AS 5146.2:2018

Australian STANDARD

Reinforced Autoclaved Aerated Concrete

Part 2: Design

STANDARDS Australia

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- Australian Institute of Building
- Building Designers Association of Australia
- Consult Australia
- CSIRO
- Engineers Australia
- Housing Industry Association
- National Precast Concrete Association Australia

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Australian Standard®

Reinforced Autoclaved Aerated Concrete

Part 2: Design

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PREFACE

This Standard was prepared by Standards Australia Committee BD-106, Autoclaved Aerated Concrete to supersede AS 5146.2:2015.

The objective of this Standard is to provide minimum requirements for the determination of the characteristic properties of Reinforced Autoclaved Aerated Concrete (AAC) members, for use in design in accordance with the requirements of AS 5146.1, *Reinforced autoclaved aerated concrete*, Part 1: *Structures*.

Statements expressed in mandatory terms in notes to tables and figures 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 appendices 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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FOREWORD

This Standard is to be read in conjunction with AS 5146.1 and AS 5146.3.

The members used in design may be—

(a) mass-produced members for incorporation into structures in accordance with common practice and details, the basic characteristic capacities of which are determined in accordance with Sections 2 to 8 and reported in accordance with Section 1 of this Standard; or

(b) customized members for incorporation into structures in a manner requiring particular design and detailing, the characteristic capacities of which are relevant to the particular structure and are determined in accordance with Sections 2 to 8.

The characteristic properties of Reinforced AAC may be determined in accordance with this Standard by either calculation (using basic properties of AAC and reinforcement) or by test.

Such values are typically the 95 percentile characteristic values, determined with at least 75 percent confidence, before the application of capacity reduction factors.

The capacity reduction factors are specified in AS 5146.1. Factors for design actions (commonly called load factors), for use when designing Reinforced AAC structures, are also specified in AS 5146.1.

This Standard specifies methods for determining characteristic values or mean values, which are similar to the methods set out in European Standard EN 12602:2008+A1:2013, *Prefabricated reinforced components of autoclaved aerated concrete*, with the following exceptions:

(i) This Standard does not permit the use of thermal prestress to enhance capacity.

(ii) This Standard does not permit the use of bond between AAC and steel reinforcement to enhance reinforcement anchorage.

(iii) This Standard requires design that differentiates between brittle failure bending capacity and ductile failure bending capacity.

This Standard has been written in a format compatible with Australian Standards that are in common use in Australia for determining design actions and other common materials. Some parts of this Standard (e.g. most of the nomenclature, formulae and detailed design) are the same as EN 12602:2008+A1. This has been done intentionally, to ensure that Reinforced AAC designs in accordance with EN 12602:2008+A1:2013 and this Standard may be used interchangeably. This ensures that Reinforced AAC members designed to one of the Standards can be verified relatively easily for use in locations where the other Standard is in common use. This similarity to EN 12602:2008+A1 is acknowledged by Standards Australia.

It has been necessary to prepare a suite of Australian Standards for Reinforced AAC, including this Standard, for the following reasons:

(A) EN 12602:2008+A1 includes European design actions and materials, which are not applicable in Australia. It is necessary to include reference to Australian Standards and Australian/New Zealand Standards for design principles, design actions, load factors, capacity reduction factors and materials testing.

(B) EN 12602:2008+A1 includes a partial capacity reduction factor approach, which is not compatible with the current approach common in Australian Standards.

(C) Additional formulae for the design for bending and definitions of ductile and brittle behaviour have been provided.

(D) Thermal prestress and bond between reinforcement and AAC have been excluded.

(E) Test details have been included in this Standard.

(F) The tests have been modified to suit referenced Australian Standards, Australian laboratory practice and the requirements of AS 5146.1 for certain design information. This Standard also provides for testing to the equivalent EN standards, with suitable modification of the reporting where necessary.

(G) This Standard has been written in a format compatible with Australian Standards and Australian/New Zealand Standards that are in common use in Australia for determining design actions and other common materials.

STANDARDS AUSTRALIA

Australian Standard
Reinforced Autoclaved Aerated Concrete

Part 2: Design

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements and sets out methods for the determination of the characteristic properties of Reinforced Autoclaved Aerated Concrete members (Reinforced AAC), with a thickness not less than 50 mm, for use in structures where the design and construction conform with AS 5146.1.

NOTES:

1 This Standard uses the term AAC (autoclaved aerated concrete material) and Reinforced AAC (wall, floor or roof panels or other members, consisting of AAC into which steel reinforcement has been cast).

2 Typical uses of Reinforced AAC include loadbearing and non-loadbearing wall panels for both internal and external use, fascias and cladding, roofs, floors, beams, lintels, piers, noise barriers and earth retaining structures.

3 This Standard does not cover the design or use of unreinforced AAC blocks.

4 This Standard does not cover the use of Reinforced AAC subject to dynamic loads, except loads due to earthquake.

5 This Standard does not cover finishes such as render, tiling, plasterboard and the like, fixings or supporting structures.

6 This Standard applies only to cases where—

(a) the design has been performed by an experienced structural engineer and design actions, material properties, section properties, bending moments, shears and deflections have been determined in accordance with the provisions of this Standard; and

(b) the execution of such work is carried out under the direction of appropriately qualified persons who are experienced in Reinforced AAC construction and who understand the structural requirements specified herein.

7 This Standard should not be interpreted in a way that prevents design using alternative materials or methods not specifically referred to herein. However, the design of such members is outside the scope of this Standard.

Means for demonstrating conformance with this Standard are given in Appendix AA.

1.2 NORMATIVE REFERENCES

The following are the normative documents referenced in this Standard.

NOTE: Documents referenced for informative purposes are listed in the Bibliography.

AS

1530 Methods for fire tests on building materials, components and structures

1530.4 Part 4: Fire-resistance test for elements of construction

2193 Calibration and classification of force-measuring systems

2702 Acoustics—Methods for the measurement of road traffic noise