HUNTON
Nativo® Wood Fiber Insulation

MANUAL FOR ENERGY EFFICIENT AND SUSTAINABLE BUILDING INSULATION

HUNTON NATIVO® WOOD FIBRE INSULATION

Nativo Wood Fibre Insulation contributes to a healthy room environment and at the same time helps improve the energy balance of your home. Wood fibre insulation excels with good moisture-handling and heat storage capasities.
The insulation is easy to install, contributes to a healthy indoor climate at construction site and is aging-resistant.
– This is a building insulation that will last for generations to come.

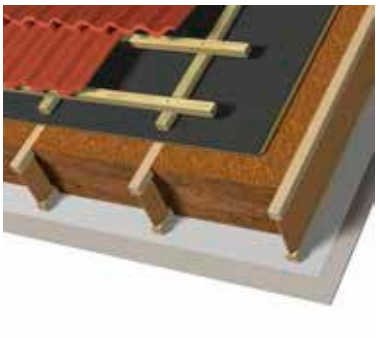
NTNO - 03/19

Contents

Introduction

This manual is about Hunton Nativo® Wood Fibre Blow-in Insulation and Hunton Nativo Wood Fibre Insulation Boards. The features and and benefits of the products are described, and it explains why Nativo Wood Fibre Insulation is suitable for use in the Nordic region and in the Nordic climate. Among other things, we describe examples both for new buildings and rehabilitation projects, demonstrating the technical specifications of the insulation and its positive contribution in a climate and environmental perspective.

Structural examples

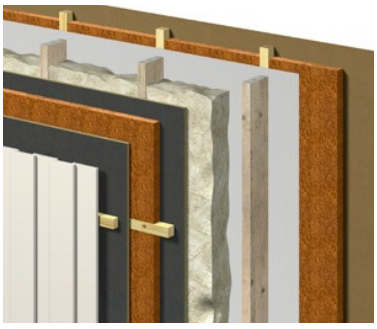


Roof structure with the following products as seen from the inside:

- Hunton Fermacell Gypsum Fibreboards
- Hunton Intello Plus vapour barrier
- Hunton I-Beams and Hunton Nativo Wood Fibre Insulation Boards or Hunton Nativo Wood Fibre Blow-in Insulation
- Hunton Underroof
- Loops, laths and roof tile

Wall structure with the following products as seen from the inside:

- Hunton Fermacell Gypsum Fibreboards
- Hunton Nativo Wood Fibre Insulation Boards (padded installation layer)
- Hunton Intello Plus vapour barrier
- Hunton I-Beam and Hunton Nativo Wood Fibre Blow-in Insulation or Boards (padded installation layer, newly fitted)
- Hunton Windproof
- Lathing and cladding



Wall construction rehabilitation as seen from the inside:

- IInterior cladding (newly fitted)
- Hunton Nativo Wood Fibre Insulation Boards (padded installation layer, newly fitted)
- Interior cladding (newly fitted)
- Timber framework with insulation of mineral wool, sawdust, wood shavings or the like (existing)
- Hunton Windproof (existing)
- Hunton Nativo Wood Fibre Insulation Boards (padded, newly fitted)
- Hunton Windproof (newly fitted)
- Lathing and cladding (newly fitted)

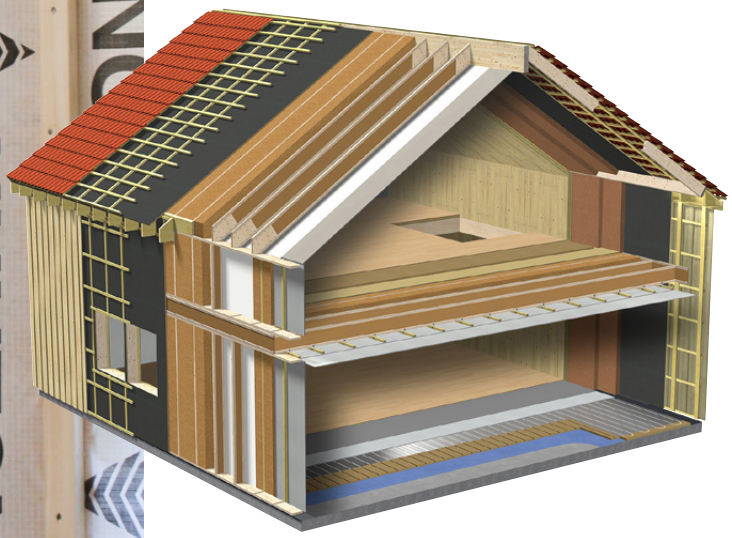
Wall construction rehabilitation as seen from the inside:

- Interior cladding (newly fitted)
- Old timber framework with weatherised Hunton Nativo Wood Fibre Blow-in Insulation
- Hunton Windproof (existing)
- Lathing and cladding (existing)

Label: Inside and outside surfaces remain untouched.

Blow-in insulation in new buildings through Hunton Intello® Plus vapour barrier

The illustration shows a wall with blow-in insulation with Nativo Wood Fibre Insulation.



Hunton Nativo Wood Fibre Blow-in Insulation has a SINTEF Byggforsk product certificate, which gives greater security to the insulation, and which complies with the imposed requirements – in new as well as in old buildings.

Product features of Nativo Wood Fibre Blow-in Insulation and Nativo Wood Fibre Insulation Boards

In 2012-2014 Hunton carried out a project in cooperation with SINTEF Byggforsk to investigate whether wood fibre-based insulation is suitable for use in the Nordic climate. During laboratory testing, a number of positive properties in relation to fire, environment and building physics were documented. Nativo Wood Fibre Insulation has got SINTEF Technical Approval and SINTEF Product Certificates.

Building physics

Moisture

Wood fibre insulation has unique product features as far as moisture is concerned. It can transport and emit moisture to a much greater extent than other types of insulation, and the reason for this is that wood fibre insulation is a hygroscopic material. This reduces the risk of condensation in the construction and related building damage. In addition, the moisture dynamics of the material contribute to a and healthy indoor climate.

The conclusion after extensive testing is:

- "Hunton Nativo Wood Fibre Insulation performs at least as well as mineral wool under the tested climate loads."
- "Hunton Nativo Wood Fibre Insulation is not as dependent on a dense internal vapour barrier as mineral wool insulation."
- "Nativo Wood Fibre Insulation Boards and Nativo Wood Fibre Blow-in Insulation have somewhat lower internal convection than mineral wool."
- "The moisture buffer rate of Hunton Nativo Wood Fibre Insulation reduces the fluctuations in relative humidity from climatic loads."

Heating

Both Nativo Wood Fibre Insulation Boards and Nativo Wood Fibre Blow-in Insulation have heat conductivity λ of 0.038 W/mK (lambda). This value is used for calculating the heat transmission coefficient of a structure, also called U value's value is determined by a standardised and static test system according to "EN 12667 Thermal performance of building materials and products – Determination of thermal resistance by means of guarded hot plate and heat flow meter methods – Products of high and medium thermal resistance". This standard does not take into account several important parameters in relation to the realistic use of the material (insulation). For example, our Nordic climate where temperatures vary from day to day and throughout the year.

In addition to the λ value, heat storage capacity and low air passage/air movement (convection), among other things, are important as well, because these affect the total insulation capacity of the material.

Thanks to the accumulation effect, Nativo Wood Fibre Insulation provides stable indoor temperatures, combined with minimal need for energy supply for heating or cooling. Corresponding effects are also achieved in solid wood and cogged structures.

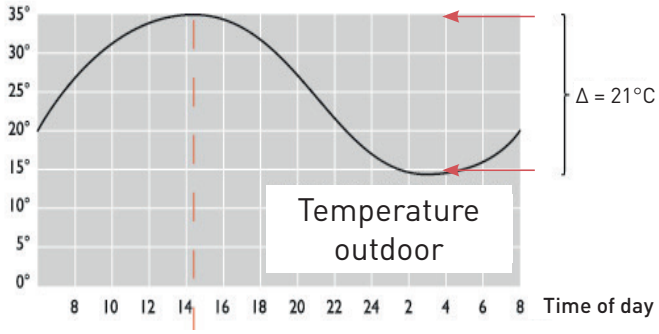
Heat resistance R

The table below shows the thicknesses needed to achieve a specific heat resistance (m^2K/W). The table shows the heat resistance in closed structures. The values apply only to the wood fibre insulation's contribution to the heat resistance.

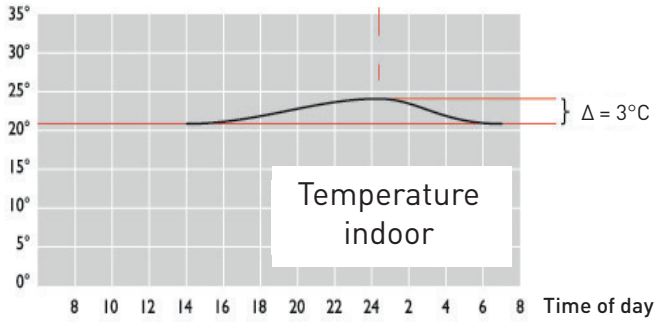
Insulation thickness (mm)	100	120	140	150	160	180	200	220	240	250	260	280	300
Heat resistance [m2K/W]	2,63	3,16	3,68	3,95	4,21	4,74	5,26	5,79	6,32	6,58	6,84	7,37	7,89

Heat retention capacity/amplitude attenuation/phase shift

Specific heat storage capacity is a material constant that indicates how much energy must be added to one kilogram of a particular material to increase its temperature by one degree Kelvin. Nativo Wood Fibre Insulation has heat capacity of 2100 J/(kg*K). This is twice as high compared to most other insulation products. High heat capacity leads to strong amplitude attenuation and significant phase shift. The illustrations below explain the principle.

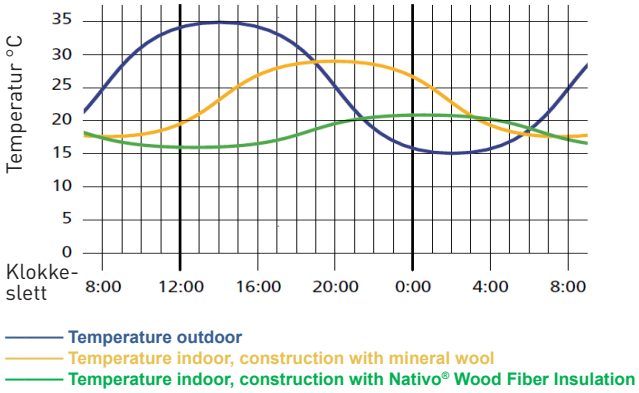


- - - - - - 10 hours phase offset between maximum temperatures



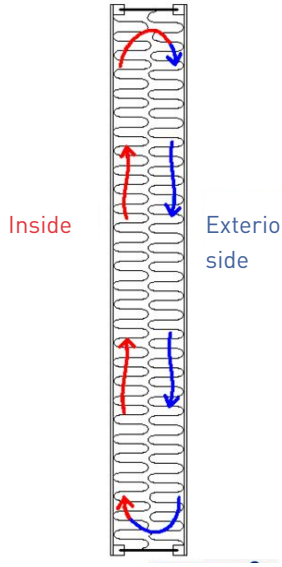
Amplitude cushioning

Δ21°C / Δ3°C= 7



While the outdoor temperature varies between 35° and 14° (21°C difference; for example, in roof structures under roof tiles), the indoor temperature increases by only 3°C. 21 divided by 3 provides an amplitude attenuation of 7.
The principle works both for positive and negative temperatures. The indoor temperature fluctuations are thus reduced much better compared to other types of insulation.

Hence, wood fibre insulation provides a more stable indoor temperature when night and day temperatures outside the building fluctuate. The effect of wood fibre insulation can be compared to what you experience in log cabins: A warm and even indoor climate and cool summer days despite high outdoor temperatures. Soapstone stoves that hold the heat for a long time when they are first heated are another example.

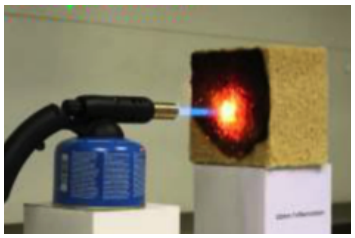


Convection in wall structures

Convection

The airflow in insulation or cavities is generally called natural convection. Convection occurs as hot air is lighter than cold air. Since there is stagnant air in the insulation that actually insulates, convection leads to increased heat loss. Wood fibre insulation reduces convection and thus heat loss in the structures. As SINTEF Byggforsk points out (Byggforskblad 573.344 Heat Insulation Materials), natural fibre insulating materials have considerably lower air passage than other materials such as, for example, light mineral wool mats. Less air circulation and lower air passage reduce heat loss and with that the energy demand for heating.

Generally, airflow carries significant amounts of water vapour. Due to the temperature gradient in the structure, this water vapour will condense when the dew point is reached. If the convection is reduced, so is the airflow, and this leads to reduced risk of moisture-related damage



The natural properties of wood fibre make it get charred in case of fire, just like wood. In addition, a natural fire-retardant substance is added to the insulation, which is also found in fire-extinguishing appliances. The substance consists of nitrogen and phosphorus (ammonium sulphate), which further enhances the charring process by absorbing the oxygen around the insulation in the event of fire.

Wood does not melt but burns at approximately constant speed. This means that in the event of fire, its development will be predictable. With its low thermal conductivity, wood ensures minimal temperature increase on unexposed sides.

Fire

Building materials must comply with certain fire performance levels. The Euro classes used to impose requirements for walls and ceilings are A1, A2, B, C, D, E, F for flammability and flame spread.
A1 is the strictest performance level. Nativo Wood Fibre Insulation is impregnated with natural flame-retardants and meets Euro class E. It can be used in fire class 1 and buildings of up to 3 floors. A standardised wall
structure both with Nativo Wood Fibre Insulation Boards and Nativo Wood Fibre Blow-in Insulation has been tested and meets the fire resistance requirements REI 30 of this fire class. For use in fire class 2 (3 and 4 floors), the fire spread of the façade must be considered. See www.hunton.no for more information.

Stability

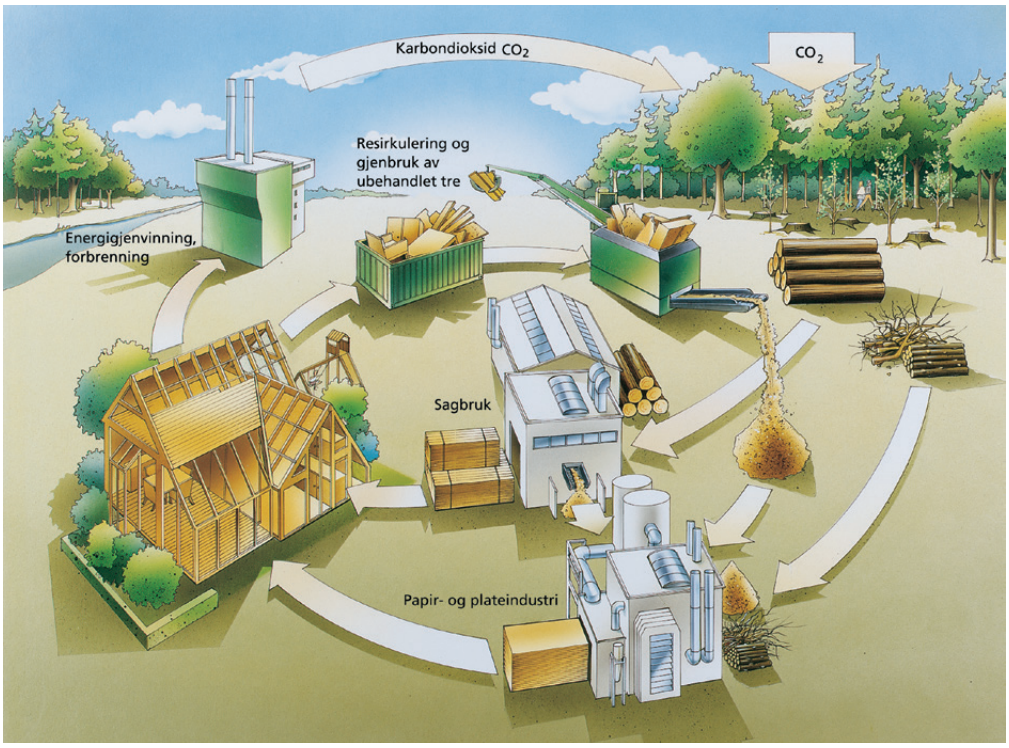
Both Nativo Wood Fibre Insulation Boards and Nativo Wood Fibre Blow-in Insulation have high density and stiffness compared to other insulation products. This gives the wood fibre insulation excellent stability. Nativo Wood Fibre Insulation Boards are clamped between the studs/rafters. They are very well seated and remain stable without losing the clamping force or shape over time. The stiffness of the material gives the installer good control when it comes to avoiding air pockets in the structure.

The same applies for Nativo Wood Fibre Blow-in Insulation. Due to the high density of the blow-in insulation and the extra large friction between the wood fibres, a strong three-dimensional network is formed. It contributes to high stability and prevents sinking and setting. Hunton quality assures these properties via continuous production control. It is tested for sinking and setting at mechanical stress and under varying climate conditions over time according to standard EN 15101

Environment and sustainability

A healthy home – also for the environment and the outside world. Nativo Wood Fibre Insulation is made of wood chips. This is leftover material from, among other things, timber production. In other words, if the wood chips had not been used in the production of insulation, it would have been sent, for example, for incineration or perhaps to waste. For many years, we have demanded from both ourselves and from our suppliers that the wood as raw material should come from forests with replanting programs. Hunton therefore only uses PEFC™ suppliers.

The use of wood fibre insulation reduces greenhouse gas emissions into the atmosphere since the wood pulp and other timber serve as carbon storage. Through photosynthesis, CO_2 is transformed to wood and other biomass. This share of CO_2 is part of the natural carbon cycle. When the tree is biodegraded at the end of its life, CO_2 goes back to Earth's carbon cycle. Utilising the forest to produce wood fibre insulation, among other things, extends the cycle. In combination with the fact that new trees grow in the forest, higher CO_2 storage is achieved, at which CO_2 is removed from the atmosphere.



Product documentation

Hunton Nativo Wood Fibre Insulation Boards and Hunton Nativo Wood Fibre Blow-in Insulation are well documented. Available information is listed below.

Hunton Nativo® Wood Fiber Insulation Board	Hunton Nativo® Wood Fiber Insulation Blow-in
• SINTEF Technical Approval (nbr 20440) • CE marked • Performance declaration (nbr 02-04-01) • Safety Data Sheet • Swedish environmental declaration BVD, Basta and Sundahus (product class A) • Emission test • FDV • Fire test according to, NS-EN 13501-1 and 1365-1	• Performance declaration (nbr 02-04-01) • Safety Data Sheet • Swedish environmental declaration BVD • FDV • Fire test according to, NS-EN 13501-1 and 1365-1

Please contact Hunton for further information regarding product documentation.

Technical specifications

Hunton Nativo® Wood Fibre Insulation Boards

Property	Test method	Performance/value	Unit	Control limit
Length tolerance	EN 822	-	mm %	1220/ ± 2
Width tolerance	EN 822	-	mm %	565/ ± 1.5
Thickness, tolerance class Tolerance	EN 823	T3	Class Tolerance	T3 -4 mm/+10% or max. 10 mm
-4 mm/+10%	NS-EN 824	-	mm/m	≤ 5
or max. 10 mm	NS-EN 825	-	mm	≤ 6
Squareness	EN 824	-	mm/m	≤ 5
Flatness	EN 825	-	mm	≤ 6
Tensile strength perpendicular to surface	EN 1607	TR 1	Class kPa	TR 1 ≥ 1.0
Water vapour resistance factor, μ, dry/wet	EN ISO 12086	- / -	-	≤ 1 / 2
Heat conductivity, declared, λD	EN 12667	0.038	W/mK	≤ 0.038
Airflow resistivity	EN 29053	AFr 5	Class kPa*s/m²	AFr 5 5
Properties during fire	NS-EN 13501-1	C	Class	-
Density ρ	-	50	[kg/m³]	-
Specific heat capacity c	-	2100	[J/(kg*K)]	-
Flow resistance	EN 29053	≥ 5	[(kPa * s)/m²]	-
EAK / AVV code	-	030105 / 170201	-	-
Heat resistance R 50/100/200 mm thickness	EN 12939	1,32 / 2,63 / 5,26	[(m²*K)/W]	

Hunton Nativo® Trefiberisolasjon Plate

Dimension (mm)			Number per pallet	Weight per pallet (kg)	m² per pallet
Thickness	Width	Length			
50	565	1220	90	186	62,0
100	565	1220	48	170	33,0
200	565	1220	24	170	16,5

Other dimensions are available upon request

Hunton Nativo® Wood Fibre Blow-in

Essential properties	Performance/class	Standard
Fire class	Class E	EN 15101:2013
Airflow resistivity (for floors)	200 kg/m^2	EN 15101:2013
Airborne sound insulation	200 kg/m^2	EN 15101:2013
Thermal resistance and conductivity (Lambda)	0.038 [W/(m*K)]	EN 15101:2013
Thickness class	T3	EN 15101:2013
Water vapour resistance	1-2	NS-EN ISO 12086
Heat capacity	2100 [J/kg*K]	

Dimensions	Packages of 15 kg
Number per package/kg per pallet	21 pcs/315 kg
Pallet size:	approx. 0.8 x 1.2 x 2.55 m (L x W x H)

Recommended densities	
Open loft and joists	approx. 32 kg/m3
Floor separators and closed beams	approx. 32-38 kg/m3
Ceiling under 45 degrees	approx. 35-42 kg/m3
Ceiling above 45 degrees and exterior wall	approx. 38-45 kg/m3

Installation

Hunton håndsag til trefiberisolasjon plate

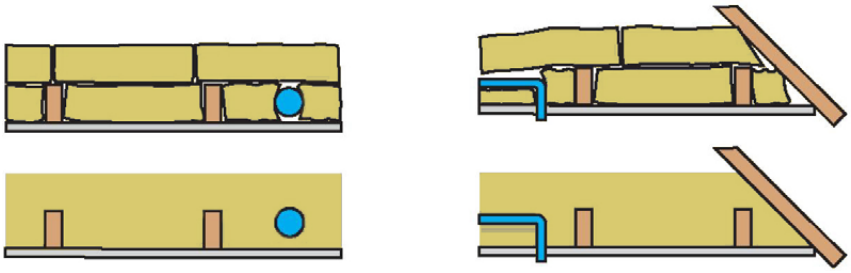
Hunton Nativo® Wood Fibre Insulation Boards

Nativo Wood Fibre Insulation Boards are installed in the same way as other types of insulation. The boards should be cut and clamped between the rafters/timber frameworks. The boards can be customised in many different ways. Hand-held circular saws, mitre saws, reciprocating saws and Hunton hand saws/knives specially adapted for the purpose can be used.

The equipment makes it easy to cut all dimensions and angles.

Hunton Nativo® Wood Fibre Blow-in

Blowing in of Nativo Wood Fibre Insulation is a fast and efficient insulation solution both for rehabilitation and new construction. Since the work is carried out by certified partners of Hunton, carpenters can save valuable working hours. On an open loft it is possible to blow in between 1000 and 2000 m^2 of insulation per day, depending on thickness. This is up to 10 times faster than manual insulation. Otherwise, logistics around and on the construction site is reduced, and space-consuming insulation storage as well as, last but not least, shrinkage and disposal of leftovers are avoided. One of the biggest advantages is that the end result provides denser and smoother insulation in all angles and hooks in the structures. This reduces the risk of, for example, thermal bridges.



The pictures illustrate the difference between manual insulation with insulating mats and blow insulation. Particularly around demanding details such as joists, rafters and installations, the blow-in method allows for smooth and safe insulation without cavities.

Example of ceiling, before and after blowing.

Open blowing

One of the most common methods of blow-in insulation is open blowing on lofts or other open beam and ceiling constructions. Then the insulation is loosely filled between the beams and on top of them. It is recommended to insulate with a thickness that at least corresponds to the authorities' minimum requirement for new buildings.

Blow-in insulation in closed structures

Nativo Wood Fibre Insulation is well suited for insulation in closed structures such as, for example, joists, ceilings, exterior walls and sloping or flat roofs. In closed structures, the insulation is compressed with a density (solidity) of up to 45 kg per m^3, depending on the type of structure. For example, there is a difference between vertical and horizontal building elements.

When insulating from the outside, the insulation is preferably blown-in through the ends, or in the hole the insulator drills, for example, in the wall or ceiling plate, or through the outer cladding for retrofit insulation. All holes are plugged and sealed before construction work continues.

When retrofitting the insulation of older homes, it is important to have an air gap between the cladding into which the cavity insulation will be blown into and filled. This is to prevent the insulation from lying completely against the cladding, which is normally painted with several coats of diffusion-tight paint. The air gap should ensure that both the cladding and the rest of the wall will dry out after damp periods.

In new constructions, the insulation is blown into the outer wall through the vapour barrier or the like from the inside where the insulator makes holes that are sealed again after the work is complete. The vapour barrier must be clamped with laths and it is appropriate to insulate prior to assembly or by installing boards as this is most effective.

At the construction site – customer checklist

Blowing contractor has prepared the following checklist for use by customers that want to have Nativo Wood Fibre Insulation blown in. This is to ensure good cooperation and optimal result for all blow-in insulation that the blowing contractor executes for you as a customer. Compliance with the points results in a quick and flexible insulation task that satisfies all parties.

- Is the site accessible to lorries? The lorries are from 8 to 12 m long, and up to 4 m high
- Has an internal cloth/vapour barrier been used that is reinforced and able to withstand the load of the blowing pressure? We recommend Hunton Intello Plus vapour barrier. Vapour barrier of plastic cannot be used, as it is too weak/elastic to withstand the blowing pressure (possibly it must be clamped with extra laths over c/c 60 cm). Remember to install vapour barrier across studs, beams and rafters, and not longitudinally. This is to avoid vertical joints directly on studs and rafters. All joints and finishes against windows, doors and similar are taped with accompanying tape.
- The vapour barrier on the inside of the outer structure should be clamped with 48x48 mm laths. Also remember clamping along windows, doors and the like. The laths are nailed with a minimum of 90 mm nails and/or 90 mm screws or longer. This is to ensure good fastening and clamping of the cloth so that it can withstand the blowing pressure.
- Is the external wind barrier plate on the wall capable of withstanding the blowing pressure? 19 mm Hunton Windproof is recommended. Thin plates of less than 15 mm are not recommended. Remember to nail with roofing nails according to the installation instructions and to clamp with laths of minimum 23x48 mm. 9 mm outside plasterboard cannot withstand the blowing pressure unless it is lathed with c/c 30 cm outside and cladding is mounted to hold the plate properly in place.

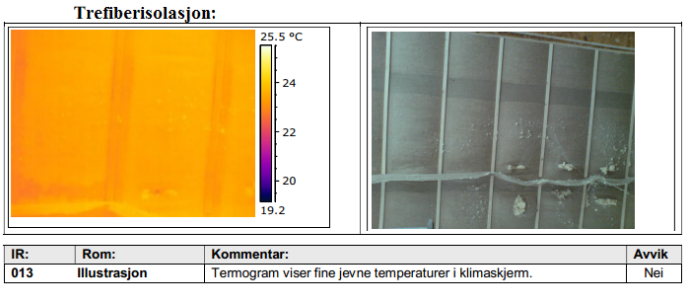
- Is the external wind barrier plate on the roof capable of withstanding the blowing pressure? We recommend Hunton Underroof with 18 or 25 mm thickness. Thin cloth products on roll are not recommended but can be used if ventilation above the cloth is sufficiently large/high
- Is there a sufficiently high edge around the ceiling hatch and other openings to prevent insulation from falling down the stairs/ladder to the attic? Is rafter pasteboard mounted 20 cm higher (in vertical line) than the intended finished height of loose blown insulation in the attic?
- Good ventilation is ensured along the eaves when insulating the ceiling (rafter pasteboard or other ventilation). Is the outer roof diffusion-open? We recommend Hunton Undertak 18 mm.
- Are there gaps of less than 10 cm in stanchions, beams or rafters? In this case, they must be insulated by hand before closing the structures again. 5-10 cm slots can be insulated with blow-in insulation if this is clarified in advance.

This list is not complete, as there may be additional or other items for special insulation tasks. In that case the bling contractor will provide information about this prior to delivery.

Densitet

The performance of blow-in insulation depends on the correct density. This is to avoid sinking and setting in the insulation material, as well as achieving low thermal conductivity combined with high heat resistance.

The density depends on how much material is blown into the structures, and the professiona blowing contractors have many years of experience in blowing the right amount and density. This way, the best possible result is achieved and the insulation works optimally. Recommended densities can be found on page 13 of this manual.



Thermography of blow-in wood fibre insulation.

Check during and after insulation

There are several different methods to inspect its own execution before, during and after the insulation takes place. One or more of the methods are used depending on the specific need in each project, thus ensuring good control of the blow-in insulation.

One method of inspection is thermography both before and after blow-in insulation. This exposes all parts of the structures and all cavities. This applies both to general works with external windproofing, and works with manual insulation or blow-in insulation.

Another method of inspecting the insulation is that blowing contractors always keeps track of how much insulation is involved during the execution of the blow-in insulation. This is continuously compared to the amounts that have been pre-calculated for the area that is being insulated. This way, there is an extra method to ensure that the correct amount of insulation is filled into all cavities.

Another method is to take physical samples using a special sleeve with associated weight that measures the density for the particular structure.

HES

Storage

Nativo Wood Fibre Insulation must be stored dry and generally protected from precipitation. The moisture content before installation should not exceed approx. 10% (weight percent water).The packaging must not be removed before the pallet is placed on a level and solid foundation.

Use of protective gear

Nativo Wood Fibre Insulation does not irritate the skin, eyes or respiratory tract and is completely harmless during normal use. We still recommend using protective equipment such as goggles and dust mask when working with the material. This complies with recommendations that generally apply to the handling, sawing and grinding of wood otherwise.

Supplementary products

Hunton Intello Plus

Areas of use

Hunton Intello Plus is used as a vapour barrier and replaces the vapour barrier (plastic film) in all types of insulated and diffusion-open roof, beam and wall structures.

The vapour barrier also ensures that building moisture can dry inwards into the room and thus provide a faster drying out of unwanted excess moisture. Particularly suitable for use on cottages and holiday homes that stay unheated for long periods, and generally for buildings where good and balanced indoor climate is needed.

Hunton Tescon Vana

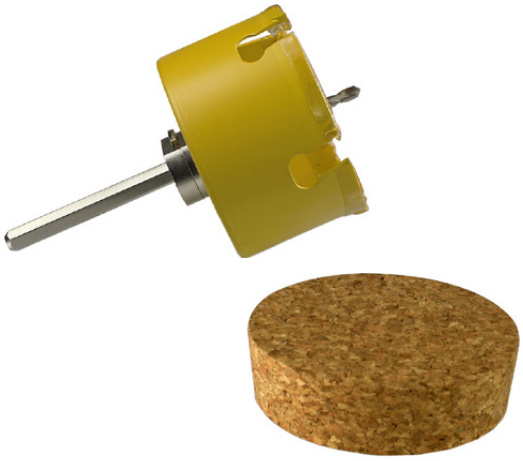
Application

Indoor

Airtight seal of vapour retarder and vapour barrier as well as air tightness of wood-based boards.

Outdoors

Durable windproof seal with highly adhesive and ageing-resistant special tape for covers, details and connections on cloth, foil, plaster, wood and wood fibre-based boards. Can be used on roofs, walls and generally elsewhere in the building structure. Associated primer should be used on porous surfaces.



Drilling and sealing holes for blow-in wood fibre insulation

The holes through which the insulation is blown in are first drilled with a diameter that is adapted as needed, and normally vary from 40 mm to 120 mm. The holes are then sealed with cork plugs.

The cork plugs are overcoatable and provide a tight and durable seal as they are conical and thus clamp well when tapped into the hole. Hunton Tescon Vana tape can also be used as a seal, especially when it has been insulated using blow-in insulation from inside the structure, through Hunton Intello Plus vapour retarder.

5 benefits of Hunton Nativo® Wood Fibre Insulation

Double heat storage capacity
By choosing Hunton Nativo Wood Fibre Insulation you get a product with unique heat storage capacity. The thermal mass of the wood fibre insulation makes it work as a heating battery that recharges and emits heat over time. This will give you stable indoor temperature – in the summer, the home will not be overheated so fast and in the winter the home will not get cold so fast. You will notice the difference.

Fire retardant
The natural properties of wood fibre make it get charred in case of fire, just like timber. In addition, a natural fire-retardant substance is added to the insulation, which is also found in fire-extinguishing appliances. The substance consists of nitrogen and phosphorus (ammonium sulphate), which further enhances the charring process by absorbing the oxygen around the insulation in the event of fire. Wood does not melt but burns at approximately constant speed. This means that in the event of fire, its development will be predictable. With its low thermal conductivity, wood ensures minimal temperature increase on unexposed sides.

Sound deadening
Nativo Wood Fibre Insulation has excellent properties as sound-absorbing material. The wood fibre insulation has soft fibre and also consists of more mass (kg) per m^3 than any other type of insulation. This makes the wood fibre insulation absorb and dampen sound very well.

10 times greater capacity to transport moisture!
Nativo Wood Fibre Insulation will absorb and release moisture (hygroscopic) in line with the moisture changes in the environment. This gives stable structural properties, which can withstand the tough Nordic climate with large variations in air humidity. Wood Fibre Insulation has the market's best ability to transport and release moisture out of the structure.

Healthy climate
Nativo Wood Fibre Insulation has stable design and shape whether you use boards or blow-in insulation. Due to the ability of natural wood fibre to reduce air movement in the insulation, it provides good sealing around windows and studs. The blow-in version will also be able to fill in and seal where other insulation cannot reach. With fewer cold bridges, you avoid a cold and draughty home and you achieve high living comfort, a healthier indoor environment and lower power bills.
In addition, Nativo Wood Fibre Insulation is a natural product that does not cause discomfort on the skin or in the respiratory tract. Neither during assembly nor afterwards for the residents.

* SINTEF concludes the following: "Hunton Nativo Wood Fibre Insulation is not as dependent on a dense internal vapour barrier as mineral wool insulation."

Hunton Nativo Wood Fibre Blow-in Insulation has SINTEF Byggforsk product certificate, which gives greater security that the insulation complies with the imposed requirements – in new as well as in old buildings.

TEKNISK GODKJENNING TG 20440 SINTEF Byggforsk

PRODUKTSERTIFIKAT PS 3119 SINTEF Certification

Mars 20219 – Hamar Media

Dette papiret er 100% resirkulert

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