AS 1275—1985
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Australian Standard®

METRIC SCREW THREADS FOR FASTENERS

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STANDARDS AUSTRALIA

RECONFIRMATION

OF
AS 1275—1985
Metric screw threads for fasteners

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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 of 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

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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
D	basic major diameter of internal thread
D_1	basic minor diameter of internal thread
D_2	basic pitch diameter of internal thread
d	basic major diameter of external thread
d_1	basic minor diameter of external thread
d_2	basic pitch diameter of external thread
P	pitch
H	height of fundamental triangle
R	root radius of external thread
S	designation for lengths of thread engagement group Short
N	designation for lengths of thread engagement group Normal
L	designation for lengths of thread engagement group Long
T	tolerance
T_{D_1}	tolerance on minor diameter of internal thread
T_{D_2}	tolerance on pitch diameter of external thread
T_d	tolerance on major diameter of external thread
T_{d_2}	tolerance on pitch diameter of external thread
G, H	fundamental deviations for internal threads
e, f, g	fundamental deviations for external threads
A_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.