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मानक

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Mazdoor Kisan Shakti Sangathan

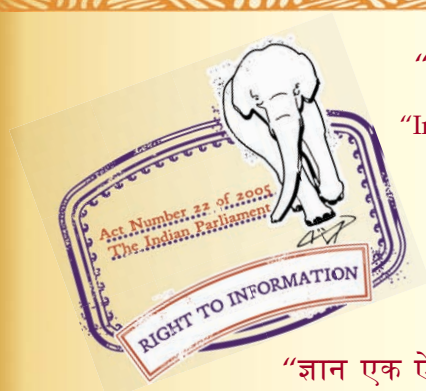
“The Right to Information, The Right to Live”

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“Step Out From the Old to the New”

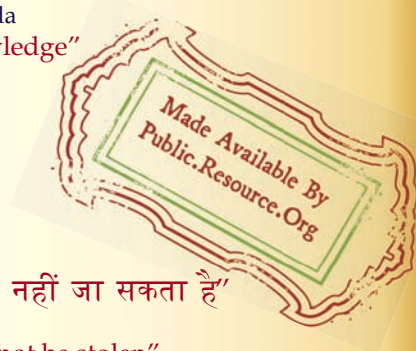
IS 9609-0 (2001): Technical Product Documentation -
Lettering, Part 0: General Requirements [PGD 24: Drawings]



“ज्ञान से एक नये भारत का निर्माण”

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Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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भाग 0 सामान्य अपेक्षाएँ

Indian Standard

**TECHNICAL PRODUCT DOCUMENTATION —
LETTERING**

PART 0 GENERAL REQUIREMENTS

ICS 01.100.01

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

NATIONAL FOREWORD

This Indian Standard (Part 0) which is identical with ISO 3098-0 : 1997 'Technical product documentation — Lettering — Part 0: General requirements' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendation of Drawings Sectional Committee and approval of the Basic and Production Engineering Division Council.

This standard (Part 0) specifies the general requirements for lettering to be used in technical product documentation (in particular on technical drawings). It includes basic conventions as well as rules for the application of lettering using the following techniques:

- a) Free-hand lettering,
- b) Templates and manual lettering instruments,
- c) Dry transfer system, and
- d) Numerically controlled lettering and draughting systems.

Other parts of this series are given as follows:

IS 9609 (Part 1) : 1983 ISO 3098-1 : 1974	Lettering on technical drawings: Part 1 English lettering (<i>first revision</i>)
IS 9609 (Part 2) : 1985 ISO 3098-2:1984	Lettering on technical drawings: Part 2 Greek characters
IS 9609 (Part 3) : 1991 ISO 3098-3 : 1987	Technical drawings — Lettering: Part 3 Diacritical and particular marks for the Latin alphabet
IS 9609 (Part 4) : 1991 ISO 3098-4 : 1984	Technical drawings — Lettering: Part 4 Cyrillic characters
IS 9609 (Part 5) : 1998	Lettering on technical drawings: Part 5 Amplified devnagri letters
IS 9609 (Part 6) : 2001 ISO 3098-5 : 1997	Technical product documentation — Lettering: Part 6 CAD lettering of the Latin alphabet, numerals and marks

The text of ISO Standard has been approved as suitable for publication as Indian Standard without deviations. In this adopted standard, certain terminology and conventions are not identical to those used in Indian Standards. Attention is especially drawn to the following:

- a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.
- b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a full point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard, which is to be substituted in its place, is listed below along with its degree of equivalence for the edition indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 128-20 : 1996 Technical drawings — General principles of presentation — Part 20: Basic conventions for lines	IS 10714 (Part 20) : 2001 Technical drawings — General principles of presentation : Part 20 Basic conventions for lines	Identical

(Continued on third cover)

Indian Standard

TECHNICAL PRODUCT DOCUMENTATION — LETTERING

PART 0 GENERAL REQUIREMENTS

1 Scope

This part of ISO 3098 specifies the general requirements for lettering, in accordance with all other parts of this International Standard, to be used in technical product documentation (in particular on technical drawings).

It includes basic conventions as well as rules for the application of lettering using the following techniques:

- a) free-hand lettering (by means of an underlaid "grid");
- b) templates (see ISO 9178) and manual lettering instruments;
- c) dry transfer systems;
- d) numerically controlled lettering and draughting systems.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 3098. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 3098 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 128-20:1996, *Technical drawings — General principles of presentation — Part 1: Basic conventions for lines*.

3 Definitions

For the purposes of this part of ISO 3098, the following definitions apply.

3.1 central line: Imaginary line in the middle of each line or line element which is a constitutive part of a graphic character set.

NOTES

- 1 Lines may be drawn by means of tubular technical pens conforming with ISO 9175-1 and ISO 9175-2.
- 2 The central line is the basic datum for the design of tools for lettering, e.g. engraving tools for templates, programs for lettering generators.

3.2 graphic character set: Finite set of different graphic characters in a fixed type of lettering, including letters of a certain alphabet, numerals, diacritical marks, punctuation marks and additional graphical symbols, that is considered complete for a given purpose (see also ISO 2382-4).

3.3 lettering

- (1) Procedure of writing graphic characters taken from a graphic character set on a (technical) drawing carrier (in addition to the graphical representation).
- (2) The whole of the nongraphical information on a (technical) drawing carrier (text, instructions, dimensions, etc.).
- (3) The whole of the graphic characters of a graphic character set which can be used for transferring nongraphical information onto a (technical) drawing carrier.

4 General requirements

The basic characteristics required of lettering are given in 4.1 to 4.3.

4.1 Legibility, which shall be maintained by a space between characters of twice the line width used for lettering.

This spacing may be reduced to one line width for a better visual effect with combinations of particular characters, e.g. LA, TV or Tr.

4.2 Suitability for the generally used copying processes (diaz copying, microfilming, telefax, etc.).

4.3 Suitability for numerically controlled draughting systems.

5 Dimensions

5.1 Nominal size

The nominal size of lettering is defined by the height (h) of the outline contour of the upper-case (capital) letters (see figure 1 and tables 1 and 2).

The dimensions shown in figures 1 to 3 as applied to the Latin (L) alphabet shall also be applied to the Cyrillic (C) and Greek (G) alphabets.

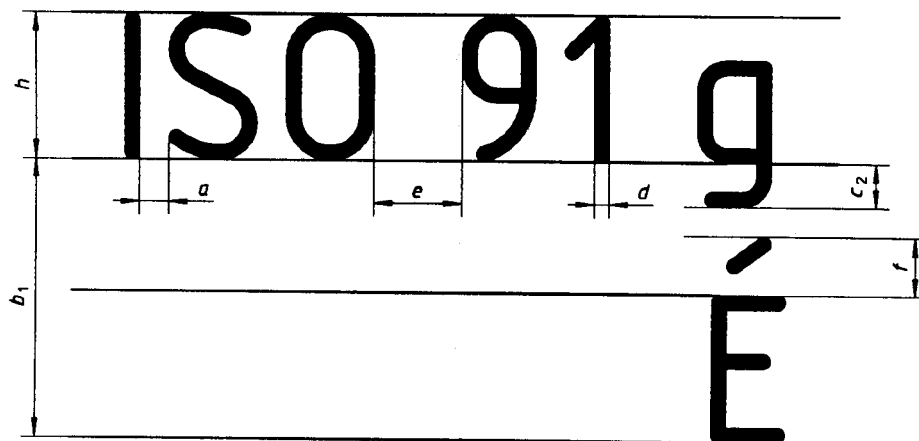


Figure 1

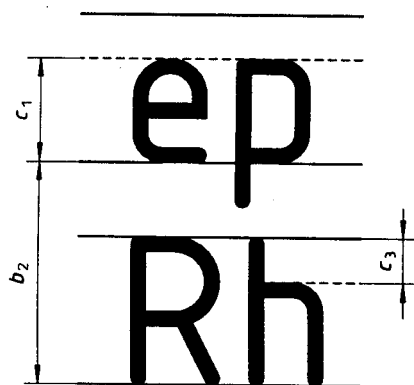


Figure 2

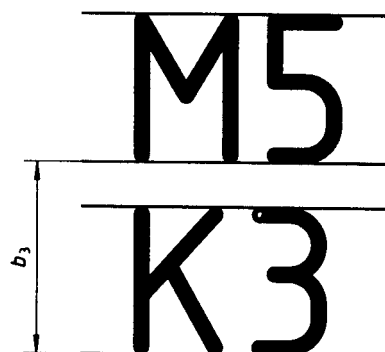


Figure 3

5.2 Location of central lines

The nominal size (h) and the spacing between characters (a) shall be taken as the basis for defining the central line (see figures 4 and 5). For other dimensions see tables 1 and 2.

$$h_1 = h - d$$

$$a_1 = a + d$$

When CAD lettering is used (see ISO 3098-5), the same sizes are required as for other techniques.

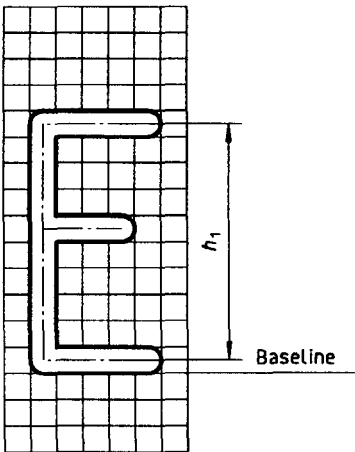


Figure 4

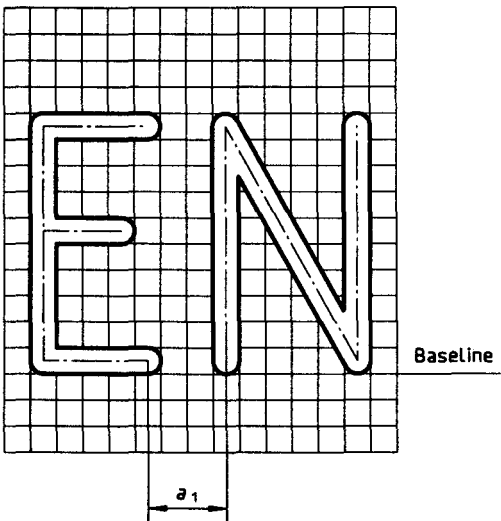


Figure 5

5.3 Range of nominal sizes

The range of nominal sizes is specified as follows:

1,8 mm; 2,5 mm; 3,5 mm; 5 mm; 7 mm; 10 mm; 14 mm; 20 mm

The multiple of $\sqrt{2}$ in the range of heights for lettering is derived from the standardized progression of dimensions for paper sizes (see ISO 216).

The line widths shall be in accordance with ISO 128-20 and the same line width shall be used for both upper-case and lower-case letters.

5.4 Lettering angle

The lettering may be vertical (upright), see figures 1 to 5, or inclined (sloped) to the right at 75° from the horizontal (see figure 6).

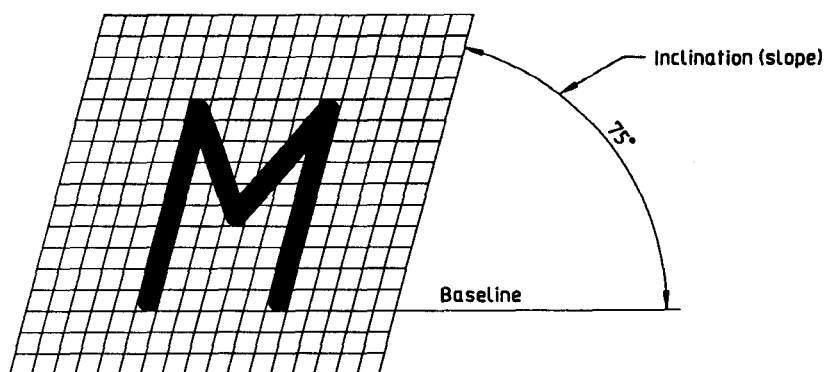


Figure 6

5.5 Types of lettering

The types of lettering are as follows:

— lettering type A, vertical (V)	}	Dimensions specified in table 1
— lettering type A, sloped (S)		
— lettering type B, vertical (V) (preferred application)	}	Dimensions specified in table 2
— lettering type B, sloped (S)		
— lettering type CA, vertical (V)	}	See ISO 3098-5 (for application of numerically controlled draughting via CAD)
— lettering type CA, sloped (S)		
— lettering type CB, vertical (V) (preferred application)		
— lettering type CB, sloped (S)		

Table 1 — Dimensioning of lettering type A

Dimensions in millimetres

Characteristic		Multiple of <i>h</i>	Dimensions							
Lettering height	<i>h</i>	$(14/14)h$	1,8	2,5	3,5	5	7	10	14	20
Height of lower-case letters (x-height)	<i>c</i> ₁	$(10/14)h$	1,3	1,8	2,5	3,5	5	7	10	14
Tail of lower-case letters	<i>c</i> ₂	$(4/14)h$	0,52	0,72	1	1,4	2	2,8	4	5,6
Stem of lower-case letters	<i>c</i> ₃	$(4/14)h$	0,52	0,72	1	1,4	2	2,8	4	5,6
Area of diacritical marks (upper-case letters)	<i>f</i>	$(5/14)h$	0,65	0,9	1,25	1,75	2,5	3,5	5	7
Spacing between characters	<i>a</i>	$(2/14)h$	0,26	0,36	0,5	0,7	1	1,4	2	2,8
Minimum spacing between baselines ¹⁾	<i>b</i> ₁	$(25/14)h$	3,25	4,5	6,25	8,75	12,5	17,5	25	35
Minimum spacing between baselines ²⁾	<i>b</i> ₂	$(21/14)h$	2,73	3,78	5,25	7,35	10,5	14,7	21	29,4
Minimum spacing between baselines ³⁾	<i>b</i> ₃	$(17/14)h$	2,21	3,06	4,25	5,95	8,5	11,9	17	23,8
Spacing between words	<i>e</i>	$(6/14)h$	0,78	1,08	1,5	2,1	3	4,2	6	8,4
Line width	<i>d</i>	$(1/14)h$	0,13 ⁴⁾	0,18 ⁴⁾	0,25	0,35 ⁴⁾	0,5	0,7 ⁴⁾	1	1,4 ⁴⁾
1) Lettering style: upper-case and lower-case letters with diacritical marks (see figure 1). 2) Lettering style: upper-case and lower-case letters without diacritical marks (see figure 2). 3) Lettering style: upper-case letters only (see figure 3). 4) Rounded values; the values of the dimensions <i>c</i> ₁ through <i>e</i> are calculated from the rounded values of <i>d</i> .										

Table 2 — Dimensioning of lettering type B

Dimensions in millimetres

Characteristic		Multiple of <i>h</i>	Dimensions							
Lettering height	<i>h</i>	$(10/10)h$	1,8	2,5	3,5	5	7	10	14	20
Height of lower-case letters (x-height)	<i>c</i> ₁	$(7/10)h$	1,26	1,75	2,5 ⁴⁾	3,5	5 ⁴⁾	7	10 ⁴⁾	14
Tail of lower-case letters	<i>c</i> ₂	$(3/10)h$	0,54	0,75	1,05	1,5	2,1	3	4,2	6
Stem of lower-case letters	<i>c</i> ₃	$(3/10)h$	0,54	0,75	1,05	1,5	2,1	3	4,2	6
Area of diacritical marks (upper-case letters)	<i>f</i>	$(4/10)h$	0,72	1	1,4	2	2,8	4	5,6	8
Spacing between characters	<i>a</i>	$(2/10)h$	0,36	0,5	0,7	1	1,4	2	2,8	4
Minimum spacing between baselines ¹⁾	<i>b</i> ₁	$(19/10)h$	3,42	4,75	6,65	9,5	13,3	19	26,6	38
Minimum spacing between baselines ²⁾	<i>b</i> ₂	$(15/10)h$	2,7	3,75	5,25	7,5	10,5	15	21	30
Minimum spacing between baselines ³⁾	<i>b</i> ₃	$(13/10)h$	2,34	3,25	4,55	6,5	9,1	13	18,2	26
Spacing between words	<i>e</i>	$(6/10)h$	1,08	1,5	2,1	3	4,2	6	8,4	12
Line width	<i>d</i>	$(1/10)h$	0,18	0,25	0,35	0,5	0,7	1	1,4	2
1) Lettering style: upper-case and lower-case letters with diacritical marks (see figure 1). 2) Lettering style: upper-case and lower-case letters without diacritical marks (see figure 2). 3) Lettering style: upper-case letters only (see figure 3). 4) Rounded values.										

5.6 Underlined and overlined texts or text fields

When a text or text field has to be underlined or overlined, it is recommended to interrupt the underlining or overlining line at all places where a lower-case letter has a tail (e.g. figure 7) or where an upper-case letter has a diacritical mark (e.g. cedilla, tilde, umlaut; see figure 8). If this is not feasible, the space between baselines shall be extended.

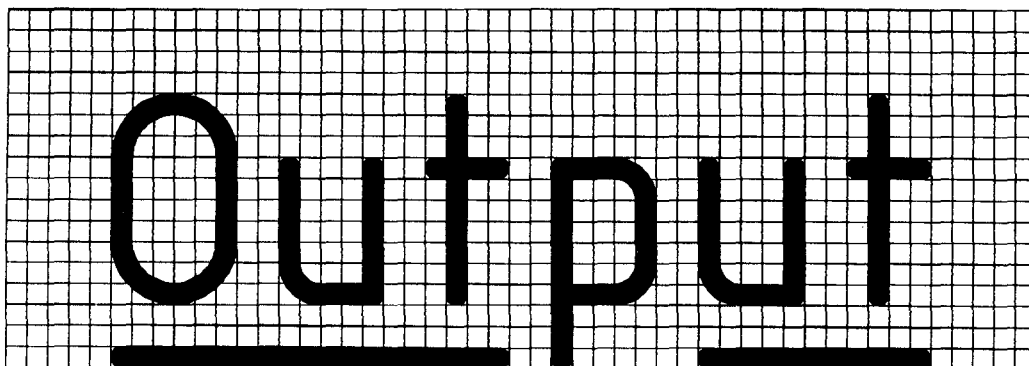


Figure 7

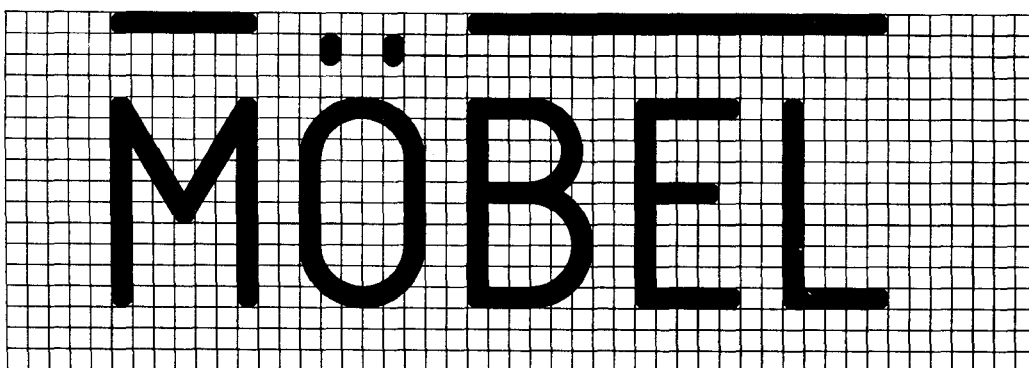


Figure 8

6 Designation

6.1 The designation of lettering types A and B shall comprise the following elements in the given order:

- "Lettering";
- "ISO 3098";
- the type of lettering ("A" or "B");
- the inclination of lettering ("V" or "S");
- the kind of alphabet ("L", "G" or "C");
- the nominal size of the lettering, in millimetres.

EXAMPLES

A graphic character set of lettering type B, vertical, Latin alphabet, of nominal size 5 mm, shall be designated as follows:

Lettering ISO 3098 - BVL - 5

A graphic character set of lettering type A, sloped, Greek alphabet, of nominal size 3,5 mm, shall be designated as follows:

Lettering ISO 3098 - ASG - 3,5

A graphic character set of lettering type B, sloped, Cyrillic alphabet, of nominal size 1,8 mm, shall be designated as follows:

Lettering ISO 3098 - BSC - 1,8

6.2 The designation of lettering types CA and CB shall comprise the following elements in the given order:

- a) "Lettering";
- b) "ISO 3098";
- c) the type of lettering ("CA" or "CB");
- d) the spacing arrangement [tabular (T) or proportional (P)];
- e) the inclination of lettering ("V" or "S");
- f) the kind of alphabet ("L", "G" or "C");
- g) the nominal size of the lettering, in millimetres.

EXAMPLES

A graphic character set of lettering type CB in tabular spacing arrangement, sloped, Latin alphabet, of nominal size 2,5 mm, shall be designated as follows:

Lettering ISO 3098 - CB TSL - 2,5

A graphic character set of lettering type CA in proportional spacing arrangement, vertical, Greek alphabet, of nominal size 3,5 mm, shall be designated as follows:

Lettering ISO 3098 - CA PVG - 3,5

Annex A **(informative)**

Bibliography

- [1] ISO 128:1982, *Technical drawings — General principles of presentation*.
- [2] ISO 216:1975, *Writing paper and certain classes of printed matter — Trimmed sizes — A and B series*.
- [3] ISO 2382-4:1987, *Information processing systems — Vocabulary — Part 4: Organization of data*.
- [4] ISO 3098-5:1997, *Technical product documentation — Lettering — Part 5: CAD lettering of the Latin alphabet, numerals and marks*.
- [5] ISO 9175-1:1988, *Tubular tips for hand-held technical pens using India ink on tracing paper — Part 1: Definitions, dimensions, designations and marking*.
- [6] ISO 9175-2:1988, *Tubular tips for hand-held technical pens using India ink on tracing paper — Part 2: Performance, test parameters and test conditions*.
- [7] ISO 9178-1:1988, *Templates for lettering and symbols — Part 1: General principles and identification markings*.
- [8] ISO 9178-3:1989, *Templates for lettering and symbols — Part 3: Slot widths for technical pens with tubular tips in accordance with ISO 9175-1*.

(Continued from second cover)

This adopted standard also gives Bibliography in Annex A, which is informative. The corresponding Indian Standards against the International Standards are given below along with their degree of equivalence for the editions indicated:

<i>International Standard</i>	<i>Corresponding Indian Standard</i>	<i>Degree of Equivalence</i>
ISO 128 : 1982 Technical drawings — General principles of presentation	IS 10714 : 1983 General principles of presentation on technical drawings	Identical
ISO 3098-5 : 1997 Technical product documentation — Lettering — Part 5: CAD lettering of the Latin alphabet, numerals and marks	IS 9609 (Part 6) : 2001 Technical product documentation — Lettering: Part 6 CAD lettering of the Latin alphabet, numerals and marks	do
ISO 9175-1 : 1988 Tubular tips for hand-held technical pens using India ink on tracing paper — Part 1: Definitions, dimensions, designations and marking	IS 14440 : 1997 Drawing instruments — Tubular tips for hand held technical pens using India ink on tracing paper — Specification	Modified
ISO 9175-2 : 1988 Tubular tips for hand-held technical pens using India ink on tracing paper — Part 2: Performance, test parameters and test conditions		
ISO 9178-1 : 1988 Templates for lettering and symbols — Part 1: General principles and identification markings	IS/ISO 9178-1 : 1988 Templates for lettering and symbols: Part 1 General principles and identification markings	Identical
ISO 9178-3 : 1989 Templates for lettering and symbols — Part 3: Slot widths for technical pens with tubular tips in accordance with ISO 9175-1	IS/ISO 9178-3 : 1989 Templates for lettering and symbols: Part 3 Slot widths for technical pens with tubular tips in accordance with ISO 9175-1	do

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Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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