AS Z30—1966

Australian Standard®

INTERCONVERSION OF INCH AND METRIC DIMENSIONS

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

American Society of Tool Engineers
Associated Chambers of Commerce
Associated Chambers of Manufactures
Australian and New Zealand Railways Conferences
Bureau of Steel Manufacturers
Defence Standards Laboratories
Department of Air
Department of Supply
Division of Applied Physics, CSIRO
Federal Chamber of Automotive Industries
Metal Trades Employers Association
The Institution of Automotive and Aeronautical Engineers
The Institution of Engineers, Australia
The Institution of Production Engineers
Universities

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PREFACE

This Australian standard was prepared by the SAA Committee on Metrology in recognition of the growing practical need for inch-millimetre conversions in Australian industry.

It is based on ISO Recommendation R370 but incorporates certain original features, intended to afford greater clarity in application of the recommended methods of conversion. These features include the classification of dimensions, definition of some relevant terms, and tables of equivalents from 0.001 to 999 inches and from 0,001 to 999 millimetres.

Metric dimensions are shown in this standard with the comma to indicate the decimal place. This recognizes that original drawings and documents from metric countries coming here for use will include the comma as the decimal point symbol. It was felt also that use of the comma with metric numerals might render these distinctive from inch numerals and thus avoid misinterpretation.

NOTE TO 1973 REPRINT: This reprint incorporates all issued corrigenda. it should be noted that the 'Note' added to Clause 1, Scope, by the Corrigenda issued August 1972 has not been incorporated as it is no longer applicable following the issue of corrected sheets for Table B9 (this reprint incorporates the Table B9 corrections). Similarly, the footnote to pages 32, 34, 36, 38, 40, 42 (Corrigenda, August 1972) is no longer required.

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STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard for INTERCONVERSION OF INCH AND METRIC DIMENSIONS

FOREWORD

The existence of two widely used systems of measurement, based on different units (yard and metre) predetermines the necessity for interconversion of these values and their derivates. During the present century rapid developments in international trade and technological co-operation have made the interconversion of inch and metric sizes an extremely frequent occurrence and many countries have published tables and recommended procedures to assist in this task. Recognition of the problems involved led the International Organization for Standardization (ISO), through its committee ISO/TC3, to undertake the preparation of an international recommendation on interconversion, issued in draft form as DIR.No.510 and subsequently published as ISO/R370.

The increasing use in Australian engineering of designs based on metric units, together with the increasing trade with "metric" countries, has emphasized the need for a standard procedure for the interconversion of inch and metric sizes. Although the conversion is basically a matter of simple arithmetic, the converted values often contain more decimal places than are required and are unsuitable for practical use (this is particularly so in the conversion from millimetres into inches). It therefore becomes necessary to arrive at an "equivalent approximate value". The procedure of determination of this equivalent approximate value must be such that will ensure the dimensional interchangeability with an accuracy commensurate with the design requirements.

The following relationship between the yard and the metre has been defined and agreed internationally:

1 yard = 0,9144 metre which gives 1 inch = 25,4 mm exactly.

This relationship is embodied in the legal definition of the Yard in the Commonwealth of Australia Weights and Measures (National Standards) Act 1960-1964 and Regulations thereunder.

INTERCONVERSION

1 SCOPE. This standard establishes rules and recommended procedures for the conversion of inch dimensions into millimetres and vice versa.

It is mainly concerned with toleranced dimensions where the accuracy of conversion is important to ensure interchangeability, use of original gauges, identity of fits, etc. Consideration is, however, also given to non-toleranced dimensions, their varieties and their conversion.

The standard also provides tables of the exact millimetre equivalents of inch values from 0.001 to 999 inches and tables of inch equivalents of millimetre values from 0,001 to 999 millimetres to the nearest value in the seventh decimal place.

For those concerned with measurements in feet or in metres, two tables covering conversion ranges of 1 to 999 feet and of 1 to 999 metres, are provided. These tables can also be used for values incorporating decimals of a foot (or of a metre) by the method of movement of the decimal point to the left.

2 DEFINITIONS. In general, the terms used in this standard are in conformity with those defined in ISO Recommendation 286* and in AS CZ1—1966†.

For convenience the definitions of some of the more important terms are given hereunder:

Basic Size (Basic Dimension)	The size by reference to which the limits of size are fixed.
Limits of Size	The two extreme (minimum and maximum) permissible sizes between which the actual size (obtained by measurement) should lie, the limiting value being included.
Upper Deviation	The algebraic difference between maximum limit and the corresponding basic size.
Lower Deviation	The algebraic difference between minimum limit and the corresponding basic size.
Tolerance	The difference between maximum and minimum limits of size (the tolerance is an absolute value).
Tolerance Zone	A zone between lines representing maximum and minimum limits of size in a graphical presentation of limits and tolerances; it corresponds by magnitude and position to the tolerance.

* ISO Recommendation 286—1964 ISO System of Limits and Fits, Part 1.
† AS CZ1—1966 Engineering Drawing Practice.