

AS 1838:2021



STANDARDS
Australia



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



Currently in preview, click buy full version

AS 1838:2021

This Australian Standard® was prepared by PL-041, Glass Reinforced Swimming Pools. It was approved on behalf of the Council of Standards Australia on 1 March 2021.

This Standard was published on 12 March 2021.

The following are represented on Committee PL-041:

- Australian Fibreglass Manufacturers Group
- Australian Institute of Building Surveyors
- Composites Australia
- Engineers Australia
- Swimming Pool and Spa Association of Australia
- University of Southern Queensland

This Standard was issued in draft form for comment as DR AS 1838:2020.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

ISBN 978 1 76113 239 1

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

Originates as AS 1838—1975.

Second edition 1989.

Jointly revised and designated as AS/NZS 1838:1994.

Revised and redesignated as AS 1838:2021.

© Standards Australia Limited 2021

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Cth).

Preface

This Standard was prepared by the Standards Australia Committee PL-041, Glass Reinforced Swimming Pools, to supersede AS/NZS 1838:1994.

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

The objective of this document is to set out procedures for the design and fabrication of premoulded fibre-reinforced plastics (FRP) swimming pools.

The major changes in this edition are as follows:

- (a) Additions and amendments to scope (see [Clause 1.1](#)), normative references (see [Clause 1.2](#)) and to terms and definitions, see [Clause 1.3](#).
- (b) Additions and amendments to materials, see [Clause 2](#).
- (c) Additions and amendments to design (see [Clause 3](#)), including the addition of hydrodynamic loads.
- (d) Additions and amendments to construction requirements (see [Clause 4](#)), including the addition of clear and textured gelcoats.
- (e) Significant changes to performance requirements (see [Clause 5](#)) in conjunction with [Appendices E](#) and [F](#).
- (f) Addition of a new appendix providing external factors that affect in-service performance, see [Appendix G](#).

The terms “normative” and “informative” are used in Standards 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

Preface	ii
Section 1 Scope and general	1
1.1 Scope.....	1
1.2 Normative references.....	1
1.3 Terms and definitions.....	1
1.4 New design and innovation.....	3
Section 2 Materials	4
2.1 Resin.....	4
2.2 Gelcoat.....	4
2.3 Reinforcement.....	4
2.4 Additives.....	4
Section 3 Design	6
3.1 General.....	6
3.1.1 Shape.....	6
3.1.2 Deflection and variations.....	6
3.1.3 Entry and exit from pool.....	6
3.1.4 Textured surfaces.....	6
3.1.5 Lifting points.....	7
3.1.6 Ties.....	7
3.1.7 Water recirculation.....	7
3.1.8 Emptying the pool.....	7
3.2 Pools for installation in the ground.....	7
3.2.1 Soil loadings.....	7
3.2.2 Other loadings.....	8
3.3 Pools for installation above ground and partially exposed above ground.....	8
3.3.1 Water loading.....	8
3.3.2 Other loadings.....	8
3.3.3 Deflection under dynamic loading.....	9
3.4 Subpool drainage.....	9
3.5 Design of bond beam.....	9
3.5.1 Concrete.....	9
3.5.2 Other materials.....	9
3.6 Fibreglass coping.....	9
Section 4 Construction requirements	10
4.1 General composite.....	10
4.2 Cosmetic layers.....	10
4.3 Corrosion barrier layer(s).....	10
4.4 Synthetic core.....	11
4.5 Structural laminate.....	11
4.6 Outer surface layer.....	11
4.7 Cure.....	11
4.8 Freedom from defects.....	11
4.9 Design details.....	12
Section 5 Performance requirements	13
5.1 Material properties.....	13
5.2 Chemical-resistance rating.....	13
5.3 Water-resistance rating.....	13
5.4 Dynamic load test for pools installed above the ground.....	13
5.5 Acetone test.....	13
5.6 Barcol hardness.....	13
5.7 In-service performance.....	13
5.7.1 Chemical-fade resistance.....	13
5.7.2 Water-resistance.....	14

5.7.3 External factors.....	14
Section 6 Records and markings.....	15
6.1 Records.....	15
6.2 Markings.....	15
Appendix A (informative) Determination of resin and glass content of corrosion barrier and structural layers.....	16
Appendix B (informative) Design guidance.....	18
Appendix C (normative) Dynamic load test.....	20
Appendix D (normative) Preparation and conditioning of test panels.....	22
Appendix E (normative) Chemical-resistance test.....	23
Appendix F (normative) Water-resistance test.....	25
Appendix G (informative) External factors affecting in-service performance.....	29
Bibliography.....	32

Australian Standard®

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

Section 1 Scope and general

1.1 Scope

This document specifies requirements for premoulded plastic swimming pools exceeding 300 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 fibre-reinforced plastic pools and swimming pools conforming to this document, refer to AS 1839.

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 in this document.

AS 1170.4, *Structural design actions, Part 4: Earthquake actions in Australia*

AS 1839, *Swimming pools — Premoulded fibre-reinforced plastics — Installation*

AS 1926.3, *Swimming pool safety, Part 3: Water recirculation systems*

AS 3600, *Concrete structures*

ISO 178, *Plastics — Determination of flexural properties*

ASTM D 2583, *Test method for indentation hardness of rigid plastics by means of a Barcol impressor*

1.3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

1.3.1 at rest

state of soil condition prior to disturbance

1.3.2 bond beam

structural member that supports the coping

Note 1 to entry: See [Clause 3.5](#).

1.3.3 competent person

person who has acquired, through education, training, qualification or experience or a combination of these, the knowledge and skill enabling that person to perform the task required

Note 1 to entry: An example would be a professional engineer who is —

- (i) a corporate member of the Institution of Engineers, Australia; or
- (ii) eligible to become a corporate member of the Institution of Engineers, Australia, and has appropriate experience and competence in the relevant field.