





# NOVATOP OPEN TECHNICAL DOCUMENTATION

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## **NOVATOP OPEN**

## FOR CEILING, ROOF STRUCTURES, AND WALL STRUCTURES

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## **CERTIFICATES, ATTESTS AND REPORTS**

ETA-15/0209 NT OPEN, TaZÚS Declaration of properties NT OPEN Certificate of constancy of performance NT OPEN, TaZÚS

Certificates, attests and reports can be downloaded on <u>www.novatop-system.com</u>

Version: 04/2020



# NOVATOP OPEN DATA SHEET

## **DESCRIPTION**

NOVATOP OPEN – The construction of the element consists of a bottom bearing multilayer panel (SWP) onto which there are glued beams (KVH, DUO, TRIO, BSH, I-girders) in the basic axial distance of 625 mm, performing the bearing function. Between the beams, there are inserted transverse reinforcing ribs, reinforcement around the perimeter and around the openings. The dimensions and the distances of the beams can be adjusted according to the requirements of the project. Connection of the panels and the ribs is carried out by gluing and cold pressing. The cavities between the beams can be fitted with thermal insulation. The element can be closed with another areal material - diffusionally open (e.g. Fermacell, DHF, DFP, etc.)

| Application                                             | Ceiling, roof structures, and wall structures                                                                                                                                                                                                                                                         |  |  |  |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Requirements                                            | EN13353                                                                                                                                                                                                                                                                                               |  |  |  |
| Operation classes                                       | SWP/1, SWP/2 according to EN 13353                                                                                                                                                                                                                                                                    |  |  |  |
| Wood                                                    | Central European spruce                                                                                                                                                                                                                                                                               |  |  |  |
| Quality of the surface (SWP)                            | No-visual structural (corresponding to C) Visual interior (corresponding to B) Classification of quality according to the internal regulations of AGROP NOVA a.s.                                                                                                                                     |  |  |  |
| Large format                                            | Ceiling and roof structures: 12,000 x 2,450 mm<br>(SWP with an inlay finger joint)<br>Wall structures: 12,000 x 2,950 mm                                                                                                                                                                              |  |  |  |
| Standard formats [mm]                                   | SWP width: 27mm (9/9/9), 19mm (6/7/6). Total height: 227 mm, 247 mm, 267 mm and other Width: 690, 1030, 2,090, 2,450, max. 2,450 mm Length: according to the project documentation, standardly 6,000, maximum 12,000 mm KVH dimensions (DUO, TRIO, BSH, I-girders): 200/60;220/60;240/60 mm and other |  |  |  |
| Dimensional tolerances according to EN 13 353           | Tolerance of nominal width and length: ± 2 mm<br>Straightness of sides: ±1 mm/m<br>Perpendicularity: ±1 mm/m                                                                                                                                                                                          |  |  |  |
| Surface (SWP)                                           | Ground – K 50, 100                                                                                                                                                                                                                                                                                    |  |  |  |
| Glue                                                    | Melamine adhesive according to EN 301, PU according to EN 15425                                                                                                                                                                                                                                       |  |  |  |
| Formaldehyde emission class                             | E1 according to EN 717-1 (max. 0,124 mg/m³)                                                                                                                                                                                                                                                           |  |  |  |
| Moisture (SWP)                                          | 10 % ± 3 %                                                                                                                                                                                                                                                                                            |  |  |  |
| Shrinkage and swelling coefficient (SWP)                | a (%/%) 0,002 – 0,012 %                                                                                                                                                                                                                                                                               |  |  |  |
| Density (SWP)                                           | approx. 490 kg/m³                                                                                                                                                                                                                                                                                     |  |  |  |
| Reaction to fire (SWP)                                  | D-s2,d0 according to EN 13501-1                                                                                                                                                                                                                                                                       |  |  |  |
| Thermal conductivity (SWP) λ                            | 0.13 W/mK, at a density of 490 kg/m³ according to EN ISO 10456                                                                                                                                                                                                                                        |  |  |  |
| Specific heat capacity c <sub>p</sub>                   | 1.600 J/kg.K according to EN ISO 10456                                                                                                                                                                                                                                                                |  |  |  |
| Factor of diffusion resistance (SWP) $\boldsymbol{\mu}$ | 200/70 (dry/wet) according to EN ISO 10456                                                                                                                                                                                                                                                            |  |  |  |
| Sound absorption (SWP)                                  | 250 – 500 Hz – 0,1<br>1000 – 2000 Hz – 0,3                                                                                                                                                                                                                                                            |  |  |  |
| Airborne sound insulation (SWP) dB                      | $R = 13x \log (m_a) + 14$<br>$m_a - surface weight kg/m^2$                                                                                                                                                                                                                                            |  |  |  |



# NOVATOP OPEN CEILINGS AND ROOFS – TYPES

**SWP width:** 27 mm (9/9/9), 19 mm (6/7/6). **Total height:** 227 mm, 247 mm, 267 mm and other

Width: 1030, 2090, 2450, max. 2.450 mm

Length: according to the project documentation, standardly 6,000, maximum 12,000

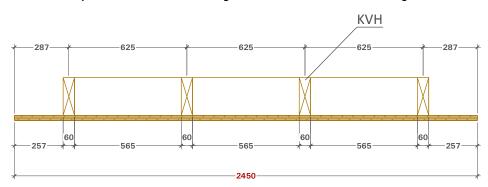
mm

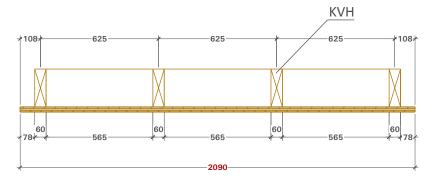
KVH dimensions (DUO,TRIO,BSH, I-girders): 200/60; 220/60; 240/60 mm and other

Maximal format: 12.000 x 2.450 mm

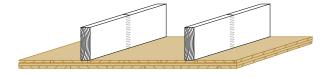
Extension of the SWP with an inlay finger joint.

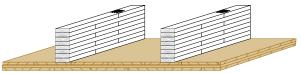
### Standard axial pitch KVH (DUO, TRIO, BSH, I-girder): 625 mm, the others according to the static assessment.



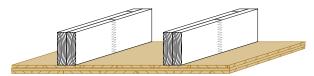


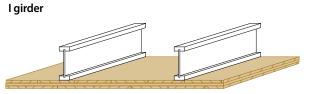
KVH BSH





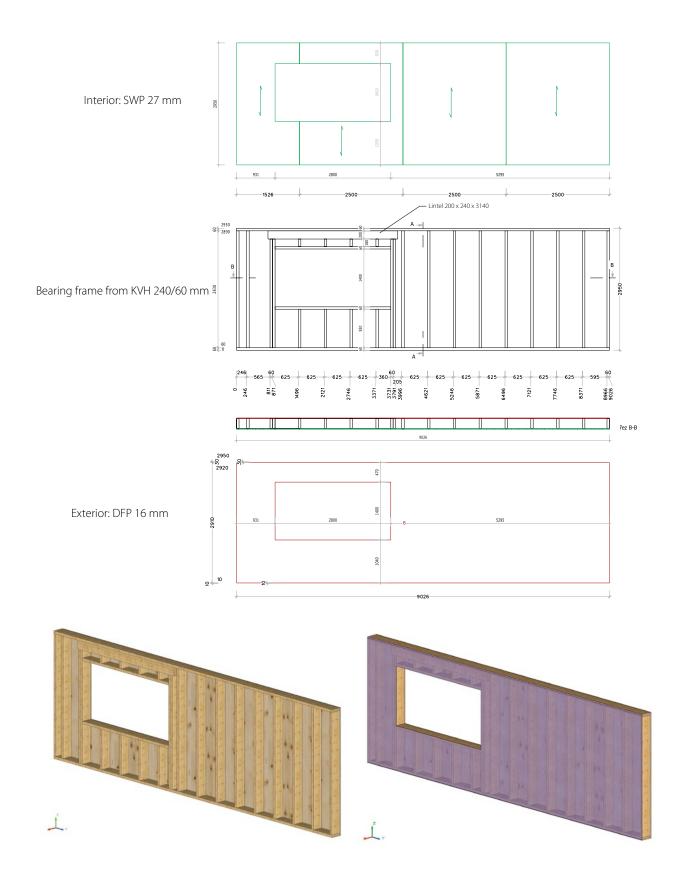
DUO (TRIO)







# NOVATOP OPEN WALLS – EXAMPLE OF IMPLEMENTATION





# NOVATOP OPEN SPECIFICATIONS OF GLUED BEAMS

KVH – solid structural wood extended with an indented joint

**DUO, TRIO** – is a massive construction two-lamella beam and a three-lamella beam formed by surface gluing of two or three structural lamellas connected longitudinally with an indented joint

BSH - glued laminated beams

Wood: spruce

**Qualities:** for visual structures, for no-visual structures **Standard length:** KVH and DUO-TRIO 5 to 13 m

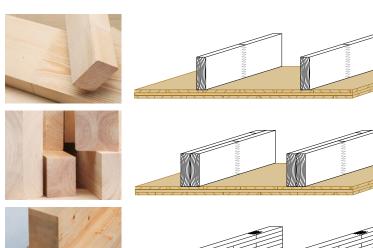
BSH 6 to 12 m

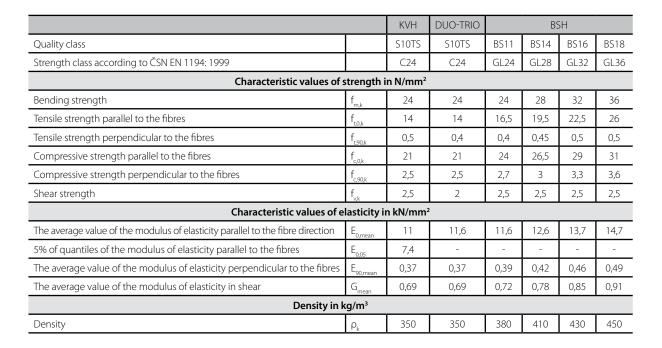
Standard height (mm): KVH and DUO-TRIO – 60, 80, 100, 120, 140, 160, 180, 200, 220, 240

BSH 80 – 1.240 mm in distances of 40 mm

Standard width (mm): KVH and DUO-TRIO –60, 80, 100

BSH 80 – 240 mm in distances of 20 mm







# NOVATOP OPEN PROCESSING, LABELLING AND PACKING

### **PROCESSING**

The structure of the NOVATOP OPEN panel consists of a bottom multi-layer board from massive solid wood (SWP); the moisture content at dispatch is  $10\% \pm 3\%$ . Beams (KVH, DUO, TRIO, BSH) performing the bearing function are glued to the bottom panel. The beams and panels are joined solely by gluing and cold pressing. According to the requirements of the project, the space between the beams can be fitted with thermal and sound insulation, or there can be prepared routes for the distribution of installations in them. All the processing is performed on the basis of the agreed production documentation on CNC machines that operate according to CAD data. The panels are most often supplied as fully processed with no further need of processing on the construction site.

**Warning:** Wood properties of this product are maintained, so it responds to changes in temperature and humidity by shrinking or, possibly, by swelling. Improper storage and use in extreme conditions (extreme temperatures and humidity) can cause cracking and deformations.

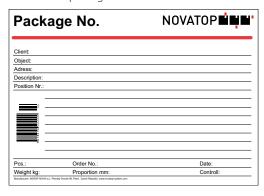
## LABELLING AND PACKING

Each panel is fitted with an identification label with a description. Following the final quality inspection, the panels are packed, wrapped in PE foil (protection against changes in humidity, contamination and partially against mechanical damage) and tightened on all sides with a tape. Each package is fitted with an identification label with a description.

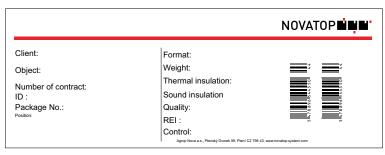
Placement of a label on the panel



Label on the package



Label on the panel



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# NOVATOP OPEN STORAGE, TRANSPORT

### **STORAGE**

The panels must be stored in an enclosed, dry space and positioned horizontally. After the removal of the protective casing, they must be carefully covered, preferably with a different sheet material.

The panels must be protected from adverse weather conditions, even on the construction site, and stored there for only the necessary time. It is essential to avoid exposing of the panels to rain and flowing water. For the protection against water, dirt and excessive solar radiation, we recommend using tarps or tarpaulins.

Warning: Improper storage may result in damage, for which the producer assumes no liability

## **TRANSPORT**

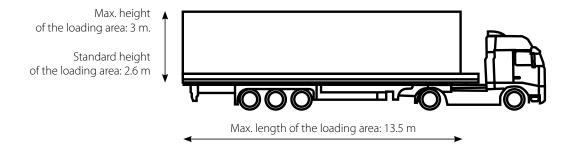
As a standard, the panels are transported in lorries (covered semi-trailers), possibly in containers. For the lorries, it is necessary to ensure entry in and exit from the construction site.

**Warning:** The panels must be at all times protected against adverse weather conditions. During longer transport under adverse climatic conditions, a change in the moisture of the panels may occur; that is why we recommend acclimatisation before processing it (gradual drying, gradual changes of temperature).

#### Maximum parameter of the load: 50 m<sup>3</sup>/24 t

At present, only horizontal loading of packages is possible. The transport of NOVATOP components is possible with different types of trucks and depends on the dimensions of the packages, ways of unloading and transport accessibility to the building site. It is necessary to ensure entry and exit of these vehicles onto the site. According to the particular conditions, when the cargo is smaller, a surcharge will be imposed due to inefficient utilization of the transport capacity.

| package width | length packet | way of landing | transportation facilities                                                        | supplementary charge |
|---------------|---------------|----------------|----------------------------------------------------------------------------------|----------------------|
| ≤ 2,1 m       | max. 6 m      | electric crane | trailer with a standard-size sheet                                               |                      |
|               |               | lift truck     | trailer with a standard-size sheet                                               |                      |
| max. 2,4 m    | max. 12 m     | electric crane | trailer with a sheet with a posibility of removing the support in the upper part |                      |
|               |               | lift truck     | trailer with a sheet with the possibility of displacement of the central pillars |                      |
| max. 2,5 m    | max. 6,5 m    | electric crane | uncovered trailer                                                                | ✓                    |
|               |               | lift truck     | trailer with a sheet with the possibility of displacement of the central pillars |                      |
| max. 2,48 m   | max. 12 m     | electric crane | uncovered trailer                                                                | ✓                    |
|               |               | lift truck     | trailer with a sheet with the possibility of displacement of the central pillars |                      |
| 2,5–3 m       | max. 12 m     | electric crane | uncovered trailer                                                                | ✓                    |
|               |               | lift truck     | uncovered trailer                                                                | ✓                    |





# NOVATOP OPEN MANIPULATION, ASSEMBLY

### MANIPULATION

Due to the high weights of the panels, cranes and special vehicles (forklift trucks) are suitable for manipulation; it is always necessary to define the maximum lifting load and range. During manipulation, it is necessary to ensure protection of the packaging material, surfaces and edges of the panels to avoid damage. NOVATOP OPEN panels are ready for manipulation during the production.

#### Manipulation with panels for ceilings and roofs:

In the longitudinal beams (KVH, DUO, TRIO, BSH), there are openings, into which special suspension straps are placed. The panels must be placed in the required assembly position using 4 suspension straps. It is important to ensure that the there was an angle of approx. 60° between the panel and the strap system. The maximum load is given by the load capacity of the suspension straps and the load capacity of the longitudinal beams and it is fixed at 300 kg per one suspension strap. The number of suspension straps per panel is determined by the load capacity of individual straps, usually there are 4 pieces.

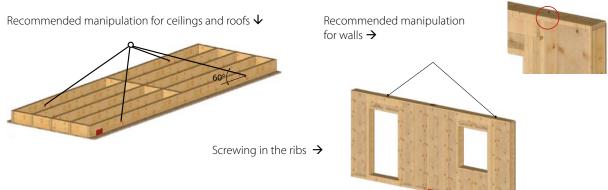
#### Manipulation with panels for walls:

Suspension screws and metal suspension shackles are used for vertical manipulation. When screwing the screws, it is necessary to take into account the centre of gravity of each panel and the position of the ribs (beams). The maximum load of the suspension screws screwed into the rib (beam) in the depth of 145 mm is given by their load capacity. When screwing perpendicularly to the fibres, one screw has load capacity of 850 kg, and, when screwing longitudinally to the fibres, one screw has load capacity of 260 kg. The number of screws per panel is determined by the load capacity of individual screws, usually two screws per one manipulated panel are used.

Suspension straps (price list item 011.003), suspension screws (price list item 011.001) and suspension metal shackles (price list item 011.002) can be ordered from the manufacturer.

Crane straps, chains and thimbles must be provided by the customer.

Warning: The panels must be at all times protected against adverse weather conditions.



## **ASSEMBLY**

The producer aims to supply fully processed panels directly to the assembly point. The assembly plan, which precisely defines the course of the assembly, is an inseparable part of the production process. Each panel is fitted with an identification label stating the position number in the assembly plan.

Individual panels are fitted by means of a crane and then anchored to the adjacent structures with various kinds of ironmongery. The exact position can be secured with the help of tightening ratchets. When hammering the panels together, it is necessary to take into account the position of the beams; when hammered together unprofessionally, the panel may get damaged. For more information, see "Instructions for assembly".

Warning: The panels must be at all times protected against adverse weather conditions.

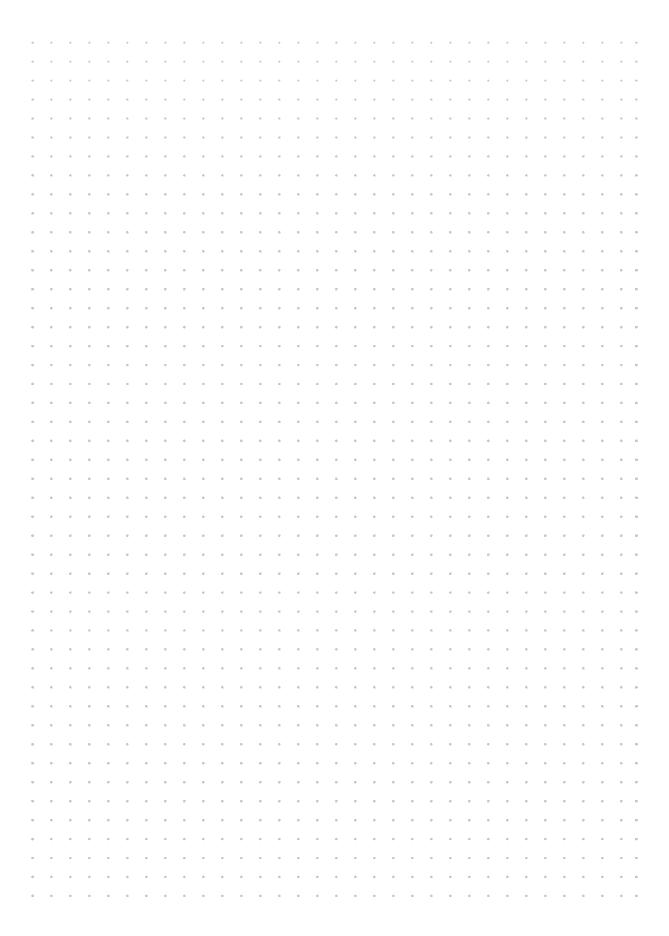
The recommended relative humidity of the environment in which NOVATOP panels are installed is 55% at 20°C. Wood cracks may occur due to low air humidity.

**Warning:** Wood properties of this product are maintained, so they respond to changes in temperature and humidity by shrinking or, possibly, by swelling. Improper storage and use in extreme conditions (extreme temperatures and humidity) can cause cracking and distortions.

The producer assumes no liability for the damage of the product due to improper storage, processing, unsuitable use or nonobservance of work procedures during the assembly.



# NOTES





# NOTES

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Manufacturer: AGROP NOVA a.s. Ptenský Dvorek 99 798 43 Ptení Czech Republic Tel.: +420 582 397 856 novatop@agrop.cz novatop-system.com

Manufacturer certificates:











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