INTERNATIONAL STANDARD 3772

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

Photography — Films (in rolls) for phototypesetting and photolettering devices — Dimensions

Photographie — Films (en rouleaux) pour appareils de photocomposition et de phototitrage — Dimensions

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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 3772 was drawn up by Technical Committee ISO/TC 42, *Photography*, and circulated to the Member Bodies in December 1974.

It has been approved by the Member Bodies of the following countries :

Australia	Ireland	Spain
Belgium	Italy	Switzerland
Bulgaria	Japan	Turkey
Canada	Mexico	United Kingdom
Czechoslovakia	Pakistan	U.S.A.
France	Romania	U.S.S.R.
Germany	South Africa, Rep. of	Yugoslavia

No Member Body expressed disapproval of the document.

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Photography — Films (in rolls) for phototypesetting and photolettering devices — Dimensions

0 INTRODUCTION

Until recently, there has been little emphasis on standardizing the sizes and dimensions of phototypesetting and photolettering films and cores. Also, the lack of definitive national standards was resulting in a proliferation of new product sizes which continued to grow at an alarming rate.

To minimize this proliferation, ISO/TC 42 decided in 1971 to develop an International Standard for these products and this document represents its initial efforts.

Preferred and recognized film width sizes are listed to encourage a reduction in the total number of film sizes being used. It is hoped that, with the co-operation of equipment manufacturers, the recognized sizes can eventually be dropped and only the preferred sizes used. However, because this is a dynamic and growing industry, guidelines have been established for calculating the dimension of new film sizes which may be required as a result of future innovations.

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies, for roll film for use in phototypesetting and photolettering devices, in two separate categories — preferred and recognized — the following pertinent characteristics :

- forms available;
- nominal film widths, including their cutting and perforating dimensions and tolerances;
- winding orientation;
- core dimensions.

Splices permitted according to nominal film lengths are included. No cutting lengths or tolerances are specified, but the annex (A.2) lists, with explanation and as a guide, nominal film lengths in both categories. Included also in the annex (A.1) are cutting rules for application when unlisted widths are required, together with additional information pertaining to perforations, their dimensions and tolerances.

2 REFERENCES

ISO 491, *Cinematography — 35 mm motion-picture film — Cutting and perforating dimensions.*

ISO 3042, *Cinematography — Labelling of containers for unexposed motion-picture films and magnetic films — Minimum information specifications.*

3 FILM FORMS AVAILABLE

Film (in rolls) for phototypesetting and photolettering devices shall have either single-edge perforating (preferred), double-edge perforating (recognized) or be unperforated (preferred).

4 CUTTING DIMENSIONS

4.1 Width

4.1.1 *Preferred widths*

The cutting widths of preferred nominal widths are listed in table 1.

TABLE 1 — **Cutting widths — preferred nominal widths**

Preferred nominal film width[1]	Cutting width			
	mm		in	
	min.	max.	min.	max.
35 mm	34,75	35,00	1.368	1.378
70 mm	69,75	70,00	2.746	2.756
100 mm	99,75	100,00	3.927	3.937
150 mm	149,50	150,00	5.885	5.905
200 mm	199,50	200,00	7.854	7.874
250 mm	249,50	250,00	9.822	9.842
300 mm	299,50	300,00	11.791	11.811

1) See clause A.1 in the annex for cutting rules applying to nominal widths not listed in tables 1 and 2.

4.1.2 *Recognized widths*

The cutting widths of recognized nominal widths are listed in table 2.

TABLE 2 — **Cutting widths — recognized nominal widths** (see 4.1.3)

Recognized nominal film width[1]	Cutting width			
	mm		in	
	min.	max.	min.	max.
3 in	75,95	76,20	2.990	3.000
4 in	101,35	101,60	3.990	4.000
6 in	151,90	152,40	5.980	6.000
8 in	202,70	203,20	7.980	8.000
9 in	228,10	228,60	8.980	9.000
9 1/4 in	234,45	234,95	9.230	9.250
10 in	253,50	254,00	9.980	10.000
11 in	278,90	279,40	10.980	11.000
205 mm	204,50	205,00	8.051	8.071

4.1.3 *Accommodation to current and future equipment designs*

The film widths listed in table 2 are recognized temporarily. However, phototypesetting and photolettering equipment manufacturers are encouraged to design future equipment to accept the preferred film sizes listed in table 1. It also is recommended that, whenever possible, existing equipment which is set up for a recognized film width be modified to accept a preferred film width.

4.2 Length

See clause A.2 in the annex.

5 PERFORATING DIMENSIONS

5.1 If perforated, film (in rolls) shall have perforations conforming to the dimensions indicated in figure 1 and specified in table 3.

5.2 The distance separating double-edge perforations, F, is not specified in order to avoid double dimensioning and problems associated with the accumulation of tolerances. If required for design purposes, this dimension and its associated tolerances can be derived from the data contained in table 3. [$F = A - 2\,(C + E)$] (See A.3.1.)

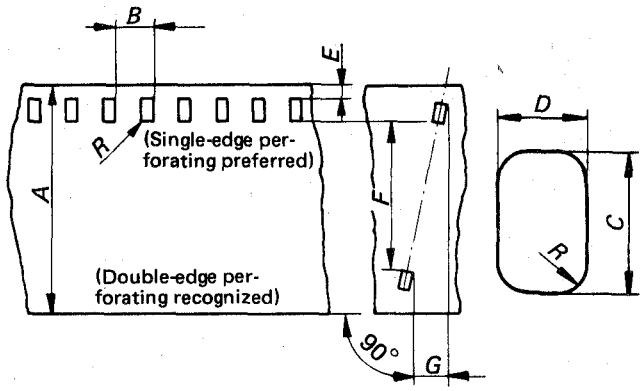

FIGURE 1 — **Perforating dimensions of films (in rolls) used in phototypesetting and photolettering devices**

TABLE 3 — ***Perforating dimensions***

Dimension	mm	in
A — nominal width ⩽ 130 mm (5 in)	nominal width $^{0}_{-0,25}$	nominal width $^{0}_{-0.010}$
A — nominal width > 130 mm (5 in)	nominal width $^{0}_{-0,50}$	nominal width $^{0}_{-0.020}$
B	4,75 ± 0,03	0.187 ± 0.001
C	2,80 ± 0,02	0.110 0 ± 0.000 8
D	1,98 ± 0,02	0.078 ± 0.000 8
E	2,00 ± 0,25	0.079 ± 0.010
F (see 5.2)		
L — length of 100 consecutive perforations	475 ± 0,40	18.70 ± 0.015
R	0,50 nominal	0.020 nominal
G — for A nominal < 250 mm (10 in)	0,25 max.	0.010 max.
for A nominal ⩾ 250 mm (10 in)	0,50 max.	0.020 max.

5.3 The dimensions specified in table 3 are similar to the Type P perforations listed in ISO 491. However, the dimensional tolerances for some of the parameters are greater for these films than those listed in ISO 491. (See A.3.2.)

1) See clause A.1 in the annex for cutting rules applying to nominal widths not listed in tables 1 and 2.

6 WINDING ORIENTATION

6.1 The preferred winding configuration shall be emulsion-in, but emulsion-out is recognized.

6.2 For purposes of identifying the emulsion-core and perforation-core relationship, where required, the following winding designations shall apply to the winding configurations specified below and in figures 2, 3 and 4 :

Winding EIA — emulsion-in, single-edge perforating (preferred)

Winding EOA — emulsion-out, single-edge perforating (recognized)

Winding EI — emulsion-in, double-edge perforating or unperforated (preferred)

Winding EO — emulsion-out, double-edge perforating or unperforated (recognized)

7 SPLICES

Splices permitted in a length of film shall not exceed the number specified in table 4.

The thickness of the splices shall not exceed 0,4 mm (0.016 in), and the tensile strength of the joint shall be not less than 3,5 N/mm (20 lbf/in). The tensile strength of any splice shall not fall below the specified minimum value during the processing and drying cycle recommended by the film manufacturers. Splices in perforated film shall be perforated. Some means of splice detection is normally required.

TABLE 4 — **Maximum number of splices according to roll length**

Nominal length[3]		Maximum number of splices
m	ft	
0 to 60	0 to 200	0
61 to 120	201 to 400	1
121 to 180	401 to 600	2
181 to 240	601 to 800	3

8 CORES

TABLE 5 — **Core dimensions**

Dimension	mm	in
Length	Nominal film width − 0,5 − 1,5	Nominal film width − 0.020 − 0.060
Inside diameter	50,7 ± 0,25	1.996 ± 0.010
Wall thickness, preferred	5,0 ± 0,5	0.197 ± 0.020
Wall thickness, recognized[4]	1,75 ± 0,25	0.069 ± 0.010

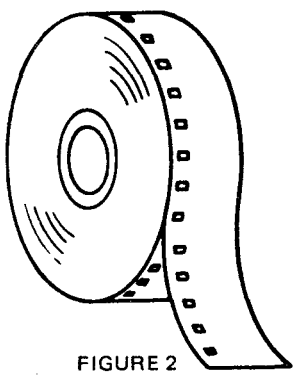

FIGURE 2

Winding EIA (emulsion-in)[1]
Winding EOA (emulsion-out)[2]

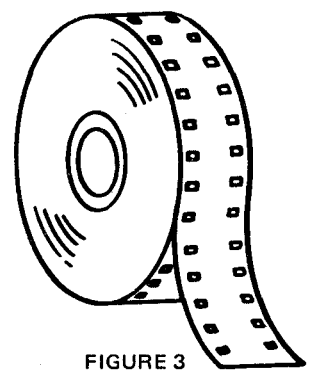

FIGURE 3

Winding EI (emulsion-in)
Winding EO (emulsion-out)

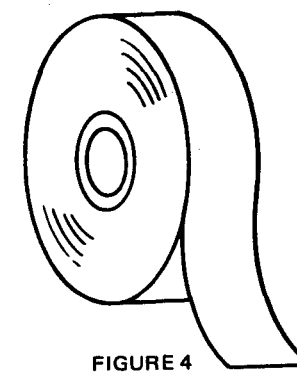

FIGURE 4

1) See ISO 3042.

2) Winding EOA has the same perforation-core relationship as Winding EIA but with the emulsion side away from the core.

3) For lengths greater than 240 m (800 ft), one additional splice is permitted for each 60 m (200 ft) increment of film.

4) Paperboard cores with this wall thickness are not suitable for rolls over 60 m (200 ft) in length because of their strength limitations.

ANNEX

ADDITIONAL INFORMATION

A.1 UNLISTED SIZES

For new film sizes not listed in tables 1 and 2, the following cutting rule applies. For nominal film widths up to and including 130 mm (5 in), the film shall be cut to the nominal width $-\,^{0}_{0,25}$ mm $\left(-\,^{0}_{0.010}\ \text{in}\right)$. For nominal film widths greater than 130 mm (5 in), the film shall be cut to the nominal width $-\,^{0}_{0,50}$ mm $\left(-\,^{0}_{0.020}\ \text{in}\right)$. It is recommended that new film widths not listed in this International Standard be in 50 mm or 100 mm increments, i.e. 350 mm, 400 mm, 450 mm, etc.

A.2 NOMINAL FILM LENGTHS

Film cutting lengths have not been specified because differences in emulsion and base thicknesses contribute more to variations in overall roll diameter than do the variations in the length established by such tolerances. As a guide, the preferred and recognized nominal film lengths are given in table 6.

TABLE 6 — **Nominal film lengths**

Preferred lengths		**Recognized lengths**	
m	ft	m	ft
15	50		
30	100		
		36	120
60	200		
		75	250
120	400		
		150	500
240	800		

Phototypesetting and photolettering device manufacturers are encouraged to design future equipment to accept the preferred nominal film lengths listed in table 6. Wherever possible, existing equipment should be modified to accept the preferred nominal film lengths.

A.3 PERFORATIONS

A.3.1 Phototypesetting and photolettering films may be perforated along one or both edges. Single-edge perforating is preferred, particularly on wider rolls, because perforation skewness, *G*, in rolls perforated on both edges can cause alignment problems in phototypesetting equipment. For rolls wider than 130 mm (5 in), which have perforations along both edges, the second row of perforations must be located to avoid problems with film dimensional changes due to ageing and temporary shrinkage (see 4.1.3 and A.3.2).

A.3.2 Some of the cutting and perforating dimensional tolerances for the phototypesetting films are greater than those for the motion-picture films using Type P perforations. These wider tolerances are necessary for the phototypesetting films because most of the sizes are in wide widths. Film supports in these wider widths are not absolutely flat or rigid; therefore, larger dimensional tolerances are needed for these films during the manufacturing operation.

Because of these larger perforation dimensional tolerances, it is recommended that equipment be designed so that the film is guided relative to the edge adjacent to the perforation rather than guided by the fit of the sprocket in the perforations. Because of the rather large tolerance on dimension *E*, the margin between the edge of the perforations and the edge of the film, the sprocket teeth shall be designed to be proportionately narrower than dimension *C*, the width of the perforation.

For films perforated along both edges, the sprocket teeth design is even more critical. Sprocket teeth used to drive the edge of the film away from the guided edge would have to be designed to take into account the tolerance on the margin, dimension *E*, and also the transverse pitch.