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Information processing — Magnetic ink character recognition —

Part 1: Print specifications for E13B

Traitement de l'information — Reconnaissance des caractères à encre magnétique —
Partie 1: Spécifications d'impression E13B

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. www.iso.org/directives

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The committee responsible for this document is ISO/TC 68, *Financial services*, Subcommittee SC 7, *Core banking*.

This first edition of ISO 1004-1, together with ISO 1004-2, cancels and replaces ISO 1004:1995, which has been technically revised.

ISO 1004 consists of the following parts, under the general title *Information processing — Magnetic ink character recognition*:

— *Part 1: Print specifications for E13B*

— *Part 2: Print specifications for CMC7*

Annexes A to D of this International Standard are for information only.

Introduction

The characters specified in this part of ISO 1004 were developed initially for use in banks to permit automatic document handling for financial institution data processing, but they have application to other automatic handling systems as well.

Information processing — Magnetic ink character recognition —

Part 1: Print specifications for E13B

1 Scope

This part of ISO 1004 specifies the shape, dimensions, magnetic signal level, and tolerances for the E-13B characters which include 10 numerals and four special symbols printed in magnetic ink and used for the purpose of character recognition. It describes the various known types of printing defects and other printing considerations, together with the tolerances permitted.

2 Character configuration

2.1 Designation

The series of standard magnetic ink characters shall consist of 10 numerals and four special symbols. They shall be identified as follows:

Name	Character appearance
One (1)	
Two (2)	
Three (3)	
Four (4)	
Five (5)	
Six (6)	
Seven (7)	
Eight (8)	
Nine (9)	
Zero (0)	
Symbol 1 (Transit)	
Symbol 2 (Amount)	
Symbol 3 (On-us)	
Symbol 4 (Dash)	

2.2 Dimensions

Detailed dimensions and the reference centre-lines of the printed characters for the 10 numerals and four special symbols shall be as shown in Figure 1 to Figure 14.

Figure 15 illustrates the character design matrix. All radii are 0,165 mm except in the character zero. All radii shall be blended with adjacent edges. Tolerance of each average edge = ± 0,038 mm. The minimum horizontal bars width is 0,279 mm. This minimum dimension does not apply to vertical bars (see 5.5).

3 Character spacing and alignment

3.1 Spacing

3.1.1 Character spacing

The distance between the right average edges of adjacent characters shall be 3,175 mm ± 0,254 mm. See Figure 16. Average edge is discussed in 5.2.

3.1.2 Tolerance accumulation

The accumulation of spacing tolerances in any common field shall be limited to the extent that the accumulation does not infringe upon the boundaries defining this field.

3.1.3 Special cases

Normally a spacing of 6,35 mm ± 0,508 mm is accumulated when two characters within a field are separated by one space.

Additional spacing tolerance of ± 1,5588 mm shall apply within a field or from field to field when printing does not guarantee to meet adjacent character spacing but only when surrounding spaces are utilized as a safety band. For those instances where a full space is not used, adjacent character spacing shall never be less than 2,921 mm or more than 4,064 mm.

3.2 Alignment

3.2.1 Reference point

Alignment is the relative vertical location of a character with respect to adjacent characters within a given field. The horizontal centre-line of each character is shown in Figure 1 through Figure 14. These centre-lines serve to establish vertical alignment of all characters, since all characters are designed about the same horizontal centre-line.

3.2.2 Tolerance

Alignment of a line of characters printed in any field shall be such that the bottom edges of adjacent characters within each field do not vary vertically by more than 0,762 mm (see Figure 17). These tolerances shall not accumulate so that the field exceeds the 6,35 mm encoding strip.

On the symbols that do not come down to the “base-line” (On-Us and Dash, Figure 13 and Figure 14), the same 0,762 mm tolerance shall apply to the horizontal centre-line.

4 Character skew

The maximum allowable character skew shall be ± 1,5° measured with respect to the aligning (bottom) edge of the document. See Figure 18.

5 Character tolerances

5.1 Dimensions

See Figures 1 to 14 for dimensions of the printed characters, and subclause 2.2.

5.2 Average edge definition

The typical edge of a printed character is not a straight line. The term “average edge” shall be used for horizontal and vertical edges and is defined as an imaginary line, parallel to either the vertical centre-line or the horizontal centre-line that divides the irregularities. The result is that the summation of the white areas on one side of the line is equal to the summation of the black areas on the other side. The average edge of the radii shall be tangent to the average edge of the stroke. See Figure 19.

5.3 Average edge tolerance

The average edge tolerance for all stroke edges shall be ± 0,038 mm applied to the dimensions (measured from the vertical centre-line and horizontal centre-line) that locate the edges. A typical illustration of this tolerance is shown at the top of Figure 20. The average edge of the radii shall be tangent to the average edges of the character, and the tolerance of the radii shall also be ± 0,038 mm.

5.4 Edge irregularity tolerance

5.4.1 Average edge irregularities

Peaks and valleys located about the average edge shall be permitted to extend to ± 0,089 mm from the average edge. An example is shown in Figure 20. However, when these occur, the summation of the edge present in the 0,038 to 0,089 mm zone shall not exceed 25 % of the total edge.

5.4.2 Edge voids

An occasional void can be present at the edge of a character stroke and creates a valley that exceeds the 0,089 mm limit mentioned in 5.4.1. See Figure 20.

No two voids as described shall occur within 0,889 mm of each other as measured from the points of maximum excursion from the average edge.

Valleys that exceed the 0,089 mm zone are voids and are controlled by the void limits given in Clause 6 and shall be measured from the average edge of a character stroke. However, any portion of an edge void that is within the 0,089 mm zone shall be included in the measurement of the percentage of the edge present in the 0,038 to 0,089 mm zone.

Figures 1 to 14 show dimensions for printed characters, in accordance with the following requirements.

— All radii shall be 0,165 mm except in character zero.

— All radii shall be blended with adjacent edges.

— Tolerance (average edge) = ± 0,038 mm

— Minimum horizontal bars width shall be 0,279 mm. This does not apply to vertical bars (see 5.5).

— All dimensions on figures below are in millimetres.

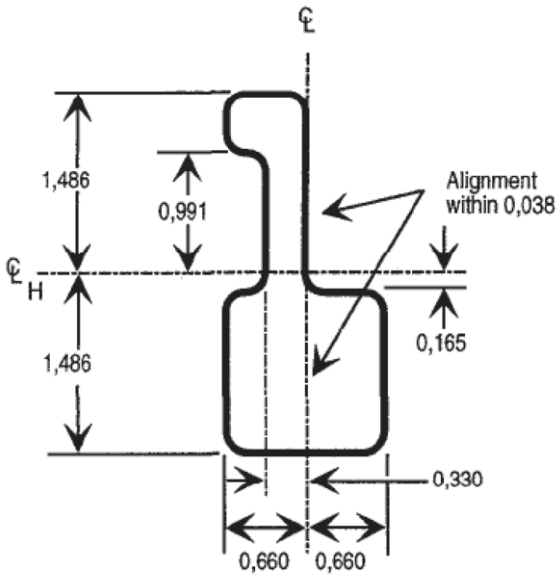

Figure 1 — One

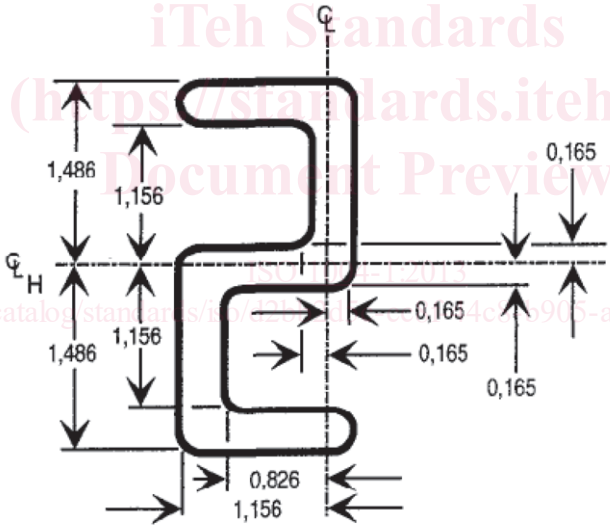

Figure 2 — Two

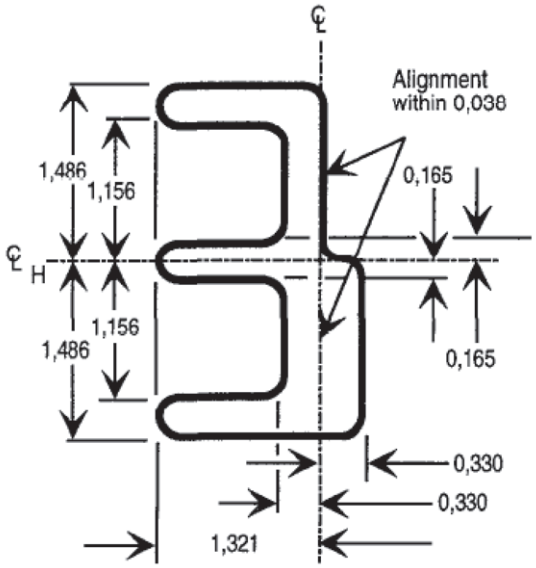

Figure 3 — Three

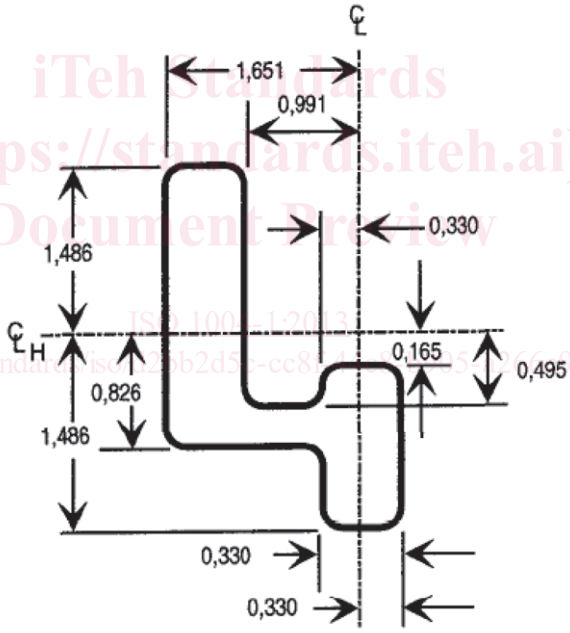

Figure 4 — Four

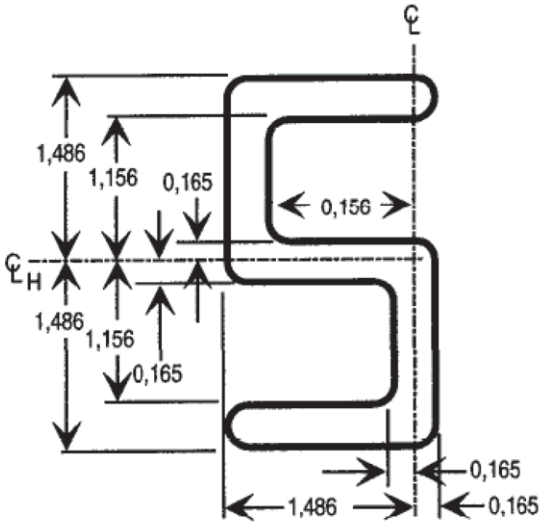

Figure 5 — Five

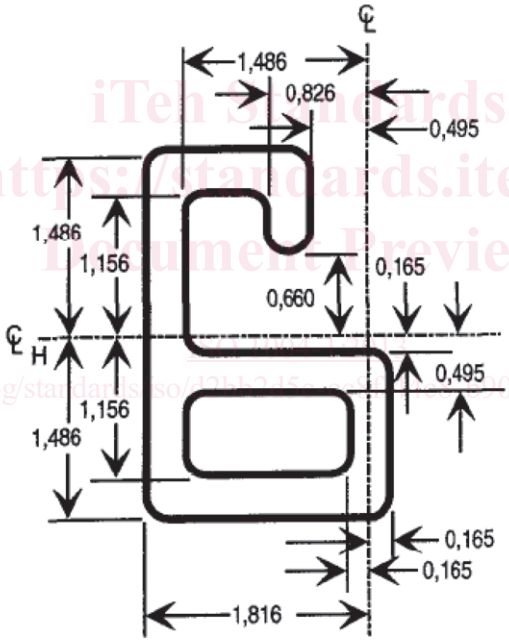

Figure 6 — Six

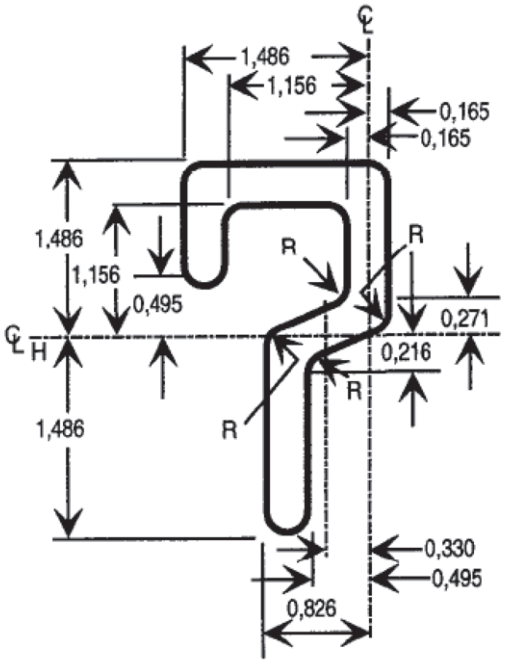

Figure 7 — Seven

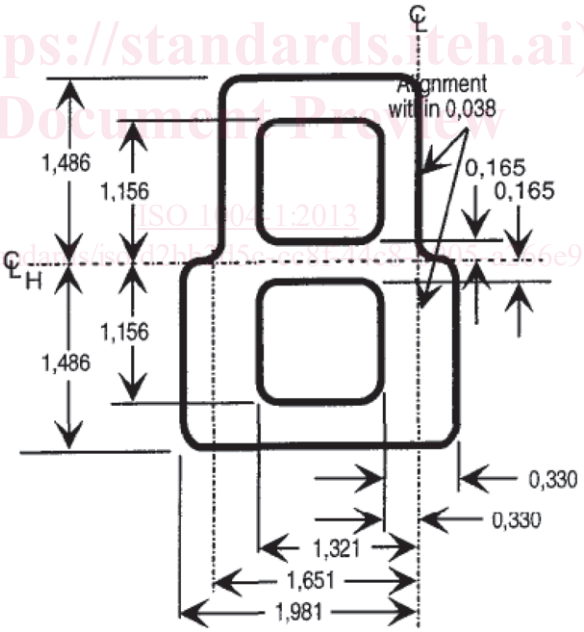

Figure 8 — Eight

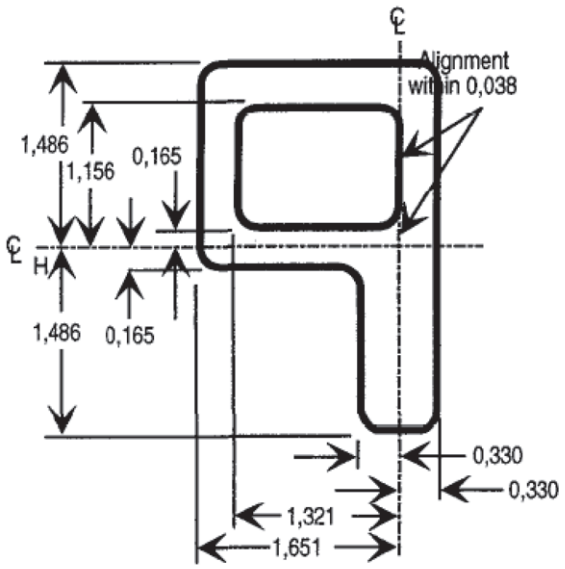

Figure 9 — Nine

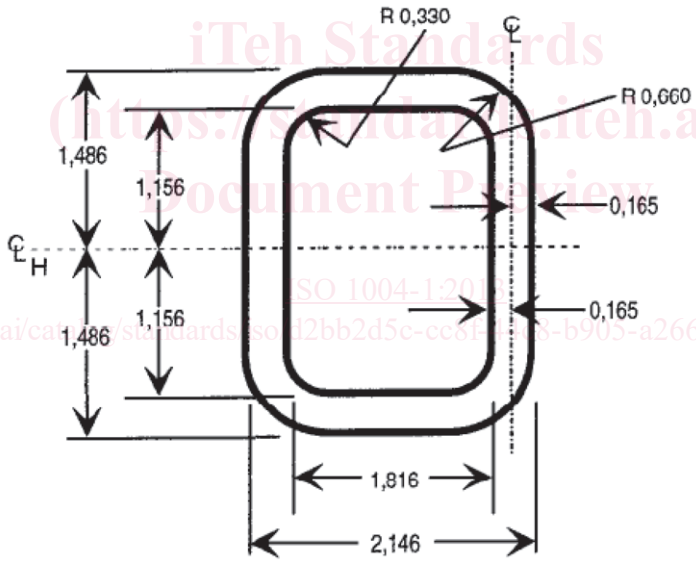

Figure 10 — Zero