

English Version

Wood-based panels - Characteristic values for structural design - Part 1: OSB, particleboards and fibreboards

Panneaux à base de bois - Valeurs caractéristiques pour la conception des structures - Partie 1: OSB, panneaux de particules et panneaux de fibres

Holzwerkstoffe - Charakteristische Werte für die Berechnung und Bemessung von Holzbauwerken - Teil 1: OSB, Spanplatten und Faserplatten

This European Standard was approved by CEN on 6 July 2025.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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European foreword

This document (EN 12369-1:2025) has been prepared by Technical Committee CEN/TC 112 “Wood-based panels”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 2026, and conflicting national standards shall be withdrawn at the latest by March 2026.

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

This document supersedes EN 12369-1:2001.

EN 12369-1:2025 includes the following significant technical changes with respect to EN 12369-1:2001:

- MDF.RWH added in the scope;
- characteristic values for MDF.RWH added in 5.5.4
- editorial changes.

This document is intended to be used in conjunction with EN 1995-1-1.

The EN 12369 series Wood-based panels — Characteristic values for structural design is currently composed of the following parts:

- Part 1: OSB, particleboards and fibreboards;
- Part 2: Plywood;
- Part 3: Solid wood panels.

Annex A is informative.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

1 Scope

This document provides information on the characteristic values for use in designing structures incorporating wood-based panels. The characteristic values given are as defined in EN 1995-1-1.

This document includes the characteristic values of both the mechanical properties and density for the panels set out below:

- OSB/2, OSB/3 and OSB/4, complying with EN 300;
- Particleboard, P4, P5 P6, P7 complying with EN 312;
- Hardboard, HB.HLA2 complying with EN 622-2;
- Medium board, MBH.LA2 complying with EN 622-3;
- MDF.LA and MDF.HLS complying with EN 622-5;
- MDF.RWH complying with EN 622-5.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EN 300, *Oriented Strand Boards (OSB) — Definitions, classification and specifications*

EN 312, *Particleboards — Specifications*

EN 323, *Wood-based panels — Determination of density*

EN 622-2, *Fibreboards — Specifications — Part 2: Requirements for hardboards*

EN 622-3, *Fibreboards — Specifications — Part 3: Requirements for medium boards*

EN 622-5, *Fibreboards — Specifications — Part 5: Requirements for dry process boards (MDF)*

EN 789, *Timber structures — Test methods — Determination of mechanical properties of wood based panels*

EN 1058, *Wood-based panels — Determination of characteristic 5-percentile values and characteristic mean values*

EN 1995-1-1:2004, *Eurocode 5: Design of timber structures — Part 1-1: General — Common rules and rules for buildings*

3 Terms, definitions and symbols

3.1 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1.1 Characteristic values

3.1.1.1

characteristic strength value

population 5-percentile value obtained from the results of tests with a duration of 300 s at an equilibrium moisture content of the test pieces relating to a temperature of 20 °C and a relative humidity of 65 %

3.1.1.2

characteristic stiffness value

either the population 5-percentile or the mean value obtained of tests with a duration of 300 s at an equilibrium moisture content of the test pieces relating to a temperature of 20 °C and a relative humidity of 65 %

Note 1 to entry: The stiffness values given in the Tables are mean values as these are most commonly used in design. A NOTE below each of the Tables explains how to calculate the 5-percentile value.

3.1.1.3

characteristic density

population 5-percentile value with mass and volume corresponding to equilibrium moisture content at a temperature of 20 °C and a relative humidity of 65 %

3.1.2 Service classes

3.1.2.1

service class 1

class characterized by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air exceeding 65 % only for a few weeks per year

[SOURCE: EN 1995-1-1:2004, 2.3.1.3]

3.1.2.2

service class 2

class characterized by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air exceeding 85 % for only a few weeks per year

[SOURCE: EN 1995-1-1:2004, 2.3.1.3]

3.1.2.3

service class 3

climatic conditions leading to higher moisture contents than in service class 2

[SOURCE: EN 1995-1-1:2004, 2.3.1.3]

3.1.3

load duration class

class characterized by the effect of a constant load acting for a certain period of time in the life of the structure

Note 1 to entry: For a variable action, the appropriate class is determined on the basis of an estimate of the interaction between the typical variation of the load with time and the rheological properties of the materials.

Note 2 to entry: For strength and stiffness calculations, actions are assigned to one of the load-duration classes given in Table 1.

Table 1 — Load-duration classes

Load-duration class	Order of accumulated duration of characteristic load	Examples of loading
Permanent	more than 10 years	self weight
Long-term	6 months to 10 years	storage
Medium-term	1 week to 6 months	imposed load
Short-term	less than one week	snow ^a and wind
Instantaneous		accidental load
^a In areas which have a heavy snow load for a prolonged period of time, part of the load should be regarded as medium-term.		

3.2 Symbols

In the tables the following symbols are used:

3.2.1 Main symbols

f	Strength
E	Modulus of elasticity (defined as stiffness in EN 1995-1-1)
G	Shear modulus
k	Modification factor in strength (k_{mod}) or stiffness (k_{def}) after a period of time relative to initial values. Values are included in EN 1995-1-1.
t	Thickness
ρ	Density as measured according to EN 323
// or 0	In the direction of the major axis of OSB
⊥ or 90	In the direction of the minor axis of OSB

3.2.2 Subscripts

m	Bending
t	Tension
c	Compression
v	Panel shear
r	Planar shear
nom	Nominal
mod	Strength
def	Deflection

4 General

The characteristic values given in this document are the minimum values applicable to products conforming to the appropriate EN specification standards. These values may be presented in the format as shown in Annex A or similar to it.

Alternatively, characteristic values other than those contained in this document shall be determined using sampling techniques set out in EN 1058 and testing procedures given in EN 789, and declared in a format as shown in Annex A or similar to it.

Additionally, these characteristic values shall be supported by the following information:

- product description;
- specification standard;
- service class or classes in which the panel can be used.

The characteristic values given in this document are either different from the requirements given in the specification standard for each type of panel product, due to differences in test methodology or size of test piece used (as in the case of bending strength and modulus of elasticity), or are absent from the specification standards (as in the case of shear, in plane tension and compression).

5 Characteristic values

5.1 General

This clause gives information on the characteristic values of both mechanical properties and density for those wood-based panels the values of which, unless specified to the contrary, have been determined using the sampling techniques set out in EN 1058 and the testing procedures given in EN 789. All structural calculations shall be done in accordance with EN 1995-1-1.

5.2 OSB (EN 300)

5.2.1 General

This subclause gives the minimum characteristic values for OSB complying with EN 300.

5.2.2 EN 300: OSB/2: Load-bearing boards for use in dry conditions and OSB/3: Load-bearing boards for use in humid conditions

When OSB/2 and OSB/3 are used structurally, the characteristic values of the mechanical properties and density given in Table 2 shall apply.

Table 2 — Characteristic values of boards complying with EN 300: OSB/2: Load bearing boards for use in dry conditions, and OSB/3: Load bearing boards for use in humid conditions

Thickness mm t_{nom}	Characteristic density (kg/m^3) and strength (N/mm^2) values									Mean stiffness values							
	Dens- ity ρ	Bending f_m		Tension f_t		Compres- sion f_c		Panel shear f_v	Planar shear f_r	N/mm^2							
										Bending		Tension		Compression		Panel shear	Planar shear
										E_m		E_t		E_c		G_v	G_r
		0	90	0	90	0	90			0	90	0	90	0	90		
> 6 to 10	550	18,0	9,0	9,9	7,2	15,9	12,9	6,8	1,0	4 930	1 980	3 800	3 000	3 800	3 000	1 080	50
> 10 to 18	550	16,4	8,2	9,4	7,0	15,4	12,7	6,8	1,0	4 930	1 980	3 800	3 000	3 800	3 000	1 080	50
> 18 to 25	550	14,8	7,4	9,0	6,8	14,8	12,4	6,8	1,0	4 930	1 980	3 800	3 000	3 800	3 000	1 080	50

The 5 % characteristic values for stiffness should be taken as 0,85 times the mean values given in Table 2. Other properties not given in Table 2 shall comply with the requirements given in EN 300 for the grades OSB/2 or OSB/3.

5.2.3 EN 300: OSB/4: heavy-duty load bearing boards for use in humid conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 3 shall apply.

Table 3 — Characteristic values of boards complying with EN 300: OSB/4: Heavy-duty load bearing boards for use in humid conditions

Thick ness mm t_{nom}	Characteristic density (kg/m ³) and strength (N/mm ²) values									Mean stiffness values (N/mm ²)							
	Density	Bending		Tension		Compression		Panel shear	Planar shear	Bending		Tension		Compression		Panel shear	Planar shear
	ρ	f_{m}		f_{t}		f_{c}		f_{v}	f_{r}	E_{m}		E_{t}		E_{c}		G_{v}	G_{r}
		0	90	0	90	0	90			0	90	0	90	0	90		
> 6 to 10	550	24,5	13,0	11,9	8,5	18,1	14,3	6,9	1,1	6 780	2 680	4 300	3 200	4 300	3 200	1 090	60
> 10 to 18	550	23,0	12,2	11,4	8,2	17,6	14,0	6,9	1,1	6 780	2 680	4 300	3 200	4 300	3 200	1 090	60
> 18 to 25	550	21,0	11,4	10,9	8,0	17,0	13,7	6,9	1,1	6 780	2 680	4 300	3 200	4 300	3 200	1 090	60

The 5 % characteristic values for stiffness should be taken as 0,85 times the mean values given in Table 3. Other properties not given in Table 3 shall comply with the requirements given in EN 300 for the grade OSB/4.

5.3 Particleboards (EN 312)

5.3.1 General

This subclause gives the minimum characteristic values for particleboards complying with EN 312.

5.3.2 EN 312: P4: Particleboards: Load-bearing boards for use in dry conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 4 shall apply.

Table 4 — Characteristic values of boards complying with EN 312: P4: Particleboards — Load-bearing boards for use in dry conditions

Thickness		Characteristic density (kg/m ³) and strength (N/mm ²) values					Mean stiffness values		
mm	Density	Bending	Tension	Compression	Panel shear	Planar shear			
t_{nom}	ρ	f_{m}	f_{t}	f_{c}	f_{v}	f_{r}	Bending E_{m}	Tension and compression $E_{\text{t}}, E_{\text{c}}$	Panel shear G_{v}
> 6 to 13	650	14,2	8,9	12,0	6,6	1,8	3 200	1 800	860
> 13 to 20	600	12,5	7,9	11,1	6,1	1,6	2 900	1 700	830
> 20 to 25	550	10,8	6,9	9,6	5,5	1,4	2 700	1 600	770
> 25 to 32	550	9,2	6,1	9,0	4,8	1,2	2 400	1 400	680
> 32 to 40	500	7,5	5,0	7,6	4,4	1,1	2 100	1 200	600
> 40	500	5,8	4,4	6,1	4,2	1,0	1 800	1 100	550

The 5 % characteristic values for stiffness should be taken as 0,8 times the mean values given in Table 4. Other properties not given in Table 4 shall comply with the requirements given in EN 312: P4.

The above characteristic values were originally calculated from product specification standards using derived conversion factors and have subsequently been verified and confirmed by testing to EN 789 and EN 1058.

5.3.3 EN 312: P5: Particleboards: Load-bearing boards for use in humid conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 5 shall apply.

Table 5 — Characteristic values of boards complying with EN 312: P5: Particleboards — Load-bearing boards for use in humid conditions

Thickness mm t_{nom}	Characteristic density (kg/m^3) and strength (N/mm^2) values					Mean stiffness values		
	Density ρ	Bending f_m	Tension f_t	Compression f_c	Panel shear f_v	Planar shear f_r	Bending E_m	Tension and Compression E_t, E_c Panel shear G_v
> 6 to 13	650	15,0	9,4	12,7	7,0	1,9	3 500	2 000 960
> 13 to 20	600	13,3	8,5	11,8	6,5	1,7	3 300	1 900 930
> 20 to 25	550	11,7	7,4	10,3	5,9	1,5	3 000	1 800 860
> 25 to 32	550	10,0	6,6	9,8	5,2	1,3	2 600	1 500 750
> 32 to 40	500	8,3	5,6	8,5	4,8	1,2	2 400	1 400 690
> 40	500	7,5	5,6	7,8	4,4	1,0	2 100	1 300 660

The 5 % characteristic values for stiffness values should be taken as 0,8 times the mean values given in Table 5. Other properties not given in Table 5 shall comply with the requirements given in EN 312:P5.

The above characteristic values were originally calculated from product specification standards using derived conversion factors and have subsequently been verified and confirmed by testing to EN 789 and EN 1058.

5.3.4 EN 312: P6: Particleboards: Heavy duty load-bearing boards for use in dry conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 6 shall apply.

Table 6 — Characteristic values of boards complying with EN 312: P6: Particleboards — Heavy-duty load-bearing boards for use in dry conditions

Thickness	Characteristic density (kg/m ³) and strength (N/mm ²) values						Mean stiffness values		
	Density	Bending	Tension	Compression	Panel shear	Planar shear	Bending	Tension and Compression	Panel shear
mm	ρ	f_m	f_t	f_c	f_v	f_r	E_m	E_t, E_c	G_v
t_{nom}									
> 6 to 13	650	16,5	10,5	14,1	7,8	1,9	4 400	2 500	1 200
> 13 to 20	600	15,0	9,5	13,3	7,3	1,7	4 100	2 400	1 150
> 20 to 25	550	13,3	8,5	12,8	6,8	1,7	3 500	2 100	1 050
> 25 to 32	550	12,5	8,3	12,2	6,5	1,7	3 300	1 900	950
> 32 to 40	500	11,7	7,8	11,9	6,0	1,7	3 100	1 800	900
> 40	500	10,0	7,5	10,4	5,5	1,7	2 800	1 700	880

The 5 % characteristic values for stiffness should be taken as 0,8 times the mean values given in Table 6. Other properties not given in Table 6 shall comply with the requirements given in EN 312:P6.

The above characteristic values were originally calculated from product specification standards using derived conversion factors and have subsequently been verified and confirmed by testing to EN 789 and EN 1058.

5.3.5 EN 312: P7: Particleboards: Heavy-duty load-bearing boards for use in humid conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 7 shall apply.

Table 7 — Characteristic values of boards complying with EN 312: P7: Particleboards — Heavy-duty load-bearing boards for use in humid conditions

Thickness	Characteristic density (kg/m ³) and strength (N/mm ²) values						Mean stiffness values		
	Density	Bending	Tension	Compression	Panel shear	Planar shear	Bending E_m	Tension and compression $E_t E_c$	Panel shear G_v
mm	ρ	f_m	f_t	f_c	f_v	f_r			
t_{nom}									
> 6 to 13	650	18,3	11,5	15,5	8,6	2,4	4 600	2 600	1 250
> 13 to 20	600	16,7	10,6	14,7	8,1	2,2	4 200	2 500	1 200
> 20 to 25	550	15,4	9,8	13,7	7,9	2,0	4 000	2 400	1 150
> 25 to 32	550	14,2	9,4	13,5	7,4	1,9	3 900	2 300	1 100
> 32 to 40	500	13,3	9,0	13,2	7,2	1,9	3 500	2 100	1 050
> 40	500	12,5	8,0	13,0	7,0	1,8	3 200	2 000	1 000

The 5 % characteristic values for stiffness should be taken as 0,8 times the mean values given in Table 7. Other properties not given in Table 7 shall comply with the requirements given in EN 312:P7.

The above characteristic values were originally calculated from product specification standards using derived conversion factors and have subsequently been verified and confirmed by testing to EN 789 and EN 1058.

5.4 Fibreboards (EN 622-2 and EN 622-3)

5.4.1 General

This subclause gives the minimum characteristic values for fibreboards complying with EN 622-2 and EN 622-3.

5.4.2 EN 622-2: Hardboards (HB.HLA2): Heavy duty load-bearing boards for use in humid conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 8 shall apply.

Table 8 — Characteristic values of fibreboards complying with EN 622-2: Hardboards — Heavy duty load-bearing boards for use in humid conditions (HB.HLA2)

Thickness	Characteristic density (kg/m ³) and strength (N/mm ²) values					Mean stiffness values			
	Density	Bending	Tension	Compression	Panel shear	Planar shear	Bending	Tension and Compression	Panel shear
t_{nom}	ρ	f_{m}	f_{t}	f_{c}	f_{v}	f_{r}	E_{m}	$E_{\text{t}}, E_{\text{c}}$	G_{v}
≤ 3,5	900	37	27	28	19	3	5 000	5 000	2 100
> 3,5 to 5,5	850	35	26	27	18	3	4 800	4 800	2 000
> 5,5	800	32	23	24	16	2,5	4 600	4 600	1 900

The 5 % characteristic values for stiffness should be taken as 0,8 times the mean values given in Table 8. Other properties not given in Table 8 shall comply with the requirements given in EN 622-2 for HB.HLA2.

The above characteristic values were calculated from product specification standards, using derived conversion factors.

5.4.3 EN 622-3: Medium boards (MBH.LA2): Heavy duty load-bearing boards for use in dry conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 9 shall apply.

Table 9 — Characteristics values of fibreboards complying with EN 622-3: Medium boards — Heavy duty load-bearing boards for use in dry conditions (MBH.LA2)

Thickness	Characteristic density (kg/m ³) and strength (N/mm ²) values						Mean stiffness values		
	Density	Bending	Tension	Compression	Panel shear	Planar shear	Bending	Tension and compression	Panel shear
mm	ρ	f_m	f_t	f_c	f_v	f_r	E_m	E_t, E_c	G_v
t_{nom}									
≤ 10	650	17	9	9	5,5	0,3	3 100	3 100	1 300
> 10	600	15	8	8	4,5	0,25	2 900	2 900	1 200

The 5 % characteristic values for stiffness should be taken as 0,8 times the mean values given in Table 9. Other properties not given in Table 9 shall comply with the requirements given in EN 622-3 for MBH.LA2.

The above characteristic values were calculated from product specification standards using derived conversion factors.

5.5 MDF (EN 622-5)

5.5.1 General

This subclause gives the minimum characteristic values for MDF complying with EN 622-5.

5.5.2 EN 622-5: MDF. LA: Load-bearing boards for use in dry conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 10 shall apply.

Table 10 — Characteristic values of boards complying with EN 622-5: MDF.LA — Load-bearing boards for use in dry conditions

Thickness	Characteristic density (kg/m ³) and strength (N/mm ²) values				Mean stiffness values			
	Density	Bending	Tension	Compression	Panel shear	Bending	Tension and compression	Panel shear
mm								
t_{nom}	ρ	f_{m}	f_{t}	f_{c}	f_{v}	E_{m}	$E_{\text{t}} E_{\text{c}}$	G_{v}
> 1,8 to 12	650	21,0	13,0	13,0	6,5	3 700	2 900	800
> 12 to 19	600	21,0	12,5	12,5	6,5	3 000	2 700	800
> 19 to 30	550	21,0	12,0	12,0	6,5	2 900	2 000	800
> 30	500	19,0	10,0	10,0	5,0	2 700	1 600	600

The 5 % characteristic values for stiffness should be taken as 0,85 times the mean values given in Table 10. Other properties not given in Table 10 shall comply with the requirements given in EN 622-5 for MDF.LA.

5.5.3 EN 622-5: MDF.HLS: Load-bearing boards for use in humid conditions

When used structurally, the characteristic values of the mechanical properties and density given in Table 11 shall apply.

**Table 11 — Characteristic values of boards complying with EN 622-5: MDF.HLS — Load-bearing boards for use in humid conditions
(When used under humid conditions these boards are restricted to instantaneous or short-term periods of loading)**

Thickness		Characteristic density (kg/m³) and strength (N/mm²) values				Mean stiffness values		
mm	Density	Bending	Tension	Compression	Panel shear	N/mm²		
t_{nom}	ρ	f_m	f_t	f_c	f_v	Bending E_m	Tension and compression E_t, E_c	Panel shear G_v
> 1,8 to 12	650	22,0	18,0	18,0	8,5	3 700	3 100	1 000
> 12 to 19	600	22,0	16,5	16,5	8,5	3 200	2 800	1 000
> 19 to 30	550	21,0	16,0	16,0	8,5	3 100	2 700	1 000
> 30	500	18,0	13,0	13,0	7,0	2 800	2 400	800

The 5 % characteristic values for stiffness should be taken as 0,85 times the mean value given in Table 11. Other properties not given in Table 11 shall comply with the requirements given in EN 622-5 for MDF.HLS.

5.5.4 EN 622-5: MDF.RWH: Rigid underlays in roofs and walls

When used structurally, the characteristic values of the mechanical properties and density given in Table 12 shall apply.

Table 12 — Characteristic values of fibreboards complying with EN 622-5: MDF.RWH — Rigid underlays in roofs and walls (when used under humid conditions these boards are restricted to instantaneous or short-term periods of loading)

Thickness		Characteristic density (kg/m ³) and strength (N/mm ²) values					Mean stiffness values			
mm		Density	Bending	Tension	Compression	Panel shear	Planar shear			
t_{nom}		ρ	f_m	f_t	f_c	f_v	f_r	Bending E_m	Tension and compression E_t, E_c	Panel shear G_v
12 to 20		500	11	7,2	6,9	2,3	0,8	2 300	1 300	450

The 5 % characteristic values for stiffness should be taken as 0,85 times the mean value given in Table 12. Other properties not given in Table 12 shall comply with the requirements given in EN 622-5 for MDF.RWH.

Annex A
(informative)

Format for the presentation of the characteristic values

Type of panel
complying with EN

Manufactured by

The characteristic values given below are minimum values as specified in EN 12369-1

Table A.1 — Format for the presentation of the characteristic values

Thickness	Characteristic density (kg/m ³) and strength (N/mm ²) values				Mean stiffness values			
	Density ρ	Bending f_m	Tension f_t	Compression f_c	Panel shear f_v	Planar shear f_r	N/mm ²	
mm								
t_{nom}								
// ⊥								

The 5 % characteristic values for stiffness should be taken as times the mean values given above. Other properties not given in the above table shall comply with the requirements given in the relevant EN specification standards.

The above panel is suitable for use in the following service class(es) defined in EN 1995-1-1.

Bibliography

EN 12369-2, *Wood-based panels — Characteristic values for structural design — Part 2: Plywood*

EN 12369-3, *Wood-based panels — Characteristic values for structural design — Part 3: Solid wood panels*

