THE FOLLOWING SCIENTIFIC, INDUSTRIAL AND GOVERNMENTAL organizations were officially represented on the committee entrusted with the preparation of this standard:

Associated Chambers of Manufactures of Australia
Australian Institute of Steel Construction
Bureau of Steel Manufacturers of Australia
Department of Defence
Department of Industry and Commerce
Electricity Supply Association of Australia
Fasteners Institute of Australia
Federal Chamber of Automotive Industries
Metal Trades Industry Association of Australia
Petroleum Refinery Engineers Advisory Committee
Railways of Australia Committee
Society of Automotive Engineers — Australasia
Telecom Australia
The Institution of Production Engineers
University of Sydney

This standard, prepared by Committee ME/29, Threaded Fasteners, was approved on behalf of the Council of the Standards Association of Australia on 24 August 1976, and was published on 1 December 1976.

To keep abreast of progress in industry, Australian standards are regularly reviewed. Suggestions for improvement to published standards, addressed to the head office of the Association, are welcomed.

This standard was issued in draft form for public review as DR 75093.

AUSTRALIAN STANDARD SPECIFICATION

HELICAL SPRING LOCK WASHERS

(METRIC SERIES)

AS 1968—1976

SUPERSEDED

First published 1976

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PREFACE

This standard was prepared by the Association's Committee on Threaded Fasteners, as part of a program to provide a comprehensive range of fastener and fastener accessory specifications in the metric series. The standard has been based on a preliminary draft prepared by the Standards Subcommittee of the Fasteners Institute of Australia.

There is no international agreement for products of this type although draft proposals have been submitted to ISO/TC 2, and it may be anticipated that these will be accepted as part of its future work program. The type of section given in the ISO proposals, however, favours the continental type of helical spring washers, i.e. a plain rectangular section, whereas this standard is in line with American practices as reflected in the Australian automotive industry, and gives a washer section which is slightly trapezoidal.

It has been generally agreed by ISO/TC 2 that the preliminary draft proposals for helical spring lock washers placed before it should become a low priority item, and thus it is unlikely that there will be any firm international agreement within the next 2 to 3 years. The Association's committee has therefore prepared this standard in advance of international documentation, to assist metric conversion by Australian industry. It is unlikely that there will be any significant changes after international agreement has been reached.

The standard, therefore, is essentially based on imperial practices transposed into the metric area, and the following standards have been taken into account in its preparation:

AS 1110	ISO Metric Hexagon Precision Bolts and Screws
AS 1237	Flat Metal Washers for General Engineering Purposes — Metric Series
AS 1427	ISO Metric Machine Screws
BS 4464:1969	Spring Washers for General Engineering and Automobile Purposes — Metric Series
ANSI B27.1—1965	Lock Washers

With the aim of rationalizing the washer series, one thickness only of washer is specified. The thickness is the one which is most favoured in Australian application, and closely approximates the medium series of helical spring lock washers given in ANSI B27.1. Also, to discourage the over-proliferation of washer sizes, this standard specifies only the ISO first choice diameter series as given for metric threaded fasteners.

This standard requires reference to the following Australian Standards:

AS 1442 Hot-rolled Carbon Steels and Carbon-manganese Steels (Bars and Semi-finished Products)
AS 1815 Method for Rockwell Hardness Test
Part 1 — Testing of Metals
AS 1817 Method for Vickers Hardness Test
Part 1 — Testing of Metals
AS 1971 Screw and Washer Assemblies (Metric Series)

STANDARDS ASSOCIATION OF AUSTRALIA

Australian Standard Specification for HELICAL SPRING LOCK WASHERS (METRIC SERIES)

1 SCOPE. This specification applies to metric series, single-coil carbon steel helical spring lock washers of —

(a) the loose over-the-thread type, to suit fasteners in the diameter range 3-36 mm inclusive, and
(b) the captive type to suit fasteners in the diameter range 3-10 mm inclusive.

The washers are mainly intended for use in general engineering and automotive applications, with right-hand screw threads. Helical spring lock washers for use with left-hand screw threads are also covered by this specification, except that the helix will be reversed.

NOTE: The captive lock washers specified are suitable for use with fasteners with ISO Metric coarse series screw threads only.

2 DEFINITIONS. For the purpose of this specification the following definitions apply:

Designation — the designated nominal size of a washer is the nominal size in millimetres of the fastener with which it is intended to be used.

Captive washer — a washer having an inside diameter which is less than the minimum major diameter of the associated external screw thread. It is designed such that, when it is pre-assembled with an externally threaded fastener before the thread rolling operation, it will be retained on the shank by the finished screw thread. (See also AS 1971, Screw and Washer Assemblies (Metric Series).)

3 APPLICATIONS. The washers specified herein are intended to serve the following dual functions:

(a) Act as a spring take-up device to compensate for developed looseness and the loss of tension between the component parts of an assembly.
(b) Act as a hardened thrust bearing to facilitate assembly and disassembly of bolted fastenings by decreasing frictional resistance between the bolted surface and bearing surface of the bolt head or nut.

4 SHAPE AND DIMENSIONS.

4.1 General. The shape and dimensions of the washers shall be in accordance with Fig. 1 and Tables 1 and 2.

Captive washers shall be such that they will not bind on the bolt or screw either before or during tightening of the fastener.