

AS/NZS 1838:1994

Australian/New Zealand Standard

**Swimming pools—Premoulded
fibre-reinforced plastics—
Design and fabrication**

STANDARDS AUSTRALIA 

STANDARDS NEW ZEALAND
Documents 



Document Sharing Hub

AS/NZS 1838:1994

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee PL/41, Glass Reinforced Swimming Pools. It was approved on behalf of the Council of Standards Australia on 16 August 1994 and on behalf of the Council of Standards New Zealand on 8 September 1994. It was published on 14 November 1994.

The following interests are represented on Committee PL/41:

Australian Fibreglass Pool Manufacturers
Australian Institute of Building Surveyors, N.S.W.
Building Services Corporation
Composites Institute of Australia, N.S.W.
Department of Consumer Affairs, N.S.W.
Swimming Pool and Spa Association of Australia

Review of Standards. To keep abreast of progress in industry, Joint Australian/New Zealand Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Joint Standards and related publications will be found in the Standards Australia and Standards New Zealand Catalogue of Publications; this information is supplemented each month by the magazines 'The Australian Standard' and 'Standards New Zealand', which subscribing members receive, and which give details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Joint Standards, addressed to the head office of either Standards Australia or Standards New Zealand, are welcomed. Notification of any inaccuracy or ambiguity found in a Joint Australian/New Zealand Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

AS/NZS 1838:1994

Australian/New Zealand Standard

Swimming pools—Premoulded fibre-reinforced plastics— Design and fabrication

First published in Australia as AS 1838—1975.
Second edition 1989.
Jointly revised and designated as Joint Standard
AS/NZS 1838:1994.

PUBLISHED JOINTLY BY:

STANDARDS AUSTRALIA
1 The Crescent,
Homebush NSW 2140 Australia

STANDARDS NEW ZEALAND
Level 10, Standards House,
155 The Terrace,
Wellington 6001 New Zealand

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee PL/41 on Glass Reinforced Swimming Pools to supersede AS 1838—1989.

This edition incorporates the following major changes to the previous edition:

- (a) Integrally moulded skimmer boxes are not accepted. A typical detail is given for a bolt-on type unit.
- (b) Minimum design soil loads are given for the design of the pool.
- (c) In-service performance requirements for surface degradation are set out.
- (d) The water resistance test is described using a temperature of 80°C instead of 100°C.

The installation of fibre-reinforced plastic pools to this Standard is covered by AS/NZS 1839, *Swimming pools—Premoulded fibre-reinforced plastics—Installation*.

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.

CONTENTS

	<i>Page</i>
1 SCOPE	3
2 REFERENCED DOCUMENTS	3
3 DEFINITIONS	3
4 MATERIALS	4
5 DESIGN CONSIDERATIONS	4
6 CONSTRUCTION REQUIREMENTS	7
7 PERFORMANCE REQUIREMENTS	8
8 MARKING	9
APPENDICES	
A DETERMINATION OF RESIN AND GLASS CONTENT OF CORROSION BARRIER AND STRUCTURAL LAYERS	10
B DESIGN GUIDANCE	12
C DYNAMIC LOAD TEST	13
D PREPARATION AND CONDITIONING OF TEST PANELS	15
E CHEMICAL-RESISTANCE TEST	16
F WATER-RESISTANCE TEST	18

© Copyright - STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Users of Standards are reminded that copyright subsists in all Standards Australia and Standards New Zealand publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia or Standards New Zealand may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia or Standards New Zealand. Permission may be conditional on an appropriate royalty payment. Australian requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia. New Zealand requests should be directed to Standards New Zealand.

Up to 10 percent of the technical content pages of a Standard may be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia or Standards New Zealand.

Inclusion of copyright material in computer software programs is also permitted without royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia or Standards New Zealand at any time.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard

**Swimming pools—Premoulded fibre-reinforced plastics—
Design and fabrication**

1 SCOPE This Standard specifies requirements for premoulded plastic swimming pools exceeding 7500 L in volume and 750 mm in depth, and constructed from fibre-reinforced plastics (FRP) based on thermosetting resin systems. It covers materials, design and performance requirements.

NOTE: For installation of swimming pools complying with this Standard, see AS/NZS 1839.

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

AS

- 1170 Minimum design loads on structures (known as the SAA Loading Code)
- 1170.4 Part 4: Earthquake loads
- 1580 Paints and related materials—Methods of test
- 1580.602.1 Method 602.1: Visual assessment of gloss
- 1886 Glossary of terms relating to plastics
- 1926 Swimming pool safety
- 1926.3 Part 3: Water recirculation and filtration systems
- 2132 Methods for the determination of the flexural properties of plastics
- 2818 Guide to swimming pool safety
- 3633 Private swimming pools—Water quality

AS/NZS

- 1839 Swimming pools—Premoulded fibre-reinforced plastics—Installation

NZS

- 4203 General Structural Design and Design Loading for Buildings
- 4441 Code of Practice for Swimming Pools

ISO

- 105 Textiles—Tests for colour fastness
- 105-A02 Part A02: Grey scale for assessing change in colour

ASTM

- D 2583 Test method for indentation hardness of rigid plastics by means of a Barcol impressor

For the purposes of this Standard where both an Australian Standard and a New Zealand Standard are referenced, the appropriate referenced Australian Standard shall be used where Australian conditions apply and the appropriate referenced New Zealand Standard shall be used where New Zealand conditions apply.

3 DEFINITIONS For the purpose of this Standard, the definitions given below and in AS 1886 apply.

3.1 Composite—the combination of the cosmetic layer, corrosion barrier, structural layer and outer surface layer (see Figure 1).

3.2 Concrete bond beam—the structural member that supports the pool shell and coping.

3.3 Coping—the horizontal rim or pool edge which is moulded integrally with the pool shell.

3.4 Corrosion barrier—a resin-rich layer immediately beneath the cosmetic gelcoat layer (see Figure 1).

3.5 Cosmetic layer—the layer in contact with the water (see Figure 1).

3.6 Outer surface layer—the layer which seals the back of the structural layer (see Figure 1).

3.7 Structural layer—the main body of the composite supplying the major part of the total strength (see Figure 1).

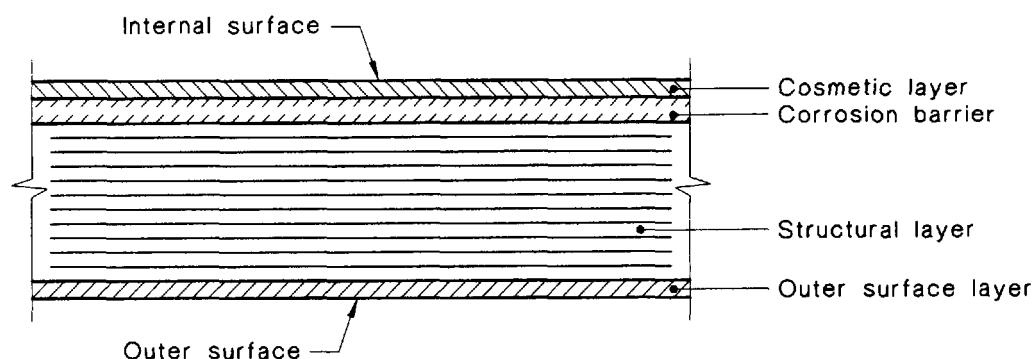


FIGURE 1 IDENTIFICATION OF COMPONENTS OF THE COMPOSITE

NOTE: Figure 1 is not to scale.

4 MATERIALS

4.1 Resin The resin component of all layers of the composite shall be an appropriate type of unsaturated polyester, epoxide, furan or vinylester resin.

4.2 Gelcoat The gelcoat forming the cosmetic layer shall be produced from a suitable resin.

4.3 Reinforcement The reinforcement shall be fibrous in nature, and readily wet and bound by the chosen resin system. Glassfibre reinforcement shall be drawn from 'E' glass with an alkali content less than 1% and which has been chemically sized and finished so as to be compatible with the resin system.

NOTE: Where the glassfibre content forms part of the specification for a swimming pool, Appendix A may be used to determine the glassfibre content of the corrosion barrier and structural layer.

4.4 Additives The gelcoat and resin may contain ultraviolet light stabilizers, pigments or dyes, and fillers to produce the required physical properties.

4.5 Use of alternative materials or methods This Standard shall not be interpreted so as to prevent the use of materials or methods of design or construction not specifically referred to herein.

5 DESIGN CONSIDERATIONS

5.1 General

5.1.1 Shape Swimming pool shapes shall be accurately defined by means of dimensioned drawings and shall comply with AS 2818 or NZS 4441 as appropriate.

5.1.2 Deflection and variations The design of the pool shall take into account the limits to the variations in shape and deflections specified in AS/NZS 1839. The design details (see Clause 6.8) shall clearly specify what deflections may be expected under the design loads.

5.1.3 Entry and exit from pool Swimming pools shall provide a means of entry and exit for pool users, which shall be moulded into the pool shell.

5.1.4 Slip-resistant surfaces Where a coping is wider than 100 mm, it shall have a slip-resistant surface.

5.1.5 Lifting points A sufficient number of lifting points shall be provided to enable the pool to be lifted and manoeuvred as required. The lifting points on any one side shall have a combined capacity of at least 1.5 times the weight of the pool shell.

5.1.6 Ties Where a concrete bond beam is a structural element of the pool, provision shall be made for structurally connecting the bond beam to the pool shell.

5.1.7 Skimmer box Skimmer boxes and suction points shall comply with AS 1926.3 or NZS 4441 as appropriate, and in no circumstances shall the integrally moulded fibreglass skimmer box be used.

For typical dimensions of a skimmer box, see Figure 2.

WARNING: WHEN CONSIDERING THE ARRANGEMENT OF THE SKIMMER BOX, SPECIAL CARE NEEDS TO BE TAKEN TO ENSURE THAT YOUNG CHILDREN ARE NOT TEMPTED TO SIT ON IT OR ON OTHER FILTRATION SYSTEM SUCTION POINTS. IN THE PAST, THIS PRACTICE HAS LED TO SERIOUS INJURIES AND, IN SOME CASES, TO DEATH BY DISEMBOWELMENT. IT HAS BEEN SHOWN THAT A REMOVABLE COVER DOES NOT PROVIDE SUFFICIENT PROTECTION AGAINST THIS KIND OF ACCIDENT.

5.1.8 Emptying the pool Specific details relating to emptying shall be provided in the booklet of pool use (see AS/NZS 1839), for use in situations where it may become necessary to drain the pool.

NOTE: The manufacturer or its representative should supply the pool owner with the booklet of pool use.

5.2 Pools for installation in the ground

5.2.1 Soil loadings The pool shall be designed so that it will withstand all likely external loadings that may be applied by the soil profile and backfill encountered at any typical location in which the shells are to be installed.

The design soil types shall be clearly stated on the design drawings.

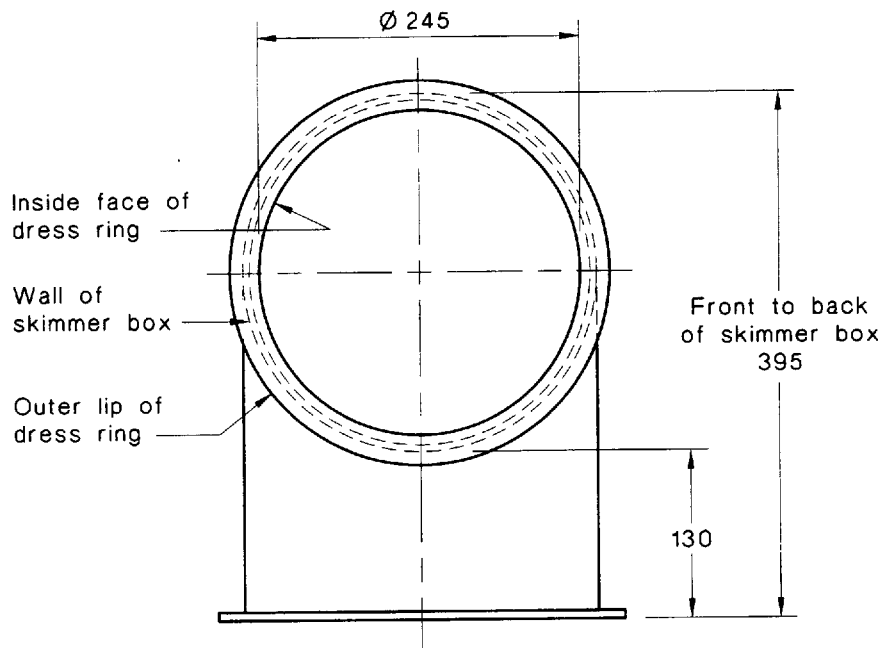
In no case shall the design horizontal pressure be less than—

- (a) 4.8 kPa per metre depth for sand only; and
- (b) 6.6 kPa per metre depth for clay and soil.

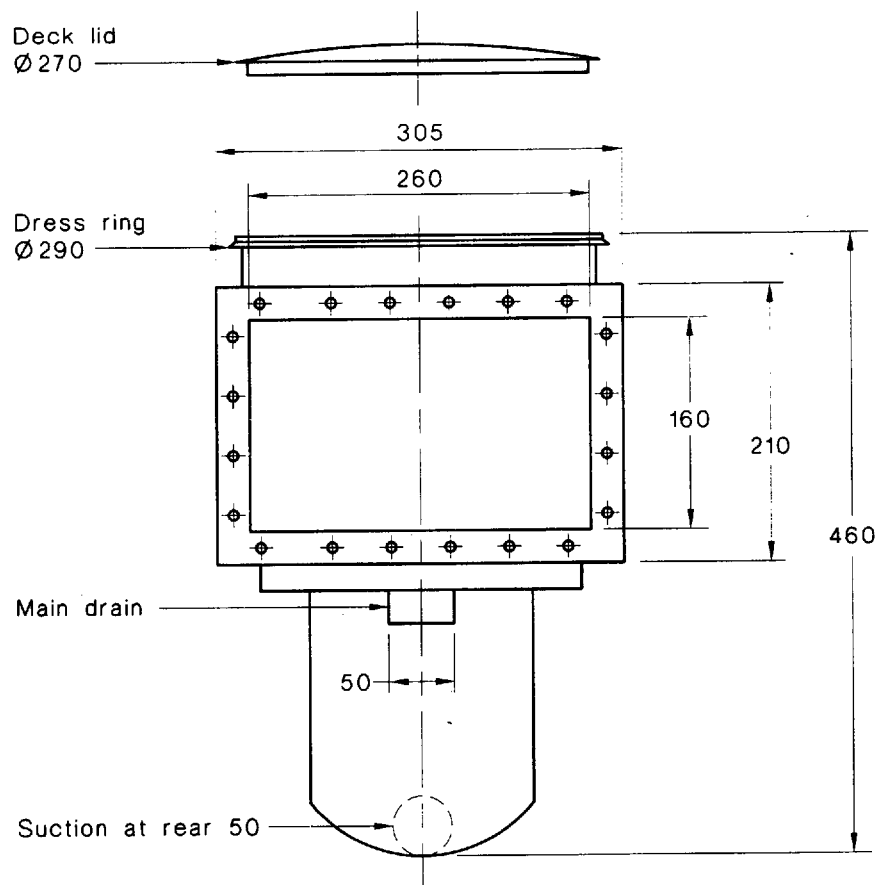
The pool, when full of water, shall be designed to resist the additional pressure from a surcharge of 2 kPa on the ground surrounding the pool.

NOTES:

- 1 For guidance on pool design, see Appendix B.
- 2 The values given in Items (a) and (b) apply only when there is no hydrostatic pressure.
- 3 The design values do not take account of loads due to heavy machinery and equipment. Where such loading may occur, it may be necessary to brace the walls.



(a) Top view



(b) Front view

DIMENSIONS IN MILLIMETRES

FIGURE 2 TYPICAL DIMENSIONS OF A SKIMMER BOX