

Specification for

**Spring washers for
general engineering
and automobile
purposes —
Metric series**

UDC 621.882.449

Confirmed
January 2012

Co-operating organizations

The Mechanical Engineering Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

Associated Offices' Technical Committee	Institute of Marine Engineers
Association of Consulting Engineers	Institution of Civil Engineers
Association of Mining Electrical and Mechanical Engineers	Institution of Gas Engineers
Board of Trade	Institution of Heating and Ventilating Engineers
British Chemical Plant Manufacturers' Association	Institution of Mechanical Engineers*
British Compressed Air Society	Institution of Mechanical Engineers (Automobile Division)
British Electrical and Allied Manufacturers' Association*	Institution of Production Engineers
British Gear Manufacturers' Association	Locomotive and Allied Manufacturers' Association of Great Britain
British Internal Combustion Engine Manufacturers' Association	London Transport Board
British Mechanical Engineering Confederation*	Machine Tool Trades Association
British Pump Manufacturers' Association	Ministry of Defence*
British Steel Industry	Ministry of Defence, Army Department
Crown Agents for Oversea Governments and Administrations	Ministry of Power
Department of Employment and Productivity (H.M. Factory Inspectorate)	Ministry of Public Building and Works
Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales	Ministry of Technology*
Engineering Equipment Users' Association	Ministry of Technology — National Engineering Laboratory
Gas Council	Ministry of Transport
	National Coal Board
	National Physical Laboratory (Ministry of Technology)
	Royal Institute of British Architects

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

Institute of Iron and Steel Wire Manufacturers	Spring Research Association
Institution of Mechanical Engineers	Telecommunication Engineering and Manufacturing Association
Radio and Electronic Component Manufacturers Federation	
Society of Motor Manufacturers and Traders Ltd.	

This British Standard, having been approved by the Mechanical Engineering Industry Standards Committee, was published under the authority of the Executive Board on 19th May, 1969

© BSI 04-1999

The following BSI references relate to the work on this standard:
Committee reference MEE/134
Draft for comment 68/22810

ISBN 580 05289 3

Amendments issued since publication

Amd. No.	Date	Comments
4308	October 1983	Indicated by a sideline in the margin

Contents

	Page
Co-operating organizations	Inside front cover
Foreword	ii
1 Scope	1
2 Material and mechanical properties	1
3 Finish	1
4 Coating	1
5 Shape	1
6 Ends	2
7 Tangling	2
8 Cranking	2
9 Dimensions	2
10 Functional tests	2
11 Quality control	3
12 Designation for enquiry, ordering and identification purposes	3
13 Identification marking	3
Appendix A BSI policy statement on screw threads and the metric system	10
Appendix B Related British Standards	10
Figure 1 — Twist test	2
Table 1 — Single coil square section spring washers — Metric series (Type A)	4
Table 2 — Single coil rectangular section spring washers — Metric series (Types B and BP)	6
Table 3 — Double coil rectangular section spring washer — Metric series (Type D)	8

Foreword

A complete list of British Standards, numbering over 9,000, fully indexed and with a note of the contents of each, will be found in the BSI Catalogue which may be purchased from BSI Sales Department. The Catalogue may be consulted in many public libraries and similar institutions.

This standard makes reference to the following British Standards:

BS 21, *Pipe threads.*

BS 427, *Method for Vickers hardness test.*

BS 860, *Tables for comparison of hardness scales.*

BS 970, *Wrought steels in the form of bars, billets and forgings up to 6 in, ruling section for automobile and general engineering purposes. En series.*

BS 1449, *Steel plate, sheet and strip.*

BS 1580, *Unified screw threads.*

BS 1706, *Electroplated coatings of cadmium and zinc on iron and steel.*

BS 1802, *Steel spring washers for general engineering and automobile purposes.*

BS 2061, *Phosphor bronze spring washers for general engineering purposes.*

BS 2870, *Rolled copper and copper alloys. Sheet, strip and foil.*

BS 2873, *Copper and copper alloys. Wire.*

BS 3643, *ISO metric screw threads.*

BS 9001, *Sampling procedures and tables for inspection by attributes for electronic parts of assessed quality.*

This British Standard Specification has been prepared under the authority of the Mechanical Engineering Industry Standards Committee as a result of the decision taken to adopt the ISO metric screw thread system in the United Kingdom (see Appendix A), and requests received from industry for the provision of a standard for metric series spring washers for general engineering and automobile purposes.

Although at present there are no ISO Recommendations or draft Recommendations relating specifically to spring washers, account has been taken of current documentation being considered by ISO Committee ISO/TC 2, "Bolts, nuts and accessories", and the following metric standards:

German Standard DIN 127, "Spring washers" (rectangular section).

German Standard DIN 7980, "Lock washers for fillister head cap screws" (square section).

Indian Standard IS: 3063, "Spring washers for bolts, nuts and screws".

A rationalized selection of ISO metric nominal sizes have been included in this specification, for use where appropriate with products manufactured to the metric threaded fastener standards listed in Appendix B. The tolerances adapted in this specification are similar to those utilized in the above-mentioned German Standards, with the exception of the limiting dimensions for the inside diameter (d_1). Concern has been expressed in British industry on the danger of spring washer failure due to "opening-out" under load, when the clearance between the inside diameter of the washer and the nominal thread size is too great.

Accordingly it was decided to reduce the limiting dimensions and tolerances for the inside diameter compared with those quoted in the specifications listed above.

Account has also been taken of the current British Standards (BS 1802¹⁾ and BS 2061²⁾), which deal with inch series products, and it was decided in this case to prepare a single specification covering mainly the dimensional and functional aspects of metric series spring washers, rather than a series of separate specifications differing only with regard to material requirements.

¹⁾ BS 1802, "Steel spring washers for general engineering and automobile purposes".

²⁾ BS 2061, "Phosphor bronze spring washers for general engineering purposes".