International Paper Sizes

A Series - General Printing A0 is 1 square meter

	MM	Inches (approximate)
A0	841 x 1189	33-1/8 x 46-1/4
A1	594 x 841	23-3/8 x 33-1/8
A2	420 x 594	16-1/2 x 23-3/8
A3	297 x 420	11-3/4 x 16-1/2
A4	210 x 297	8-1/4 x 11-3/4
A5	148 x 210	5-7/8 x 8-1/4
A6	105 x 148	4-1/8 x 5-7/8
A7	74 x 105	2-7/8 x 4-1/8
A8	52 x 74	2 x 2-7/8
A9	37 x 52	1-1/2 x 2
A10	26 x 37	1 x 1-1/2

B Series - Posters and Charts B0 1 meter by 1 meter times the square root of 2 (1.414) Note the Japanese have B0 to be 1.5 square meters.

	MM	Inches (approximate)
B0	1000 x 1414	39-1/8 x 55-1/8
B1	707 x 1000	27-7/8 x 39-1/8
B2	500 x 707	19-5/8 x 27-7/8
B3	353 x 500	13-7/8 x 19-5/8
B4	250 x 353	9-7/8 x 13-7/8
B5	176 x 250	7 x 9-7/8
B6	125 x 176	5 x 7
B7	88 x 125	3-1/2 x 5
B8	62 x 88	2-1/2 x 3-1/2
B9	44 x 62	1-3/4 x 2-1/2
B10	31 x 44	1-1/4 x 1-3/4

Here are my calculations using the formulas listed below. The round up seams to occur at a point of .7 and not at .5 like normally. Below .7 just drop the decimal part to come up with the true used value. The 4A0 is saying it is 4 time the size of a "A0". The JB group is the Japanese JIS P 0138-61 standard.

```
Paper          Calculated                Rounded up .7 and up
size      Width         Height        Width    Height        Width            Height

4A0    1681.793mm X 2378.414mm     1682mm X 2378mm     66  7/32inch X 93  5/ 8inch
2A0    1189.207mm X 1681.793mm     1189mm X 1682mm     46 13/16inch X 66  7/32inch
A 0     840.896mm X 1189.207mm      841mm X 1189mm     33  1/ 8inch X 46 13/16inch
A 1     594.604mm X  840.896mm      594mm X  841mm     23  3/ 8inch X 33  1/ 8inch
A 2     420.448mm X  594.604mm      420mm X  594mm     16 17/32inch X 23  3/ 8inch
A 3     297.302mm X  420.448mm      297mm X  420mm     11 11/16inch X 16 17/32inch
A 4     210.224mm X  297.302mm      210mm X  297mm      8  9/32inch X 11 11/16inch
A 5     148.651mm X  210.224mm      148mm X  210mm      5 13/16inch X  8  9/32inch
A 6     105.112mm X  148.651mm      105mm X  148mm      4  1/ 8inch X  5 13/16inch
A 7      74.325mm X  105.112mm       74mm X  105mm      2 29/32inch X  4  1/ 8inch
A 8      52.556mm X   74.325mm       52mm X   74mm      2  1/16inch X  2 29/32inch
A 9      37.163mm X   52.556mm       37mm X   52mm      1 15/32inch X  2  1/16inch
A10      26.278mm X   37.163mm       26mm X   37mm      1  1/32inch X  1 15/32inch

B 0    1000.000mm X 1414.214mm     1000mm X 1414mm     39  3/ 8inch X 55 21/32inch
B 1     707.107mm X 1000.000mm      707mm X 1000mm     27 27/32inch X 39  3/ 8inch
B 2     500.000mm X  707.107mm      500mm X  707mm     19 11/16inch X 27 27/32inch
B 3     353.553mm X  500.000mm      353mm X  500mm     13 29/32inch X 19 11/16inch
B 4     250.000mm X  353.553mm      250mm X  353mm      9 27/32inch X 13 29/32inch
B 5     176.777mm X  250.000mm      177mm X  250mm      6 31/32inch X  9 27/32inch
B 6     125.000mm X  176.777mm      125mm X  177mm      4 29/32inch X  6 31/32inch
B 7      88.388mm X  125.000mm       88mm X  125mm      3 15/32inch X  4 29/32inch
B 8      62.500mm X   88.388mm       62mm X   88mm      2  7/16inch X  3 15/32inch
B 9      44.194mm X   62.500mm       44mm X   62mm      1 23/32inch X  2  7/16inch
B10      31.250mm X   44.194mm       31mm X   44mm      1  7/32inch X  1 23/32inch

C 0     917.004mm X 1296.840mm      917mm X 1297mm     36  3/32inch X 51  1/16inch
C 1     648.420mm X  917.004mm      648mm X  917mm     25  1/ 2inch X 36  3/32inch
C 2     458.502mm X  648.420mm      458mm X  648mm     18  1/32inch X 25  1/ 2inch
C 3     324.210mm X  458.502mm      324mm X  458mm     12  3/ 4inch X 18  1/32inch
C 4     229.251mm X  324.210mm      229mm X  324mm      9  1/32inch X 12  3/ 4inch
C 5     162.105mm X  229.251mm      162mm X  229mm      6  3/ 8inch X  9  1/32inch
C 6     114.626mm X  162.105mm      114mm X  162mm      4  1/ 2inch X  6  3/ 8inch
C 7      81.052mm X  114.626mm       81mm X  114mm      3  3/16inch X  4  1/ 2inch
C 8      57.313mm X   81.052mm       57mm X   81mm      2  1/ 4inch X  3  3/16inch
C 9      40.526mm X   57.313mm       40mm X   57mm      1  9/16inch X  2  1/ 4inch
C10      28.656mm X   40.526mm       28mm X   40mm      1  3/32inch X  1  9/16inch

JB 0   1029.884mm X 1456.475mm     1030mm X 1456mm     40  9/16inch X 57  5/16inch
JB 1    728.238mm X 1029.884mm      728mm X 1030mm     28 21/32inch X 40  9/16inch
JB 2    514.942mm X  728.238mm      515mm X  728mm     20  9/32inch X 28 21/32inch
JB 3    364.119mm X  514.942mm      364mm X  515mm     14 11/32inch X 20  9/32inch
JB 4    257.471mm X  364.119mm      257mm X  364mm     10  1/ 8inch X 14 11/32inch
JB 5    182.059mm X  257.471mm      182mm X  257mm      7  5/32inch X 10  1/ 8inch
JB 6    128.735mm X  182.059mm      129mm X  182mm      5  3/32inch X  7  5/32inch
JB 7     91.030mm X  128.735mm       91mm X  129mm      3 19/32inch X  5  3/32inch
JB 8     64.368mm X   91.030mm       64mm X   91mm      2 17/32inch X  3 19/32inch
JB 9     45.515mm X   64.368mm       45mm X   64mm      1 25/32inch X  2 17/32inch
JB10     32.184mm X   45.515mm       32mm X   45mm      1  1/ 4inch X  1 25/32inch
```

Guide to Envelope Sizes & Styles

On this page you will find many of the most common envelope styles and sizes. While this chart is very comprehensive, it still may not cover every size or style needed for every situation. If you find what you need, great! If you don't, please call us - we can have a custom size printed and converted for you.

Commercial | Catalog | Booklet | Announcement | Baronial | Remittance | Clasp

Commercial or Business Envelopes | [top]
This is the most common type of envelope and is primarily used for business and personal correspondence, business reply mail, statements, and direct mailings. They are available with or without windows.

Style (or number)	Size
6 1/4	3 1/2 x 6
6 1/2	3 1/2 x 6 1/4
6 3/4	3 5/8 x 6 1/2
7	3 3/4 x 6 3/4
7 3/4	3 7/8 x 7 1/2
Monarch	3 3/8 x 7 1/2
Check	3 5/8 x 8 5/8
9	3 7/8 x 8 7/8
10	4 1/8 x 9 1/2
10 1/2	4 1/2 x 9 1/2
11	4 1/2 x 10 3/8
12	4 3/4 x 11
14	5 x 11 1/2
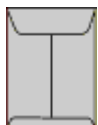
**Catalog and Open End Envelopes** | [top]
Catalog or "open end" envelopes are mainly used to mail large booklets, packages of materials, and even... catalogs. The flap on a catalog envelope is on the short dimension.

Style (or number)	Size
Catalog	
1	6 x 9
1 3/4	6 1/2 x 9 1/2
3	7 x 10
6	7 1/2 x 10 1/2
8	8 1/4 x 11 1/4
9 3/4	8 3/4 x 11 1/4
10 1/2	9 x 12
12 1/2	9 1/2 x 12 1/2
13 1/2	10 x 13
	10 x 15
14 1/2	11 1/2 x 14 1/2

15 1/2	12 x 15 1/2
Policy	
10	4 1/8 x 9 1/2
11	4 1/2 x 10 3/8
14	5 x 11 1/2
Scarf	
1	4 5/8 x 6 3/4
3	5 x 7 1/2
4 1/4	5 1/2 x 7 1/2
6	5 1/2 x 8 1/4
7 [glove]	4 x 6 3/8
8 [glove]	3 7/8 x 7 1/2
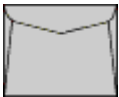
Booklet Envelopes | [top]

Booklet, or "open side" envelopes are used to mail small packages of documents, corporate or sales literature, annual reports. Booklet style envelopes are used in high volume mailings because they can be used in high speed inserting machines.

Style (or number)	Size
3	4 3/4 x 6 1/2
4 1/2	5 1/2 x 7 1/2
5	5 1/2 x 8 1/8
6	5 3/4 x 8 7/8
6 1/2	6 x 9
6 5/8	6 x 9 1/2
6 3/4	6 1/2 x 9 1/2
7	6 1/4 x 9 5/8
7 1/4	7 x 10
7 1/2	7 1/2 x 10 1/2
9	8 3/4 x 11 1/2
9 1/2	9 x 12
10	9 1/2 x 12 5/8
13	10 x 13

Announcement Envelopes | [top]

Announcement envelopes are used for formal business and personal purposes such as invitations, changes of address, etc. Announcement envelopes are usually sold with an insert as a set. There are several different varieties of inserts, so be sure to speak to one of our customer care representatives about your options. This table lists the "square flap" variety of announcement envelopes. For a pointed flap, please see the Baronial table.

Style (or number)	Size
A-2	4 3/8 x 5 3/4
A-6	4 3/4 x 6 1/2
A-7	5 1/4 x 7 1/4
A-8	5 1/2 x 8 1/8

A-Long	3 7/8 x 8 7/8
A-10	6 x 9 1/2

Baronial Envelopes | [top]

Baronial envelopes are used for formal business and personal purposes such as invitations, changes of address, etc. Announcement envelopes are usually sold with an insert as a set. There are several different varieties of inserts, so be sure to speak to one of our customer care representatives about your options. Baronial envelopes have a pointed flap, for a square flap envelope, please see the Announcement table.

Style (or number)	Size
4 Bar	3 5/8 x 5 1/8
5 Bar	4 1/8 x 5 5/8
5 1/2 Bar	4 3/8 x 5 3/4
6 Bar	4 3/4 x 6 1/2
LEE	5 1/4 x 7 1/4

Remittance Envelopes | [top]

Remittance envelopes are usually preprinted with a return address. They are mainly used for collecting payments.

Style (or number)	Size
Tu Way	3 1/2 x 6 1/2
6 1/2 Remit	3 1/2 x 6 1/4
6 3/4 Remit	3 5/8 x 6 1/2
9 Remit	3 7/8 x 8 7/8
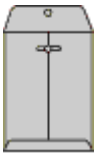
Clasp Envelopes | [top]

Clasp envelopes are the utility vehicles of the envelope family. They are usually made of a heavier stock and with their clasp, are reusable. Clasp envelopes open on the short dimension and are not machine insertable. Many times, they are preprinted with a routing table for repeated use.

Style (or number)	Size
0	2 1/4 x 4 1/4
5	3 1/8 x 5 1/2
10	3 3/8 x 6
15	4 x 6 3/8
9 1/2	4 1/8 x 9 1/2
11	4 1/2 x 10 3/8
25	4 5/8 x 6 3/4
35	5 x 7 1/2
14	5 x 11 1/2
50	5 1/2 x 8 1/4
55	6 x 9
63	6 1/2 x 9 1/2
68	7 x 10

75	7 1/2 x 10 1/2
80	8 x 11
81	8 1/4 x 11 1/4
83	8 1/2 x 11 1/2
87	8 3/4 x 11 1/4
90	9 x 12
93	9 1/2 x 12 1/2
94	9 1/4 x 14 1/2
95	10 x 12
97	10 x 13
98	10 x 15
105	11 1/2 x 14 1/2
110	12 x 15 1/2

Found the following pages at http://www.cl.cam.ac.uk/~mgk25/iso-paper.html.

International Standard Paper Sizes

by Markus Kuhn

Standard paper sizes like ISO A4 are today widely used all over the world. This text explains the ISO 216 paper size system and the ideas behind its design.

Globalization starts with getting the details right. Inconsequent use of SI units and international standard paper sizes is today the primary cause for US businesses failing to meet the expectations of the global economy.

The ISO paper size concept

In the ISO paper size system, all pages have a height-to-width ratio of square root of two (1:1.4142). This aspect ratio is especially convenient for a paper size. If you put two pages with this aspect ratio next to each other, or equivalently cut one parallel to its shorter side into two equal pieces, then the resulting page will have again the same width/height ratio.

The ISO paper sizes are based on the metric system. The square-root-of-two ratio does not permit both the height and width of the pages to be nicely rounded metric lengths. Therefore, the area of the pages has been defined to have round metric values. As paper is usually specified in g/m², this simplifies calculation of the mass of a document if the format and number of pages are known.

ISO 216 defines the A series of paper sizes as follows:

The height divided by the width of all formats is the square root of two (1.4142). Format A0 has an area of one square meter. Format A1 is A0 cut into two equal pieces, i.e. A1 is as high as A0 is wide and A1 is half as wide as A0 is high. All smaller A series formats are defined in the same way by cutting the next larger format in the series parallel to its shorter side into two equal pieces. The standardized height and width of the paper formats is a rounded number of millimeters.

For applications where the ISO A series does not provide an adequate format, the B series has been introduced to cover a wider range of paper sizes. The C series of formats has been defined for envelopes.

The width and height of a B series format is the geometric mean between the corresponding A format and the next larger A format. For instance, B1 is the geometric mean between A1 and A0, that means the magnification factor that scales A1 to B1 also scales B1 to A0. Similarly, the formats of the C series are the geometric mean between the A and B series formats with the same number. For example, an A4 letter fits nicely into a C4 envelope, which in turn fits as nicely into a B4 envelope. If you fold this letter once to A5 format, then it will fit nicely into a C5 envelope.

[The Japanese JIS P 0138-61 standard defines the same A series as ISO 216, but a slightly different B series of paper sizes, sometimes called the JIS B or JB series. JIS B0 has an area of 1.5 m², such that the area of JIS B pages is the arithmetic mean of the area of the A series pages with the same and the next higher number, and not as in the ISO B series the geometric mean. For example JB3 is 364 × 515, JB4 is 257 × 364, and JB5 is 182 × 257 mm. Using the JIS B series should be avoided because it introduces additional magnification factors and is not an international standard.]

The following table shows the width and height of all ISO A and B paper formats, as well as the ISO C envelope formats. The dimensions are in millimeters:

A Series Formats		B Series Formats		C Series Formats	
4A0	1682 × 2378	-	-	-	-
2A0	1189 × 1682	-	-	-	-
A0	841 × 1189	B0	1000 × 1414	C0	917 × 1297
A1	594 × 841	B1	707 × 1000	C1	648 × 917
A2	420 × 594	B2	500 × 707	C2	458 × 648
A3	297 × 420	B3	353 × 500	C3	324 × 458

A4	210×297	B4	250×353	C4	229×324
A5	148×210	B5	176×250	C5	162×229
A6	105×148	B6	125×176	C6	114×162
A7	74×105	B7	88×125	C7	81×114
A8	52×74	B8	62×88	C8	57×81
A9	37×52	B9	44×62	C9	40×57
A10	26×37	B10	31×44	C10	28×40

The allowed tolerances are ±1.5 mm for dimensions up to 150 mm, ±2 mm for dimensions above 150 mm up to 600 mm, and ±3 mm for dimensions above 600 mm. Some national equivalents of ISO 216 specify tighter tolerances, for instance DIN 476 requires ±1 mm, ±1.5 mm, and ±2 mm respectively for the same ranges of dimensions.

Application examples

The ISO standard paper size system covers a wide range of formats, but not all of them are widely used in practice. Among all formats, A4 is clearly the most important one for daily office use. Some main applications of the most popular formats can be summarized as:

A0,A1 technical drawings, posters
A2,A3 drawings, diagrams, large tables
A4 letters, magazines, forms, catalogs, laser printer and copying machine output
A5 note pads
A6 postcards
B5,A5,B6,A6 books
C4,C5,C6 envelopes for A4 letters: unfolded (C4), folded once (C5), folded twice (C6)
B4,A3 newspapers, supported by most copying machines in addition to A4

The main advantage of the ISO standard paper sizes becomes obvious for users of copying machines:

Example 1:

You are in a library and want to copy an article out of a journal that has A4 format. In order to save paper, you want copy two journal pages onto each sheet of A4 xerox paper. If you open the journal, the two A4 pages that you will now see together have A3 format. By setting the magnification factor on the copying machine to 71% (that is sqrt(0.5)), or by pressing the A3?A4 button that is available on most copying machines, both A4 pages of the journal article together will fill exactly the A4 page produced by the copying machine. One reproduced A4 page will now have A5 format. No wasted paper margins appear, no text has been cut off, and no experiments for finding the appropriate magnification factor are necessary. The same principle works for books in B5 or A5 format.

Copying machines designed for ISO paper sizes usually provide special keys for the following frequently needed magnification factors:

71% sqrt(0.5) A3 -> A4
84% sqrt(sqrt(0.5)) B4 -> A4
119% sqrt(sqrt(2)) A4 -> B4 (also B5 -> A4)
141% sqrt(2) A4 -> A3 (also A5 -> A4)

Not only the operation of copying machines in offices and libraries, but also repro photography, microfilming, and printing are simplified by the 1:sqrt(2) aspect ratio of ISO paper sizes.

Example 2:

If you prepare a letter, you will have to know the weight of the content in order to determine the postal fee. This can be very conveniently calculated with the ISO A series paper sizes. Usual typewriter and laser printer paper weighs 80 g/m². An A0 page has an area of 1 m², and the next smaller A series page has half of this area. Therefore the A4 format has an area of 1/16

m² and weighs with the common paper quality 5 g per page. If we estimate 20 g for a C4 envelope (including some safety margin), then you will be able to put 16 A4 pages into a letter before you reach the 100 g limit for the next higher postal fee.

Calculation of the mass of books, newspapers, or packed paper is equally trivial. You probably will not need such calculations often, but they nicely show the beauty of the concept of metric paper sizes.

Using standard paper sizes saves money and makes life simpler in many applications. For example, if all scientific journals used only ISO formats, then libraries would have to buy only very few different sizes for the binders. Shelves can be designed such that standard formats will fit in exactly without too much wasted shelf volume. The ISO formats are used for surprisingly many things besides office paper: the German citizen ID card has format A7, both the European Union and the U.S. (!) passport have format B7, and library microfiches have format A6. In some countries (e.g., Germany) even many brands of toilet paper have format A6.

Further details

Calculating the dimensions

Although the ISO paper sizes are specified in the standard with the width and height given in millimeters, the dimensions can also be calculated with the following formulas:

Format	Width [m]	Height [m]	
An	$2^{(-1/4-n/2)}$	$2^{(1/4-n/2)}$	
Bn	$2^{(-n/2)}$	$2^{(1/2-n/2)}$	
Cn	$2^{(-1/8-n/2)}$	$2^{(3/8-n/2)}$	
BJn	$2^{(.04248425-n/2)}$	$2^{(.54248125-n/2)}$	The Japanese JIS P 0138-61 standard

Note ^ means raise the 2 to the quaintly in brackets power

The actual millimeter dimensions in the standard have been calculated by progressively rounding down any division-by-two result, as the small program iso-paper.c demonstrates. This guarantees that two A(n-1) pages together are never larger than an An page.

Aspect ratios other than sqrt(2)

Sometimes, paper formats with a different aspect ratio are required for labels, tickets, and other purposes. These should preferably be derived by cutting standard series sizes into 3, 4, or 8 equal parts, parallel with the shorter side, such that the ratio between the longer and shorter side is greater than the square root of two. Some example long formats in millimeters are:

1/3 A4	99 × 210
1/4 A4	74 × 210
1/8 A4	37 × 210
1/4 A3	105 × 297
1/3 A5	70 × 148

The 1/3 A4 format (99 × 210 mm) is also commonly applied for reduced letterheads for short notes that contain not much more than a one sentence message and fit without folding into a DL envelope.

Envelope formats

For postal purposes, ISO 269 and DIN 678 define the following envelope formats:

Format	Size [mm]	Content Format
C6	114 × 162	A4 folded twice = A6
DL	110 × 220	A4 folded twice = 1/3 A4
C6/C5	114 × 229	A4 folded twice = 1/3 A4

C5	162 × 229	A4 folded once = A5
C4	229 × 324	A4
C3	324 × 458	A3
B6	125 × 176	C6 envelope
B5	176 × 250	C5 envelope
B4	250 × 353	C4 envelope
E4	280 × 400	B4

The DL format is the most widely used business letter format. DL probably originally stood for "DIN lang" historically, but ISO 269 now explains this abbreviation more diplomatically as "Dimension Lengthwise" instead. Its size falls somewhat out of the system and equipment manufacturers have complained that it is slightly too small for the reliable automatic enveloping, therefore DIN 678 introduced the C6/C5 format as an alternative for DL.

There currently exists no ISO standard for envelopes with an address window, so let's have a look at the corresponding DIN standard. DIN 680 specifies that a transparent address window has to be 90 × 45 mm large and its left edge should be located 20 mm from the left edge of the envelope. For C6, DL, and C6/C5 envelopes, the bottom edge of the window should be 15 mm from the bottom edge of the envelope. For C4 envelopes, the top edge of the window should be either 27 or 45 mm from the top edge of the envelope.

Untrimmed paper formats

All A and B series formats described so far are trimmed paper end sizes, i.e. these are the dimensions of the paper delivered to the user or reader. Other ISO standards define the format serieses RA and SRA for untrimmed raw paper, where SRA stands for "supplementary raw format A" ("sekundäres Rohformat A"). These formats are only slightly larger than the corresponding A series formats. Sheets in these formats will be cut to the end format after binding. The ISO RA0 format has an area of 1.05 m² and the ISO SRA0 format has an area of 1.15 m². These formats also follow the sqrt(2)-ratio and half-area rule, but the dimensions of the start format have been rounded to the full centimeter. The common untrimmed paper formats that printers order from the paper manufacturers are

RA Series Formats		SRA Series Formats	
RA0	860 × 1220	SRA0	900 × 1280
RA1	610 × 860	SRA1	640 × 900
RA2	430 × 610	SRA2	450 × 640
RA3	305 × 430	SRA3	320 × 450
RA4	215 × 305	SRA4	225 × 320

The RA and SRA dimensions are also used as roll widths in rotating printing presses.

Filing holes

ISO 838 specifies that for filing purposes, two holes of 6±0.5 mm diameter can be punched into the sheets. The centers of the two holes are 80±0.5 mm apart and have a distance of 12±1 mm to the nearest edge of the sheet. The holes are located symmetrically in relation to the axis of the sheet or document. Any format that is at least as large as A7 can be filed using this system. Not specified in ISO 838, but also widely used, is an upwards compatible 4-hole system. In it, the two middle holes correspond to ISO 838, plus there are two additional holes located 80 mm above and below these to provide for more stability. This way, sheets with four punched holes can also be filed in ISO 838 2-hole binders.

Folder and file sizes

ISO 623 specifies the sizes of folders and files intended to receive either A4 sheets or simple folders (without back) that are not designed for any particular filing system or cabinet. The sizes specified are those of the overall rectangular surface when the folders or files are folded, exclusive any margin or tabs. Simple folders without back or mechanism are 220 × 315 mm large. Folders and files with a very small back (less than 25 mm) with or without mechanism are 240 × 320 mm large. Files with wide back (exceeding 25 mm) are 250 × 320 mm (without a mechanism) or 290 × 320 mm if they include a mechanism. All these are maximum dimensions. Standardizing folder and file sizes help in optimizing shelf design and provides a uniform shelf look and handling even if folders from various manufacturers are used.

Technical drawing pen sizes

Technical drawing pens follow the same principle. The standard sizes differ by a factor sqrt(2): 2.00 mm, 1.40 mm, 1.00 mm, 0.70 mm, 0.50 mm, 0.35 mm, 0.25 mm, 0.18 mm, 0.13 mm. So after drawing with a 0.35 mm pen on A3 paper and reducing it to A4, you can continue with the 0.25 mm pen. (ISO 9175-1)

Overhead projectors

When you prepare overhead projector slides for a conference, you might wonder, how large the picture area of the projector that you will have available will be. ISO 7943-1 specifies two standard sizes of overhead projector picture areas: Type A is 250 × 250 mm (corners rounded with a radius less than 60 mm) and Type B is 285 × 285 mm (corners rounded with a radius less than 40 mm or cut off diagonally no more than 40 mm). Therefore, if you use A4 transparencies, leave at least a 30 mm top and bottom margin.

Identification cards

ISO 7810 specifies identification cards and defines the following three standard formats: ID-1 = 85.60 × 53.98 mm (= 3.370 × 2.125 in), ID-2 = 105 × 74 mm (= A7), and ID-3 = 125 × 88 mm (= B7). ID-1 is the common format for banking cards (0.76 mm thick) and is also widely used for business cards and driver's licences. The standard passport format is B7 (= ID-3).

History of the ISO paper formats

The practical and aesthetic advantages of the sqrt(2) aspect ratio for paper sizes were probably first noted by the physics professor Georg Christoph Lichtenberg (University of Göttingen, Germany, 1742-1799) in a letter that he wrote 1786-10-25 to Johann Beckmann. After introducing the meter measurement, the French government published 1794-11-03 the "Loi sur le timbre" (no. 2136), a law on the taxation of paper that defined several formats that correspond already exactly to the modern ISO paper sizes: "Grand registre" = ISO A2, "grand papier" = ISO B3, "moyen papier" = ISO A3, "petit papier" = ISO B4, "demi feuille" = ISO B5, "effets de commerce" = ISO 1/2 B5.

The French format series never became widely known and was quickly forgotten again. The A, B, and C series paper formats, which are based on the exact same design principles, were completely independently reinvented over a hundred years after the "Loi sur le timbre" in Germany by Dr. Walter Porstmann. They were adopted as the German standard DIN 476 in 1922 as a replacement for the vast variety of other paper formats that had been used before, in order to make paper stocking and document reproduction cheaper and more efficient.

The DIN paper formats were soon also introduced in many other countries, for example Belgium (1924), Netherlands (1925), Norway (1926), Switzerland (1929), Sweden (1930), Soviet Union (1934), Hungary (1938), Italy (1939), Uruguay (1942), Argentina and Brazil (1943), Spain (1947), Austria (1948), Romania (1949), Japan (1951), Denmark and Czechoslovakia (1953), Israel and Portugal (1954), Yugoslavia (1956), India and Poland (1957), United Kingdom (1959), Venezuela (1962), New Zealand (1963), Iceland (1964), Mexico (1965), South Africa (1966), France/Peru/Turkey (1967), Chile (1968), Greece/Simbabwe/Singapur (1970), Bangladesh (1972), Thailand and Barbados (1973), Australia and Ecuador (1974), Columbia and Kuwait (1975). Porstmann's DIN paper format system finally became both an international standard (ISO 216) as well as the official United Nations document format in 1975 and it is today used in almost all countries on this planet. In 1977, a large German car manufacturer performed a study of the paper formats found in their incoming mail and concluded that out of 148 examined countries, 88 used already the A series formats then. [Source: Helbig/Hennig 1988]

Hints for North American paper users

The United States and Canada are today the only industrialized nations in which the ISO standard paper sizes are not yet widely used. In US office applications, the paper formats "Letter" (216 × 279 mm), "Legal" (216 × 356 mm), "Executive" (190 × 254 mm), and "Ledger/Tabloid" (279 × 432 mm) are widely used today. There exists also an American National Standard ANSI/ASME Y14.1 for technical drawing paper sizes A (216 × 279 mm), B (279 × 432 mm), C (432 × 559 mm), D (559 × 864 mm), E (864 × 1118 mm), and there are many other unsystematic formats for various applications in use. The "Letter", "Legal", "Tabloid", and other formats (although not these names) are defined in the American National Standard ANSI

X3.151-1987. The new American National Standard ANSI/ASME Y14.1m-1995 specifies now the ISO A0-A4 formats for technical drawings.

The Canadian standard CAN 2-9.60M "Paper Sizes for Correspondence" defines the six formats P1 (560 × 860 mm), P2 (430 × 560 mm), P3 (280 × 430 mm), P4 (215 × 280 mm), P5 (140 × 215 mm), and P6 (107 × 140 mm). These are just the US sizes rounded to the nearest half centimeter (P4 ~ US Letter, P3 ~ US Ledger). This Canadian standard was introduced in 1976, even though the Ontario Government had already introduced the ISO A series formats before in 1972. Even though these Canadian paper sizes look somewhat like a pseudo-metric standard, they still suffer from the two major inconveniences of the US formats, namely they have no common height/width ratio and they differ significantly from what the rest of the world uses.

Both the "Letter" and "Legal" letter format could easily be replaced by A4, "Executive" (if it is really needed) by B5, and "Ledger/Tabloid" by A3. Similarly, the A-E formats can be replaced by A4-A0. It can be hoped and expected that with the continuing introduction of the metric system in the United States, the ISO paper formats will eventually replace non-standard paper formats also in North America. Due to popular demand, I have prepared an unofficial table with the ISO sizes in inch fractions. Each listed inch fraction has the smallest denominator that keeps the value within the ISO 216 tolerance limits. Product designers should preferably use the official millimeter values instead.

A Series Formats		B Series Formats		C Series Formats	
4A0	66 1/4 × 93 5/8	-	-	-	-
2A0	46 3/4 × 66 1/4	-	-	-	-
A0	33 × 46 3/4	B0	39 3/8 × 55 3/4	C0	36 × 51
A1	23 3/8 × 33	B1	27 3/4 × 39 3/8	C1	25 1/2 × 36
A2	16 1/2 × 23 3/8	B2	19 3/4 × 27 3/4	C2	18 × 25 1/2
A3	11 3/4 × 16 1/2	B3	13 7/8 × 19 3/4	C3	12 3/4 × 18
A4	8 1/4 × 11 3/4	B4	9 7/8 × 13 7/8	C4	9 × 12 3/4
A5	5 7/8 × 8 1/4	B5	7 × 9 7/8	C5	6 3/8 × 9
A6	4 1/8 × 5 7/8	B6	4 7/8 × 7	C6	4 1/2 × 6 3/8
A7	2 7/8 × 4 1/8	B7	3 1/2 × 4 7/8	C7	3 3/16 × 4 1/2
A8	2 × 2 7/8	B8	2 1/2 × 3 1/2	C8	2 1/4 × 3 3/16
A9	1 1/2 × 2	B9	1 3/4 × 2 1/2	C9	1 5/8 × 2 1/4
A10	1 × 1 1/2	B10	1 1/4 × 1 3/4	C10	1 1/8 × 1 5/8

The dominance of the "Letter" format instead of ISO A4 as the common laser-printer paper format in North America causes a lot of problems in daily international document exchange with the USA and Canada. ISO A4 is 6 mm less wide but 18 mm higher than the U.S. "Letter" format. Word processing documents with an A4 layout can often not be printed without loss of information on "Letter" paper or require you to reformat the text, which will change the page numbering. "Letter" format documents printed outside North America either show too much white space on the top or bottom of the page or the printer refuses to operate as "Letter" format paper has been selected by the software but is not available. A4 documents have to be copied or printed with a 94% magnification factor to fit on the 6% less tall "Letter" paper, and "Letter" documents have to be printed with 97% size to fit on the 3% less wide A4 format.

Conversion to A4 as the common business letter and document format in North America would not cause any significant cost. Practically all modern software, copying machines, and laser printers sold today in the US support already A4 paper as a standard feature.

Universities in the U.S. increasingly use A4 paper in laser printers and library copying machines, because most journals and conferences outside North America require papers to be submitted in A4 format and many journals and conference proceedings are printed in A4 format.

The three-hole filing system widely used in the U.S. is not compatible with the two-hole ISO system used in most other countries. The three-hole system could of course also be used on A4 pages, but many files with a three-hole mechanism are only designed for U.S. "Letter" sheets and are not tall enough to reliably protect A4 pages. Another disadvantage of the three-hole system is that is is not suitable for storing formats smaller than U.S. "Letter".

The U.S. Postal Service standard-size range for first-class or single piece third-class mail weighing up to 28 g includes ISO C6 and DL envelopes. Unfortunately, the height limit for standard size mail is currently 7 mm too small for C5 envelopes,

therefore C5 and C4 envelopes count as nonstandard-size mail and require a surcharge. The U.S. currently use a quite large number of envelope formats.

The U.S. paper industry has managed to come up with a truly bizarre way of specifying the density of paper. Instead of providing you with the obvious quotient of mass per area (e.g., in grams per square meter, ounces per square yard, whatever), they specify the total mass M of a ream of N pages of some size X×Y. This means, you have to know four (!) values in order to understand how to calculate the (scalar) density of the paper. For example "20 lb paper" can mean that a ream of 500 pages in format 24×36 in has a total mass of 20 pounds. These ream sizes of 500×24 in $\times 36$ in = 278.70912 m² are somewhat typical in newsprint applications but not universal, as 17×22 in, 25×38 in and other reference sheet sizes are used as well! With 453.59237 g/lb and 278.70912 m²/ream, we get roughly 1 lb/ream = 1.63 g/m² for this particular ream size. It is a big pain if you have to do these conversions yourself and you really should complain to paper suppliers who still do not manage to communicate the proper g/m² values (commonly called "grammage" in both English and French) for their products.

And before I forget it, readers fascinated by the idea of Central Europeans using A6 as a toilet paper size might also be interested to hear that the U.S. have for the same application field a standard square format of 4.5×4.5 in = 114×114 mm, which is for instance documented in New Jersey Specification No. 7572-01 (May 1997), section 2.3.

Below follow some links to various other on-line locations that will help you to enter the ISO paper format world.

Guide to A4 Paper Setup for Windows or WordPerfect by NIST The Guide to International Paper Sizes by EDS Inc. describes ISO, JIS, and non-metric paper formats Making Postscript and Acrobat Files International by Jacob Palme explains the problems caused by the difference between U.S. Letter and ISO A4 laser printer paper formats

Although it is rarely advertised, ISO A4 laser printer and copying paper as well as suitable files and folders are already available today from many U.S. office supply companies. A4 paper and supplies are regularly ordered in the U.S. today, especially by companies and organizations with a lot of international correspondence, including universities and government agencies. It seems that in the U.S. at the moment only higher-quality paper brands are easily available in A4. If you cannot find any supply for A4 paper in your area, then try for example the following vendors, who have confirmed to have A4 paper or related articles on stock for fast delivery:

Empire Imports Inc., custsvc@empireimports.com, European Office Supplies, P.O. Box 2728, Amherst, MA 01004-2728, phone 1-800-544-4744, fax 1-800-835-5140, has a good selection of A4 filebinders, ISO hole punches, A4 paper, etc. Staples has recently started to offer A4 paper (e.g., "Fore DP White Office Paper, 210mm x 297mm International Size", item no. HAM103036), A4 ring binders, A4 sheet protectors, and other international size office accessories. Xerox, phone 1-800-822-2200, sells A4 paper (e.g., "Premium Multipurpose 4024, a-4 size", order no. 3R2594) for laser printers and copying machines. Carstens carstens@carstens.com, phone 1-800-782-1524, sells A4 ringbinders. ComStar Company. Metro Paper, sales@metropaper.com, phone 1-800-607-2737. more on-line paper vendors can easily be found via the Yahoo! Internet directory.

This is just a small arbitrary collection of paper vendors that offer ISO format paper. Please mail me if you know other useful hints and net resources about working with ISO paper sizes. I especially want to invite North American vendors of ISO paper format related products (paper, filing material, replacement paper trays, etc.) to contact me so that I can collect pointers to these companies here.

References

This text summarizes and explains the content of the following international standards:

ISO 216:1975, Writing paper and certain classes of printed matter -- Trimmed sizes -- A and B series.
ISO 269:1985, Correspondence envelopes -- Designation and sizes.
ISO 623:1974, Paper and board -- Folders and files -- Sizes.
ISO 838:1974, Paper -- Holes for general filing purposes -- Specifications.
ISO 7943-1:1987, Overhead Projectors -- Projection Stages -- Dimensions

[Note: There is a new 1996 revision draft of ISO 216 which I have not yet seen. Contact me if you have more information.]

The following standards contain related information but are not covered here completely:

ISO 217:1995, Paper -- Untrimmed sizes -- Designation and tolerances for primary and supplementary ranges, and indication of machine direction.
ISO 328:1974, Picture postcards and lettercards -- Size.
ISO 353:1975, Processed writing paper and certain classes of printed matter -- Method of expression of dimensions.
ISO 416:1974, Picture postcards -- Area reserved for the address.
ISO 478:1974, Paper -- Untrimmed stock sizes for the ISO-A Series -- ISO primary range.
ISO 479:1975, Paper -- Untrimmed sizes -- Designation and tolerances.
ISO 593:1974, Paper -- Untrimmed stock sizes for the ISO-A Series -- ISO supplementary range.
ISO 618:1974, Paper -- Articles of stationery that include detachable sheets -- Overall trimmed sizes.

These standards are available from

International Organization for Standardization
Case postale 56
1, rue de Varembé
CH-1211 Genève 20
Switzerland

phone: +41 22 749 01 11
fax: +41 22 733 34 30
email: sales@isocs.iso.ch

The most comprehensive source of information about the ISO and North American paper formats and many related standards, as well as their respective histories, is the book

Max Helbig, Winfried Hennig: DIN-Format A4 - Ein Erfolgssystem in Gefahr. Beuth-Kommentare, Deutsches Institut für Normung, Beuth Verlag, 1988, 144 pages, ISBN 3-410-11878-0, ~17 EUR.

Here are a few more references for those interested in the introduction of ISO paper sizes in North America:

Response from Michael F. DiMario, U.S. Public Printer, on my request for information about the introduction of ISO 216 paper formats in U.S. government agencies. Ad Hoc Committee Report - Metric Usage in Federal Printing, a study done by the U.S. government that shows that migration to international standard paper formats is feasible and, with few exceptions, would not cause significant costs.

If you have any suggestions about how this text might be improved, please contact me by email. I wish to thank for helpful suggestions Gary Brown, Gene Fornario, Don Hillger, Arild Jensen, Joseph B. Reid, Bruce Naylor, Ryan Park, and others.

Hypertext links to this text are very welcome. You may freely reuse any part of this text in your own publications. If you do, I would appreciate a free copy.

You might also be interested in the Metric Typographic Units and International Standard Date and Time Notation Web pages.

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http://www.cl.cam.ac.uk/~mgk25/iso-paper.html

Comparison Chart of Various Paper Weights

Caliper

Caliper is the thickness of a sheet of paper expressed in thousandth of an inch. This measurement is taken with a micro meter. Normally, paper caliper should not have more than a plus or minus 5% variance within a sheet. Usually the greater the caliper (the thicker the paper), the greater the paper weight but this depends on the density and finish of the paper. Therefore, the following chart is meant to be approximate. Every Paper.com paper shows the caliper for that particular paper.

Basis Weight

The basis weight of a paper is the weight of 500 sheets, measured in pounds, in that paper's basic sheet size. It is important to note that the "basic sheet size" is not the same for all types of paper and it is never 8 1/2 x 11. 8 1/2 x 11 is the result of cutting a Basic Sheet of Bond paper.

Equivalent Weight

While different paper types have different basic sizes, papers can still be compared by using equivalent weight. In this example a 24 pound bond has the equivalent weight as 60 pound offset.

Caliper (inches)	Bond	Offset	Cover	Tag	Index	Points	millimeters	Metric (grams/sq meter)
.0032	16	41	22	37	33	3.2	0.081	60.15 gsm
.0036	18	45	24	41	37	3.6	0.092	66.61 gsm
.0038	20	50	27	45	41	3.8	0.097	74.01 gsm
.0048	24	60	32	55	49	4.8	0.12	88.81 gsm
.0058	28	70	38	64	57	5.8	0.147	103.61 gsm
.0060	29	73	40	62	60	6	0.152	109.11 gsm
.0061	31	81	43	73	66	6.1	0.155	118.42 gsm
.0062	35	90	48	80	74	6.2	0.157	131.68 gsm
.0068	36	90	50	82	75	6.8	0.173	135.45 gsm
.0072	39	100	54	91	81	7.2	0.183	148.02 gsm
.0073	40	100	56	93	83	7.3	0.185	150.5 gsm
.0074	43	110	60	100	90	7.4	0.188	161.78 gsm
.0076	44	110	61	102	92	7.6	0.193	165.55 gsm
.0078	47	120	65	108	97	8	0.198	176.83 gsm
.0085	53	135	74	122	110	9	0.216	199.41 gsm
.009	54	137	75	125	113	9	0.229	203.17 gsm
.0092	58	146	80	134	120	9.5	0.234	218.22 gsm

.0095	65	165	90	150	135	10	0.241	244.56 gsm
.010	67	170	93	156	140	10.5	0.25	252.08 gsm
.011	72	183	100	166	150	11	0.289	270.9 gsm
.013	76	192	105	175	158	13	0.33	285.95 gsm
.014	82	208	114	189	170	14	0.356	308.52 gsm
.015	87	220	120	200	180	15	0.38	312 gsm
.0175	105	267	146	244	220	18	0.445	385.06 gsm