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**BS 308 : Part 1 : October 1972**  
UDC 744 : 003.63 : 621.753

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# Engineering drawing practice

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## Part 1. General principles

### Amendments issued since publication

| Amd. No. | Date of issue | Text affected                |
|----------|---------------|------------------------------|
| 1761     | JULY 1975     | Incorporated in this reprint |
|          |               |                              |
|          |               |                              |
|          |               |                              |

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# BS 308 : Part 1 : 1972

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As amended  
July 1975

## Foreword

The revision of this British Standard has been prepared, under the authority of the Mechanical Engineering Industry Standards Committee, principally to bring the standard into line with published Recommendations of the International Organization for Standardization (ISO) on engineering drawing practice and in particular to introduce as the standard convention the system of geometrical tolerance symbols specified in ISO/R 1101 and related ISO Recommendations\*. These symbols were shown in Appendix A and Appendix B to the previous edition of this standard. There has also been liaison between the USA, Canada and the UK in order to minimize divergences between the national standards and to eliminate areas of misunderstanding, but without in any way impairing the agreement of this standard with the ISO Recommendations.

For convenience in use, this British Standard is published in three Parts as follows:

(1) This Part 1, 'General principles', corresponds to the early sections of previous editions of BS 308 and is concerned with layout, scales, types of lines, methods of projection, lettering, sections and the conventional

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representation of common features. It is in conformity with ISO/R 128 'Engineering drawings, principles of presentation'.

The previous edition of this British Standard included, in Supplement No. 1, separate recommendations for the preparation of drawings suitable for microfilming. In this publication, no separate provision is made for such drawings. The text is so arranged that drawings prepared in accordance with this standard will be suitable for microfilming.

As amended  
July 1975

(2) Part 2, 'Dimensioning and tolerancing of size' concerns not only the methods of indicating dimensions and tolerances of size on drawings in accordance with ISO/R 129 'Engineering drawings, dimensioning' and ISO/R 406 'Inscription of linear and angular tolerances' but also includes guidance on the dimensioning and tolerancing of tapers in accordance with concurrent ISO discussions. Also included in this Part is guidance on machining and surface texture symbols in accordance with ISO/R 1302 'The indication of surface texture on drawings'.

(3) Part 3, 'Geometrical tolerancing' is concerned with the system used for the control of various types of geometrical form and positional error both for single and for related features. It describes the appropriate symbols and is in conformity with ISO/R 1101 and related ISO Recommendations\* but includes a more complete explanation. Drawings of practical engineering components are included in appendices to illustrate the text.

The principles of geometrical tolerancing contained in Part 3 of this standard are unchanged from those in previous editions of the standard; the introduction of the ISO symbols is to enable the tolerances to be set out in a more succinct form and to overcome the language barrier.

With each of the last two editions of this standard, an abridged edition was published, but, with the publication of the standard in Parts, an abridged edition is not considered to be necessary and has been discontinued.

The revision was undertaken at a time when the United Kingdom was changing to the metric system. The revision was not necessary on this account, for the principles of engineering drawing are the same whichever system of units is used and BS 308 : 1964 included the necessary recommendations on dimensioning and scales for a drawing to be made using metric units. However, the opportunity has been taken to use metric units in place of imperial units in the examples. Once again, no change in principle is implied, and brief information relevant to the imperial system of units has been retained in Appendix A to Part 2.

It will be noted that this standard recommends the use of the full point as the decimal sign in connection with metric units. The amendment to delete the comma in favour of the point was made in July 1970 in order to present a unified system within the United Kingdom. It is known however, that a number of trade associations and individual companies have chosen to retain the use of the decimal comma for drawings in the metric system, both as a means of indication of the system of measurement used and also to be in agreement with general practice in Europe.

## Notes on the use of this Part of the standard

(1) The figures used in the text of this standard are complete only in so far as is necessary to illustrate the point under consideration and they are not intended to be fully dimensioned working drawings. The linear dimensions shown in the figures are in millimetres.

(2) Similarly, numerical values of dimensions and tolerances given throughout are typical only and are not quoted as recommended practices.

(3) In the illustrations to this standard, the convention is adopted of using capital letters for notes that are intended to appear on the drawing, and lower case letters for explanatory notes that are not intended to appear on the drawing.

(4) This standard recognizes both FIRST ANGLE and THIRD ANGLE methods of projection (see Section 6) and examples of both methods are included.

(5) The clauses on dimensioning and tolerancing in Part 2 relate mainly to drawings which define products in their completely finished state *as required by the designer*. Such drawings do not necessarily define the manufacturing methods by which the design requirements are met. Many of the principles and practices, however, can be applied to process drawings which may define products in a partly finished state.

(6) It is strongly recommended that when a drawing has been prepared in accordance with this standard, and particularly when geometrical tolerances are specified (see Part 3), the drawing should carry a prominent note to this effect, such as 'For explanation of dimensions, notes, etc., see BS 308'.

\* 'Technical drawings—tolerances of form and of position', Part I, ISO/R 1101, 'Generalities, symbols, indications on drawings', Part II, ISO/DIS 2692, 'Maximum material principle', Part III, ISO/R 1660, 'Dimensioning and tolerancing of profiles', Part IV, ISO/R 1661, 'Practical examples of indication on drawings'.

THIS BRITISH STANDARD, having been approved by the Mechanical Engineering Industry Standards Committee, was published under the authority of the Executive Board on 13 October, 1972.

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First published September 1927

First revision December 1943

Second revision December 1953

Third revision November 1964

Fourth revision October 1972

ISBN: 0 580 07407 2

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

Committee reference MEE/10 MEE/10/1 Draft for approval 71/38177

## Co-operating organizations

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

Associated Offices' Technical Committee  
Association of Consulting Engineers  
Association of Hydraulic Equipment Manufacturers Ltd  
Association of Mining Electrical and Mechanical Engineers  
British Compressed Air Society  
\*British Electrical and Allied Manufacturers' Association  
\*British Gear Manufacturers' Association  
British Internal Combustion Engine Manufacturers' Association  
British Mechanical Engineering Confederation  
British Pump Manufacturers' Association  
British Steel Industry  
Crown Agents for Oversea Governments and Administrations  
Department of Employment (H.M. Factory Inspectorate)  
Department of the Environment  
\*Department of Trade and Industry  
Department of Trade and Industry—National Engineering Laboratory  
\*Electricity Council, the Central Electricity Generating Board and the Area Boards in England and Wales

\*Engineering Equipment Users' Association  
Gas Council  
Institution of Civil Engineers  
Institution of Gas Engineers  
Institution of Heating and Ventilating Engineers  
\*Institution of Mechanical Engineers  
Institution of Mechanical Engineers (Automobile Division)  
Institution of Plant Engineers  
\*Institution of Production Engineers  
London Transport Executive  
Machine Tool Trades Association  
Ministry of Defence  
\*Ministry of Defence, Army Department  
National Coal Board  
National Physical Laboratory (Department of Trade and Industry)  
Process Plant Association  
Royal Institute of British Architects  
Telecommunications Engineering Manufacturing Association  
Water-tube Boilermakers' Association

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:

British Metalworking Plantmakers' Association  
British Railways Board  
Department of Education and Science  
Draughtsmen's and Allied Technicians' Association  
Drawing Office Material Manufacturers' and Dealers' Association  
Electronic Engineering Association  
Imperial College of Science and Technology  
Institution of Engineering Designers  
Ministry of Defence (Navy)

Post Office  
Railway Industry Association of Great Britain  
Scientific Instrument Manufacturers' Association of Great Britain  
Society of British Aerospace Companies  
Society of Motor Manufacturers and Traders Ltd  
United Kingdom Atomic Energy Authority  
University of Manchester Institute of Science and Technology