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SCREWING TAPS

Part 1—GENERAL PURPOSE METRIC SCREW THREADS

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

CSIRO, Division of Tribophysics

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 Production Engineers

Materials Research Laboratories

Railways of Australia Committee

Telecom Australia.

This standard, prepared by Committee ME/28, Screw Threads, was approved on behalf of the Council of the Standards Association of Australia on 1 June 1978, and was published on 1 July 1978.

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Part 1—GENERAL PURPOSE METRIC SCREW THREADS

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PREFACE

This standard was prepared by the Association's Committee on Screw Threads. It supersedes AS B88, Part 1 — 1958, Screwing Taps — Taps for Threads other than Unified Threads, which was the endorsement of BS 949: Part 1: 1951.

The purpose of this standard is to provide information for the tapping of metric screw threads in accordance with AS 1275, Metric Screw Threads for Fasteners (based on ISO Recommendations), and AS 1721, General Purpose Metric Screw Threads. The need for the standard arose primarily because Australia has adopted the metric (SI) system of measurement, but it is equally important that Australian practice be aligned with current world practice as given in ISO standards.

The standard is comprehensive in its scope in so far as it contains all relevant information, including tapping drill sizes, within the one document and brings together the information contained separately in one ISO recommendation and three ISO standards; additionally, the standard includes 'cut thread taps' which are not currently covered in ISO documents. The following ISO documents were taken into account in its preparation:

ISO/R529 Short Machine and Hand Taps — General Dimensions

ISO 2283 Long Shank Machine Taps with Nominal Diameters from 3 to 24 mm and $^1/_8$ to 1 inch — General Dimensions

ISO 2857 Ground Thread Taps for ISO Metric Threads of Tolerances 4H to 8H and 4G to 6G, Coarse and Fine Pitches — Manufacturing Tolerances on the Threaded Portion

ISO 2306 Drills for Use Prior to Tapping Screw Threads.

With respect to tap blanks sizes for standard machine and hand taps, the standard seeks to rationalize the number of varieties from that given in ISO/R529 and consequently covers only the metric coarse and fine pitch series in the size range from 1 mm to 64 mm inclusive. The general dimensions for these sizes are identical with those in ISO/R529. Information is given in Appendix D (which is also in agreement with ISO/R529) on tap blank sizes for diameters up to and including 100 mm, which are also suitable for extra fine and non-standard diameter pitch combinations.

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In the interests of promoting world standardization the tolerances and deviations for the threaded portion of ground thread taps are basically the same as those given in ISO 2857, even though the committee considered that these were far from optimum. In ISO 2857 the deviations, which take into account the different thread classes, are restricted to the pitch diameter only, whereas in this standard they are additionally applied to the major diameter. It was felt by the committee that unless this requirement was included, i.e. that the whole thread profile be moved according to the internal thread deviation, there was a serious risk of interference on the major diameter (on assembly), particularly with coated threads. As in the case with tap blanks the number of sizes of fine pitch series screw thread taps has been reduced from that given in ISO 2857 to align this standard with AS 1275 and AS 1721.

The committee also noted that the ISO system for tolerances on ground thread taps was unsuitable for critical tapping applications, and that there was an urgent need for such information. Under the inch system of measurement the American 'H' system of tap tolerances was extensively used in Australian industry for critical applications. It was favoured because it provided a graded series of deviations from nominal size, and enabled users to select a particular tap deviation more precisely than is possible with the ISO system. Realizing this and also being aware that the 'H' system was imperially based and hence unsuitable for soft conversion to metric units, the committee has developed a graded tap tolerancing system which has the ISO system as its base and yet extends and subdivides this system to give equivalence to the 'H' system.

Cut thread taps are used in Australia for certain tapping applications and currently these are not covered by ISO standards. The committee considered that there would continue to be a need for these relatively low cost taps in a metric series and consequently the relevant requirements are included in this standard. The tolerancing system for the threaded element has been developed by the committee and approximates the system for inch taps given in AS B88, Part I. The system given in this standard, however, has the ISO system as its base and it is expected that users will benefit by having a single coherent system of tolerancing for all taps.

General dimensions for long shank machine taps are the same as those given in ISO 2283 except that again the number of varieties has been reduced to align this standard with AS 1275 and AS 1721; the size range covered is the same as that in ISO 2283. Because long shank machine taps are not used much in Australia, details for these taps are given in an appendix. It should be noted that these taps are not normally carried as stock items.

In the preparation of this standard the committee gave serious consideration to the inclusion of recommendations with respect to tapping drill sizes, suitable for the whole series of general purpose metric screw threads. It was considered that essential basic information in this area would be of value to both designers and production engineers particularly during the interim period of metric conversion when it would be helpful

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