metal framing members



AS 2753:2018

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- Australian Paint Manufacturers Federation
- Gypsum Board Manufacturers of Australasia
- Housing Industry Association

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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee BD-011, Interior Board Linings, to supersede AS 2753—1985, *Adhesives — Mastic — For bonding gypsum linings to wood and metal framing members*.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to specify requirements for adhesives intended for bonding gypsum plaster linings to timber and metal framing members.

Test requirements and test methods for the adhesive used for the application of all thicknesses of gypsum linings are also covered. The specification provides a basis for ensuring the quality of adhesives. In service compatibility of the adhesive with metal framing material has been covered by including a pH requirement.

The changes in this edition are as follows:

- (a) Expanding the scope, performance requirements and testing methods to cover all adhesives suitable for installation of gypsum linings in accordance with AS/NZS 2589.
- (b) Updated references to and requirements for timber and metal framing test specimens.
- (c) Improvements in test methods.

Statements expressed in mandatory terms in notes to tables are deemed to be requirements of this Standard.

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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Adhesives—For bonding gypsum plaster linings to wood and metal framing members

Section 1 Scope and general

1.1 Scope

This Standard specifies requirements for adhesives intended for bonding the back surface of gypsum plasterboard or fibre-reinforced gypsum plaster sheet (together gypsum linings) to timber framing members and to metal framing members comprising zinc and zinc alloy coated steel.

1.2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

AS 1157.1, *Methods of testing materials for resistance to fungal growth, Part 1: General principles of testing*

AS 1157.10, *Methods of testing materials for resistance to fungal growth, Part 10: Resistance of dried or cured adhesives and glues to fungal growth*

AS 1321.7, *Methods for sampling and testing adhesives, Part 7: pH value of aqueous extracts of uncured adhesives and of their components, and of cured adhesive films*

AS 1397, *Continuous hot-dip metallic coated steel sheet and strip — Coatings of zinc and zinc alloyed with aluminium and magnesium*

AS 1720.2, *Timber structures, Part 2: Timber properties*

AS 2193, *Calibration and classification of force-measuring systems*

AS 2754.2, *Adhesives for timber and timber products, Part 2: Polymer emulsion adhesives*

AS/NZS 1604.1, *Specification for preservative treatment — Sawn and round timber*

AS/NZS 2269.0, *Plywood — Structural, Part 0: Specifications*

AS/NZS 2588, *Gypsum plasterboard*

AS/NZS 2589, *Gypsum linings — Application and finishing*

NZS 3602, *Timber and wood-based products for use in building*

NZS 3640, *Chemical preservation of round and sawn timber*

1.3 Definitions

For the purpose of this Standard, the following definitions apply:

1.3.1

framing member

1.3.1.1

timber

timber as used in framing in accordance with NZS 3602 or AS 1720

1.3.1.2**metal**

zinc or zinc alloy coated steel as used in framing in accordance with AS 1397

Note 1 to entry: Users are referred to manufacturer guidance where gypsum linings are to be adhesively attached to other materials.

1.3.2**fully cured**

an applied adhesive is fully cured after drying or chemical reaction is completed, to achieve an ultimate equilibrium state, set or hardness

1.3.3**may**

indicates the existence of an option

1.3.4**plaster linings****1.3.4.1****gypsum plasterboard**

a machine-made plaster lining in accordance with AS/NZS 2588

1.3.4.2**fibre-reinforced gypsum plaster**

a gypsum product that forms a stiff body with one surface suitable for decoration

1.3.5**preservation treatment**

timber treated in accordance with AS 1604.1 or NZS 3640

1.3.6**shall**

indicates that a statement is mandatory

1.3.7**should**

indicates a recommendation

1.3.8**wetting**

the ability of a liquid or paste to maintain contact with a solid surface, see [Appendix C](#)

1.4 Alternative systems

Alternative methods of assembly and procedures that are not specified in this Standard may be used, provided it can be demonstrated that the result or alternative system satisfies the requirements of this Standard.

Section 2 Sampling and testing**2.1 Sampling**

The testing regimes shall comprise a minimum of three test specimens.

2.2 Test conditions

Unless otherwise specified, all mixing and testing of the adhesive shall be carried out at a temperature of $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and a relative humidity of $50\% \pm 5\%$. The adhesive shall be mixed and used as prescribed by the supplier.

Section 3 Test requirements

3.1 Test materials

3.1.1 Plaster lining

The tests specified in this Standard use gypsum plasterboard in accordance with AS/NZS 2588 as a gypsum lining.

NOTE Other gypsum linings, such as fibre reinforced gypsum plaster sheet, may also be used.

3.1.2 Framing members

3.1.2.1 Timber

Timber species used for framing members shall be radiata pine (knot free clears) as outlined in Table 2 of NZS 3602 or in accordance with AS 1720.2. The bonding face of test specimens shall be dressed. Both preservation treated and untreated specimens are permitted. The following applies to treated specimens:

- (a) For Australia, specimens shall be treated in accordance with AS 1604.11 to Hazard Class H2.
- (b) For New Zealand, specimens shall be treated in accordance with NZS 3640 to Hazard Class H1.2.

The treatment type and method of manufacturer shall be specified in the report.

NOTE 1 Dressed timber has been machine finished and is smooth.

NOTE 2 Some timber treatment additives may detrimentally affect adhesive bond performance, refer with treatment supplier.

3.1.2.2 Metal

Material framing material used in this Standard shall conform to AS 1397.

3.2 Consistency/sag resistance

The adhesive shall be uniform, homogenous mixtures, free of lumps exceeding 1 mm diameter and be of uniform consistency. When applied to a wall or ceiling framing member in accordance with AS/NZS 2589, the adhesive shall exhibit a consistency capable of ensuring non-sagging properties. Its sag resistance shall be determined in accordance with the method in [Appendix A](#). The sag resistance shall be such that the adhesive does not drop off from the plasterboard for at least 15 min at temperatures of $4\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and $45\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

3.3 Open assembly time

The adhesive shall not dry out quickly and shall remain workable for at least 30 min, to enable the user sufficient time to apply the gypsum lining. The ability of the adhesive to transfer after a specified open assembly time shall be determined in accordance with the method in [Appendix B](#). The sum of the area where adhesive transfer has occurred and where liner-board failure has occurred shall exceed 75 % of the adhered surface of the 50 mm × 50 mm gypsum plasterboard piece.

3.4 Wetting characteristics

The adhesive shall wet the framing member. The wetting characteristics of the adhesive shall be determined in accordance with the method in [Appendix C](#). The adhesive shall fail 100 % cohesively.

3.5 Bond strength in shear

3.5.1 After 24 h and 14 days drying

The bond strength in shear of the adhesive shall be determined in accordance with the method in [Clause D.2](#) or [Clause D.3](#) of [Appendix D](#), as appropriate. Each assembly shall be —

- (a) not less than 100 kPa after 24 h conditioning; and
- (b) not less than 300 kPa after 14 days conditioning.

3.5.2 After cyclic ageing

The bond strength in shear of the adhesive after cyclic ageing shall be determined in accordance with the method in [Clause D.2](#) or [Clause D.3](#) of [Appendix D](#). The bond strength shall be not less than 220 kPa.

3.6 Bond maintenance

3.6.1 In shear under static load

The bond maintenance of the adhesive in shear under static load shall be determined in accordance with the method in [Appendix E](#). The assemblies shall support weight masses of —

- (a) 500 g for 24 h at $70\text{ °C} \pm 2\text{ °C}$; and
- (b) 2 kg for 24 h at $23\text{ °C} \pm 2\text{ °C}$.

3.6.2 In tension under static load and high humidity

The bond maintenance of the adhesive in tension under static load and high humidity shall be determined in accordance with the method in [Appendix F](#). No separation of the assemblies shall occur within 7 days.

3.7 Bond strength in tension after 24 h and 14 days drying

The bond strength in tension of the adhesive shall be determined in accordance with the method in [Appendix G](#). The bond strength shall be determined using —

- (a) timber or metal as specified (see [Clause 3.1.2](#)), and be not less than 100 kPa after 24 h drying or shall exhibit cohesive failure between the paper plies in the case of gypsum plasterboard; and
- (b) timber or metal as specified (see [Clause 3.1.2](#)), and be not less than 190 kPa after 14 days drying or shall exhibit cohesive failure between the paper plies in the case of gypsum plasterboard.

3.8 Bridging characteristics

The adhesive shall be capable of maintaining a bridged condition between the framing member and gypsum plasterboard after complete curing. The bridging characteristics of the adhesive shall be determined in accordance with the method in [Appendix H](#). The bridged adhesive shall tear paper from the back of the gypsum plasterboard in at least 90 % of the bonded area.

3.9 Flexibility after heat ageing

The adhesive shall remain flexible after drying out. The flexibility of the adhesive after heat ageing shall be determined in accordance with the method in [Appendix I](#). The adhesive shall not be embrittled, as evidenced by chipping, cracking or flaking after 500 h exposure.

3.10 Cyclic storage stability

The adhesive shall be capable of withstanding substantial variations in storage temperatures. After cycling and testing in accordance with [Appendix J](#), the adhesive shall conform with the requirements for consistency in [Clause 3.2](#). The shear strength shall be not less than the minimum specified in [Clause 3.5.1\(a\)](#).

3.11 Resistance to fungal growth

The fully cured adhesive shall be resistant to fungal growth in service. The resistance of the adhesive to fungal growth shall be determined in accordance with the method in AS 1157.10. The adhesive shall give a fungal rating of not greater than 1 in accordance with AS 1157.1.

3.12 pH of water-based adhesives

The pH of water-based adhesives as supplied shall be determined in accordance with the method in AS 1321.7. The pH of water-based adhesives shall be within the range 7–9.

Adhesive ingredients which may detrimentally affect the protective coating of metal framing shall be prohibited.

3.13 Shelf life

When stored at a temperature between 5 °C and 30 °C in an unopened, manufacturer's packaging, the adhesive shall conform to this Standard for a period of at least 1 year from the date of manufacture.

Section 4 Product information, labelling and packaging

4.1 Product information

All necessary information on bonding procedures such as mixing, spreading, pot life, open and closed assembly times, as well as on shelf life, and cleaning instructions shall be supplied.

4.2 Labelling and packaging

4.2.1 Labelling

Each container shall be labelled in accordance with the relevant statutory regulations. The container label shall include the following:

- (a) The manufacturer's name or trade name or mark.
- (b) The batch number.
- (c) The calendar date by which the adhesive has to be used.
- (d) The intended purpose, i.e. whether for —
 - (i) untreated timber;
 - (ii) treated timber (and treatment);
 - (iii) treated and untreated timber;
 - (iv) metal framing member; or
 - (v) timber and metal framing.

4.2.2 Packaging

The adhesive shall be packed in suitable airtight containers, protected where necessary by an outer pack to prevent damage in transport.

NOTE Manufacturers who place the number of this Standard on adhesive containers, on packaging or on related literature should ensure that the product is manufactured to conform with or meet the requirements of this Standard.

4.3 Report

The complete identification of the adhesive and substrate(s) tested, including adhesive form, type, source and manufacturer's code number shall be reported.

NOTE A sample template for a composite test report is given in [Appendix M](#).

Appendix A (normative)

Method for determining sag resistance

A.1 Scope

This Appendix sets out the method for determining the sag resistance of adhesive used for bonding gypsum plaster linings to framing members.

A.2 Principle

A specified volume of the adhesive is applied to a gypsum plasterboard piece which is placed horizontally with the adhesive mass hanging vertically downwards. Its sag resistance is determined by its ability to remain on the plasterboard for a specified time.

A.3 Apparatus and materials

The following apparatus and materials are required:

- (a) A split template of suitable non-corrosive material, generally as shown in [Figure A.1](#), 10 mm $\pm$ 0.25 mm thick, with a 25 mm $\pm$ 0.25 mm diameter hole.
- (b) A square-ended stainless steel spatula.
- (c) Three gypsum plasterboard pieces, approximately 250 mm $\times$ 150 mm.
- (d) Approximately 50 mm long piece of straight 1.00 mm nominal external diameter metal wire.
- (e) Oven and refrigerator.
- (f) Timing device.

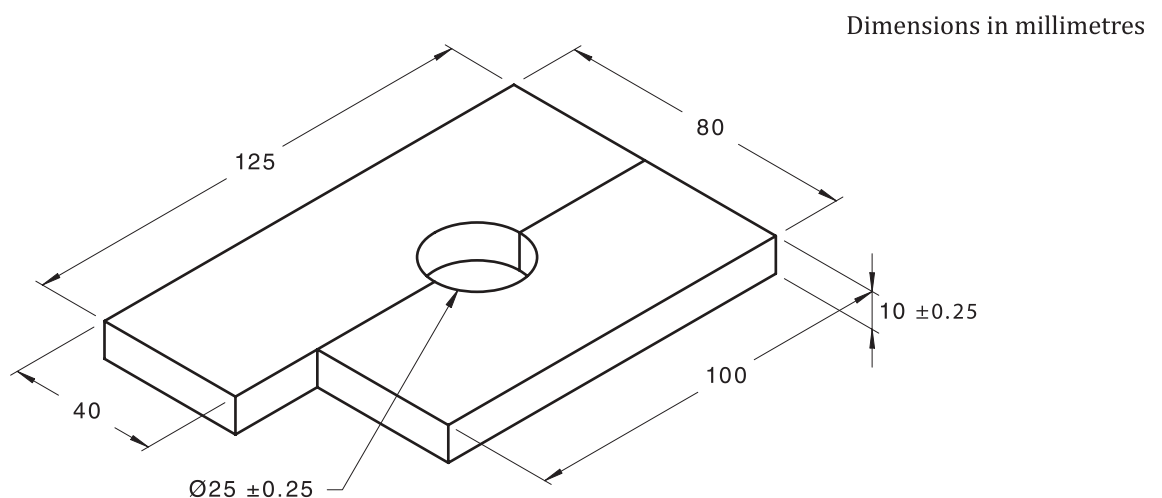


Figure A.1 — Split template

A.4 Conditioning

The adhesive and test equipment shall be conditioned at each test temperature, i.e. $4\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and $45\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ for 24 h before testing.

A.5 Procedure

The procedure shall be as follows for each test temperature:

- (a) Open the new container of adhesive.
- (b) Place the template on the gypsum plasterboard piece and fill the hole with adhesive using the spatula, taking care to wet the gypsum plasterboard piece with the adhesive and to avoid including any air bubbles with the adhesive.

NOTE Care should be taken to ensure that the split template is not allowed to separate during filling.

- (c) Press the adhesive into the hole in the template with the spatula and strike off level.
- (d) Using the straight piece of metal wire held vertically, separate the adhesive from the template, removing first one half and then the other half of the template. Take care not to undercut the cylinder of adhesive formed.
- (e) Within 30 s of starting to apply the adhesive, turn the gypsum plasterboard piece over so that the cylinder of adhesive hangs vertically downwards. Support the gypsum plasterboard pieces on blocks in the conditioned atmosphere free from vibration.
- (f) Repeat this procedure for each test temperature.

A.6 Test report

The report shall include whether or not the adhesive has remained on the plasterboard piece for 15 min, for each test temperature.