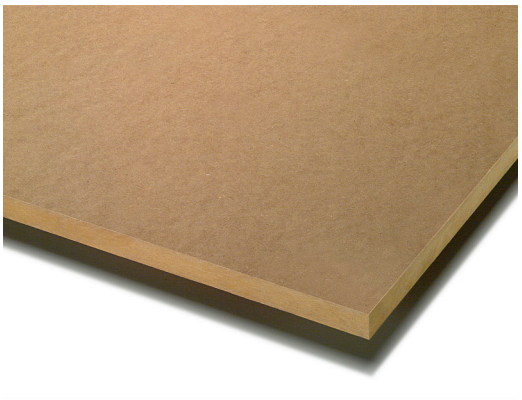
Designation: mdf
Version: 01.06.2018
Source: Holzforschung Austria
Preparation: HFA, PLB

MDF



General Description

MDF is manufactured in a " dry process" with a synthetic adhesive. Boards are categorised according to their density: High Density Fibreboard (HDF) with a density ≥ 800 kg/m³, light MDF (L-MDF) with a density ≤ 650 kg/m³ and ultra light MDF (UL-MDF) with a density ≤ 550 kg/m³. By changing the composition of the synthetic binder or by incorporation of other additives enhanced properties can be provided. Properties such as fire resistance, moisture resistance and resistance against biological attack can be altered. Vapour permeable fibreboards are a special product within the range of fibreboards. Moisture can easily pass through the permeable boards to the outside. Often tongue and grove profiles on two or four sides of the board, simplify installation of these panels in practice.

Range of applications

_ as stated in the manufacturer' s approval or
_ according to EN 622-5

Technical class	Requirement	Service classes acc. to EN 1995-1-1
MDF.LA	Loadbearing boards for use in dry conditions.	1
MDF.HLS	Loadbearing boards for use in humid conditions.	1 and 2
MDF.RWH	rigid underlays in roofs and walls	

Typical board sizes [mm]

Length	2500 – 2800
Width	675 – 1250
Thickness	13, 15 (2 – 45 possible)

Technical References

_ Approval provided by the manufacturer or

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

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MDF

Mechanical properties

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

The mechanical properties and densities (characteristic values) for MDF.LA are provided in Table 1. These values apply if MDF.LA is used as load-bearing board in service class 1 conditions. The mechanical properties and densities (characteristic values) for MDF.HLS are provided in Table 2. These values apply if MDF.HLS 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 this tables 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 this tables should be multiplied by 0,85.

	MDF.LA			
Thickness[mm]	>1,8–12	>12–19	>19–30	>30
ρ_k [kg/m³]	650	600	550	500
$f_{m,k}$ [N/mm²]	21,0	21,0	21,0	19,0
$f_{t,k}$ [N/mm²]	13,0	12,5	12,0	10,0
$f_{c,k}$ [N/mm²]	13,0	12,5	12,0	10,0
$f_{v,k}$ [N/mm²]	6,5	6,5	6,5	5,0
E_m [N/mm²]	3700	3000	2900	2700
$E_{t,c}$ [N/mm²]	2900	2700	2000	1600
G_v [N/mm²]	800	800	800	600

Table 1: Characteristic values of boards manufactured acc. to EN 622-5; MDF.LA (excerpt from EN 12369-1)

	MDF.HLS			
Thickness[mm]	>1,8–12	>12–19	>19–30	>30
ρ_k [kg/m³]	650	600	550	500
$f_{m,k}$ [N/mm²]	22,0	22,0	21,0	18,0
$f_{t,k}$ [N/mm²]	18,0	16,5	16,0	13,0
$f_{c,k}$ [N/mm²]	18,0	16,5	16,0	13,0
$f_{v,k}$ [N/mm²]	8,5	8,5	8,5	7,0
E_m [N/mm²]	3700	3200	3100	2800
$E_{t,c}$ [N/mm²]	3100	2800	2700	2400
G_v [N/mm²]	1000	1000	1000	800

Table 2: Characteristic values of boards manufactured acc. to EN 622-5; MDF.HLS (excerpt from EN 12369-1)

Physical properties

_ as stated in the manufacturer's approval or
_ according to EN ISO 10456 (Building materials and products – Hygrothermal properties – Tabulated design values and procedures for determining declared and design thermal values).

	MDF		
ρ [kg/m³]	400	600	800
λ [W/mK]	0,10	0,14	0,18
μ	5/10	12/20	20/30
c [kJ/kgK]	1,7	1,7	1,7

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.

Fire performance

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

	≥600 kg/m³, ≥9 mm*
Euroclass	D
Smoke production	s2
Flaming droplets	d0

...except floor assemblies
*end-use conditions according to EN 13986 are to be considered

_ according to EN 1995-1-2

	ρ_k=450 kg/m³, 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:

$\beta_{0,\rho,t} = \beta_0 \, k_\rho \, k_h$ where
$k_\rho = \sqrt{(450/\rho_k)}$
$k_h = \sqrt{(20/h_p)}$
ρ_k ... characteristic density in kg/m³
h_p ... board thickness in mm