

Australian Standard<sup>®</sup>

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**SCREWING TAPS**

**Part 3—INCH SERIES  
SCREW THREADS**

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The following scientific, industrial and governmental organizations and departments were officially represented on the committee entrusted with the preparation of this standard:

CSIRO, Division of Materials Science  
CSIRO, National Measurement Laboratory  
Confederation of Australian Industry  
Department of Defence  
Department of Productivity  
Department of Technical and Further Education  
Electricity Supply Association of Australia  
Fasteners Institute of Australia  
Institution of Engineers, Australia  
Institution of Production Engineers  
Metal Trades Industry Association of Australia  
Railways of Australia Committee  
Telecom Australia

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## PREFACE

This standard was prepared by the Association's Committee on Screw Threads as a replacement for AS B88, Parts 1 and 2, which covered taps for parallel inch screw threads, and which was the endorsement of BS 949, Parts 1 and 2.

The purpose of this standard is to provide up-to-date information on taps for threads other than the metric series, which are covered in Part 1 of AS 2181. It was recognized by the committee that although the screw threads referred to herein are obsolescent, they will be required for a considerable period by industry, and the need for a tap standard will exist during this period. It was also felt that the opportunity should be taken at this time to rationalize the tap class system so that it aligns as far as practicable with the tap tolerance system given in Part 1 for metric screw threads.

It was noted that BS 949 is currently undergoing revision by the British Standards Institution, and the main requirements for the tap tolerancing system given in this standard are in line with those proposed for BS 949. The British draft, however separates the screw threads into different categories in line with the ISO\* system, i.e. only the BSW, BSF and BA series threads are designated as obsolescent. The reason for this apparently is that the Unified screw thread system is currently covered by ISO standards as the ISO inch system of screw threads. It was felt, by the committee however that insofar as Australian usage is concerned, all threads other than the metric series and pipe threads should be declared obsolescent, and it should be noted that all screw threads referred to in this standard will be phased out over a period of time.

In the preparation of this standard, as noted previously, the opportunity was taken to design as far as practical with the requirements for metric taps given in Part 1 of AS 2181, and the tap blank sizes given herein are the same as those given in that standard. This will have the effect of permitting interchangeability of screwing taps in metric tapping heads and related thread-cutting equipment and should be beneficial to the user. As an interim measure, however, if so required by the user, imperial taps with inch series blank dimensions could be supplied and the relative sizes are given in an appendix.

There are no international standards covering tolerances for the threaded portion of taps for inch series threads (including BA threads), and no ISO standards will be developed, consequently the tolerance system for the threaded portion of taps used in this standard generally aligns with the previously used zone system. Attention is drawn to the Scope (Clause 1.1) for further information in this regard. In order that there will be a common system of designation for tap tolerance classes for all thread types this ISO metric tap class designation system has been adopted for ground thread taps. Because the ISO tap designation system does not cover taps with cut threads, such taps which were previously designated 'Zone 5' will henceforth simply be designated 'cut thread taps'. This is to avoid the confusion which could arise by having taps designated 'Classes 1, 2 and 3' and 'Zone 5'.

The general dimensions of the tap blank size are the same as those given in ISO 529, Short Machine Taps and Hand Taps.

This standard requires reference to the following standards:

- AS 1654 Limits and Fits for Engineering
- AS 1817 Method for Vickers Hardness Test  
Part 1—Testing of Metals
- AS B46 British Association (BA) Screw threads
- AS B47 Parallel Screw Threads of Whitworth form
- AS B133 Unified Screw Threads

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\* ISO=International Organization for Standardization.

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## STANDARDS ASSOCIATION OF AUSTRALIA

**Australian Standard**  
for  
**SCREWING TAPS**

## PART 3—INCH SERIES SCREW THREADS

## SECTION 1. SCOPE AND GENERAL

**1.1 SCOPE.** This standard specifies requirements for taps for cutting BA and inch series screw threads. It includes standard machine taps with ground threads, and also taps with cut threads. General dimensions, tolerances and deviations for the threaded portion, types of taps and other main features are specified, but the details of design are left to the manufacturer.

NOTE: If specific design features are required these must be specified by the purchaser at the time of his enquiry or order.

Taps for tapping of nut threads are not covered in this standard owing to the many varieties in existence.

The standard covers screw threads of the following types and size ranges:

Unified Coarse Series (UNC) No 1—64 to 4 in—4

Unified Fine Series (UNF) No 0—80 to 1½ in—12

British Standard Whitworth Series (BSW) ⅛ in—40 to 4 in—3

British Standard Fine Series (BSF) ⅜/16 in—32 to 3 in—5

British Association Series (BA) 14 BA—0 BA

The tolerances for the threaded portion of taps are based on those given in previous Australian standards, i.e. the 'zone' tolerance values. To promote a common designation system for all taps the ISO (metric) tap designation system has been introduced for ground thread taps only. Taps with cut threads are designated 'cut thread taps'.

The number of tap classes for the various thread types, their relationship to the zone tolerance system and typical application details are given in Table 1.1.

**TABLE 1.1**  
**DETAILS OF TAP CLASSES**

Thread series	Designated tap class	Suitable to produce thread class	Relationship to zone system
UNC and UNF	1	3B	1 and 2 combined
	2	2B	3
	3	1B	4
	Cut-thread	1B	5
BSW and BSF	2	Medium	3
	3	Normal	4
	Cut-thread	Normal	5
BA	2	Normal	3
	Cut-thread	Normal	5

## NOTES:

- To ensure the interchangeability of machine taps in related holders, the tap blank dimensions given in this standard are the same as those specified in AS 2181, Part 1, for metric threads.
- During the transition period to the ISO system, taps may be supplied with general dimensions in accordance with Appendix D which represents the current practices soft-converted into metric dimensions. If the purchaser specifically requires taps with ISO general dimensions as given in Tables 2.1 and 2.2 this should be indicated in his enquiry or order.

**1.2 TERMS AND DEFINITIONS.** For the purpose of this standard, the terms and definitions given in Clauses 1.2.1 and 1.2.2 and Figs 1.1 to 1.6 apply.

**1.2.1 Terms and Definitions of the Thread Profiles.** General terms related to the screw thread profile of an internal thread and a tap are given in Figs 1.1 to 1.4.

**1.2.2 General Terminology of Taps.**

**1.2.2.1 General.** The terminology applicable to taps and their dimensions is given in Clauses 1.2.2.2 to 1.2.2.15 and in Fig. 1.5.

**1.2.2.2 Nominal diameter**—the nominal diameter of a tap is the nominal diameter of the screw thread to be cut.

**1.2.2.3 Screwing tap**—a multiple edged tool for producing an internal screw thread.

**1.2.2.4 Cut thread tap**—a tap the thread of which was formed by thread cutting or rolling while still in the un-heat-treated condition.

**1.2.2.5 Ground thread tap**—a tap the thread form of which is finished by grinding after hardening and tempering.

**1.2.2.6 Chamfer relief**—the radial relief applied to the chamfer of a tap to provide clearance for a cutting edge.

**1.2.2.7 Taper tap**—a tap having a thread chamfer of approximately 8 to 10 pitches at the start of the thread (approximately 4 degrees per side) (see V, Fig. 1.6).

**1.2.2.8 Intermediate tap**—a tap having a thread chamfer of approximately 3 to 5 pitches at the start of the thread (approximately 8 degrees per side) (see V, Fig. 1.6).

**1.2.2.9 Bottoming tap**—a tap having a thread chamfer of approximately 1 to 2 pitches at the start of the thread (approximately 23 degrees per side) (see V, Fig. 1.6).