

JIS

JAPANESE INDUSTRIAL STANDARD

**Handprinted HIRAGANA
characters for Optical
Character Recognition**

JIS X 9009—1991

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Handprinted HIRAGANA characters for Optical
Character Recognition

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1. Scope

This Japanese Industrial Standard specifies the character form of handprinted HIRAGANA to be used for Optical Character Recognition (hereafter, referred to as OCR) as well as the specification of lateral and vertical writing relating to this.

Informative reference: The character form of handprinted KANJI for OCR and items relating to this are shown as informative reference.

2. Definitions

For the purpose of this standard, the following definitions of terms apply.

- (1) HIRAGANA Hiragana shall be the following 85 in total of characters and symbols "あいうえお かきくけこ さしすせそ たちつと なにぬねの はひふへほ まみむめも やゆよ らりるれろ わゐゑをん がぎぐげご ざじずぜぞ だぢづでど ばびぶべぼ ぱぴぷぺぽ あいうえおつやゆよわ and . (period) ,(comma)".
- (2) character form Actual graphics realized at writing or printing.
- (3) character style This is the general idea of characters in the base of expressed character form and designates the manner of points and strokes as elements to discriminate individual characters. Namely, the character style is abstract and is expressed as character form in reality.
- (4) line element Line written in one stroke of pen constructing individual character form.
- (5) line width Width of line element.
- (6) clearance Significant blank to be held between line elements constructing character form.
- (7) projection Part of line element projected from intersection with line to be reference when two line elements intersect or contact at one point.

This is recognized in character form such as "あ お か き け さ す せ たち な ぬ ね は ま み む め も や ゆ よ れ わ を あ ゃ め よ わ".

- (8) HANE (Sweep) Additional part indicating transition in writing order from end part of one line element to other line element.

This is recognized in character form of "い か い".

- (9) short line element Relatively short line element in character form constructed with plural line elements.

This is recognized in character form in "う え お そ な ふ む や ら , (comma) う え お そ".

- (10) microloop Minute closed range generated by connection or intersection of same line elements.

This is recognized in character form of "お す な ん ね は ほ ま み む よ る 。 (period) ん ぬ ぶ".

- (11) form process chart reference side Side to be reference at machine reading. It shall be lateral in the case of lateral writing and vertical in the case of vertical writing (see Annex Fig. 1).
- (12) entry frame Inside of rectangle indicating the place to be written with one character form enclosed by lines parallel and perpendicular to form process chart reference side (see Annex Fig. 1).
- (13) width of entry frame Distance between vertical lines (in inside) constructing one entry frame (see Annex Fig. 1).
- (14) height of entry frame Distance between lateral lines (in inside) constructing one entry frame (see Annex Fig. 1).
- (15) entry range Minimum rectangular range containing all entry frames of continuous set in one line with sides parallel and perpendicular to form process chart reference side. However, one line shall be taken in lateral direction in the case of lateral writing and in vertical direction in the case of vertical writing (see Annex Fig. 2).
- (16) line interval Distance between central lines of two entry frames adjacent in direction perpendicular to line direction. However, the central line shall be a perpendicular bisection of vertical side of entry frame in the case of lateral writing and perpendicular bisection of lateral side of entry frame in the case of vertical writing (see Annex Fig. 1).
- (17) margin between entry frames Distance between entry frames in one entry range. Distance from vertical line in right end to vertical line in left end of next entry frame in the case of lateral writing. Distance from lateral line in lower end to lateral line in upper end of next entry frame in the case of vertical writing (see Annex Fig. 1).
- (18) character boundary Minimum rectangle with sides parallel or perpendicular to form process chart reference side containing in its inside all line elements of one character form (see Annex Fig. 1).
- (19) clear area Rectangular range containing entry range with sides parallel or perpendicular to form process chart reference side and margin part around it (see Annex Fig. 2).
- (20) drop-out colour Colour which can be discriminated clearly from that of surrounding margin part by human eye but with hue, chromaticness and lightness almost unable to be perceived by OCR device.

3. Classification and Designation of Character Styles

The character styles shall be classified in one sort and shall be designated as OCR-HH.

4. Character Forms

The character forms shall be as follows.

あ	い	う	え	お	か	き	く	け	こ
さ	し	す	せ	そ	た	ち	つ	て	と
な	に	ぬ	ね	の	は	ひ	ふ	へ	ほ
ま	み	む	め	も	や	ゆ	よ	ら	り
る	れ	ろ	わ	ゐ	ゑ	を	ん		
が	ぎ	ぐ	げ	ご	ざ	じ	ず	ぜ	ぞ
だ	ぢ	づ	で	ど	ば	び	ぶ	べ	ぼ
ぱ	ぴ	ぷ	ぺ	ぽ	あ	い	う	え	お
っ	ゃ	ゅ	ょ	わ	。	、			

5. Summary of Entry

5.1 Summary of General Entry One HIRAGANA character shall be written by the character form shown in 4. within one entry frame.

5.2 Clearance The clearance shown in character forms of 4. shall be 0.5 mm or over.

Further, the character shall not be written so that the clearance may be generated at a position other than those shown in 4.

5.3 Projection HANE (sweep) and KAZARI (serif) The excessive projections, HANE (sweep) and other decorative additional parts shall not be made in position other than those shown in 4.

5.4 Short Line Elements The short line elements shall be 1.0 mm or over in length.

5.5 Microloops The microloop shall be 0.5 mm or over in internal diameter.

5.6 Size of Character Form The tolerances of width and height of character boundary shall be as shown in Table 1.

Table 1. Tolerance of Size of Character Form

Classification of character form	い, つ, へ	う, く, し, も, り	Other upper-case character
Width	$\frac{2}{3}W_{toW}$	$\frac{1}{2}W_{toW}$	$\frac{2}{3}W_{toW}$
Length	$\frac{1}{2}H_{toH}$	$\frac{2}{3}H_{toH}$	

Remarks: H is the height of entry frame and W is its width.

Further, the lowercase characters (あいうえおつやゆよわ) shall be written in size of 1/2 to 2/3 of size of uppercase characters to be written in the same entry range.

5.7 Line Width The tolerance range of line width shall be 0.25 to 0.65 mm.

6. Entry Frames

6.1 Minimum Entry Frame In order to ensure the separation between line elements of character, the minimum width of entry frame shall be 7 mm and the height of entry frame shall be 1.0 to 1.4 times of width (see Annex Fig. 1).

6.2 Arrangement of Entry Frames The minimum margin between entry frames shall be 1.5 mm. The line interval shall be taken so that the clear area may not enter in entry range of an other line (see Annex Fig. 1).

6.3 Spectral Characteristics The entry frames shall be printed in drop out colour.

7. Entry Ranges

The entry range must be determined in every line by collecting entry frames. However, one line may be divided in sets of HIRAGANA as recognition objects to take as a separate entry range in each.

8. Clear Areas

The clear areas shall be as follows.

- (1) In the case of lateral writing, the vertical distances of upper and lower boundaries of clear area and upper and lower boundaries of entry frame shall be 4 mm or over and the lateral distances of left and right boundaries and left and right boundaries of entry range shall be 6 mm or over.
- (2) In the case of vertical writing, the horizontal distance of left and right boundaries of clear area and left and right boundaries of entry range shall be 4 mm or over and the vertical distance of upper and lower boundaries of clear area and upper and lower boundaries of entry range shall be 6 mm or over.
- (3) There must be only entry frames and HIRAGANA as recognition objects in the clear area. The clear area may overlap each other with clear area of entry range adjacent in upper and under and left and right but must not overlap each other with other entry range (see Annex Fig. 2).

Remarks: The characters printed in drop-out colours are allowed to be in the clear area.

Reference Standards:

JIS X 0208-Code of the Japanese Graphic Character Set for Information Interchange

JIS X 9004-Printing Specifications for Optical Character Recognition

JIS X 9005-Handprinted KATAKANA Characters for Optical Character Recognition

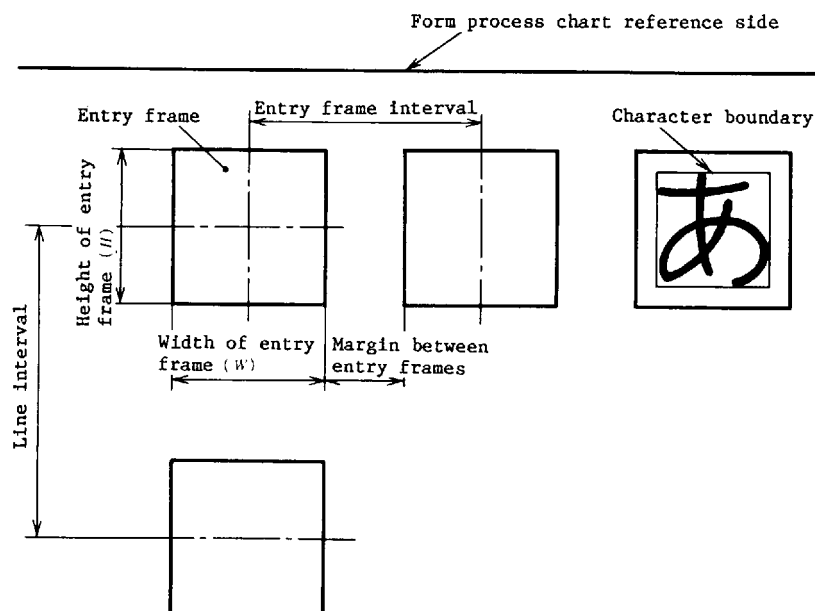
JIS X 9006-Handprinted Numerals for Optical Character Recognition

JIS X 9007-Handprinted Alphabets for Optical Character Recognition

JIS X 9008-Handprinted Symbols for Optical Character Recognition

Annex Fig. 1. Form process chart reference side, entry frames and character boundaries

(1) In the case of lateral writing



(2) In the case of vertical writing

