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European Technical Assessment

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General Part

Technical Assessment Body issuing the European Technical Assessment:
Technický a skúšobný ústav stavebný, n. o.

Trade name of the construction Product

SIP panels SERVUS UKRAINE

Product family to which the construction product belongs

Product area code: 14
WOOD BASED PANELS AND ELEMENTS

Manufacturer

Trading House SERVUS Ltd.
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Manufacturing plant

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This European Technical Assessment contains

16 pages including 4 Annexes which form an integral part of this assessment.

This European Technical Assessment is issued in accordance with Article 95(4) of Regulation (EU) 2024/3110, on the basis of

EAD 140022-00-0304
Prefabricated wood-based loadbearing stressed skin panels

This version replaces

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Specific parts

1 Technical description of the product

Panels are manufactured in nominal thicknesses 120 mm, 170 mm, 210 mm and 270 mm. Skins of panels are made of 15 mm thick OSB/3 or OSB/4 oriented strand boards. The core of panels is made of expanded polystyrene (EPS) or expanded polystyrene with graphite (grey EPS). Width of standard panels ranges from 625 mm to 1 250 mm. Maximum length (or height in case of walls) of standard panels is 3 000 mm. Skin boards are glued to insulation core by one component polyurethane adhesive for structural use, type I according to EN 15425, subclasses GP or SP.

Detailed composition of panels and components such as joints are described in Annex 1. Detailed material specifications are given in Annex 2.

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

2.1 Intended use

Panels are intended for use in timber structures subject to service classes 1 and 2 according to EN 1995-1-1.

“SIP panels SERVUS UKRAINE” are intended for use in single or multiple-storey constructions as load-bearing external walls, loadbearing internal walls, separating walls, loadbearing inner leafs of external walls, loadbearing floor panels and loadbearing panels of flat or pitched roofs.

The product should be protected by a weather resistant outer cladding layer when used in external walls or roofs.

Panels can be also used as infill panels in frame constructions.

Suitability for the intended use is considered individually according to the standards and law regulations valid in the country of panels use.

2.2 Intended working life of the construction product

Provisions made in this European Technical Assessment are based on an assumed intended working life of panels of 50 years.

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

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

3.1 Mechanical resistance and stiffness in general (BWR 1)

The load-carrying capacities have been calculated in accordance with EN 1995-1-1 and EAD 140022-00-0304. The data 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 an appropriate national code. Additional strength of panels can be achieved by using structural engineering principles and introducing structural members such as ribs or posts within panels.

3.1.1 Bending strength perpendicular to the skin

Design load-carrying capacities for wall panels are given in Annex 3, Table 6.

Design load-carrying capacities for the floors and ceilings are given in Annex 3, Table 8.

3.1.2 Compression strength parallel to the skin

Design load-carrying capacities for the wall panels are given in Annex 3, Table 6.

3.1.3 Compression strength perpendicular to the skin

No performance assessed.

3.1.4 Shear strength perpendicular to the skin

No performance assessed.

3.1.5 Racking resistance

Racking resistance of wall panels are given in Annex 3, Table 6.

3.1.6 Resistance to concentrated loads

No performance assessed.

3.1.7 Density of the components

Characteristic values of the density of the components are given in Annex 2, Table 4.

3.1.8 Creep and duration of the load

Parameters k_{mod} and k_{def} according to EN 1995-1-1 for OSB/3 board are given in Table 1 and for structural timber in Table 2.

Parameters k_{mod} and k_{def} for EPS according to EAD 140022-00-0304, Annex A are given in Table 3.

Table 1 – Parameters k_{mod} and k_{def} for OSB/3 board

Parameter	Duration of load	Service class 1	Service class 2
k_{mod}	Instantaneous	1,10	0,90
	Shor-term	0,90	0,70
	Medium-term	0,70	0,55
	Long-term	0,50	0,40
	Permanent	0,40	0,30
k_{def}	-	1,50	2,25

Table 2 – Parameters k_{mod} and k_{def} for structural timber

Parameter	Duration of load	Service class 1	Service class 2
k_{mod}	Instantaneous	1,10	1,10
	Shor-term	0,90	0,90
	Medium-term	0,80	0,80
	Long-term	0,70	0,70
	Permanent	0,60	0,60
k_{def}	-	0,60	0,80

Table 3 – Parameters k_{mod} and k_{def} for EPS

Parameter	Duration of load	Service class 1	Service class 2
k_{mod}	Instantaneous	0,25	0,25
	Shor-term	0,50	0,50
	Medium-term	0,75	0,75
	Long-term	1,00	1,00
	Permanent	1,00	1,00
k_{def}	-	7,00	7,00

3.1.9 Dimensional stability

Production tolerances of the SIP panels SERVUS UKRAINE are given in Annex 1. No performance assessed for swelling and shrinkage.

3.2 Safety in case of fire (BWR 2)

3.2.1 Reaction to fire

The classification of the materials and components according to EN 13501-1 is given in Annex 2, Table 4. Those materials which are deemed to satisfy all requirements for the performance characteristic without need for testing according to Commission Decisions are given in Annex 2 with reference to the related Commission Decision.

3.2.2 Resistance to fire

No performance assessed.

3.3 Hygiene, health and environment (BWR 3)

3.3.1 Content, emission and release of dangerous substances

No performance assessed for identified intended release scenarios for the kits and intended use with respect to dangerous substances:

- IA2: Product with indirect contact to indoor air (e.g. covered products) but possible impact on indoor air.

Formaldehyde emission of OSB boards is assessed as class E1. Adhesive and insulation core contain no formaldehyde. Release of pentachlorophenol (PCP) of OSB boards is less than 3 ppm.

Chemically treated wood will be used only if national legislation demands it. Any chemically treated wood or wood-based products shall follow national provisions and provisions of the biocide directives.

3.3.2 Water vapour permeability and moisture resistance

No performance assessed for external envelope and internal surfaces. The water vapour resistance factors μ (-) of the SIP panel components are given in Annex 2, Table 4.

3.4 Safety in use (BWR 4)

3.4.1 Impact and shock resistance

Wall and floor SIP panels SERVUS UKRAINE with axial spacing of ribs $e \leq 625$ mm have satisfactory impact and shock resistance for normal use in residential housing, office buildings, etc. No performance assessed for wall and floor panels with axial spacing of ribs $e \geq 625$ mm.

3.5 Protection against noise (BWR 5)

3.5.1 Airborne sound insulation

No performance assessed.

3.5.2 Impact sound insulation

No performance assessed.

3.5.3 Sound absorption

No performance assessed.

3.6 Energy economy and heat retention (BWR 6)

3.6.1 Thermal conductivity

Thermal conductivity of the components is given in Annex 2, Table 4.

3.6.2 Air permeability

No performance assessed.

3.6.3 Thermal inertia

No performance assessed.

3.7 Natural durability

Panels can be used in service classes 1 and 2 according to EN 1995-1-1 and EN 335. The products may be exposed directly to the weather for a short time during installation. OSB/3 and OSB/4 boards were assessed to have satisfactory durability for intended use in use classes 1 and 2 according to EN 335. Natural durability of timber components according to EN 350 is given in Annex 4, Table 11. Minimal requirements for corrosion protection of mechanical fasteners is given in Annex 4, Table 12.

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

The AVCP system 1 is applied (further described in Annex V to Regulation (EU) No 305/2011).

The manufacturer shall draw up the declaration of performance and determine the product-type on the basis of the assessments and verifications of constancy of performance carried out under the system 1 on the basis of:

- (a) The manufacturer shall carry out:
 - (1) Factory production control;
 - (2) Further testing of samples taken at the manufacturing plant by the manufacturer in accordance with the prescribed test plan.
- (b) The notified product certification body shall decide on the issuing, restriction, suspension or withdrawal of the certificate of constancy of performance of the construction product on the basis of the outcome of the following assessments and verifications carried out by that body:
 - (3) An assessment of the performance of the construction product carried out on the basis of testing (including sampling), calculation, tabulated values or descriptive documentation of the product;
 - (4) Initial inspection of the manufacturing plant and of factory production control;
 - (5) Continuous surveillance, assessment and evaluation of factory production control.

Continuous surveillance, assessment and evaluation of factory production control have to be performed at least twice a year.

5. Additional requirements for SIP panels SERVUS UKRAINE

5.1 Control plan and factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures. This production control system shall insure that the product is in conformity with this European Technical Assessment.

The manufacturer shall use only the materials stated in the technical documentation¹ of this European Technical Assessment. The factory production control shall be in accordance with the control plan which is part of the technical documentation of this European Technical Assessment.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

¹ The technical documentation of this European Technical Assessment has been deposited at TSÚS.

5.2 Manufacturing

SIP panels SERVUS UKRAINE are manufactured in accordance with the provisions of European Technical Assessment using the manufacturing process as identified in the inspection of the manufacturing plant and factory production control by the notified body and laid down in the technical documentation.

5.3 CE marking

The CE marking shall be affixed visibly, legibly and indelibly to the panel or to a label attached to it. Where this is not possible or not warranted on account of the nature of the panel, it shall be affixed to the packaging or to the accompanying documents.

The CE marking shall be followed by:

- two last digits of the year in which it was first affixed;
- name and the registered address of the manufacturer, or the identifying mark allowing identification of the name and address of the manufacturer easily and without any ambiguity;
- unique identification code of the product-type;
- reference number of the declaration of performance;
- level or class of the performance declared;
- reference to the harmonised technical specification applied (number of the ETA);
- identification number of the notified body;
- intended use as laid down in the harmonised technical specification applied.

Manufacturer prefers to mark products in accompanying documentation.

5.4 Packing, transport and storage

The manufacturer's manual for the packaging, transport and storage of panels shall be followed.

Panels and their components shall be protected from weather exposure and mechanical damage during transportation and storage.

Panels and their components cannot be lifted or stored in such a way that will cause damage or excessive deformation to them.

5.5 Installation

Panels and their components shall be checked before installation that they have not been damaged during transportation or storage. Damaged components and materials shall be replaced by good ones.

The installation guide prepared by the manufacturer shall be followed. Installation guide shall contain all important aspects such as:

- assembly methods and necessary equipment;
- standard assembly joints and special joints;
- completion of joints between panels and components (structural fixing, weather sealing, etc.);
- additional materials and components applied on the site, which are a precondition for the fitness of use;
- details of stiffening of panels;
- requirements related to the foundations;
- protection against weather during installation.

5.6 Use, maintenance, repair

It is the responsibility of the manufacturer to ensure that each delivery contains proper information for the use maintenance and repairs of panels and their components on the basis of the European Technical Assessment.

Panels shall be regularly inspected and maintained in accordance with maintenance instructions which should be available on a manufacturer's website or shipped with each delivery.

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Annexes

- Annex 1 Details of SIP panels SERVUS UKRAINE
- Annex 2 Specifications of materials and components
- Annex 3 Load capacities of the SIP panels SERVUS UKRAINE
- Annex 4 Durability of timber and use classes for components and fasteners

Annex 1

Details of SIP panels SERVUS UKRAINE

“SIP panels SERVUS UKRAINE” are made of insulation core and outer skin. The core of standard panel is made of expanded polystyrene EPS 70 or EPS 70 with graphite. Skin of the panel is made of 15 mm thick OSB/3 or OSB/4. Skin is area-wide glued to the insulation core by one component polyurethane glue for structural use, type I according to EN 15425, subclasses GP or SP. Glue must be suitable at least for use class 2 or higher. Standard dimensions of the panels are given in Figure 1. It is possible to use also other different dimensions of “SIP panels SERVUS UKRAINE”.

Dimensions in mm

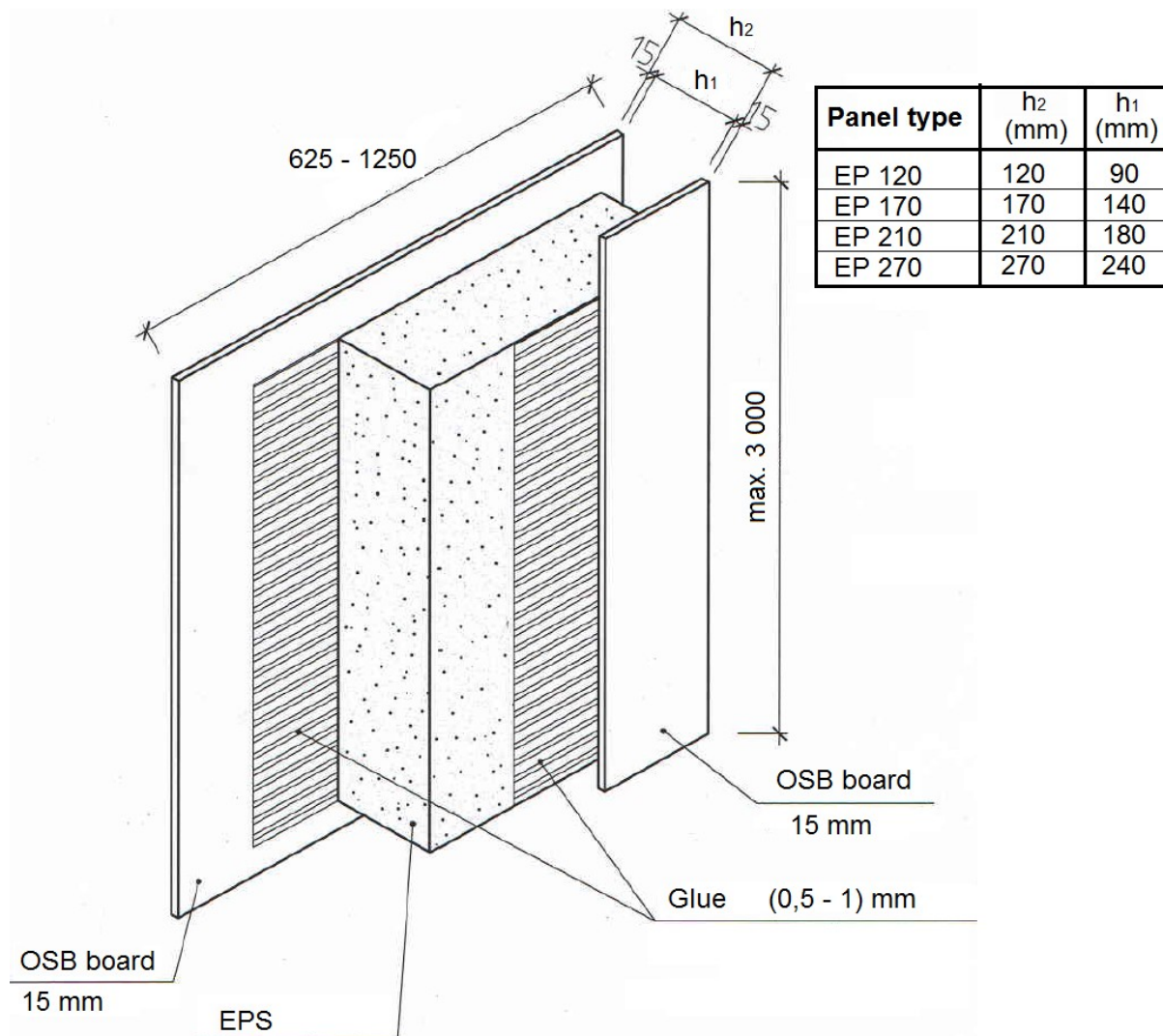


Figure 1 – Standard format of the SIP panels with OSB/3 or OSB/4 skins

Production tolerances of SIP panels SERVUS UKRAINE:

SIP panels SERVUS UKRAINE dimensions:

length ± 5 mm
height ± 5 mm
thickness ± 5 mm
grooves and other cuttings ± 3 mm

Building openings in SIP panels SERVUS UKRAINE:

width ± 3 mm
height ± 3 mm

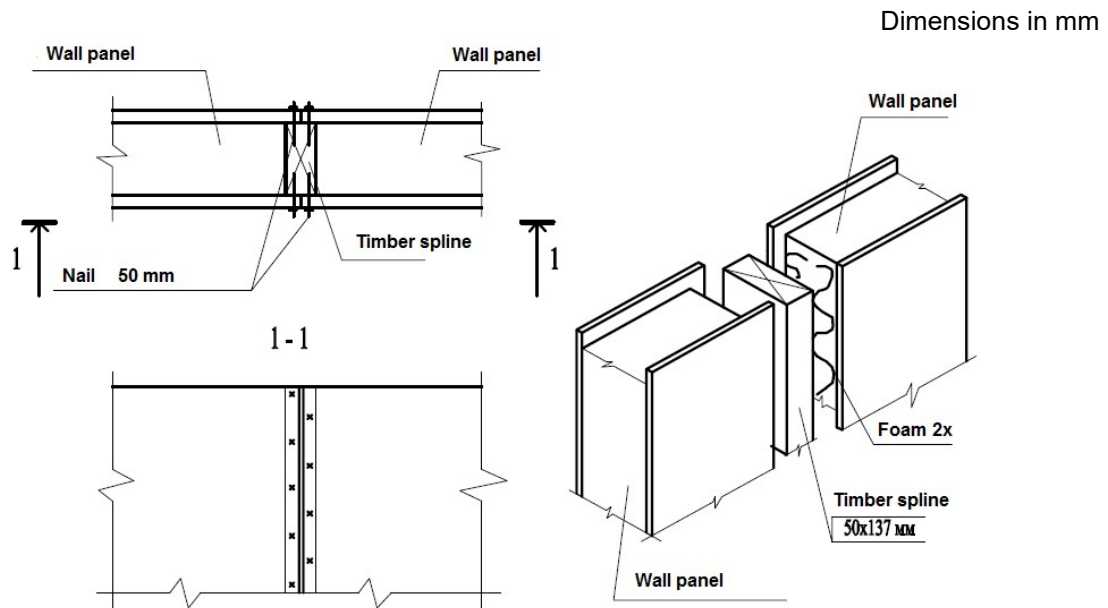


Figure 2 – Connection of SIP panels SERVUS UKRAINE

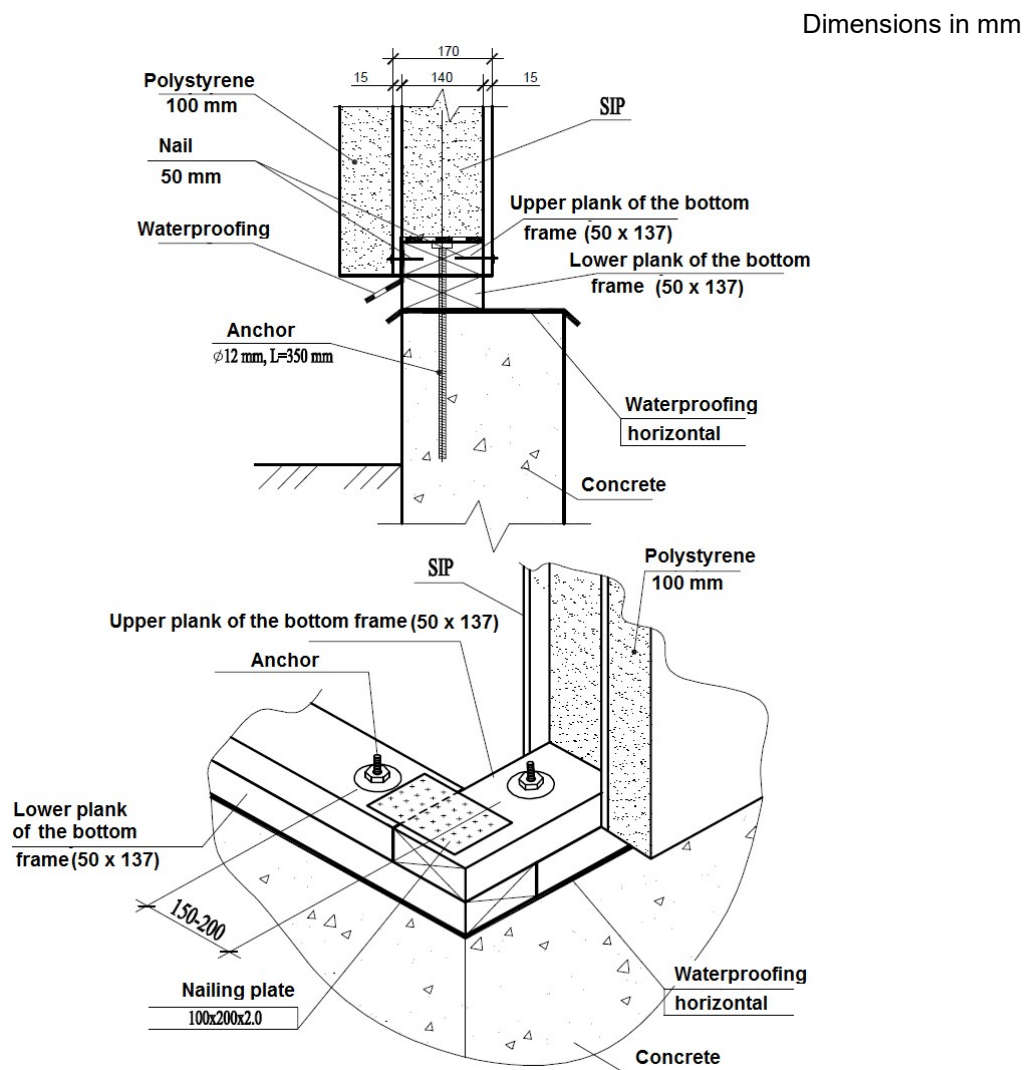


Figure 3 – Junction of wall made of SIP panels SERVUS UKRAINE to concrete base plate

Annex 2

Specifications of materials and components

Table 4 – Specifications of materials and components

Component/ Material	Technical specification	Class	Density (kg/m ³)	Formaldehyde release class	Water vapour resistance factor μ (-)	Reaction to fire class	
Structural timber with rectangular cross section	EN 14081-1 EN 338 EN 1912	C24 or better, $\lambda = 0,130^{2)}$ W/(m·K)	according to EN 338	–	50 (dry) 20 (wet)	D-s2, d0	Commission Decision 2003/43/EC ³⁾
Structural finger jointed solid timber	EN 15497	C24 or better, $\lambda = 0,130^{2)}$ W/(m·K)	according to EN 338	E1	50 (dry) 20 (wet)	D-s2, d0	Commission Decision 2003/43/EC ³⁾
OSB boards	EN 300 EN 13986	OSB/3, OSB/4 $\lambda = 0,130^{2)}$ W/(m·K)	≥ 600	E1	200 (dry) 150 (wet)	D-s2, d0	Commission Decision 2003/43/EC ³⁾
Expanded polystyrene (EPS)	EN 13163	EPS 70 or better $\lambda_D = 0,039^{5)}$ W/(m·K)	≥ 16	–	30 to 70	E	EN 13501-1
Expanded polystyrene (EPS) with graphite	EN 13163	EPS 70 or better $\lambda_D = 0,032^{5)}$ W/(m·K)	≥ 16	–	30 to 70	E	EN 13501-1
One component polyurethane adhesive for structural use	EN 15425	For use in service class 2 or higher according to EN 1995-1-1; Type I, subclasses GP or SP according to EN 15425		–	–	No performance assessed	
Nails, screws for wood and other steel mechanical fasteners ⁵⁾	According to manufacturer specification	–	–	–	–	A1	Commission Decision 96/603/EC ⁴⁾
¹⁾ Amended by Commission Decisions 2003/593/EC, 2006/673/EC and 2007/348/EC. ²⁾ According to EN ISO 10456. ³⁾ Amended by Commission Decisions 2003/593/EC, 2006/673/EC and 2007/348/EC. ⁴⁾ Amended by Commission Decisions 2000/605/EC and 2003/424/EC. ⁵⁾ λ_D – declared value of coefficient of thermal conductivity.							

Table 5 – Mechanical properties of insulation core of the SIP panels SERVUS UKRAINE

Material	Compression strength f_{ck} (N/mm ²)	Tension strength f_{tk} (N/mm ²)	Shear strength f_{vk} (N/mm ²)	Stiffness modulus $E_{t(c),mean}$ (N/mm ²)	Stiffness modulus G_{mean} (N/mm ²)
EPS 100	0,100	0,150	0,075	6	2,73
EPS 70	0,070	0,115	0,055	4,5	2,05

Annex 3

Load capacities of the SIP panels SERVUS UKRAINE

The mechanical resistance is given for the panels with undivided OSB/3 skin and EPS 70 core. The skin must be area-wide glued to the core by appropriate glue for structural use in at least use class 2 or higher.

Walls

Load values for perimeter walls are calculated for service class 2 according to EN 1995-1-1. Height L_{max} of the SIP panel wall used in calculation is 2 800 mm. Mechanical properties of insulation core used in the calculation model are given in ETA Annex 2, Table 5. SIP panels connected with timber ribs are used in the calculation model.

Load values are design values according to EN 1995-1-1 and related EN standards. OSB/3 characteristic values according to EN 12369-1. Strength class of timber members is C24 according to EN 338.

Given modification, deformation and partial factors (k_{mod} , k_{def} , γ_m) shall be used in accordance to EN 1995-1-1, taking in account load duration and corresponding service class.

Table 6 – Mechanical resistance of the SIP panels used in perimeter wall constructions

SIP panel type	Timber splines spacing e (mm)	Loads – design values				
		Medium term in vertical direction E_d (kN/m)	Combination of loads		Short term perpendicular to wall w_d (kN/m ²)	Short term, Racking resistance $F_{v,Ed}$ (kN)
			Medium term in vertical direction E_d (kN/m)	Short term load perpendicular to wall w_d (kN/m ²)		
EP 120	625	44,093	39,093	2,250	3,000	2,450
	1 250	39,093	20,093	1,350	1,605	2,450
EP 170	625	68,998	58,998	4,125	4,500	2,450
	1 250	48,998	43,998	2,250	2,625	2,450
EP 210	625	83,866	73,866	5,550	6,000	2,450
	1 250	53,998	51,998	3,300	3,600	2,450
EP 270	625	90,809	83,809	7,500	8,250	2,450
	1 250	54,109	54,109	5,250	5,250	2,450
NOTE 1 Given values are valid for wall height $h = 2\,800$ mm.						
NOTE 2 Loadbearing capacities are determined for use class 2.						
NOTE 3 Values for short term load perpendicular to wall w_d are valid in case of fulfilling the maximum spacing between anchors of perimeter wall $e_{kot,max}$, see Table 7 and Figure 7.						
NOTE 4 The design values stated in this table are calculated using the modification factors, deformation factors and partial factors for material properties according to EN 1995-1-1 and EAD 140022-00-0304. These factors may differ between the member states, so that other design values apply in those member states. Modification factors and deformation factors for components of panels used in calculation are stated in ETA, clause 3.1.8.						

Table 7 – Maximum spacing between anchors of perimeter wall

SIP panel type	Wall thickness (mm)	Timber splines spacing, e (mm)	Maximum spacing between anchors, $e_{kot,max}$ (mm)
EP 120	120	625	830
		1 250	1 000
EP 170	170	625	550
		1 250	950
EP 210	210	625	410
		1 250	690
EP 270	270	625	300
		1 250	470

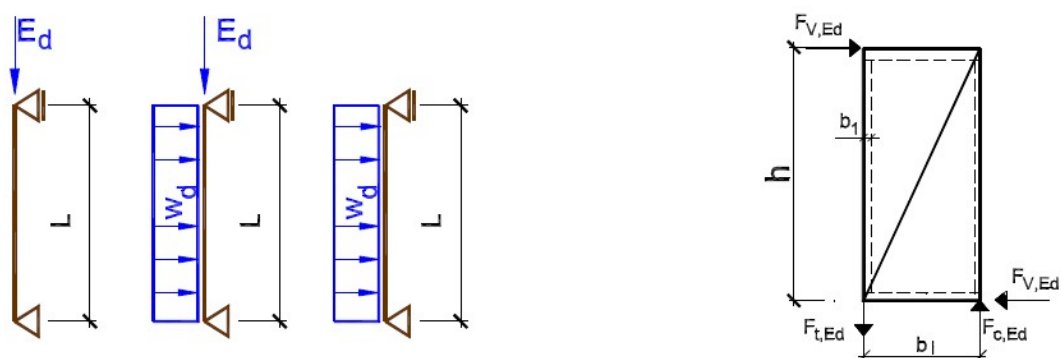


Figure 4 – Loads and their combinations for panels used in wall constructions

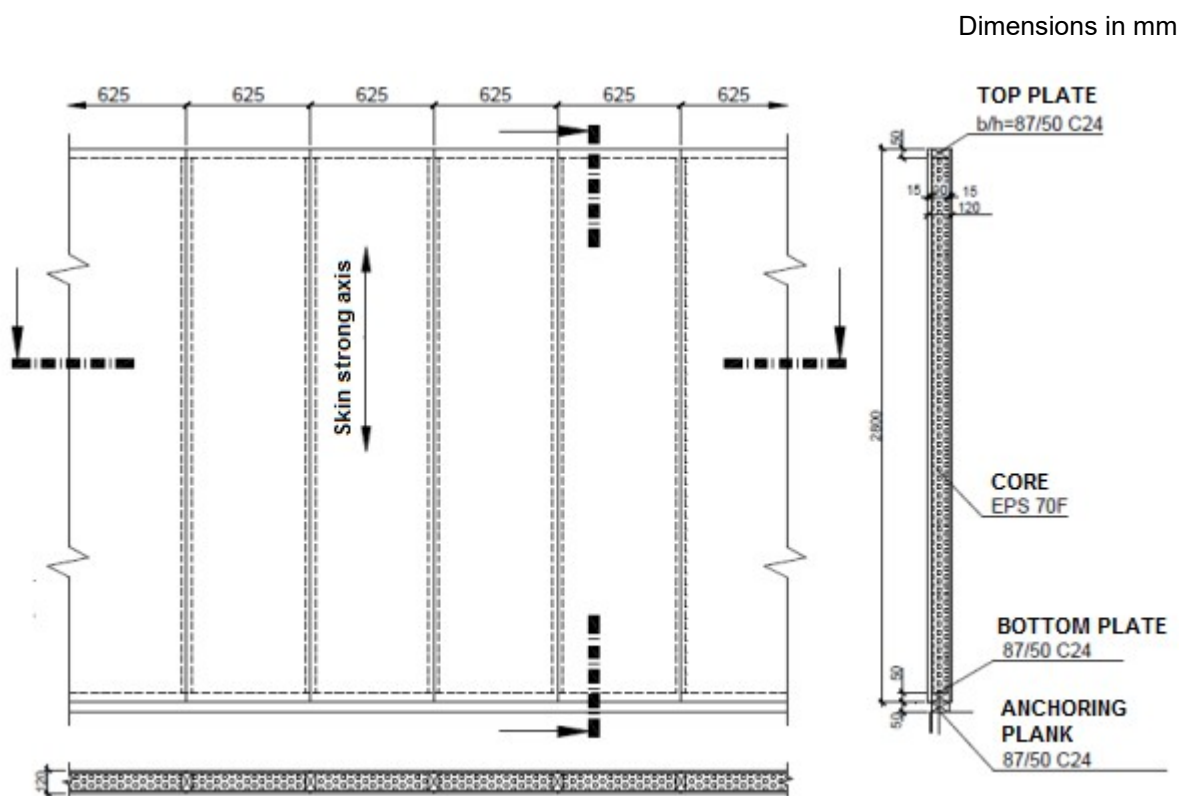


Figure 5 – Static scheme of perimeter wall with SIP panels EP 120, timber splines spacing $e = 625$ mm

Dimensions in mm

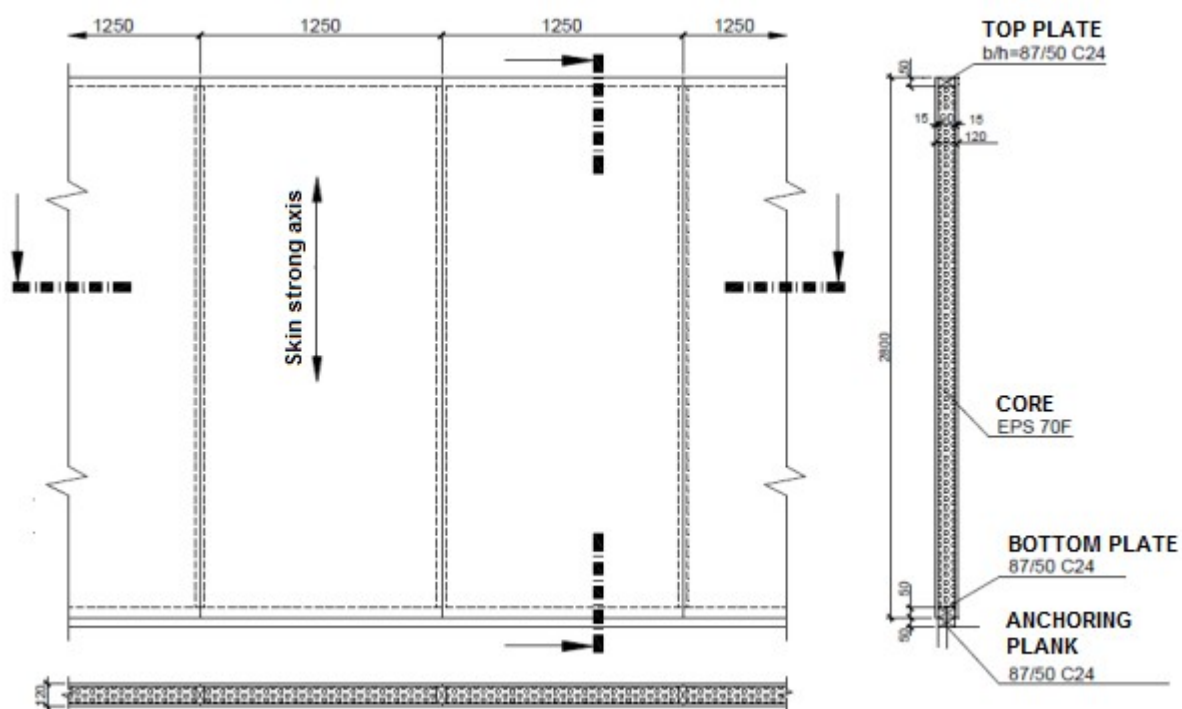


Figure 6 – Static scheme of perimeter wall with SIP panels EP 120, timber splines spacing $e = 1250$ mm

Dimensions in mm

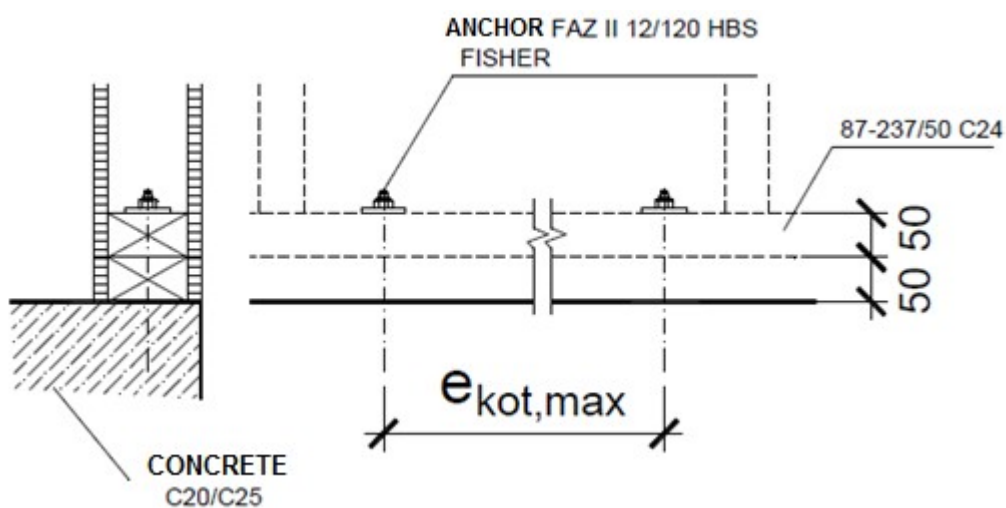


Figure 7 – Anchoring of perimeter wall

Floors

Load values of floors are calculated for service class 1 according to EN 1995-1-1. Maximum span between supports is 6 000 mm. Calculation model is valid for floors made of SIP panels SERVUS UKRAINE and timber beams. Mechanical properties of insulation core used in the calculation model are given in ETA Annex 2, Table 5. SIP panels connected with timber ribs are used in the calculation model.

Load values are design values according to EN 1995-1-1 and related standards. Self-load of the panel is included in calculation. OSB/3 characteristic values according to EN 12369-1. Strength class of timber members is C24 according to EN 338.

Given modification, deformation and partial factors (k_{mod} , k_{def} , γ_m) shall be used in accordance to EN 1995-1-1, taking in account load duration and corresponding service class.

Table 8 – Mechanical resistance of the floors made of SIP panels and floor beams

SIP panel type	Span L (mm)	Floor beam spacing e (mm)	Medium term load in vertical direction E_d (kN/m)
EP 120 EP 170 EP 210 EP 270	4 200	600	4,87
	4 200	550	5,14
	4 600	500	4,39
	4 850	450	4,19
	5 150	400	3,92
	5 400	350	3,79
	5 650	300	3,79
	6 000	250	3,79
NOTE 1 Strength class of floor beams used in calculation is C24.			
NOTE 2 Geometrical details of beams used in calculation are given in Figure 9.			
NOTE 3 The design values stated in this table are calculated using the modification factors, deformation factors and partial factors for material properties according to EN 1995-1-1 and EAD 140022-00-0304. These factors may differ between the member states, so that other design values apply in those member states. Modification factors and deformation factors for components of panels used in calculation are stated in ETA, clause 3.1.8.			

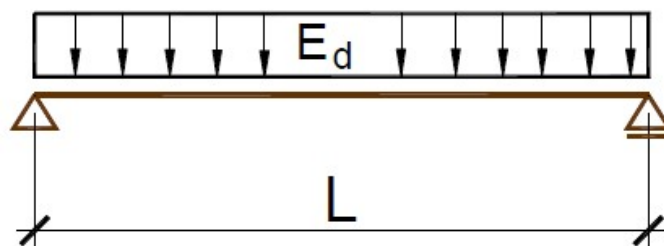


Figure 8 – Floor load

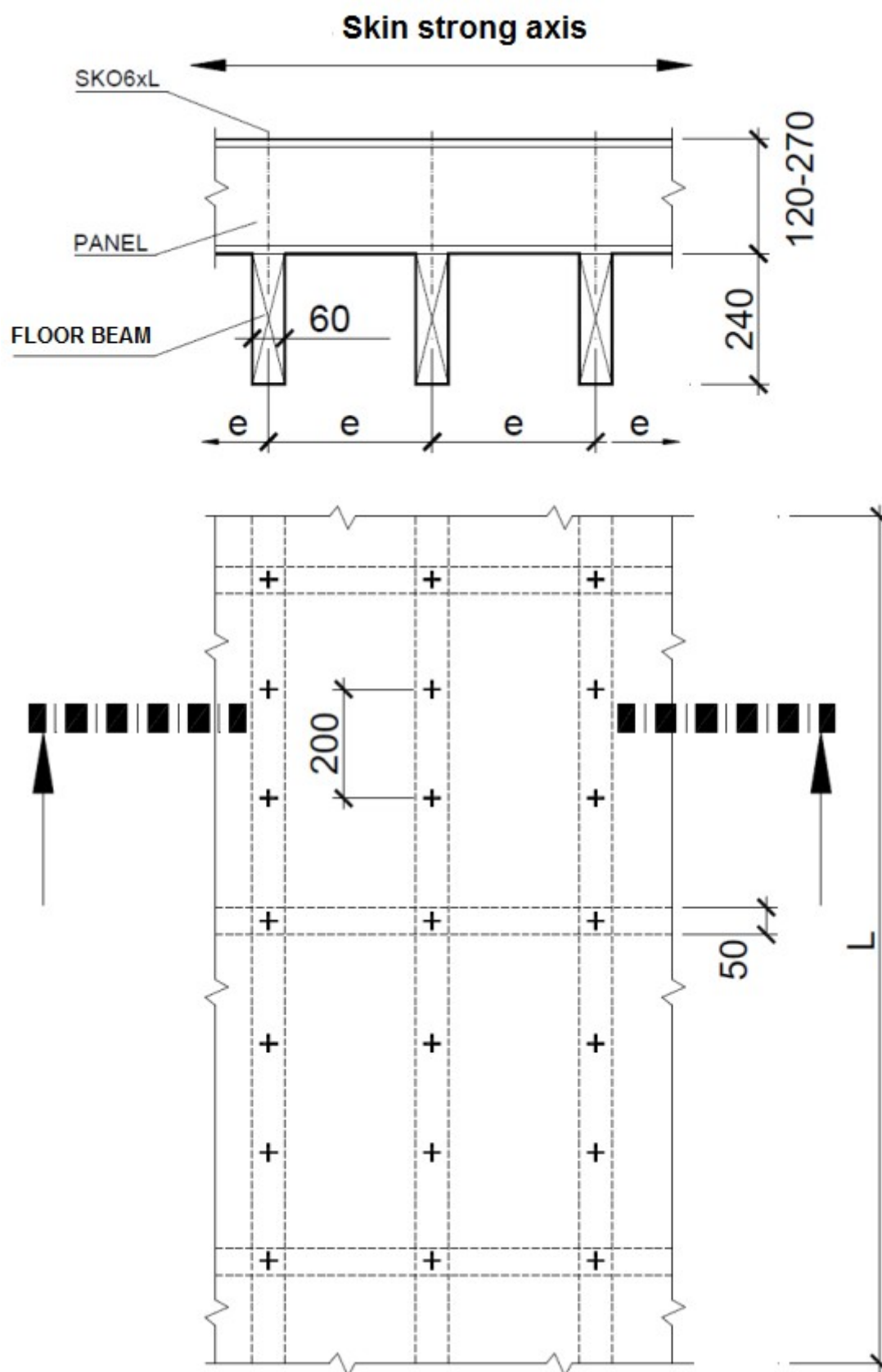


Figure 9 – Static scheme of floors made of SIP panels

Annex 4

Durability of timber and use classes for components and fasteners

Table 9 – Use classes according to EN 335

Type of component	Use class
SIP panels SERVUS UKRAINE used in internal partition walls or floors, load-bearing wood or wood-based components in internal partition walls or floors	1
SIP panels SERVUS UKRAINE used in perimeter walls or roofs, load-bearing wood or wood-based components in perimeter walls or roofs	2

Table 10 – Service class according to EN 1995-1-1 for fasteners used in SIP panels SERVUS UKRAINE

Type of component	Use class
Wall, floor, roof fixing on the inside of the thermal insulation	1
Wall, floor, roof fixing on the outside of the thermal insulation, but not exposed to direct weathering	2

Table 11 – Natural durability of the wood according EN 350

Species	Fungi	Hylotrupes	Anobium	Termites
Spruce (<i>Picea abies</i>)	4	S	S	S
Fir (<i>Abies alba</i>)	4	S	S	S
Pine (<i>Pinus sylvestris</i>)	3 - 4	D	D	S
Larch (<i>Larix decidua</i>)	3 - 4	D	D	S

Table 12 – Minimal requirements for common fasteners corrosion protection according to EN 1995-1-1 and EN ISO 2081

Component	Service class 1	Service class 2	Service class 3
Nails and screws with $d \leq 4$ mm	None	Fe/Zn 12c	Fe/Zn 25c ²⁾
Bolts, dowels, nails and screws with $d > 4$ mm	None	None	Fe/Zn 25c ²⁾
Staples	Fe/Zn 12c ²⁾	Fe/Zn 12c ²⁾	Stainless steel
If hot dip coating is used on dowel type fasteners, Fe/Zn 12C shall be replaced by a layer of zinc of minimum 39 µm and Fe/Zn 25C by a layer of zinc of minimum 49 µm in accordance with EN ISO 1461.			