

AS 1275—1985
Reconfirmed 2017

Australian Standard[®]

**METRIC SCREW THREADS FOR
FASTENERS**

This Australian standard was prepared by Committee ME/28, Screw Threads. It was approved on behalf of the Council of the Standards Association of Australia on 8 November 1984 and published on 4 April 1985.

The following interests are represented on Committee ME/28:

Confederation of Australian Industry
CSIRO, Division of Applied Physics
Department of Defence
Department of Defence Support
Department of Technical and Further Education, N.S.W.
Electricity Supply Association of Australia
Fasteners Institute of Australia
Federal Chamber of Automotive Industries
Institution of Engineers Australia
Institution of Production Engineers
Metal Trades Industry Association of Australia
Railways of Australia Committee
Society of Automotive Engineers, Australasia

Review of Australian Standards. *To keep abreast of progress in industry, Australian 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 Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

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

This Standard was issued in draft form for comment as DR 83215.

STANDARDS AUSTRALIA

RECONFIRMATION

OF

AS 1275—1985

Metric screw threads for fasteners

RECONFIRMATION NOTICE

Technical Committee ME-029 has reviewed the content of this publication and in accordance with Standards Australia procedures for reconfirmation, it has been determined that the publication is still valid and does not require change.

Certain documents referenced in the publication may have been amended since the original date of publication. Users are advised to ensure that they are using the latest versions of such documents as appropriate, unless advised otherwise in this Reconfirmation Notice.

Approved for reconfirmation in accordance with Standards Australia procedures for reconfirmation on 16 June 2017.

The following are represented on Technical Committee ME-029:

Association of Accredited Certification Bodies
Association of Wall and Ceiling Industries of Australia
Australian Chamber of Commerce and Industry
Australian Engineered Fasteners and Anchors Council
Australian Industry Group
Australian Steel Institute
AUSTROADS
Bureau of Steel Manufacturers of Australia
Galvanizers Association of Australia
Materials Australia
National Association of Steel-Framed Housing
National Association of Testing Authorities Australia
New Zealand Heavy Engineering Research Association
Society of Automotive Engineers- Australasia
Steel Construction New Zealand
Swinburne University of Technology

NOTES

Australian Standard[®]

**METRIC SCREW THREADS FOR
FASTENERS**

First published (as AS B275)	1968
AS 1275 first published	1972
Second edition	1985

Incorporating:
Amdt 1—1986

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140

PREFACE

This edition of this standard was prepared by the Association's Committee on Screw Threads, to supersede AS 1275—1972.

Since AS 1275 was first published, the major ISO standards dealing with metric screw threads (see later listing) have been revised, and are now in conflict with the information given in AS 1275—1972. This is particularly true with respect to the root curvature for external threads, and the limits specified for the thread roots of both external and internal threads.

A further important consideration is that the ISO standards for metric screw threads are now being adopted virtually unchanged by most developed and developing countries, and therefore it is important that the Australian standards be aligned with their ISO counterparts as much as possible. This has been the aim in this edition of the standard.

During the preparation of AS 1275 in the early 1970s, it was noted by the committee that the ISO symbols used for the various screw thread parameters were illogical, and so a more logical system was introduced in the Australian standards. This was supported by sustained comment to ISO/TC1 proposing the Australian symbols. Unfortunately the Australian proposals were not accepted by ISO/TC1 and the original ISO symbols were retained. One of the major changes in this edition therefore has been to introduce the ISO symbology for the screw thread parameters.

The other major change is with regard to the limits given for the thread roots on both external and internal threads. In AS 1275—1972 these limits were completely specified, whereas in the ISO standards only the minimum minor diameter is specified for external threads and the nominal (basic) major diameter is given for internal threads; the actual limits being indirectly controlled by the length of straight flanks. Furthermore a root curvature for external threads is only specified for threads intended for fasteners of property Class 8.8 and above. All other external threads may have a root configuration in accordance with the basic/design profile.

It was considered that the ISO approach on the limits for the thread roots was practical and should be adopted, because this would permit maximum flexibility in manufacture without being unduly detrimental to either the strength of the screw thread or to its assembly properties. However, the ISO root curvature for external threads, taken to the extreme could cause problems by introducing a notch effect, which may lead to fatigue failure in threads in some steels which have a high tensile level and/or have been severely cold worked. A cautionary statement to this effect has therefore been included in this standard.

This standard has been based on and is in complete alignment with the following ISO standards:

ISO 68—1973	ISO General Purpose Screw Threads—Basic Profile
ISO 261—1973	ISO General Purpose Metric Screw Threads —General Plan
ISO 262—1973	ISO General Purpose Metric Screw Threads —Selected Sizes for Screws, Bolts and Nuts
ISO 724—1978	ISO Metric Screw Threads—Basic Dimensions
ISO 965/1—1980	ISO General Purpose Metric Screw Threads —Tolerances— Part 1: Principles and Basic Data
ISO 965/2—1980	ISO General Purpose Metric Screw Threads—Tolerances— Part 2: Limits of Sizes for General Purpose Bolt and Nut Threads—Medium Quality
ISO 965/3—1980	ISO General Purpose Metric Screw Threads —Tolerances— Part 3: Deviations for Constructional Threads

© Copyright — STANDARDS AUSTRALIA

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

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

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no 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 at any time.

CONTENTS

	<i>Page</i>
SECTION 1. SCOPE AND GENERAL	
1.1 Scope	4
1.2 Application	4
1.3 Referenced Documents	4
1.4 Definitions	4
1.5 Symbols	4
1.6 Verification	4
1.7 Stress Area (A_s)	4
SECTION 2. SCREW THREAD PROFILES	
2.1 Scope of Section	5
2.2 Basic Profile	5
2.3 Maximum Material Profile	6
2.4 Least Material Profile	7
2.5 Limiting Profiles	7
2.6 Root Contours	8
SECTION 3. DIMENSIONS AND TOLERANCES	
3.1 Scope of Section	10
3.2 Basic Dimensions	10
3.3 Tolerance Positions	10
3.4 Fundamental Deviations	10
3.5 Tolerance Grades	11
3.6 Tolerance Classes	11
3.7 Limits of Size	14
3.8 Coated Threads	14
SECTION 4. DESIGNATION OF SCREW THREADS	
4.1 Scope of Section	15
4.2 Complete Designation for Internal Threads	15
4.3 Complete Designation for External Threads	15
4.4 Shortened Designation for Coarse Pitch Series Threads	15
4.5 Designation of a Thread Fit	15
APPENDICES	
A Notes on the Production of External Threads	16
B Comparison of Symbols (Notations) for Screw Thread Parameters	17

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
METRIC SCREW THREADS FOR FASTENERS

SECTION 1. SCOPE AND GENERAL

1.1 SCOPE. This standard specifies requirements for single start, parallel, coarse pitch series metric screw threads, mainly intended for threaded fasteners.

The standard covers screw threads from 1.6 mm diameter up to and including 64 mm diameter, in tolerance classes 6e, 6f, 6g and 8g, for external threads; and 6H and 6G for internal threads.

The standard gives information on symbols for screw thread parameters, tolerances, deviations, thread classes, designation and verification.

Appendices are included giving notes on the production of screw threads and a comparison of symbols used in this standard and the 1972 edition.

NOTES:

1. The coarse pitch series given in this standard comprises the 1st and 2nd choice diameter/pitch combinations (for coarse pitch series threads) extracted from AS 1721. They are the same as those given in ISO 261 and ISO 262; the latter covering diameters up to and including 39 mm only.
2. For information on the bases of the metric screw thread system and associated formulas, see AS 1721.

1.2 APPLICATION. This standard gives information on the design, manufacture and use of ISO coarse pitch series metric parallel screw threads.

The standard is intended for adoption by industry and government authorities concerned with the design, manufacture and/or use of metric screw threads.

1.3 REFERENCED DOCUMENTS. The following standards are referred to in this standard:

AS 1014	Gauging of Metric Screw Threads
AS 1098	Roller-type Screw Calliper Gauges
AS 1110	ISO Metric Hexagon Precision Bolts and Screws
AS 1111	ISO Metric Hexagon Commercial Bolts and Screws
AS 1112	ISO Metric Hexagon Nuts, including Thin Nuts, Slotted Nuts and Castle Nuts
AS 1214	Hot-dip Galvanized Coatings on Threaded Fasteners (ISO Metric Coarse Thread Series)
AS 1252	High-strength Steel Bolts with Associated Nuts and Washers for Structural Engineering
AS 1654	Limits and Fits for Engineering
AS 1721	General Purpose Metric Screw Threads
AS 1897	Electroplated Coatings on Threaded Components (Metric Coarse Series)
AS XXXX*	Glossary of Terms for Screw Threads
ISO 261	ISO General Purpose Metric Screw Threads—General Plan

ISO 262 ISO General Purpose Metric Screw Threads—Selected Sizes for Screws, Bolts and Nuts

1.4 DEFINITIONS. For the purpose of this standard, the definitions given in AS XXXX apply.

1.5 SYMBOLS. The symbols used in this standard to define the screw thread parameters are given in Table 1.1.

NOTE: These are now aligned with the ISO symbols. For comparison of the current symbols with those used in AS 1275—1972, see Appendix B.

TABLE 1.1
SYMBOLS

Symbol	Explanation
<i>D</i>	basic major diameter of internal thread
<i>D</i> ₁	basic minor diameter of internal thread
<i>D</i> ₂	basic pitch diameter of internal thread
<i>d</i>	basic major diameter of external thread
<i>d</i> ₁	basic minor diameter of external thread
<i>d</i> ₂	basic pitch diameter of external thread
<i>P</i>	pitch
<i>H</i>	height of fundamental triangle
<i>R</i>	root radius of external thread
<i>S</i>	designation for lengths of thread engagement group Short
<i>N</i>	designation for lengths of thread engagement group Normal
<i>L</i>	designation for lengths of thread engagement group Long
<i>T</i>	tolerance
<i>T</i> _{D1}	tolerance on minor diameter of internal thread
<i>T</i> _{D2}	tolerance on pitch diameter of external thread
<i>T</i> _d	tolerance on major diameter of external thread
<i>T</i> _d	tolerance on pitch diameter of external thread
<i>G, H</i>	fundamental deviations for internal threads
<i>e, f, g</i>	fundamental deviations for external threads
<i>A</i> _s	nominal stress area (external threads)

1.6 VERIFICATION. The form and dimensions of screw threads to this standard should preferably be verified by gauging in accordance with AS 1014.

The method(s) of verification (inspection) to be used on any particular occasion will however, depend on such things as the thread diameter, the thread class, the number of items produced and the method of manufacture.

Where gauging is impractical, the threads may be verified by direct measurement or by optical methods; or a combination of both.

1.7 STRESS AREA (*A*_s). The cross-sectional area used for calculating the tensile and proof loads for threaded fasteners is based on the following formula:

$$A_s = \frac{\pi}{4} (D - 0.9382P)^2$$

NOTE: Calculated values of the stress areas are given in Table 3.3.

* In course of preparation.