



NORBORD Europe Ltd  
 Station Road  
 Cowie  
 Stirling  
 Scotland  
 FK7 7BQ

DoP ref: **NP4DoPv5**

EN13986:2004 +A1:2015

2812

04

E1

P4

10mm to 38mm

Structural use in dry conditions

Essential characteristics	Performance						
	Thickness(mm)						
	>10 to 13	>13 to 20	>20 to 25	>25 to 32	>32 to 40		18 T&G 400mm centres
<sup>1</sup> Characteristic Strength (N/mm <sup>2</sup> )							
- Bending $f_m$	14.2	12.5	10.8	9.2	7.5		12.5
- Compression $f_c$	12	11.1	9.6	9.0	7.6		11.1
- Tension $f_t$	8.9	7.9	6.9	6.1	5.0		7.9
- Panel Shear $f_v$	6.6	6.1	5.5	4.8	4.4		6.1
- Planar shear $f_r$	1.8	1.6	1.4	1.2	1.1		1.6
<sup>1</sup> Mean Stiffness (MOE) (N/mm <sup>2</sup> )							
- Tension $E_t$	1800	1700	1600	1400	1200		1700
- Compression $E_c$	1800	1700	1600	1400	1200		1700
- Bending $E_m$	3200	2900	2700	2400	2100		2900
- Panel Shear $G_v$	860	830	770	680	600		830
Punching Shear Characteristic strength under point load $F_{max,k}$ (kN) <i>(for floors and roofs)</i>	NPD	NPD	NPD	NPD	NPD		5.4
Punching Shear Mean stiffness under point load, $R_{mean}$ (N/mm) <i>(for floors and roofs)</i>	NPD	NPD	NPD	NPD	NPD		840
Racking resistance <i>(for walls)</i> Characteristic Strength $F_{Rd,max,k}$ (N)	NPD	NPD	NPD	NPD	NPD		NPD
Racking resistance <i>(for walls)</i> Mean Stiffness $R_{mean}$ (N/mm)	NPD	NPD	NPD	NPD	NPD		NPD
Soft Body Impact resistance Floor/roofs Walls	NPD	NPD	NPD	NPD	NPD		Impact Class 1 Pass Floor
Embedment strength $f_h$ (N/mm <sup>2</sup> )	NPD	NPD	NPD	NPD	NPD		NPD

<sup>2</sup> Reaction to fire  (see notes to table for field of application details and associated documentation references)		Minimum thickness	Class (excluding floorings) <sup>g</sup>	Class (Flooring) <sup>h</sup>
	Without an air gap behind the panel <sup>abef</sup>	9	D-s2,d0	D <sub>fi</sub> ,s1
	With a closed or open air gap ≤ 22mm behind the panel <sup>cef</sup>	9	D-s2,d2	-
	Closed air gap behind the panel <sup>def</sup>	15	D-s2,d0	D <sub>fi</sub> ,s1
	With an open air gap behind the panel <sup>def</sup>	18	D-s2,d0	D <sub>fi</sub> ,s1
	Any end use <sup>ef</sup>	3	E	E <sub>fl</sub>
a -Mounted without an air gap directly against class A1 or A2-s1, d0 products with minimum density 10kg/m3 or at least class D-s2, d2 products with minimum density 400 kg/m3. b -A substrate of cellulose insulation material of at least class E may be included if mounted directly against the wood-based panel, but not for floorings. c -Mounted with an air gap behind. The reverse face of the cavity shall be at least class A2-s1, d0 products with minimum density 10 kg/m3. d -Mounted with an air gap behind. The reverse face of the cavity shall be at least class D-s2, d2 products with minimum density 400 kg/m3. e -Veneered, phenol- and melamine-faced panels are included for class excl. floorings. f -A vapour barrier with a thickness up to 0,4 mm and a mass up to 200 g/m <sup>2</sup> can be mounted in between the wood-based panel and a substrate if there are no air gaps in between. g -Class Provided for in Table 1 of the Annex to decision 2000/147/EC h -Class Provided for in Table 2 of the Annex to decision 2000/147/EC				

	>10 to 13	>13 to 20	>20 to 25	>25 to 32	>32 to 40			18 T&G 400 centres		
Water vapour permeability $\mu$	NPD	NPD	NPD	NPD	NPD			NPD		
Release of formaldehyde	E1	E1	E1	E1	E1			E1		
Release (content) of pentachlorophenol (PCP)	≤5ppm	≤5ppm	≤5ppm	≤5ppm	≤5ppm			≤5ppm		
Airborne sound insulation (surface mass) R (dB)	NPD	NPD	NPD	NPD	NPD			NPD		
<sup>3</sup> Sound absorption Frequency range 250Hz to 500Hz ( $\alpha$ )	0.1	0.1	0.1	0.1	0.1			0.1		
<sup>3</sup> Sound absorption Frequency range 1000Hz to 2000Hz ( $\alpha$ )	0.25	0.25	0.25	0.25	0.25			0.25		
Thermal conductivity $\lambda$ (W/m.K)	NPD	NPD	NPD	NPD	NPD			NPD		
Air Permeability $V_0$ (m3/h)	NPD	NPD	NPD	NPD	NPD			NPD		
<b>Durability</b>										
Internal bond (N/mm <sup>2</sup> )	0.45	0.45	0.40	0.35	0.30			0.45		
Swelling in thickness (%)	11	10	10	10	9			10		
<sup>4</sup> Mechanical (Creep $k_{def}$ ) service class 1	2.25	2.25	2.25	2.25	2.25			2.25		
<sup>4</sup> Mechanical (Duration of Load, $k_{mod}$ )	Action Mode									
	Permanent		Long Term		Medium Term	Short Term		Instantaneous		
<sup>4</sup> Service Class 1	0.30		0.45		0.65	0.85		1.10		
Biological	Use class 1									

## NOTES TO TABLE

1 Taken from EN 12369-1:2001

2 reaction to fire classes from Table 1 of Commission Decision 2003/43/EC of January 2003 (OJEU L13 of 18.1.2003) corrected by Corrigendum (OJEU L33 of 8.2.2003) and amended by Commission decision 2007/348/EC of May 2007 (OJEU L131 of 23-05-2007); also reproduced in Table three of EN 13986:2004+A1:2015 for wood-based panels installed according to CEN/TR 12872

3 Taken from Table 10 of EN 13986:2004+A1:2015

4 Taken from Eurocode 5 EN 1995-1-1 2004+A2:2014