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**GOST 33757-2016 Flat Wooden Pallets. Technical conditions**

GOST 33757-2016

INTERSTATE STANDARD

 Flat Wooden Pallets

Specifications

ICS 55.180.20

Date of enforcement 2017-05-01

Preamble

The objectives, general principles and the basic procedure for conduct of operations on interstate standardization are established in [GOST 1.0-2015](http://docs.cntd.ru/document/1200128307) "Interstate System for Standardization. General Provisions" and [GOST 1.2-2015](http://docs.cntd.ru/document/1200128308) "Interstate System for Standardization. Interstate standards, rules and best practices on interstate standardization. Regulation on adoption, approval, update and cancelation rules"

**Information on standard**

1 DEVELOPED by the Technical Committee for Standardization TK 223 "Packaging"

2 INTRODUCED by the Federal Agency for Technical Regulation and Metrology

3 ADOPTED by the Interstate Council for Standardization, Metrology and Certification (Protocol of July 27, 2016 N 89-P)

Voted for the adoption:

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| --- | --- | --- |
|  |  |  |
| Abbreviation of the country according [to IC (ISO 3166) 004-97](http://docs.cntd.ru/document/842501075) | Country code by[IC (ISO 3166) 004-97](http://docs.cntd.ru/document/842501075) | Abbreviation of the national standards body |
| Armenia | AM | Ministry of Economy of the Republic of Armenia |
| Belarus | BY | GOSSTANDART of the Republic of Belarus |
| Kyrgyzstan | KG | KyrgyzStandard |
| Russia | EN | Rosstandart |
| Tajikistan | TJ | Tadjikstandart |

4. Based on decrees of the Federal Technical Regulation and Metrology Service of October 12, 2016 N 1386-art. Interstate Standard GOST 33757-2016 became effective as the national standard of the Russian Federation from May 1, 2017

5. INSTEAD [OF GOST 9078-84](http://docs.cntd.ru/document/1200023508), [GOST 9557-87](http://docs.cntd.ru/document/1200023509)

6. REEDITION. February 2019

*Information on amendments to this standard are published in the annual information index "National standards" and the text of amendments and amendments - in the monthly information index "National standards". In the event of revision (substitution) or voidance of this standard, a notification will be published in the monthly information index "National standards". Relevant information, notice and provisions are also published in the public information system – on the official website of the Federal Agency for Technical Regulation and Metrology on the Internet (www.gost.ru)*

1 Application

This standard applies to flat wooden pallets (hereinafter referred to as pallets) intended for the formation of transport packages and for the mechanized loading and off-loading, transportation and warehousing operations.

2 Regulatory links

The following interstate standards are referenced in the present standard:

[GOST OIML R 76-1-2011](http://docs.cntd.ru/document/1200096305) State system for ensuring the uniformity of measurements. Non-automatic weighing instruments. Part 1. Metrological and technical requirements. Tests

[GOST 12.3.002-2014](http://docs.cntd.ru/document/1200124407) Occupational safety standards system. Loading and off-loading/ works. General safety requirements

[GOST 12.3.009-76](http://docs.cntd.ru/document/9051603) Occupational safety standards system. Material handling. General safety requirements

[GOST 12.3.034-84](http://docs.cntd.ru/document/1200007714) Occupational safety standards system. Wood protection works. General safety requirements

[GOST 12.3.042-88](http://docs.cntd.ru/document/1200008344) Occupational safety standards system. Woodworking manufacture. General safety requirements

[GOST 427-75](http://docs.cntd.ru/document/1200004030) Measuring metric rulers. Technical conditions

[GOST ISO 445-2013](http://docs.cntd.ru/document/1200107444) Means for the palletization. Pallets. Terms and definitions

[GOST ISO 2234-2014](http://docs.cntd.ru/document/1200110847) Packaging. - Complete filled transport packages and unit loads. Methods of stacking tests using a static load

[GOST 2695-83](http://docs.cntd.ru/document/1200001718) Sawn timber broadleaved species. Specifications

[GOST 7016-2013](http://docs.cntd.ru/document/1200103831) Products of wood and wood materials. Roughness parameters

[GOST 7502-98](http://docs.cntd.ru/document/1200004328) Measuring metal tapes. Specifications

[GOST 8486-86](http://docs.cntd.ru/document/1200004108) Coniferous sawn timber. Specifications

[GOST ISO 8611-1-2014](http://docs.cntd.ru/document/1200112009) Pallets for materials handling. Flat pallets. Part 1. Test methods

[GOST ISO 8611-2-2014](http://docs.cntd.ru/document/1200121072) Pаllets fоr loads. Flat рallets. Part 2. Performance requirements and selection of tests

[GOST ISO 8611-3-2014](http://docs.cntd.ru/document/1200120654) Pallets for loads transportation. Flat pallets. Part 3. Maximum working loads

[GOST 12172-2016](http://docs.cntd.ru/document/1200144299)  Phenol-polyvinylacetyl adhesives. Specifications

[GOST 14192-96](http://docs.cntd.ru/document/1200006710) Marking of cargoes

[GOST 15150-69](http://docs.cntd.ru/document/1200003320) Machines, instruments and other industrial products. Modifications for different climatic regions. Categories, operating, storage and transportation conditions as to environment climatic aspects influence

[GOST 15612-2013](http://docs.cntd.ru/document/1200103828) Products from wood and wood materials. Methods for determination of roughness parameters

[GOST 16588-91](http://docs.cntd.ru/document/1200004029) Sawn products and wooden details. Methods for determining moisture content

[GOST 18106-72](http://docs.cntd.ru/document/1200009350) Filled transport container. Designation of testing components

[GOST 18211-72](http://docs.cntd.ru/document/1200011233) Transport tare. Compression test method

[GOST 18425-73](http://docs.cntd.ru/document/1200011235) Complete, filled transport packages. Vertical impact test by dropping

[GOST 21798-76](http://docs.cntd.ru/document/1200009560) Packages filled transport. Method of conditioning for testing

Applying this standard, it is advisable to check the operation of the reference standards in the public information system - on the official website of the Federal Agency for Technical Regulation and Metrology on the Internet or on the annual information index "National standards", which was published as of January 1 of this year, National standards for the current year.

If the reference standard is substituted (amended), the substituted (modified) standard should be used when referring to this standard. If the reference standard is voided without replacement, then the provision in which it is referenced to shall apply in a part without prejudice to this reference.

3 Types, key parameters and dimensions

3.1 The types of pallets, their definitions, parts of pallets and their characteristics must comply [with GOST ISO 445](http://docs.cntd.ru/document/1200107444).

3.2. In the Appendix A, B and Tables 1 and 2 are specified the main types and designations of pallets, parameters and dimensions depending on the size of the pallet.

Other types of pallets with different structural elements (parts) and dimensions may be manufactured in accordance with the technical and/or technological documentation of the customer upon the special request of the customer.

Table 1

|  |  |  |
| --- | --- | --- |
|  |  |  |
| Type and Name of pallet | Basic size  mm | Designation |
| P2 - single deck two-wayP4 - single deck four-way | 1200x800 | For all modes of transport within the country, for foreign trade shipments and warehouse operations |

3.3 In specifying the dimensions of the pallet, the length, width and height (), mm shall be given. The overall dimensions of the pallet, mm, depending on its type, must correspond to the following:

-  - length - 1200,

-  - width - 800, 1000, 1200;

-  - height - 100, 150, 180.

3.4 The maximum deviation of the overall dimensions of the pallet shall not exceed ±5 mm.

3.5 The weight of the pallet, kg, must not exceed:

- 40 - for all types of pallets with overall dimensions 1200x800 mm;

3.6 In storage, reshipment and freight handling with its uniform distribution not less than 85% of the pallet area depending on the unit size and mass of the pallet and the load place, the mass of the pallet, gross, kg, shall not be more:
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- for all types of pallets with overall dimensions 1200x800 mm - 1000 (e.g. one oversize load, bags), 1250 (e.g. unfastened boxes);
3.7 Material capacity of pallets, m, - no more than 0,046.

3.8 The reference designation for the pallet at the time of order shall contain: type, gross mass expressed in tons, material from which the pallet is made, designation of this standard.

3.9 The pallet shall consist of upper deck, cross boards, base boards and blockwoods.

Refer to Table 2 for the dimensions of the pallet parts.

**Table 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  |  |  |
| **Item number (Appendix B, Figure B.1)** | **Part name** | **Height** | **Width** | **Length** |
| 1 | Outermost deck board | 22 | 100 | 1200 |
| 2 | Intermediate deck board | 22 | 100 |
| 3 | Middle deck board | 22 | 100 |
| 4 | Cross board | 22 | 100 | 800 |
| 5 | Outermost base board  | 22 | 100 | 1200 |
| 6 | Middle base board  | 22 | 100 |
| 7 | Blockwood | 75 | 100 | 100 |
|  |  |  |  |  |
| 8 | Fastening element by 4.1.13 | - | - | - |

3.10 The maximum deviation of the dimensions of the pallet parts shall not exceed the following:

- length and width of board and blockwoods - ±5 mm;

- board height and blockwoods - ±2 mm.

4 General technical requirement

Pallets are manufactured in accordance with the requirements of this standard for technical and/or manufacturing documentation, production drawings for specific types of pallets.

**4.1 Features**

4.1.1 The design of pallets shall ensure: reliability and operational convenience; safety condition of cargo during stacking and loading/off-loading operations; the capability of carrying out safe loading and unloading operations by forklift trucks or other means of transport (other machinery).

4.1.2 The bottom deck surface of the pallets must be at least 40% of the upper deck surface.

4.1.3 The parts of the pallets shall be clean of wood defects, such as: full-width wane, inbarks, mechanical damage, decay and foreign inclusions.

4.1.4 Half-width wanes of each part is permissible on two edges, provided that they are clean of bark and that the transversal dimension of the wane does not exceed 15 mm.

4.1.5 One deep shake, no more than the width of the board is permissible in each board if the deep shake is not formed during the assembly of the pallet. Only face shakes caused due to the shrinkage are allowed in the blockwoods.

4.1.6 The included sapwood is allowed in broadleaf wood, if it is not more than 1/4 of the width of the board and 1/2 of the thickness of the board.

In coniferous and deciduous wood, mushroom sapwood coloration are allowed, which are not the result of poor drying or storage conditions.

4.1.7 Knots up to 10 mm by diameter are not taken into account. Only intergrown knots are allowed. The diameter of a single knot must not exceed:

- 1/4 width of the board - for transverse boards;

- 1/3 width of the board - for other type of boards.

On each section of the board corresponding to the length, width of the board, the sum of the diameters of several knots must not exceed:

- 1/3 width of the board - for transverse boards;

- 1/2 width of the board - for other boards.

4.1.8 The knotholes that dropped out during the processing of the boards shall be sealed with wood plugs of the same species as the boards, using a water-resistant glue according [to GOST 12172](http://docs.cntd.ru/document/1200144299) or other technical documentation.

4.1.9 The boards and blockwoods shall be entire.

It is allowed to use two-piece blockwoods, connected by water-resistant adhesives according to technical documentation, by agreement with the customer.

The wood grain of the blockwood should be situated along to the pallet. No core is allowed in the blockwood.

4.1.10 All surfaces of boards and blockwoods shall be sawn round, except for chamfers on the longitudinal edges of the base boards in the insertion points of the lifting device fork. Chamfers are formed by slicing or shaping. The corners of the pallet must be sawn round.

4.1.11 Roughness parameter of the top surface of the upper deck parts of pallet is 500 microns and other surfaces - 1250 microns according [to GOST 7016](http://docs.cntd.ru/document/1200103831).

4.1.12 The wood moisture content of the pallet shall not exceed 22%.

4.1.13 Pallets are made by connecting the longitudinal deck plates with cross boards, blockwoods and base boards with fastening elements.

Types and designation of fastening elements - according [to GOST ISO 445](http://docs.cntd.ru/document/1200107444).

All fastening elements for connection of deck boards with transverse boards shall be done with phosphated or oxidized nails with a ring-shaped knurling by a diameter from 2,8 to 3,5 mm and a length from 40 to 60 mm according to technical documentation.

Deck boards are connected with blockwoods with screw or rag nails according to technical documentation with a diameter from 2,8 to 4,2 mm and a length from 80 to 90 mm.

The base boards are connected with blockwoods with screw or rag nails with a diameter from 2,8 to 4,2 mm and a length from 70 to 90 mm according to the technical documentation.

Nails must be hammered in lengthwise to the deck boards. The protruding ends of the nails should be bent and sunk into the wood on the underside of the transverse boards across the grains. The outermost deck boards and cross boards are connected by at least one nail.

The heads of the nails must be sunk into the wood by 1,0-1,5 mm.

Each blockwood must be connected to both the deck and the base boards with at least three nails, which must not be part of the grain of blockwoods and must be as far apart as possible.

Other types, sizes and number of nails according to technical documentation are allowed to be used for the manufacture of pallets by agreement with the customer.

When assembling pallets, the fastening elements are installed vertically at least 25 mm from the crosscut end and board edge.

After assembly, the blockwoods and boards must not be cracked when the nails are hammered in.

Blockwoods and boards made of hardwoods must be pre-drilled. The diameter of the hole must be 1 mm smaller than the diameter of the mounting part. The depth of the hole must be 70% of the length of the mounting piece.

4.1.14 In the assembly of pallets are not allowed the following:

- deviation of the overall dimensions - more than 5 mm;

- deviation from parallelism of surfaces of top and bottom decking - more than 3 mm;

- the difference in the diagonal length of the upper or lower surface - more than 2 mm;

- through clearance between the mating surfaces of the parts;

- part-through clearance between the mating surfaces of the parts - more than 0,5 mm;

- shatters, traversing cracks, cracks near fasteners.

4.1.15 Lifespan failure must be at least 150 operations for a two-way pallet and 300 operations for a four-way pallet.

4.1.16 Torn-off force of the pallet joint assembled (average of 20 measurements and at least 75% of all forces measured) must be for connections of at least, kN:

- 3,0 - intermediate deck board - cross board;

- 5,5 - deck board - cross board - blockwood;

- 5,5 - base board - blockwood.

4.1.17 The requirements to characteristics for pallet testing, test methods and definition of workloads depending on pallet application are given in [GOST ISO 8611-1](http://docs.cntd.ru/document/1200112009), [GOST ISO 8611-2](http://docs.cntd.ru/document/1200121072), [GOST ISO 8611-3](http://docs.cntd.ru/document/1200120654).

4.1.18 The pallet must withstand the bending test of the upper deck when racking along the length and width of the pallet (bending stiffness, test 1 *b*), according to the paragraph 8.1 and figure 1 [GOST ISO 8611-1](http://docs.cntd.ru/document/1200112009); table 1 (test 6) [GOST ISO 8611-2](http://docs.cntd.ru/document/1200121072) and [GOST ISO 2234](http://docs.cntd.ru/document/1200110847).

Herewith, the maximum deflection, mm, of the upper deck depending on the standard size of the pallet and the distributed weight on it  1000 kg; within 30 minutes it should be not more than 2% - residual deflection; after the relaxation period - not more than 0,7% of the distance between the supports of the pallet  ().

4.1.19 The upper deck of the pallet must be able to withstand the fork grab of the forklift truck (bending stiffness, test, 2 *b*) according to the paragraph 8.2. Table 1 and Figure 2  [GOST ISO 8611-1](http://docs.cntd.ru/document/1200112009), table 1 (test 6) [GOST ISO 8611-2](http://docs.cntd.ru/document/1200121072) and [GOST 18211](http://docs.cntd.ru/document/1200160391).

In the same time, the maximum deflection, mm, of the top deck under load, depending on the standard size of the pallet with the equally distributed weight on the pallet and while being the load on the forklift truck or other conveyances intended for carriage of such loads of 1000 kg; must be no more than 20 mm - residual deflection, after the relaxation period - 0 mm.

4.1.20 The pallet must withstand the bending test of the upper and lower deck boards of the pallet during stacking (bending stiffness, test 4*b*) according to the paragraph 8.4, Table 1 and Figure 4 [GOST ISO 8611-1](http://docs.cntd.ru/document/1200112009), Table 1 (Test 6) [GOST ISO 8611-2](http://docs.cntd.ru/document/1200121072) and [GOST ISO 2234](http://docs.cntd.ru/document/1200110847).
At the same time, the maximum deflection, mm, of upper deck depending on the standard size of the pallet and the equally distributed weight on it under a load of 2,5 2500 kg; which for 24 hours should be no more than 2% - residual deflection, mm; after the relaxation period - no more than 0,7% of the distance between the supports of the pallet  ().

4.1.21 The pallet with lugs must withstand the bending test of the top deck when lifting with hoisting sling (bending stiffness, test 6*b*) according to the paragraph 8.6, Table 1 and Figure 6 [GOST ISO 8611-1](http://docs.cntd.ru/document/1200112009), Table 1 (Test 6) and [GOST ISO 8611-2](http://docs.cntd.ru/document/1200121072).

Herewith, the maximum deflection, mm, of the top deck, depending on the size of the standard pallet and the weight distributed on it under the load of 1,25 1250 kg; which for 10 minutes should be no more than 2%, the residual deflection, mm, after the relaxation period - not more than 0,7% of the distance between the supports of the pallet  ().

4.1.22 The pallets of all standard sizes shall be suitable for the following tests: When falling at an angle, resistance to impacts (assembly strength), vertically hanging pallet from a height, 1 m (diagonal hardness, Test 9) according to the paragraph 8.9, Table 1 and Figure 9 [GOST ISO 8611-1](http://docs.cntd.ru/document/1200112009), Table 1 (Test 6) [GOST ISO 8611-2](http://docs.cntd.ru/document/1200121072) and [GOST 18425](http://docs.cntd.ru/document/1200160392).

At the same time, the diagonal length change of the pallet, mm, after six drops by the same angle should be no more than 4% of its original length.

4.1.23 After testing, no damage or breakage of pallet parts may be permitted to limit the performance or functionality of the pallet.

**4.2 Requirement for raw materials**

4.2.1 Pallet parts are made from sawn timber not lower than the 2nd grade: Coniferous species according [to GOST 8486](http://docs.cntd.ru/document/1200004108) and broadleaved species according [to GOST 2695](http://docs.cntd.ru/document/1200001718).

4.2.2 By agreement with the customer, it is allowed to manufacture parts of pallets from sawn timber of the 3rd grade of coniferous species according [to GOST 8486](http://docs.cntd.ru/document/1200004108) and broadleaved species according [to GOST 2695](http://docs.cntd.ru/document/1200001718).

4.2.3 According to technical documentation the phosphated or oxidized ring-knurled nails, screw or rag nails are used as fasteners for the connection of pallet parts.

4.2.4 The surfaces of the pallet parts may be processed with fungicide according to the technical documentation by agreement with the customer.

4.2.5 The sanitary and hygienic measurements of materials used in the manufacture of pallets must comply with the requirements of the Technical Regulation [[1](http://docs.cntd.ru/document/902299529)] (if the scope of this standard applies to pallets) and/or with the active legislation of the country, that has adopted this standard.

**4.3 Marking**

4.3.1 Shipping label of pallets - according [to GOST 14192](http://docs.cntd.ru/document/1200006710).

4.3.2 Marking is placed directly on pallets and/or on labels indicating:

- Name and designation of the pallet;

- Manufacturing country name;

- Name of manufacturing enterprise and its legal address;

- Trademark (if any);

- Type, size of the pallet and its identifier;

- Pallet weight, in kg;

- Gross mass in t;

- Date of manufacture;

- Standard marking or other technical documentation under which the pallet is manufactured;

- Recycling symbol "Mobius strip".

4.3.3 Markings shall be made in Russian and/or the national language of the pallet manufacturer, subject to the relevant requirements established by the active legislation of the country that has adopted this standard.

Marking in a different language can be done by agreement with the customer.

4.3.4 Marking must be made on the longitudinal sides of the blockwoods. The marking is applied by burning methods.

Embossing with subsequent painting is allowed.

The methods, location and content of the marking shall be established in the technical and/or technological documentation on pallets for specific products, taking into account the requirements and regulations established by the active legislation of the country that has adopted this standard.

The marking should be clear, abrasion resistant and easy to read.

5 Safety requirements

5.1 Wooden pallets shall be non-toxic and safe to handle.

5.2 Pallets are flammable and fire-dangerous.

In storage, the pallets should be protected from sources of ignition and follow  [regulations](http://docs.cntd.ru/document/902344800) of fire safety.

If the pallets are ignited, they should be extinguished by any means of fire extinguisher.

5.3 The manufacture of pallets is associated with the use of low-toxic and fire-hazardous materials.

Pallets are manufactured in premises equipped with local and general exchange intake and exhaust ventilation.

The room must comply with sanitary and fire regulations.

The production of pallets should be provided with technical control means of aerial environment in the working space.

5.4 Safety requirements for handling, transportation and warehousing operations of pallets - according [to GOST 12.3.009](http://docs.cntd.ru/document/9051603).

5.5 Safety requirements for pallet manufacturing - according [to GOST 12.3.002](http://docs.cntd.ru/document/1200124407), [GOST 12.3.034](http://docs.cntd.ru/document/1200007714), [GOST 12.3.042](http://docs.cntd.ru/document/1200008344).

6 Requirements of resource conservation and ecology

6.1 For the purpose of resource conservation and to prevent environmental pollution, waste generated from manufacture of pallets as well as the second-hand pallets are used for secondary material resources (wood waste).

6.2 The second-hand and unsuitable for further use pallets are subject to recycling in accordance with the procedure established by the law of the country that has adopted this standard.

7 Acceptance Rules

7.1 The pallets are presented for acceptance in lots.

The lot is the number of pallets of the same type, design and size, with single quality certificate containing:

- Name of manufacturing country;

- Name of manufacturing enterprise, its legal address and contact telephone numbers;

- Trademark (if any);

- Name, designation, type and overall dimensions of the pallets;

- Lot number;

- Quantity of pallets;

- Date of manufacture;

- Designation of this standard or other technical documentation;

- Testing results or certificate of compliance of pallets with the requirements of this standard;

- Recycling Symbol "Mobius strip" indicating at after-use disposal.

Other information regarding the quality of the pallets shall be included in the quality certificate.

7.2 The delivery-acceptance, periodic and model pallet testing are performed during the quality control in accordance with Table 3.

Table 3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
| Monitored indicator | Test category | Item number |
|  | Acceptance testing | Periodictesting | Modeltesting | Tchnical requirements | Testing methods |
| Appearance, wood quality, pallet assemblies | + | - | + | 4.1.3-4.1.10, 4.1.14 | 8.6 |
| Overall dimensions | + | - | + | 3.3, 3.4 | 8.3 |
| Pallet weight  | + | - | + | 3.5 | 8.4 |
| Parts Dimensions  | + | - | + | 3.9 | 8.5 |
| Surface roughness of parts | + | - | + | 4.1.11 | 8.7 |
| Moisture content of parts | + | - | + | 4.1.12 | 8.8 |
| Lifespan value | + | - | + | 4.1.15 | 8.9 |
| Torn-off force of joint assembled  | + | - | + | 4.1.16 | 8.10 |
| Stiffness when the upper deck is bent during racking | - | + | - | 4.1.18 | 8.11, 8.12 |
| Stiffness when the upper deck is bent during lifting by the fork grab  | - | + | - | 4.1.19 | 8.11, 8.12 |
| Stiffness when the top and bottom decks are bent during stacking | - | + | - | 4.1.20 | 8.11, 8.12 |
| Stiffness when the pallet top deck with the lugs is bent during lifting by slings | - | + | - | 4.1.21 | 8.11, 8.12 |
| Impact resistance (assembly strength) when dropped at the angle | - | + | - | 4.1.22 | 8.11, 8.12 |
| Completeness and correctness of the marking | + | - | + | 6 | 8.6 |
| Note – the symbol " + " means that the indicator shall be checked; the symbol " - " is not checked. |

7.3 Acceptance testing - the control tests of a batch of pallets, which determine its suitability for delivery and their use in line with the technical and/or technological documentation, shall be conducted for each controlled lot of pallets.

7.4 Periodic testing – the control tests of pallets to control the quality stability and the opportunity to continue the production shall be carried out at least once a year at batches of pallets that have passed acceptance tests, according to the results of which they decide on the possibility of continuing the production of pallets.

Periodic testing of pallets are carried out once a year, with a minimum of three pallets that have been passed the acceptance test.

The results of periodic tests shall be documented by a protocol.

Upon the approval of the customer, other periodic testing dates and controlled indicators may be established in the technical and/or process documentation for the pallets for the specified products, as approved in the established procedure, taking into account the requirements and regulations established by the law of the country that adopted this standard.

7.5 Model tests - pallet control tests are performed to assess the efficiency and feasibility of the modifications made to the design, type and size of the pallets in the manufacturing process or in case of introduction and appliance of new materials to amend the pallet production technology, or in the event of diverging opinions in the evaluation of the quality of the pallets.

7.6 The acceptance of pallet lot shall be performed on basis of the statistical acceptance quality control.

The sampling control plan and procedure shall be set forth in the technical documentation for the specific types of pallets in line with the requirements of the normative documents for statistical methods and sampling procedure, approved in accordance with the established rule [[2](http://docs.cntd.ru/document/1200049982)].

7.7 In case if in the technical documentation is not defined the sampling control plan and procedure for the specific types of pallets, the pallet control is carried out on a two-staged normal sampling plan, with an overall alternate control level II based on the acceptable quality level (AQL), the recommended values of which are given in Table 4.

Table 4

|  |  |
| --- | --- |
|  |  |
| Monitored indicator  | Acceptable quality level (AQL), (percentage of non-compliant units), % |
| Appearance, wood quality, pallet assemblies, dimensions, weight, marking quality | 6,5 |
| Roughness, moisture of parts | 6,5 |
| Service hours per failure | 6,5 |
| Torn-off force of assembled joints  | 6,5 |
| Stiffness when the top deck is bent during racking | 2,5 |
| Stiffness when the upper deck is bent during lifting by the fork grab | 2,5 |
| Stiffness when the top and bottom decks are bent when stacking | 2,5 |
| Stiffness when the pallet top deck with the lugs is bent during lifting by slings | 2,5 |
| Impact resistance (assembly strength) when dropped at an angle  | 2,5 |

7.8 for quality control, lots of pallets are randomly selected from different locations in the volumes shown in Table 5.

Depending on the volume of the pallet lot, the number of samples and the acceptable quality level (AQL, %), the acceptance and reject numbers are determined according to Table 5.

Table 5

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Lot volume, pcs | Sampling | Number of samples, pcs | Total sampling volume, pcs | Acceptable quality level AQL (percentage of non-compliant products), % for normal control |
|  |  |  |  | 2,5 | 6,5 |
|  |  |  |  | Ас | Re | Ас | Re |
|  |  | To | 150 | Incl. | First | 8 | 8 | 0 | 2 | 0 | 3 |
|  |  |  |  |  | Second | 8 | 16 | 1 | 2 | 3 | 4 |
| from | 150 | to | 280 | Incl. | First | 13 | 13 | 0 | 2 | 1 | 3 |
|  |  |  |  |  | Second | 13 | 26 | 1 | 2 | 4 | 5 |
| " | 280 | to | 500 | " | First | 20 | 20 | 0 | 3 | 2 | 5 |
|  |  |  |  |  | Second | 20 | 40 | 3 | 4 | 6 | 7 |
| " | 500 | to | 1200 | " | First | 32 | 32 | 1 | 3 | 3 | 6 |
|  |  |  |  |  | Second | 32 | 64 | 4 | 5 | 9 | 10 |
| " | 1200 | to | 3200 | " | First | 50 | 50 | 2 | 5 | 5 | 9 |
|  |  |  |  |  | Second | 50 | 100 | 6 | 7 | 12 | 13 |
| " | 3200 | to | 10000 | " | First | 80 | 80 | 3 | 6 | 7 | 11 |
|  |  |  |  |  | Second | 80 | 160 | 9 | 10 | 18 | 19 |
| Note - the following symbols are used in this table: AC - acceptance number; Re - reject number. |

7.9 If the number of non-compliant units in the first sample is less than or equal to the first stage acceptance number, the lot shall be accepted. If the number of non-compliant items found in the first sample exceeds or equals the first stage defective number, the lot shall be considered as unacceptable.

7.10 If the number of non-compliant first sample units is within the interval between the first stage acceptance and reject numbers, the second sample should be monitored with the volume set by the plan. The number of non-compliant products found in the first and second samples shall be summarized.

If the cumulative (total) number of non-compliant products is less than or equal to the second stage acceptance number, the lot shall be considered as acceptable. If the cumulative (total) number of non-compliant production exceeds or equals the second stage reject number, the lot shall be considered as unacceptable.

7.11 If in the first sample are not identified pallets meeting the solidity test requirements, then the pallets selected in the second sample are not subject to solidity testing.

7.12 By agreement with the customer, other quality conformance inspections may be established in the technical documentation on specific category of pallets, production procedures, depending on the designation of the pallets and the relevance of test item non-conformity for pallet quality indicators.

Note - if the quality level is expressed by the percentage of non-compliant products, the value AQL, %, must not exceed 10%\*.
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\* see [GOST R ISO 2859-1-2007](http://docs.cntd.ru/document/1200049982) "Statistical methods. Alternative sampling procedures. Part 1: Sampling plans for successive lots on the basis of an acceptable level of quality".

8 Test methods

8.1 Prior to testing, pallets will be conditioned for 24 hours according to the regime of 5 [GOST 21798](http://docs.cntd.ru/document/1200009560) - at air temperature (20±1)°C and relative humidity (65±2)%.

8.2 To each sample is assigned a sequence number and the surfaces are marked in accordance with the requirements [of GOST 18106](http://docs.cntd.ru/document/1200009350).

8.3 The overall dimensions of the pallet at 3.3, 3.4 are controlled by measuring tool - tape measure in accordance with requirements of [GOST 7502](http://docs.cntd.ru/document/1200004328)  accurate to within 1 mm.

8.4 The weight of the pallet of 3.5 is controlled by weighing on a scale of medium precision class with an accuracy of ±0,5 kg in accordance with [GOST OIML R 76-1](http://docs.cntd.ru/document/1200096305).

8.5 The dimensions of the pallet parts per 3.9 are controlled by a metal ruler in accordance with the requirements [of GOST 427](http://docs.cntd.ru/document/1200004030).

8.6 Assembling adequacy, vices of wood on 4.1.3-4.1.10, 4.1.14, quality and correctness of marking on 6 are monitored by external inspection.

8.7 Surface roughness of the parts of the pallet on 4.1.11 is checked in accordance with requirements [GOST 15612](http://docs.cntd.ru/document/1200103828).

8.8 Moisture content of wooden parts per 4.1.12 is controlled in accordance with [GOST 16588](http://docs.cntd.ru/document/1200004029)  by means of a moisture meter.

8.9 Lifespan failure 4.1.15 are monitored by testing a pallet with an equally distributed weight of 3.6 by gripping the pallet with the forklift truck, lifting to a height of 0,3 m, lowering onto a horizontal surface and releasing the forks of the truck. To repeat the test cycle, the truck moves away from 1,0 to 1,5 m.

The tests are carried out by inserting the forks of the forklift truck on one side and on the other side of the pallet.

8.10 The torn-off force of the assembled joints by 4.1.16 is checked on the test machine using the tool, the diagram of which is given in Appendix B.

20 samples of each of the three types of assembled joints are tested. The samples shown in Appendix D are cut from the finished pallets or made as separate assemblies on the same equipment and using the same materials as in the lot of pallets.

The pallet failed testing if at least one board cracks or is folded or the connection area of parts are deviated from each other at more than 2 mm.

8.11 The mechanical resistance of the pallet is controlled in accordance with requirements 4.1.17-4.1.23.

8.12 The maximum deflection of the pallet under load and the residual deflection after the relaxation period are controlled by a metal ruler according [to GOST 427](http://docs.cntd.ru/document/1200004030). Relaxation period - 1 hour per [GOST ISO 8611-2](http://docs.cntd.ru/document/1200121072).

9 Transportation and storage

9.1 Empty pallets are transported in packages by all types of transport pursuant to the rules applicable to the specific transportation means.

Storage - by category/group of storage conditions **Ж 3** [GOST 15150](http://docs.cntd.ru/document/1200003320).

In the bag, the pallets must be bound together with longitudinal and transverse ties from the packing tape according to the regulatory documentation.

By agreement with the customer, pallets can be transported without tying.

Pallets should be protected from exposure to atmospheric precipitation during transportation.

Loading/ off-loading of pallets and their relocation in the storage and production areas shall be implemented by forklift trucks and cranes, inserted without impact on the corresponding pallet openings.

9.2 Empty pallets shall be stored under the category/group of storage conditions of **Ж 2** [GOST 15150](http://docs.cntd.ru/document/1200003320) in covered warehouses with asphalt covering, providing the use of forklift trucks and/or other equipment.

In Storage, the pallets are stacked with the correct rectangular shape. Each stack of up to 300 pcs of pallets, stacked in one or two rows.

The height of the stack shall be not more than 3 m. The vertical deviation of the stack shall be not more than 50 mm.

The stack shall be placed at a distance of 0,4-0,5 m from the walls of the warehouse.

Between the stacks shall be left a passage, the width of which depends on the used lifting transport equipment, but it should not be less than 2 m.

The distance between the pallet stacks and the warehouse ceiling in height shall not be less than 0,5 m.

Warehouses should be equipped with fire alarms.

9.3 Pallets may be transported in open transport means and stored in open storage areas for a short time period, covered with tarpaulin or other moisture-resistant material.

10 Instructions for use

10.1 The wooden returnable pallet are designed for repeated use, not less than two, but not more than seven turns.

10.2 The pallet turns is the formation of the package, its transportation to the destination place, the handling (warehousing) and the return of the pallet to the supplier.

10.3 Loading, unloading and handling of both loaded and empty pallets shall be carried out by hauling devices, which support the entire width of the pallet.

10.4 The pallets cannot be subjected to impact action.

10.5 Requirements applicable to manufacturing of pallets apply to repairs during the operation.

11 Manufacturer warranty

11.1 The manufacturer guarantees compliance of the pallets with the requirements of this standard while maintaining the operating, storage and transportation conditions by the user.

11.2 The warranty operating life of the pallets is 12 months from the date of commissioning of the pallet, provided that the requirements of this standard are met.

Appendix A (recommended). Pallet types and characteristics

Appendix A
(recommended)

Table A.1

|  |  |
| --- | --- |
|  |  |
| Type and specification of the pallet | Figure |
| P2 - single deck two-way | ГОСТ 33757-2016 Поддоны плоские деревянные. Технические условияFigure 1 |
| P4 - single deck four-way | ГОСТ 33757-2016 Поддоны плоские деревянные. Технические условияFigure 2 |

Appendix B (Reference): reference designation of the pallet parts

Appendix B
(reference)

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| --- |
|  |
| ГОСТ 33757-2016 Поддоны плоские деревянные. Технические условия |

Figure B.1

*1* - outermost deck board; *2* - intermediate deck board; *3* - middle deck board; *4* – cross board; *5* - outermost base board; *6* - middle base board; *7* – small blockwood; *8* - large blockwood; *9* - fastening elements (nails)

Appendix B (recommended). A test machine diagram to monitor the torn-off force of the assembled joints

Appendix C
(recommended)

|  |
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|  |
| ГОСТ 33757-2016 Поддоны плоские деревянные. Технические условия |

Figure B.1

*1* - clamp, clamping blockwood; *2* - clamp, pressing on a board; *3* - device, measuring force directed on torn-off of a blockwood from a board

Appendix D (Mandatory). Sample diagrams used to monitor the torn-off resistance of the assembled joints

Appendix D
(Mandatory)

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| ГОСТ 33757-2016 Поддоны плоские деревянные. Технические условия |

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