



NOVATOP CLT STANDARD  
Technical documentation

# ON-LINE SUPPORT

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Product



Technical  
documentation



Certificates

# NOVATOP CLT STANDARD CONTENTS

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**Warning:**  
You can find the current technical documentation on the website in downloads section.

## DESCRIPTION

CLT STANDARD are structural large-format panels made of cross-laminated timber (CLT – cross laminated timber). The panels are manufactured from spruce lamellas dried to 12–14% and put together in layers; the layers form an angle of 90°. The lamellas are connected with an inlay finger joint. The number of layers is odd (3, 5, 7) and determines the final thickness of the panel.

<b>Use</b>	Horizontal and vertical applications
<b>Requirements</b>	ETA – 17/0004
<b>Wood</b>	Central European spruce
<b>Surface quality</b>	Non-visual structural Lamella strength of C24 The lamellas are connected with an inlay finger joint
<b>Large format</b>	Max 12,000 x 2,950 mm or 10,000 x 3,500
<b>Standard formats (mm)</b>	3-layer CLT: 60, 80, 84, 90, 110, 120 mm 5-layer CLT: 100, 120, 124, 140, 160, 180, 200 mm 7-layer CLT: 180, 200 mm Combination of lamellas 20, 30 and 40 mm.
<b>Dimensional tolerances</b>	Nominal width and length tolerance: $\pm 2$ mm Straightness of sides: $\pm 1$ mm/m Squareness: $\pm 1$ mm/m
<b>Surface</b>	Planed lamellas, surface not sanded
<b>Glue</b>	PU according to EN 15425
<b>Formaldehyde emission class</b>	E1 according to EN 717-1 (max. 0.124 mg/m <sup>3</sup> )
<b>Humidity</b>	12 % $\pm$ 2 %
<b>Density</b>	approx. 450 kg/m <sup>3</sup>
<b>Reaction to fire</b>	D-s2,d0 according to EN 13501-1
<b>Thermal conductivity (<math>\lambda</math>)</b>	0.13 W/mK according to EN ISO 10456
<b>Specific heat capacity <math>c_p</math></b>	1.600 J/kgK according to EN ISO 10456
<b>Factor of diffusion resistance (<math>\mu</math>)</b>	200/70 (dry/wet) according to EN ISO 10456
<b>Airborne sound insulation (dB)</b>	$R = 13 \times \log(m_s) + 14$ $m_s$ – surface weight kg/m <sup>2</sup>

# NOVATOP CLT STANDARD PANEL COMPOSITIONS

## STRUCTURAL TYPE OF PANELS



3 layers



5 layers



7 layers

## VISUAL TYPE OF PANELS

Gluing with a 3-layer panel (SWP) - thickness of 19 mm, visual quality (B).



3 layers + SWP



5 layers + SWP



5 layers + SWP

# NOVATOP CLT STANDARD ASSORTMENT

## RANGE OF PRODUCTS

Number of layers	Total thickness	Marking	Lamella structure (mm)						SWP19 gluing option (B)	
			L	Q	L	Q	L	Q		
L – longitudinal direction of the fibres (parallel to production length)										
3	60	CLT60 L-3S NSI	20	20	20				x	
	80	CLT80 L-3S NSI	30	20	30				✓	
	84	CLT84 L-3S NSI	28	28	28				x	
	90	CLT90 L-3S NSI	30	30	30				✓	
	100	CLT100 L-3S NSI	30	40	30				✓	
	110	CLT110 L-3S NSI	40	30	40				✓	
	120	CLT120 L-3S NSI	40	40	40				✓	
5	100	CLT100 L-5S NSI	20	20	20	20	20	✓		
	120	CLT110 L-5S NSI	30	20	20	20	30	✓		
	124	CLT120 L-5S NSI	27	20	30	20	27	x		
	140	CLT140 L-5S NSI	40	20	20	20	40	✓		
	160	CLT160 L-5S NSI	40	20	40	20	40	✓		
	180	CLT180 L-5S NSI	40	30	40	30	40	✓		
	200	CLT200 L-5S NSI	40	40	40	40	40	✓		
7	180	CLT180 L-7S NSI	30	20	30	20	30	20	30	✓
	200	CLT200 L-7S NSI	40	20	20	40	20	20	40	✓
Q – transverse direction of the fibres (perpendicular to production length)										
3	60	CLT60 Q-3S NSI	20	20	20				x	
	80	CLT80 Q-3S NSI	30	20	30				✓	
	84	CLT84 Q-3S NSI	28	28	28				x	
	90	CLT90 Q-3S NSI	30	30	30				✓	
	100	CLT100 Q-3S NSI	30	40	30				✓	
	110	CLT110 Q-3S NSI	40	30	40				✓	
	120	CLT120 Q-3S NSI	40	40	40				✓	
5	100	CLT100 Q-5S NSI	20	20	20	20	20	✓		
	120	CLT110 Q-5S NSI	30	20	20	20	30	✓		
	124	CLT120 Q-5S NSI	27	20	30	20	27	x		
	140	CLT140 Q-5S NSI	30	20	40	20	30	✓		
	160	CLT160 Q-5S NSI	40	20	40	20	40	✓		

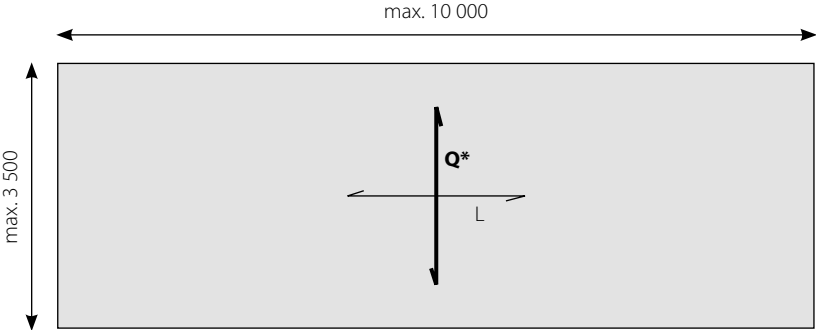
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2

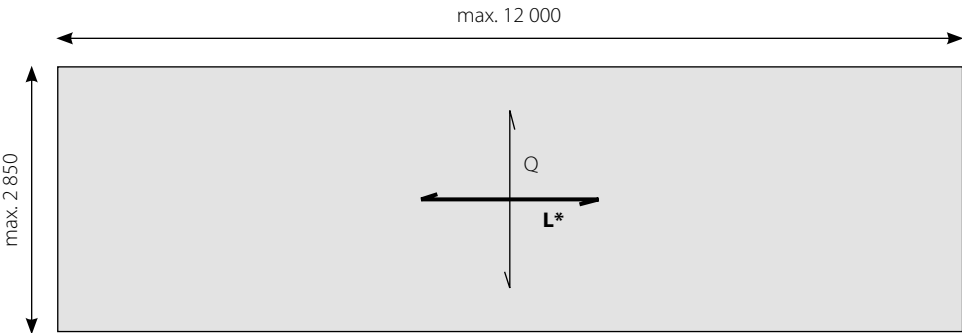
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# NOVATOP CLT STANDARD FORMATS

## MAXIMUM FORMATS



\* usual fibre direction

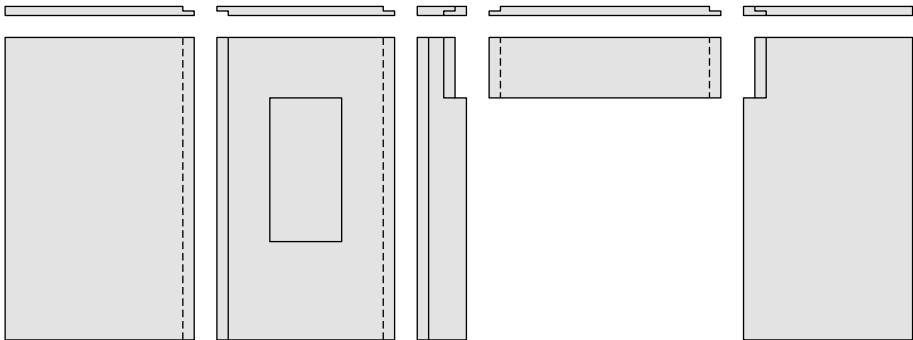


\* usual fibre direction

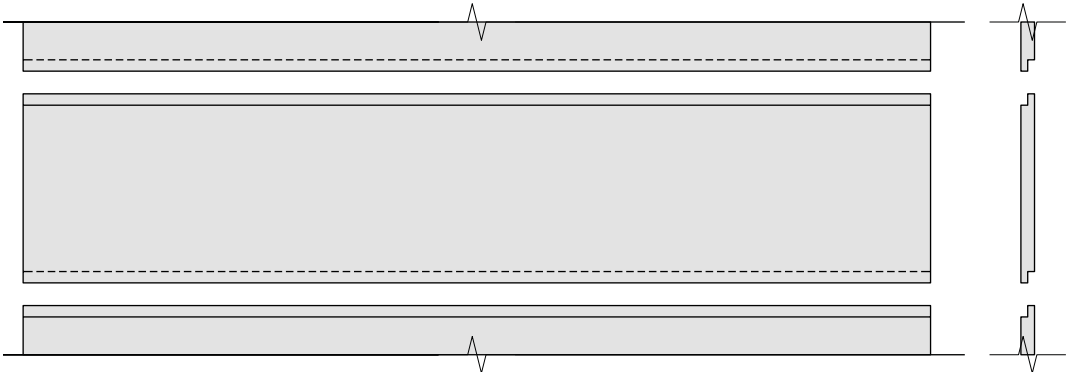
Q – transverse direction of fibres  
L – longitudinal direction of fibres

## PRINCIPLES OF CONNECTION

### Walls



### Ceilings





# NOVATOP CLT STANDARD PROCESSING, LABELLING AND PACKING

## PROCESSING

NOVATOP CLT STANDARD panels are processed from lamellas of solid natural wood (SWP). The lamellas are glued together in every layer. The thickness of the layers can differ and determines the final thickness of the panel. The moisture content at dispatch is  $12\% \pm 2\%$ .

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.

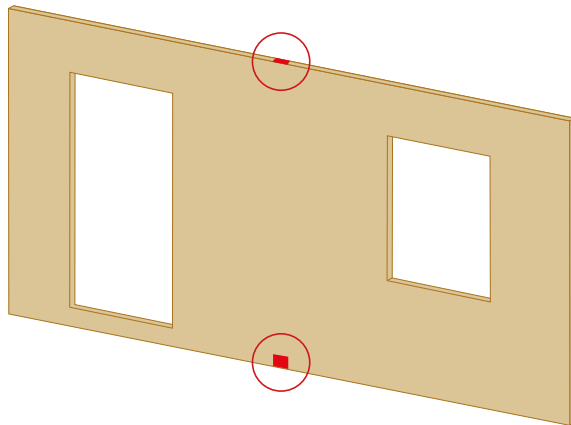
**Recommendation:** In large formats, the panels have a relatively high dead weight and, therefore, we recommend their final processing in the production.

## LABELLING AND PACKING



Each panel is fitted with an identification label with a description. The labels are placed at the top edge and at the bottom of each panel. With the external walls, the inside of the panel bears a bottom label; with the internal walls, the bottom label is placed in the visual direction of the wall that is entered in the drawing.

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 labels on the panel



Label on the package

Package Nr.		
<hr/>		
Client: _____		
Object: _____		
Address: _____		
Description: _____		
Position Nr.: _____		
_____		
_____		
_____		
_____		
_____		
_____		
_____		
Pcs.:	Date:	
Weight:	Proportion:	Control:
<small>Manufacturer: AGROP NOVA a.s., Pletenský Dvůrek 99, Pletň, Czech Republic, www.novatosystem.com</small>		

Label on the panel

Positions No.:		
<hr/>		
Client: _____		Date: _____
Object: _____		Control: _____
Product: _____		
Description: _____		
Adhesive: _____		
Quality: _____		
_____		
<small>ADRESA VÝROBCE: AGROP NOVA a.s., Pletenský Dvůrek 99, Pletň, Czech Republic, www.novatosystem.cz</small>		



# NOVATOP CLT STANDARD TRANSPORT, STORAGE

## 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 load parameters: 50 m<sup>3</sup>/24 t**

The transport of NOVATOP components is possible by different types of lorries and depends on the dimensions of the packages, methods of unloading and transport availability on the construction site. It is necessary to ensure the entry and exit of these vehicles to the construction site. According to the particular conditions, when the cargo is smaller, a surcharge will be imposed due to inefficient utilization of the transport capacity.

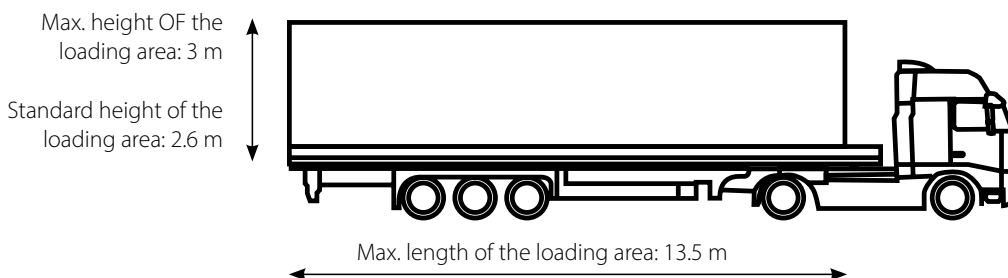
## STORAGE

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.

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

width of packages	length of packages	unloading method	transportation options	surcharge
≤ 2,1 m	max. 6 m	crane	semi-trailer with tarpaulin of standard dimensions	
		forklift truck	semi-trailer with tarpaulin of standard	
max. 2,4 m	max. 12 m	crane	semi-trailer with tarpaulin with the possibility of removing the support in the upper part	
		forklift truck	semi-trailer with a tarpaulin with the possibility of moving the centre posts	
max. 2,5 m	max. 6,5 m	crane	open semi-trailer	✓
		forklift truck	semi-trailer with a tarpaulin with the possibility of moving the centre posts	
max. 2,48 m	max. 12 m	crane	open semi-trailer	✓
		forklift truck	semi-trailer with a tarpaulin with the possibility of moving the centre posts	
2,5–3 m	max. 12 m	crane	open semi-trailer	✓
		forklift truck	open semi-trailer	✓
3–3,5 m	max. 10 m	crane	open semi-trailer – special permit	✓
		forklift truck	open semi-trailer – special permit	✓



# NOVATOP CLT STANDARD HANDLING, 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 in advance the maximum lifting load and range. During handling, it is necessary to ensure protection of the packaging material, surfaces and edges of the panels to avoid damage.

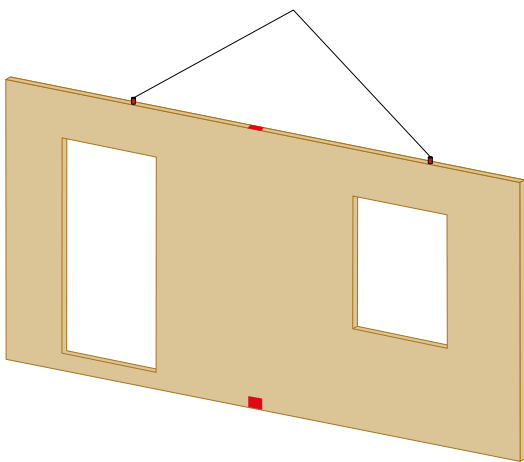
When handling NOVATOP CLT STANDARD panels, suspension screws and suspension metal shackles are used, which can be ordered from the manufacturer.

When screwing the screws, it is necessary to take into account the centre of gravity of each panel. The maximum load of the suspension screws screwed into 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.

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

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

Recommended manipulation



Recommended placement of the screw according to the direction of the fibres



## ASSEMBLY

The custom-made panels (in exact formats, with selected processing of joints, with openings for windows and doors and with other individual adjustments) are forwarded directly to the assembly point. Individual panels are fitted by means of a crane. You can build directly from the lorry, without further intermediate warehouse manipulation. The panels are connected with wood screws and the connection with other structures is carried out using various kinds of building hardware. We recommend determining the exact position with the help of tightening ratchets. For more information, see "Instructions for assembly".

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

**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 deformations. 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.

# NOVATOP CLT STANDARD USE, MAINTENANCE, WARRANTY

## APPLICATION

1. CLT STANDARD are intended for horizontal and vertical building structures in non-visual quality.
2. In the case of cladding the CLT STANDARD panel with a three-layer NOVATOP SWP panel in visual quality, we recommend treating the visual side of the interior with a suitable surface treatment intended for solid wood (glazing paints, oils, waxes for the interior), which significantly increases resistance to dirt and UV radiation. The technological procedure is governed by the instructions of the manufacturer of the selected coating. Untreated wood naturally darkens.
3. In the case of glueing the CLT panel with SWP in visual quality, the recommended relative humidity of the environment in which the panels are installed is 55 % at 20 °C.
4. Information on processing and assembly can be found in the assembly instructions. **Warning:** The panels must be at all times protected against adverse weather conditions.

## MAINTENANCE

### **Recommended maintenance in the case of cladding the CLT STANDARD panel with a three-layer NOVATOP SWP panel in visual quality.**

1. The panels need to be protected from moisture (air conditioning condensate, running or dripping water, etc.).
2. We recommend regularly removing dust and dirt on the surface of the visible sides of the panels gently with a dry cloth or gently using a vacuum cleaner with an attachment (dust brush).
3. In the case of moderate soiling of the wooden surface, we recommend using a soft dry or moistened cloth or sponge, or using cleaning agents intended for wooden surfaces. Do not use excessive amounts of water.
4. Wooden surface damage that cannot be cleaned (alcohol marker, scratches) can be solved by gently sanding the affected area and then treating it with the same type of coating. The technological procedure is governed by the instructions of the manufacturer of the selected coating. **Warning:** When placing decorations, pictures, lights shelves, etc., it is necessary to take into account that, after a certain time, the UV radiation will „burn“ their contours, and the treatment of this place may be more demanding.

### **WARNING**

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

## WARRANTY

1. The manufacturer is responsible for the quality, functionality and completeness of the goods delivered to the customer according to the framework purchase contract concluded between the supplier and the customer. The manufacturer provides a 10-year warranty on the functionality of the panels. The warranty period begins on the day of delivery of the goods to the customer and is based on the conditions specified in the specific purchase contract. Surface treatments conducted by the manufacturer are covered with a fixed two-year warranty.
2. The manufacturer is not liable for any defects of the goods due to any improper handling, installation and using of the elements, defects arising in connection with an excessive load on the elements during their use, and damage to the goods caused by force majeure or third parties, including the defects and subsequent damage caused by weather conditions during the construction. The manufacturer is not responsible for any defects that will occur with the panels (and the structure as a whole) as a result of errors in the project documentation (e.g. in terms of statics of the structure) and/or improper assembly of the structure, including failure to keep relative atmospheric humidity of the environment.
3. The recommended relative humidity of the environment in which the panels will be built is 40–60% at 20°C. The warranty does not apply to cracks in the wood that were created as a result of low humidity.
4. The warranty does not cover direct or indirect consequential damages caused by improper care and maintenance or wear and tear caused by normal use.

## NON-VISUAL EXECUTION OF PANELS

**Spruce – non-visual quality.** The surface is made of planed lamellas and is not sanded. Classification of quality according to the internal regulations of AGROP NOVA a.s.





# NOVATOP CLT STANDARD QUALITY SPECIFICATIONS

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## VISUAL EXECUTION OF THE PANELS – GLUED WITH A 3-LAYER PANEL (SWP)

**Spruce – visual quality.** The surface lamellas are of higher quality timber. The surface is sanded with repaired knots from branches of different sizes, closed, puttied, without colouring. Pulp is allowed to a lesser extent. Small abrasions and bumps to a depth of 1 mm and an area of 10 mm<sup>2</sup> are permitted. Defects on the edge of the board are allowed up to 10 mm. The section surfaces and the milled surfaces always correspond to no-visual quality. When packed, the panels are interleaved with cardboard. Classification of quality according to the internal regulations of AGROP NOVA a.s.



# NOVATOP CLT STANDARD QUALITY SPECIFICATIONS

## VISUAL QUALITY OF A 3-LAYER NOVATOP SWP PANEL

Classification of quality according to the internal regulations of AGROP NOVA a.s.	
Features for sorting	Visual quality (B)
<b>General, requirements, longitudinal joints</b>	flawless gluing without open joints
<b>Structure, course of fibres, compression wood</b>	roughly grown and light compression wood allowed
<b>Knottiness</b>	Occasionally black knots-eyes permissible up to a diameter of 10 mm, *(healthy, firmly ingrown knots without special requirements)
<b>Repairs with natural knots</b>	there may not be 2 knots next to each other *(permissible up to a diameter of 35 mm)
<b>Pitch pockets</b>	exceptionally permissible up to 5 x 50 mm, not clumps or mass occurrence
<b>Repaired pitch pockets</b>	exceptionally permissible above 5 x 50 mm, repaired with a boat-shaped wedge
<b>Cortex</b>	inadmissible, *(bark pockets repaired up to 35 mm)
<b>Cracks</b>	shallow surface cracks exceptionally permissible, passing end cracks up to 50 mm of length exceptionally permissible
<b>Core (pith)</b>	pith permissible with a total length of up to 600 mm in one piece or as the sum of passing parts
<b>Insect infestation, worm</b>	not allowed
<b>Discolouration, fungus</b>	permissible blueing up to a width of 10 mm and a length of 200 mm
<b>Thickness of glued joints</b>	max. 0.3 mm
<b>Surface machining</b>	occasional small defects are permissible
<b>The quality of the edge of the panel (bulges, battered places, chipped splinters, pulled-out fibres)</b>	within 10 mm from the edge is exceptionally permissible
<b>Combining different types of wood</b>	not allowed
<b>Width of individual parts – excluding the outer ones</b>	at least 60 mm
<b>Wood pattern</b>	without special requirements

1

2

3

# NOTES

Grid of dots for notes.





novatop-clt.com

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

Manufacturer certificates:

