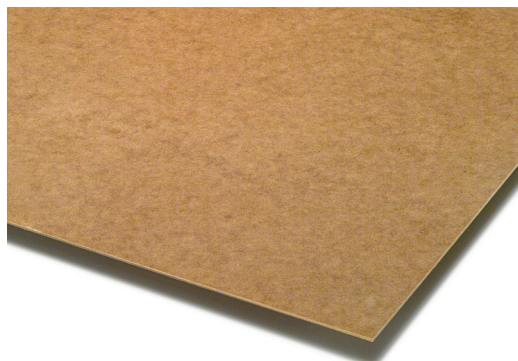


Hardboard



General Description

Hardboard consists of lignocellulosic fibre (e.g. wood, straw, bagasse) of thickness of up to 8 mm and a density $\geq 900 \text{ kg/m}^3$. Hardboard is manufactured using heat and pressure. Most hardboards are produced in a "wet process", where a fibre moisture content of more than 20% at the forming stage is common. In these hardboards, one face is rough due to the use of a mesh screen for dewatering. Boards manufactured in the "dry process" exhibit smooth surfaces on both sides. The panels are bonded primarily by felting of the fibres and their inherent adhesive properties. Usually, only small amounts of a synthetic binder are added to the fibres. By incor-

porating additives (e.g. hydrophobic agents, fungicides, fire retardants) or post-treatments certain properties of the board can be altered. Due to their visco-elastic behaviour boards can be shaped during processing, and bends with a radius less than 25 cm are possible.

Range of applications

as stated in the manufacturer's approval or according to EN 622-2

Technical class	Requirement	Service classes acc. to EN 1995-1-1
HB.LA	Load-bearing boards for use in dry conditions	1
HB.HLA1	Load-bearing boards for use in humid conditions.	1 and 2
HB.HLA2	Heavy duty load-bearing boards for use in humid conditions	1 and 2

Typical board sizes [mm]

Length	2500
Width	1250
Thickness	3,2 – 8

Technical References

Approval provided by the manufacturer or

EN 622-2	Fibreboards – Specifications Part 2: Requirements for hardboards
EN 316	Wood fibre boards – Definition, classification and symbols
EN 13986	Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking
EN 1058	Wood-based panels – Determination of characteristic 5-percentile values and characteristic mean values
EN 1995-1-1/2	Eurocode 5 – Design of timber structures Part 1-1: General – Common rules and rules for buildings Part 1-2: General – Structural fire design
ÖNORM B 1995-1-1/2	Eurocode 5: Nationale Festlegungen, nationale Erläuterungen und nationale Ergänzungen zu ÖNORM EN 1995-1-1/2 (Eurocode 5: National specifications for the implementation of EN 1995-1-1/2, national comments and national supplements)
EN 12369-1	Wood-based panels Characteristic values for structural design Part 1: OSB, particleboards and fibreboards
EN 13501-1	Fire classification of construction products and building elements Part 1: Classification using data from reaction to fire tests

Hardboard

Mechanical properties

- _ as stated in the manufacturer's approval or
- _ according to EN 12369-1

The mechanical properties and densities (characteristic values) are provided in Table 1. These values apply if HB.HLA2 is used as load-bearing board in service class 1 and 2 conditions. Please note that all the characteristic values regarding mechanical properties and densities provided in Table 1 have to be modified according to EN 1995-1-1 based on the service class and the duration of load (k_{mod} and k_{def}). To obtain the 5%-characteristic value of the stiffness, the average value listed in Table 1 should be multiplied by 0,85.

Thickness[mm]	HB.HLA2		
	≤3,5	>3,5-5,5	>5,5
ρ_k [kg/m ³]	900	850	800
$f_{m,k}$ [N/mm ²]	37	35	32
$f_{t,k}$ [N/mm ²]	27	26	23
$f_{c,k}$ [N/mm ²]	28	27	24
$f_{v,k}$ [N/mm ²]	19	18	16
$f_{r,k}$ [N/mm ²]	3	3	2,5
E_m [N/mm ²]	5000	4800	4600
$E_{t,c}$ [N/mm ²]	5000	4800	4600
G_v [N/mm ²]	2100	2000	1900

Table 1: Characteristic values for boards manufactured according to EN 622-2; HB.HLA2 (extract from EN 12369-1)

Remark: No characteristic values are provided in European standards for panels of the types HB.LA and HB.HLA1. If required, the mechanical properties have to be determined in accordance with EN 1058 or the values provided in suitable test certificates have to be used.

Physical properties

- _ as stated in the manufacturer's approval or
- _ as stated in the research report " Determination of thermal, acoustic and fire performance of wood and wood-based composites" (in German), MA 39-VFA (2002)

	Hardbord
ρ [kg/m ³]	1011
μ min – max	97,3 – 147,2
f_k [Hz]	9300 – 9600 (3,2)
(d [mm])	4660 – 5000 (6)

Please note: the μ -value of a material can be subject to substantial deviations. When uncertain use values provided in testing reports if such documents are available.

- _ as stated in the " Catalogue of the thermal performance of building materials and components" , (Austrian Standards Institute, 2001)

	Hardbord
ρ [kg/m ³]	1000
λ [W/mK]	0,22
c [kJ/kgK]	1,7

Fire performance

- _ as stated in the manufacturer's approval or
- _ according to EN 13986
- _ according to Commission Decision 2007/348/EC

	≥900 kg/m ³ , ≥6 mm*
Euroclass	D
Smoke production	s2
Flaming droplets	d0

... except floor assemblies

*end-use condition according to EN 13986

- _ according to EN 1995-1-2

	$\rho_k=450$ kg/m ³ , 20 mm
charring rate β_0	0,9 mm/min

Please note: for other densities and thicknesses < 20 mm the charring rate is to be calculated according to the following equation:

$$\beta_{0,p,t} = \beta_0 k_p k_h \text{ where}$$

$$k_p = \sqrt{(450 / \rho_k)}$$

$$k_h = \sqrt{(20 / h_p)}$$

ρ_k ... characteristic density in kg/m³
 h_p ... board thickness in mm