AS 4672:2025

Australian STANDARD®

STANDARDS Australia

Steel prestressing materials for concrete



AS 4672:2025

This Australian Standard® was prepared by BD-084, Steel Reinforcing and Prestressing Materials. It was approved on behalf of Standards Australia's Standards Development and Accreditation Committee on 29 May 2025.

This Standard was published on 27 June 2025.

The following are represented on Committee BD-084:

Australasian Certification Authority for Reinforcing and Structural Steels
Australasian Wire Industry Association
Australian Industry Group
Australian Steel Association
Austroads
Bureau of Steel Manufacturers of Australia
Concrete Pipe Association of Australasia
Engineers Australia
Galvanizers Association of Australia
Master Builders Australia
National Precast Concrete Association Australia
National Transport Research Organization
Steel Reinforcement Institute of Australia
The University of Sydney
Weld Australia

This Standard was issued for comment as DR AS 4672:2024

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 products by visiting:

www.standards.org.au

ISBN: 978 1 76175 207 0

Australian Standard®

Steel prestressing materials for concrete

AS 1310 first published 1972.
Second edition 1987.
AS 1311 first published 1972.
Second edition 1987.
AS 1313 originated as AS A144-1963.
Second edition 1971.
AS A144-1971 revised and redesignated AS 1313-1972.
Second edition 1989.
AS 1310-1987, AS 1311-1987 and AS 1313-1989 revised, amalgamated and redesignated (in part) as AS/NZS 4672.1:2007.
Reissued incorporating Amendment No 1 (November 2018) and redesignated as AS 4672.1:2007.
Reissued incorporating Amendment No 2 (October 2020).
AS 4672.1:2007 and AS/NZS 4672.2:2007 revised, amalgamated and redesignated as AS 4672:2025.

© Standards Australia Limited 2025

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).

How to read this Standard

This page explains the meaning of the language and structure of this Standard.

Refer to Standards Australia's Standardisation Guide 006 for more details about drafting rules.

Australian and Australian/New Zealand Standards are voluntary unless they are referenced in legislation or called up in contracts.

Requirements

To conform to a Standard, all requirements in the Standard need to be met.

A requirement is any statement in the Standard which uses the word "shall".

Recommendations, permissions and possibilities

The following words are commonly used in Standards, but statements using them do not have to be followed to conform to the Standard:

(a) "should" means that something is recommended.

(b) "may" means that something is permitted.

(c) "can" means that something is possible.

Structure of Standards

A Standard always has the following parts:

(i) The Preface states who developed the Standard, what the Standard is aiming to do, and how it relates to other documents.

(ii) The Scope states what the Standard is about, what it covers and what it does not cover.

(iii) The Normative references clause lists other documents that are referenced in the Standard as part of requirements.

(iv) The Terms and definitions clause defines important terms to help with understanding the Standard.

A Standard may also include other parts, such as the following:

(1) A normative appendix sets additional requirements that need to be conformed to.

(2) An informative appendix provides additional information or guidance. An informative appendix provides additional information or guidance. They usually do not contain requirements. If an informative appendix does contain requirements, the Standard will explain when those requirements apply.

(3) A Bibliography lists documents referenced in the Standard but not as part of requirements.

Many Standards include notes. Notes provide recommendations and/or guidance only. They never contain requirements.

Preface

This Standard has been prepared by the Australian members of Joint Standards Australia/Standards New Zealand Committee BD-084, Steel Reinforcing and Prestressing Materials, to supersede AS 4672.1:2007, *Steel prestressing materials, Part 1: General requirements*, and AS/NZS 4672.2:2007, *Steel prestressing materials, Part 2: Testing requirements*.

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 the Standard is to provide a material specification for high tensile stress relieved wire, strand, and steel bars for use in prestressed concrete structures which have been designed in accordance with AS 3600, AS 5100, or similar Standards.

Key differences between this Standard and the two previous Standards that it replaces are briefly outlined below:

(a) The requirements for the various materials, and the testing and conformance requirements have been combined into one Standard.

(b) Normative product conformity requirements in Appendices A and B have been redrafted for alignment with the principles used in AS/NZS 4671, where possible. Note that this document still relies primarily on unit of product or unit of manufacture testing for conformance to long-term quality levels only for manufacturing control where applicable.

(c) Requirements for as drawn wire and quenched and tempered wire have been not included as these products are generally no longer sold to customers.

(d) Requirements for stress relieved wire and strand are similar to the previous versions to ensure alignment with the applicable Australian design Standards, while requirements for bars are now more aligned with relevant international Standards.

(e) Rationalization of sizes of wire and strand to more closely reflect sizes typically available in the current Australian market, but with the option to supply other sizes based on equivalent ISO Standards subject to agreement between the manufacturer and the purchaser.

(f) Introduction of Relaxation Class 3 for Strand which is aligned with some specifications for strand used in bridge construction.

(g) Changes to the Isothermal Relaxation Test Method.

(h) Definition of bar types being hot rolled bars with ribs, and hot rolled bars with cold rolled threads, that reflect product currently available in the Australian market.

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.

© Standards Australia Limited 2025

Contents

Page

Preface ..... **v**

Section 1 Scope and general **1**
1.1 Scope 1
1.2 Normative references 1
1.3 Terms and definitions 2
1.4 Notation 4
1.5 Classification and designation 4

Section 2 General requirements **5**
2.1 Geometrical properties 5
2.2 Mechanical properties 5
2.2.1 Testing 5
2.2.2 Tensile properties determination 6
2.2.3 Isothermal relaxation 6
2.2.4 Fatigue 6
2.2.5 Straightness 6
2.3 Chemical composition 7
2.4 Rounding of numbers 7
2.5 Surface condition 7
2.6 Delivery, transport, storage and identification 7
2.7 Conformance test certificates 7

Section 3 Stress-relieved wire **9**
3.1 Scope of section 9
3.2 Conditions of manufacture 9
3.3 Geometric properties and surface configuration 9
3.4 Mechanical properties 9
3.4.1 General 9
3.4.2 Strength 9
3.4.3 Elongation and ductility 10
3.4.4 Bending 10
3.4.5 Relaxation 10
3.4.6 Fatigue 10
3.4.7 Modulus of elasticity 11
3.4.8 Straightness 11
3.5 Designation 11
3.6 Delivery, transport and storage 11

Section 4 Strand **12**
4.1 Scope of section 12
4.2 Conditions of manufacture 12
4.2.1 Welding 12
4.2.2 Feed wires 12
4.2.3 Stress-relieving treatment 12
4.2.4 Compacted strand 12
4.2.5 Indented strand 13
4.3 Geometric properties and surface configuration 13
4.4 Mechanical properties 14
4.4.1 General 14
4.4.2 Strength 14
4.4.3 Elongation and ductility 15
4.4.4 Relaxation 15
4.4.5 Fatigue 15
4.4.6 Modulus of elasticity 15
4.4.7 Straightness 15
4.5 Designation 15
4.6 Delivery, transport and storage 15

© Standards Australia Limited 2025

Section 5 Hot rolled steel bars **17**
5.1 Scope of section 17
5.2 Conditions of manufacture 17
5.3 Geometric properties and surface configuration 17
5.4 Mechanical properties 18
5.4.1 General 18
5.4.2 Strength 18
5.4.3 Elongation and ductility 20
5.4.4 Bending 20
5.4.5 Relaxation 21
5.4.6 Fatigue 21
5.4.7 Modulus of elasticity 21
5.4.8 Straightness 21
5.5 Nuts, threaded anchors and couplers 21
5.6 Designation 21
5.7 Delivery, transport and storage 22
Appendix A (normative) **Product conformity** **23**
Appendix B (normative) **Manufacturing control** **26**
Appendix C (informative) **Examples of surface configurations** **31**
Appendix D (informative) **Purchasing guidelines** **35**
Appendix E (normative) **Isothermal relaxation testing** **36**

© Standards Australia Limited 2025

NOTES

Australian Standard®

Steel prestressing materials for concrete

Section 1 Scope and general

1.1 Scope

This document specifies requirements for high tensile strength steel to be used for prestressing or post-tensioning of concrete and other similar purposes (e.g. masonry structures). Stay cables for bridges or other similar applications are out of the scope of this document.

This document applies only to steel in the condition as supplied by the manufacturer. It does not cover requirements for anchorage devices, nor materials used in conjunction with the prestressing steel in structural components (see Note 1).

The specific properties for each type of prestressing steel are given in Sections 3 to 5.

NOTE 1 Anchorage devices are covered by AS/NZS 1314. Couplers need to be specified separately.

NOTE 2 Advice and recommendations on information to be supplied by the purchaser (if required) at the time of enquiry and order are contained in the purchasing guidelines set out in Appendix D.

1.2 Normative references

The following documents are referred to in this document in such a way that some or all of their content constitutes requirements of this document:

AS 1391, *Metallic materials — Tensile testing — Method of test at room temperature*

AS 1545, *Methods for the calibration and grading of extensometers*

AS 2193, *Calibration and classification of force-measuring systems*

AS 2505.2, *Metallic materials, Method 2: Bars, rods and solid shapes — Bend tests*

AS 2505.4, *Metallic materials, Method 4: Wire — Reverse bend test*

AS 2706, *Numerical values — Rounding and interpretation of limiting values*

AS/NZS 1314, *Prestressing anchorages*

AS/NZS 4671, *Steel for the reinforcement of concrete*

AS ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

ISO 6892.1:2019, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 6934-3, *Steel for the prestressing of concrete — Part 3: Quenched and tempered wire*

ISO 6934-4, *Steel for the prestressing of concrete — Part 4: Strand*

ISO 6934-5, *Steel for the prestressing of concrete — Part 5: Hot-rolled steel bars with or without subsequent processing*

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

ISO 9513:2012/Cor 1:2013, *Metallic materials — Calibration of extensometer systems used in uniaxial testing — TECHNICAL CORRIGENDUM 1*

© Standards Australia Limited 2025