

Specification for

Spring retaining rings —

Part 2: Carbon Steel E Clips

UDC 621.887

Confirmed December 2011

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

The Government department 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:

Ministry of Aviation	Individual manufacturers of spring retaining rings
Radio and Electronic Component Manufacturers' Federation	

This British Standard, having been approved by the Mechanical Engineering Industry Standards Committee and endorsed by the Chairman of the Engineering Divisional Council, was published under the authority of the General Council on 29 July 1965

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The following BSI references relate to the work on this standard:
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Foreword

This standard makes reference to the following British Standards:

BS 240, *Method for Brinell hardness test*.

BS 427, *Method for Vickers hardness test*.

BS 860, *Table of approximate comparison of hardness scales*.

BS 891, *Method for Rockwell hardness test*.

BS 1133, *Packaging code. Section 6. Temporary prevention of corrosion of metal surfaces (during transportation and storage)*.

BS 1134, *Centre-line-average height method for the assessment of surface texture*.

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

This British Standard has been prepared under the authority of the Mechanical Engineering Industry Standards Committee. It forms a companion work to BS 3673-1, "*Carbon steel circlips*".

E clips are commonly used within a great variety of industries and it can be shown that variations in clip diameter and thickness are sometimes essential — usually to locate a component of particular design or to meet a higher thrust load. Because of the diversity of application it has proved extremely difficult to standardize on logical inch and metric size ranges which are adequate.

This has, however, been achieved in Table 1 and Table 2 of the standard, but recognizing the difficulties which would arise from too radical an immediate reduction in available sizes, certain sizes have been included in Table 3 as alternatives to the preferred inch sizes of Table 1.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

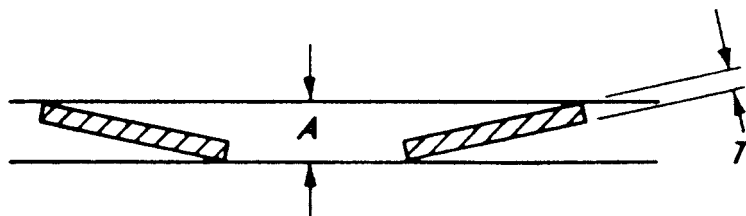
This British Standard relates to spring retaining rings of the E clip type in both inch and metric dimensional ranges.

Requirements for material, heat treatment, hardness and manufacture are laid down together with dimensions and tolerances. The requirements for the finish and the testing of the clips are also given.

2 Nomenclature

For the purposes of this British Standard the nomenclature of Figure 1 has been adopted together with the following definitions:

- a) *Nominal size*. The nominal size of an E clip is equal to the maximum diameter of groove for which the clip is designed.
- b) *Radial flatness error (dish)*. On a nominally flat E clip, the amount by which the actual thickness is exceeded by the distance separating two parallel planes which just contain the sectional profile of the clip, the free ends of which are positioned in a common plane in order to discount any spiral effect which may be present.



Radial flatness error = $A - T$
(measured including thickness T)

3 Material

E clips shall be manufactured from material conforming to a suitable composition selected from the BS 1449 En42¹⁾ range. Alternatively carbon steels having equivalent mechanical properties may be used provided that the clips are capable of satisfying the test requirements of Clause 8.

4 Heat treatment and hardness

E clips shall be hardened and tempered so that the hardness after tempering shall be not less than 480 HV. The hardness shall be measured in accordance with BS 427-1²⁾, due account being taken of the thickness of the clip when determining the test load to be applied.

Alternatively, when the size of the clip permits, the hardness may be measured in accordance with BS 240-1³⁾ or BS 891-1⁴⁾, in which cases the equivalent hardness values to the Vickers scale shall be determined in accordance with BS 860⁵⁾.

¹⁾ BS 1449 "Steel plate, sheet and strip".

²⁾ BS 427, "Method for Vickers hardness test", Part 1: "Testing of metals".

³⁾ BS 891, "Method for Rockwell hardness test", Part 1: "Testing of metals".

⁴⁾ BS 240, "Method for Brinell hardness test", Part 1: "Testing of metals".

⁵⁾ BS 860, "Table of approximate comparison of hardness scales".