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(JFPMA/JSA)

Fiberboards

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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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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by 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 Fiberboard and Particleboard Manufacturers Association (JFPMA)/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 A 5905**:2003 is replaced with this Standard.

However, **JIS A 5905**: 2003 may be applied in the **JIS** mark certification based on the relevant provisions of Article 19 Clause 1, etc. of the Industrial Standardization Law until September 21, 2015.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

Fiberboards

Introduction

This Japanese Industrial Standard has been prepared based on the first edition of **ISO 16895-1** published in 2008, the first edition of **ISO 16895-2** published in 2010, the first edition of **ISO 27769-1** published in 2009 and the first edition of **ISO 27769-2** published in 2009 with some modifications of the technical contents made to reflect domestic situations.

The portions given dotted underlines are the matters in which the contents of the corresponding International Standards have been modified. A list of modifications with the explanations is given in Annex JA. A comparison table between previous and current editions of this Standard on technically significant revisions is given in Annex JB.

1 Scope

This Standard specifies the fiberboards which are formed mainly from plant fibers of woods or the like.

NOTE : The International Standards corresponding to this Standard and the symbol of degree of correspondence are as follows.

ISO 16895-1 : 2008 *Wood-based panels — Dry-process fibreboard — Part 1 : Classifications*

ISO 16895-2 : 2010 *Wood-based panels — Dry-process fibreboard — Part 2 : Requirements*

ISO 27769-1 : 2009 *Wood-based panels — Wet-process fibreboard — Part 1 : Classifications*

ISO 27769-2 : 2009 *Wood-based panels — Wet-process fibreboard — Part 2 : Requirements* (Overall evaluation : MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and **JIS** are IDT (identical), MOD (modified), and NEQ (not equivalent) according to **ISO/IEC Guide 21-1**.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS A 1321 *Testing method for incombustibility of internal finish material and procedure of buildings*

JIS A 1408 *Test methods of bending and impact for building boards*

JIS A 1412-1 *Test method for thermal resistance and related properties of thermal*

insulations — Part 1 : Guarded hot plate apparatus

JIS A 1412-2 *Test method for thermal resistance and related properties of thermal insulations — Part 2 : Heat flow meter apparatus*

JIS A 1415 *Methods of exposure to laboratory light sources for polymeric material of buildings*

JIS A 1460 *Building boards Determination of formaldehyde emission — Desicator method*

JIS A 5508 *Nails*

JIS B 1112 *Cross-recessed head wood screws*

JIS B 7512 *Steel tape measures*

JIS B 7526 *Squares*

JIS K 3302 *Laundry bar soaps*

JIS K 7102 *Testing method for colour fastness of plastics upon exposure to light of the carbon arc*

JIS K 8355 *Acetic acid (Reagent)*

JIS K 8594 *Petroleum benzine (Reagent)*

JIS K 8624 *Sodium carbonate decahydrate (Reagent)*

JIS K 8625 *Sodium carbonate (Reagent)*

JIS K 8886 *Acetic anhydride (Reagent)*

JIS L 0804 *Grey scale for assessing change in colour*

JIS L 0805 *Grey scale for assessing staining*

JIS S 6026 *Crayons and oil pastels*

JIS Z 8401 *Guide to the rounding of numbers*

JIS Z 8730 *Colour specification — Colour differences of object colours*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1 sheet making

forming pulp or fibers into a mat-shaped sheet or a mat

3.2 wet process

method of producing fiberboards with a forming line moisture content, as a mass fraction, of 20 % or greater

The primary bonding of wet-process fiberboards results from the felting of the fibers, their inherent adhesive properties or resins.

3.3 dry process

method of producing fiberboards with a forming line moisture content, as a mass fraction, of less than or equal to 20 %

The primary bonding of dry-process fiberboards results from applied adhesives or resins.

[redacted]sis

state where decorative coatings such as an overlay and painting are not applied to the face and back

[redacted]uctural

products to be used mainly as load-bearing members of buildings

3.6 curing

pre-test treatment performed on a test piece until it reaches the moisture content of air-dried state or a constant mass

4 Types and symbols

Fiberboards are classified into insulation fiberboards (hereafter referred to as "insulation boards"), medium density fiberboards (hereafter referred to as "MDF"), and hard fiberboards (hereafter referred to as "hard boards"), accoridng to the density, use and manufacturing process, as shown in Table 1.

Table 1 Types and symbols

Type	Division	Symbol	Density	Main use	Manufacturing process	
					Wet process	Dry process
Insulation board	Straw mat (TATAMI) board	T-IB	Under 0.27 g/cm³	For straw mat (TATAMI) base	○	
	Class A insulation board	A-IB	Under 0.35 g/cm³	For substrate for interior finish For heat insulation	○	
	Sheathing board	S-IB	Under 0.40 g/cm³	For sheathing of outside walls	○	
MDF	Ordinary MDF	G-MDF	0.35 g/cm³ or over	Furniture, fixtures, etc.	—	○
	Structural MDF	S-MDF	0.70 g/cm³ or over to and excl. 0.85 g/cm³	For structures	—	○
Hard board		HB	0.80 g/cm³ or over	For architecture, packaging, etc.	○	

a) **Insulation board** Insulation boards are classified according to incombustibility as shown in Table 2.

the adhered surface, and measure the maximum load (P') at separation. Calculate the in-plane tensile strength by the following formula :

Where, due to the quality of the test piece, the deflection of the test piece is expected to be such that it may affect the measurement, a cover plate or the like may be used for reinforcement of the test piece.

$$PT = \frac{P'}{400}$$

where, PT : in-plane tensile strength (N/mm^2)
P' : maximum load at separation (N)
400 : area of adhesive attachment (mm^2)

Unit: mm

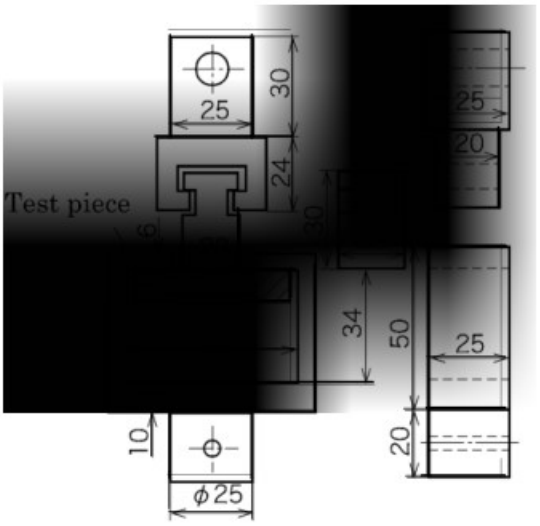


Figure 12 In-plane tensile strength test apparatus (example)

7.21 Impact resistance test

For the impact resistance test of the decorative hard board for interior finish and decorative MDF, place the test piece with its top surface facing upward by the overall support on sand which is the supporting method S1 specified in Table 3 in **5.2** of **JIS A 1408**. Drop a spherical weight made of steel as specified in Table 25 from the specified height onto the center of the test piece surface. Visually observe the surface for cracks and fractures, and measure the diameter of the recess. For the impact resistance test of the decorative hard board for exterior finish, fix the test piece on the rigid supporting frame with four sides as shown in Figure 13 with its decorative surface facing upward, and drop an egg-plant shaped weight (symbol W1-1000) as shown in Figure 14 from the height of 60 cm onto the center of the test piece, and then observe the decorative surface.

R shown in Figure 14 is 1/2 the diameter given in Table 25, and other dimensions are approximation to the mass given in Table 25.

Table 25 Weight used for impact resistance test

Classification	Thickness of test piece mm	Weight to be used				Drop height of the weight cm
		Symbol	Mass g	Nominal size	Diameter mm	
Decorative hard board for interior finish	Under 5	W2-300	Approx. 286	$1\frac{5}{8}$	Approx. 41	50
	5 or over	W2-500	Approx. 530	2	Approx. 51	50
Decorative hard board for exterior finish		W1-1000	Approx. 1 000	—	52	60
Decorative MDF	Under 15	W2-300	Approx. 286	$1\frac{5}{8}$	Approx. 41	50
	15 or over	W2-500	Approx. 530	2	Approx. 51	100

Figure 13 Supporting frame for impact resistance test of decorative hard board for exterior finish

Figure 14 Shape of weight

7.22 Acid resistance test

Place the test piece horizontally, drop several drops of 5 % acetic acid solution [11] onto the surface of the test piece and cover the drops with a watch glass. After 2 h, remove the watch glass, and immediately wash the test piece with water and allow it to stand in a room, and after 24 h, visually observe the condition of the test piece surface.

Note [11] Solution prepared by using acetic acid specified in **JIS K 8355** or acetic anhydride specified in **JIS K 8886**.

7.23 Alkali resistance test

Place the test piece horizontally, drop several drops of 1 % sodium carbonate solution [12] onto the surface of the test piece and cover the drops with a watch glass. After 2 h, re-

move the watch glass, immediately wash the test piece with water and allow it to stand in a room. After 24 h, visually observe the condition of the test piece surface.

Note [12] Solution prepared by using sodium carbonate (10 hydrate) specified in **JIS K 8624** or sodium carbonate specified in **JIS K 8625**.

7.24 Stain resistance test

Fix the test piece horizontally, place a plate having a punched hole part of 2 cm × 4 cm over the test piece surface, and rub a red crayon specified in **JIS S 6026** over the decorative surface of the test piece until the red color covers it entirely and the decorative surface is no longer visible, and allow to stand for 2 h. Wipe off the crayon color with a cloth or a nylon brush soaked with petroleum benzine specified in **JIS K 8594** taking care not to damage the decorative layer, and observe the surface by comparing it against gray scales specified in **JIS L 0805**.

7.25 Change-in-color resistance test

Irradiate the test piece using a testing machine specified in **3.1 (1)** of **JIS K 7102** for 48 h in accordance with Method B-1 specified in clause **2 (2.1)** of **JIS K 7102**, and then observe the test piece for cracks, swelling or the like on the surface. Leave to stand in a dark place of a relatively dry room.

The reference test piece which is not subjected to irradiation shall have been left to stand in the same place prior to test.

Remove the test piece from the dark place after irradiation of 2 h or longer, and measure the change in color by the gray scales specified in **JIS L 0804**, or by using the colorimeter specified in **JIS K 7102** according to $L^*a^*b^*$ color space specified in **JIS Z 8730.** For the test pieces with grain or other patterns, however, the change in color shall be obtained as the mean of values of three test pieces.

When an enclosed carbon-arc type light- and water-exposure apparatus or an open flame sunshine carbon-arc type light- and water-exposure apparatus is used, verify the comparative data after irradiation for 48 h by an enclosed carbon-arc type light-exposure apparatus.

7.26 Scratch resistance test

In a Martens scratch tester with 3 mm sphere diameter, load of the tester being 4.9 N, slide the test piece with its surface facing upward over the distance of about 30 mm in both lontgitudinal and transverse directions. Carry out this test at three points respectively in longitudinal and transverse directions, and visually observe the test piece from a distance of about 60 cm.

7.27 Film adhesion test

Adhere an attachment having an adhesive surface of 20 mm square as shown in Figure 15 to the center of the decorative surface of the test piece by using an adhesive. After the adhesive has solidified, make scribe marks that reach the base material on the decorative surface of the test piece around the attachment periphery. Fix the chuck as indicated in Figure 15, pull in the direction orthogonal to the adhesive surface at the

loading speed of about 2 mm/min, and observe the fractured surface. Express the result by the lowest of all the five measurements.

NOTE 1 Recommended adhesive is two-part and non-solvent epoxy resin adhesive with high viscosity (as for epoxy resin, epoxy equivalent 170 to 250, and as for hardener, a modified polyamide resin with amine value 200 to 300), or cyano-acrylate adhesive.

NOTE 2 The attachment shall be made of steel or may be made of other materials, taking into consideration of the disposability.

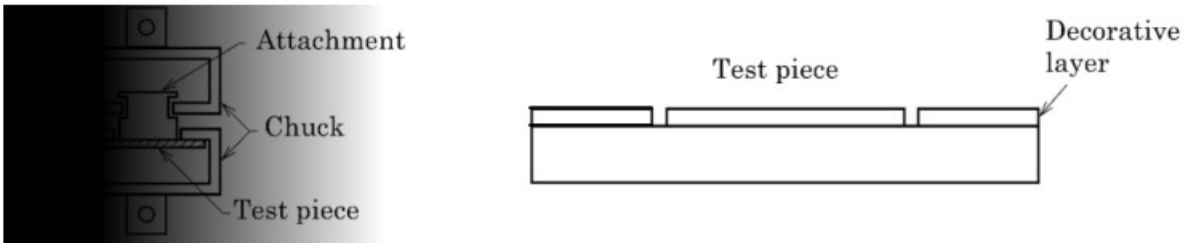
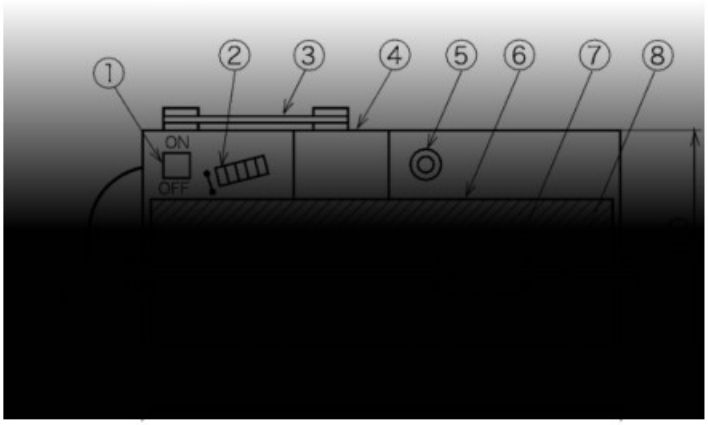


Figure 15 Test piece and attachment for film adhesion test

Washability test

Put the test piece, with its decorative surface facing upward, horizontally on the test [illegible] the washability test machine [13] as indicated in Figure 16. Put the pretreated [14] [illegible] on the decorative surface of the test piece, and rub the brush against the decorative surface with the pressure of 4.41 N. In this operation, moisten the rubbed surface constantly with soapy water [16], and after 500 reciprocations of the brush, remove the test piece from the tester, wash it with water and observe the 100-mm length central portion of the rubbed surface under the diffused daylight. Express the test result with the lower value of the two measurements.

Unit: mm



① Electric-driven switch
② Display board for number of reciprocations
③ Belt
④ Motor
⑤ Rotary shaft
⑥ Test piece receiving dish
⑦ Brush holding base
⑧ Wire rope

Figure 16 Washability test machine

Notes [13] The washability test machine is structured to reciprocate the brush over the test piece, as indicated in Figure 16. The brush shall be reciprocated over the distance of about 300 mm at the rate of about 37 reciprocations per minute at approximately equal speed between the space of about 100 mm in the center. A washability test machine suitable for this test is a Gardner straight-line washability machine.

[14] The bristles of the brush shall have been immersed to a depth of 12 mm in water at a temperature of about 20 °C for about 30 min. Immediately before the test, the brush shall be whipped vigorously to shake off the moisture, and then immersed in soapy water until the bristles are sufficiently wet.

[15] The brush shall be provided with 60 holes of 3 mm diameter on the base of size 90 mm × 38 mm, each of the holes being uniformly planted with black pig bristles trimmed flat and normally to the length direction to a length of about 19 mm. The base shall be made of fine-grained and hard wood with a thickness of about 25 mm or made of aluminium with a thickness of about 13 mm.

[16] The 0.5 % solution without additive (Type 1) as specified in **JIS K 3302**.

7.29 Weatherability test

Insert the test piece in a test piece holder in accordance with the method specified in **JIS A 1415**, mount it on the test apparatus for accelerated artificial exposure, and start the irradiation. When the total irradiation time has reached 500 h for WV type or 250 h for WS type, take out the test piece and after leaving it to stand for 1 h, observe the surface condition comparing it with the non-exposed board [17]. Express the test result with the lowest value of the three test results.

Note [17] The non-exposed decorative board shall be stored in a room not directly exposed to sunlight.

7.30 Incombustibility test

The incombustibility test shall be in accordance with **JIS A 1321**.

8 Inspection

8.1 Types of inspection and inspection items

The products shall be inspected by the type inspection [18] and the delivery inspection [19]. Only the items relevant to the type of the product shall be inspected.

Sampling for the delivery inspection shall be according to a reasonable sampling plan agreed between the interested parties.

Notes [18] An inspection to judge whether the quality of a product satisfies all the characteristics stated in the design (when the product has been newly designed, modified, or production conditions have been changed).

[19] An inspection performed on delivery of a product which is identical in design and manufacture to those already accepted in the type inspection to judge whether it satisfies the required characteristics.

a) Type inspection items

1) Appearance inspection

2) Dimensional inspection

3) Density inspection

4) Moisture content inspection

5) Bending strength inspection

6) Inspection of bending strength under wet condition

7) Water absorption inspection

8) Inspection of swelling in thickness after immersion in water

9) Inspection of change in length after immersion in water

10) Internal bond inspection

11) Wood screw holding power inspection

12) Nail pulling-out resistance inspection

13) Nail-head pull-through force inspection

14) Lateral nail resistance inspection

15) Formaldehyde emission inspection

16) Thermal insulation inspection

17) In-plane tensile strength inspection

18) Impact resistance inspection

19) Acid resistance inspection

20) Alkali resistance inspection

21) Stain resistance inspection

22) Change-in-color resistance inspection

23) Scratch resistance inspection

24) Film adhesion inspection

25) Washability inspection

26) Weatherability inspection

27) Incombustibility inspection

b) Delivery inspection items

1) Appearance inspection

2) Dimensional inspection

3) Density inspection

4) Moisture content inspection

5) Bending strength inspection

6) Inspection of bending strength under wet condition

7) Water absorption inspection

8) Inspection of swelling in thickness after immersion in water

9) Inspection of change in length after immersion in water

10) Internal bond inspection

11) Wood screw holding power inspection

12) Nail pulling-out resistance inspection

13) In-plane tensile strength inspection

14) Impact resistance inspection

8.2 Judgment criteria

In the inspections, those products having been found to be in conformance with each of the requirements in clauses **5** and **6** as a result of the tests specified in clause **7** shall be accepted.

In tests using more than one test piece, all the individual test results shall meet the requirement, except where the mean value is specified.

9 Designation of product

Designation of product shall be in accordance with the following examples. However, the classification according to the front/back surface conditions, classification according to smoothness, and "ordinary" before ordinary MDF may be omitted.

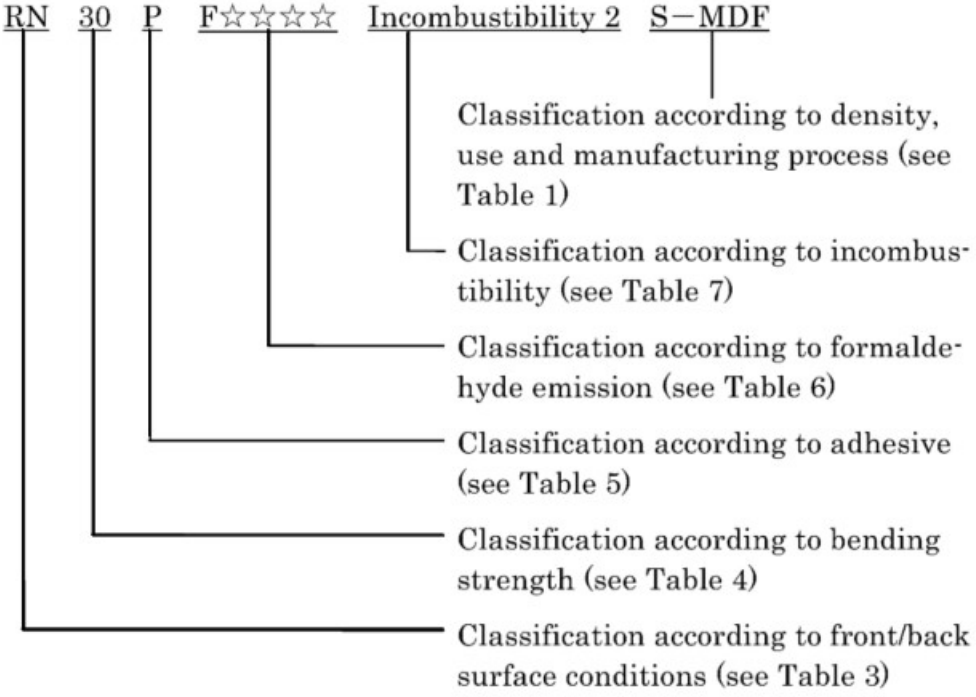
a) Insulation board

Example 1 A-IB Incombustibility 3

- Incombustibility 3: Classification according to incombustibility (see Table 2)
- A-IB: Classification according to density, use and manufacturing process (see Table 1)

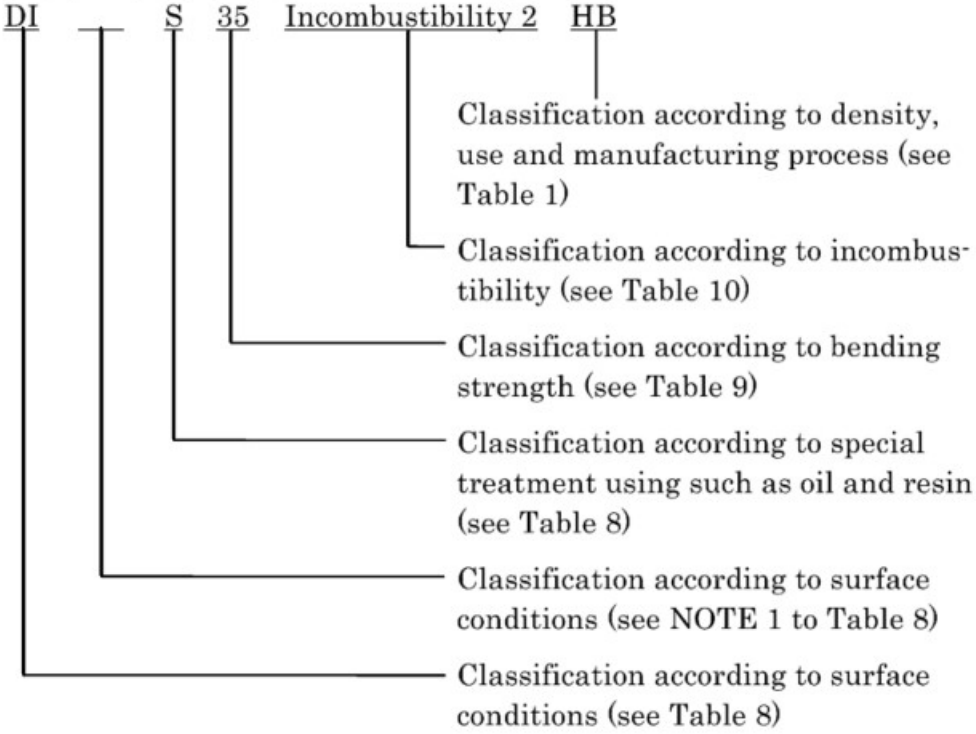
b) MDF

Example 2	RS	30	M	F☆☆☆	Incombustibility 2	G−MDF
Example 3	RS	25	U	F☆☆☆☆		MDF
Example 4	DO	30	U	F☆☆☆☆		G−MDF
Example 5	RN	30	P	F☆☆☆☆	Incombustibility 2	S−MDF



c) Hard board

Example 6	RS	S1S	S	35	Incombustibility 3	HB
Example 7	DI	—	S	35	Incombustibility 2	HB



10 Marking

The following information shall be marked on the products or on packages of the products which satisfy all the requirements laid out by this Standard. The marking may be given on each lot.

For the MDF products for sheathing (floor, inside wall, outside wall, roof) that are to be marked with formaldehyde emission grade, the classification according to formaldehyde emission (or its symbol), and items in **c)** and **d)** shall be marked on each product.

a) Number of this Standard, and type or symbol

b) Dimensions (thickness × width × length)

c) Month and year of manufacture or their abbreviation

d) Manufacturer's name or its abbreviation

e) Cautions (see example below)

Example Sufficient care shall be exercised in storage so as not to allow the product to absorb formaldehyde emission from other products.

Bibliography : JIS A 1129-1 *Methods of measurement for length change of mortar and concrete — Part 1 : Method with comparator*

Annex JA (informative)
Comparison table between JIS and corresponding International Standards

JIS A 5905 : 2014 *Fiberboards*					**ISO 16895-1** : 2008 *Wood-based panels — Dry-process fibreboard — Part 1 : Classifications* **ISO 16895-2** : 2010 *Wood-based panels — Dry-process fibreboard — Part 2 : Requirements* **ISO 27769-1** : 2009 *Wood-based panels — Wet-process fibreboard — Part 1 : Classifications* **ISO 27769-2** : 2009 *Wood-based panels — Wet-process fibreboard — Part 2 : Requirements*		
(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
1 Scope	This Standard specifies the fiberboards which are formed mainly from plant fibers of woods or the like.	**ISO 16895-1** **ISO 27769-1**	1 1	Classification of dry process fiberboards into four types Classification of wet process fiberboards into two types	Alteration	**JIS** combines the contents of the two International Standards into one standard. **JIS** gives classification according to manufacturing process in another clause.	No revision proposal will be made to **ISO**.
2 Normative references							
3 Terms and definitions		**ISO 16895-1** **ISO 27769-1**	3 3		Alteration	**JIS** adds terms that are necessary for the specification of **JIS**.	No substantive deviation.

(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
4 Types and symbols	Classification according to density, use and manufacturing process	**ISO 16895-1** **ISO 27769-1**	4, 5 3.2, 4	Expression of required qualities with symbols and abbreviated terms. Classification into three types according to density Classification of products according to the conditions of use	Alteration	**JIS** gives all the classifications of fiberboards including principal classifications that are currently available by classification tables. The products in agreement with the density range are not necessarily supplied. The use conditions are not necessarily the same among countries and regions.	Alteration is made based on the difference in users' needs resulting from difference in climate and architectural culture. Revision request has been submitted to **ISO**.
5 Shape, dimensions and tolerances	Specifications of thickness, width, and length, and dimensional tolerances for each product.	**ISO 16895-2** **ISO 27769-2**	4.5 4.4	Specification by thickness range No specific dimensions requirements for width and length	Alteration	**JIS** adds specific dimensions actually used in business dealings.	Alteration is made based on the difference in users' needs resulting from difference in climate and architectural culture. Marking method will be continuously reviewed.
6 Quality 6.1 Appearance	Surface defects and appearance of the decorative boards are specified in Table 14.		—	No specification	Addition	No corresponding clause in **ISO** Standard.	Addition of appearance requirement which is essential in **JIS** product standards.

(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
6.2 Performance	Classification and quality requirements given in Tables 15 to 23.	**ISO 16895-2** **ISO 27769-2**	4.5 to 8.3 4.4, 5 to 6	Fiberboard requirements given according to the humidity conditions in the use environment and the density range of the fiberboard.	Alteration	**JIS** shows all the classifications of fiberboards that are currently available in classification tables. The products in agreement with the density range are not necessarily supplied.	Alteration is made based on the difference in users' needs resulting from difference in climate and architectural culture. Revision proposal to **ISO** has been submitted.
7 Test methods 7.2.2 Curing of test pieces	Requirements for dimensions and number of test pieces to be used, given in Table 24	**ISO 16895-2** **ISO 27769-2**			Alteration	**JIS** gives test piece requirements (dimensions and number) for all the tests in one table.	No substantive deviation.
7.3.1 Thickness	Position and number of measurements	**ISO 16895-2** **ISO 27769-2**	4.5 4.4	Position and number of measurements	Alteration	The **ISO** Standard specifies three measurement points in a side in the longitudinal direction, whereas **JIS** leaves the measurement points to be random (though it specifies the distance from the edges).	**JIS** specifications are more practical. Revision proposal to **ISO** will be discussed.
7.3.2 Width and length	Position and number of measurements	**ISO 16895-2** **ISO 27769-2**	4.5 4.4	Identical with **JIS**.	Identical		—

(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
7.3.3 Squareness	Measurement Method B	**ISO 16895-2** **ISO 27769-2**	4.5 4.4	Measurement Method A is equivalent to the method in **JIS**.	Alteration	**JIS** adds a measurement method.	—
7.4 Density test	Measurement method	**ISO 16895-2** **ISO 27769-2**	4.5 4.4	Test piece size of 50 mm square. Use of a balance with a precision of 0.01 g	Alteration	Test piece size of 150 mm or over is permitted.	Specification in line with the domestic situation. This matter will be reviewed at the next revision.
7.5 Moisture content test	Measurement method	**ISO 16895-2** **ISO 27769-2**	4.5 4.4	Identical with **JIS**.	Identical		—
7.6 Breaking load test				No specification.	Addition	**JIS** specifies that the mean value of test results in longitudinal and transverse directions is to be reported, similarly to the bending strength test.	

(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
7.7 Bending strength test	Measurement method	**ISO 16895-2** **ISO 27769-2**	5 to 8 5.2	Dimensions of supports and loading head, distance between the centers of supports (at least 20 times the thickness of test piece), loading speed where maximum load is reached within 60 s ± 30 s	Alteration	Deviation in the test piece size, test span, supports, and loading speed. Test apparatus specification is technically equivalent to that in **ISO**. Test result to be reported is the mean of longitudinal and transverse test results in **ISO**, while it is the smaller value of the two in **JIS**.	Specification in line with the domestic situation. The test conditions will be reviewed at the next revision.
7.8 Bending Young's modulus test	Measurement method	**ISO 16895-2** **ISO 27769-2**	5 to 8 5, 6	Dimensions of supports and loading head, distance between the centers of supports (at least 20 times the thickness of test piece), loading speed where maximum load is reached within 60 s ± 30 s	Alteration	Deviation in the test piece size, test span, supports, and loading speed. Test apparatus specification is technically equivalent to that in **ISO**. Test result to be reported is the mean of longitudinal and transverse test results in **ISO**, while it is the smaller value of the two in **JIS**.	Specification in line with the domestic situation. Proposal regarding the test conditions will be submitted at the next revision.

(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
7.9 Test of bending strength under wet condition a) Test A b) Test B	Moistening conditions and measurement method	**ISO 16895-2**	7.5 to 7.11	Moistening conditions equivalent to **JIS**. Test apparatus and instrument specifications are given in more detail than **JIS**. The bending strength test in accordance with **ISO 16978**.	Alteration	Deviation in the test piece size, test span, supports, and loading speed. **JIS** test apparatus specification is technically equivalent to that in **ISO**.	Specification in line with the domestic situation. The test conditions will be reviewed at the next revision.
7.10 Water absorption test				No specification	Addition	No corresponding clause in **ISO** Standard.	Addition of specification item/content which is essential in **JIS** product standards.
7.11 Test of swelling in thickness after immersion in water	Measurement method	**ISO 16895-2** **ISO 27769-2**	5 to 7 5	Identical with **JIS**.	Identical		—
7.12 Test of change in length after immersion in water				No specification	Addition	No corresponding clause in **ISO** Standard.	Addition of specification item/content which is essential in **JIS** product standards.

(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
7.13 Internal bond test	Measurement method	**ISO 16895-2**	7	The loading speed where the maximum load is reached within 60 s ± 30 s	Alteration	**JIS** specifies the pulling-out load speed of about 2 mm/min.	Specification in line with the domestic situation. The test conditions will be reviewed at the next revision.
7.14 Wood screw holding power test	Measurement method	**ISO 16895-1**	6.2	The loading speed where the maximum load is reached within 60 s ± 30 s	Alteration	**JIS** specifies the pulling-out load speed of about 2 mm/min.	Specification in line with the domestic situation. The test conditions will be reviewed at the next revision.
7.15 Nail pulling-out resistance test				No specification	Addition	No corresponding clause in **ISO** Standard.	Addition of specification item/content which is essential in **JIS** product standards.
7.16 Nail-head pull-through force test							
7.17 Lateral nail resistance test							
7.18 Formaldehyde emission test	Measurement method	**ISO 16895-2**	4.6	Identical with **JIS**.	Identical		—

(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
7.19 Thermal insulation test				No specification	Addition	No corresponding clause in **ISO** Standard.	Addition of specification item/content which is essential in **JIS** product standards.
7.20 In-plane tensile strength test		**ISO 16895-2**	7.3, 7.6, 7.9, 8.2 to 8.4	Identical with **JIS**.	Identical		
7.21 Impact resistance test				No specification	Addition	No corresponding clause in **ISO** Standard.	Addition of specification item/content which is essential in **JIS** product standards.
7.22 Acid resistance test							
7.23 Alkali resistance test							
7.24 Stain resistance test							
7.25 Change-in-color resistance test							

(I) Requirements in **JIS**		(II) International Standard number	(III) Requirements in International Standard		(IV) Classification and details of technical deviation between **JIS** and the International Standard by clause		(V) Justification for the technical deviation and future measures
No. and title of clause	Content		No. of clause	Content	Classification by clause	Detail of technical deviation	
7.26 Scratch resistance test							
7.27 Film adhesion test							
7.28 Washability test							
7.29 Weatherability test							
7.30 Incombustibility test							
8 Inspection				No specification	Addition	No corresponding clause in **ISO** Standard.	Addition of specification item/content which is essential in **JIS** product standards.
9 Designation of product				No specification	Addition	No corresponding clause in **ISO** Standard.	Addition of specification item/content which is essential in **JIS** product standards.
10 Marking		**ISO 16895-2**	9		Alteration	**ISO** specification is almost identical with **JIS** specification.	No substantive deviation.

Overall degree of correspondence between **JIS** and International Standards (**ISO 16895-1** : 2008, **ISO 16895-2** : 2010, **ISO 27769-1** : 2009, **ISO 27769-2** : 2009): MOD
NOTE 1 Symbols in sub-columns of classification by clause in the above table indicate as follows: — Identical : Identical in technical contents. — Addition : Adds the specification item(s) or content(s) which are not included in International Standard. — Alteration : Alters the specification content(s) which are included in International Standard.
NOTE 2 Symbol in column of overall degree of correspondence between **JIS** and International Standards in the above table indicates as follows: — MOD : Modifies International Standards.

Annex JB (informative)

Comparison table between previous and current editions of this Standard on technically significant revisions

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
4 Types and symbols	・Classifies the entire fiberboards according to density, use and manufacturing process (see Table 1) ・Classifies ordinary MDFs and structural MDFs according to density, principal use and manufacturing process.	3.1 Classification by density	Classifies fiberboards according to density and manufacturing process (see Table 1).	・The current edition makes clear the correlation between products by indicating all the fiberboards using the list of density, use and manufacturing process. ・The current edition classifies MDFs into ordinary MDFs and structural MDFs.
Table 2 Classification according to incombustibility [4 b) 5)] [4 c) 3)]	Deletes the "ordinary" from the incombustibility classification.	3.2 b) Classification by incombustibility [3.3 e)] [3.4 c)]	Classifies into "incombustibility 3" and "ordinary".	① No demand for "ordinary" in the classification according to incombustibility. ② To avoid confusion with "ordinary MDF".
4 b) MDF	Specifies ordinary MDF and structural MDF and provides classification of structural MDFs, similarly to that of ordinary MDFs, according to conditions of face and back surfaces, bending strength, adhesive used, formaldehyde emission and incombustibility.	3.3 MDF	Gives only MDF (equivalent to ordinary MDF) classification.	The current edition divides MDFs into ordinary MDF and structural MDF, though the classification within MDFs is not changed from the previous edition.
5 Shape, dimensions and tolerances		4 Shape, dimensions and tolerance		

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
Table 11 Thickness	Adds thickness specification values 2.7, 4, 5.5, 14, 19.6, 25, 27 mm. Specifies only 9 mm for structural MDF.	Table 12 Thickness	Specifies thickness values 2.5, 3, 7, 9, 12, 15, 18, 21, 24, 30 mm for MDF.	For ordinary MDF, the current edition has added the thicknesses that are considered to be widely used based on actual sales results as of 2012 to the thicknesses conventionally given. For structural MDF, the current edition specifies only a thickness of 9 mm in consideration of actual sales results.
Table 12 Width and length	Gives the width and length specifications in a table. Adds specification of width and length for structural MDF.	Figure 1 Width and length	Illustrates the width and length specifications using figures.	In order to respond to various size requests of the users', the current edition gives specifications in a table which facilitates arbitrary combination of width and length. For structural MDF, the width and length specifications that allow for the future notification are given with reference to those of ordinary MDF.
Table 13 Dimensional tolerances and squareness	Specifies the thickness tolerance for structural MDF to be ±0.5 mm, regardless of the surface conditions of front/back surfaces.	—	—	Since MDF is excellent in surface smoothness and thickness accuracy compared with other wood fiberboards, the current edition permits use of either unpolished or polished board for the structural MDF, as it is permitted for ordinary MDF. The current edition also specifies the thickness tolerance to be ±0.5 mm regardless of an unpolished board or a polished board in consideration of the influence on structural resistance.

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
Table 13 (concluded)	Specifies two methods for squareness measurement: method A (using square) and method B (measurement of the difference between two diagonals). Gives the same specification values as the previous edition for measurement method A. Changes specification values for measurement method B.	Table 13 Dimensional tolerances and squareness	Only specifies squareness that is measured by using a square.	Because of the wide demand field of fiberboards, compared with that of other wood boards, there are many product thicknesses for fiberboards, and many width and length specifications that are peculiar. Based on the fact that the determination of these dimensions are in many cases agreed as a result of consultations with the users, the current edition permits tolerances and squareness, as well as dimensions, that are agreed between the interested parties. The current edition specifies two methods for squareness measurement, and provides specification value for each. In addition to the conventional method using a flat section square, the current edition has adopted the method determining the squareness based on the difference between diagonals by referring to **JIS A 5422** and **JIS A 5404**. Further, for consistency with the square of 2 mm or under given in the previous specification, the current edition specifies the theoretical calculated value of 3 mm or under.
6 Quality 6.2 Performance	Requires conformance of items specified in Table 15 to requirements in Table 16 to Table 23, as a result of the tests performed in accordance with the methods specified in clause **7**.	5.2 Quality	Requires conformance of items specified in Table 15 to requirements in Table 16 to Table 22, as a result of the tests performed in accordance with the methods specified in clause **5**.	The correlation between products, quality requirements and specification values is not changed. The current edition has added new quality requirement items and informative values.

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
6.2 (continuded)	Specifies the quality requirements for structural MDF.	5.2 Quality	—	The current edition has added quality requirement items peculiar to the structural MDF, namely, nail-head pull-through force and lateral nail resistance, in addition to the items specified for the ordinary MDF.
	Gives specification values of quality requirement items that are treated as informative values (bending Young's modulus and formaldehyde emission).		—	For convenience, the current edition has added in the tables the specification values for test items that are treated as informative values, since for quality standard, they are in some cases reported in answer to the customer's request.
	Thermal insulation (thermal conductivity)		Thermal insulation (heat resistance)	The change has been made for consistency with **JIS A 9521** (Thermal insulation materials for buildings).
	Table 16 Quality of insulation board 1) Formaldehyde emission		Table 16 Quality of insulation board 1) No specification values	1) Though insulation boards are not targeted for notification, the current edition specifies the markings of F☆☆☆☆ and F☆☆☆ for the case where they are to be marked with formaldehyde emission grade.
	2) Thermal conductivity to be marked in [W/(m·K)]		2) Thermal resistance to be marked in (m^2·K/W)	2) The change has been made for consistency with **JIS A 9521** (Thermal insulation materials for buildings).
	Table 19 Quality of structural MDF 1) Density 0.7 g/cm^3 or over to and excl. 0.85 g/cm^3		—	1) The current edition has set the density range based on the test results of load-bearing walls and base material performance verification test.
	2) Moisture content 5 % or over up to and incl. 13 %			2) Same specification as that of ordinary MDF

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
6.2 (continuded)	3) Bending strength under ordinary conditions Type 30 : 30.0 N/mm² or over Type 25 : 25.0 N/mm² or over	5.2 Quality		3) Based on the relation between the board density (bending strength) and the wall ratio established by the verification experiment conducted by the Forestry and Forest Products Research Institute, the current edition divides the bending strength requirements into the low density range (Type 25) and high density range (Type 30), so as to enable the application of wall ratio in the notification according to the performance of the board.
	4) Bending strength under wet conditions Type 30 : 15.0 N/mm² or over Type 25 : 12.5 N/mm² or over			4) The current edition gives the bending strength requirement as the quality requirement for structural face material, to evaluate adhesion endurance. The specifications for test A and test B are correlated with the classification according to the adhesive required.
	5) Swelling in thickness after immersion in water 12 % or under			5) The current edition gives the swelling requirement as the quality requirement for structural face material to evaluate adhesion endurance, which is the same requirement as ordinary MDF.
	6) Internal bond Type 30: 0.5 N/mm² or over Type 25: 0.4 N/mm² or over			6) Though verification of this item as one of the quality characteristics is not required for structural face material, the current edition gives the same requirement as ordinary MDF.
	7) Lateral nail resistance 1.0 kN or over			7) The current edition specifies this item as a characteristic quality requirement for structural MDF.
	8) Nail-head pull-through force 1.0 kN or over			8) Same as above

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
6.2 (concluded)	9) Formaldehyde emission F☆☆☆☆ F☆☆☆	5.2 Quality		9) Since insulation boards are wooden boards manufactured using adhesives, for conformance with the laws and regulations of the Building Standards Act, the current edition gives the same formaldehyde emission requirement as the products currently distributed in domestic market.
	10) Bending Young's modulus Type 30 : 2 500 N/mm^2 or over Type 25 : 2 000 N/mm^2 or over			10) Though verification of this item is not required as one of the quality characteristics for load-bearing walls, since it is considered necessary for a quality control, the current edition specifies the same values as ordinary MDF.
	Table 20 to Table 22 Quality of hard board 1) Formaldehyde emission		Table 19 to Table 21 Quality of hard board 1) No specification values	1) Though hard boards are not targeted for notification, the current edition specifies the markings of F☆☆☆☆ and F☆☆☆ for the case where they are to be marked with formaldehyde emission grade.
	Table 23 Incombustibility Adds incombustible structural MDF.		Table 22 Incombustibility —	
7.1.1 Rounding of figures	Specifies the method of rounding test result figures.	—	—	The current edition specifies the method of rounding the test result figures in accordance with Rule B of **JIS Z 8401**. The rounding is performed on the figures obtained to one place lower than the values of the respective quality requirements given in Table 17 to Table 23.

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
7.2.2 Curing of test pieces	Note 1) Test pieces in air-dried state are those which have been left at least for 7 days in a well-ventilated room, those with the moisture content regulated during manufacture or those with moisture content equivalent to that in the as-shipped condition. Note 2) Test pieces having reached a constant mass are those with the mass variation, when the mass is measured every 24 h, which has reached 0.1 % or under, or if the measurement of mass change is difficult due to the quality of the test specimen, those confirmed by a reasonable method to have reached a constant mass.	6.1.2 Conditioning of test specimens	Note (9) The air-dried condition means that the test piece has been left for at least 7 days in a room which is well ventilated. Note (10) The constant weight means the value where the mass is measured every 24 h and the rate of change reaches 0.1 % or under.	In order to speed up the quality inspection before shipment, the current edition has added in the definition of "air-dried state" the test pieces with the moisture content regulated during manufacture or those with moisture content equivalent to that in the as-shipped condition. The current edition has also added in the definition of "constant mass" those test pieces of which the measurement of mass change is difficult due to its quality, and which are confirmed to have reached a constant mass by adjusting the test piece size and specifying a reasonable method for verifying the constant mass by collected data.
	Table 24 Dimensions and number of test pieces Specifies dimensions and number of test pieces for bending Young's modulus test, nail-head pull-through force test, and lateral nail resistance test.		Table 23 Dimensions and number of test pieces —	The nail-head pull-through force test has been specified based on NAIL-HEAD PULL-THROUGH TEST given in ASTM (American Society for Testing and Materials) D1037-96, and the lateral nail resistance test, based on LATERAL NAIL RESISTANCE TEST given in ASTM D1037-96.
	Thermal insulation test, dimensions of test piece 200 mm × 200 mm or 300 mm × 300 mm		Thermal insulation test, dimensions of test piece 900 mm × 900 mm	The dimensions have been reviewed corresponding to the changes made in the test method.

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
7.2.2 (concluded)	Note [a] The span shall be 15 times the nominal thickness and 150 mm or over. For boards with a thickness 3 mm or under, it shall be 100 mm or over.		Note (11) The span shall be 15 times the indicated thickness and be 150 mm or over.	The minimum span of 150 mm, if applied to thin products (about 3 mm), will lead to significant deformation of the test piece and to prolonged test duration. The current edition has adopted the minimum span value of 100 mm specified in **ISO 16978** : 2003 exclusively for products with a thickness 3 mm or under, based on the decision that this alteration from the previous edition will not affect the performance values.
7.3.1 Thickness	Four points at four corners which are 15 mm or more from the respective edges.	6.2.1 Thickness	Four points of 20 mm or over inside the periphery	The current edition permits measurements at positions closer to the periphery of the sample than as specified by the previous edition, based on the users' requests and suitability of the thickness measuring instrument.
7.3.3 Squareness	Method A : method using a flat section square Method B : measurement of the difference between two diagonals	6.2.3 Measurement of squareness	Method using a flat section square	The current edition specifies two methods for squareness measurement and specification values for each. The current edition has adopted the method of measuring the length difference between two diagonals as a method equivalent to the method using a square, by referring to the control methods specified in **JIS A 5422** and **JIS A 5404**. Alteration has been made in the dimensions of a square to be used, which is Grade 1 flat section square specified in **JIS B 7526**, and in measurement position.

Current edition (**JIS A 5905** : 2014)		Previous edition (**JIS A 5905** : 2003)		Reason for revision
No. and title of clause	Content	No. and title of clause	Content	
7.9 Test of bending strength under wet condition	Description of test method In water at a temperature of 20 °C ± 2 °C.	6.7 Test of bending strength under wet condition	Description of test method In water at normal temperature	The previous edition specifies that, after immersion in warmed water, the test piece is to be immersed in water at normal temperature for 1 h. The current edition has revised the temperature to avoid dispersion in the test results possibly caused by the temperature of water used for cooling of the test piece after thermal load. The temperature condition for this cooling procedure should be constant. The specific temperature condition, "water at a temperature of 20 °C ± 2 °C", is adopted from **ISO 20585** for conformance with the **ISO** standard.
7.16 Nail-head pull-through force test	Describes a test method.	—	—	The current edition specifies this method as one of the quality verification items for structural MDF. This test is one of the type inspection items.
7.17 Lateral nail resistance test	Describes a test method.	—	—	The current edition specifies this method as one of the quality verification items for structural MDF. This test is one of the type inspection items.
7.19 Thermal insulation test	The thermal resistance of the board is determined in accordance with the guarded hot plate method (GHP method) specified in **JIS A 1412-1** or the heat flow meter method (HFM method) specified in **JIS A 1412-2** where the surface temperature is measured at the average temperature of 23 °C ± 1 °C in the direction of heat flow upward.	6.15 Thermal insulation test	The thermal resistance is obtained in accordance with **JIS A 1420** where the surface temperature is measured at the average temperature of 30 °C ± 3 °C in the direction of heat flow upward.	The test method and average temperature have been reviewed for consistency with **JIS A 9521** (Thermal insulation materials for buildings).

Errata for JIS (English edition) are printed in *Standardization and Quality Control*, published monthly by the Japanese Standards Association, and also provided to subscribers of JIS (English edition) in *Monthly Information*.

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