AS 1354—1984

Australian Standard®

WRENCHES—COMBINATION—RING AND OPEN-ENDED

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The following interests are represented on Committee ME/10:

Australian Automobile Association

Bureau of Steel Manufacturers of Australia

Confederation of Australian Industry

Deakin University

Department of Industrial Relations, N.S.W.

Department of Technical and Further Education, N.S.W.

Electricity Supply Association of Australia

Fasteners Institute of Australia

Metal Trades Industry Association of Australia

National Association of Australian State Road Authorities

Railways of Australia Committee

Royal Melbourne Institute of Technology

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WRENCHES—COMBINATION—RING AND OPEN-ENDED

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PREFACE

This edition of this standard was prepared by the Association's Committee on Hand Tools to supersede AS 1354—1973. It applies to forged combination wrenches (ring and open-ended) and is intended to serve as a basis for the manufacture and purchase of these tools for general engineering applications.

In this edition the dimensions for inch series wrenches have been included as an appendix and the standard therefore supersedes AS B328—1973, Combination Wrenches—Ring and Open Ended (inch series).

The committee decided to include the inch series wrenches as an appendix, because the overall dimensions for both metric and inch series are based on the same formulas, and all requirements apply equally to both series. Although the inch series are officially obsolescent, a continuing demand for them is expected for a number of years.

The material and dimensional requirements are based on Australian practice and differ from those in the 1973 edition, while the remainder of the standard is broadly based on the following ISO* standards:

ISO 691 Spanner Gaps and Sockets—Metric Series—Tolerances for General Use

ISO 1711 Hand Operated Wrenches and Sockets—Technical Specifications

ISO 3318† Assembly Tools for Screws and Nuts—Open-end Double-head Engineers' Wrenches, Double-head Box Wrenches and Combination Wrenches—Maximum Widths of Heads

and subsequent ISO proposals in this field considered during the preparation of the standard.

The standard includes requirements for materials and heat treatment, hardness, quality of finish, marking and testing.

It should be noted that not all sizes listed are necessarily available and purchasers are advised to consult with suppliers concerning lists of stock production sizes.

The designation 'wrench' is used in contrast to the accepted Australian designation 'spanner' and is based on the nomenclature adopted by ISO. Although the committee accepts that the designation 'wrench' is still not commonly used in Australia, it retained its use with a view to aligning Australian and ISO terminology.

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* International Organization for Standardization.
† This International standard was used for the sizes listed therein only.

CONTENTS

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard
for
WRENCHES—COMBINATION—RING AND OPEN-ENDED

1 SCOPE. This standard specifies requirements for combination wrenches, with one end open-ended and the other a ring, having an internal double-hexagon. These wrenches are suitable for use with fasteners dimensioned in accordance with the following Australian and ISO standards:

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 1393 Coach Screws (Metric Series) (with ISO Hexagon Heads)

AS 1427 ISO Metric Machine Screws

ISO 272 Fasteners—Hexagon Products—Widths Across Flats

NOTES:
1. In some applications, e.g. locknuts, the wrenches complying with this standard may not be suitable for thin nuts manufactured to AS 1112.
2. The dimensions for inch series wrenches are given in Appendix A.

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

AS 1192 Electroplated Coatings of Nickel and Chromium

AS 1444 Wrought Alloy Steels—AISI-SAE Standard, Hardenability (H) and Stainless Series

AS 1654 Limits and Fits for Engineering

AS 1997 Plain Limit Gauges

AS 2451 Bolts, Screws and Nuts with British Standard Whitworth Threads

AS 2465 Unified Hexagon Bolts, Screws and Nuts (UNC and UNF Threads)

3 METHOD OF MANUFACTURE, MATERIALS AND HEAT TREATMENT

3.1 Method of manufacture. All wrenches shall be steel forgings, the material being conditioned to forging quality requirements of AS 1444.

3.2 Materials and heat treatment. Wrenches shall be made from an alloy steel with a minimum carbon content of 0.35 percent complying with AS 1444 (Tables 2.1 and 3.1), or equivalent, and shall be hardened by quenching in oil and tempered to comply with the hardness requirement of Clause 6.2.1 and mechanical property requirements of Clauses 6.3 and 6.4 and Table 2 of this standard.

4 FINISH.

4.1 General. Sharp corners shall be removed from all wrenches and surfaces shall be free from burrs, cracks, forging flash and other detrimental defects.

4.2 Coatings. Unless otherwise specified, wrenches shall be nickel-chromium plated in accordance with AS 1192. The coatings shall be electro-deposited and shall consist of nickel to a minimum thickness of 5.1 μm followed by chromium to a minimum thickness of 0.25 μm.

4.3 Quality. The coatings shall be adherent, smooth, continuous and free from pits, blisters and other defects which would reduce their protective value and serviceability.

5 DESIGN AND DIMENSIONS.

5.1 Design. Wrenches shall be suitable for use on both hexagonal and squarehead bolts and nuts and should, in general, conform to the design shown in Fig. 1.

NOTES:
1. The illustration in Fig. 1 is the desired format for combination wrenches, but this is not restrictive except for the dimensions specified in Table 2.
2. All dimensions shown in Fig. 1 are to be calculated in accordance with the formulas listed in Appendix B.

5.2 Dimensions.

5.2.1 *General.* Dimensions, as shown in Fig. 1, are specified in Table 2.

5.2.2 *Head width (B).* The head width shall be different for each nominal size.

5.2.3 *External diameter of ring (B_1).* The external diameter of the ring shall be different for each nominal size.

5.2.4 *Jaw depth (D).* The jaw depth shall be different for each nominal size and is a function of the jaw opening.

5.2.5 *Jaw opening and internal hexagon opening (S).* The jaw opening and the internal hexagon opening shall be different for each nominal size and shall be the same for both heads.

5.2.6 *Head thickness (T).* The head thickness (open end) shall be different for each nominal size.

5.2.7 *Head thickness (T_1).* The head thickness (ring end) shall be different for each nominal size.

NOTES:
1. Preferred sizes for combination wrenches are listed in Table 2. These sizes are based on and include most sizes specified in ISO 3318 at the time of publication of this standard.
2. Non-preferred sizes for combination wrenches are also listed in Table 2. These sizes (20 mm and 23 mm) are used in Australia and are not included in ISO 3318 at the time of publication of this standard.

6 TESTING REQUIREMENTS AND PROCEDURES.

6.1 General. The following tests should be conducted in accordance with a sampling plan, and the test results recorded in a test report:

(a) Hardness test (see Clause 6.2).