

AS 2767—1994
Reconfirmed 2016

Australian Standard[®]

Rigid plastic containers

This Australian Standard was prepared by Committee PK/30, Plastic Containers. It was approved on behalf of the Council of Standards Australia on 10 January 1994 and published on 18 April 1994.

The following interests are represented on Committee PK/30:

- Australian Fruit Juice Cordial Manufacturers Association
- Australian Institute of Petroleum
- Australian Institute of Packaging
- Australian Paint Manufacturers Federation
- Australian Road Transport Federation
- Council of Australian Food Technology Associations
- Department of Defence
- Grocery Manufacturers of Australia
- National Standards Commission
- Packaging Council of Australia
- Railways of Australia Committee
- The Plastic Industry Association

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This Standard was issued in draft form for comment as DR 89062.

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 2767—1994

Rigid plastic containers

RECONFIRMATION NOTICE

Technical Committee PK-025 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 11 November 2015.

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Australian Maritime Safety Authority
Australian Paint Manufacturers' Federation
Canmakers Institute of Australia
Printing Industries Association of Australia

NOTES

Australian Standard[®]

Rigid plastic containers

First published in part as AS K163—1967.
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PREFACE

This Standard was prepared by the Standards Australia Committee on Plastic Containers under the supervision of the Multitechnics Standards Policy Board to supersede AS 1936—1976, *Plastics containers for transport of materials* and AS 2767.1—1985, *Plastics containers (up to 5 litres capacity)*, Part 1: *Unplasticized PVC containers—Tolerances on capacity, dimensions and mass*.

Following the deregulation of sizes of containers in Australia, those Clauses of AS 2767.1 that specified sizes and tolerances became redundant and, in preparing this edition of this Standard, the committee decided to merge the contents of AS 2767.1 and AS 1936 to delete the container classifications, and to extend the range of incorporated test methods. For these reasons, and because the majority of the test methods are in outline form only, this Standard is extremely flexible in its application, and provides the basis for arriving at reliable specifications for any rigid plastic container having a capacity of up to and including 250 L or 400 kg.

This Standard is applicable to rigid plastic containers for non-dangerous goods and, with limitations, for dangerous goods. Some of the test methods in this Standard are similar or identical in principle to those specified in the ADG Code for rigid plastic containers for the transport of dangerous goods while others are supplementary. While it is required by regulations in all States and territories of Australia that containers used for the transportation of dangerous goods be tested strictly in accordance with the methods set out in the ADG Code, comply with the criteria of acceptance therein and meet certain other specific requirements, the supplementary tests provided in this Standard can be useful for the specification of such containers.

Even for non-dangerous goods it is important that minimum packaging specifications are established to ensure their safe transport and distribution. Where such goods can be expected to encounter extremes of temperature or pressure or where the value of the contained goods is high, it may be advisable to specify the use of rigid plastic containers that meet, or approximate to, dangerous goods requirements.

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

Australian Standard
Rigid plastic containers

1 SCOPE This Standard outlines test methods and certain performance requirements for rigid plastic containers manufactured by any method and having nominal capacities of up to and including 250 L or 400 kg.

It is applicable to containers for non-dangerous goods and, with limitations (see Preface), for dangerous goods.

NOTES:

- 1 The use of this Standard may involve exposure to hazardous materials, operations and equipment.

This Standard does not purport to address all the safety problems associated with its use. It is the responsibility of whoever uses it to consult and establish appropriate safety and health practices, and to determine the applicability of regulatory limitations prior to use.

- 2 Appendix A provides purchasing guidelines which may be specified by the purchaser at the time of enquiry or order.

2 REFERENCED AND RELATED DOCUMENTS The following documents are referred to in this Standard.

STANDARDS**AS**

1349	Bourdon tube pressure and vacuum gauges
1463	Polyethylene pipe extrusion compounds
2070	Plastics materials for food contact use
2070.1	Part 1: Polyethylene
2070.2	Part 2: Poly(vinyl chloride) (PVC) compound
2070.3	Part 3: Styrene plastics materials
2070.4	Part 4: Acrylonitrile plastics materials
2070.5	Part 5: Polypropylene
2070.6	Part 6: Colourants
2070.7	Part 7: Poly(vinylidene chloride) (PVDC)
2216	Glass and rigid plastics containers for poisonous substances
2400	Packaging
2400.1	Part 1: Glossary of packaging terms
2582	Complete, filled transport packages—Methods of test
2582.2	Method 2: Conditioning for testing
2582.3	Method 3: Stacking, compression test
2582.4	Method 4: Vertical impact test by dropping
2609	Materials used for the packaging of food and beverages—Methods for the assessment of odour and taint
2906	Fuel containers—Portable—Plastics and metal

ASTM

- D2561 Environmental stress-crack resistance of blow-molded polyethylene containers
- D2684 Permeability of thermoplastic containers to packaged reagents or proprietary products

BS

- 4839 Blow moulded polyolefin containers
- 4839.1 Part 1: Containers up to 5 litres capacity
- 4839.2 Part 2: Containers over 5 litres and up to 60 litres capacity

ACTDG (Advisory Committee on the Transport of Dangerous Goods)

ADG Code Australian code for the transport of dangerous goods by road and rail

Attention is drawn to the following related documents:

RELATED DOCUMENTS

ASTM

- E96 Water vapour transmission of materials
- D543 Resistance of plastic to chemical reagents
- D1434 Determining gas permeability characteristics of plastic film and sheeting
- D3985 Oxygen gas transmission rate through plastic film and sheeting using a coulometric sensor

3 DEFINITIONS For the purpose of this Standard, the definitions given in AS 2400.1 and those below apply:

NOTE: Certain of the definitions given in this Clause are illustrated, with respect to particular types of containers, as shown in Figure 1.

3.1 Capacity—the internal volume of a container as qualified in the definitions below.

3.1.1 Brimful capacity—the volume of water at $20 \pm 2^\circ\text{C}$ which can be filled into a container (without its primary closure) when oriented in a specified way (normally on its base).

3.1.2 Filled capacity—the volume of goods at $20 \pm 2^\circ\text{C}$ in a container.

3.1.3 Fillable capacity—the maximum volume of water at $20 \pm 2^\circ\text{C}$ that can fit into a container in its filling orientation (closed except for its primary filling opening) such that on fitting of the primary closure, adding more water would cause an overflow.

3.1.4 Internal capacity—the maximum volume of water at $20 \pm 2^\circ\text{C}$ that can fit into a container closed as for transport, excluding any non-intrusive recesses in the closure of the primary filling opening.

3.1.5 Nominal capacity—the volume of goods at $20 \pm 2^\circ\text{C}$ for which the container is designed.

NOTE: The Standing Committee on Trade Measurement (Packaging) specifies 20°C for determination of capacity.

3.2 Filling margin—the difference between brimful capacity and nominal capacity of a container, expressed as a percentage of the nominal capacity.

$$\text{Filling margin, (\%)} = \frac{\text{Brimful capacity} - \text{Nominal capacity}}{\text{Nominal capacity}} \times 100$$

NOTE: The difference may be expressed as the linear measurement between the two capacity levels.

3.3 Packaging—

- (a) in relation to liquid goods, a container having a capacity not exceeding 250 L; and
- (b) in relation to solid goods, a container holding, or capable of holding, not more than 400 kg of those goods in an undivided quantity.

Packaging includes any other components or materials necessary for a container to perform its containment function.

NOTE: For the purpose of this Standard the term ‘container’ is used synonymously with and in place of ‘packaging’, where appropriate.

3.3.1 Combination packaging—combination of packagings for transport purposes, consisting of one or more inner packagings secured in an outer packaging.

3.3.2 Composite packaging—a packaging consisting of an outer packaging and an inner receptacle, so constructed that the inner receptacle and the outer packaging form an integral packaging.

NOTE: Once assembled it remains an integrated single unit; it is filled, stored, transported and emptied as such.

3.3.3 Inner packaging—the container that is in contact with the goods.

3.3.4 Outer packaging—the outer protection of a composite or combination packaging together with any absorbent materials, cushioning and any other components used to contain and protect inner receptacles or inner packagings.

3.3.5 Sole packaging—a free-standing container which is used without the benefit of an outer protective packaging or supporting framework.

3.4 Ullage—the difference between the internal capacity of a container and the volume occupied by the contents, expressed as a percentage of the filled capacity of the container—

$$\text{i.e. Ullage, (\%)} = \frac{\text{Internal capacity} - \text{filled capacity}}{\text{Internal capacity}} \times 100$$

NOTE: Another definition commonly used by industry expresses ullage as a percentage of filled capacity rather than of internal capacity.

4 MATERIAL SELECTION AND CONTAINER CONSTRUCTION REQUIREMENTS

4.1 General Materials used in the manufacture of rigid plastic containers shall enable the container to comply with the requirements of this Standard.

NOTE: Section 4 may be waived at the discretion of the purchaser.

4.2 Product compatibility In some instances, packed product can degrade the packing material leading to chemical and physical changes which can affect the suitability of the container for its intended purpose. In particular, the expected life of the container may be decreased and any such decrease will probably be accelerated by increasing temperatures.

The term ‘product compatibility’ is used to refer to interaction between containers and the products packed in them. Compatibility is considered to exist between a container and the packed product if, within the intended shelf life of the package, the following criteria are met:

- (a) The relevant performance characteristics of the container remain within an appropriate range of values required by the purchaser, or as required by the regulatory authority.

- (b) The product is not contaminated, and does not suffer an essential component loss (e.g. a flavour change) due to absorption or subsequent transmission of this component from the product by the packaging material beyond an extent required by the purchaser. Changes in flavour, appearance, shelf life and purity in packed foodstuffs may need to be stipulated. AS 2070, Parts 1 to 7 defines additives permitted for plastic in contact with foodstuffs and AS 2609 defines methods for the assessment of odour and taint. Plastic containers suitable for food contact use shall use ingredients complying with the requirements of AS 2070, Parts 1 to 7.
- (c) Not less than the specified quantity of the product is contained.

Conduct of product compatibility testing is primarily the responsibility of the purchaser, and may be assessed by tests specified in Clauses 4.5 and 4.6.

Visual examination is of great importance as it may suggest that further investigations are required. Criteria which may prove useful include change in appearance, gloss, texture, and evidence of decomposition, discolouration, swelling, cloudiness, tack, rubber texture, crazing, bubbles and cracks.

4.3 Ultraviolet stabilizers Where required for dangerous and other goods, protection of packing materials against ultraviolet radiation shall be provided by the addition of carbon black or other suitable pigments or stabilizers. (See AS 2070, Parts 1 to 7 for food contact applications). These additives should be compatible with the contents and remain effective throughout the life of the container.

For polyethylene, the minimum level of ultraviolet protection shall be the equivalent of that provided by 0.3% by mass of benzophenone. Other types of ultraviolet stabilizers such as benzotriazoles and hindered amines may be employed, singly or in combinations, provided they confer a similar degree of protection to benzophenone type stabilizers. A further alternative is to add a minimum rate of 2.0% by mass of carbon black, of the type and dispersion specified in AS 1463.

Where use is made of carbon black, pigments or stabilizers other than those used in the manufacture of the previously tested plastic formulation, retesting shall be carried out if the carbon black or pigment content exceeds 3% by mass. The content of ultraviolet stabilizers is not limited except for food contact applications.

For materials other than polyolefins or, for additives other than benzotriazole, benzophenone, or carbon black, the manufacturer should demonstrate that the protection provided is not less than the minimum level for polyolefins described above.

In addition, the manufacturer should ensure that all materials and additives used are not less compatible with the intended contents than polyolefins with the additives described above.

4.4 Colour Some Standards and regulations require containers of specific colours, e.g. see AS 2216 and AS 2906.

4.5 Environmental stress cracking resistance The environmental stress cracking resistance of the container shall be tested in accordance with Appendix B.

4.6 Mass change of filling materials The mass change of filling materials shall be tested in accordance with Appendix C.

4.7 Brimful capacity The brimful capacity shall be tested in accordance with Appendix D. Table 4.1 gives typical minimum retail brimful capacities.

4.8 Internal capacity The internal capacity shall be tested in accordance with Appendix E.

4.9 External body dimension The external body dimensions shall be tested in accordance with Appendix F.

4.10 Finish dimensions The finish dimensions shall be tested in accordance with Appendix G.

4.11 Wall thickness The wall thickness shall be tested in accordance with Appendix H.

4.12 Opacity The opacity shall be tested in accordance with Appendix I.

4.13 Surface energy of plastic for adhesion of decorations The surface energy of plastic for adhesion of decorations shall be tested in accordance with Appendix J.

4.14 Surface flatness for decorations The surface flatness for decorations shall be tested in accordance with Appendix K.

4.15 Ink and label adhesion to decorated containers The ink and label adhesion to decorated containers shall be tested in accordance with Appendix L.

4.16 Product resistance of the decoration Decorated containers should maintain the quality and legibility of their decorations, which may include safety information, even after prolonged contact with their contents or other materials with which they may reasonably be expected to come into contact.

The product resistance of the decoration shall be tested in accordance with Appendix M.

4.17 Determination of electrostatic dust attraction by the container shall be tested in accordance with Appendix N.

4.18 Effectiveness of closures on plastic containers shall be tested in accordance with Appendix O.

4.19 Leakage through seams and walls of containers The leakage through the seams and walls of containers shall be tested in accordance with Appendix P.

4.20 Product resistance to internal hydraulic pressure The product resistance to internal hydraulic pressure shall be tested in accordance with Appendix Q.

4.21 Drop impact resistance The drop impact resistance of plastic containers shall be tested in accordance with Appendix R.

4.22 Handle strength Handle strength of plastic containers shall be tested in accordance with Appendix S.

4.23 Top load resistance The top load resistance of a plastic container shall be tested in accordance with Appendix T.

4.24 Toppling resistance The toppling resistance shall be tested in accordance with Appendix U.

4.25 Base rocking The test method for determining the degree to which a container might rock when standing on its base shall be tested in accordance with Appendix V.

5 MANUFACTURE

5.1 General Containers shall be manufactured to comply with performance requirements specified in Section 6.

5.2 Capacity Where appropriate, the capacity of a container shall comply with the uniform weights and measures legislation on packaging. For packaging of dangerous goods, limitations of particular packaging methods specified in the ADG Code apply.

5.3 Freedom from defects The container shall be free from manufacturing defects which could adversely affect its performance.

NOTE: Where the presence, size or frequency of any defect is considered to be of concern, arrangements should be made between the purchaser/regulatory authority/certifying body (as appropriate), and the manufacturer. This may be achieved by the provision of acceptable type samples or methods of test.

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

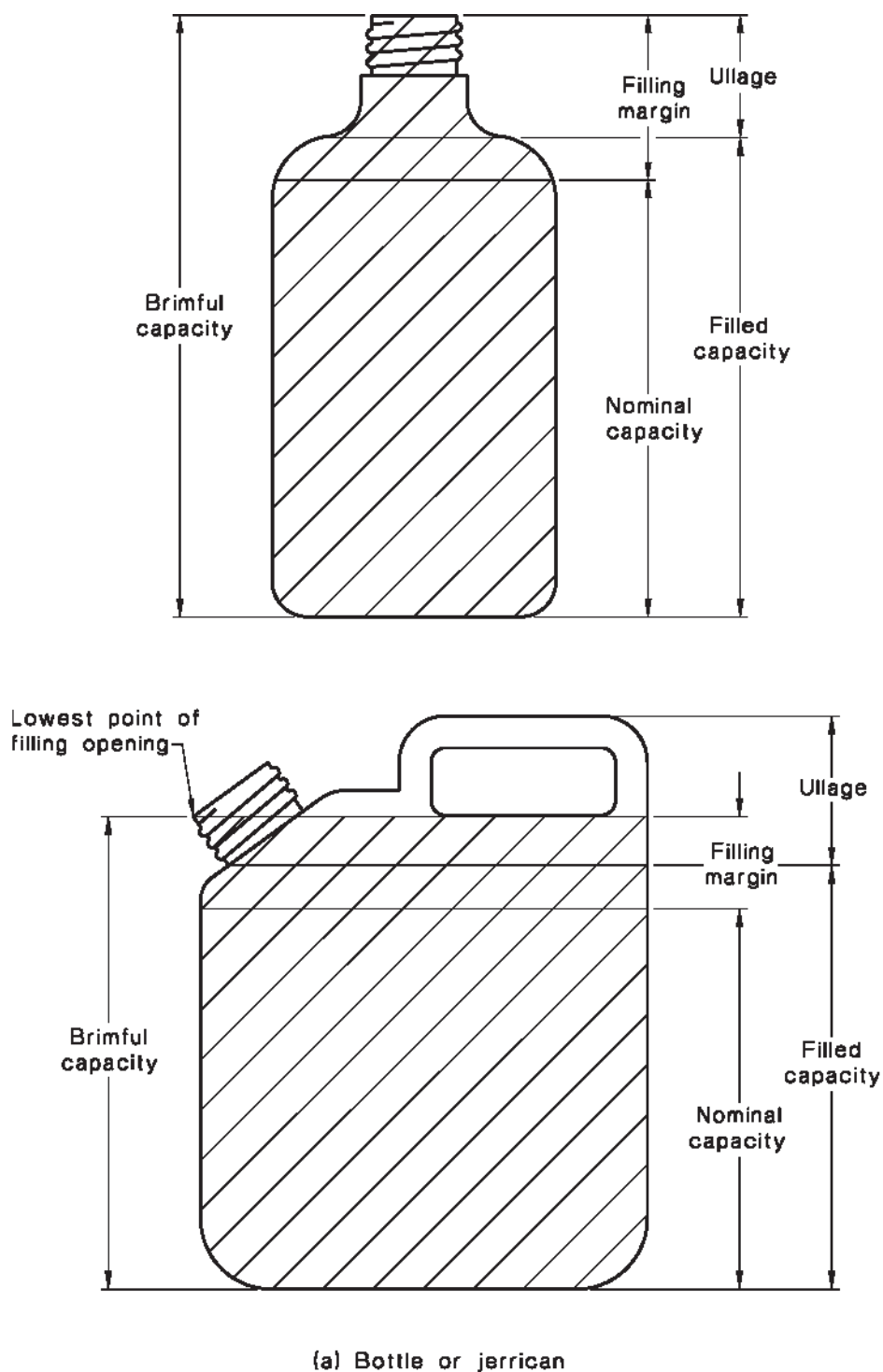
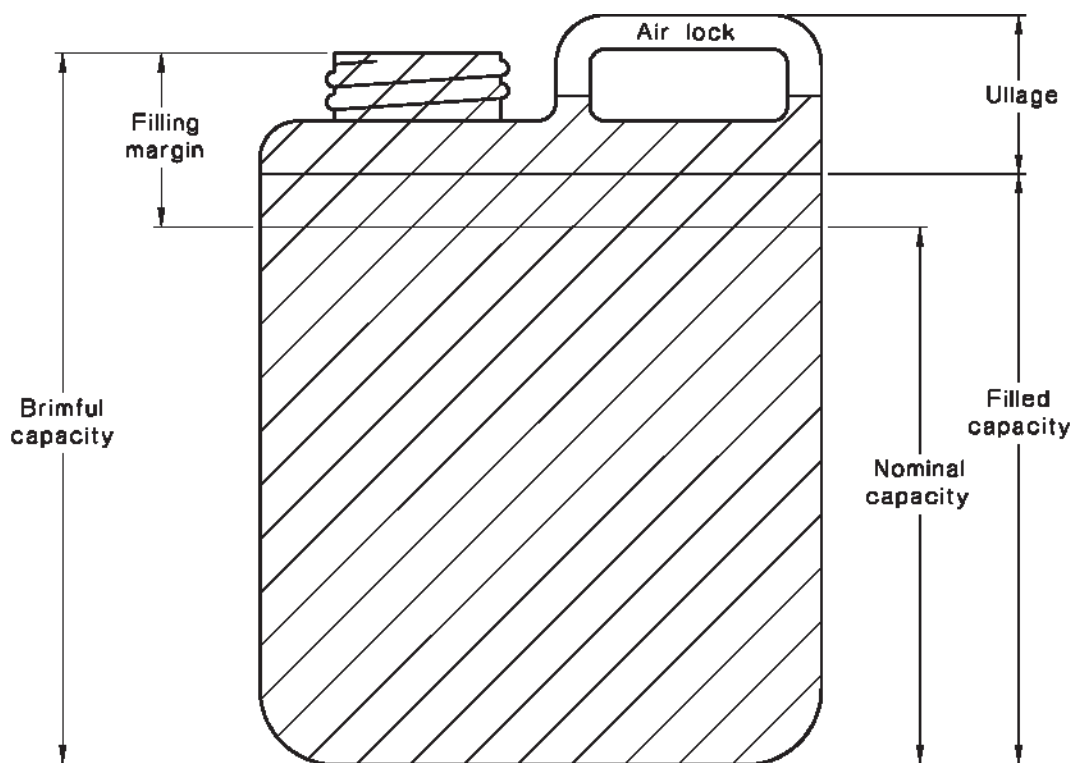
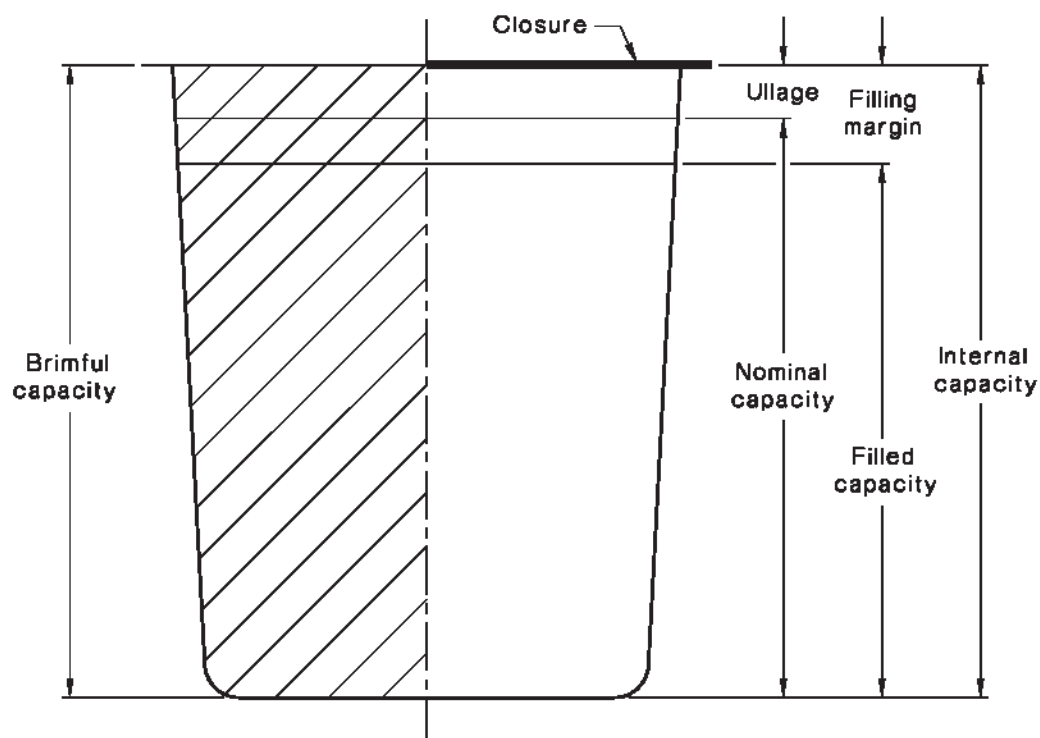


FIGURE 1 (in part) ILLUSTRATED DEFINITIONS

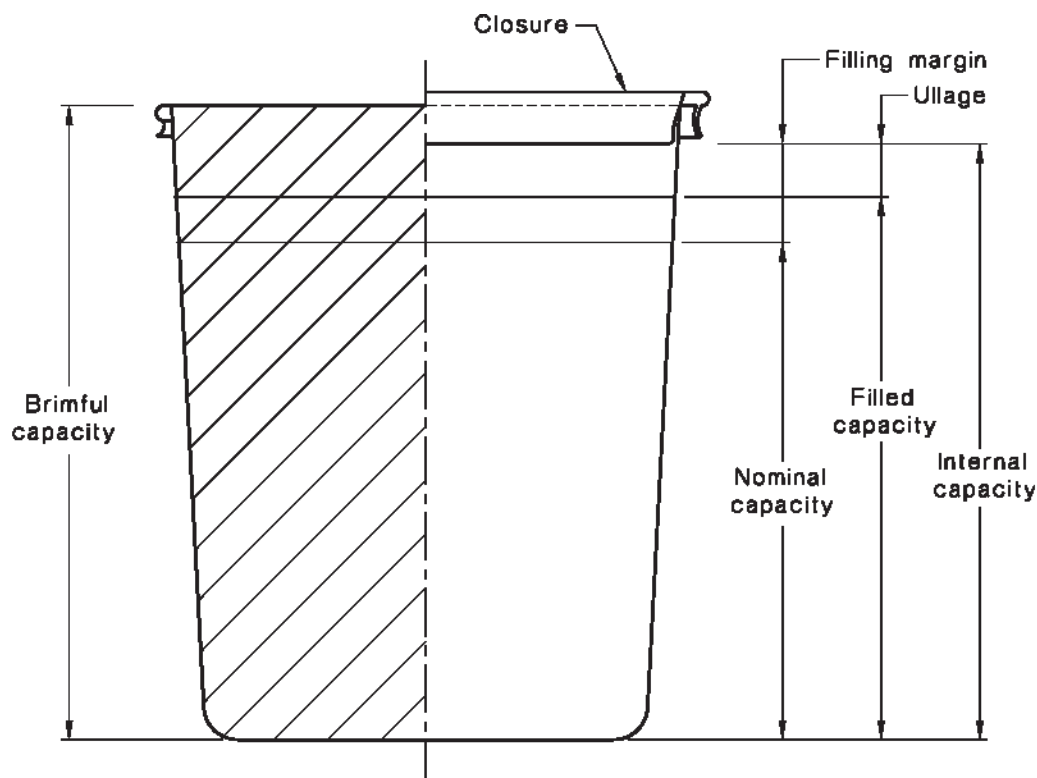


(b) Jerrican



(c) Cup or tub with flat closure adhered or welded to the container rim

FIGURE 1 (in part) ILLUSTRATED DEFINITIONS



(d) Tub or pail with enclosure that intrudes into the container

FIGURE 1 (in part) ILLUSTRATED DEFINITIONS

5.4 Ullage A minimum ullage may be required by regulation, or necessitated by the application for which the container is to be used.

6 PERFORMANCE CRITERIA

6.1 General Except where the final application of the container is dependent upon regulatory requirements, the performance criteria of containers as defined in Clauses 6.2 to 6.9 apply.

NOTES:

- 1 The requirement to perform any of these tests may be waived at the discretion of the purchaser.
- 2 Plastic containers do not achieve their ultimate mechanical properties for some time after moulding. For this reason, a period of 48 h should elapse between manufacture and testing for type approval, or for referee testing if disputes arise. Such a delay is clearly unacceptable for quality assurance purposes, and for such purposes it is therefore necessary to establish a correlation between results obtained in tests of containers immediately after moulding, and those obtained after the 48 h period.

6.2 Closures leakage When tested in accordance with Appendix O, containers shall not leak before the minimum time agreed with the purchaser.

6.3 Leakage When tested in accordance with Appendix P, containers shall not leak before the minimum time agreed with the purchaser for an agreed method and associated pressure.

6.4 Resistance to internal hydraulic pressure When tested in accordance with Appendix Q, containers shall not leak before the minimum time agreed with the purchaser for an agreed hydraulic pressure.

TABLE 4.1
TYPICAL MINIMUM RETAIL
BRIMFUL CAPACITIES

Nominal capacity mL	Brimful capacity min.* mL	Increase over nominal capacity %
5	N.S.	N.S.
10	N.S.	N.S.
15	N.S.	N.S.
20	22	+10
25	27	+8
50	54	+8
75	81	+8
100	108	+8
125	134	+7.2
150	160	+6.7
200	211	+5.5
250	263	+5.2
375	394	+5.1
500	525	+5.0
750	781	+4.1
1 000	1 035	+3.5
1 250	1 290	+3.2
1 500	1 544	+2.9
2 000	2 054	+2.7
2 500	2 563	+2.5
3 000	3 075	+2.5
4 000	4 100	+2.5
5 000	5 125	+2.5
>5 000	—	+2.5

* Consideration is to be given to the free space requirements under Deceptive Packaging Legislation.

N.S. Not specified.

6.5 Drop impact resistance When tested in accordance with Appendix R, containers shall not leak.

6.6 Handle strength When tested in accordance with Appendix S, the handle shall remain serviceable and the container shall not leak.

6.7 Top-load resistance The top-load resistance test shall be conducted in accordance with the method described in Appendix T, based on the principles specified in AS 2582.3. The determined load and deformation shall comply with any regulatory requirements and have an appropriate safety margin for the expected conditions of handling and storage.

6.8 Toppling resistance When tested in accordance with Appendix U, the tilt angle shall be appropriate to the conditions of use specified by the purchaser.

6.9 Base rocking When tested in accordance with Appendix V, the period of rocking shall not exceed 5 s.

APPENDIX A
PURCHASING GUIDELINES
(Informative)

A1 GENERAL Australian Standards are intended to include all technical requirements for relevant products, but do not purport to incorporate all of the necessary provisions of a contract. This Appendix contains advice and recommendations on the information to be supplied by the purchaser at the time of enquiry or order.

A2 INFORMATION TO BE SUPPLIED BY THE PURCHASER After making due reference to the explanations, advice and recommendations contained in this Appendix, the purchaser should, where appropriate, provide the following information at the time of enquiry or order:

- (a) Materials of construction and colours.
- (b) Level of compatibility between the product to be filled and the packaging materials.
- (c) Type(s) of closure.
- (d) Nominal, brimful and internal capacities.
- (e) Body and neck dimensions.
- (f) Decoration required.
- (g) Any particular markings required to comply with regulatory requirements.
- (h) Codes or regulations with which the container is required to comply.
- (i) Other relevant criteria drawn from this document.
- (j) Maximum and minimum mass of the container.
- (k) Manufacturer's name or registered trademark and the date of manufacture.

APPENDIX B

DETERMINATION OF ENVIRONMENTAL STRESS CRACKING RESISTANCE

(Normative)

B1 SCOPE This Appendix provides the structure of a test method for determining, under accelerated conditions, the environmental stress cracking resistance (ESCR) of plastic containers to filling materials. The actual parameters of the test should be appropriate to the intended end usage of the product.

B2 APPLICATION Under certain conditions of stress, and in the presence of environments such as soaps and wetting agents, plastic may exhibit mechanical failure by cracking at stresses appreciably below those that would cause cracking in the absence of these environments.

Results obtained from this test method may be used for estimating the shelf life of containers in terms of their resistance to environmental stress cracking, provided that this is done against a rigorous background of practical field experience and reproducible data.

This test is applicable to type testing only.

B3 PRINCIPLE The specimen is placed in an environment of controlled temperature, in contact with a wetting agent that may cause cracking.

B4 APPARATUS The following apparatus is required:

- (a) A circulating air oven capable of maintaining a temperature of either $60 \pm 2^\circ\text{C}$ or $40 \pm 2^\circ\text{C}$.
- (b) Polyethylene bags approximately 0.04 mm thick, to suit the test container size.
- (c) A means of weighing containers to an accuracy of 0.01%.

B5 TEST SAMPLES A minimum of 16 containers is required. Specimens shall be selected from each mould cavity. Specimens shall not be tested until at least 48 h after manufacture.

B6 CONDITIONING Specimens should be conditioned at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity.

B7 PROCEDURE The procedure shall be as follows:

- (a) Fill each specimen to one-half of its nominal capacity with the material to be packed.

NOTE: Other test materials may be used, as specified in ASTM D2561.

- (b) Apply each closure in such a way that a gastight seal is achieved. Either vented closures shall be replaced by similar non-vented closures or vents shall be sealed.
- (c) Place each specimen in a plastic bag and close the bag opening by folding or tying loosely. Do not heat-seal the bag.
- (d) Condition and weigh each specimen at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ relative humidity.
- (e) Place the specimens in the circulating air oven maintained at $60 \pm 2^\circ\text{C}$. Invert half the specimens during the period of test.

WARNING: SOME TEST LIQUIDS CAN CAUSE EXTREME PRESSURE BUILD-UP UPON HEATING. UNDER THESE CONDITIONS, CONTAINERS CAN RUPTURE WITH EXPLOSIVE FORCE.

NOTE: Where an accelerated test (at elevated temperatures) may not give a true indication of the long-term performance, the test should be conducted at an appropriate lower temperature.

- (f) Inspect each specimen after 1 d, 7 d, 14 d, 21 d and 28 d for visible failure, such as cracks or loss of internal pressure. Weigh each specimen at each inspection period, ideally after conditioning at $23 \pm 2^{\circ}\text{C}$ and 50% relative humidity.

B8 REPORT The following information shall be reported:

- (a) A full description of each specimen, including dimensions, design, material specification and previous history.
- (b) The number of specimens tested.
- (c) The filling materials used.
- (d) Conditioning and the test conditions.
- (e) The degree and location of any deformation or failure or visual evidence of loss of internal pressure in each specimen at each inspection period.
- (f) Changes in mass of each specimen.
- (g) Any observations which may assist in correct interpretation.
- (h) Date.
- (i) Signature of tester.
- (j) Reference to this test method, i.e. AS 2767, Appendix B.

APPENDIX C
DETERMINATION OF MASS CHANGE OF FILLING MATERIALS
(Normative)

C1 SCOPE This Appendix provides the structure of a test method for determining the mass change of the filling materials due to permeation of materials through plastic containers. The actual parameters of the test should be appropriate to the intended end usage of the product.

NOTE: This test method is based on ASTM D2684. Care should be taken in selection of appropriate materials. Some products packed in plastic have low boiling points; others may have vapour pressure at 60°C which exceeds the reduced pressure resistance.

C2 APPLICATION The method may be used for type testing or for quality control.

C3 PRINCIPLE The specimen is filled with an appropriate filling material and placed in a controlled environment of temperature and humidity; any weight loss or gain is recorded.

C4 APPARATUS The following apparatus is required:

- (a) A circulating air oven capable of maintaining a temperature of $60 \pm 2^\circ\text{C}$ and, if necessary, of maintaining relative humidity in a specified range.
- (b) A means of weighing containers to an accuracy of 0.01%.
- (c) A means of controlling the atmosphere at $23 \pm 2^\circ\text{C}$.

C5 TEST SAMPLE A minimum of 20 specimens is required. Specimens shall not be tested until at least 48 h after manufacture.

C6 CONDITIONING Specimens should be conditioned at $23 \pm 2^\circ\text{C}$ after manufacture. Other conditions may be used, depending on product to be packed.

C7 PROCEDURE The procedure shall be as follows:

- (a) Weigh and record the mass of each specimen with its closure fitted in position.
- (b) Remove closures and fill each specimen to its nominal capacity with the material to be packaged.
- (c) Re-weigh and record the mass of each specimen with the closure(s) in position. Apply each closure in such a way that a gastight seal is achieved. Either vented closures shall be replaced by similar non-vented closures or vents shall be sealed.
- (d) Place the specimens in the circulating air oven at $60 \pm 2^\circ\text{C}$; invert half the specimens during the period of test.

NOTE: Where an accelerated test (at elevated temperatures) may not give a true indication of long-term performance, then the test should be conducted at an appropriate lower temperature.

- (e) Weigh each specimen after 1 d, 7 d, 14 d, 21 d and 28 d. If consistent weighings are not obtained within 6 h from the time of removal, record the last mass and resume the test.

C8 REPORT The following information shall be reported:

- (a) A full description of each specimen, including dimensions, design, material specification and previous history.
- (b) The number of specimens tested.
- (c) The filling material used.
- (d) Conditioning and the test conditions.
- (e) The percentage change in mass for each specimen at each timed weighing.
- (f) A description of any change in the appearance of each specimen and of the filling material.
- (g) Any observation which may assist in correct interpretation.
- (h) Date.
- (i) Signature of tester.
- (j) Reference to this test method, i.e. AS 2767, Appendix C.

APPENDIX D
DETERMINATION OF BRIMFUL CAPACITY
(Normative)

D1 SCOPE This Appendix provides the structure of a test method for determining the brimful capacity of plastic containers. The actual parameters of the test should be appropriate to the intended end usage of the product.

D2 APPLICATION The method may be used for type testing or for quality control.

D3 PRINCIPLE The specimen is orientated in a specified way and filled with water through a specified opening until the water level reaches a strike disc placed over the opening. The volume of water used represents the brimful capacity.

D4 APPARATUS The following apparatus is required as appropriate:

- (a) A means of weighing specimens to an accuracy of 0.1% or better.
- (b) A means of conditioning specimens at $20 \pm 2^\circ\text{C}$.
- (c) A rigid, transparent plastic strike disc (see Figure D1).
- (d) A pipette.

D5 TEST SAMPLES At least three specimens shall be selected from each mould cavity. Specimens shall not be tested until at least 48 h after manufacture.

NOTE: Any earlier testing for quality control purposes will need to make allowance in the results for subsequent changes, e.g. shrinkage.

D6 CONDITIONING Specimens should be conditioned at $20 \pm 2^\circ\text{C}$. For specific applications, other conditions set out in AS 2582.2, may be used.

NOTE: The volumes determined using water at $20 \pm 2^\circ\text{C}$ may differ from those using actual goods, because of different hydrostatic pressures brought about by both different densities and container orientations during filling. These pressure differences may cause more or less deformation of the container walls.

D7 PROCEDURE The procedure shall be as follows:

- (a) Weigh—
 - (i) the empty container with any secondary closures firmly in place (m_1); and
 - (ii) where appropriate, a suitable size, rigid, transparent disc (m_2) (see Figures D1 and D2).
- (b) Stand the container on the weighing device in the required orientation, which will usually be on its base.
- (c) Fill the container with water to within approximately 3 mm of the brim. Allow to stand for 1 min.

NOTES:

- 1 Once filling has started, the container should not be disturbed from its specified orientation. Any airlocks should be left undisturbed (see Figure D2).
- 2 The time that the container is allowed to stand before final filling or top-up can influence the brimful capacity.