

SMARTPLY® STRONGDECK

The ideal panel for durable, moisture resistant mezzanine flooring.

SMARTPLY STRONGDECK is a strong and durable 30mm OSB/4 panel developed for heavy duty loadbearing applications in humid conditions (Service class 2 as defined in Eurocode 5) such as mezzanine flooring, industrial and commercial flooring, storage platforms and industrial shelving.

SMARTPLY® STRONGDECK

APPLICATIONS

- Durable Mezzanine Flooring
- Heavy duty, load bearing environments
- Space saving racking
- Heavy duty shelving
- Online retail - garment/package handling multi-tier warehousing
- Industrial warehousing and storage unit floor space additions
- Humid environments

BENEFITS OVER 38MM CHIPBOARD

SMARTPLY STRONGDECK is stronger and more durable than the chipboard alternatives available:

- Stronger than P5 alternatives
- Suitable for use in Service Class 2 conditions unlike P6 alternatives (Service Class 1 only)
- Reduced thickness swell
- Lighter than the chipboard alternatives despite larger surface area per panel:
 - > 10% lighter than P5
 - > 17% lighter than P6
- Quicker to install (larger panels):
 - > 12% more coverage than 2.4 x 0.6m panels
 - > 28% more coverage than 2.1 x 0.6m panels
- Zero added formaldehyde contributing to BREEAM credits and LEED points.
- Manufactured from FSC® Certified timber from our own forest – assured supply of sustainable raw material.

SMARTPLY STRONGDECK is manufactured in accordance with the requirements of OSB/4 as defined in EN 300 – *Oriented Strand Boards (OSB) – Definitions, classification and specifications*. It is a solid panel with no core gaps or hollow pockets and is CE marked in accordance with the harmonised standard EN 13986 – *Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking*.

SMARTPLY STRONGDECK is an extremely high-performance engineered wood panel suitable for the most demanding structural applications. It is manufactured using state of the art ContiRoll® technology consisting of moisture resistant and formaldehyde-free bonding of wood strands, precision strand orientation and continuous pressing.

SPECIFICATION & SUITABILITY

EN 300 classifies OSB panels by their properties which relate to their intended use. SMARTPLY STRONGDECK is classified as follows:

- OSB/4 – Heavy-duty load-bearing panel for use in humid conditions.

Structures comprising SMARTPLY OSB/4 should be assigned to service class 1 or 2 as defined in EN 1995-1-1 (Eurocode 5). According to this standard, SMARTPLY OSB/4 is suitable for use in both of these service classes. Although OSB/4 is more resistant to moisture than OSB/3, this does not mean that the panel is waterproof. SMARTPLY accepts no liability for any damage or loss of strength caused by prolonged water exposure during the construction process, or during the service life of the product.



PANEL PROPERTIES

TABLE 1: SMARTPLY STRONGDECK mechanical and physical properties

Mechanical Properties	Test method	Unit	Requirement EN 300
Panel thickness	-	mm	30
Nominal Density	EN 323	kg/m ³	600
Mean density tolerance	EN 323	%	+/- 15%
Bending strength - major axis	EN 310	N/mm ²	24
Bending strength - minor axis	EN 310	N/mm ²	13
Modulus of elasticity - major axis	EN 310	N/mm ²	4800
Modulus of elasticity - minor axis	EN 310	N/mm ²	1900
Internal bond	EN 319	N/mm ²	0.35
Bending strength after cyclic test	EN 321 EN 310	N/mm ²	6
Swelling in thickness after 24hrs	EN 317	%	≤ 12
Formaldehyde release	EN 120	mg/100g	≤ 8.0 (E1)
Moisture content - ex works	EN 322	%	2 - 12%

General tolerances	Test method	Unit	Requirement EN 300
Length	EN 324-1	mm	+/- 3.0
Width	EN 324-1	mm	+/- 3.0
Thickness (sanded)	EN 324-1	mm	+/- 0.3
Edge straightness	EN 324-2	mm/m	+/- 1.5
Squareness	EN 324-2	mm/m	≤ 2.0

Physical properties	Test method	Unit	
Thermal conductivity	EN 13986	W/(m.K)	0.13
Reaction to Fire	EN 13501-1 EN 13986	-	DFL-s1 (flooring) D-s2,d0 (excluding flooring)
Dimensional change at 1% change in panel moisture content	EN 318	%	Length = 0.02 Width = 0.03 Thickness = 0.5

TABLE 2: SMARTPLY STRONGDECK structural properties

Properties	Designation	30 mm
Characteristic strength properties (N/mm ²)		
Bending strength major axis	$f_{m,0,k}$	24.50
Bending strength minor axis	$f_{m,90,k}$	15.0
Planar shear strength	$f_{v,r,k}$	0.70
Mean stiffness properties (N/mm ²)		
Bending modulus major axis	$E_{0,mean}$	8100
Bending modulus minor axis	$E_{90,mean}$	3000
Planar shear modulus	$G_{r,mean}$	40

The structural properties of SMARTPLY STRONGDECK are derived from extensive testing conducted in accordance to EN 789 – *Timber Structures – Test Methods – Determination of Mechanical Properties of Wood Based Panels*. The characteristic values are calculated in accordance to EN 1058 – *Wood-based panels. Determination of characteristic 5-percentile values and characteristic mean values*.

LOAD BEARING APPLICATIONS AND DESIGN CONSIDERATIONS

For structural design, SMARTPLY STRONGDECK properties (Table 2 and in the Declaration of Performance) should be used in conjunction with the appropriate load duration and service class factors for the final use of the panels. As design guidance, the performance of the panels under uniformly distributed loading and concentrated loading is provided in the sections below for various situations.



UNIFORMLY DISTRIBUTED LOAD:

The load bearing capacities of SMARTPLY STRONGDECK were determined for a number of loading situations (service class, single or double spans, duration of loading, deflection limits). Table 3 assumes that the supporting structure (joists, beams and columns) have been designed in accordance to the relevant structural design standards (Eurocodes).

The UDL in the tables are based on the limit states design principles of the Eurocode 0 (Basis of structural design), Eurocode 1 (Actions on structures) and Eurocode 5 (Design of timber structures).

The information provided in Table 3 was obtained by calculation and refers to applications where the panels are installed with the main axis perpendicular to the joists, with loads applied uniformly and simultaneously on panels installed over equal length spans. For all other situations it is the responsibility of the end users, or the contracted engineer to determine the design loads of the panels using the material properties provided.

Table 3(a): UDL Load-bearing capacities (single span)

SERVICE CLASS 1									
		Medium Term loading (kN/m ²)				Long Term loading (kN/m ²)			
		Joists Centres (mm)				Joists Centres (mm)			
		400	600	800	1200	400	600	800	1200
Strength Limit		79.40	35.29	19.85	8.82	56.71	25.21	14.18	6.30
Deflection Limit	L/200	29.00	8.59	3.62	1.07	20.71	6.14	2.59	0.77
	L/250	23.20	6.87	2.90	0.86	16.57	4.91	2.07	0.61
	L/300	19.33	5.73	2.42	0.72	13.81	4.09	1.73	0.51

SERVICE CLASS 2									
		Medium Term loading (kN/m ²)				Long Term loading (kN/m ²)			
		Joists Centres (mm)				Joists Centres (mm)			
		400	600	800	1200	400	600	800	1200
Strength Limit		62.38	27.73	15.60	6.93	45.37	20.16	11.34	5.04
Deflection Limit	L/200	17.90	5.30	2.24	0.66	13.02	3.86	1.63	0.48
	L/250	14.32	4.24	1.79	0.53	10.41	3.09	1.30	0.39
	L/300	11.93	3.54	1.49	0.44	8.68	2.57	1.08	0.32

Table 3(b): UDL Load-bearing capacities (Double span)

SERVICE CLASS 1									
		Medium Term loading (kN/m ²)				Long Term loading (kN/m ²)			
		Joists Centres (mm)				Joists Centres (mm)			
		400	600	800	1200	400	600	800	1200
Strength Limit		79.40	35.29	19.85	8.82	56.71	25.21	14.18	6.30
Deflection Limit	L/200	69.78	20.68	8.72	2.58	49.85	14.77	6.23	1.85
	L/250	55.83	16.54	6.98	2.07	39.88	11.82	4.98	1.48
	L/300	46.52	13.78	5.82	1.72	33.23	9.85	4.15	1.23

SERVICE CLASS 2									
		Medium Term loading (kN/m ²)				Long Term loading (kN/m ²)			
		Joists Centres (mm)				Joists Centres (mm)			
		400	600	800	1200	400	600	800	1200
Strength Limit		62.38	27.73	15.60	6.93	45.37	20.16	11.34	5.04
Deflection Limit	L/200	43.08	12.76	5.39	1.60	31.33	9.28	3.92	1.16
	L/250	34.46	10.21	4.31	1.28	25.07	7.43	3.13	0.93
	L/300	28.72	8.51	3.59	1.06	20.89	6.19	2.61	0.77

Tables 3(a) and 3(b) were derived from the characteristic strength and stiffness properties of Table 2 and determined by the structural timber experts of Edinburgh Napier University Centre for Timber Engineering.

CONCENTRATED LOAD

The performance of the panel when subjected to point loading was tested in accordance to EN 1195 – *Timber structures – Test methods – Performance of structural floor decking*. The tests were performed in the Centre for Timber Engineering of Edinburgh Napier University on a floor system with joists installed at various centre spacings. The tests were conducted with a 50*50mm loading pad, with the load applied at the weakest point of the floors (i.e. near the T&G joints at the centre of the span). The characteristic load and mean stiffness obtained were used to calculate the design loads in Table 4.

The values in Table 4 were determined from the test results and by using the design method, assumptions and factors recommended in the National foreword of BS EN 12871:2013 (No serviceability limits used, partial factor $\gamma_Q = 1.35$ and reduction factor $K_{red} = 0.89$).

For all other applications (such as dynamic effects, serviceability limits...) it is the responsibility of the end users, or the contracted engineer to determine the design loads based on the concentrated load performance of SMARTPLY STRONGDECK provided in the Declaration of Performance.

Table 4: Design point loads

Service class	Medium Term loading (kN)			Long Term loading (kN)		
	Joists Centres (mm)			Joists Centres (mm)		
	400	600	800	400	600	800
SC 1	6.63	5.62	4.66	4.73	4.01	3.33
SC 2	5.21	4.41	3.66	3.79	3.21	2.66

INSTALLATION

SMARTPLY STRONGDECK panels should be laid with their long edges across the supporting joists and in a straight line. The short square edges should be centred on the support joists. Panels should have a minimum bearing of 17.5mm on joists or noggins. It is important that edges around the perimeter of the floor and around service penetrations are continuously supported on joists or noggins.

Starting from the back wall of the building lay the first row of panels maintaining the expansion gaps. The next rows should be staggered to form a brick-bond pattern.

The T&G joint should be glued using D3 or D4 rated (EN 204) adhesive on both the tongue and groove of the joints about to be installed, making sure that the entire joint is bonded.

It is also recommended to glue the panels to supporting timber joists. This ensures a reliable distribution of the loads, improves the floor performance and reduces the risk of creaking noises.

Further information is provided in the SMARTPLY STRONGDECK installation guide.

FIXINGS

SMARTPLY STRONGDECK must be secured to the supporting structure with the appropriate fixings that are suitable for the design Service Class (for Service Class 2 designs, the fixings should be corrosion resistant). For best results and to avoid damage it is particularly important to ensure that fixing heads do not protrude above the panel surface. If a surface coating is applied, then it is recommended to embed the fixing head below the panel surface.

The fixings should be at least 8mm from the edge of the panels, and the recommended spacing is 150mm along the perimeter of each panel and 300mm at intermediate supports.

For securing to timber joists it is recommended to use self-drilling screws with a min. diameter of 0.16 x thickness and min. length of 2 x thickness.

For securing to cold rolled and light gauge steel joists (thickness $\leq 4.0\text{mm}$) it is recommended to use self-drilling screws for wood to steel connections such as Simpson Strong-Tie Mezzanine Floor Screws.

EXPANSION GAPS

Wood-based panels experience dimensional change when subjected to changes in moisture content. It is necessary to allow for such movement by incorporating expansion gaps along the perimeter of the floors, at any point where the floor abuts an upstand and at intermediate sections for long floors ($>10\text{-}12\text{m}$). This expansion gap must be 2mm per metre length of floor but not less than 10mm wide and can be covered or filled with easily compressible material.

Further information on expansion gaps is provided in the FLOOR datasheets.

Notes: A 3mm gap must be left between all adjoining square edges of panels. T&G panels have an expansion gap included in the T&G joint, so T&G edges must be butted together with the joints glued. However, the requirement for perimeter and intermediate expansion gaps still applies.

SMARTPLY® STRONGDECK

ZERO ADDED FORMALDEHYDE

SMARTPLY STRONGDECK is manufactured using advanced resin technology that results in a high performance, zero added formaldehyde panel. This specialist resin formulation provides a superior bond with the wood strands as it has a reaction with the wood itself, when put under intense heat, creating a chemical weld. This is a different and superior type of bond to the mechanical weld that formaldehyde-based products exhibit. Depth of penetration is well beyond the minimum 0.3 mm needed for a wood resin to provide adequate adhesive strength. This extra resin penetration also greatly improves the wood's resistance to thickness swell.

IMPORTANT NOTES

The recommendations provided in this technical data sheet for the correct use of SMARTPLY STRONGDECK are specifically designed to ensure longevity and performance of this quality product in service. It is therefore essential that these recommendations are strictly followed.

The product is designed to be installed by a competent general builder or contractor, experienced with this type of product, in strict accordance with the technical guidance provided in the relevant SMARTPLY product technical data sheets.

SMARTPLY EUROPE DAC cannot be held responsible for damages arising from non-adherence to these recommendations, or product failures resulting from inadequate structural design or misuse of this product.

In order to provide comprehensive guidance for the correct use of SMARTPLY STRONGDECK, this technical datasheet makes reference to relevant BS and EN standards. SMARTPLY EUROPE DAC cannot be held responsible for claims arising from the use of any information that has been extracted from such sources.

SUPPLIED DIMENSIONS

- 2400 x 675 x 30mm TG2
- Tongue & Groove on the two long edges



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