International Standard ISO 2894

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Embossed credit cards — Specifications, numbering system and registration procedure

Cartes de crédit estampées — Spécifications, système de numérotation et procédure d'enregistrement

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 2894 was developed by Technical Committee ISO/TC 95, *Office machines*. The first edition (ISO 2894-1974) had been approved by the member bodies of the following countries :

Australia	Italy	Thailand
Bulgaria	Japan	Turkey
Canada	Mexico	United Kingdom
Egypt, Arab Rep. of	Romania	USA
Finland	Sweden	
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The member body of the following country had expressed disapproval of the document on technical grounds :

Germany, F. R.

This second edition, which supersedes ISO 2894-1974, incorporates draft Amendment 1, which was circulated to the member bodies in October 1977, and which has been approved by the member bodies of the following countries :

Australia	Iran	Sweden
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Czechoslovakia	Mexico	United Kingdom
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It also incorporates draft Amendment 2, which was circulated to the member bodies in December 1979, and which has been approved by the member bodies of the following countries :

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No member body expressed disapproval of the document.

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Embossed credit cards — Specifications, numbering system and registration procedure

0 Introduction

Credit cards carrying embossed data are in wide use in several industries. They facilitate the automatic transfer of the embossed data on documents by means of imprinters, thus avoiding the risk of misinterpretation and misreading inherent in the time-consuming manual transcription.

With the introduction of optical character recognition technology, it has been possible to use the imprinted data, or the relevant part of it, for direct input into an automatic data processing system. When data is in compliance with an internationally recognized and specified format, it is possible for any system involved to interpret the appropriate part of the data and process them accordingly, thus allowing information interchange on an international basis.

NOTE — The characteristics of the card described herein apply to international interchange systems and do not preclude any national systems from utilizing specifications.

1 Scope and field of application

This International Standard for embossed credit card defines the physical specifications of the card, type fonts, location and dimensions of the embossed data and an account numbering system. It further specifies the procedure by which card issuer identifiers shall be registered and promulgated for the information and use of all concerned.

2 References

ISO 554, *Standard atmospheres for conditioning and/or testing — Standard reference atmosphere — Specifications.*

ISO 1073, *Alphanumeric character sets for optical recognition*

— *Part 1 : Character set OCR-A — Shapes and dimensions of the printed image.*

— *Part 2 : Character set OCR-B — Shapes and dimensions of the printed image.*

ISO 1831, *Printing specifications for optical character recognition.*

3 Definition

credit card : A card generally used to identify parties to a financial transaction and provide input data for a transaction.

4 Physical characteristics

4.1 Material

The card shall be made of PVC (polyvinyl chloride) and/or PVCA (polyvinyl chloride acetate) laminated plastic or a material having equal or better performance characteristics. Specific attention shall be paid to the characteristics affecting its suitability for embossing and the resistance to crushing and collapsing of the embossed parts when operating in the imprinter.

4.2 Card dimensions (see figure 1)

4.2.1 Actual dimensions

All points on the edges of the card in the finished state, except for the rounded corners, shall fall between two concentric, similarly aligned, rectangles which are dimensioned as follows :

— outer rectangle : base length 85,72 mm (3.375 in)
height 54,03 mm (2.127 in)

— inner rectangle : base length 85,47 mm (3.365 in)
height 53,92 mm (2.123 in)

These dimensions apply under the standard test atmosphere of 20 °C (88 °F) and 65 % relative humidity (see ISO 554).

4.3 Card thickness

The thickness of the embossed card shall be

0,76 ± 0,08 mm (0.030 ± 0.003 in)

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4.4 Corners

The corners shall be rounded with a radius of 3,18 mm (0.125 in).

Care should be taken to avoid misalignments between the rounded corners and the straight edges of the card.

4.5 Card edges

Edge burrs normal to the card face shall not exceed 0,08 mm (0.003 in) above the card surface.

4.6 General characteristics

4.6.1 Deformation properties

The card must be of such nature that deformations in normal use (bends not creases) can be reduced elastically to flatness by the reading or printing device without impairing the function of the card.

4.6.2 Flammability

The card shall be flame resistant and self-extinguishing in still air.

4.6.3 Toxicity

The card shall present no toxic hazards in the course of normal use.

4.6.4 Resistance to chemicals

The card shall be resistant to chemical effects arising in normal handling and use.

4.6.5 Temperature stability

The card shall remain structurally reliable and usable at environmental temperatures between −35 °C and + 50 °C (−30 °F and + 122 °F).

NOTE — Environmental temperatures as defined do not mean card temperatures but refer to the environment in which the card is used.

4.6.6 Humidity

The card shall be reliably usable at a relative air humidity between 5 % and 95 %, with a maximum wet bulb temperature of 25 °C (77 °F).

4.6.7 Ultra-violet light

The card and its printed text shall resist the ultra-violet light which will appear in normal use.

4.6.8 Durability

Durability of the card is not established in this International Standard. It is based on a mutual agreement between the card issuer and the manufacturer.

5 Location and dimensions of embossed data

5.1 Assigned areas

Two areas are assigned to the card for the embossing of data (see figure 2) :

Area 1 : Area reserved for the number identifying both the issuer and the cardholder's account. It is called "account number line". The imprints from this area are intended both for human reading and optical character recognition.

Area 2 : Area provided for the cardholder's identification data such as name, address, and other data which may be required. It is called "name and address area". Data contained in this area of the card or imprinted from it are normally intended for human reading only.

5.2 Account number line

The account number line area provides space for a single line of data. This line comprises a maximum of 19 character positions, spaced nominally 3,63 mm (7 characters to the inch).

The number of utilized (embossed) character positions will depend upon the application requirements.

NOTE — When designing a new system, it is advisable to provide for the maximum flexibility of use, i.e. :

— justify the embossed account number to the left,

— make allowance for an account number with maximum length.

If these provisions are not taken into account, it may be necessary to agree on certain limitations before the interchange of cards and data among different systems can effectively take place. (An example is shown in annex C.)

5.2.1 Embossing specifications

The embossing specifications for the account number line are indicated in the following (reference is also made to the dimensions of figure 2 where appropriate) :

a) centreline of account number line to the bottom of the card (E) :

21,42 ± 0,12 mm (0.843 ± 0.005 in)

b) centreline of the first character position to the left of the card (F) :

10,18 ± 0,25 mm (0.401 ± 0.010 in)

c) nominal character spacing :

3,63 mm (0.143 in)

d) minimum spacing between two consecutive characters :

3,48 mm (0.137 in)

e) tolerance of distance between centrelines of first and last character of the line (tolerance of M) :

± 0,08 mm (± 0.003 in)

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f) maximum height at the printing surface of the characters of the embossed account number line area, encompassing centreline skew and character misalignment (D) :

4,32 mm (0.170 in)

g) profile embossed height over the card surface (G) :

$0{,}48\ ^{0}_{-0{,}05}$ mm ($0.019\ ^{0}_{-0.002}$ in)

5.2.2 Type fonts and print specifications

The account number line shall be embossed so as to produce on the imprinted document the image of characters from one of the three sets specified below :

— two of these sets are the internationally standardized sets, namely the OCR-A and OCR-B fonts, which are described in ISO 1073/1, ISO 1073/2 and ISO 1831. In view of the particular requirements of the application, size IV has to be used.

— the third set, which has gained wide use in the past in similar applications, is the 7 B font, which is described in annexes A and B.

NOTE — To ensure system compatibility in the choice of font, the attention of intending users is drawn to the necessity of agreement with their potential interchanging partners.

5.3 Name and address area

The name and address area provides space for four lines of data. Each line comprises 27 character positions, nominally spaced 2,54 mm (10 characters to the inch). The number of character positions effectively embossed and the layout of the data will depend upon the application requirements. Any information embossed on the name and address area should always be embossed as far as possible from the account number line.

WARNING — Those card issuers who require to emboss four (4) name and address lines should be aware that the imprinted documents produced from their cards may not be acceptable in an interchange environment due to OCR clear area requirements on some types of OCR reading equipment.

5.3.1 Embossing specifications

The embossing specifications for the name and address area are indicated in the following (reference is also made to the dimensions of figure 2 where appropriate) :

a) centreline of the first character position of each line to the left of the card (J) :

7,65 ± 0,25 mm (0.301 ± 0.010 in)

NOTE — The first character in the name and address area need not be justified. However, the use of 27 character positions is based upon 7,65 mm (0.301 in) centreline for the first character.

b) nominal character spacing :

2,54 mm (0.100 in)

c) minimum spacing between two consecutive characters :

2,46 mm (0.097 in)

d) maximum cumulative tolerance between the centrelines of the first and the last character of each line (tolerance of L) :

± 0,08 mm (± 0.003 in)

e) bottom margin of the embossed name and address area (H) :

minimum 2,41 mm (0.095 in)
maximum 3,30 mm (0.130 in)

f) maximum height of the embossed name and address area, encompassing centreline skew and character misalignment (I) :

14,53 mm (0.572 in)

NOTE — The measurement is referenced to the printing surface and does not include tolerances.

g) profile embossed height over the card surface (K) :

$0{,}46\ ^{0}_{-0{,}051}$ mm ($0.018\ ^{0}_{-0.002}$ in)

6 Credit card account numbering system

6.1 Numeric account number format

The recommended numeric account number format consists of two parts, the first for issuer identification, the second for individual account identification. A check-digit is also specified within the account number.

Allowed characters are the digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 and the character space or blank or an information separator.

6.2 The issuer identification

Examples of account number formats are shown in annex D.

6.2.1 Major industry identifier

The first (high order decimal) digit will identify the issuing industry as follows :

1 — Universal air travel plan (UATP)

2 — Airlines on-line/personal cards

3 — Travel and entertainment

4 — Banking institutions

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5 — Banking institutions

6 — Retail merchandising

7 — Petroleum industry

8 — Reserved for future assignment

9 — Reserved for future assignment

0 — Government sponsored number

6.2.2 Issuer identifier

The second, third and fourth digits will form the issuer identifier except :

a) When the major industry identifier used is "0" or "6", the second, third, fourth and fifth digits will form the issuer identifier.

b) When the major industry identifier used is "4" the second, third, fourth, fifth and sixth digits will form the issuer identifier.

c) When the major industry identifier used is "5" and the second digit is :

1, 2 or 3 :
that second digit will indicate how many following digits, in conjunction with that second digit, form the issuer identifier.

or 0, 4, 5, 6, 7 and 8 :
the next four digits, in conjunction with the second digit, form the issuer identifier.

or 9 :
the allocation is reserved for use in accordance with ISO 4909.

6.3 Space

A blank space is recommended to be inserted between the issuer identification and the individual account identifier.

6.4 Individual account identification

Personal or individual account identification numbers will be assigned at the option of the card issuing company and will be entered in the remaining positions of the account number line except for one position which is reserved for the check-digit (see 6.5).

NOTE — If in specific circumstances it is desirable to have a geographical routing number, it is highly recommended that the first digit(s) (high order) of the individual account identification be used for this purpose.

6.5 Check-digit

The individual account identification is followed by a check-digit character, which is calculated on all digits of the full account number including the major industry identifier and the issuer identifier. This character is computed according to the Luhn formula for modulus 10 check-digit (see annex E).

7 Registration

7.1 Field of application

A number assigned to a card issuer, in accordance with this International Standard, will be for the information and use of all those interested.

7.2 The registration authority

The registration authority shall maintain a register of the numbers assigned to card issuers. The contents of this register will be available to the ISO member bodies and liaison organizations.

One of the members of the ISO Sub-Committee ISO/TC 95/SC 17 (Credit cards and identification cards) or an approved body shall be appointed to act as the registration authority for the purpose of this International Standard.

7.3 Registration procedure

The procedure for the registration of card issuers and of the issuer identifiers assigned to them is contained in annex F.

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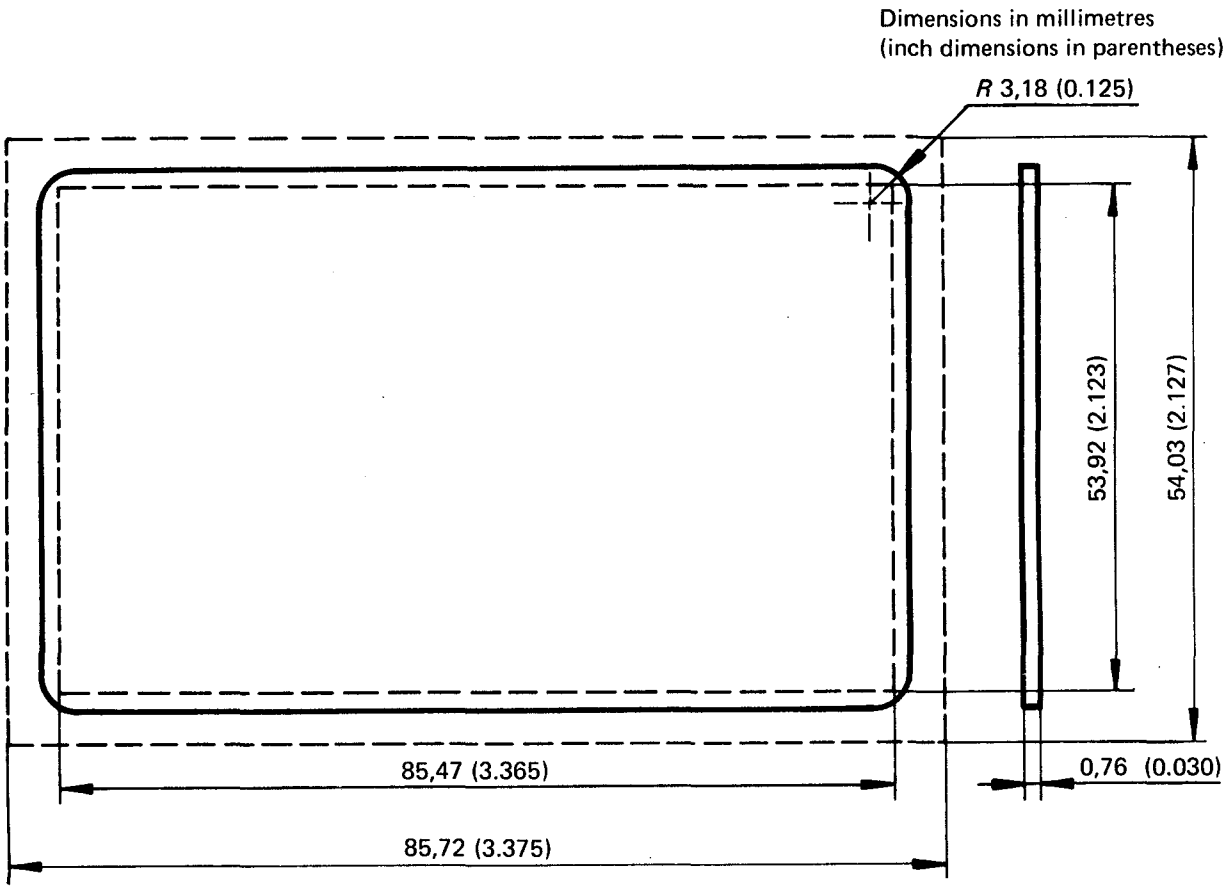

FIGURE 1 — **Card dimensions**

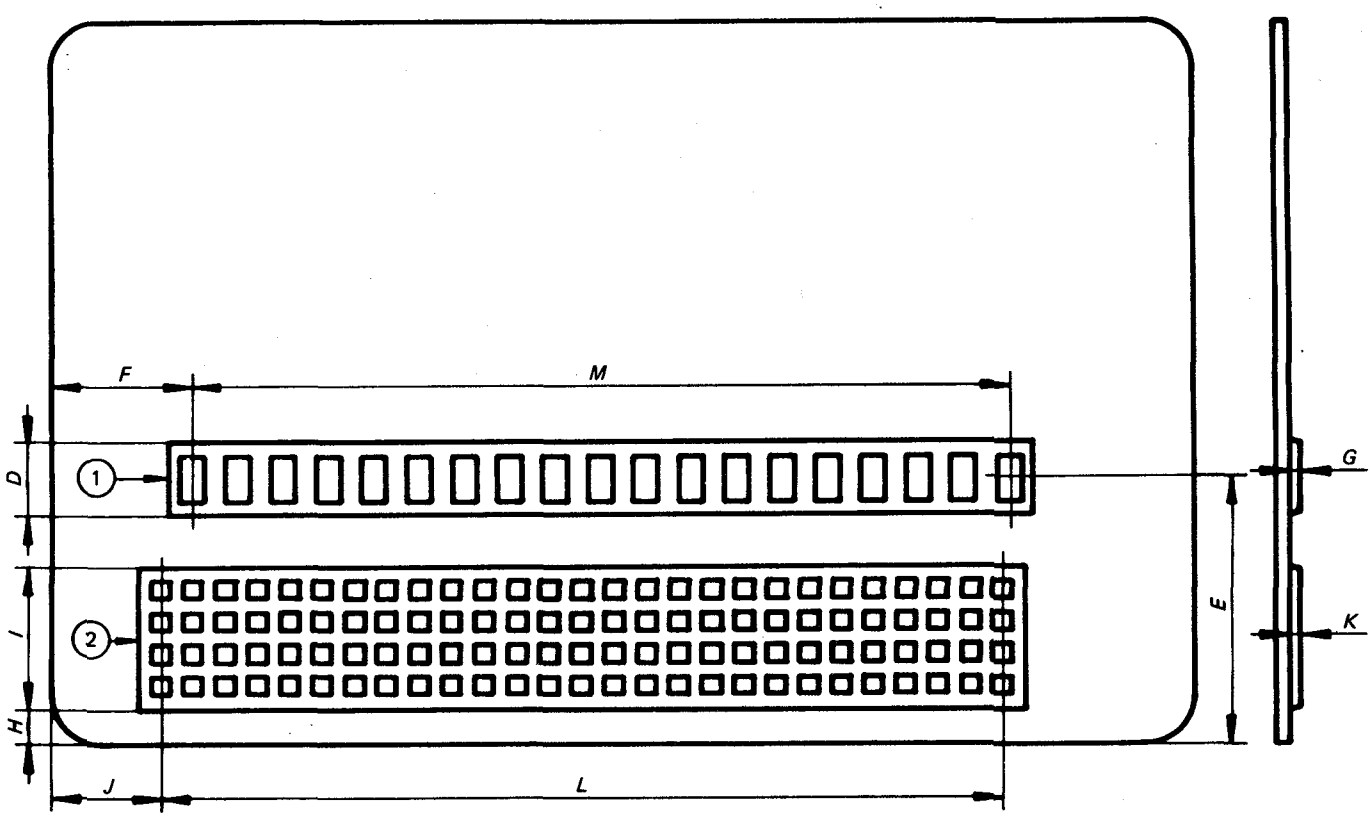

FIGURE 2 — **Embossing specifications**

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Annex A

7 B Print specifications

(This annex does not form part of the standard.)

A.1 Character set — 7 B Font

The 7 B font consists of the following characters :

The numerals 0 to 9 inclusive.

A.2 Character dimensions — Printed image

Nominal character height	3,81 mm (0.150 in) (centreline)
Nominal character width	2,03 mm (0.080 in) (centreline)
Nominal stroke width	0,51 mm (0.020 in)
Maximum stroke width	0,76 mm (0.030 in)
Minimum stroke width	0,25 mm (0.010 in)

A.3 Character spacing and alignment

The nominal horizontal spacing of the characters as printed is 7 to the inch.

The minimum horizontal separation between adjacent characters is 0,38 mm (0.015 in).

Vertical misalignment between adjacent characters must not exceed 2,03 mm (0.080 in).

Character skew must not exceed ± 3°.

Total line skew must not exceed the limits of the print zone as defined in the document specifications.

A.4 Printing characteristics

A.4.1 Ink density

For optimum performance, the ink (carbon) density of the printed character shall be such that its reflectance is not more than 20 % of the average reflectance of the document on which the character is printed. At worst, the ink density of the printed character must be such that its reflectance is not more than 60 % of the average reflectance of the document on which the character is printed.

NOTE — Reflectance is measured with an incident illumination of 45° and a viewing angle of 90° to the surface of the document, and using an aperture of measurement 0,20 mm^2 (0.008 in^2) on the document.

Acceptable voids and acceptable extraneous marks as defined in A.4.2 and A.4.3 are exceptions to the ink density requirement.

A.4.2 Voids

A void is any area within the maximum stroke width dimension of a printed character in which the reflectance exceeds 60 % of the average reflectance of the document on which a character is printed.

Voids can be acceptable provided they can be entirely contained in a circle of 0,25 mm (0.010 in) diameter, there is a minimum separation of 0,71 mm (0.028 in) centre to centre between the voids, and provided the resulting minimum effective stroke width dimension is not less than 0,20 mm (0.008 in).

No unacceptable voids can be permitted.

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A.4.3 Extraneous marks

An extraneous mark is any mark within either the printing or clear zone, but not within the printed character area, in which the reflectance is less than 60 % of the average reflectance of the document on which the marks occur.

Extraneous marks can be acceptable provided they can be entirely contained within a circle of 0,25 mm (0.010 in) diameter, and provided there is a minimum separation between the marks of 0,71 mm (0.028 in) centre to centre.

No unacceptable extraneous marks can be permitted.

A.4.4 Embossing

Deformation of the document surface as a result of printing shall not exceed 0,13 mm (0.005 in).

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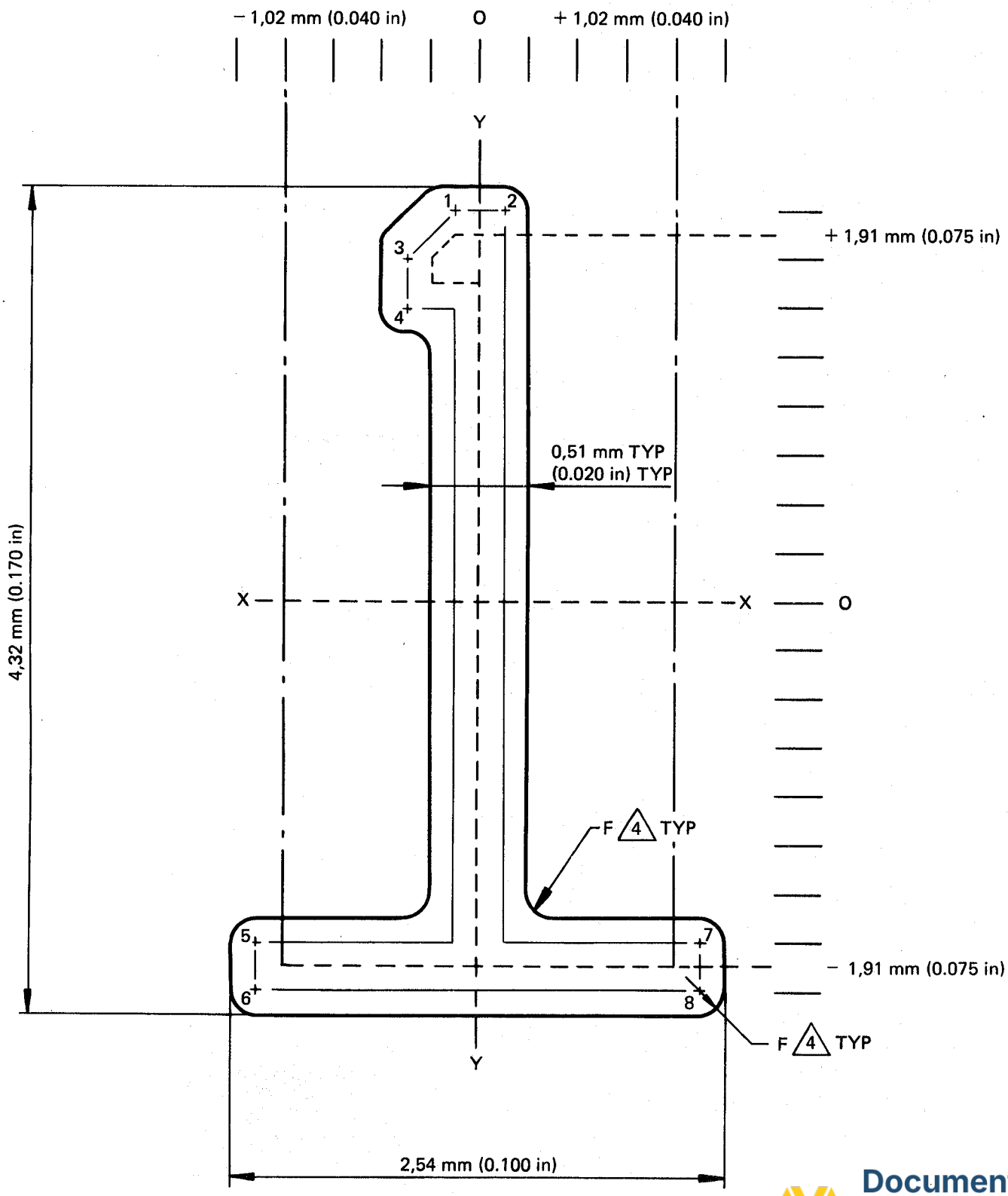
Annex B

Printed image of the 7 B font

(This annex does not form part of the standard.)



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NUMERAL 1

Co-ordinates Table 1

No.	X value from Y – Y		Y value from X – X	
	millimetres	inches	millimetres	inches
1	– 0,13	– 0.005	+ 2,03	+ 0.080
2	+ 0,13	+ 0.005	+ 2,03	+ 0.080
3	– 0,38	– 0.015	+ 1,78	+ 0.070
4	– 0,38	– 0.015	+ 1,52	+ 0.060
5	– 1,14	– 0.045	– 1,78	– 0.070
6	– 1,14	– 0.045	– 2,03	– 0.080
7	+ 1,14	+ 0.045	– 1,78	– 0.070
8	+ 1,14	+ 0.045	– 2,03	– 0.080

NOTES

1 Closest nominal spacing 7 characters per 25,4 mm (1 in). Wider spacing is permissible.

2 Character shown as printed on document and not necessarily as engraved or embossed.

3 Tolerances : all character centreline dimensions are ± 0,08 mm (± 0.003 in).

4 Radius of fairing (F) on stroke edges is 0,13 mm (0.005 in) nominal ± 0,13 mm (± 0.005 in).

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