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**Photography — Medical
radiographic cassettes/screens/films
and hard-copy imaging films —
Dimensions and specifications**

ICS 11.040.50;37.040.25

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Health, Labour and Welfare and the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by Japan Industries Association of Radiological Systems (JIRA)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently JIS Z 4905 : 1998 (revised) and JIS Z 4912 : 1992 (withdrawn and integrated) are replaced with this Standard.

In order to conform to the International Standard, this revision has been prepared based on ISO 4090 : 2001-08-15 Third edition (*Photography—Medical radiographic cassettes/screens/films and hard-copy imaging films — Dimensions and specifications*).

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In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

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Photography—Medical radiographic cassettes/screens/films and hard-copy imaging films—Dimensions and specifications

Introduction This Japanese Industrial Standard has been prepared based on the third edition of ISO 4090 *Photography—Medical radiographic cassettes/screens/films and hard-copy imaging films—Dimensions and specifications* published in August, 2001 with some modifications of the technical contents.

The portions underlined with dots are the matters in which the contents of the original International Standard have been modified. A list of modifications with the explanations is given in annex 1(informative).

1 Scope This Standard specifies the nominal sizes, aim dimensions with tolerances, weights, and certain tests for medical radiographic cassettes (hereafter referred to as “cassettes”), screens, and films.

Remarks : The International Standard corresponding to this Standard is as follows.

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standard and JIS are IDT(identical), MOD(modified), and NEQ(not equivalent) according to ISO/IEC Guide 21.

ISO 4090 : 2001 *Photography—Medical radiographic cassettes/screens/films and hard-copy imaging films—Dimensions and specifications*
(MOD)

2 Normative references The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. If the indication of the year of publication is given to these referred standards, only the edition of indicated year constitutes the provision of this Standard but the revision and amendment made thereafter do not apply.

ISO 554 : 1976 *Standard atmospheres for conditioning and/or testing—Specifications*

IEC 61267 : 1994 *Medical diagnostic X-ray equipment—Radiation conditions for use in the determination of characteristics*

3 Terms and definitions For the purposes of this Standard, the following terms and definitions apply.

3.1 preferred mammography sizes current industry standard, reflecting modern industry trends

NOTE : Aim and tolerance dimensions are different for preferred sizes versus recognized sizes.

3.2 recognized mammography sizes former industry standard, listed because this older format is expected to be used in clinical applications worldwide for some time to come

4 Conditions for measurement of dimensions The dimensions and tolerances specified in this Standard shall apply at the time of manufacture (except where specifically stated otherwise), when measured under atmospheric conditions of $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 5) \%$ relative humidity, as specified in ISO 554.

5 Radiographic cassettes

5.1 Dimensions

5.1.1 Nominal sizes, aim and tolerance dimensions Nominal sizes, aim and tolerance dimensions and weight for preferred radiographic cassette (hereafter including “dental radiographic cassette”) sizes shall conform to the values given in tables 1 and 2.

Nominal sizes, aim and tolerance dimensions and weight for recognized radiographic cassette sizes shall conform to the values given in tables 3 and 4.

The materials and design of the cassette shall ensure that, under normal conditions of use over a relative humidity range from 30 % to 85 % and a temperature range from $10 ^\circ\text{C}$ to $40 ^\circ\text{C}$, the shape and dimensions comply with the limits for the outer dimensions (OD) and inner dimensions (ID) given in tables 1, 2, 3 and 4.

Table 1 Preferred radiographic cassette sizes of metric origin

Nominal size cm	Cassette (ID) mm			Cassette (OD) mm			Thickness mm	Max. weight (without screen) g
	Min.	Aim	Max.	Min.	Aim	Max.		
13×18	131.5× 181.5	132×182	133×183	156.5 × 206.5	157.5× 207.5	158.5 × 208.5	+1 15–2	500
18×24	181.5× 241.5	182×242	183×243	206.5 × 266.5	207.5× 267.5	208.5× 268.5	+1 15 2	800
18×43	181.5× 433.5	182×434	183×435	206.5 × 456.5	207.5× 457.5	208.5× 458.5	+1 15–2	1 000
20×40	201.5× 401.5	202×402	203×403	226.5 × 426.5	227.5 × 427.5	228.5× 428.5	+1 15–2	1 000
24×30	241.5× 301.5	242×302	243×303	266.5 × 326.5	267.5× 327.5	268.5× 328.5	+1 15–2	1 200
30×40	301.5× 401.5	302×402	303×403	326.5 × 426.5	327.5× 427.5	328.5× 428.5	+1 15 2	1 900
30×90	301.5× 901.5	302×902	303×903	326.5 × 926.5	327.5× 927.5	328.5× 928.5	+1 16.5–3.5	
30×120	301.5× 1 201.5	302×1 202	303×1203	326.5× 1 226.5	327.5× 1 227.5	328.5× 1 228.5	+1 16.5–3.5	—
Dental radiography (Extra-oral)								
13×30	131.5× 301.5	132×302	133×303	156.5× 326.5	157.5× 327.5	158.5 × 328.5	+1 15 2	800
15×30	151.5× 301.5	152×302	153×303	176.5× 326.5	177.5× 327.5	178.5× 328.5	+1 15–2	800

Table 2 Preferred radiographic cassette sizes of inch origin

Nominal size cm	Cassette (ID) mm			Cassette (OD) mm			Thickness mm	Max. weight (without screen) g
	Min.	Aim	Max.	Min.	Aim	Max.		
20×25 (8×10)	204.7× 255.5	205.2×256	206.2×257	229.7× 280.5	230.7× 281.5	231.7× 282.5	+1 15–2	1 000
35×35 (14×14)	357.5× 357.5	358×358	359×359	382.5× 382.5	383.5× 383.5	384.5× 384.5	+1 15–2	1 000
35×43 (14×17)	357.5× 433.5	358×434	359×435	382.5× 458.5	383.5× 459.5	384.5× 460.5	+1 15–2	2 100

Table 3 Recognized radiographic cassette sizes of metric origin

Nominal size cm	Cassette (ID) mm			Cassette (OD) mm			Thickness mm	Max. weight (without screen) g
	Min.	Aim	Max.	Min.	Aim	Max.		
24×24	241.5× 241.5	242×242	243×243	266.5× 266.5	267.5× 267.5	268.5× 268.5	+1 15–2	1 000
30×30	301.5× 301.5	302×302	303×303	326.5× 326.5	327.5× 327.5	328.5× 328.5	+1 15–2	1 400
40×40	401.5× 401.5	402×402	403×403	426.5× 426.5	427.5× 427.5	428.5× 428.5	+1 15–2	1 900
20×96	201.5× 961.5	202×962	203×963	226.5× 986.5	227.5× 987.5	228.5× 988.5	+1 16.5–3.5	—

Table 4 Recognized radiographic cassette sizes of inch origin

Nominal size cm	Cassette (ID) mm			Cassette (OD) mm			Thickness mm	Max. weight (without screen) g
	Min.	Aim	Max.	Min.	Aim	Max.		
25×30 (10×12)	255.5× 306.3	256× 306.8	257× 307.8	280.5× 331.3	281.5× 332.3	282.5× 333.3	+1 15–2	1 200
28×35 (11×14)	280.9× 357.1	281.4× 357.6	282.4× 358.6	305.9× 382.1	306.9× 383.1	307.9× 384.1	+1 15–2	1 900
30×35 (12×14)	301.5× 357.5	302×358	303×359	326.5× 382.5	327.5× 383.5	328.5× 384.5	+1 15–2	1 900
30×38 (12×15)	306.3× 382.5	306.8× 383	307.8× 384	331.3× 407.5	332.3× 408.5	333.3× 409.5	+1 15–2	1 900

5.1.2 Denomination Radiographic cassettes are denoted by the nominal size expressed in numerical values (in centimetres) without adding the measurement unit “cm”.

Example : Cassette 18×24 (eighteen by twenty-four) denotes a radiographic cassette for a film with nominal size 18 cm×24 cm.

5.1.3 Outer dimensions (OD) The outer dimensions, in the plane of the film, shall be 27.5 mm ± 1 mm more than the nominal size of the cassette. (However, nominal size in this case is the size which does not include errors.)

Cassettes of nominal sizes that have both dimensions not exceeding 43.2 cm shall have an aim thickness of 15 mm, minimum thickness of 13 mm, and maximum thickness of 16 mm.

Cassettes of nominal sizes that have one or both dimensions greater than 43.2 cm shall have an aim thickness of 16.5 mm, minimum thickness of 13 mm, and maximum thickness of 17.5 mm.

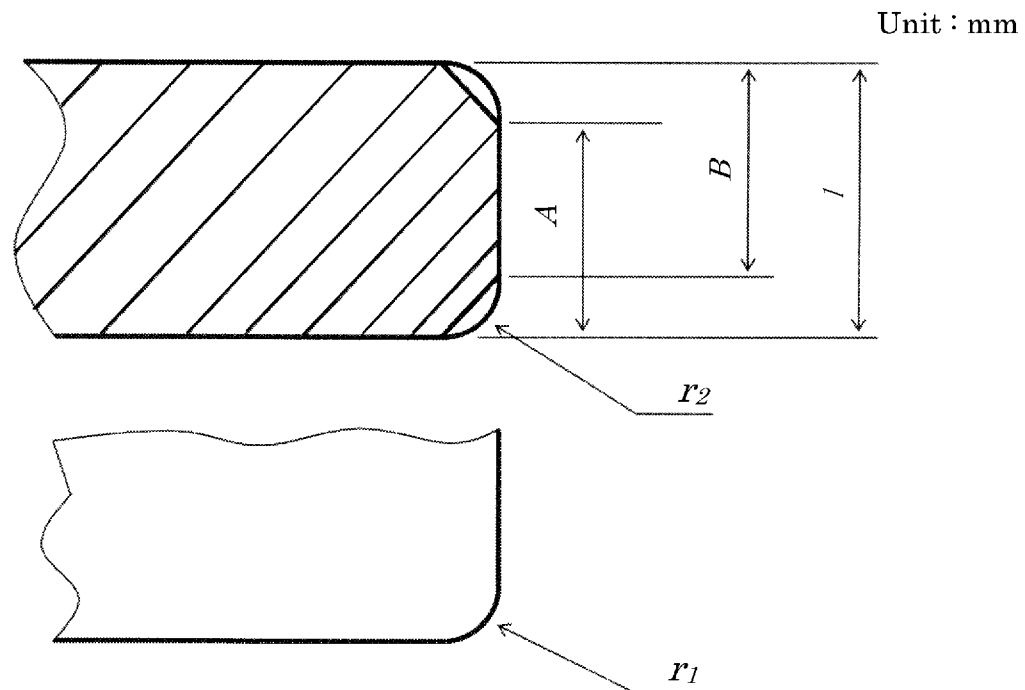
The specified thickness of a cassette is intended to ensure that the cassette can be properly fixed in a defined position under a load (e.g. within a holder or rails of the equipment for which it is used). In no case shall the maximum thickness tolerance, as given in tables 1, 2, 3 and 4, be exceeded in any part of the cassette.

The corners and edges of the cassette, as shown in the top view of figure 1, shall be smoothed or shaped over a quarter circle to a radius (r_1) of 10 mm maximum and 1 mm minimum.

The other edges, as shown in the side view of figure 1, shall be smoothed over a quarter circle to a radius (r_2) of at least 1.5 mm.

The greatest value for the radius (r_2) results from the minimum required planes as given by the dimensions A and B in the side view of figure 1.

All parts of the cassette, such as hinges, locks and marking devices (5.4.2), shall be within the tolerances given in tables 1, 2, 3 and 4 and shall be within the limits for corners and edges.



Dimension	Radiographic cassettes	Mammography cassettes
r_1	$1 \leq r_1 \leq 10$	$3 \leq r_1 \leq 10$
r_2	1.5 minimum	1.5 minimum
A	greater than 11	greater than 11
B	greater than 11	greater than 11
l	see tables 1 to 4	see tables 5 and 6

Figure 1 Cassette outside dimensions

5.1.4 Inner dimensions (ID) The inner dimensions, in the plane of the film, shall be as given in tables 1, 2, 3 and 4.

5.2 Geometric accuracy

5.2.1 Outer geometric accuracy

5.2.1.1 Squareness The squareness of the cassette shall conform to the requirements given in normative annex B.

5.2.1.2 Flatness When a closed radiographic cassette is laid on a flat surface, no part of the cassette shall depart from that surface by more than 16mm. In the case that the nominal size of the radiographic cassette is over 43.2 cm, no part of cassette shall depart from that surface by more than 17.5 mm.

5.2.1.3 Parallelism The front and back of the radiographic cassette shall be parallel to each other within 0.3 mm over any length of 100 mm.

5.2.2 Inner geometric accuracy

5.2.2.1 Squareness The squareness of the cassette shall conform to the requirements given in normative annex B.

5.3 Incident beam attenuation The front cover of the cassette shall have an absorption not greater than the equivalent of 1.8 mm of pure aluminum (99 %) when traversed by radiation of quality RQA 4 [approximately 60 kV (see IEC 61267)].

5.4 Cassette design

5.4.1 Opening When the cassette is lying on a plane surface, it shall be possible to open the back in such a way that it contacts the surface without the hinges being stressed.

5.4.2 Marking device In order to identify the film in use, the cassette shall either permit the use of a means for marking the film, or it shall be equipped on its outside with a means for labelling.

The provision of a means to allow a semi-transparent marking of the cassette's own characteristics (e.g. intensifying screens, types of films, etc.) is optional.

5.4.3 Light-tightness Under normal conditions of use, the cassette shall be light-tight. Informative annex C describes a typical and...practical test for light-tightness.

5.4.4 Screen-film contact The cassette shall ensure close screen-film contact over the entire area between the intensifying screens and the radiographic film. Informative annex D describes a test method for screen-film contact of radiographic cassettes.

5.4.5 Front cover recognition Unless cassettes are specifically designed so that either side can be used as the front cover, they shall be designed so that the front cover is distinguishable from the back by touch when handling the cassette with X-ray protective gloves.

The distinction between the front and back covers shall be clearly visible under normal safelight conditions.

5.4.6 Handling Radiographic cassettes of the same nominal size shall be able to be placed in, removed from, and stacked in a container, and also handled by devices without affecting each other and without opening.