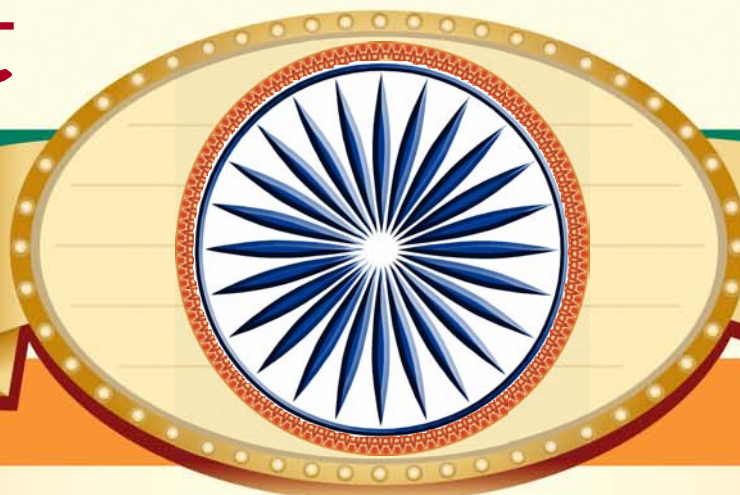


इंटरनेट

मानक



Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

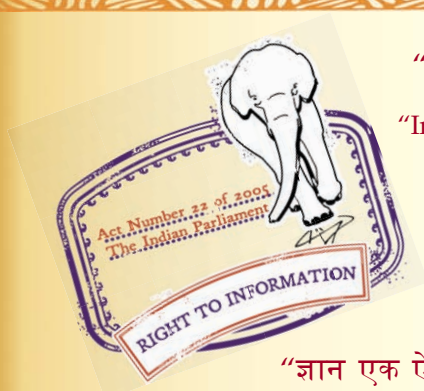
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

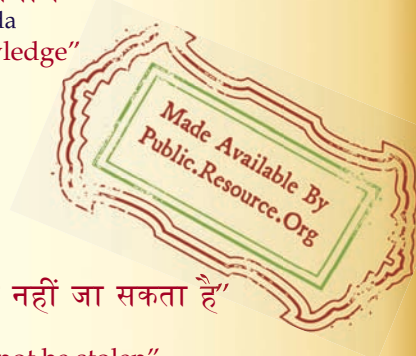
IS 11158 (1984): Proportions and Dimensions of Symbols for Geometrical Tolerancing Used in Technical Drawings [PGD 24: Drawings]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

[Reaffirmed 2005]



PROPORTIONS AND DIMENSIONS OF SYMBOLS FOR GEOMETRICAL TOLERANCING USED IN TECHNICAL DRAWINGS

(ISO Title : Technical Drawings — Symbols for Geometrical
Tolerancing — Proportions and Dimensions)

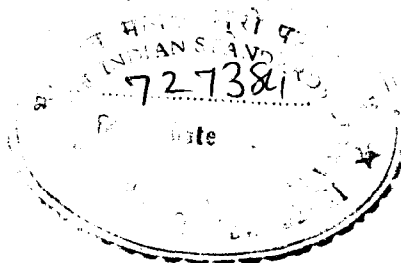
National Foreword

This Indian Standard which is identical with ISO 7083-1983 'Technical drawings — Symbols for geometrical tolerancing — Proportions and dimensions', issued by the International Organization for Standardization (ISO) was adopted by the Indian Standards Institution on the recommendation of the Drawings Sectional Committee and approved by the Mechanical Engineering Division Council.

Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

Cross References

<i>International Standard</i>	<i>Corresponding Indian Standard</i>
ISO 1101-1983	IS : 8000 (Part 1)-1976 Tolerances of form and of position for engineering drawings : Part 1 Generalities, symbols, indications on drawings (Technically equivalent)
ISO 3098/1-1974	IS : 9069-1983 English lettering for technical drawings (<i>first revision</i>) (Identical)
ISO 5459-1981	IS : 10721-1983 Datum and datum systems for geometrical tolerancing on technical drawings (Identical)



Adopted 4 September 1984

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Gr 5

0 Introduction

The purpose of this International Standard is to give instructions for the correct execution of the symbols for geometrical tolerancing on technical drawings (see ISO 1101 and ISO 5459), and to harmonize the dimensioning of these symbols with the lettering used for dimensioning and other indications on the drawing.

1 Scope and field of application

This International Standard specifies the recommended proportions and lays down the dimensions for the symbols used to indicate geometrical tolerancing on technical drawings.

The symbols and their lettering may be hand-written (using a rule for drawing the frames) or executed by means of other appropriate methods (for example, stencils, transfers, mechanical drawing, etc.).

The dimensions of the symbols are based on the standard heights of lettering given in ISO 3098/1.

2 References

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and runout — Generalities, definitions, symbols, indication on drawings*.¹⁾

ISO 3098/1, *Technical drawings — Lettering — Part 1: Currently used characters*.

ISO 5459, *Technical drawings — Geometrical tolerancing — Datums and datum-systems for geometrical tolerances*.

3 General conditions

3.1 The lettering used with the symbols shall be in accordance with the specifications of ISO 3098/1.

3.2 It is recommended that on any one drawing the height, thickness of lines and type of lettering with the symbols be equal to those applied for the dimensioning and other indications on that drawing.

4 Proportions

Examples for the proportions of the symbols and frames for use with lettering type B, vertical or inclined, are shown in figures 1 to 21.

The configurations are depicted on a grid with a spacing equal to the thickness of line. The design of the inscribed characters is mostly not shown, but shall be the same as in ISO 3098/1 for lettering type B, vertical or inclined.

For the alternative lettering type A, vertical or inclined, appropriate grids should be used, but it is understood that

- frames are always drawn as squares or rectangles;
- symbols for tolerated characteristics and additional symbols (see ISO 1101) are always to be depicted as shown in figures 1 to 21.

¹⁾ At present at the stage of draft. (Revision of ISO/R 1101/1-1969.)

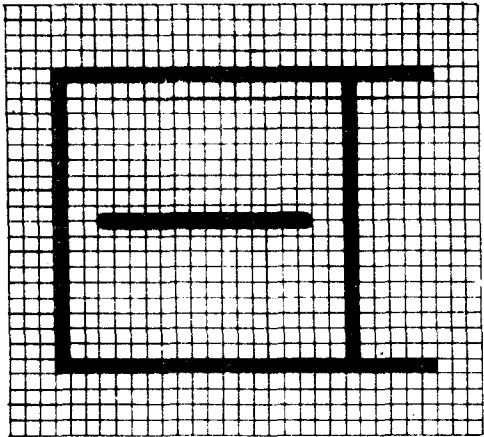


Figure 1 — Straightness

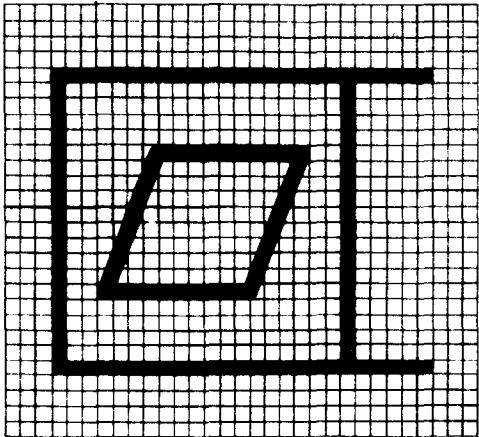


Figure 2 — Flatness

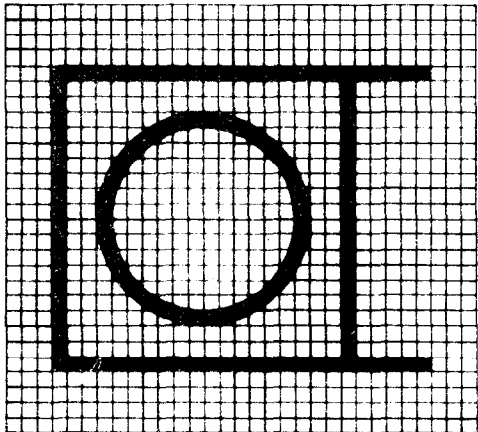


Figure 3 — Circularity (roundness)

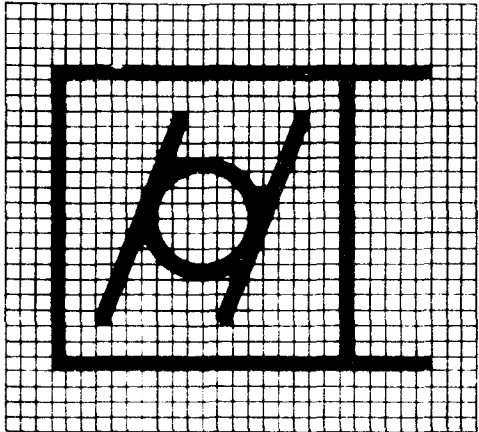


Figure 4 — Cylindricity

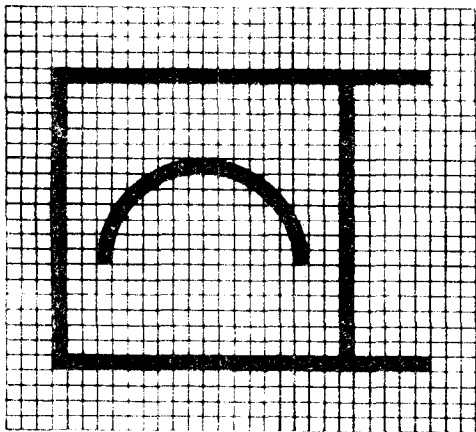


Figure 5 — Profile of any line

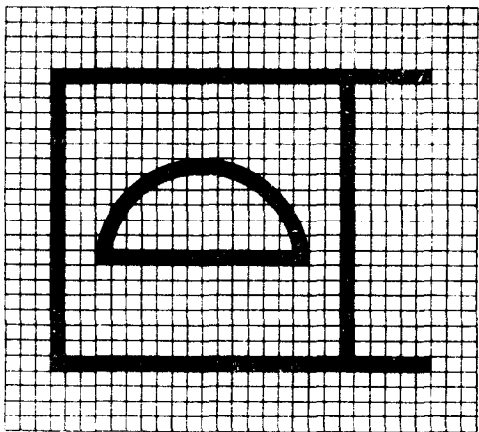


Figure 6 — Profile of any surface

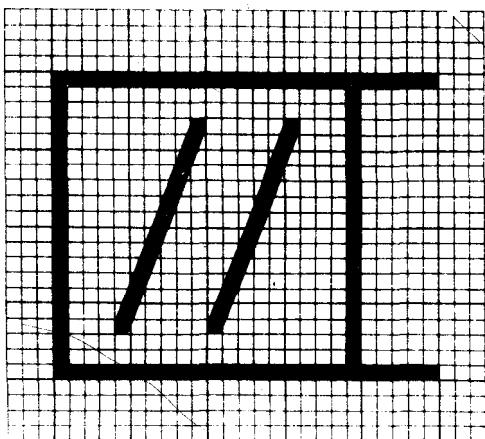


Figure 7 — Parallelism

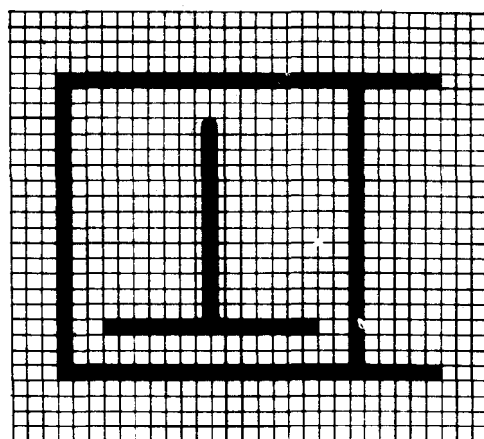


Figure 8 — Perpendicularity

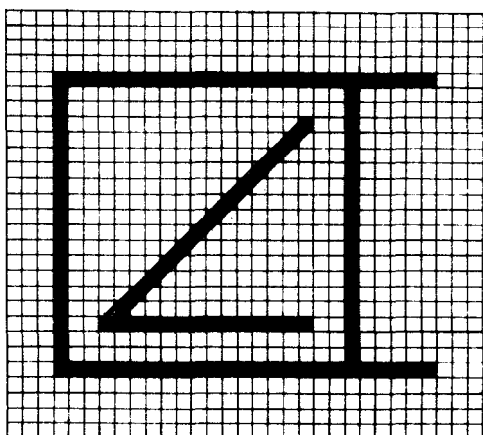


Figure 9 — Angularity

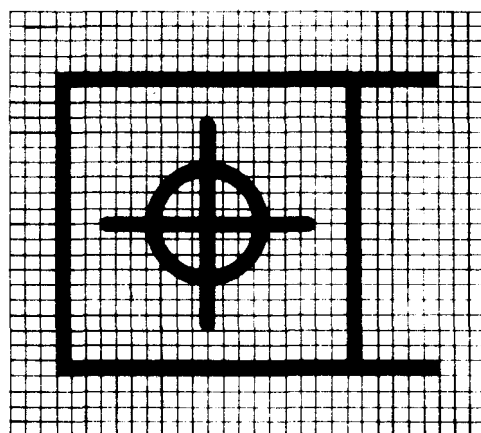


Figure 10 — Position

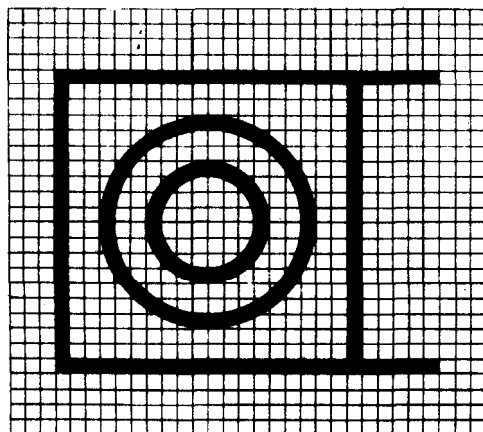


Figure 11 — Concentricity and coaxiality

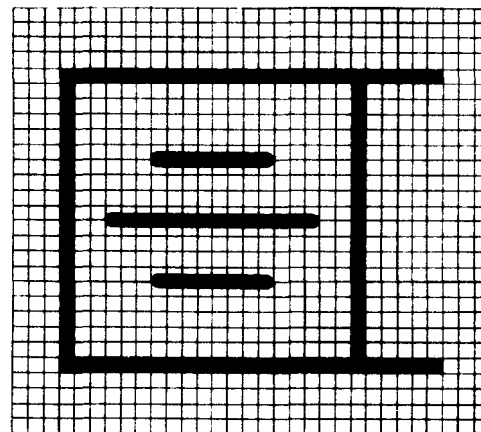


Figure 12 — Symmetry

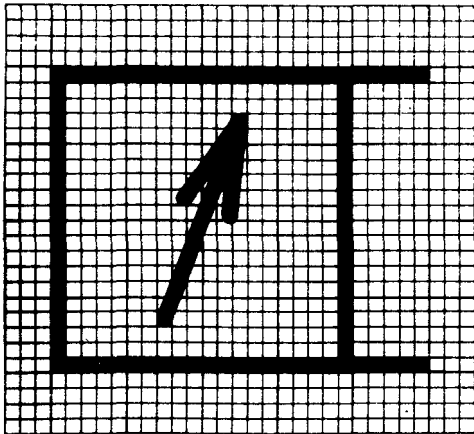


Figure 13 — Simple runout

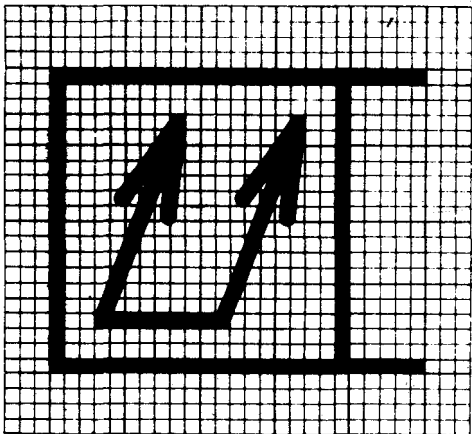


Figure 14 — Total runout

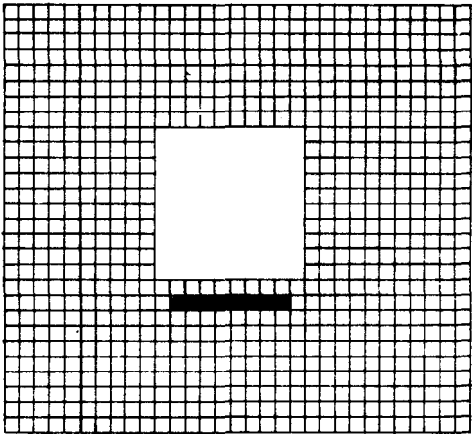


Figure 15 — Indication of toleranced feature (by reference letter)

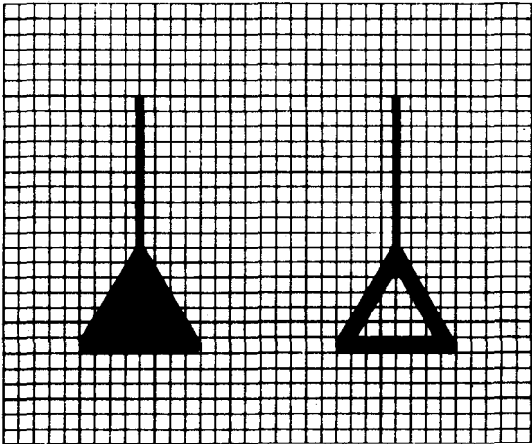


Figure 16 — Indication of datum (direct)

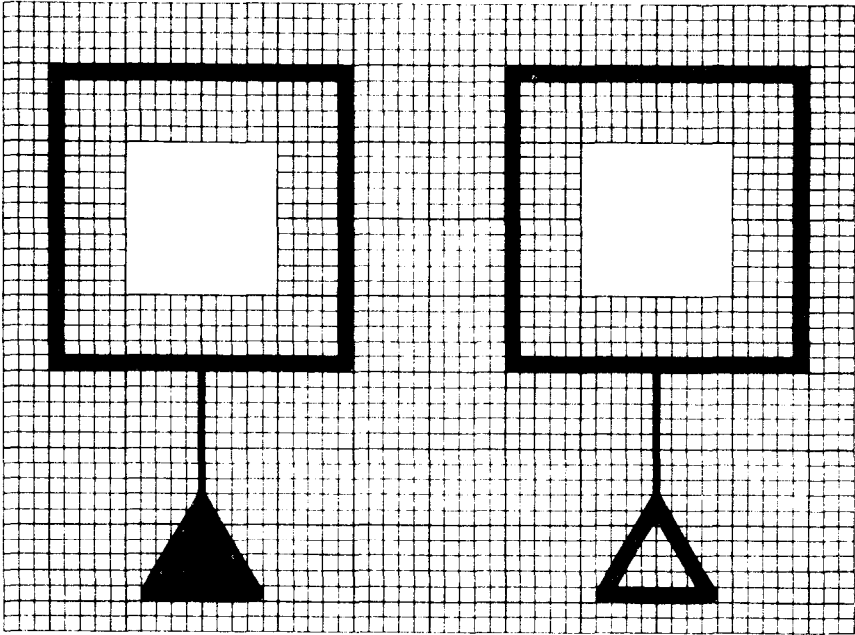


Figure 17 — Indication of datum (by reference letter)

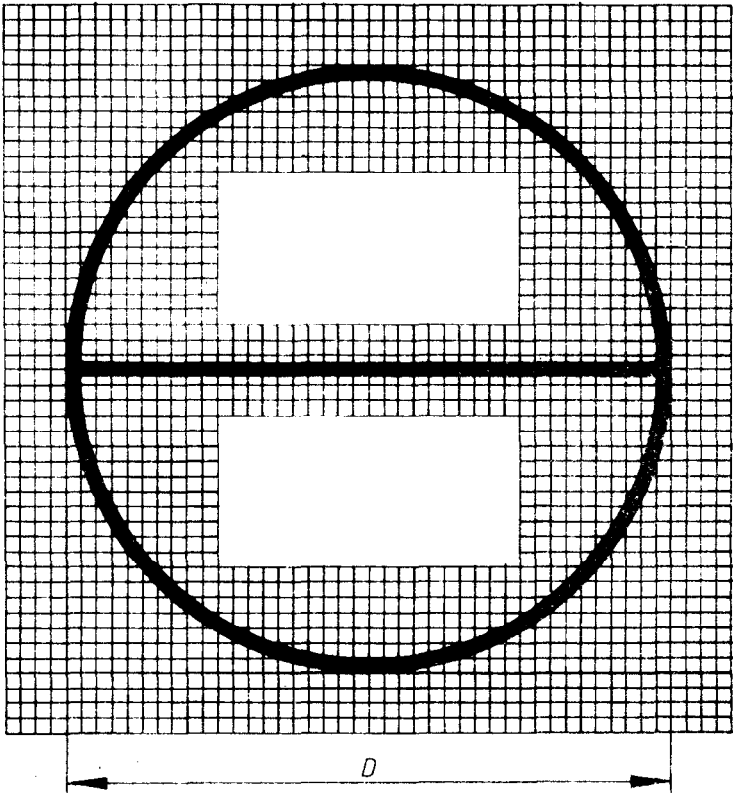
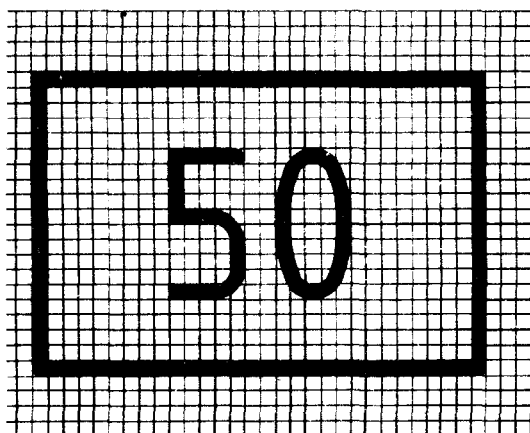
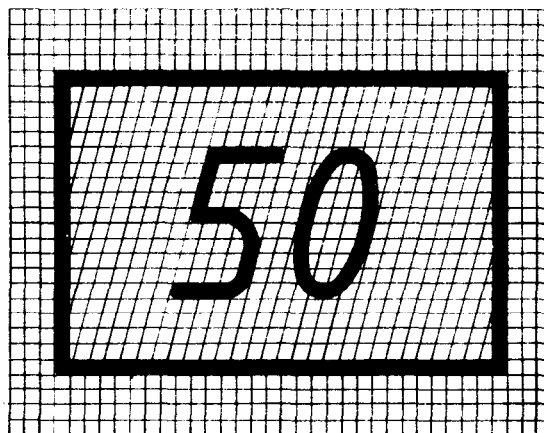


Figure 18 — Datum target (ISO 5459)

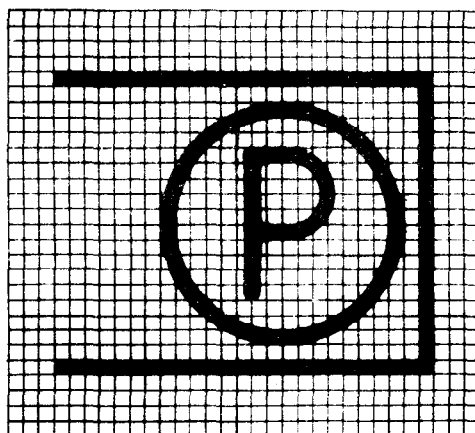


a)

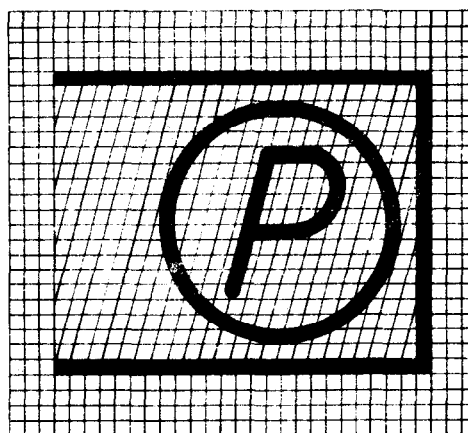


b)

Figure 19 — Theoretically exact dimension

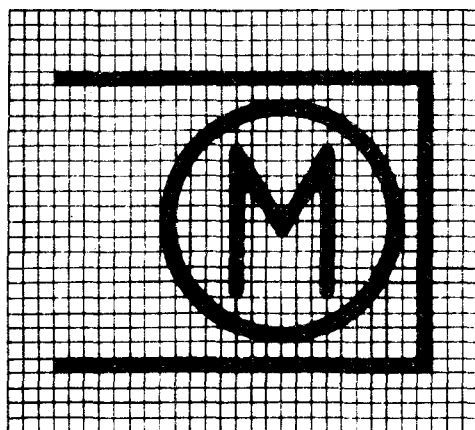


a)

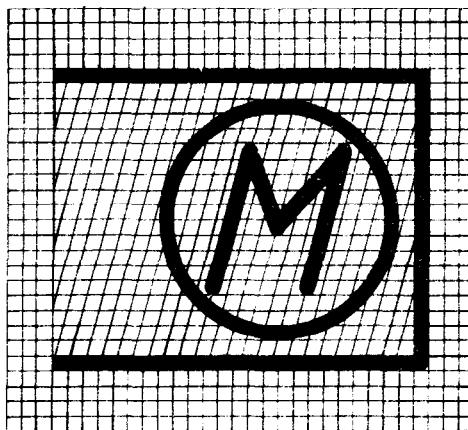


b)

Figure 20 — Projected tolerance zone



a)



b)

Figure 21 — Maximum material condition

5 Dimensions

5.1 Recommended dimensions of the symbols with lettering type A are specified in table 1, those for use with lettering type B in table 2.

Table 1 – Lettering type A
Dimensions in millimetres

Characteristic	Recommended dimensions					
Height of frame (H) *	7	10	14	20	28	40
Height of characters (h)	3,5	5	7	10	14	20
Diameter (D) **	14	20	28	40	56	80
Thickness of line (d)	0,25	0,35	0,5	0,7	1	1,4

Table 2 – Lettering type B
Dimensions in millimetres

Characteristic	Recommended dimensions						
Height of frame (H) *	5	7	10	14	20	28	40
Height of characters (h)	2,5	3,5	5	7	10	14	20
Diameter (D) **	10	14	20	28	40	56	80
Thickness of line (d)	0,25	0,35	0,5	0,7	1	1,4	2

* Where an additional tolerance value is to be inscribed in a lower compartment (see ISO 1101), this height should be increased, dependent on the heights of the inscriptions.

** See figure 18.

5.2 The recommended widths of the frame should be :

- first compartment, equal to height of frame (H);
- second compartment, to suit the length of the inscription;
- third and subsequent compartments, if required, to suit the width of the reference letter (or letters).

The distances between the vertical strokes of the compartments and the inscriptions shall be at least twice the thickness of lines, with a minimum of 0,7 mm.

6 Examples

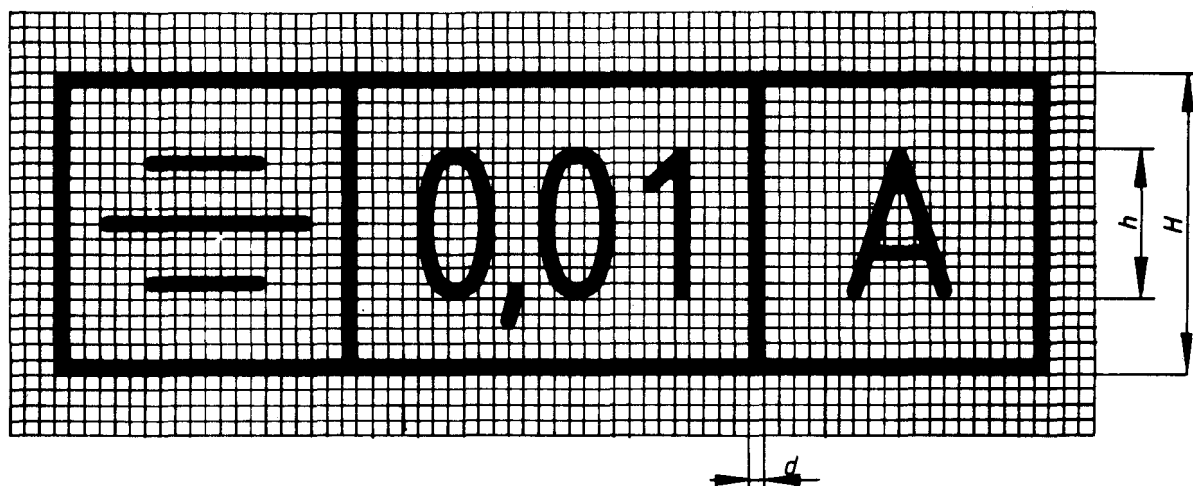


Figure 22a) — Lettering B, vertical

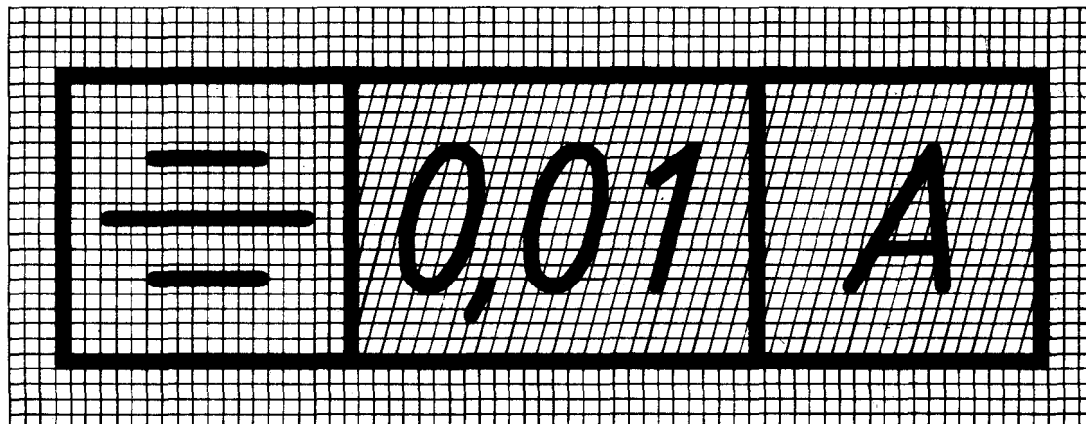


Figure 22b) — Lettering B, inclined

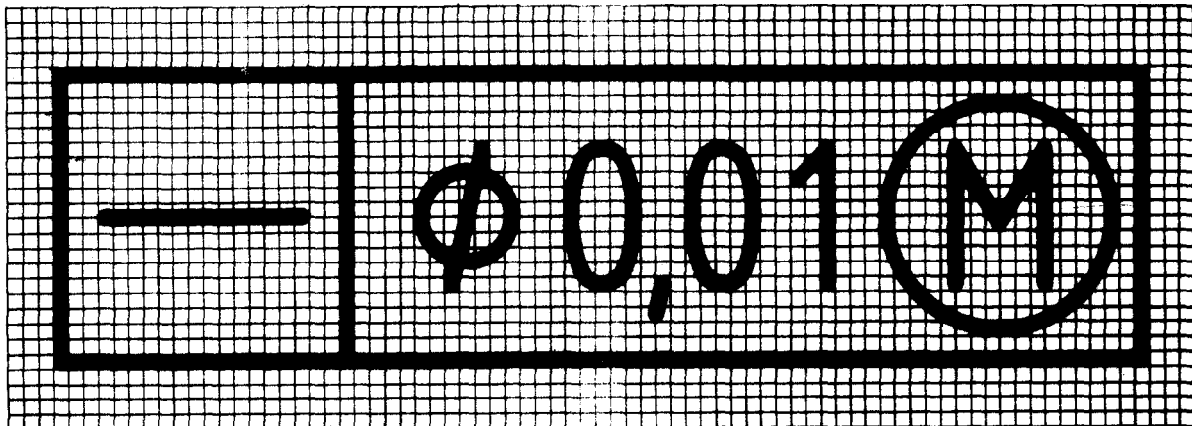


Figure 23a) — Lettering B, vertical

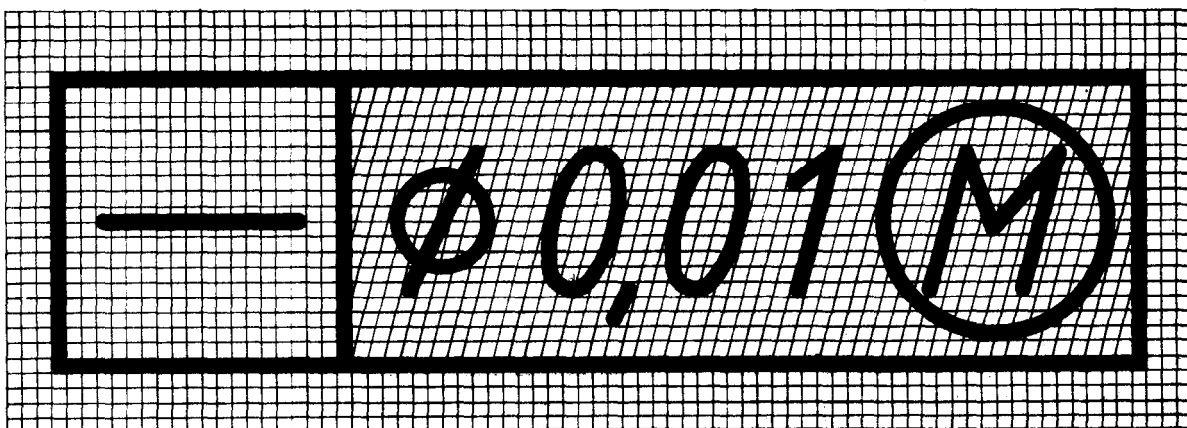


Figure 23b) — Lettering B, inclined