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# International Standard



# 2708

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Micrographics — Transparent A6 size microfiche of variable division — Image arrangements A and B

*Micrographie — Microfiche transparente de format A6 à partition variable — Dispositions d'images A et B*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

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 2708 was developed by Technical Committee ISO/TC 171, *Micrographics*.

This third edition was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the second edition (i.e. ISO 2708:1976) which had been approved by the member bodies of the following countries :

Australia	Germany, F. R.	Spain
Belgium	Hungary	Switzerland
Bulgaria	India	Thailand
Canada	Israel	Turkey
Czechoslovakia	Italy	United Kingdom
Denmark	New Zealand	USA
Egypt, Arab Rep. of	Poland	USSR
Finland	Romania	Yugoslavia
France	South Africa, Rep. of	

The member bodies of the following countries had expressed disapproval of the document on technical grounds :

Japan  
Netherlands

# Micrographics — Transparent A6 size microfiche of variable division — Image arrangements A and B

## 1 Scope and field of application

This International Standard specifies the physical characteristics of a transparent A6 size microfiche, with image arrangements "A" and "B", obtained by division of two alternative image areas into a variable number of image frames adapted to the different sizes and other characteristics of documents for reproduction.

Transparent microfiches of variable division are used for the reproduction of documents of any type and size not exceeding 4 A0, including large size documents such as posters, newspapers and engineering drawings.

These microfiches are intended for international interchange of information and for micropublishing.

Alternative image arrangements, obtained by uniform division of a microfiche, are specified in ISO 2707. ISO 2707 and ISO 2708 do not apply to computer output microfiche.<sup>1)</sup>

## 2 References

ISO 216, *Writing paper and certain classes of printed matter — Trimmed sizes — A and B series.*

ISO 446, *Microcopying — ISO No. 1 Mire. — Description and use in photographic documentary reproduction.*

ISO 543, *Cinematography — Motion-picture safety film — Definition, testing and marking.*

ISO 2707, *Microcopying — Transparent A6 size microfiche of uniform division — Image arrangements No. 1 and No. 2.*

ISO 3334, *Microcopying — ISO Test chart No. 2 — Description and use in photographic documentary reproduction.*

## 3 Principles and application of image arrangements A and B

### 3.1 Image arrangement A

The first method of dividing the microfiche into image areas, defined in 4.1.2, allows documents of any type, and of any size between sizes 4 A0 and A6, to be produced.

Since documents for reproduction, such as plans, written works and surveys, have sizes mostly similar to the series A sizes of ISO 216, a value very close to that of  $\sqrt{2}$  (common to all the ISO sizes) has been adopted for the ratio between the larger and smaller dimension of the microfiche image of all the proposed sizes, or "aspect ratio".

The different image sizes proposed are generally obtained by successive divisions into two equal parts of the total surface of the image available, which corresponds to a single image recorded on each microfiche. This method of division adheres to the above-mentioned value of "aspect ratio".

One of the sizes thus obtained by subdivision is the nearest to the current size of 35 mm microfilm images, which allows contact printing of microfiches using microfilm of this size.

### 3.2 Image arrangement B

The second method of dividing the microfiche into image areas, also defined in 4.1.2, allows the reproduction of documents of any type from A0 to A6 with the same series of reduction ratios as those used for micrographics engineering drawings and technical office documents. The heading area above the image area is deeper than that with image arrangement A.

1) See ISO 5126, *Micrographics — Computer output microfiche (COM) — Microfiche A6.*

## 4 Physical characteristics

### 4.1 Dimensions (see figures 1 and 2)

#### 4.1.1 Overall size

The external dimensions of the microfiche shall be a rectangle of 105 mm × 148 mm.<sup>1)</sup>

When tolerances are specified for the distribution microfiche they will apply immediately after processing. The measurements shall be made when the film has come to equilibrium at 23 ± 2 °C and 50 ± 5 % relative humidity. Size variations due to raw stock slitting and processing should be considered in determining the tolerances. Additional size changes may occur during ageing, especially for films on cellulose ester supports. (See annex A, clause A.2.) Temporary size changes due to temperature and humidity changes are described in annex A, clause A.3.

#### 4.1.2 Sizes of image areas

The dimensions of the image areas shall be as follows :

##### Image arrangement A

95 mm × 133 mm

##### Image arrangement B

82,5 mm × 141 mm

The image areas thus defined do not include the heading area.

#### 4.1.3 Margins

##### 4.1.3.1 Lower margins

The lower margins shall have the following nominal widths :

- image arrangement A : 0,5 mm;
- image arrangement B : 4 mm.

##### 4.1.3.2 Lateral margins

For each of the two image arrangements A and B the lateral margins shall have equal nominal widths.

#### 4.2 Corner rounding

The corners of the microfiche may be rounded, with the excep-

tion of those corners which have been subjected to a corner cut. When corners are rounded, the process shall not remove more than 3 mm of either of the two edges forming the corner.

#### 4.3 Measurements involving cut-off corners

Where segments of an edge have been removed by corner rounding or corner cuts, a straight line extending the remainder of the edge in the relevant direction shall constitute the basis for measuring dimensions and spacing.

#### 4.4 Identification of sensitized side

To facilitate microfiche-to-microfiche copying a notch or a corner cut may be used to identify the sensitized layer of the microfiche, as follows : when a sheet of raw film or a microfiche is held with the long sides in a vertical position and the notch or corner cut is in the upper right-hand corner, the sensitized side shall be towards the observer.

When a notch is used, it shall be made in the shorter side of the sheet, near the appropriate corner. The notch may be of any shape, but it shall not penetrate more than 1,6 mm inward from the edge of the microfiche.

When a corner cut is used, it shall be made in the appropriate corner of the heading area only. The nominal dimensions of the cut are as follows : 6 mm along the longer side of the microfiche and 9 mm along the shorter side.

#### 4.5 Heading area backing

An opaque or semi-opaque backing<sup>2)</sup> for the heading area is optional. If a heading area backing is used, it shall not increase the thickness of the fiche by more than 0,01 mm.

#### 4.6 Safety film

The film used shall comply with ISO 543.

## 5 Reduction scale

The reduction scales applicable to the two image arrangements A and B shall have the following nominal values, with a tolerance of  $\frac{0}{-4}$  % (these reduction ratios correspond to the standard sizes; in the cases of other sizes, any other reduction ratios between 9 and 30 may be selected) :

- image arrangement A : 1:9 1:12,75 1:18 1:25,5
- image arrangement B : 1:10,6 1:15 1:21,2 1:30

1) ISO 6148, *Photography — Film (silver-gelatin and non-silver gelatin types) for micrographic uses — Dimensions of sheet and roll material* (in preparation) will provide manufacturing tolerances for raw film. Until ISO 6148 is published, the manufacturing tolerances for raw film shall be 105  $\frac{0}{-0,25}$  mm × 148  $\frac{0}{-0,5}$  mm.

(See annex A for more information.)

2) The use of such backing restricts duplication.

## 6 Requirements for use

### 6.1 Heading area

#### 6.1.1 Depth

##### 6.1.1.1 Image arrangement A

The fixed area for the heading above the image area shall have a nominal depth of 9,5 mm.

##### 6.1.1.2 Image arrangement B

The fixed area for the heading above the image area shall have a depth of 16,5 mm to which the lower and upper margins must be added, the nominal widths of which are 1 mm.

#### 6.1.2 Characters of the heading

So that the heading is easily legible without magnification, the characters of the heading in the area fixed for it shall have a minimum height of 1,2 mm, whether they are small letters or capitals, and the line spacing shall be at least 2 mm.

The reduction scale used for the heading shall be determined in such a way as to provide these minimum dimensions, taking into account the corresponding dimensions of the characters of the machine used for printing the heading to be photographed.

#### 6.2 Division of image areas

The image areas corresponding to image arrangements A and B shall be subdivided into frames in accordance with the specifications given in tables 2 and 3.

#### 6.3 Areas for supplementary headings

In a case where an image area corresponding to image arrangement A is divided into at least four rows, the top row of image frames may be used completely to enlarge the area of the heading legible without magnification.

#### 6.4 Microimage placement and orientation

6.4.1 Microimages shall be positioned within one of the grid patterns specified in this International Standard and, for uniform division, in ISO 2707 (an example is shown in figure 3). All measurements use the bottom edge and the bottom left-hand corner of the fiche as reference.

6.4.2 When the microfiche is held so that the heading is right-reading and upright, microimages shall always be right-reading and, whenever possible, upright.

6.4.3 If the text of a microimage is not upright on the microfiche, it shall appear on the fiche rotated 90° counterclockwise from the upright position.

6.4.4 A margin of at least 0,12 mm shall be left between the information area and the frame boundary.

### 6.5 Sectional filming

If a document is too large to be microfilmed in one exposure, it may be exposed in sections according to one of the two methods, I and II, as defined in 6.5.1 and 6.5.2.

#### 6.5.1 Method I

The original is microfilmed in sections with not less than 25 mm overlap of original material, according to figure 4. If the document's image height can be accommodated in a single frame but its width cannot, the document shall be sectionalized in the manner shown in figure 4a. If the document's image width can be accommodated in a single frame but its height cannot, the document shall be sectionalized in the manner shown in figure 4b.

NOTE — The illustrations in figure 4 represent the original documents, and when method I of sectionalizing documents is used, the sections of the original will appear on the microfiche in normal sequence.

#### 6.5.2 Method II

When method II [see figure 4 c)] is used, the document is filmed with not less than 25 mm overlap of original material, in such a manner that the sections have the same geometrical array on the microfiche as they had in the original.

### 6.6 Double-page images

When two images are microfilmed in a single exposure to fall within a double frame area, the information area of each page shall appear within a single frame area.

### 6.7 Bound volumes

If a bound volume is small enough for a pair of facing pages to be accommodated upright and right-reading within a single frame at a standard reduction scale (see clause 5), then each pair of facing pages shall be placed in a single frame.

### 6.8 Pagination

When the microfiche is held so that the heading is upright and right-reading, the first microimage shall be placed in the upper left corner of the grid area, in the frame identified as A1. Succeeding frames shall appear in sequence from left to right and downward from row to row.

### 6.9 Trailer microfiche identification

When trailer microfiche are used, each microfiche in the set, including the first one, shall be identified sequentially, and the last microfiche in the set shall be identified as the last one.

### 6.10 Frame identification

Where co-ordinate identification is used for location of images, alphabetic characters shall be used to identify rows. Starting at the top row below the heading, the first row shall be A, the second B, and so on.

Columns shall be identified by numerals starting at the left. The first column shall be 1, the second 2, and so on.

The identification of co-ordinates on the microfiche is optional. If co-ordinates are shown on the microfiche, they shall be located in the margins (see figure 3) or in the lower portion of the heading area.<sup>1)</sup>

**6.11 Index frame**

If an index to a microfiche is to be provided, the placement of the last microimage of the index shall be the bottom right corner of the grid area. Preceding index frames shall appear in reverse sequence subtracting from the allotted format.

**6.12 Cutting mark**

Each microfiche may carry a cutting mark to provide for automatic cutting of processed roll film into microfiche. This cutting mark shall be 3,0 mm × 3,0 mm square, and the centre of the square shall be located 32,0 ± 0,2 mm from the left

edge of the microfiche, with the bottom edge of the square within 0,2 mm of the bottom edge of the microfiche.

**7 Curl and bow**

A fully processed microfiche cut to distribution size shall be placed convex side down on a flat surface for at least 6 h in an atmosphere in which the temperature is 23 ± 2 °C and the relative humidity 50 ± 5 %, after which no part of the microfiche shall be more than 6,5 mm above the surface.<sup>2)</sup>

**8 Legibility or quality of microfiches**

When a microfiche is examined as described in ISO 446 or ISO 3334, the characters or the patterns from a mire or test chart are to be legible on the microfiche if they have the sizes or the pattern numbers indicated in table 1 for first and second generation or distribution copies; the latter is a microfiche from which a copy satisfying the quality requirements can be obtained.

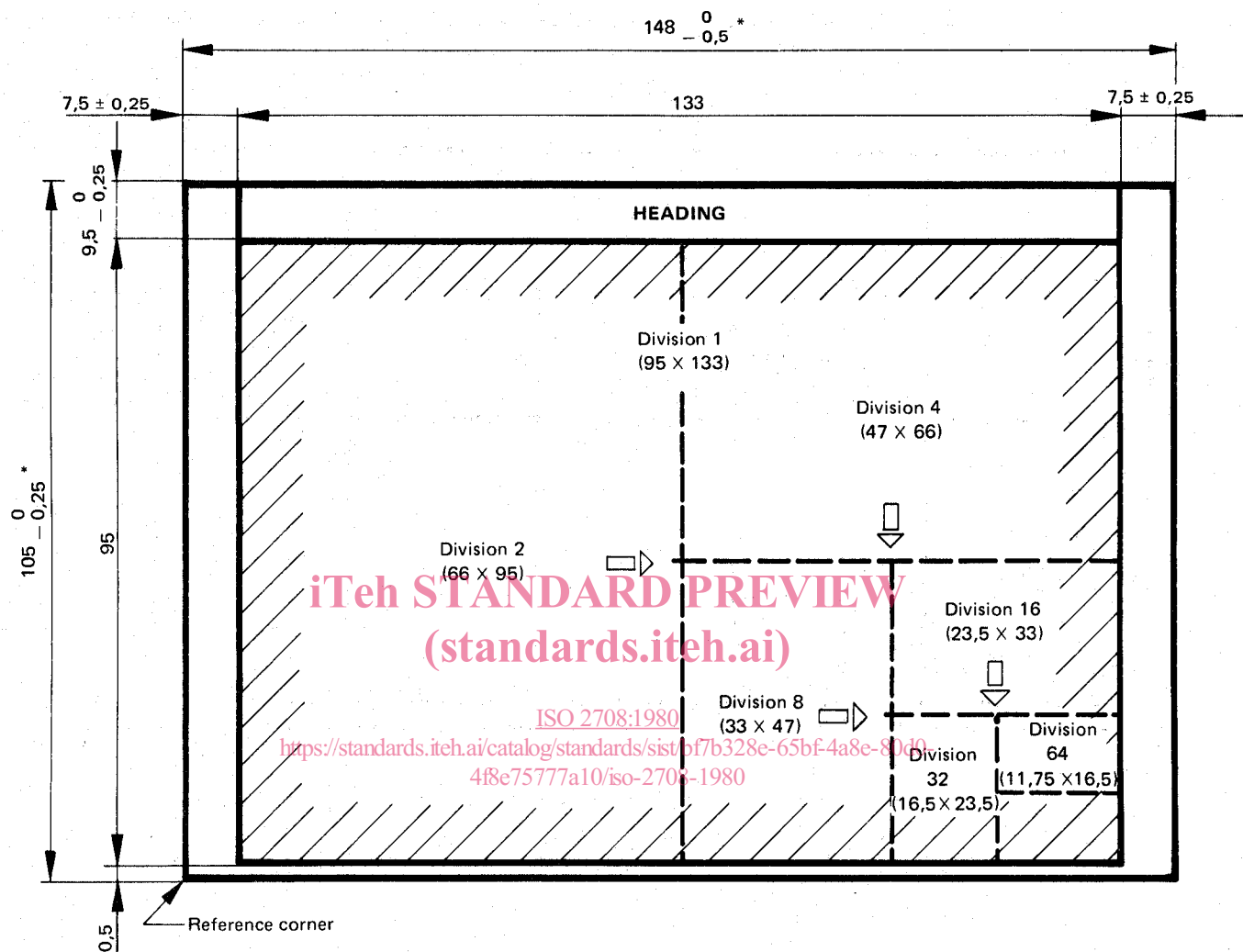
Table 1 — Legibility or quality of microfiches

Reduction scale	ISO No. 1 Mire character size			ISO Test chart No. 2 Pattern number		
	1st generation	2nd generation	Distribution copy	1st generation	2nd generation	Distribution copy
1:30	90	100	112	4,5	4,0	3,6
1:25,5	80	90	100	5,0	4,5	4,0
1:21,2	70	80	90	5,6	5,0	4,5
1:18	63	70	80	6,3	5,6	5,0
1:15	56	63	70	7,1	6,3	5,6
1:12,75; 1:10,6; 1:9	45	50	56	9,0	8,0	7,1

1) When co-ordinates are placed in the bottom margin, they may interfere with automatic cutters sensing the cutting mark.

2) For automatic retrieval, less curl and bow may be necessary.

Dimensions in millimetres



\* Manufacturing tolerances for raw film

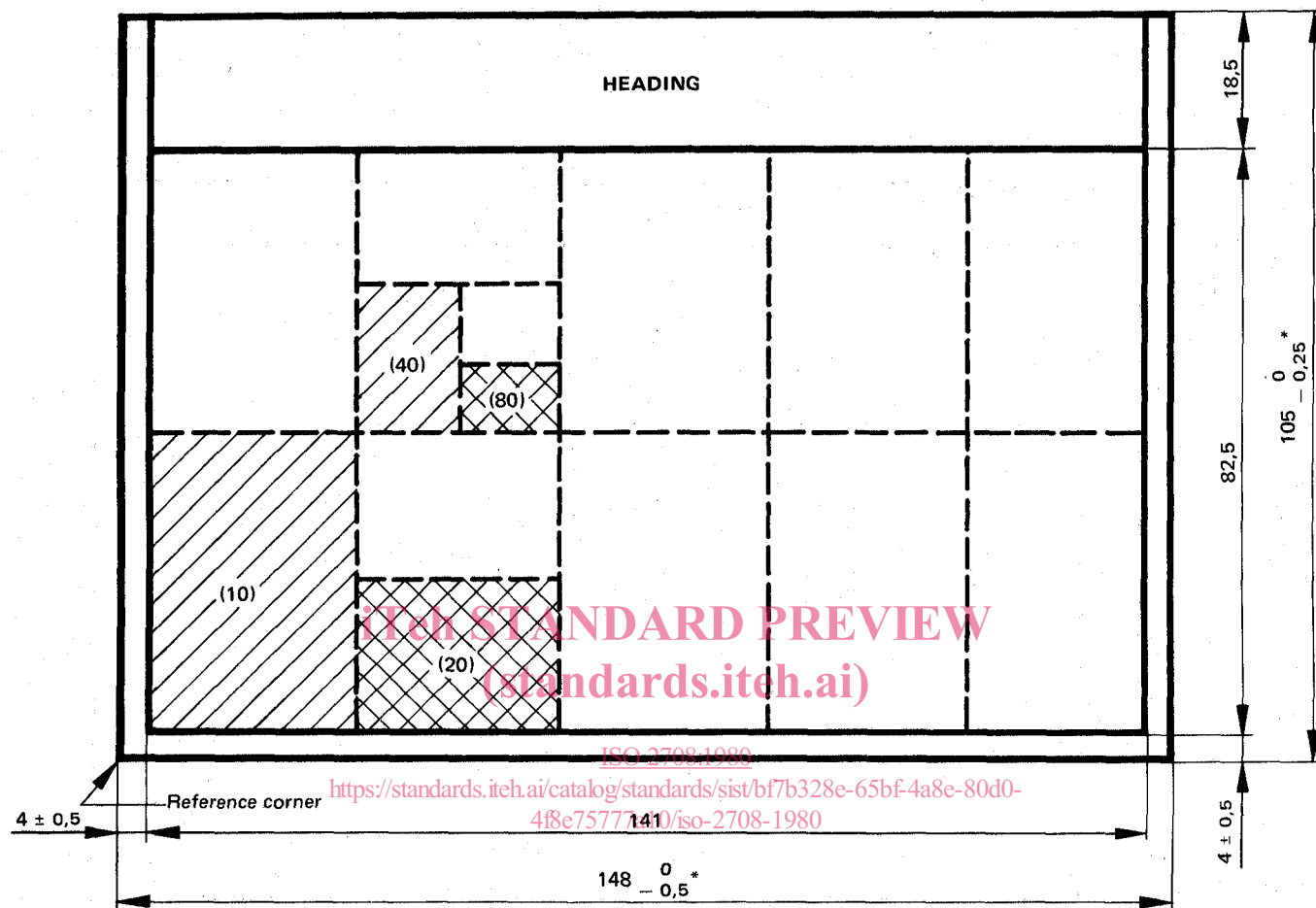
Figure 1 – Image arrangement A

Table 2 – Division of image area corresponding to image arrangement A (95 mm x 133 mm)

Dimensions in millimetres

Number of		Frame		Document sizes reproducible at different reduction scales				Corresponding A sizes
rows	columns	size	number	1:9	1:12,75	1:18	1:25,5	
1	1	95 x 133	1	855 x 1 197	1 211 x 1 695	1 710 x 2 394		A0 2A0 4A0
1	2	66 x 95	2	594 x 855	842 x 1 211	1 188 x 1 710	1 683 x 2 422	A1 A0 2A0 4A0
2	2	47 x 66	4	423 x 594	599 x 842	846 x 1 188	1 198 x 1 683	A2 A1 A0 2A0
2	4	33 x 47	8	297 x 423	421 x 599	594 x 846	842 x 1 198	A3 A2 A1 A0
4	4	23,5 x 33	16	212 x 297	300 x 421	423 x 594	599 x 842	A4 A3 A2 A1
4	8	16,5 x 23,5	32	148,5 x 212	210 x 300	297 x 423	421 x 599	A5 A4 A3 A2
8	8	11,75 x 16,5	64	106 x 148,5	150 x 210	212 x 297	297 x 421	A6 A5 A4 A3

Dimensions in millimetres



\* Manufacturing tolerances for raw film

Figure 2 – Image arrangement B

Table 3 – Division of image area corresponding to image arrangement B (82,5 mm × 141 mm)

Dimensions in millimetres

Number of		Frame		Document sizes reproducible at different reduction scales				Corresponding A sizes			
rows	columns	size	number	1:10,6	1:15	1:21,2	1:30	A3	A2	A1	A0
2	5	28,2 × 41,25	10	298 × 437	423 × 619	597 × 874	846 × 1 236	A3	A2	A1	A0
4	5	20,6 × 28,2	20	218 × 298	309 × 423	436 × 597	618 × 846	A4	A3	A2	A1
5	6	16,5 × 23,5	30	174 × 249	247 × 352	349 × 498	495 × 705	A5	A4	A3	A2
4	10	14,1 × 20,6	40	149 × 218	211 × 309	298 × 436	423 × 618	A5	A4	A3	A2
5	12	11,75 × 16,5	60	124 × 174	176 × 247	249 × 349	352 × 495	A6	A5	A4	A3
8	10	10,3 × 14,1	80	109 × 149	154 × 211	218 × 298	309 × 423	A6	A5	A4	A3



Dimensions in millimetres

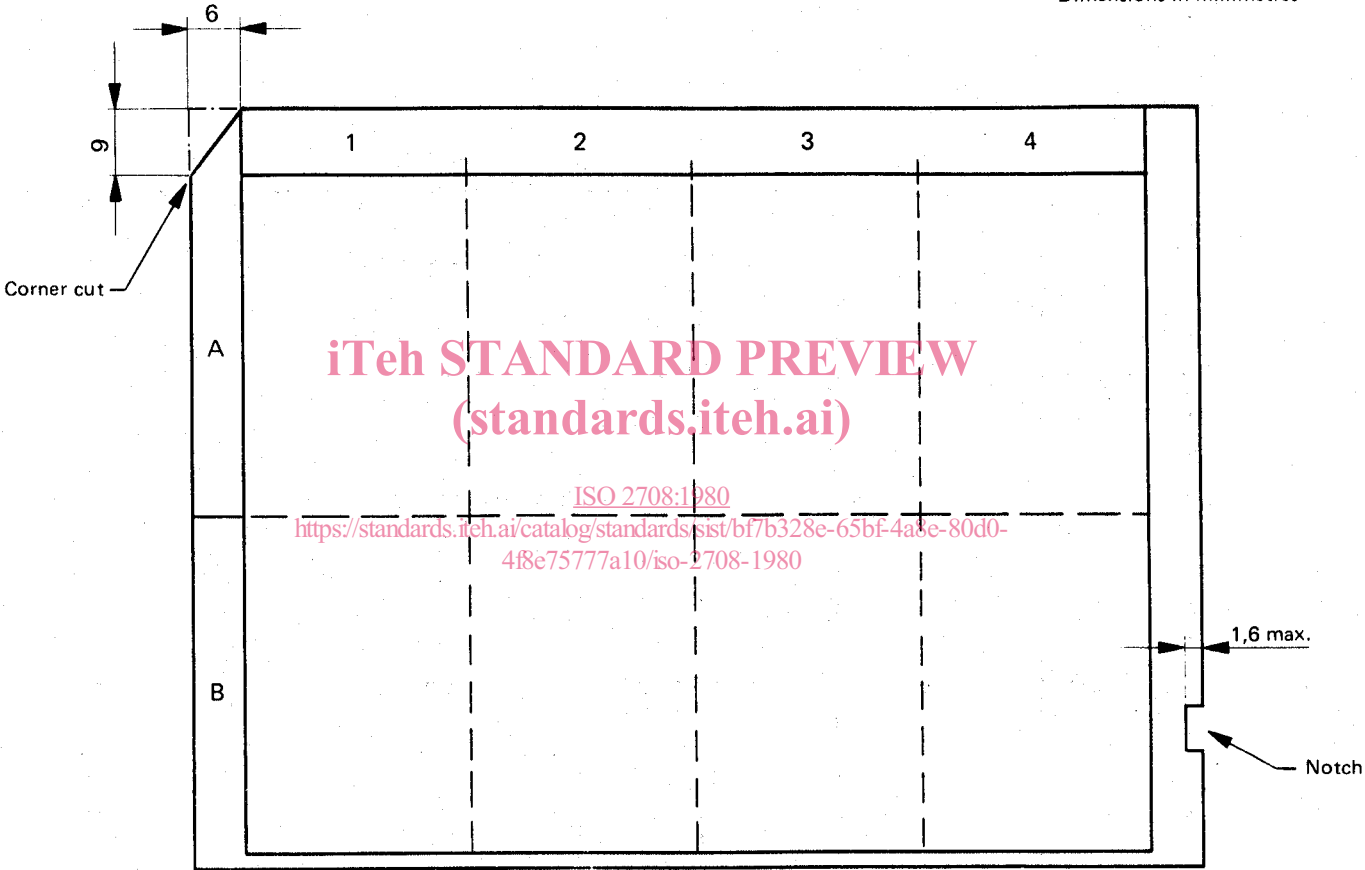


Figure 3 — Example of microfiche of variable division, using image arrangement A (8 image division)