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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-21/0048 of 2025/04/09

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:	Kingspan TEK – Prefabricated Wood-based Loadbearing Stressed Skin Panels
Product family to which the above construction product belongs:	Prefabricated wood-based loadbearing stressed skin panels
Manufacturer:	Kingspan Insulation Ltd Pembridge Leominster Herefordshire HR6 9LA United Kingdom Tel: + 44 (0)1544 387 382 Fax: + 44 (0)1544 387 482 e-mail: technical@kingspantek.co.uk website: www.kingspantek.co.uk
Manufacturing plant:	Kingspan Insulation Ltd (Selby Plant) Sherburn Enterprise Park Enterprise Way Sherburn-in-Elmet Leeds North Yorkshire LS25 6NA United Kingdom
This European Technical Assessment contains:	14 pages including 3 annexes which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	EAD 140022-00-0304 for Pre-fabricated wood-based loadbearing stressed Skin Panels
This version replaces:	The ETA with the same number issued on 2024-02-20

II SPECIFIC PART OF THE EUROPEAN TECHNICAL ASSESSMENT

1 Technical description of product

Prefabricated Wood-based Loadbearing Stressed Skin Panels form a panelised method of construction. Panels are available with a nominal thickness of either 142 or 172 mm. Each panel has two outer skins of 15 mm thick OSB/3 (oriented strand board, type 3), separated by a core of 112 or 142 mm thick zero-rated Ozone-Depleting Potential, rigid polyurethane (PUR).

The panels are available in widths ranging from 200 to 1220 mm and lengths up to 7500 mm, and are supplied in the appropriate shapes and sizes for each project. Other components, such as sealant, fixings and jointing pieces, will be required to enable installation to be made in accordance with the ETA holder's recommendations. The panels' design is a cassette joint system, which is also sealed using expanding urethane foam.

Manufacturing
The panels are produced in standard dimensions which assemble into load-bearing walls on-site. Custom dimensions to suit the requirements of the works are available. Production of panels is performed on the basis of the developed project and detailed workshop drawings.

2 Specification of the intended use in accordance with the applicable European Assessment Document (hereinafter EAD)

Kingspan TEK panels are for use in single- or multiple-occupancy constructions up to four storeys high as: the loadbearing inner leaf of an external wall; a loadbearing internal wall; a single or double leaf of a separating wall; or pitched roofing panels, where the Essential Requirements in the Construction Products Regulation apply.

The panels are for use in timber structures, subject to the dry, internal conditions defined by service classes 1 and 2 of EN 1995-1-1 and for members subject to static or quasi-static loading. However, the panels are not suitable to be used for structural flooring construction.

The panels may also be used in non-load bearing applications

The provisions made in this European Technical Assessment are based on an assumed intended working life of the wood slab elements of 50 years.

The real working life may be, in normal conditions, considerably longer without major degradation affecting the essential requirements of the works.

The indications given on the working life cannot be interpreted as a guarantee given by the producer or Assessment Body but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

Characteristic	Assessment of characteristic
3.1 Mechanical resistance and stability (BWR1)	
Mechanical resistance and stiffness	Clause 3.1.1
Bending strength	Annex B
Compression strength parallel to the skin	No performance assessed
Compression strength perpendicular to the skin	No performance assessed
Shear strength	Annex B
Racking resistance	Annex B
Resistance to concentrated loads	Annex B
Density	Annex A
Creep and duration of load	Annex B
Dimensional stability	Clause 3.1.2
3.2 Safety in case of fire (BWR2)	
Reaction to fire	Clause 3.2.1
Resistance to fire	Clause 3.2.2
3.3 Hygiene, health and the environment (BWR 3)	
Water vapor permeability and moisture resistance	No performance assessed
Content, emission and/or release of dangerous substances	Clause 3.3.1
3.4 Safety and accessibility in use (BWR 4)	
Impact resistance	No performance assessed
3.5 Protection against noise (BWR 5)	
Airborne sound insulation	Annex A
Impact sound insulation	No performance assessed
Sound absorption	No performance assessed
3.6 Energy economy and heat retention (BWR 6)	
Thermal resistance	Annex A and C
Air permeability	No Performance assessed
Thermal inertia	Annex A
3.7 Durability	
Durability	Clause 3.7.1

3.1 Mechanical resistance and stability

3.1.1 Mechanical resistance and stiffness as well as serviceability

The mechanical properties, and design-load-carrying capacities for the wall and roof panels, are given in Annex B of this ETA, and have been derived in accordance with EAD 140022-00-0304. They should be used for designs in accordance with EN 1995-1-1, EN 1991-1-1, EN 1991-1-2 and EN 1991-1-3 or the appropriate national regulation.

The load-carrying capacities have been derived by calculation, and calculation assisted by testing. Additional strength of the panels can be achieved using structural engineering principles and via the introduction of structural members, such as ribs or posts within the panels.

In the calculations, the maximum vertical design loads for each roof span and pitch of panels for each load duration at Ultimate Limit State (ULS) are shown in Tables B1 and B2, Annex B. However, the values do not include Serviceability Limit State (SLS) checks, such as deflection. It should be emphasised that deflection limits in Serviceability Limit State (SLS) must be checked for roof panels as per EAD 140022-00-0304 and EN 1995-1-1, and considering the shear deformations.

The assessment body has assessed a method of design analysis developed by the ETA holder. The method is based on EOTA TR019 in respect of the roof panels, and sandwich theory in respect of the wall panels. ETA-Danmark A/S holds the data on file.

The product is not assessed for resistance to earthquakes. For regions with high seismic activity, an individual assessment is to be carried out in accordance with standards and national regulations.

Any national provisions must be taken into consideration.

Calculations of stability of each structure is to be performed on a case-by-case basis.

3.1.2 Dimensional stability

Significant variations in moisture content in the panel leading to excessive dimensional changes of the product may cause undesirable damage of the product and the structure. Such variations of the moisture content must be prevented.

Relative moisture content of the panels at installation must be compatible with moisture content in the final application to ensure that the dimensional changes the panels may undergo would not have adverse effects on the product or the structure.

3.2 Safety in case of fire

3.2.1 Reaction to fire

The panel skins are based on EC Decision 2003/43/EC classified as class D-s2, d0 in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364.

The core material of the panel – Kingspan TEK – is classified as class E in accordance with EN 13501-1 and Commission Delegated Regulation 2016/364. The field of application for the classification is core material with a thickness of at least 60 mm, with nominal weight per unit area of 2,05 kg/m^2 and nominal density of 34,26 kg/m^3.

3.2.2 Resistance to fire

Performance of the panels in relation to fire resistance was established after the panels were tested as a ‘load-bearing wall construction’, in accordance with the EN 1365-1 : 2012 test method. The test results were classified in accordance with EN 13501-2 : 2016 as **REI 30**, based on the test, which consisted of a 142 mm Kingspan TEK panel, softwood timber battens (25 mm thick by 38 mm wide) fixed and over clad with a single layer of 12.5 mm thick gypsum plasterboard Type A, and as **REI 60** based on the test, which consisted of a 142 mm Kingspan TEK panel, softwood timber battens (25 mm thick by 50 mm wide) vertically fixed and over clad with a single layer of 15 mm thick Type F gypsum plasterboard, referenced “Firecheck board”.

In cases where parts of the works in which the panels are intended to be incorporated, installed or applied fall within the scope of EN 1995-1-1, the fire design may be calculated in accordance with EN 1995-1-2.

3.3 Content, emission and/or release of dangerous substances

3.3.1 Dangerous substances

According to the manufacturer’s declaration, the product specification has been assessed for dangerous substances, taking account of Directive 67/548/EEC, Regulation (EC) No 1272/2008 *Indicative list of dangerous substances*, Council Directive 76/769/EEC and the list on the database established on the EC

construction website to verify that it does not contain such substances above the acceptable limits. The formaldehyde potential of the OSB skins is designated Class E1 in accordance with EN 13986: 2004. According to the manufacturer's declaration, the rigid urethane insulation core, when enclosed between the OSB skins, is suitable for use in interior spaces.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (eg transposed European legislation and national laws, regulations and administrative provisions). To meet the provisions of the EU Regulations, these requirements also need to be complied with, when and where they apply.

3.7.1 Durability

The panels can be used in service classes 1 and 2 as defined in EN 1995-1-1: 2004 and in Use Classes 1 and 2 as specified in EN 335: 2013. The products may be exposed directly to the weather for a short time during installation, depending on the weather conditions. However, they should be covered by a suitable breather membrane, as soon as possible, after they are erected.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

4.1 AVCP system

According to the Decision 2000/447/EC of the European Commission, the system of assessment and verification of constancy of performance (see Annex V to the regulation (EU) No 305/2011) is System 1.

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark prior to CE marking

Issued in Copenhagen on 2025-04-09 by

Thomas Bruun
Managing Director, ETA-Danmark

ANNEX A PRODUCT DETAILS

This annex applies to the Kingspan TEK panels / Prefabricated Wood-based Loadbearing Stressed Skin Panels described in the main body of the ETA.

BASIC REQUIREMENTS

Table A1.1 – Description of the basic requirements

Basic works requirements BWR / Essential characteristics	**Verification Procedure**	**Class / Use category / Numerical value**
Basic Works Requirement 1 (BWR 1): Mechanical resistance and stability		
Mechanical resistance and stability		
Wall design load of 142 and 172 mm thickness	EN 1995-1-1	See Annex B
Roof design load of 142 and 172 mm thickness	EN 1995-1-1	See Annex B
Connecting means	EN 1995-1-1	
Dimensional stability		
During operation, change in the moisture content must not occur in order to avoid undesirable deformations		
Basic Works Requirement 2 (BWR 2): Safety in case of fire		
Reaction to fire		
OSB board Grade 3	2003/43/EC (1)	D-s2, d0
Rigid urethane insulation core	EN ISO 11925-2 and classified to EN 13501-1	E
Wooden structural element	2003/43/EC (1)	D-s2, d0
Explanation: (1) As amended by Commission decision 2003/593/EC,2006/673/EC and 2007/348/EC		
Fire resistance		
142 mm	Tested to EN 1365-1 and classified to EN 13501-2	REI 30
Fire resistance test construction: - 12.5 mm Type A plasterboard, eg KNAUF - 25 x 38 mm timber batten - Kingspan TEK panel		
142 mm	Tested to EN 1365-1 and classified to EN 13501-2	REI 60
Fire resistance test construction: - 15 mm Type F plasterboard, eg “Firecheck board” - 25 x 50 mm timber batten - Kingspan TEK panel		
Basic Works Requirement 3 (BWR 3): Hygiene, health and environment		
Vapour permeability and moisture resistance		
OSB board (ρ = 650 kg/m^3)	EN ISO 10456	μ = 30-50 (-)
Thermal insulation, PU (ρ = 32-35 kg/m^3)	EN ISO 12572	μ = 70-100 (-)
Wooden structural element (ρ = 500 kg/m^3)	EN ISO 10456	μ = 20-50 (-)
Content and/or release of dangerous substances	No performance assessed	
Formaldehyde from OSB boards	EN 13986 + A1	Class E1
Pentachlorophenol PCP from OSB boards	EN 13986 + A1	PCP≤ 5ppm or PCP≥ 5ppm
Basic Works Requirement 4 (BWR 4): Safety and accessibility in use		
Impact resistance	No performance assessed Product does not comprise floor finishing	

Table A1.1 – Description of the basic requirements (continued)

Basic works requirements BWR / Essential characteristics	Verification Procedure	Class / Use category / Numerical value
Basic Works Requirement 5 (BWR 5): Protection against noise		
Airborne sound insulation		
OSB Board (15 mm thickness) Insulation core PU (112 mm thickness) OSB Board (15 mm thickness)	EN ISO 717-1 Measurement Procedure in accordance with EN ISO 140-3	Weighted sound reduction: $R_w(C;C_{tr})$=31 (-2;-5)dB
Basic Works Requirement 5 (BWR 5): Protection against noise		
Impact sound insulation	No performance assessed Product does not include interior and exterior surface finishing	
Sound absorption	No performance assessed	
Basic Works Requirement 6 (BWR 6): Energy economy and heat retention		
Thermal resistance		
Input parameters for calculating thermal resistance according to BS EN ISO 6946 and EN ISO 10211		
Thermal conductivity		
OSB boards	EN 13986	λ = 0.13 W/(m.K)
Thermal insulation rigid urethane core	EN 13165	λ_D = 0.024 W/(m.K)
Wooden structural element	EN ISO 10456	λ = 0.13 W/(m.K)
Air permeability	No performance assessed	
Thermal inertia		
Characteristic density		
OSB board	EN 13986	ρ > 650 kg/m^3
Thermal insulation, PU core	EN 13165	ρ = 32-35 kg/m^3
Spruce, fir wood (C24 and C16)	EN 338	ρ = 350-420 kg/m^3
Specific thermal capacity		
OSB boards (ρ = 650 kg/m^3)	EN ISO 10456	C_p = 1700 J/(kg.K)
Thermal insulation, PU core (ρ = 32-35 kg/m^3)	EN ISO 10456	C_p = 1400 J/(kg.K)
Wooden structural element (ρ = 500 kg/m^3)	EN ISO 10456	C_p = 1600 J/(kg.K)

Table A1.2 — Connection of panels

	Kingspan TEK 142 mm	Kingspan TEK 172 mm
Panel to spline	2.8 x 63 mm galvanized ring shank nails	2.8 x 63 mm galvanized ring shank nails
Panel to timber post/end timbers	Expanding urethane foam, when connecting panel to panel – 2 beads of silicone sealant	Expanding urethane foam, when connecting panel to panel – 2 beads of silicone sealant
	2.8 x 63 mm galvanized ring shank nails	2.8 x 63 mm galvanized ring shank nails

For further information please see Kingspan TEK construction manual

Figure 1 Cassette joint system

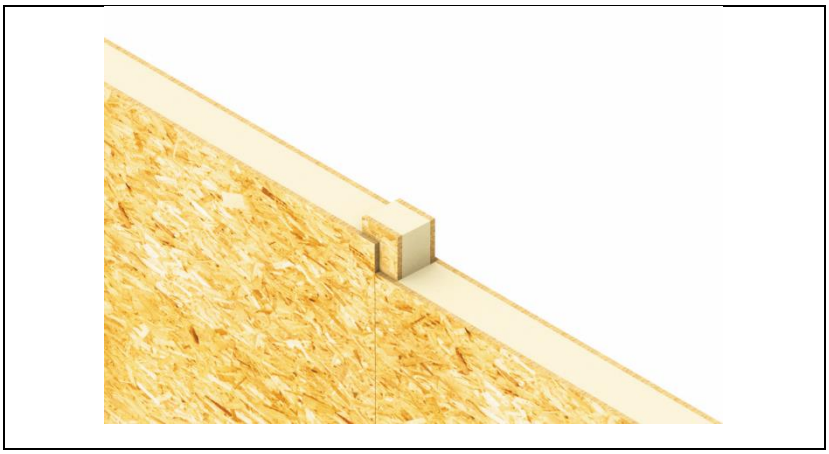


Figure 2 Connection through timber spline

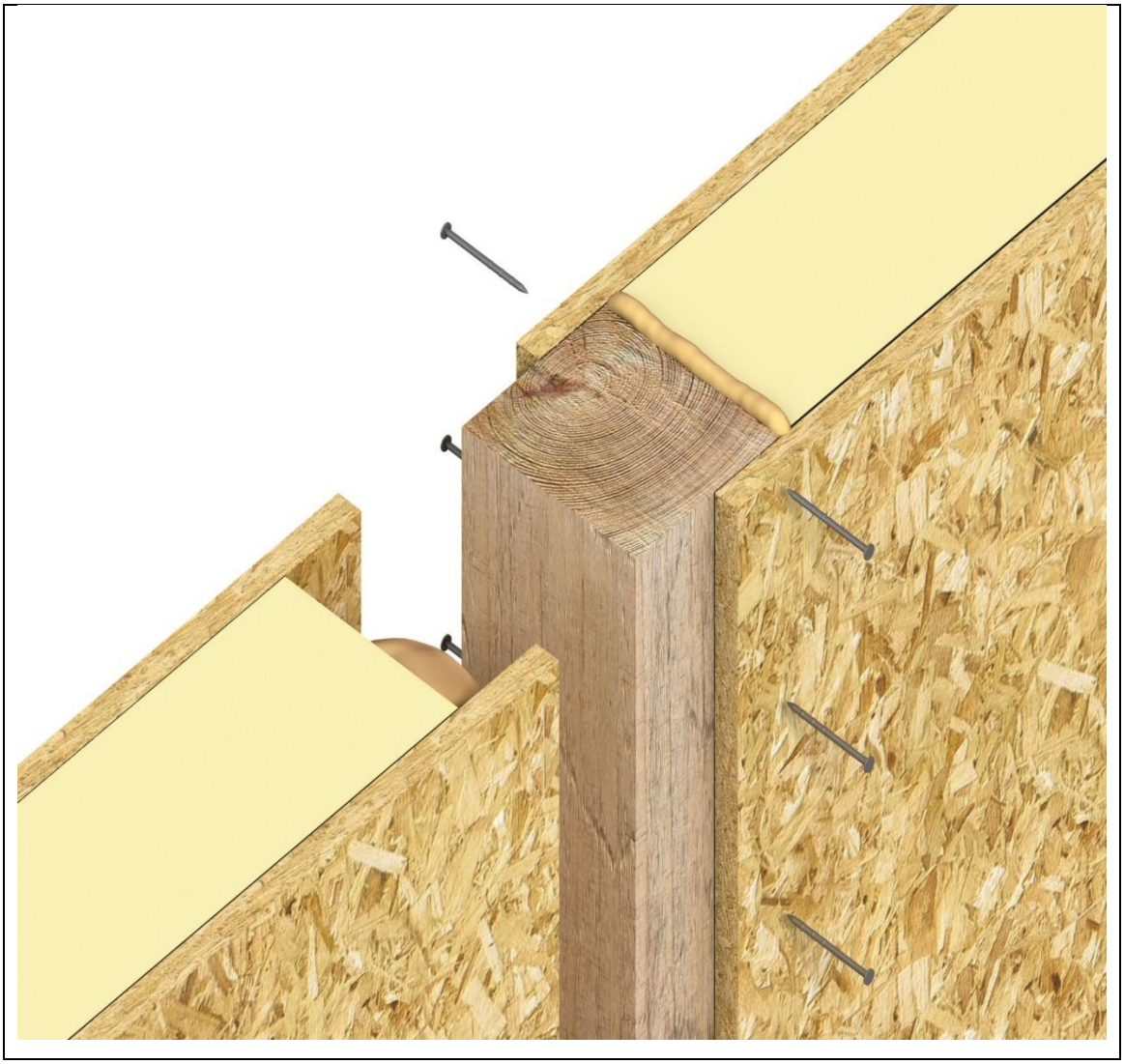
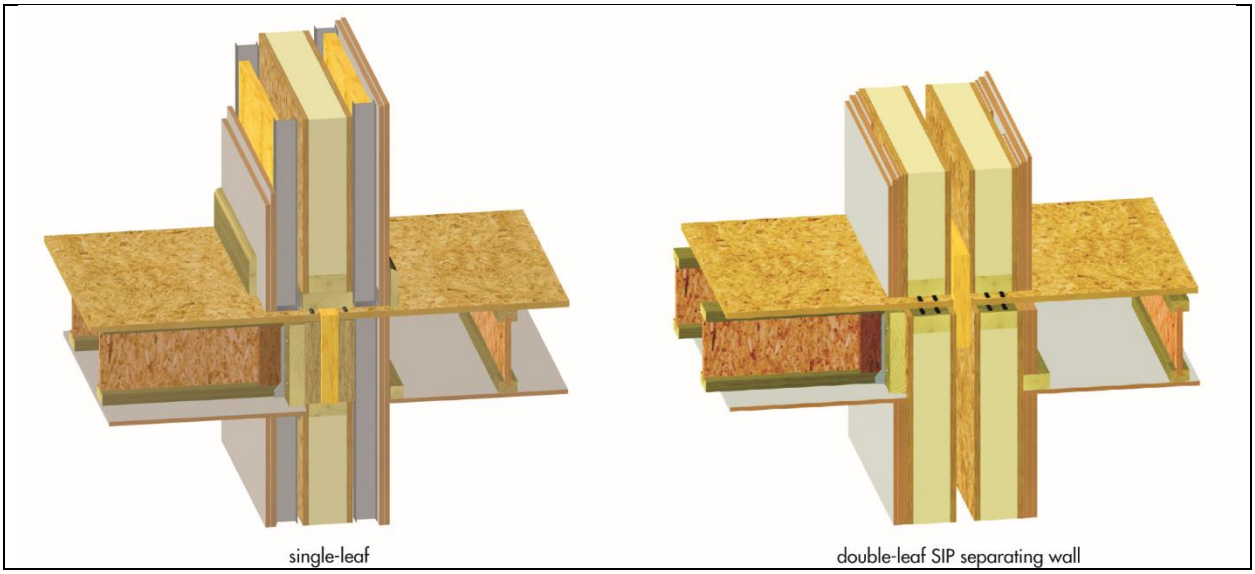


Figure 3 Separating wall details



ANNEX B DESIGN LOAD TABLES FOR KINGSPAN TEK 142 AND TEK 172 WALL AND ROOF PANELS

Table B1 Structural properties – limit state design(1) – TEK 142

Strength (per metre width of panel)		**Duration of load**				
		Permanent	**Long**	**Medium**	**Short**	**Instantaneous**
Bending strength perpendicular to plane of the panel(2) (M_{Rd})	kN·m	4.48	5.97	8.21	10.4	13.4
Shear strength(2) (V_{Rd})	kN	3.81	7.62	11.4	15.2	15.2
Bearing strength perpendicular to plane of the panel(3) (B) min. 45 mm bearing	kN	3.66	7.32	11.0	14.6	14.6
Axial strength (N)(10)						
wall height <2400 mm	kN	38.5	50.8	57.9	64.7	78.1
wall height 2400 – 2700 mm	kN	33.4	44.4	57.9	64.7	78.1
wall height 2700 – 3000 mm	kN	29.0	38.8	57.9	64.7	78.1
wall height 3000 – 3500 mm	kN	23.3	31.4	47.6	64.7	78.1
wall height 3500 – 4000 mm	kN	18.9	25.7	39.3	64.7	78.1
wall height 4000 – 4800 mm	kN	14.0	19.2	29.6	50.4	62.6
Racking strength(4)(5)(6) (R) with ø2.8 x 63 mm smooth nails to each face						
75 mm nail centres	kN	N/A	N/A	N/A	8.89	10.9
100 mm nail centres	kN	N/A	N/A	N/A	7.42	9.07
150 mm nail centres	kN	N/A	N/A	N/A	5.58	6.82
Stiffness (per metre width of panel)(7)(8)(9)						
El_{inst}	N·mm²	4.60E+11				
Deformation factor due to bending ($k_{def, EI}$)	–	1.87				
GA_{inst}	N	5.70E+05				
Deformation factor due to shear ($k_{def, GA}$)	–	6.45				

(1) The strength values in this Table are design values that should be compared to the worst loading case at the Ultimate Limit State (ULS)

(2) When checking a panel under combined loading (axial + bending), the interaction formula $N_{Ed} / N_{Rd} + M_{Ed} / M_{Rd} \leq 1.0$ (where N_{Ed} and M_{Ed} are calculated from design loads, and N_{Rd} and M_{Rd} are taken from the values in the above Table). The deflection of the panel should also be checked to ensure it is within appropriate limits

(3) The bearing strength (B) should be used where a panel spans continuously over a central support. The bearing strength at an end support should be resisted by including an edge timber in the panel at the support

(4) Racking resistance is influenced by the spacing of fixing nails around the perimeter (minimum 50 mm, maximum 150 mm). The racking resistance for other nail spacing can be calculated – the Certificate holder's advice should be sought

(5) Racking resistance was calculated according to EN 1991-1-1, Method B. The fixing spacing factor (k_s) is included in the racking resistance values, but the wall shape factor (k_d) and the load factor ($k_{i,q}$) must be applied to the strength values

(6) The dimension of nails given for the racking resistance relates to machine-driven nails with tensile strength of 600N·mm^{-2}. The capacity of other fixings can be calculated in accordance with EN 1995-1-1, Method B

(7) The stiffness values and deflection factors must be used to calculate the instantaneous and final deflection according to EN 1995-1-1

(8) The deflection due to shear must be taken into account

(9) An appropriate deflection limit should be defined for each project on a case-by-case basis

(10) Structural insulated panels transfer any in-plane forces through the OSB/3 outer skin. The facing OSB/3 skin is to be fully supported on both faces of the panel, typically bearing directly on the top and bottom sill.

2. *Table B2 Structural properties – limit state design(1) - TEK 172*

Strength (per metre width of panel)		**Duration of load**				
		Permanent	**Long**	**Medium**	**Short**	**Instantaneous**
Bending strength perpendicular to plane of the panel(2) (M_{Rd})	kN·m	5.53	5.97	8.21	10.4	13.4
Shear strength(2) (V_{Rd})	kN	4.71	9.42	14.1	18.8	18.8
Bearing strength perpendicular to plane of the panel(3) (B) min. 45 mm bearing	kN	3.66	7.32	11.0	14.6	14.6
Axial strength (N)(10)						
wall height <2400 mm	kN	43.4	51.2	57.9	64.7	78.1
wall height 2400 – 2700 mm	kN	43.4	51.2	57.9	64.7	78.1
wall height 2700 – 3000 mm	kN	40.0	51.2	57.9	64.7	78.1
wall height 3000 – 3500 mm	kN	32.7	43.8	57.9	64.7	78.1
wall height 3500 – 4000 mm	kN	27.0	36.4	55.2	64.7	78.1
wall height 4000 – 4800 mm	kN	20.4	27.7	42.4	64.7	78.1
Racking strength(4)(5)(6) (R) with ø2.8 x 63 mm smooth nails to each face						
75 mm nail centres	kN	N/A	N/A	N/A	8.89	10.9
100 mm nail centres	kN	N/A	N/A	N/A	7.42	9.07
150 mm nail centres	kN	N/A	N/A	N/A	5.58	6.82
Stiffness (per metre width of panel)(7)(8)(9)						
El_{inst}	N·mm^2	7.02 E+11				
Deformation factor due to bending ($k_{def, EI}$)	–	1.87				
GA_{inst}	N	6.89E+05				
Deformation factor due to shear ($k_{def, GA}$)	–	6.45				

(1) The strength values in this Table are design values that should be compared to the worst loading case at the ULS

(2) When checking a panel under combined loading (axial + bending), the interaction formula $N_{Ed} / N_{Rd} + M_{Ed} / M_{Rd} \leq 1.0$ (where N_{Ed} and M_{Ed} are calculated from design loads and N_{Rd} and M_{Rd} are taken from the values in the above Table). The deflection of the panel should also be checked to ensure it is within appropriate limits

(3) The bearing strength (B) should be used where a panel spans continuously over a central support. The bearing strength at an end support should be resisted by including an edge timber in the panel at the support

(4) Racking resistance is influenced by the spacing of fixing nails around the perimeter (minimum 50 mm, maximum 150 mm). The racking resistance for other nail spacing can be calculated – the Certificate holder's advice should be sought

(5) Racking resistance was calculated according to EN 1991-1-1, Method B. The fixing spacing factor (k_s) is included in the racking resistance values, but the wall shape factor (k_d) and the load factor ($k_{i,q}$) must be applied to the strength values

(6) The dimension of nails given for the racking resistance relates to machine-driven nails with tensile strength of 600N·mm^{-2}. The capacity of other fixings can be calculated in accordance with EN 1995-1-1, Method B

(7) The stiffness values and deflection factors must be used to calculate the instantaneous and final deflection according to EN 1995-1-1

(8) The deflection due to shear must be taken into account

(9) An appropriate deflection limit should be defined for each project on a case-by-case basis

(10) Structural insulated panels transfer any in-plane forces through the OSB/3 outer skin. The facing OSB/3 skin is to be fully supported on both faces of the panel, typically bearing directly on the top and bottom sill.

ANNEX C THERMAL DATA

The thermal conductivities (λ values) given in Table C1 may be used to conduct thermal transmittance (U value) calculations in accordance with EN ISO 6946.

Table C1 Thermal conductivity of associated materials

Material	**λ value ($W \cdot m^{-1} \cdot K^{-1}$)**
Plasterboard	0.25
Timber	0.13
PUR insulation(1)	0.024(2)
OSB/3	0.13

(1) Rigid urethane insulation.

(2) This value is determined in accordance with EN 12667 and declared in accordance with EN 13165.