



Reinforced Autoclaved Aerated Concrete

Part 2: Design



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 - Building Designers Association of Australia
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 - Housing Industry Association
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-

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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.

CONTENTS

	<i>Page</i>
FOREWORD.....	6
 SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE.....	8
1.2 NORMATIVE REFERENCES	8
1.3 DEFINITIONS.....	10
1.4 NOTATION.....	13
1.5 INFORMATION TO BE PROVIDED IN DESIGN DOCUMENTS.....	20
 SECTION 2 MATERIAL AND MEMBER PROPERTIES	
2.1 GENERAL.....	22
2.2 AAC DENSITY	22
2.3 AAC CHARACTERISTIC COMPRESSIVE STRENGTH	22
2.4 AAC CHARACTERISTIC FLEXURAL STRENGTH.....	22
2.5 AAC MODULUS OF ELASTICITY	23
2.6 AAC CREEP	23
2.7 AAC MOISTURE CONTENT.....	23
2.8 AAC DRYING SHRINKAGE	23
2.9 AAC THERMAL EXPANSION.....	23
2.10 AAC FREEZE-THAW PROPERTIES.....	23
2.11 STEEL REINFORCEMENT STRENGTHS AND ELONGATION.....	23
2.12 DIMENSIONS OF REINFORCED AAC MEMBERS	24
2.13 CORROSION PROTECTION OF STEEL REINFORCEMENT	24
2.14 STRENGTH OF WELDED JOINTS IN STEEL REINFORCEMENT	24
2.15 CHARACTERISTIC BENDING CAPACITY OF REINFORCED AAC MEMBERS.....	24
2.16 CHARACTERISTIC OUT-OF-PLANE SHEAR CAPACITY OF REINFORCED AAC MEMBERS AND JOINTS	24
2.17 CHARACTERISTIC IN-PLANE SHEAR CAPACITY OF REINFORCED AAC MEMBERS	25
2.18 CHARACTERISTIC IN-PLANE SHEAR CAPACITY BETWEEN LAYERS OF REINFORCED AAC MEMBERS	25
2.19 CHARACTERISTIC PUNCHING SHEAR CAPACITY OF REINFORCED AAC MEMBERS	25
2.20 CHARACTERISTIC AXIAL LOAD CAPACITY OF REINFORCED AAC MEMBERS	25
2.21 FIRE RESISTANCE LEVELS (FRLs) OF REINFORCED AAC MEMBERS	25
2.22 AAC THERMAL CONDUCTIVITY AND THERMAL RESISTANCE	25
2.23 AAC SOUND ATTENUATION.....	26
 SECTION 3 DETERMINATION OF AAC AND REINFORCEMENT PROPERTIES BY CALCULATION	
3.1 GENERAL.....	27
3.2 AAC DENSITY	27
3.3 AAC CHARACTERISTIC COMPRESSIVE STRENGTH	29
3.4 AAC CHARACTERISTIC FLEXURAL STRENGTH AND CHARACTERISTIC TENSILE STRENGTH	30
3.5 AAC MODULUS OF ELASTICITY AND POISSON'S RATIO	30
3.6 AAC CREEP	31

	<i>Page</i>
3.7 AAC DRYING SHRINKAGE	32
3.8 AAC THERMAL EXPANSION	33
3.9 STEEL REINFORCEMENT PROPERTIES	34
 SECTION 4 DETERMINATION OF REINFORCED AAC MEMBER ULTIMATE CAPACITIES BY CALCULATION	
4.1 GENERAL	35
4.2 CHARACTERISTIC BENDING CAPACITY OF REINFORCED AAC MEMBERS	37
4.3 CHARACTERISTIC OUT-OF-PLANE SHEAR CAPACITY OF REINFORCED AAC MEMBERS	40
4.4 CHARACTERISTIC BEARING CAPACITY AND PUNCHING SHEAR CAPACITY OF REINFORCED AAC MEMBERS	45
4.5 PRIMARY TORSION AND COMBINED PRIMARY TORSION AND SHEAR	48
4.6 CHARACTERISTIC IN-PLANE SHEAR CAPACITY OF REINFORCED AAC MEMBERS	50
4.7 CHARACTERISTIC SHEAR CAPACITY BETWEEN LAYERS OF REINFORCED AAC MEMBERS	51
4.8 CHARACTERISTIC AXIAL LOAD CAPACITY OF REINFORCED AAC MEMBERS	51
 SECTION 5 DETERMINATION OF REINFORCED AAC SERVICEABILITY CAPACITIES BY CALCULATION	
5.1 GENERAL	59
5.2 LIMITATION OF STRESSES UNDER SERVICEABILITY CONDITIONS	59
5.3 SERVICEABILITY LIMIT STATES OF CRACKING— BASIC CONSIDERATIONS	60
5.4 SERVICEABILITY LIMIT STATES OF DEFORMATION	60
 SECTION 6 DETERMINATION OF REINFORCED AAC FIRE RESISTANCE LEVELS (FRLs) BY CALCULATION	
6.1 GENERAL	64
6.2 REQUIREMENTS FOR THE DETERMINATION OF FRLs BY CALCULATION	64
 SECTION 7 DETERMINATION OF REINFORCED AAC THERMAL PROPERTIES BY CALCULATION	
7.1 GENERAL	65
7.2 DECLARATION OF AAC THERMAL CONDUCTIVITY AND THERMAL RESISTANCE	65
 SECTION 8 DETAILING	
8.1 GENERAL	66
8.2 TOLERANCES	66
8.3 DETAILING REINFORCEMENT	68
8.4 SUPPORT LENGTH	71
8.5 CHASES AND HOLES	72
8.6 DURABILITY	72
 APPENDICES	
A ASSESSMENT OF STRENGTH VALUES FROM TEST RESULTS	73
B DETERMINATION OF CHARACTERISTIC VALUE	75
C AAC MEAN DRY DENSITY	77

	<i>Page</i>
D AAC CHARACTERISTIC COMPRESSIVE STRENGTH	80
E AAC CHARACTERISTIC FLEXURAL STRENGTH	84
F AAC MODULUS OF ELASTICITY	88
G AAC CREEP	93
H AAC MOISTURE CONTENT	98
I AAC DRYING SHRINKAGE	101
J AAC FREEZE-THAW PROPERTIES	106
K DIMENSIONS OF REINFORCED AAC MEMBERS	111
L CORROSION PROTECTION OF STEEL REINFORCEMENT BY SALT BATH IMMERSION	114
M CORROSION PROTECTION OF STEEL REINFORCEMENT BY COVER MEASUREMENT	118
N STRENGTH OF WELDED JOINTS IN STEEL REINFORCEMENT	120
O STEEL STRESSES IN UNLOADED AAC MEMBERS	122
P CHARACTERISTIC BENDING CAPACITY OF REINFORCED AAC MEMBERS	125
Q CHARACTERISTIC OUT-OF-PLANE SHEAR CAPACITY OF REINFORCED AAC MEMBERS AND JOINTS	132
R CHARACTERISTIC IN-PLANE SHEAR CAPACITY OF REINFORCED AAC MEMBERS	137
S CHARACTERISTIC IN-PLANE SHEAR CAPACITY BETWEEN LAYERS OF REINFORCED AAC MEMBERS	144
T CHARACTERISTIC PUNCHING SHEAR CAPACITY OF REINFORCED AAC MEMBERS	148
U CHARACTERISTIC AXIAL LOAD CAPACITY OF REINFORCED AAC MEMBERS	152
V FIRE RESISTANCE LEVELS (FRLs)	159
W MODULUS OF ELASTICITY AND MAXIMUM STRAIN OF AAC AND REINFORCING STEEL AT ELEVATED TEMPERATURE	176
X JOINTS BETWEEN AAC COMPONENTS SATISFYING RESISTANCE TO FIRE	178
Y TEMPERATURE PROFILES OF AAC WALL, FLOOR AND ROOF COMPONENTS AND AAC BEAMS	181
Z RESISTANCE TO FIRE—TABULATED DATA FOR WALLS WITH MECHANICAL IMPACT	193
AA MEANS FOR DEMONSTRATING CONFORMANCE WITH THIS STANDARD	195
BIBLIOGRAPHY	197

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