ICS 79.060.01
B 70

LY

Forestry Industry Standard of the People's Republic of China

LY/T 2874—2017

Wood-based slot board for exhibition

陈列用木质挂板

(English Translation)

Issue date: 2017-06-05 Implementation date:2017-09-01

Issued by State Forestry Administration of the People's Republic of China

Foreword

SAC/TC 198 is in charge of this English translation. In case of any doubt about the contents of the English translation, the Chinese original shall be considered authoritative.

This standard was drafted in accordance with the rules given in GB/T 1.1—2009.

Attention is drawn to the possibility that some of the elements of this standard may be the subject of patent rights. The issuing body of this document shall not be held responsible for identifying any or all such patent rights.

This standard was prepared by SAC/TC 198, National Technical Committee on Wood-based Panels of Standardization Administration of China.

Wood-based slot board for exhibition

1 Scope

This standard specifies the terms and definitions, classification, requirements, inspection methods and inspection rules, as well as markings, packaging, transportation, and storage of wood-based slot board for display.

This standard applies to the wood-based slot board for display defined in subclause 3.1.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

GB/T 2828.1—2012 *Sampling procedures for inspection by attributes—Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

GB/T 17657—2013 *Test methods of evaluating the properties of wood-based panels and surface decorated wood-based panels*

GB 18580 *Indoor decorating and refurbishing materials —Limit of formaldehyde emission of wood-based panels and finishing products*

GB/T 18585 *Indoor decorating and refurbishing materials—Limit of harmful substances of wallpapers*

GB/T 19367—2009 *Wood-based panels —Determination of dimensions of panels*

3 Terms and definitions

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

3.1
wood-based slot board for exhibition
wood-based slot board for display
slatwall panel for display

product made of wood-based panels with machined grooves fitted with aluminum alloy or plastic inserts for article display or decoration

3.2

slot dent

jagged grooving edges on the decorative surface caused by improper machining

3.3

slot port breakage

wane or breakage at the ends of a slot

3.4

distance between adjacent slots

spacing of two adjacent grooves

3.5

insert

alloy or plastic component with constant profiles fitted in the slot/groove of wood-based slot board for display

3.6

load bearing capacity

maximum weight a wood-based slot board can bear through the hanger fitted into the inserts

4 Classifications

4.1 According to the wood-based panel types

a) fiberboard slot board;

b) particleboard slot board;

c) plywood slot board;

d) oriented strand board (OSB) slot board.

4.2 According to load bearing capacity

a) light-duty slot board;

b) medium-duty slot board;

c) heavy-duty slot board.

4.3 According to surface decorative materials

a) resin-impregnated paper overlaid slot board;

b) PVC (polyvinyl chloride) film overlaid slot board;

c) decorative veneer overlaid slot board.

5 Requirements

5.1 Appearance quality

Slot boards are divided into Superior Grade and Qualified Grade according to the appearance quality of the face. The requirements of appearance quality shall conform to Table 1.

Table 1 Requirements for appearance quality

Defect		Superior Grade	Qualified Grade
Slot dent		Not permitted	Permitted if the insert is not revealed
Slot port breakage		Not permitted	Permitted up to a width of 3 mm and up to 2 breakages every 10 slots
Color unmatching		Permitted if it is not conspicuous	
Surface check[a]		Not permitted	
Tearing of resin impregnated paper[a]		Not permitted	Permitted up to one if the tearing length is no more than 100mm
Wrinkle[b]		Not permitted	Permitted if it is not conspicuous
Bubble[b]		Not permitted	Permitted if it is slight
Split, strip-missing[c]	Maximum width /mm	Not permitted	1
	Maximum length /mm	Not permitted	200
Gap[c]	Maximum width /mm	Not permitted	0.5
	Maximum length /mm	Not permitted	300
Dent, imprint, bulge[c]	Permitted number in 1 m^2	Not permitted	1
Overlap[c]	Maximum width /mm	Not permitted	0.5
Delamination		Not permitted	
Blister		Not permitted	
Staining		Permitted if it is not conspicuous	
Sharp edge on insert		Not permitted	
Note: under the inspection condition and inspected with a normal vision, “slight” means visible within 0.5 m,, “not conspicuous” means visible at the distance of 1 m , and “conspicuous” means visible at the distance of more than 1 m.			
[a] Applicable to resin impregnated paper overlaid slot board only. [b] Applicable to PVC film overlaid slot board only. [c] Applicable to decorative veneer overlaid slot board only.			

5.2 Dimensions and tolerances

5.2.1 Dimension

Length: 2440 mm, 2400 mm, 1220 mm, 1200mm;

Width: 1220mm, 1200mm;

Thickness: 15 mm, 16 mm, 18 mm;

Distance between adjacent slots: 75 mm, 100 mm, 150 mm.

Other dimensions can be negotiated between the supplier and the buyer.

5.2.2 Dimensional tolerances

Dimensional tolerances shall conform to the requirements listed in Table 2.

Table 2 Dimensional tolerances

Item	Unit	Tolerance
Length	mm/m	±2.0
Width	mm/m	±2.0
Thickness	mm	±0.3
Squareness	mm/m	≤1.0
Edge straightness	mm/m	≤1.0
Distance between adjacent slots	mm	±2.0

5.3 Physical and chemical properties

5.3.1 The physical and chemical properties of resin-impregnated paper overlaid slot boards shall conform to the requirements specified in Table 3.

Table 3 Requirements on the physical and chemical properties of resin-impregnated paper overlaid slot board for display

Property	Requirement			
	Surface decorative fiberboard slot board	Surface decorative particleboard slot board	Surface decorative plywood slot board	Surface decorative OSB slot board
Moisture content/%	3.0～10.0	3.0～13.0	5.0～16.0	2.0～12.0
Thickness swelling after 2 h water soaking/%	—	≤7.0	—	—
Thickness swelling 24 h water soaking /%	≤8.0	—	—	≤15.0
Resistance to surface staining/grade	≥4			
Light fastness/grade	≥4			
Surface resistance to high-low temperature cycle	No split, no blister			
Delamination	—	—	Permitted up to an accumulation of delamination length of 25 mm for each glueline on a single edge of a test piece	—
Formaldehyde emission limit	Shall conform to the requirements specified in GB 18580			

5.3.2 The physical and chemical properties of PVC film overlaid slot board for display shall conform to the requirements specified in Table 4

Table 4 Requirements on the physical and chemical properties of PVC film overlaid slot board for display

Property	Requirement			
	Surface decorative fiberboard slot board	Surface decorative particleboard slot board	Surface decorative plywood slot board	Surface decorative OSB slot board
MC/%	4.0～13.0	4.0～13.0	6.0～14.0	2.0～12.0
Thickness swelling after 2 h water soaking/%	—	≤7.0	—	—
Thickness swelling after 24 h water soaking /%	≤8.0	—	—	≤15.0
Resistance to surface staining/grade	≥4			
Surface resistance to high-low temperature cycle	No split, no blister			
Color and gloss stability	No split, no blister, no crack, no bump or hollow on the surface, no discoloring or gloss change			
Delamination	—	—	Permitted up to an accumulation of delamination length of 25 mm for each glueline on a single edge of a test piece	—
Resistance to delamination/N	Minimum 40, average≥45			
Formaldehyde emission	Shall conform to the requirements specified in GB 18580			
Limit of harmful substances of PVC film	Shall conform to the requirements specified in GB 18585			

5.3.3 The physical and chemical properties of veneer-faced slot board for display shall conform to the requirements specified in Table 5.

Table 5 Requirements on the physical and chemical properties of veneer overlaid slot board for display

Property	Requirement			
	Surface decorative fiberboard slot board	Surface decorative particleboard slot board	Surface decorative plywood slot board	Surface decorative OSB slot board
MC/%	4.0～13.0	4.0～13.0	6.0～14.0	2.0～12.0
Surface resistance to high-low temperature cycle	No split, no bulge, no color change, no wrinkle			
Delamination	Permitted up to an accumulation of delamination length of 25 mm for each glueline in a single edge of a test piece			
Formaldehyde emission	Shall conform to the requirements specified in GB 18580			

5.4 Load bearing capacity

The load bearing capacity of the whole unit of slot board, including the inserts and metal hanger, shall conform to the requirements specified in Table 6. Other testing conditions and requirements can be agreed on between the supplier and the buyer.

Table 6 Requirements for load bearing capacity

Property	Load condition	Requirement
Load bearing capacity	Light-duty: 5 kg, 24 h	Boards: no split, no delamination; Inserts: no conspicuous deformation; Metal hangers: no loosening or falling off
	Medium-duty: 20 kg, 24 h	
	Heavy-duty:30 kg, 24 h	

6 Inspection methods

6.1 Appearance quality

6.1.1 The height of horizontal inspection table shall be about 700 mm.

6.1.2 The light source shall be three 40-watt fluorescent lamps with a spacing approximately 400 mm. The fluorescent lamp shall be parallel to the board length, 2 meters above the inspection table. The inspection shall not be affected by natural light.

6.1.3 The inspector shall have a normal vision with or without vision correction. The inspection shall be conducted on both sides of a board at a distance of 0.5 m ~ 1.5m from the inspector's eyes, and at a viewing angle of 30° ~ 90° .

6.2 Dimensions and tolerances

6.2.1 Instruments and tools

6.2.1.1 Micrometer: minimum interval 0.01 mm

6.2.1.2 Caliper: minimum interval 0.1 mm

6.2.1.3 Steel tape ruler: minimum interval 1 mm

6.2.1.4 Steel straight ruler: minimum interval 0.5 mm

6.2.2 Length and width measurement

In accordance with GB/T 19367—2009, subclause 8.2.

6.2.3 Thickness measurement

In accordance with GB/T 19367—2009, subclause 8.1.

6.2.4 Squareness measurement

In accordance with GB/T 19367—2009, subclause 8.3.

6.2.5 Edge straightness measurement

In accordance with GB/T 19367—2009, subclause 8.4.

6.2.6 Measurement of distance between adjacent slots

With a steel straight ruler, the distance between adjacent grooves shall be measured along the direction perpendicular to the groove length to the nearest of 0.5 mm, as illustrated in Fig.1.

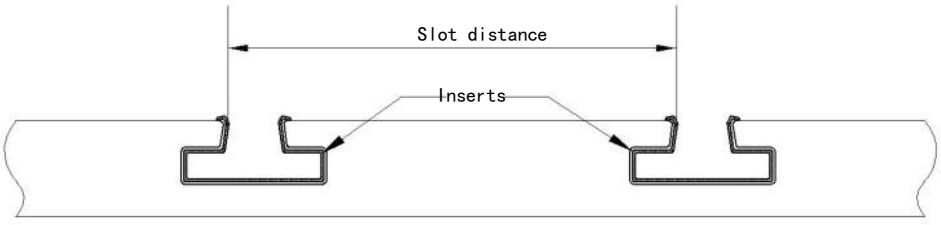


Fig.1 Illustration for slot distance measurement

6.3 Physical and chemical properties

6.3.1 Dimensions and quantity of test pieces

The dimensions and quantity of test pieces shall be prepared according to Table 7.

Table 7 Dimensions and quantity of test pieces

Item	Dimension/mm	Quantity	Cutting requirement
Moisture content	75×75	3	—
Delamination	75×75	6	—
Resistance to surface staining	100×100	1	—
Thickness swelling	50×50	6	Slot distance≤75mm, see Fig.2
Surface resistance to high-low temperature cycle	100×100	3	—
Light fastness	As testing devices required	1	—
Load bearing capacity	200×100	6	±1mm, the slot shall be in the center of test piece and parallel to the length direction of the test piece, see Fig.7
Gloss stability	150×75	1	—
Resistance to delamination	100×25	3	—
Formaldehyde emission	Prepared according to GB 18580. A slot shall be completely included, see Fig.3.		
Limit of harmful substance in PVC film	Prepared according to GB 18585		

6.3.2 Moisture content

In accordance with GB/T 17657—2013, Subclause 4.3, no conditioning for test pieces is needed.

6.3.3 Delamination

In accordance with GB/T 17657—2013, Subclause 4.19, no conditioning for test pieces is needed.

6.3.4 Thickness swelling

In accordance with GB/T 17657—2013, Subclause 4.4, no conditioning for test pieces is needed. Only one side of the specimen is allowed to contain a slot if the slot distance is no more than 75 mm. See Fig.2

Unit: mm

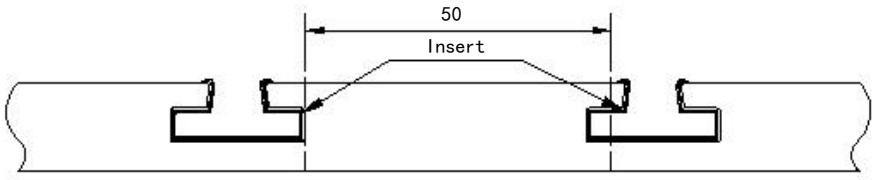


Fig.2 Illustration for preparing thickness swelling test pieces when the slot distance is no more than 75 mm

6.3.5 Surface resistance to high-low temperature cycle

For resin-impregnated paper overlaid slot board, surface resistance to high-low temperature cycle shall be tested according to GB/T 17657—2013,4.37;For PVC film overlaid and veneer overlaid slot boards, test shall be carried out according to GB/T 17657—2013, Subclause 4.38. No conditioning is needed for all test pieces mentioned above.

6.3.6 Resistance to surface staining

Test shall be conducted in accordance with GB/T 17657—2013,Subclause 4.41. Acetone and black coffee shall be adopted as the contaminants for the test respectively. No conditioning for test pieces is needed.

6.3.7 Light fastness

Test shall be conducted in accordance with GB/T 17657—2013, Subclause 4.30. The exposure shall be terminated when the color difference between the exposed and unexposed parts of the blue wool standard sample reaches Level.4 of grey scale. No conditioning for test pieces is needed.

6.3.8 Gloss stability

In accordance with GB/T 17657—2013, Subclause 4.31. No Conditioning for test pieces is needed .

6.3.9 Resistance to delamination

In accordance with GB/T 17657—2013, Subclause 4.20. No Conditioning for test pieces is needed.

6.3.10 Formaldehyde emission limit

In accordance with GB 18580. One slot shall remain on each test piece. See Fig.3.

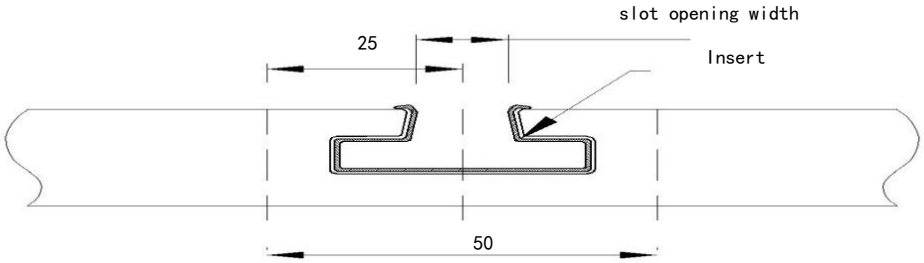


Fig.3 Illustration of cutting pattern of formaldehyde emission test pieces

6.3.11 Limit of harmful substance in PVC film

In accordance with GB 18585.

6.4 Load bearing capacity

6.4.1 Testing equipment and tools

6.4.1.1 Tape ruler

Minimum interval: 1 mm.

6.4.1.2 Caliper

Minimum interval: 0.1mm

6.4.1.3 Weights

(5±0.2) kg; (20±0.25) kg; (30±0.3) kg

6.4.1.4 Metal hanger

The dimensions of metal hangers shall conform to the requirements illustrated in Fig.4. The dimensional tolerances shall be ±0.1 mm. The weight shall not exceed 250 g. The surface of the hangers should be free of rust, split, false welding, weld penetration and other defects that may affect the test results. The hangers shall not deform or break under a load of 60 kg.

Unit: mm

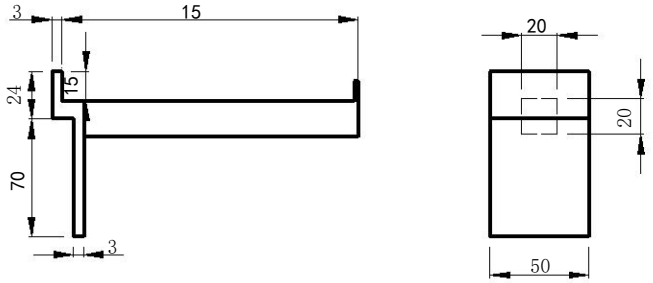
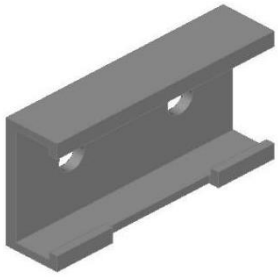


Fig.4 Illustration of a hanger for load bearing capacity test

6.4.1.5 Metal adapter

The metal adapter shall conform to the requirements illustrated in Fig.5. Its dimensional tolerances shall be ±0.1 mm.



Unit: mm

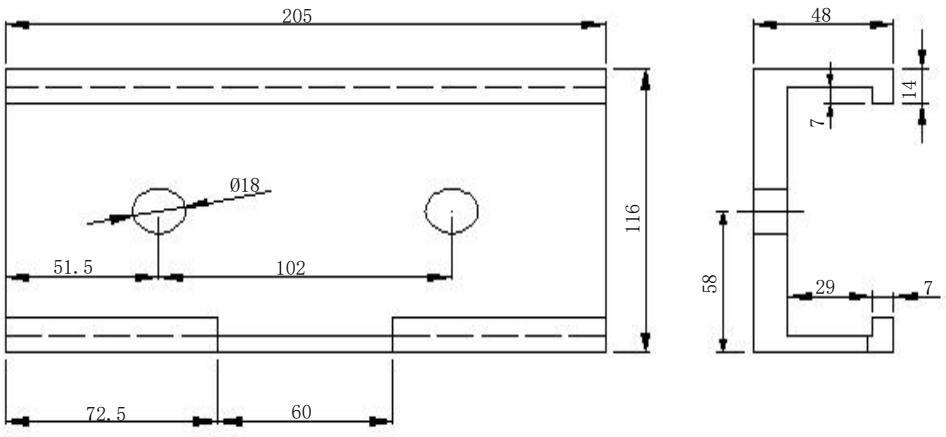


Fig.5 Illustration of the metal adapter for load bearing capacity test

6.4.1.6 Test equipment

The test equipment is mainly composed of three parts, as illustrated in Fig.6.

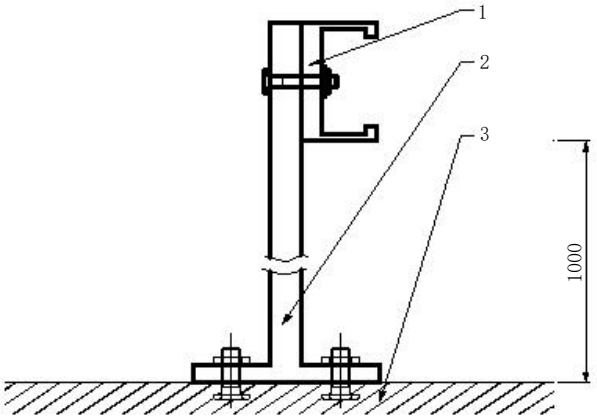
——Metal adapter (1) ;

——Device for fixing the metal adapter(fixture) (2) ;

——Ground or testing platform (3) .

The metal adapter (1) is secured to the fixture (2) 1 meter above the ground or the testing platform. The fixture shall be firmly fixed with the ground or the testing platform, it shall always be kept perpendicular to the ground or the testing platform without tilting during the test with a maximum load of 50 kg and a hanging arm length of 100 mm.

Unit: mm



Key:

1——Metal adapter;

2——Equipment for fixing the metal adapter(fixture);

3——Ground or testing platform.

Fig.6 Illustration for the load bearing capacity equipment setting

6.4.2 Dimension of test pieces

The length and width shall be (200±1) mm and (100±1)mm, respectively. The slot/groove shall be parallel to the edge of the test piece and located in the center of test piece, as illustrated in Fig.7.

Unit: mm

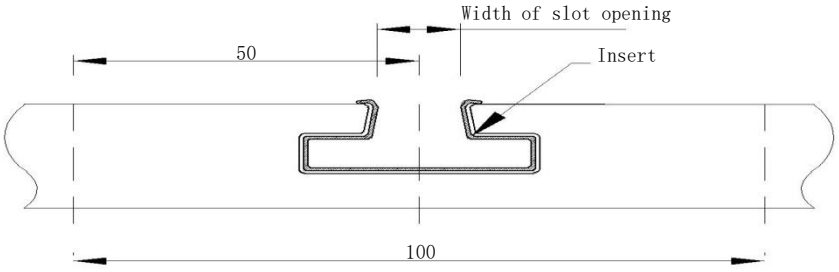


Fig.7 Dimensions of load bearing capacity test piece

6.4.3 Test procedures

Step 1: The test pieces shall be conditioned to a constant mass according to GB/T 17657-

2013,4.2.3.2.

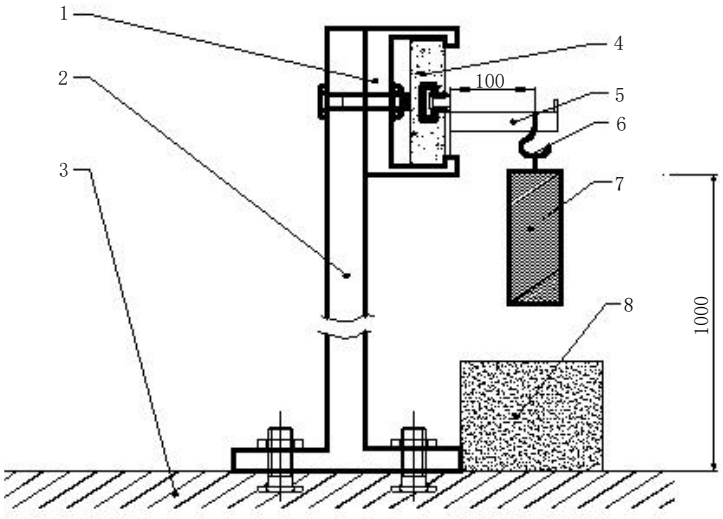
Step 2: Install a test piece to the adapter, as illustrated in Fig.8.

Step 3: Install a hanger to the insert.

Step 4: Gently and vertically load the hanging weight at a distance of 100 mm from the test piece with a hook or rope capable of bearing the weight, as specified in 5.4. The testing lasts 24 h. If the hanger is broken during the test, a new test piece shall be prepared and tested. A buffer shall be positioned below the weight.

Step 5: Unload the weight and inspect the test piece as specified in 5.4 after the test.

Unit: mm



Key:

1	Metal adapter:	5	Hanger;
2	Equipment for fixing the metal adapter;	6	Hook;
3	Ground orthe testing platform;	7	Balancing weight
4	Test piece of slot board for display;	8	Buffer

Fig. 8 Illustration for load bearing capacity test

6.4.4 Comprehensive determination

If the load bearing capacity of all the test pieces conforms to the requirements, the test pieces shall be determined as qualified.

7 Inspection rules

7.1 Inspection classification

Inspection is divided into factory inspection and type inspection.

7.1.1 Factory inspection includes:

a) Appearance quality inspection;

b) Dimension inspection;

c) Physical and chemical properties: moisture content, formaldehyde emission and load bearing capacity.

7.1.2 Type inspection

Type inspection includes inspection of appearance quality, dimension and all items of physical and chemical properties.

7.1.3 Type inspection shall be implemented in any of the following cases:

a) When new products are manufactured or the production line is transferred;

b) When the raw and auxiliary materials or production processes undergo major changes;

c) At least once a year during normal production;

d) When production resumes after suspension for more than three months;

e) When the quality supervision agency requires.

7.2 Sampling

7.2.1 Each of the inspection lot shall be composed of the same product steadily produced form the same raw material in the same producing technique and the same specification. An inspection lot may be composed of one or more lots prepared by the manufactory covering the production produced within one week. The inspection lot may be divided into more lots for sampling if the size is too big.

7.2.2 The sample for inspection shall be randomly selected from the inspection lot. The sample may be composed of one or more individual products of the same quality. The test pieces for testing physicochemical properties and load bearing capacity shall be randomly selected from these individual products in accordance with Table 7.

7.2.3 Inspection of appearance quality shall be conducted according to Subclause 5.1. The double sampling plans for normal inspection specified in GB/T 2828.1—2012 shall be adopted

with the inspection level of II and the acceptance quality limit AQL of 4.0, as shown in Table 8.

Table 8 Sampling plans for appearance quality

Lot size (N)	Sample	Sample size	Cumulated sample size	Acceptance number	Rejection number
≤150	The 1st The 2nd	13 13	13 26	0 3	3 4
151～280	The 1st The 2nd	20 20	20 40	1 4	3 5
281～500	The 1st The 2nd	32 32	32 64	2 6	5 7
501～1 200	The 1st The 2nd	50 50	50 100	3 9	6 10
1 201～3 200	The 1st The 2nd	80 80	80 160	5 12	9 13

7.2.4 Inspection for dimensions and tolerances shall conducted in accordance with Subclause 5.2. The double sampling plans for normal inspection shall be adopted with the inspection level I and the acceptance quality limit AQL 4.0, as shown in Table 9.

Table 9 Sampling plans for dimensions

Lot size (N)	Sample	Sample size	Cumulated sample size	Acceptance numbered	Rejectiopn number
≤150	The 1st The 2nd	5 5	5 10	0 1	2 2
151～280	The 1st The 2nd	8 8	8 16	0 1	2 2
281～500	The 1st The 2nd	13 13	13 26	0 3	3 4
501～1 200	The 1st The 2nd	20 20	20 40	1 4	3 5
1 201～3 200	The 1st The 2nd	32 32	32 64	2 6	5 7

7.2.5 Inspection for physicochemical properties

For the inspection of physicochemical properties, sampling plans are indicated in Table 10. With regard to the results of the first inspection for n_1 samples, if a certain inspection item fails, the inspection is allowed to repeat for once. Re-inspect the failed item in n_2 samples from the same batch of products. If all the samples conform to the requirements after re-inspection, the lot shall be considered acceptable. If one inspection item failed, the lot shall be considered unacceptable.

Table 10 Sampling plans for physicochemical properties

Lot size	Sample size of the first inspection	Sample size of the second inspection
≤1 200	2	4
1 201～3200	3	6
3201～10 000	4	8
>10 000	5	10

7.3 Conformity determination rules

If all the test results of appearance quality, dimensions and physicochemical properties conform to the requirements of a certain grade, the lot shall be considered acceptable. If not, the lot shall be considered as unacceptable.

8 Marking, packaging, transportation and storage

8.1 Marking

The package of the product shall be labeled with the following marks: product name, the substrate material, the face decorative material, dimensions, grade, load bearing capacity, formaldehyde emission grade, the date of manufacture, and the code of inspector, etc.

8.2 Packaging

The products shall be separately packed according to product specification, type and grade. The requirement on packaging can be agreed by the supplier and the buyer. Products delivered in batches shall be labeled with the names of manufacturer and the recipient, product’s name and the amount and the label to warn against moisture and direct sun light.

8.3 Transportation

The transportation of the product can be agreed on between buyer and supplier. During the transportation, the surface scratch and collision shall be avoided and shall be proof against water, moisture, sunlight and fire.

8.3 Storage

The products shall be tidily laid in flat stacks, avoiding direct contacting with the ground. Products shall be stacked according to classification and grade, and each stack shall be marked accordingly. The storage place shall be proof against rain, moisture sunlight and away from fire.