



NOVATOP SWP
Technical documentation



NOVATOP 

TECHNICAL DOCUMENTATION

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ASSORTMENT

NOVATOP SWP – 3-layer solid wood panel

Spruce

Standard formats

■ Spruce Local ■ Spruce Nordic

Thickness Quality	14 mm (4-6-4)	16 mm(5-6-5)	19 mm (6-7-6)	21 mm (6-9-6)	27 mm (6-15-6)	27 mm (9-9-9)	32 mm (9-14-9)	42 mm (9-24-9)	50 mm (9-32-9)	60 mm (9-42-9)
Pcs. in packet	37	30	25	20	18	18	15	12	10	8
A/B										
A/C										
AB/B										
AB/C										
B/B										
B/C										
B/D										
C/C										
C/D										
D/D										

2,5 x 5	2,5 x 4	2,5 x 2,75*	2,5 x 2,5	2,1 x 5	2,1 x 4	2,1 x 2,75*	2,1 x 2,5
1,25 x 5	1,25 x 4	1,25 x 2,75*	1,25 x 2,5	1,04 x 5	1,04 x 4	1,04 x 2,75*	1,04 x 2,5

* Formats 2,75 m only local spruce to thickness 27 mm

Formats in length 6 m

Thickness Quality	19 mm (6-7-6)	21 mm (6-9-6)	27 mm (6-15-6)	27 mm (9-9-9)	32 mm (9-14-9)	42 mm (9-24-9)	50 mm (9-32-9)	60 mm (9-42-9)
Pcs. in packet	25	20	18	18	15	12	10	8
B/C								
B/D								
C/C								
C/D								

2,5 x 6	2,5 x 3	2,1 x 6	2,1 x 3	1,25 x 6	1,25 x 3	1,04 x 6	1,04 x 3
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Silver fir

Standard formats

Thickness Quality	19 mm (6-7-6)	27 mm (6-15-6)
Pcs. in packet	25	18
AB/C		

1,25 x 5	2,5 x 5	1,25 x 6	2,5 x 6
2,5 x 3	1,25 x 3		

Siberian larch

Standard formats

Thickness Quality	19 mm (6-7-6)	27 mm (9-9-9)
Pcs. in packet	25	18
AB/C		

1,04 x 5	1,25 x 5	2,1 x 5	2,5 x 5
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ASSORTMENT

NOVATOP STATIC – 5-layer solid wood panel

Spruce

Standard formats

Thickness Quality	45 mm (9-9-9-9-9)	60 mm (9-9-24-9-9)
Pcs. in packet	10	8
B/B		
B/C		
B/D		
C/C		
C/D		
D/D		

2,5 x 5	2,1 x 5	1,25 x 5	1,04 x 5
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2,5 x 6	2,1 x 6	1,25 x 6	1,04 x 6
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NOVATOP STATIC L
Longitudinal direction of the grain of the surface lamellas



NOVATOP STATIC Q
Transverse direction of the grain of the surface lamellas

TECHNICAL SPECIFICATIONS

NOVATOP SWP

NOVATOP SWP – Multi-layer solid wood panel	
Description	Multilayer panels NOVATOP SWP are made of coniferous sawnwood dried to 8% (larch 12%). Each layer of the panel consists of lamellas of massive solid wood. The three-layer panel consists of two outer layers and one middle layer with the fibres perpendicular to the course of the fibres of the surface layers. The five-layer panel has two parallel upper layers from each side and one middle layer with the fibres perpendicular to the course of the fibres of the surface layers. The thickness of the layers can differ and determines the final thickness of the panel. The lamellas of the middle layer are glued longitudinally, and lengthwise they are connected with the butted joint or they can be continuous. Their thickness is a maximum of 42 mm. The outer layers are made of continuous lamellas with a thickness of 6 or 9 mm and a width of 93–143 mm. On every panel, there is always the same width of the surface lamellas whose right side faces the surface. The longitudinal joints of the lamellas are glued together. The adhesive used is waterproof and the gluing of the surface lamellas corresponds with AW 100 or D4 according to EN 204. The quality of sanding corresponds to the grain size of 100 (coarser sanding is made to order).
Technical background	EN 13353  EN 13986 Ö-Norm B3022 DIN 68800
Technical classes of the panels	SWP/1 – solid wood panels for internal use in dry areas SWP/2 – solid wood panels for internal use in damp areas SWP/3 – solid wood panels for external use
Processed wood species	Local spruce, Nordic spruce, Siberian larch, Silver fir
Surface	All NOVATOP SWP panels sanded, with a grain size of 100 by default, rough surface with a grain size of 50 on request. The thickness tolerance for sanding is ± 0.2 mm.
Panel formats	The NOVATOP SWP is large-format sheet material according to EN 12775 made in standard sizes and construction according to the "Assortment tables". Dimensional tolerances according to EN 13353 Nominal width and length tolerance ± 2 mm Side perpendicularity: 1 mm/m Rectangularity: 1 mm/m
Surface lamella width	93–143 mm
Surface quality	The NOVATOP SWP surface is classified into 4 basic quality grades - A, B, C, D and combinations thereof. The classification parameters are in the table "CLASS ATTRIBUTES". The quality grades of surface lamellas are classified according to EN 13017-1, and AGROP NOVA a.s. technical procedures.


TECHNICAL SPECIFICATIONS NOVATOP SWP

NOVATOP SWP – Multi-layer solid wood panels

Sawn wood for production	The sawn wood for NOVATOP SWP production originates from permanently managed forests from suppliers certified for PEFC.
Glueing	NOVATOP SWP are glued in all joints. The glueing process meets the following requirements: AW100 according to DIN 68705 and B3008 D4 according to EN 204 The surface lamellas are glued together and to the surface of the middle layer with melamine adhesive. The middle layer lamellas are glued with PVAc adhesive. The patching of natural knots is glued with PVAc.
Patching material	putty, patching of natural knots with diameter ranging from 10 to 40 mm
Emissions	HCHO - NOVATOP SWP are virtually free of formaldehyde, see the data sheets. SWP are made without pentachlorophenol, wood protection agents and organic solvents.
Other SWP parameters	The mechanical and physical properties of the individual panel types and constructional technical values are provided in the respective data sheets.
Certificates	NATUREPLUS – Certificate PEFC – Certificate ISPM – Certificate Declaration of properties NOVATOP SWP Declaration of properties NOVATOP STAT Declaration of properties NOVATOP STATIC Declaration of properties NOVATOP FREE Certificate of conformity of the factory production control SWP/1, SWP/2, SWP/3 – Certificate Certificate of conformity of the factory production control SWP/1 SD, SWP/2 SD, SWP/3 SD – Certificate Emissions of harmful substances – Test Emissions analysis – Test Formaldehyde emission – Test Steam diffusion – Test
Waste	The product packaging material is to be disposed of as per the applicable regulations valid in the customer's country. The waste produced during the product processing may be incinerated in any equipment designated for incinerating wood material.

TECHNICAL DATA SHEET

NOVATOP SWP

NOVATOP SWP – Bearing and non-bearing 3-layer solid wood panel according to EN 13986	
Requirements	EN 13353, EN 13986 
Operation classes	SWP/1, SWP/2, SWP/3 according to EN 13353
Technical classes	SWP/1 NS, SWP/2 NS, SWP/3 NS, SWP/1 S, SWP/2 S, SWP/3 S
Wood species	Local spruce, Nordic spruce, Siberian larch
Glueing	AW100 according to DIN 68705, SWP/3 according to EN 13354
Adhesive	Melamine adhesive
Standard formats (mm)	thickness: 14, 16, 19, 21, 27 (6-15-6), 27 (9-9-9), 32, 42, 50, 60 width: 1040, 1250, 2100, 2500 length: 2500, 2750, 3000, 4000, 5000, 6000, 7000, 8000, 10000
Surface	sanded – K 50, 100
Moisture	spruce 8±2%, larch 12±2%
Density	spruce cca 490 kg/m ³ , larch cca 580 kg/m ³
Formaldehyde emission class	EN according to EN 717-1, EN16516 for values refer to the test reports
Reaction to fire	D-s2, d0 according to EN 13 501-1
Design value of thermal conductivity (λ)	for spruce 0,13 W/mK at a density of panels 490 kg/m ³ according to EN ISO 10456 for larch 0,15 W/mK at a density of panels 580 kg/m ³ according to EN ISO 10456
Factor of diffusion resistance (μ)	200/70 (dry/wet) according to EN ISO 10456
Sound absorption	250 – 500 Hz – 0,1 1000 – 2000 Hz – 0,3
Airborne sound insulation (dB)	$R = 13 \times \log(m_a) + 14$ m_a – surface weight kg/m ²
Specific thermal capacity (c_p)	1600 J/kgK according to EN ISO 10456

Requirements for density and characteristic strength values according to EN 13353

Property	Testing method	Panel nominal thickness [mm]				
		>12 ≤ 20	>20 ≤ 30	>30 ≤ 42	> 42	
Stress perpendicular to the panel plane [N/mm²]						
$f_{m,0,k}$	Bending strength parallel to the fibres of the outer layers	EN 789	35	30	16	12
$f_{m,90,k}$	Bending strength perpendicular to the fibres of the outer layers	EN 789	5	5	9	9
$E_{0,mean}$	Modulus of elasticity parallel to the fibres of the outer layers	EN 789	8500	7000	6500	6000
$E_{90,mean}$	Modulus of elasticity perpendicular to the fibres of the outer layers	EN 789	470	470	1300	1300

Certificates

SWP/1	1393-CPR-0018
SWP/2	1393-CPR-0019
SWP/3	1393-CPR-0020

TECHNICAL DATA SHEET

NOVATOP SWP SD

NOVATOP SWP SD – Bearing 3-layer solid wood panel with declared values according to EN 13986	
Requirements	EN 13353, EN 13986 
Operation classes	SWP/1, SWP/2, SWP/3 according to EN 13353
Technical classes	SWP/1 SD, SWP/2 SD, SWP 3 SD
Wood species	SLocal spruce, Nordic spruce, Siberian larch
Glueing	AW100 according to DIN 68705, SWP/3 according to EN 13354
Adhesive	Melamine adhesive
Standard formats (mm)	thickness: 14, 16, 19, 21, 27 (6-15-6), 27 (9-9-9), 32, 42, 50, 60 width: 1040, 1250, 2100, 2500 length: 2500, 2750, 3000, 4000, 5000, 6000
Surface	sanded – K 50, 100
Moisture	spruce 8±2%, larch 12±2%
Density	spruce cca 490 kg/m ³ , larch cca 580 kg/m ³
Formaldehyde emission class	EN according to EN 717-1, EN16516 for values refer to the test reports
Reaction to fire	D-s2, d0 according to EN 13 501-1
Design value of thermal conductivity (λ)	for spruce 0,13 W/mK at a density of panels 490 kg/m ³ according to EN ISO 10456 for larch 0,15 W/mK at a density of panels 580 kg/m ³ according to EN ISO 10456
Factor of diffusion resistance (μ)	200/70 (dry/wet) according to EN ISO 10456
Sound absorption	250 – 500 Hz – 0,1 1000 – 2000 Hz – 0,3
Airborne sound insulation (dB)	$R = 13 \times \log(m_a) + 14$ m_a – surface weight kg/m ²
Specific thermal capacity (c_p)	1600 J/kgK according to EN ISO 10456

TECHNICAL DATA SHEET

NOVATOP SWP SD

Characteristic values of panels SWP/1 SD, SWP/2 SD, SWP/3 SD in N/mm²

Panels with butted joints in the middle layer

Type of panel	16	19	22	27 Typ a	27 Typ b	32	42	50	60
Number of layers	3	3	3	3	3	3	3	3	3
Thickness [mm]	16	19	22	27	27	32	42	50	60
Thick. of surface lamellas[mm]	5,0	6,0	6,0	6,0	9,0	9,0	9,0	9,0	9,0
Thick. of middle lamellas [mm]	6,0	7,0	10,0	15,0	9,0	14,0	24,0	32,0	42,0

Stress perpendicular to the panel plane [N/mm²]

f_{m,0,k}	Bending strength parallel to the fibres of the outer layers	34,7	33,1	30,0	25,0	28,9	27,6	24,6	22,4	20,1
f_{m,90,k}	Bending strength perpendicular to the fibres of the outer layers	3,4	3,3	4,1	5,4	3,1	3,9	5,6	6,7	7,8
E_{m,0}	Modulus of elasticity parallel to the fibres of the outer layers	10900	10900	10500	9600	11100	10600	9400	8600	7700
E_{m,90}	Modulus of elasticity perpendicular to the fibres of the outer layers	500	450	700	1150	400	650	1250	1650	2100
f_{v,k}	Shear strength	1,1								
G	Shear modulus of elasticity	90								

Stress in the panel plane [N/mm²]

f_{m,0,k}	Bending strength parallel to the fibres of the outer layers	19,1	19,3	16,8	13,9	20,3	17,3	13,4	11,4	9,7
f_{m,90,k}	Bending strength perpendicular to the fibres of the outer layers	5,9	5,8	7,1	8,6	5,3	6,8	8,8	9,8	10,7
f_{t,0,k}	Tensile strength parallel to the fibres of the outer layers	12,8	12,9	11,2	9,3	13,6	11,5	9,0	7,6	6,5
f_{t,90,k}	Tensile strength perpendicular to the fibres of the outer layers	4,0	3,9	4,7	5,7	3,6	4,6	5,9	6,5	7,1
f_{c,0,k}	Compressive strength parallel to the fibres of the outer layers	19,1	19,3	16,8	13,9	20,3	17,3	13,4	11,4	9,7
f_{c,90,k}	Compressive strength perpendicular to the fibres of the outer layers	5,9	5,8	7,1	8,6	5,3	6,8	8,8	9,8	10,7
f_{v,k}	Shear strength	3,0								
E_{m,0}	Modulus of elasticity parallel to the fibres of the outer layers	7300	7400	6400	5300	7800	6600	5100	4400	3700
E_{m,90}	Modulus of elasticity perpendicular to the fibres of the outer layers	2300	2250	2700	3300	2050	2600	3350	3750	4100
G	Shear modulus of elasticity	600								


Certificates

SWP/1 SD	1393-CPR-0918
SWP/2 SD	1393-CPR-0921
SWP/3 SD	1393-CPR-0922

TECHNICAL DATA SHEET

NOVATOP FREE

NOVATOP FREE – Non-supporting 3-layer solid wood panel glued with adhesive without formaldehyde

Requirements	EN 13353, EN 13986 
Operation classes	SWP/1, SWP/2 according to EN 13353
Technical classes	SWP/1 NS, SWP/2 NS according to EN 13353
Wood species	Local spruce, Nordic spruce, silver fir
Glueing	D4 according to EN 204
Adhesive	PVAc
Standard formats (mm)	thickness: 14, 16, 19, 21, 27 (6-15-6), 27 (9-9-9), 32, 42, 50, 60 width: 1040, 1250, 2100, 2500 length: 2500, 2750, 3000, 4000, 5000, 6000
Surface	sanded – K 50, 100
Moisture	spruce, silver fir 8±2%
Density	spruce, silver fir cca 490 Kg/m ³
Formaldehyde emission class	EN according to EN 717-1, EN16516, for values refer to the test reports
Reaction to fire	D-s2, d0 according to EN 13 501-1
Design value of thermal conductivity (λ)	for spruce, silver fir 0,13 W/mK at a density of panels 490 kg/m ³ according to EN ISO 10456
Factor of diffusion resistance (μ)	200/70 (dry/wet) according to EN ISO 10456
Sound absorption	250 – 500 Hz – 0,1 1000 – 2000 Hz – 0,3
Airborne sound insulation (dB)	$R = 13 \times \log(m_a) + 14$ m_a – surface weight kg/m ²
Specific thermal capacity (c_p)	1600 J/kgK according to EN ISO 10456

TECHNICAL DATA SHEET NOVATOP FREE

Requirements for density and characteristic strength values according to EN 13353

Property	Testing method	Panel nominal thickness [mm]				
		>12 ≤ 20	>20 ≤ 30	>30 ≤ 42	> 42	
Stress perpendicular to the panel plane [N/mm²]						
$f_{m,0,k}$	Bending strength parallel to the fibres of the outer layers	EN 789	35	30	16	12
$f_{m,90,k}$	Bending strength perpendicular to the fibres of the outer layers	EN 789	5	5	9	9
$E_{m,0}$	Modulus of elasticity parallel to the fibres of the outer layers	EN 789	8500	7000	6500	6000
$E_{m,90}$	Modulus of elasticity perpendicular to the fibres of the outer layers	EN 789	470	470	1300	1300

Multi-layer panels made of growing wood, fixed with formaldehyde-free glue, are characteristic with extremely low formaldehyde emission. As the glue does not contain any formaldehyde, the emission values measured correspond to the natural contents of the formaldehyde in wood.

Caution:

Due to the formaldehyde-free glue used during the production of the SWP, the same values of formaldehyde emission are reached even after the glued joint is open: such panels are then good to use especially as acoustic panels. The formaldehyde emission complies with the very strict requirements of Japanese standards JIS, the strictest class F****.

TECHNICAL DATA SHEET

NOVATOP STATIC

NOVATOP STATIC – 5-layer solid wood panel		
Demands	EN13353, EN13986 CE	
Operation classes	SWP/1, SWP/2 according to EN 13353	
Technical classes	SWP/1 NS, SWP/2 NS, SWP/1 SD, SWP/2 SD	
Wood Species	Local spruce	
Glueing	AW100 according to DIN 68705, SWP/3 according to EN 13354	
Adhesive	Melamine adhesive	
Surface quality	No-visual construction (corresponds to C) Visual living space (corresponds to B) Sorting of quality according to internal regulations of AGROP NOVA a.s.	
Surface	Sanded – K 50, 100	
Large format (mm)	max. 12.000 x 2.500 (Junctions: finger joint)	
Standard formats (mm)	NOVATOP STATIC L (Bending strength parallel)	NOVATOP STATIC Q (Bending strength perpendicular)
	Length: 2.500, 5.000, 6.000 Width: 1.040, 1.250, 2.100, 2.500 Thickness: 45, 60	Length: 4.950 Width: 2.500 Thickness: 45, 60
Dimensional tolerances according to EN 13 353	Tolerance of nominal width and length: ± 2 mm Straightness of the sides: ± 1 mm/m Rectangularity: ± 1 mm/m	
Formaldehyde emission class	EN according to EN 717-1, EN16516, for values refer to the test reports	
Moisture	10 % \pm 3 %	
Coefficient of shrinkage and swelling	α (%/%) 0,002 – 0,012 %	
Density	cca 490 kg/m ³	
Reaction to fire	D-s2,d0 according to EN 13501-1	
Design value of thermal conductivity (λ)	for spruce 0,13 W/mK at a density of panels of 490 kg/m ³ according to EN ISO 10456	
Specific thermal capacity (c_p)	1600 J/kgK according to EN ISO 10456	
Factor of diffusion resistance (μ)	200/70 (dry/wet) according to EN ISO 10456	
Sound absorption	250 – 500 Hz – 0,1 1000 – 2000 Hz – 0,3	
Airborne sound insulation (dB)	$R = 13 \times \log(m_a) + 14$ m_a – surface weight kg/m ²	

Cross-sectional values

45 mm

(9p-9p-9q-9p-9p)



60 mm

(9p-9p-24q-9p-9p)



Thickness	45 mm	60 mm
Structure pattern	9p-9p-9q-9p-9p	9p-9p-24q-9p-9p
Moment of inertia I	6.05E+06 mm ⁴	1.31E+07 mm ⁴
Section modulus W	2.69E+05 mm ³	4.37E+05 mm ³

The cross-sectional values NOVATOP STATIC relate to panel width of 1 m. While determining the defluxion, take care especially of the deformation by sparring.

Composition of lamellas



NOVATOP STATIC L
longitudinal direction of the grain of the surface lamellas



NOVATOP STATIC Q
transverse direction of the grain of the surface lamellas

TECHNICAL DATA SHEET

NOVATOP STATIC

Characteristic strength values of selected types of panels in N/mm² for dimensioning according to DIN 1052:2008-12

Panels with butted joints in the middle layer

Type plate	45 (9-9-9-9-9)	60 Typ A (9-9-24-9-9)
Number of layers	5	5
Thickness [mm]	45	60
Thickness of surface lamellas [mm]	18,0	18,0
Thickness of middle lamellas [mm]	9,0	24,0

Stress perpendicular to the panel plane [N/mm²]

$f_{m,0,k}$	Bending strength parallel to the fibres of the outer layers	29,8	28,1
$f_{m,90,k}$	Bending strength perpendicular to the fibres of the outer layers	3,1	3,6
$E_{m,0}$	Modulus of elasticity parallel to the fibres of the outer layers	11400	10800
$E_{m,90}$	Modulus of elasticity perpendicular to the fibres of the outer layers	250	550
$f_{v,k}$	Shear strength	1,1	
G	Shear modulus of elasticity	90	

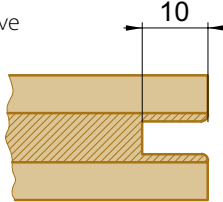
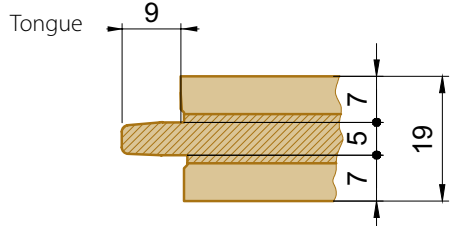
Stress in the panel plane [N/mm²]

$f_{m,0,k}$	Bending strength parallel to the fibres of the outer layers	24,2	18,4
$f_{m,90,k}$	Bending strength perpendicular to the fibres of the outer layers	3,4	6,3
$f_{t,0,k}$	Tensile strength parallel to the fibres of the outer layers	16,1	12,3
$f_{t,90,k}$	Tensile strength perpendicular to the fibres of the outer layers	2,3	4,2
$f_{c,0,k}$	Compressive strength parallel to the fibres of the outer layers	24,2	18,4
$f_{c,90,k}$	Compressive strength perpendicular to the fibres of the outer layers	3,4	6,3
$f_{v,k}$	Shear strength	3,0	
$E_{m,0}$	Modulus of elasticity parallel to the fibres of the outer layers	9300	7100
$E_{m,90}$	Modulus of elasticity perpendicular to the fibres of the outer layers	1300	2400
G	Shear modulus of elasticity	600	

Note: the factor k_h is incorporated in the table.

TECHNICAL DATA SHEET NOVATOP FLOOR

NOVATOP FLOOR – 3-layer solid wood panel with tongue and groove around the perimeter

Demands	EN 13353, EN 13986
Technical classes	SWP/1, SWP/2, SWP/3 according to EN 13353
Wood Species	Spruce
Glueing	AW100 according to DIN 68705, SWP/3 according to EN 13354, D4 according to EN 204
Adhesive	Melamine adhesive
Standard format (mm)	Thickness: 19 (6-7-6) Width: 400 Length: 2450
Dimensional tolerances	Machining tolerance in the thickness $\pm 0,2\text{mm}$ Tolerance of sanding thickness $\pm 0,2\text{mm}$ Width and length tolerance in the thickness of $\pm 0,5\text{mm}$
Surface	Sanded – K 120
Moisture	Spruce $8\pm 2\%$
Density	Spruce cca 490 Kg/m^3
Formaldehyde emission class	EN according to EN 717-1, EN16516 for values refer to the test reports
Reaction to fire	D-s2, d0 according to EN 13 501-1
Design value of thermal conductivity (λ)	for spruce $0,13 \text{ W/mK}$ at a density of panels of 490 kg/m^3 according to EN ISO 10456
Factor of diffusion resistance (μ)	200/70 (dry/wet) according to EN ISO 10456
Sound absorption	250 – 500 Hz – 0,1 1000 – 2000 Hz – 0,3
Airborne sound insulation (dB)	$R = 13 \times \log(m_a) + 14$ m_a – surface weight kg/m^2
Specific thermal capacity (c_p)	1600 J/kgK according to EN ISO 10456
Machining of edges (mm)	<p>Groove  Tongue </p>

FEATURES FOR QUALITY SORTING SPRUCE

Features for sorting	Quality classes				
	A	AB	B	C	D
General requirements, longitudinal joints	flawless gluing without open joints	flawless gluing without open joints	flawless gluing without open joints	flawless gluing, repaired longitudinal joints allowed	flawless gluing, repaired longitudinal joints allowed
Structure, course of fibres, compression wood	finely grown, straight fibres, without compression wood	finely grown, straight fibres, without compression wood	roughly grown and light compression wood allowed	no special requirements	no special requirements
Knottiness	healthy, firmly joint knots up to the diameter of 30 mm allowed	healthy, firmly joint knots up to the diameter of 50 mm. Occasionally black knots-eyes allowed up to the diameter of 5 mm	Occasionally black knots-eyes allowed up to the diameter of 10 mm *(Healthy, firmly ingrown knots without special requirements)	no special requirements	no special requirements
Repair natural knots	occasionally allowed up to the diameter of 15 mm	allowed up to the diameter of 20 mm 2 knots next to each other are not allowed	2 knots next to each other are not allowed *(Allowed up to the diameter of 35 mm)	no special requirements	no special requirements
Pitch pockets	occasionally allowed up to 2 x 30 mm	occasionally allowed up to 2 x 30 mm	occasionally allowed up to 5 x 50mm, no clumps or mass occurrence	no special requirements	no special requirements
Repaired pitch pockets	occasionally allowed above 2 x 30 mm repaired with a boat-shaped wedge	occasionally allowed above 2 x 30 mm repaired with a boat-shaped wedge	occasionally allowed above 5 x 50 mm repaired with a boat-shaped wedge	allowed above 5 x 50 mm repaired with a boat-shaped wedge	no special requirements
Bark	not allowed	not allowed, inbarks repaired up to 20 mm	not allowed, *(Bark pockets repaired up to 35 mm)	occasionally allowed	no special requirements
Cracks	shallow surface cracks occasionally allowed	shallow surface cracks occasionally allowed, open end cracks up to 50 mm of length occasionally allowed	shallow surface cracks occasionally allowed, open end cracks up to 50 mm of length occasionally allowed	no special requirements	no special requirements
Core /pith/	no pith	no pith	pith allowed in the total length up to 600 mm straight or as a sum of passing parts	no special requirements	no special requirements
Infestation with insect, worm	not allowed	not allowed	not allowed	not allowed, worm occasionally allowed	not allowed, worm occasionally allowed
Discolouration, fungus	not allowed	not allowed	allowed blue stains up to the width of 10 mm and length of 200 mm	no special requirements rot not allowed	no special requirements rot not allowed
Sap					
Thickness of glued joints	max. 0.2 mm	max. 0,3 mm	max. 0,3 mm	no special requirements	no special requirements
Surface machining	no defects	occasionally allowed small defects	occasionally allowed small defects	occasionally allowed small defects	no special requirements
Quality of the panel edge such as bulges, battered places	not allowed	up to 10 mm from the edge occasionally allowed	up to 10 mm from the edge occasionally allowed	up to 50 mm from the edge occasionally allowed	no special requirements
Combination of different wood species	not allowed	not allowed	not allowed	allowed	no special requirements
Width of individual parts - excluding the outer ones	at least 60 mm	at least 60 mm	at least 60 mm	no special requirements	no special requirements
Wood pattern	according to the colour and the structure uniform wood pattern	no special requirements	no special requirements	no special requirements	no special requirements

For lengths above 6 m with a continuous lamela.

FEATURES FOR QUALITY SORTING LARCH

Features for sorting	Quality classes				
	A	AB	B	C	D
General requirements, longitudinal joints	flawless gluing without open joints	flawless gluing without open joints	flawless gluing without open joints	flawless gluing, repaired longitudinal joints allowed	flawless gluing, repaired longitudinal joints allowed
Structure, course of fibres, compression wood	finely grown, straight fibres, without compression wood	finely grown, straight fibres, without compression wood	roughly grown and light compression wood allowed	no special requirements	no special requirements
Knottiness	healthy, firmly joint knots up to the diameter of 60 mm allowed	healthy, firmly joint knots up to the diameter of 60 mm. Occasionally black knots-eyes allowed up to the diameter of 5 mm	healthy, firmly joint knots up to the diameter of 60 mm. Occasionally black knots-eyes allowed up to the diameter of 10 mm	no special requirements	no special requirements
Repair natural knots	occasionally allowed up to the diameter of 15 mm	allowed up to the diameter of 20 mm 2 knots next to each other are not allowed	allowed up to the diameter of 30 mm 2 knots next to each other are not allowed	no special requirements	no special requirements
Pitch pockets	occasionally allowed up to 2 x 30 mm	occasionally allowed up to 2 x 30 mm	occasionally allowed up to 5 x 50 mm, no clumps or mass occurrence	no special requirements	no special requirements
Repaired pitch pockets	occasionally allowed above 2 x 30 mm repaired with a boat-shaped wedge	occasionally allowed above 2 x 30 mm repaired with a boat-shaped wedge	occasionally allowed above 5 x 50 mm repaired with a boat-shaped wedge	allowed above 5 x 50 mm repaired with a boat-shaped wedge	no special requirements
Bark	not allowed	not allowed, inbarks repaired up to 20 mm	not allowed, inbarks repaired up to 30 mm	occasionally allowed	no special requirements
Cracks	shallow surface cracks occasionally allowed	shallow surface cracks occasionally allowed, open end cracks up to 50 mm of length occasionally allowed	shallow surface cracks occasionally allowed, open end cracks up to 50 mm of length occasionally allowed	no special requirements	no special requirements
Core /pith/	no pith	no pith	pith allowed in the total length up to 600 mm straight or as a sum of passing parts	no special requirements	no special requirements
Infestation with insect, worm	not allowed	not allowed	not allowed	not allowed, worm occasionally allowed	not allowed, worm occasionally allowed
Discolouration, fungus	not allowed	not allowed	allowed discolouration up to the width of 10 mm and length of 200 mm	no special requirements rot not allowed	no special requirements rot not allowed
Sap	with larch, narrow stripes up to 20 % of the width of lamellas allowed	with larch, narrow stripes up to 20 % of the width of lamellas allowed	allowed	no special requirements	no special requirements
Thickness of glued joints	max. 0,2 mm	max. 0,3 mm	max. 0,3 mm	no special requirements	no special requirements
Surface machining	no defects	occasionally allowed small defects	occasionally allowed small defects	occasionally allowed small defects	no special requirements
Quality of the panel edge such as bulges, battered places	not allowed	up to 10 mm from the edge occasionally allowed	up to 10 mm from the edge occasionally allowed	up to 50 mm from the edge occasionally allowed	no special requirements
Combination of different wood species	not allowed	not allowed	not allowed	allowed	no special requirements
Width of individual parts - excluding the outer ones	at least 60 mm	at least 60 mm	at least 60 mm	no special requirements	no special requirements
Wood pattern	according to the colour and the structure uniform wood pattern	no special requirements	no special requirements	no special requirements	no special requirements

FEATURES FOR QUALITY SORTING FIR

Features for sorting	Quality classes			
	A	AB	B	C
General requirements, longitudinal joints		flawless gluing without open joints		flawless gluing, repaired longitudinal joints allowed
Structure, course of fibres, compression wood		finely grown, straight fibres, without compression wood		no special requirements
Knottiness		healthy, firmly joint knots up to the diameter of 5 mm.		no special requirements
Repair natural knots		not allowed		no special requirements
Bark		not allowed		no special requirements
Cracks		shallow surface cracks occasionally allowed		no special requirements
Infestation with insect, worm		not allowed		not allowed, worm occasionally allowed
Discolouration, fungus		discolouration allowed in red, yellow, brown		no special requirements rot not allowed
Thickness of glued joints		max. 0,3 mm		no special requirements
Surface machining		no defects		occasionally allowed small defects
Quality of the panel edge such as bulges, battered places		not allowed		up to 50 mm from the edge occasionally allowed
Combination of different wood species		not allowed		allowed
Width of individual parts - excluding the outer ones		at least 60 mm		no special requirements
Wood pattern		according to the colour and the structure uniform wood pattern		no special requirements

STRUCTURED SURFACE NOVATOP SWP

Types of surface	fine and coarse brushing, chopping
Wood	spruce , larch
Standard thicknesses (mm)	14 (4-6-4), 16 (5-6-5), 19 (6-7-6), 21 (6-9-6), 27 (6-15-6), 27 (9-9-9), 32 (9-14-9), 42 (9-24-9), 50 (9-32-9), 60 (9-42-9)
Standard formats (mm)	up to 2100 x 6000, min. length 1000 mm
Maximum weight of the panel	220 kg
Machining possibilities	Standard: Tongue and groove, grooves from the side Non-standard: According to the individual demand Exact formatting: According to the individual demand



Fine brushing



Coarse brushing



Chopping with fine brushing

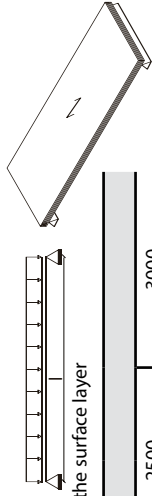
TECHNICAL DATA SHEET

NOVATOP ALTHOLZ

NOVATOP ALTHOLZ – 3-layer solid wood panel with a one-sided covering layer made of old wood	
Type of wood	spruce
Thickness	19 mm
Standard formats (mm)	Width: 1250 Length: 2600, 2800, 3000, 3200
Gluing	D4
Glue	PVAc
Moisture of wood	8 %
Composition	3-layers, middle layer - spruce, one surface layer - old wood, the other surface layer – spruce
Width of the covering lamellas	80-230 mm 3-layers, middle layer - spruce, covering layers - old wood
Thickness of the covering lamellas	approx. 6 mm, may, depending on the board type, show a higher tolerance
Types of boards	4 old sunburnt boards, or boards from formwork, manually brushed 1 beams and boards from a roof truss, manually brushed (Warning: only length 3200 mm)
Surface	4A colour shade - black, dark brown, sometimes nail holes, places repaired with old wood 4B colour shade - dark brown up to light grey, sometimes nail holes, places repaired with old wood 4C colour shade - brown, light brown up to light grey 1A colour shade - light brown, light grey, beige
Possibility of processing	Standard: spring and groove, grooves from sides Non-standard: according to individual needs Precision blanks: according to individual needs

Warning: Distinctive and striking appearance of wood, colour differences, damage, nail holes, cracks caused by drying and woodworm holes are tolerable with NOVATOP ALTHOLZ three-layer boards.

PRELIMINARY DIMENSIONING NOVATOP SWP SD A NOVATOP STATIC



Incidental load	Stable load		Girder of a single field: Load perpendicular to the panel plane and parallel to the fibre direction of the surface layer												
	q_k [kN/m ²]	Cat.	Span [mm]												
			500	1000	1500	2000	2500	3000							
1,0	1,5	A	16-60b	22-60b	32-60b	42-60	45-60b	60b	60a-60b						
1,0	2,0	A		27a-60b	42-60b	50-60	60a-60b	-	-						
1,0	3,0	C		27b-60b	42-60	60	60a-60b	-	-						
1,0	4,0	C		32-60b	42-60	45-60b	60a-60b	-	-						
1,0	5,0	C			50-60	45-60b	60a-60b	-	-						
1,5	1,5	A	16-60b	22-60b	42-60b	50-60b	45-60b	60a-60b							
1,5	2,0	A		27a-60b	42-60	60	60a-60b	-	-						
1,5	3,0	C		27b-60b	42-60	60	60a-60b	-	-						
1,5	4,0	C		32-60b	50-60b	45-60b	60a-60b	-	-						
1,5	5,0	C													
2,0	1,5	A	16-60b	27a-60b	42-60b	60	60a-60b	60a-60b							
2,0	2,0	A		27b-60b	42-60b	60	60a-60b	60b	-						
2,0	3,0	C			50-60b	45-60b	60a-60b	-	-						
2,0	4,0	C		32-60b	50-60b	45-60b	60a-60b	-	-						
2,0	5,0	C													
2,5	1,5	A	16-60b	27a-60b	42-60b	60	60a-60b	-							
2,5	2,0	A		27b-60b	42-60b	60	60a-60b	-	-						
2,5	3,0	C			50-60b	45-60b	60a-60b	-	-						
2,5	4,0	C		32-60b	50-60b	45-60b	60a-60b	-	-						
2,5	5,0	C													
3,0	1,5	A	16-60b	27a-60b	42-60b	60	60a-60b	-							
3,0	2,0	A		27b-60b	42-60b	60	60a-60b	-	-						
3,0	3,0	C			50-60b	45-60b	60a-60b	-	-						
3,0	4,0	C		32-60b	50-60b	45-60b	60a-60b	-	-						
3,0	5,0	C													

The table is used for preliminary sizing "SWP NOVATOP" 3 to 5 layer plates under Z- 9.1-572 and gives the useful types of plate steel. The following deflection limits must comply with DIN 1052:2008-12:

$$w_{\text{quasi}} \leq \ell / 300$$

$$w_{\text{fin}} - w_{\text{G,stat}} \leq \ell / 200$$

$$w_{\text{fin}} - w_0 \leq \ell / 200$$

The loads are fixed (constant load, utility load) as a uniform load over the entire load length of the beam perpendicular to the plane of the plate.

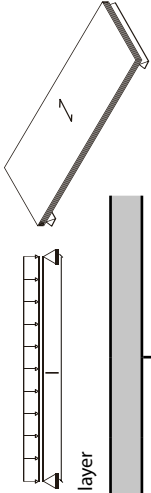
Column 1: constant load [kN/m²]; the net weight of the plate is taken into account

Column 2: perpendicular categories of utility load according to DIN 1055-3:2006-03 table 1

Column 3: perpendicular not load q_k [kN/m²] DIN 1055-3:2006-03 table 1

It's necessary to control separately the vibration characteristics using the "SWP NOVATOP" 3 and 5-layers panels as a ceiling. The table is used to pre-size "SWP NOVATOP" 3 and 5-layers panels and doesn't replace exact statistical findings.

PRELIMINARY DIMENSIONING NOVATOP STATIC



Girder of a single field: Load perpendicular to the panel plane and transversally to the fibre direction of the surface layer

Incidental load	Stable load	Span [mm]													
		500	750	1000	1250	1500	1750	2000	2250						
g_k	Cat.	q_k													
[kN/m ²]		[kN/m ²]													
1,0	A	1,5	16-60b	16-60b	22-60b	32-60b	42-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,0	A	2,0	16-60b	19-60b	27b-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,0	C	3,0	16-60b	19-60b	27b-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,0	C	4,0	16-60b	22-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,0	C	5,0	16-60b	22-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	A	1,5	16-60b	16-60b	27a-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	A	2,0	16-60b	19-60b	27a-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	C	3,0	16-60b	19-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	C	4,0	16-60b	22-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	C	5,0	16-60b	22-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	A	1,5	16-60b	22-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	A	2,0	16-60b	22-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	C	3,0	16-60b	27a-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	C	4,0	16-60b	27a-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	C	5,0	16-60b	27a-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	A	1,5	16-60b	19-60b	27b-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	A	2,0	16-60b	19-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	C	3,0	16-60b	22-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	C	4,0	16-60b	22-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	C	5,0	16-60b	27a-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	A	1,5	16-60b	19-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	A	2,0	16-60b	22-60b	32-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	C	3,0	16-60b	22-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	C	4,0	16-60b	27a-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	C	5,0	16-60b	27a-60b	42-60b	50-60	60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b

The following deflection limits must comply with DIN 1052:2008-12:

$$w_{\text{def,inst}} \leq l / 300$$

$$w_{\text{def}} = w_{\text{def,inst}} \cdot \ell / 200$$

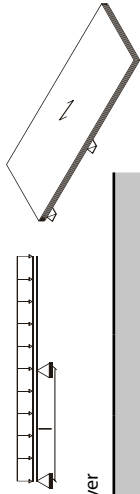
$$w_{\text{def}} = w_{\text{def}} \cdot \ell / 200$$

It's necessary to control separately the vibration characteristics using the "SWP NOVATOP" 3 and 5-layers panels as a ceiling. The table is used to pre-size "SWP NOVATOP" 3 and 5-layers panels and doesn't replace exact statistical findings.

The table is used for preliminary sizing "SWP NOVATOP" 3 to 5 layer plates under Z 9.1-572 and gives the useful types of plate the standard range and load in the category of use n°1 under DIN 1052:2008-12.
The loads are fixed (constant load, utility load) as a uniform load over the entire load length of the beam perpendicular to the planes of the plate.

Column 1: constant load [kN/m²]; the net weight of the plate is taken into account
Column 2: perpendicular categories of utility load according to DIN 1055-3:2006-03 table 1
Column 3: perpendicular hot load q_k [kN/m²] DIN 1055-3:2006-03 table 1

PRELIMINARY DIMENSIONING NOVATOP STATIC



Girder of a single field: Load perpendicular to the panel plane and parallel to the fibre direction of the surface layer

Incidental load q_k	Stable load q_k	Span [mm]													
		Cat.	500	750	1000	1250	1500	1750	2000	2250					
1,0	1,5	A	19-60b	19-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,0	2,0	A	22-60b	22-60b	27b-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,0	3,0	C	27a-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,0	4,0	C	27b-60b	27b-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,0	5,0	C	27b-60b	27b-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	1,5	A	22-60b	22-60b	27b-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	2,0	A	27a-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	3,0	C	27b-60b	27b-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	4,0	C	27b-60b	27b-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
1,5	5,0	C	27b-60b	27b-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	1,5	A	16-60b	16-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	2,0	A	19-60b	19-60b	27b-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	3,0	C	27a-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	4,0	C	27b-60b	27b-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,0	5,0	C	32-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	1,5	A	16-60b	16-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	2,0	A	19-60b	19-60b	27b-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	3,0	C	27a-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	4,0	C	27b-60b	27b-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
2,5	5,0	C	32-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	1,5	A	19-60b	19-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	2,0	A	27a-60b	27a-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	3,0	C	27b-60b	27b-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	4,0	C	32-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b
3,0	5,0	C	32-60b	32-60b	42-60b	45-60b	50-60	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b	60a-60b

The following deflection limits must comply with DIN 1052:2008-1-2:

$w_{Q,lim} = \ell / 300$
Cantilever: $\ell / 150$

$w_{fin} - w_{G,mit} = \ell / 200$
Cantilever: $\ell_k / 100$

$w_{fin} - w_G = \ell / 200$
Cantilever: $\ell_k / 100$

It's necessary to control separately the vibration characteristics using the "SWP NOVATOP" 3 and 5-layers panels as a ceiling. The table is used to pre-size "NOVATOP NOVA" 3 and 5-layers panels and doesn't replace exact statistical findings.

The table is used for preliminary sizing "SWP NOVATOP" 3 to 5 layer plates under Z-9.1-572 and gives the useful types of plate the standard range and load in the category of use n°1 under DIN 1052:2008-1-2.

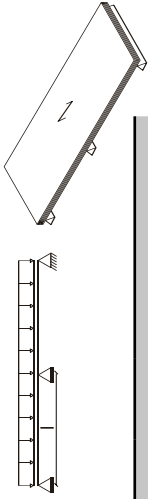
The loads are fixed (constant load, utility load as a uniform load over the entire load length of the beam perpendicular to the plane of the plate.

Column 1: constant load [kN/m²]; the net weight of the plate is taken into account

Column 2: perpendicular categories of utility load according to DIN 1055-3:2006-03 table 1

Column 3: perpendicular hot load q_k [kN/m²] DIN 1055-3:2006-03 table 1

PRELIMINARY DIMENSIONING NOVATOP STATIC



Incidental load	Stable load		Beam of two fields : the load at right angles to the plate and paralely to the surface layer											
	g_j [kN/m ²]	Cat.	q_k [kN/m ²]	Rozpětí [mm]										
				500	1000	1500	2000	2500	3000	3500	4000			
1,0	A	1,5	16-60b	16-60b	16-60b	27-60b	32-60b	42-60	45-60b	50-60	60a-60b	60	60a-60b	4000
					19-60b	27b-60b	42-60b	50-60	60a-60b	60	60a-60b	60b		
					22-60b	32-60b	42-60	45-60b	60a-60b	60	60a-60b			
1,5	A	1,5	19-60b	19-60b	19-60b	27a-60b	42-60b	50-60	45-60b	60	60a-60a	60a-60b		
					19-60b	32-60b	42-60	45-60b	60	60a-60a	60a-60b			
					22-60b	42-60b	50-60	45-60b	60a-60b	60	60a-60b			
2,0	A	1,5	16-60b	16-60b	19-60b	27b-60b	42-60b	50-60	45-60b	60	60a-60b	60a-60b		
					22-60b	32-60b	50-60	45-60b	60	60a-60a	60b			
					27b-60b	42-60b	60a-60b	60a-60b						
2,5	A	1,5	16-60b	16-60b	19-60b	32-60b	42-60	45-60b	60	60a-60b	60a-60b			
					22-60b	42-60b	50-60	45-60b	60	60a-60a	60b			
					27b-60b	42-60b	60a-60b	60a-60b						
3,0	A	1,5	16-60b	16-60b	22-60b	32-60b	42-60	45-60b	60	60a-60b	60a-60b			
					27a-60b	42-60b	50-60	45-60b	60a-60b	60	60a-60b			

The following deflection limits must comply with DIN 1052:2008-12:

$$w_{d,inst} \leq \ell / 300$$

$$w_{fin} - w_{d,inst} \leq \ell / 200$$

$$w_{fin} - w_{d,inst} \leq \ell / 200$$

It's necessary to control separately the vibration characteristics using the 'SWP NOVATOP' 3 and 5-layers panels as a ceiling. The table is used to pre-size 'SWP NOVATOP' 3 and 5-layers panels and doesn't replace exact statistical findings.

Column 1: constant load [kN/m²]; the net weight of the plate is taken into account
 Column 2: perpendicular categories of utility load according to DIN 1055-3:2006-03 table 1
 Column 3: perpendicular hot load q_k [kN/m²] DIN 1055-3:2006-03 table 1

1. General information

In the following document, there is shown an example of detailed designing and verification on the three-layer panel by the company AGROP NOVA a.s. (stress perpendicular to the panel, the course of fibres of the surface layer in the span direction). Verifications of load-carrying capacity and serviceability have been carried out.

2. System and loading

2.1 Material:

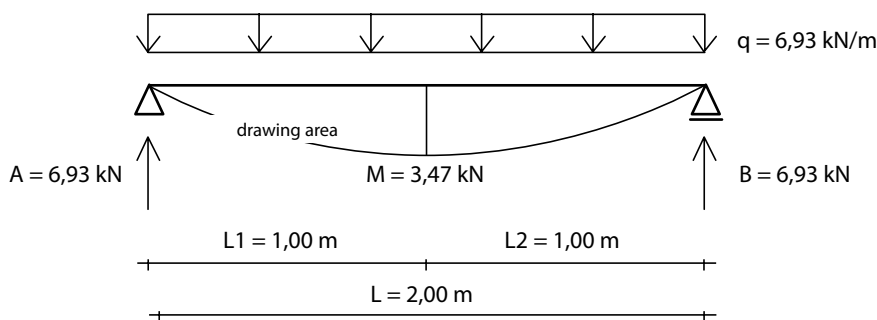
Three-layer panel Type 60	
Thickness of the surface layer	$d_1 = 9 \text{ mm}$
Thickness of the central layer	$d_2 = 42 \text{ mm}$
Flexural modulus of elasticity	$E_{m,0,BW} = 11.500 \text{ N/mm}^2$
Modulus of elasticity in shear, (rolling shear)	$G_{BW} = 90 \text{ N/mm}^2$
Characteristic bending strength	$f_{m,0,BW} = 30,0 \text{ N/mm}^2$
Characteristic shearing strength	$f_{v,BW} = 1,10 \text{ N/mm}^2$
Design value of bending strength	$f_{m,0,d} = 20,77 \text{ N/mm}^2$
Design value of shearing strength	$f_{v,d} = 0,76 \text{ N/mm}^2$
Creep coefficient	$k_{def} = 0,6$

2.2 Loading:

Class of use	1
Permanent loading:	$g_k = 1,50 \text{ kN/m}$
Imposed load:	$q_k = 3,00 \text{ kN/m; category C}$
	$\rightarrow k_{mod} = 0,90$

2.2.1 Verification of load-carrying capacity

$$q_d = 1,35 \cdot (0,06 \cdot 5,0 + 1,5) + 1,5 \cdot 3,0 = 6,93 \text{ kNm}$$



maximum bending moment

$$M_d = \frac{q_d \cdot \ell^2}{8} = \frac{6,93 \cdot 2,0^2}{8} = 3,47 \text{ kNm}$$

maximum shear force

$$V_d = \frac{q_d \cdot \ell}{2} = \frac{6,93 \cdot 2,0}{2} = 6,93 \text{ kNm}$$

EXAMPLE BY DESIGNING

2.2.2 Verification of serviceability

Verification of serviceability according to DIN 1052:2008-12

Total loading

$$q_{k,g} = 0,06 \cdot 5,0 \cdot 1 + 1,5 = 1,8 \text{ kNm}$$

$$q_{k,g} = 3,0 \text{ kNm}$$

3. Determination of section parameters

Surface layer:

Area of cross-section	$A_1 = 9.000 \text{ mm}^2$
Cross-section modulus	$W_1 = 13.500 \text{ mm}^3$
Static moment of area	$S_1 = 242.343 \text{ mm}^3$
Moment of inertia of the cross-section	$I_1 = 60.750 \text{ mm}^4$
	$C/s = 2.143 \text{ mm}^2$

Computation of γ_1 :

$$\gamma_1 = \frac{1}{1 + \frac{\pi^2 \cdot E_1 \cdot A_1}{\ell^2 \cdot \frac{C}{s}}} = \frac{1}{1 + \frac{\pi^2 \cdot 11.500 \cdot 9000}{2000^2 \cdot 2143}} = 0,894$$

$$\gamma_2 = 1,0$$

Computation of arms a_1 and a_2

$$a_2 = \frac{\gamma_1 \cdot A_1 \cdot \left[\frac{d_1}{2} + d_2 + \frac{d_1}{2} \right]}{\gamma_1 \cdot A_1 + \gamma_2 \cdot A_1} = \frac{0,894 \cdot 9.000 \cdot \left[\frac{9}{2} + 42 + \frac{9}{2} \right]}{0,894 \cdot 9.000 + 1,0 \cdot 9.000} = 24,07 \text{ mm}$$

$$a_1 = \left[\frac{d_1}{2} + d_2 + \frac{d_1}{2} \right] - a_2 = \left[\frac{9}{2} + 42 + \frac{9}{2} \right] - 24,07 = 26,93 \text{ mm}$$

From the abovementioned results the efficient inertia moment I_{eff}

$$\begin{aligned} I_{\text{eff}} &= I_1 \cdot \gamma_1 \cdot a_1^2 \cdot A_1 + I_1 + \gamma_2 \cdot a_2^2 \cdot A_1 \\ &= 60.750 + 0,894 \cdot 26,93^2 \cdot 9.000 + 60.750 + 1,0 \cdot 24,07^2 \cdot 9.000 = 11.170.944 \text{ mm}^4 \end{aligned}$$

4. Examination of load-carrying capacity

4.1 Examination of bending strength

$$\sigma_{m,d} = \frac{M_d}{I_{\text{eff}}} \cdot \left[\gamma_1 \cdot a_1 + \frac{d_1}{2} \right] = \frac{3,47 \cdot 10^6}{11.170.944} \cdot \left[0,894 \cdot 26,93 + \frac{9}{2} \right] = 8,88 \text{ N/mm}^2$$

$$\frac{\sigma_{m,d}}{f_{m,0,d}} = \frac{8,88}{20,77} = 0,43 < 1,0$$

4.2 Shear strength assessment

$$\tau_{v,d} = \frac{V_d \cdot \gamma_1 \cdot S_1}{I_{\text{eff}} \cdot b} = \frac{6930 \cdot 0,894 \cdot 242.343}{11.170.944 \cdot 1000} = 0,134$$

$$\frac{\tau_{v,d}}{f_{v,d}} = \frac{0,134}{0,76} = 0,18 < 1,0$$

5. Verification of serviceability according to DIN 1052:2008-12

5.1 Initial elastic deformation

$$w_{g,\text{inst}} = \frac{5}{384} \cdot \frac{q_{k,g} \cdot \ell^4}{E \cdot I_{\text{eff}}} = \frac{5}{384} \cdot \frac{1,8 \cdot 2000^4}{11.500 \cdot 11.170.944} = 2,92 \text{ mm}$$

$$w_{g,\text{inst}} = \frac{5}{384} \cdot \frac{q_{k,g} \cdot \ell^4}{E \cdot I_{\text{eff}}} = \frac{5}{384} \cdot \frac{3,0 \cdot 2000^4}{11.500 \cdot 11.170.944} = 4,86 \text{ mm}$$

5.2 Final elastic deformation

5.2.1 From permanent load

$$w_{G,\text{fin}} = w_{G,\text{inst}} \cdot (1 + k_{\text{def}}) = 2,92 \cdot (1 + 0,6) = 4,67 \text{ mm}$$

5.2.2 From imposed load

For a characteristic design situation

$$w_{Q,\text{fin}} = w_{Q,\text{inst}} \cdot (1 + \Psi_2 \cdot k_{\text{def}}) = 4,86 \cdot (1 + 0,3 \cdot 0,6) = 5,74 \text{ mm}$$

for a quasi-stable design situation

$$w_{Q,\text{fin}} = \Psi_2 \cdot w_{Q,\text{inst}} \cdot (1 + k_{\text{def}}) = 0,3 \cdot 4,86 \cdot (1 + 0,6) = 2,33 \text{ mm}$$

5.3. Verification of recommended values

5.3.1 Deformation in a characteristic design situation

$$w_{Q,\text{inst}} = 4,86 \text{ mm} < \frac{\ell}{300} = \frac{2000}{300} = 6,67 \text{ mm} \quad (\eta = 0,73)$$

and

$$w_{\text{fin}} - w_{G,\text{inst}} = (4,67 + 5,74) - 2,92 = 7,49 \text{ mm} < \frac{\ell}{200} = \frac{2000}{200} = 10 \text{ mm} \quad (\eta = 0,75)$$

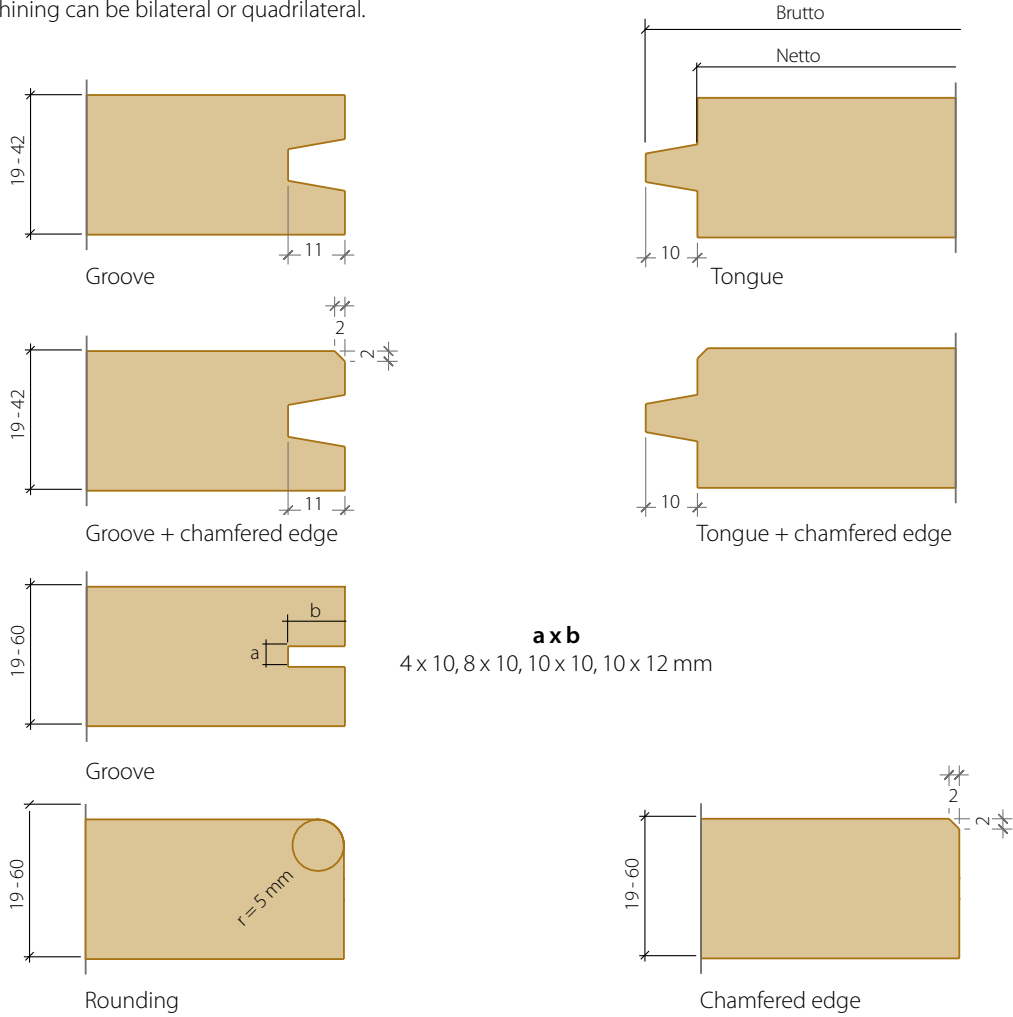
5.3.2 Deformation in a quasi-stable design situation

$$w_{\text{fin}} = 4,67 + 2,33 = 7,00 \text{ mm} < \frac{\ell}{200} = \frac{2000}{200} = 10 \text{ mm} \quad (\eta = 0,70)$$

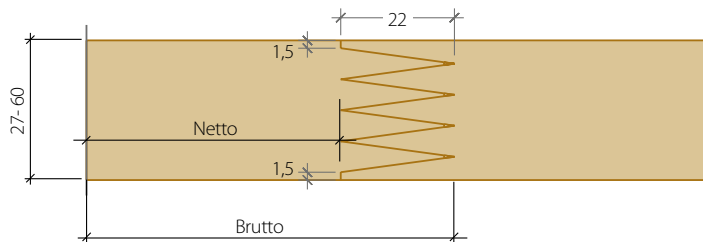
MACHINING OPTIONS NOVATOP SWP

Standard machining of edges

The machining can be bilateral or quadrilateral.



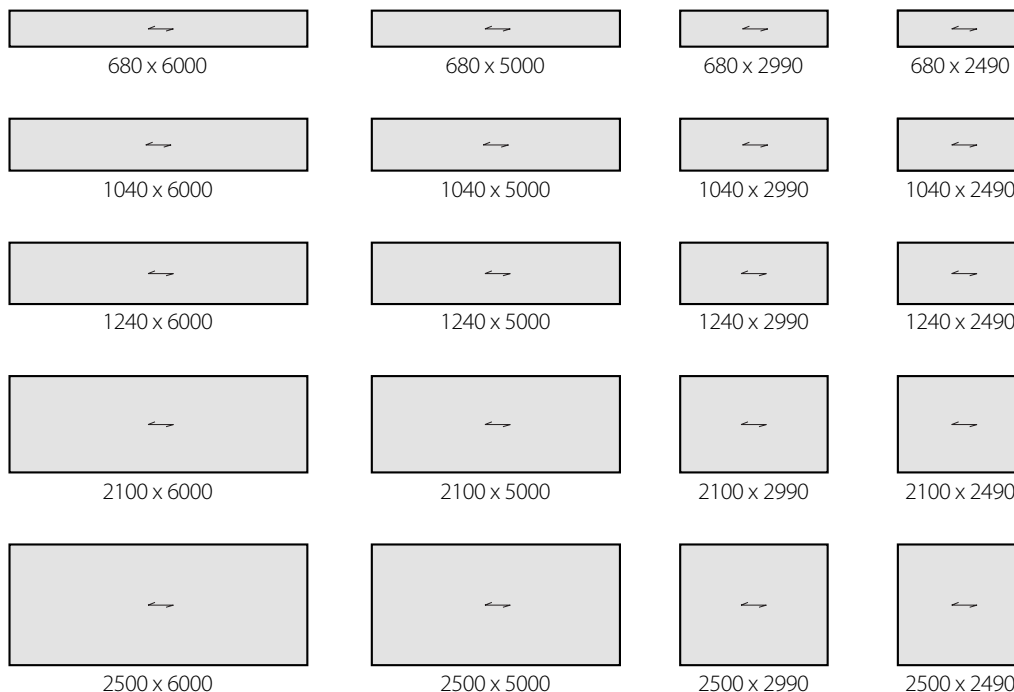
Extension with an inlay finger joint



Non-standard machining

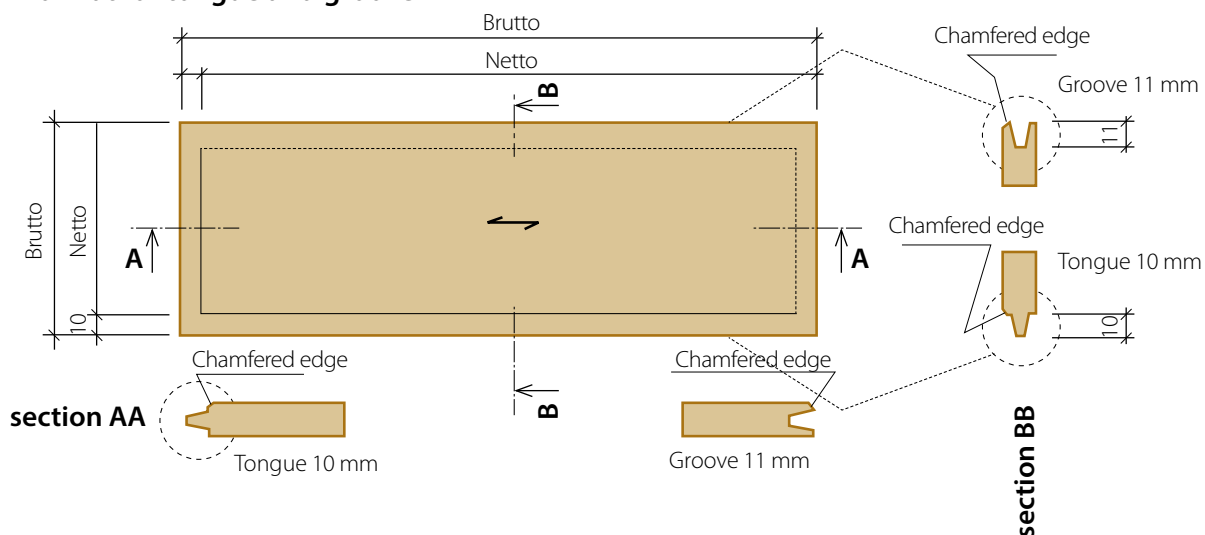
Individually according to the demand, see the examples of machining.

Standard formats – netto (mm)



Non-standard formats (mm): min. 500 x 2000

Format for tongue and groove



Machining tolerance

Machining tolerance in the thickness of	± 0,4 mm
Tolerance of nominal width and length	± 0,5 mm
Tolerance of sanding thickness	± 0,2 mm

MACHINING OPTIONS

CNC Hamuel Reichenbacher

Formats

Maximum format: 6000 x 2500 mm

Tolerance of nominal width and length: $\pm 0,5$ mm

Tools

Circular saw:

\varnothing 300 mm, thickness 3,2 mm

\varnothing 450 mm, thickness 4 mm

Milling tools

Vertical milling can create any number of openings with various profiles including grooves and channels etc.

\varnothing 8 mm – spiral shank mill, length 30 mm

\varnothing 10 mm – spiral shank mill, length 40 mm

\varnothing 20 mm – spiral shank mill, length 50, 120 mm

\varnothing 30 mm – spiral shank mill, length 180 mm

a set for the tongue and the groove

a set for the dowtail joint (depth 22 mm)

Drills

\varnothing 12 mm, length 100 mm

\varnothing 15 mm, length 100 mm



Exact formatting



Circular saw



Milling tools

Standard machining



Inlay finger joint



Tongue and groove



Grooves from the side



Exact formatting

Non-Standard machining



Milling of openings of various shapes



Grooves from the top



Milling of openings of various shapes



Milling of various shapes

EXAMPLES MACHINING NOVATOP SWP

Non-Standard machining



Profile made by milling



Profile made by cutting



Profile made by perforation



Profile of various shapes



Special projects



Special projects

PACKAGING, HANDLING AND TRANSPORTATION

NOVATOP SWP

Packaging

By default, the multi-layer solid wooden panels are packed in packages with the number of units as per the SWP "Packaging table", placed on wooden blocks (span of approximately 1m), packed in PE foil protecting against changes in humidity, contamination and partially against mechanical damage, tightened on all sides with tape, while another packing method is acceptable upon agreement.

Handling

The NOVATOP SWP packages are suitable for handling with use of front-end or side fork loaders and cranes with respect to the risk of damage to the product edges, panel surface and packa-

ging material, the approximate weight of one standard package with a size of 2100x5000 mm is 2500 kg.

Transportation

By default, the NOVATOP panels are transported on trucks (covered semi-trailers), or 20' and 40' containers. The informative loading capacity of a truck, or 40' container is 40m³ of SWP.

Caution

The product moisture might change during longer transportation in adverse weather conditions, and therefore, we recommend acclimatization before further processing.

Table of packaging for standard formats 5000 x 2100 m

Thickness	Construct	Pcs. in packet	m ² in packet	m ² in truck	spruce kg/m ²	larch kg/m ²
14	4-6-4	37	388,5	3108	6,86	X
16	5-6-5	30	315	2520	7,84	X
19	6-7-6	25	262,5	2100	9,31	11,21
21	6-9-6	20	210	1680	10,78	12,98
27	6-15-6	18	189	1512	13,23	15,93
27	9-9-9	18	189	1512	13,23	15,93
32	9-14-9	15	157,5	1260	15,68	18,88
42	9-24-9	12	126	1008	20,58	24,78
50	9-32-9	10	105	840	24,5	29,5
60	9-42-9	8	84	672	28,8	35,4



STORAGE AND PROCESSING

NOVATOP SWP

Storage

The multi-layer solid wood panels must be stored in closed and dry premises, placed in a horizontal position one on top of another and supported by templates with spacing of about 1m, they should be covered with other sheet material, such as P, MDF etc. after the packaging material is removed.

Caution

The improper storage of SWP may cause damage for which the producer shall not assume any responsibility.

Processing

The multi-layer solid wood panels (SWP) are made of solid wood, whereas the moisture on delivery is $8\% \pm 2\%$ for technical classes SWP/1, $10\% \pm 3\%$ for SWP/2 and $12\% \pm 3\%$ for technical class SWP/3. For this product, the wood properties are preserved and therefore, it reacts to changes in temperature and humidity by shrinking or swelling. Improper sto-

rage before processing and use in extreme temperatures and humidity may result in cracking and deformation. SWP may be processed with the use of any common wood-working tools and machines and treated by common processes as solid wood. When using SWP outdoors, it is important to consider the natural properties of solid wood.

Caution

The producer shall not assume any liability for product damage as a result of improper processing or product application, such as use in extreme weather conditions or failure to follow the working procedures.

The solid wood panel made from Siberian larch is designated for exterior use. For product damage as a result of using in interiors the producer do not assume any liability.

The producer guarantees the values of formaldehyde emission mentioned in the security data sheets only for panels with a closed surface. The values of formaldehyde emissions may increase as a result of the perforation of surface lamellas (e.g. acoustic).

Wood dust comes into existence while machining.



Natureplus

Limits on emissions of harmful substances and their content

PEFC

Certificate of conformity of the factory production control SWP/1, SWP/2, SWP/3

Certificate of conformity of the factory production control SWP/1 SD, SWP/2 SD, SWP/3 SD

ISPM

Declaration of properties NOVATOP SWP/SWP SD

Declaration of properties NOVATOP STAT

Declaration of properties NOVATOP FREE

Declaration of properties NOVATOP STATIC

All certificates can be downloaded at www.novatopswp.cz.



NOTES

A large grid of small dots for taking notes, consisting of 30 columns and 30 rows.

A large grid of small dots for taking notes, consisting of 30 columns and 30 rows.

NOTES

A large grid of small dots for taking notes, consisting of 20 columns and 30 rows.



www.novatop-swp.cz

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Manufacturer certificates:



The technical documentation and the certificates
can be downloaded at www.novatop-swp.cz



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FOR REGIONAL DEVELOPMENT
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