

Australian/New Zealand Standard[®]

**Plastic roof and wall cladding
materials**

**Part 4: Unplasticized polyvinyl
chloride (uPVC) wall cladding
boards**

STANDARDS AUSTRALIA
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STANDARDS NEW ZEALAND
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This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee PL/22, Plastic Building Sheets. It was approved on behalf of the Council of Standards Australia on 25 August 1995 and on behalf of the Council of Standards New Zealand on 28 August 1995. It was published on 5 December 1995.

The following interests are represented on Committee PL/22:

Australian Building Codes Board
Australian Institute of Building Surveyors
Building Research Association of New Zealand
CSIRO, Division of Building, Construction & Engineering, Australia
Composites Institute of Australia
Housing Industry Association, Australia
Plastics and Chemicals Industry Association, Australia
Plastics Institute of New Zealand
University of Adelaide
WorkCover Authority of N.S.W.

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PREFACE

This standard was prepared by the Joint Australian/New Zealand Standards Committee (JANZSC) for Plastic Building Products in accordance with AS 2520—1987 (in part), Legislative Instruments (L.I.) 1995/100, and the following:

This standard applies to uPVC wall cladding boards. It is intended that a uniform appearance will be achieved by compliance with this standard in 1995.

This standard is one of a series of standards for plastic roof and wall cladding materials which will be published in the near future.

Australian/New Zealand Standard[®]

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Part 4: Unplasticized polyvinyl chloride (uPVC) wall cladding boards

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PREFACE

This Standard was prepared by the Joint Australia/New Zealand Standards Committee PL/22 on Plastic Building Sheets to supersede AS 2920—1987 (in part), *Unplasticized polyvinyl chloride (uPVC) wall cladding*.

This Standard applies to uPVC wall cladding boards. It is anticipated that a surface distortion test will be called up by amendment to this Standard in 1996.

This Standard is one of a series of Standards for plastic roof and wall cladding materials which, when complete, will comprise:

AS/NZS

- 4256 Plastic roof and wall cladding materials
- 4256.1 Part 1: General requirements
- 4256.2 Part 2: Unplasticized polyvinyl chloride (uPVC) building sheets
- 4256.3 Part 3: Glass-fibre reinforced polyester (GRP)
- 4256.4 Part 4: Unplasticized polyvinyl chloride (uPVC) wall cladding and boards (this Standard)
- 4256.5 Part 5: Polycarbonate*

These Standards are to be used in conjunction with the series of test methods for plastic building sheets which, when complete, will comprise:

AS/NZS

- 4257 Plastic roof and wall cladding materials—Methods of test
- 4257.0 Part 0: General introduction and list of methods
- 4257.1 Method 1: Determination of dimensional properties
- 4257.2 Method 2: Determination of dimensional stability at 60°C
- 4257.3 Method 3: Determination of mass per unit area of sheet
- 4257.4 Method 4: Determination of diffuse light transmission
- 4257.5 Method 5: Determination of glass-fibre content
- 4257.6 Method 6: Determination of impact resistance
- 4257.7 Method 7: Determination of colourfastness, light transmission and impact resistance following ultraviolet light exposure
- 4257.8 Method 8: Determination of residual styrene
- 4257.9 Method 9: Determination of bending strength and modulus of elasticity*

It is issued as a Joint Standard under the terms of the Active Cooperation Agreement between Standards Australia and Standards New Zealand.

In New Zealand, technical requirements for building construction are contained in New Zealand Building Code and the Building Regulations. The following Code clauses are, or may be, relevant in respect to plastic building sheets: B1 Structure, C3 Spread of Fire, E2 External Moisture, E3 Internal Moisture, F2 Hazardous Buildings Materials, G7 Natural Light, H1 Energy Efficiency.

The term 'informative' has been used in this Standard to define the application of the appendix to which it applies. An 'informative' appendix is only for information and guidance.

* In course of preparation.

CONTENTS

		<i>Page</i>
1	SCOPE	4
2	APPLICATION	4
3	REFERENCED DOCUMENTS	4
4	DEFINITIONS	5
5	COMPOSITION	5
6	CLASSIFICATION	5
7	WORKMANSHIP	5
8	DIMENSIONAL REQUIREMENTS	5
9	DURABILITY	6
10	TEST REQUIREMENTS	7
11	MARKING	7
APPENDIX A MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS STANDARD		8

Originated as part of AS 2920—1987.
Revised and redesignated in part as AS/NZS 4256.4:1995.

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STANDARDS AUSTRALIA

Australian Standard

Plastic roof and wall cladding materials

Part 4: Unplasticized polyvinyl chloride (uPVC) wall cladding boards

1 SCOPE This Standard specifies requirements for uncoated, opaque, uPVC sheets extruded and formed into profiles for use with accessories as external wall cladding.

NOTES:

- 1 This Standard deals primarily with uPVC weatherboard-style wall cladding.
- 2 Methods for determining compliance with this Standard are given in Appendix A.

2 APPLICATION This Standard is intended to apply to uPVC wall cladding attached to new construction wall structures or over existing walls in accordance with AS 2921. It shall be read in conjunction with AS/NZS 4256.1.

3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- | | |
|---------|---|
| 1199* | Sampling procedures and tables for inspection by attributes |
| 1399* | Guide to AS 1199—Sampling procedures and tables for inspection by attributes |
| 1745* | Outdoor weathering of plastics in the Australian environment |
| 1745.1* | Part 1: Commercial products |
| 2464 | Methods of testing thermal insulation |
| 2464.6 | Part 6: Steady-state thermal transmission properties by means of the guarded hot plate |
| 2921 | Unplasticized polyvinyl chloride (uPVC) wall cladding—General installation requirements |

AS/NZS

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| 4256 | Plastic roof and wall cladding materials |
| 4256.1 | Part 1: General requirements |
| 4257 | Plastic roof and wall cladding materials—Methods of test |
| 4257.1 | Method 1: Determination of dimensional properties |
| 4257.6 | Method 6: Determination of impact resistance |
| 4257.7 | Method 7: Determination of colourfastness, light transmission and impact resistance following ultraviolet light exposure |
| 4257.9 | Method 9: Determination of bending strength and modulus of elasticity |
| ISO 9000 | Quality management and quality assurance standards |
| ISO 9000.1 | Part 1: Guidelines for selection and use |
| ISO 9004 | Quality management and quality system elements |
| ISO 9004.1 | Part 1: Guidelines |

* These Standards have been approved by the New Zealand Standards Council for use in New Zealand.

SAA/SANZ

HB18* Guidelines for third-party certification and accreditation

HB18.44* Guide 44—General rules for ISO or IEC international third-party certification schemes for products

4 DEFINITIONS For the purpose of this Standard, the definitions given in AS/NZS 4256.1 and those below apply.

4.1 Accessories—other products required to complete the finished wall system.

4.2 Cladding—any material used to face a building or structure.

4.3 Thickness—thickness of the material constituting the wall of the cladding as distinct from the thickness of the profile. See Figure 1(a), (b) and (c).

NOTE: The material maybe of a fine cellular texture or the cladding may be double-walled.

5 COMPOSITION Cladding manufactured to this Standard shall comprise polyvinyl chloride resins and additives to which surface treatments may be applied.

6 CLASSIFICATION For the purpose of this Standard, cladding shall be classified as follows:

(a) **Type A** is cladding with a transverse bending stiffness greater than or equal to 1.0 Nm^2 .

(b) **Type B** is cladding with a transverse bending stiffness less than 1.0 Nm^2 .

Values of transverse bending stiffness shall be determined in accordance with AS/NZS 4257.9.

Type A cladding can be fixed directly to structural framing. Type B cladding can only be used when fully and continuously supported over structural framing or over existing walling. Refer Figure 1 for cladding classifications.

7 WORKMANSHIP The sheet shall be uniform in colour, translucency or opacity and finish and shall be substantially free of defects affecting appearance or serviceability including scratches, dents, die-lines, blisters, bubbles, bulges, waves, ripples, crazing or inclusions.

NOTE: Defects described in this Clause cannot be completely quantified. Where the presence, size or frequency of any of these are considered to be of concern, agreements should be made between the purchaser and the manufacturer. This may be achieved by the provision of acceptable type samples.

Where defects are present and the product is submitted for acceptance, the manufacturer should be able to demonstrate fitness for purpose.

8 DIMENSIONAL REQUIREMENTS

8.1 Length When measured in accordance with AS/NZS 4257.1, the tolerance on a nominated length of any cladding shall be $+10, -0 \text{ mm}$.

8.2 Width When measured in accordance with AS/NZS 4257.1, the tolerances on width shall be as follows:

(a) On a nominated width of cladding $\pm 2 \text{ mm}$.

(b) Individual measurements of width shall not vary from the mean determination of width by more than $\pm 1 \text{ mm}$ per 100 mm of width.

* These Standards have been approved by the New Zealand Standards Council for use in New Zealand.

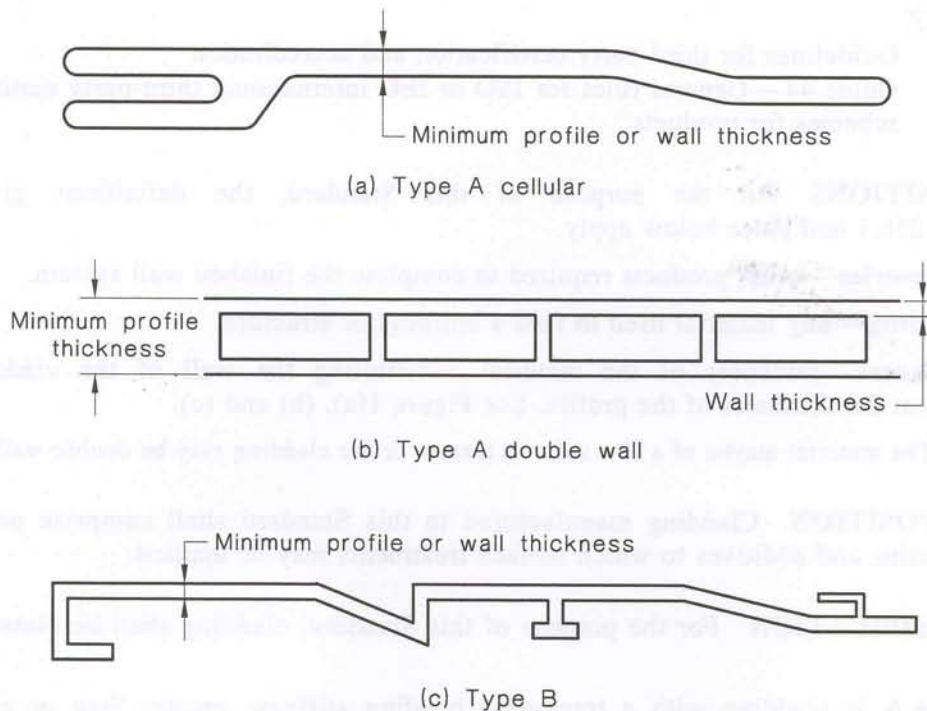


FIGURE 1 CLADDING CLASSIFICATIONS

8.3 Thickness When measured in accordance with AS/NZS 4257.1, the minimum wall thickness of the exposed cladding area shall not vary from the nominal thickness, as specified by the manufacturer, by more than -10%.

8.4 Squareness The corners of the sheet shall conform to a right angle so that the gap between a side of the sheet and a true right angle shall not exceed 5 mm for each metre run of width. In addition, the difference in the measurement of the diagonals, as measured at the corners of a sheet, shall not exceed 15 mm.

8.5 Straightness When measured in accordance with AS/NZS 4257.1, straightness of cladding shall not deviate by more than 5 mm for any 1 m of length.

9 DURABILITY Where a claim of life expectancy is made, it shall be based upon outdoor exposure testing, in accordance with the method described in AS 1745.1 and predicted according to AS 1745.2. Such life expectancy shall relate to climatic zones corresponding to, or less severe than, the test exposure site over the duration of the exposure test. Until specified in AS 1745, the climatic areas for exposure of specimens in New Zealand shall be chosen according to the areas defined as follows:

- (a) For compliance in the alpine zones, exposure shall occur at an altitude above 1200 m in the North Island and above 1000 m in the South Island.
- (b) For compliance in specific non-alpine climatic areas, exposure shall occur in an appropriate area having a mean daily global radiation value for the exposure period not less than 15% below that for which compliance is sought. For example exposure in Invercargill would be unsuitable for compliance in Auckland because the mean daily global radiation in Invercargill is more than 15% below that for Auckland.

After natural exposure, the sheet shall comply with Clause 6 and have an impact resistance of 1.96 J at 23°C, when tested in accordance with AS/NZS 4257.6.

Where accelerated weathering can be shown to give equivalent results to outdoor exposure for the material under assessment, life expectancy may be based upon those results.

10 TEST REQUIREMENTS

10.1 General Where cladding has insulation added as an integral part of the sheet, measurements of transverse bending stiffness shall be made with the insulation removed.

10.2 Impact resistance When tested in accordance with AS/NZS 4257.6, using an impact energy of 9 J at 23°C and 6.8 at 0°C, the impact characteristics shall be such that the sheet shall have a true impact rate (TIR) below 10% at a confidence level of 90%. For double walled sheets failure in one wall shall constitute a failure of the sheet.

Failure is defined as fracture into a number of pieces or the development of a rupture (hole, tear, etc.), that is clearly visible when the sample is held up to a light source. Indentation may not constitute a failure. Where in doubt, the development of a rupture should be established by applying water to the impression left by the impactor. If water drips through the specimen within 60 s, a rupture is deemed to have developed.

10.3 Thermal conductance Where a claim of insulating properties is made, the thermal conductance is to be tested in accordance with AS 2464.6.

NOTE: The test specimen may be produced by butting and taping together flat sections cut from a representative sample of cladding.

10.4 Colourfastness and impact resistance following ultraviolet light exposure When tested in accordance with AS/NZS 4257.7, the exposed sheet shall comply with the following criteria:

- (a) Visual inspection shall show no evidence of surface cracking or crazing.
- (b) The increase in value (L^*) of the exposed specimen shall be not greater than four units compared to the unexposed specimens.
- (c) When tested using the impact energy and failure criteria defined in Clause 10.2, the 23°C impact resistance of the five exposed specimens shall be such that no test specimens shall fracture or develop a hole when struck.

11 MARKING Each sheet shall be legibly labelled or indelibly marked with the following information:

- (a) Manufacturer's name or registered mark.
- (b) The words 'TYPE A' or 'TYPE B', as appropriate.
- (c) Where a claim of durability is made in accordance with Clause 9, each sheet shall be permanently marked with the date of manufacture and the manufacturers name or registered marks.

NOTE: Manufacturers making a statement of compliance with this 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

MEANS FOR DEMONSTRATING COMPLIANCE WITH THIS STANDARD

(Informative)

A1 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.

A2 STATISTICAL SAMPLING Statistical sampling is a procedure which 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, guidance to which is given in AS 1399.

A3 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 SAA HB18.44 (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.

A4 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 9000.1:1994 and AS/NZS ISO 9004.1:1994.

A5 OTHER MEANS OF ASSESSMENT If the above methods are considered inappropriate, determination of compliance with the requirements of this Standard may be assessed by being 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 with the full requirements of the Standard.

Standards Australia

Standards Australia is an independent not-for-profit organization, established in 1922. It operates formally under a Royal Charter as the Standards Association of Australia and has recognition as the peak Standards body in Australia through a Memorandum of Understanding with the Commonwealth Government. The essence of its operation is to bring together individuals and organizations committed to a common objective—to establish Australian Standards as national benchmarks for products and services so as to enhance quality of life and industry efficiency.

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 an Active Cooperation Agreement 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 members of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC).

Membership and Information

A comprehensive range of services is provided to subscribing members of Standards Australia and Standards New Zealand. Up to date information on the latest local and international developments in standardization, priority access to publications and credit facilities are some of these services. Standards Australia's comprehensive Information Centres in Sydney and Melbourne, and Standards New Zealand's Wellington Centre, also provide reference access to Australian, New Zealand, Joint and international Standards as well as those applicable in overseas markets. Enquiries about subscribing membership are welcomed.

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