

PROCESSING INSTRUCTIONS

WALL AND FACADE





Wall installation instructions

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Product overview

Product	Edge	Thicknesses in mm	Insulation value λ_B W/mK	Wood construction	Mineral substrates
Naturheld 180	Tongue and groove	40 - 120	0.045	Wooden frame construction	-
Naturheld 140	Tongue and groove	80 - 140	0.043	Wood frame construction and solid wood	approved
Naturheld 110	Stump	80 - 200	0.041	Solid wood	Approved
Naturheld 220	Stump	20 - 35	0.049	Jamb panel	
Compartmental insulation					
Naturheld FLOW		∞	0.040	Blow-in insulation	
Naturheld FLEX		30 - 300	0.038	Insulation mats	

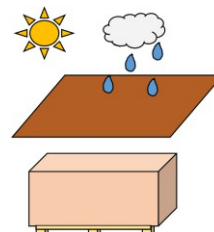
Product data sheets and approvals available for download at: <https://www.naturheld.global/downloadbereich/>

Storage and transport

Check the condition of the goods upon receipt, observe the package inserts and keep them together with the delivery notes.

Unloading and transport on the construction site must be carried out using a suitable crane or forklift truck.

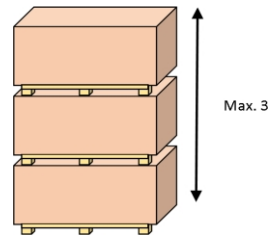
The insulation materials must be stored in a dry place and protected from UV radiation and mechanical damage.



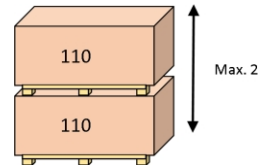


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A maximum of three pallets of insulation boards with a bulk density of 140–220 kg/m³ may be stacked on top of each other.



Two pallets of insulation boards with a raw density of 110 kg/m³ may be stacked.



Flex cavity insulation and blow-in insulation must not be stacked.



Processing

Cutting

- Naturheld insulation boards can be processed using standard woodworking tools. Hand and table saws, band saws and special insulation saws are suitable. Cut-outs can be made using jigsaws with serrated blades.
- Due to the dust generated, a powerful extraction system is recommended.
- Wear a dust mask.



Wall installation instructions

Compartment insulation

Naturheld blow-in insulation

- Naturheld blow-in insulation may only be installed by trained specialists using suitable blow-in machines.
- The sub-roof panel should be at least 35 mm thick when blowing in Naturheld blow-in insulation on site.

Naturheld Flex

- Flex insulation mats can be cut using special insulation saws, electric handsaws or band saws.
- Offcuts from Flex can be combined.

In general, the regulations of the BG and TR GS 533 must be observed.



Wall installation instructions

Weathering and winter storage

Naturheld 110, 140 and 180 can be exposed to the elements for 4 weeks as ETICS insulation or plaster base boards. Prolonged exposure to the elements reduces plaster adhesion due to precipitation and UV light. This requires additional work steps.

A short-term exceeding (approx. two weeks) of the weathering time is usually not a problem.

Protection with tarpaulins

If it becomes clear at an early stage that the ETICS insulation cannot be plastered on time, we recommend protecting the insulation by covering the entire exterior surface of the building with tarpaulins, especially in front of the building openings.

Finishing the insulation boards

If this is not possible or unforeseen delays occur, weather conditions will cause fibres on the upper side of the insulation boards to come loose.

weather conditions. The longer the insulation is exposed to the weather, the more fibres will come loose. These loose fibres must be carefully removed before plastering. To do this, the façade can be sanded with coarse sandpaper (60 grit) and the sanding dust removed with a vacuum cleaner or oil-free compressed air. The insulation can be plastered as usual.

The boards should be completely dry before plastering.

Winter storage with base coat

If there is little time available, the ETICS panels can also be overwintered with just the base coat.

To do this, simply apply the reinforcement compound with a comb trowel to a thickness of approx. 3 mm. It is not yet necessary to insert reinforcement fabric.

pay particular attention to window connections and window sills so that moisture cannot penetrate here either.

In spring, the second layer of reinforcement compound can then be applied with the mesh and the façade can be finished as usual.

Before completion, ensure that the façade is sufficiently dry.

Blow-in insulation and centre-to-centre distance

Naturheld 180 is available from 40 mm and Naturheld 140 from 80 mm with a centre-to-centre distance of substructure up to 83.3 mm for warping resistance. Therefore, stud spacings of up to 83.3 mm can be selected. When using blow-in insulation, the cavities must be blown in before plastering.

Base and splash protection in timber construction

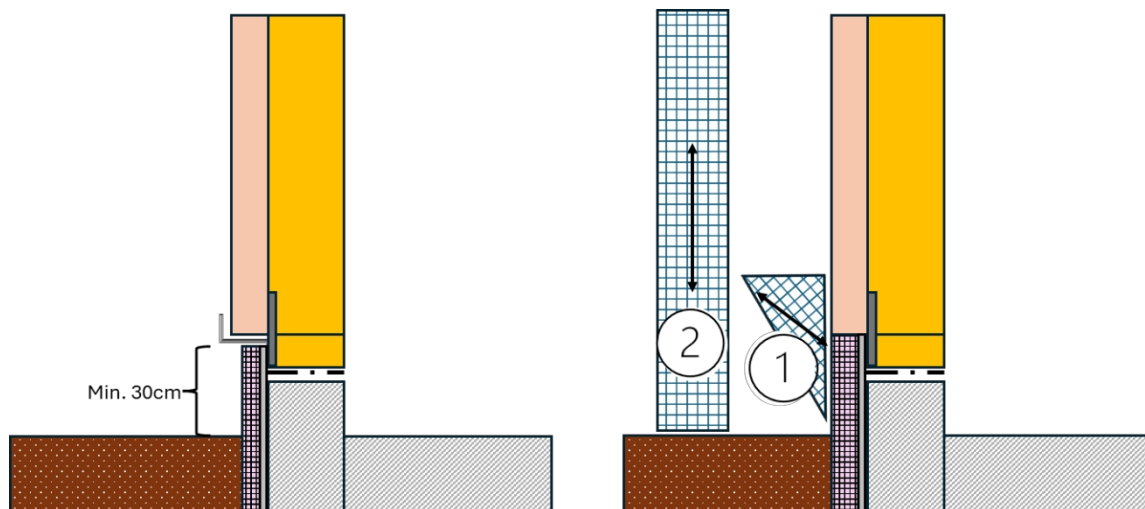
The base must be designed in accordance with DIN EN 68800. This usually involves creating a splash protection area of 30 cm above the future floor with special perimeter insulation. Special measures such as sufficient slope or splash-proof surfaces can prevent this.

Area reduced to up to 5 cm. Soft wood fibre must not be used in areas exposed to splashing water or in contact with the ground.

The transition from perimeter insulation is achieved by means of a skirting board and a visible step:

or seamlessly with continuous plaster, which must be

must be double reinforced over the joint. The reinforcement mesh should cover the joint by at least 15 cm and laid diagonally in the first layer:



Skirting and splash protection on mineral substrates

The plinth must be splash-proof. This is usually achieved by

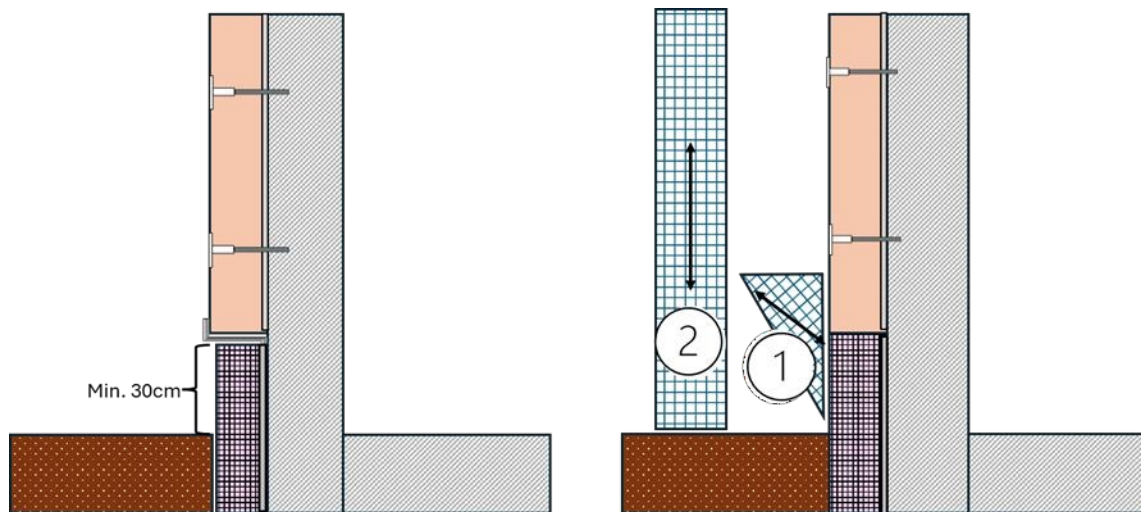
Splash zone of 30 cm above the future floor with special perimeter insulation. Special measures such as sufficient slope or splash-proof surfaces can reduce this zone to as little as 5 cm. Soft wood fibre insulation must not be used in

splash zone or in contact with the ground.

The transition from perimeter insulation is achieved by means of a skirting board and a visible step:

or seamlessly with continuous plaster, which must be double reinforced

be double reinforced over the joint. The reinforcement mesh should cover the joint by at least 15 cm and be laid diagonally in the first layer:



Laying Naturheld panels on studwork

For stud frames, either tongue-and-groove panels or large-format Naturheld 180 panels with blunt edges should be selected, which are joined in the centre of a stud. Floating joints are not permitted with blunt-edged panels.

Laying small-format panels

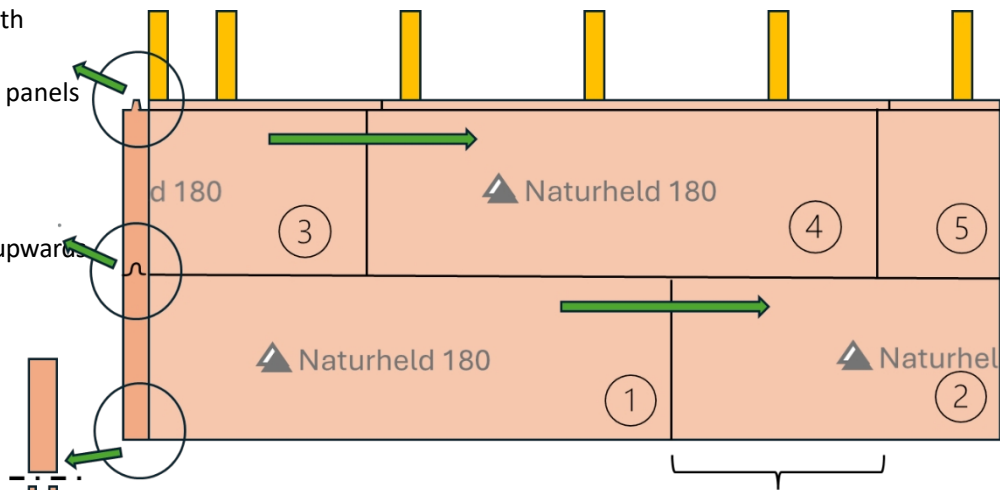
For small-format panels, the longitudinal tongue is removed from the first row. The groove must always be laid facing upwards. The individual panels should be laid offset by one rafter field and at least 30 cm

. Cross joints are not permitted. Sufficiently large offcuts can be used to start the next row (see Nos. 2 and 3).

Corner solution with auxiliary strip, no interlocking of the panels required.

The tongue faces upwards

Remove the lower groove sides



Offset the joints between the rows by at least 30 cm and a rafter field

Fastening

The panels may only be fastened using approved fasteners

	Fastening materials	Minimum penetration depth into the load-bearing substrate
Screws for wood substrates	EJOT STR-H / maxit STR-H	35 mm
	EJOT HFS	35 mm

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Wide-back staples	Staples in accordance with DIN EN 14592, rustproof	30 (Depending on length, follow manufacturer's instructions!)
Dowel for mineral substrates	EJOT STR-U / maxit STR-U In addition, the insulation boards are bonded to the substrate	35 mm (note the type of masonry, plus plaster layer thickness)

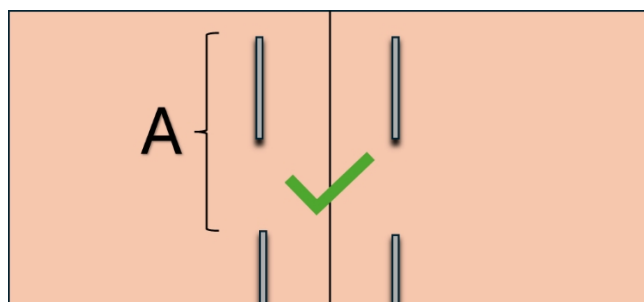
The fasteners must be flush with the surface. Wide-back staples are placed diagonally at an angle of 30–60° in the panel surface:



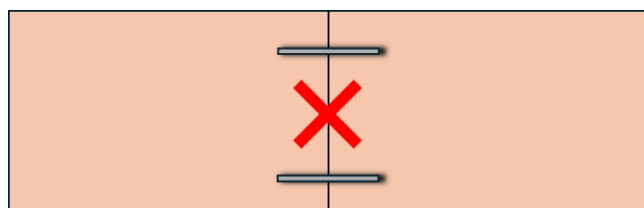
Edge distances of the clips and fastening of large-format Naturheld insulation boards

Butt joints must be joined on studs. A stud width of 60 mm is sufficient if the edge distances of the clips are maintained. The edge distances are determined by the thickness of the clip wire. This is 1.8–2 mm thick.

For butt joints, the staples are driven in upright. The vertical distances (A) depend on dependent on the wind load.



Staples driven horizontally across the joint are not permitted.



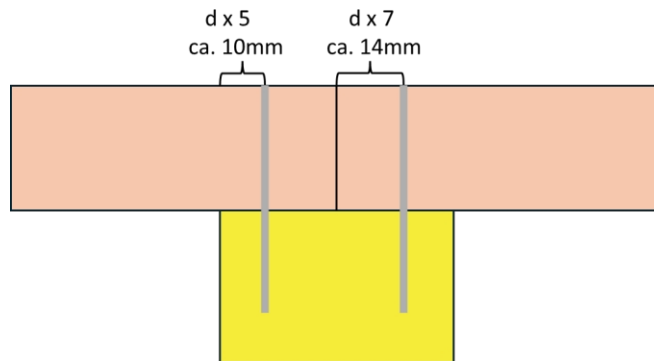


Wall installation instructions

The following applies to wide-back staples:

Edge distance from wood:
5x staple diameter,

Edge distance from Naturheld insulation
board: 7x staple diameter



Fastener quantities depending on wind loads

In addition to the type of insulation material and substrate, the quantities and spacing of the fasteners depend on the wind load zone and storey height. At building edges and slab sections. The specifications apply to a maximum building height of 10 m. For taller buildings, a fastening statics calculation must be performed. Since the use of wood fibre insulation materials is largely limited to buildings in building classes 1–3, the effects of building height are usually negligible.

A calculation by a structural engineer is also necessary for buildings in wind zone 4. The information provided here is not a structural verification, but is intended for planning and calculation purposes.

The exact load capacities of the fasteners can be found in the applicable approval.

Wall installation instructions



Wind zones according to DIN 1055-4:2005-03		
The specifications are basic speeds, valid up to a building height of 10 m.		
Wind zone	Wind speed m/s	Wind suction kN/m ²
1	22.5	-0.32
2	25.0	-0.39
3	27.5	-0.47
4	30.0	-0.56



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Minimum number of fasteners required For stud frames

The quantity of fasteners is regulated in the approvals. There may also be differences between the approvals, meaning that fewer fasteners may be used in individual cases. The following information refers to the highest specified quantity of fasteners in each case.

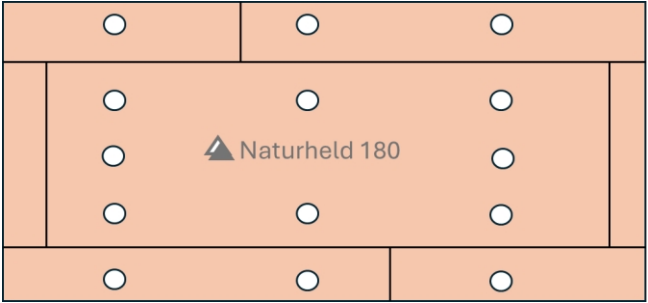
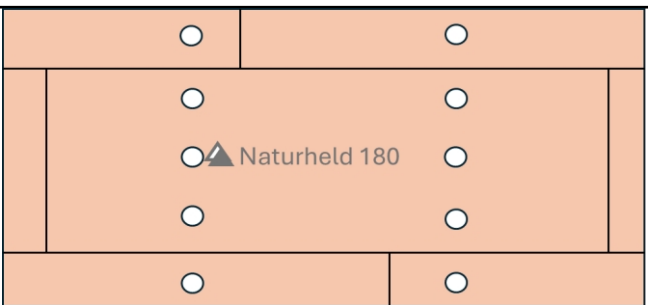
Naturheld 180	Substrate	Wind zone 1-3	Wind zone 4
EJOT ejotherm STR-H	Wood	4 pieces per m ²	5 pieces per m ²
EJOT HFS		5 pieces per m ²	6 pieces per m ²
Wide-back staple		9 pieces per m ²	13 pieces per m ²

Naturheld 140	Substrate	Wind zone 1-3	Wind zone 4
EJOT ejotherm STR-H	Wood	4 pieces per m ²	5 pieces per m ²
EJOT HFS		5 pieces per m ²	6 pieces per m ²
Wide-back staple		9 pieces per m ²	13 pieces per m ²
EJOT ejotherm STR-U	mineral	3 pieces per m ²	4 pieces per m ²

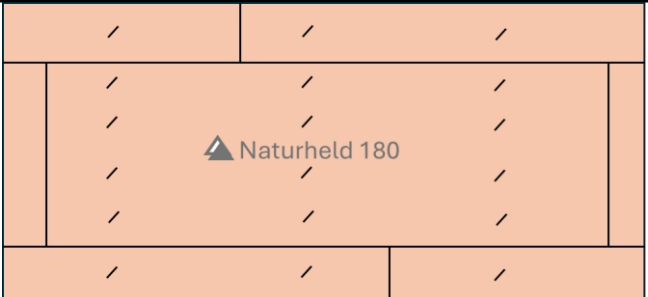
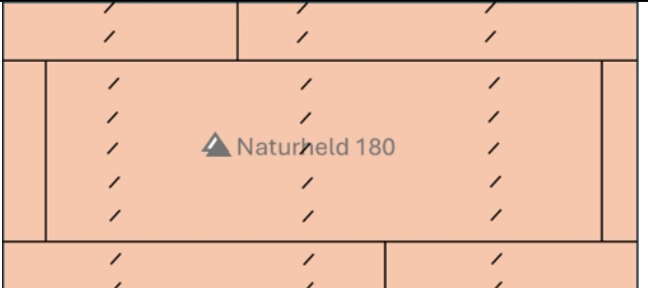
In addition, the approvals stipulate that in timber frame construction on studs or timber ribs, **at least three fasteners per panel width** must always be placed on at least two studs. This results in the following dowel distribution:

Naturheld 180 and Naturheld 140 with EJOT STR-H		
Edge distance of the screws at least 150 mm		
625 mm centre distance naturheld 180 + naturheld 140 615 mm width	Wind zones 1-4 2 to 3 dowels per panel width per stud	
833 mm centre distance Naturheld 180 + Naturheld 140 615 mm width	Wind zones 1 - 4 3 dowels per panel width per post	

Naturheld 180 and Naturheld 140 with EJOT HFS
Minimum edge distance of dowels 150 mm

<p>625 mm centre distance</p> <p>Naturheld 180 + Naturheld 140 615 mm width</p>	<p>Wind zones 1-4</p> <p>2 to 3 dowels per Panel width per Stand</p>	
<p>833 mm Centre distance</p> <p>Naturheld 180 + Naturheld 140 615 mm width</p>	<p>Wind zones 1-3</p> <p>3 dowels per Panel width per Stand</p>	

Naturheld 180 and Naturheld 140 with wide-back staples
according to DIN EN 14592

<p>625 mm centre distance</p> <p>naturheld 180 + naturheld 140 615 mm width</p>	<p>Wind zones 1-3</p> <p>4 clips per panel width per post Clamp spacing max. 120 mm</p>	
<p>625 mm centre distance</p> <p>naturheld 180 + naturheld 140 615 mm width</p>	<p>Wind zone 4</p> <p>5 clamps per panel width per stand Clamp spacing max. 100 mm</p>	



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<p>833 mm centre distance Naturheld 180 + Naturheld 140 615 mm width</p>	<p>Wind zone 1 - 3</p> <p>5 clips per panel width per upright Clamp spacing max. 100 mm</p>	
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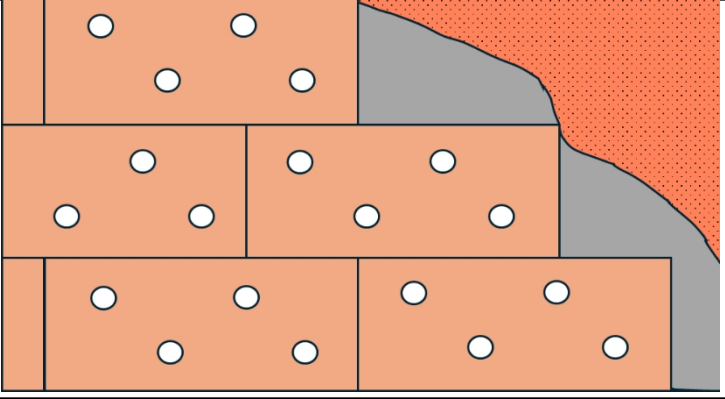
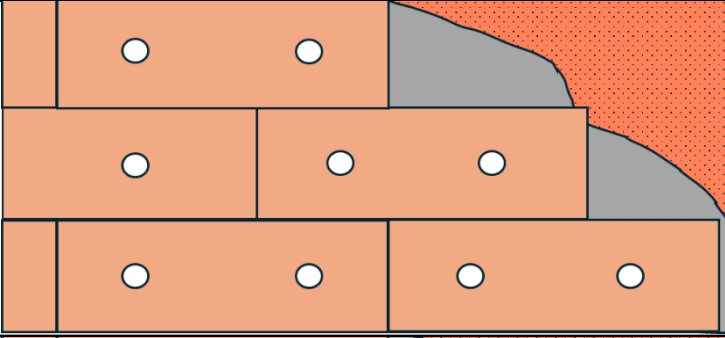
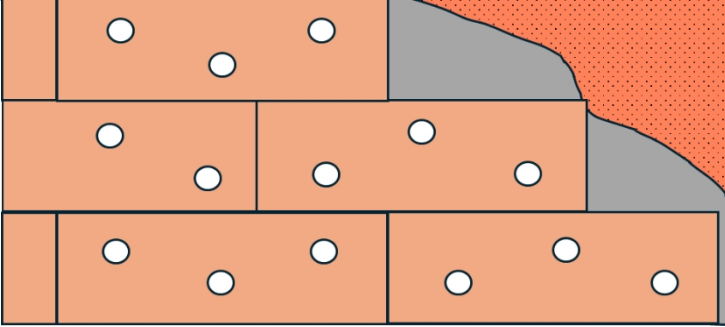
Fastening the panels to flat substrates

Some approvals also regulate the placement of dowels in the panel joints, but not in all. As this significantly increases the amount of fasteners required without offering any serious advantage, we recommend inserting the dowels into the panel surface, at least 150 mm away from the edge of the panel. If you wish to dowel panel joints, please refer to the approvals for information on the dowel quantities can be found in the approvals.

The following quantities of fasteners refer exclusively to fastening in the panel surface:

Naturheld 110	Substrate	Wind zone 1-3	Wind zone 4
EJOT ejotharm STR-H	Wood	4 pieces per m ²	5 pieces per m ²
EJOT HFS		5 pieces per m ²	6 pieces per m ²
Wide-back staple		9 pieces per m ²	13 pieces per m ²
EJOT ejotharm STR-U	mineral	4 pieces per m ²	5 pieces per m ²

<p>Naturheld 110 with EJOT STR-H and STR-U Edge distance of dowels at least 150 mm</p> <p>Dowel quantities and distribution apply equally to solid wood, panel materials and mineral substrates. No adhesive is required on wooden substrates; on mineral substrates, the Insulation boards should also be bonded using the dot-and-dab method or over the entire surface.</p>		
<p>Naturheld 110 1250 x 600 mm Up to 100 mm thick</p>	<p>Wind zones 1-3 3 dowels per board</p>	

	<p>Wind zone 4 4 dowels per panel</p>	
<p>Naturheld 110 1200 x 400 mm From 120 mm thickness</p>	<p>Wind zones 1-3 2 dowels per panel</p>	
	<p>Wind zone 4 3 dowels per panel</p>	

Joints between panels

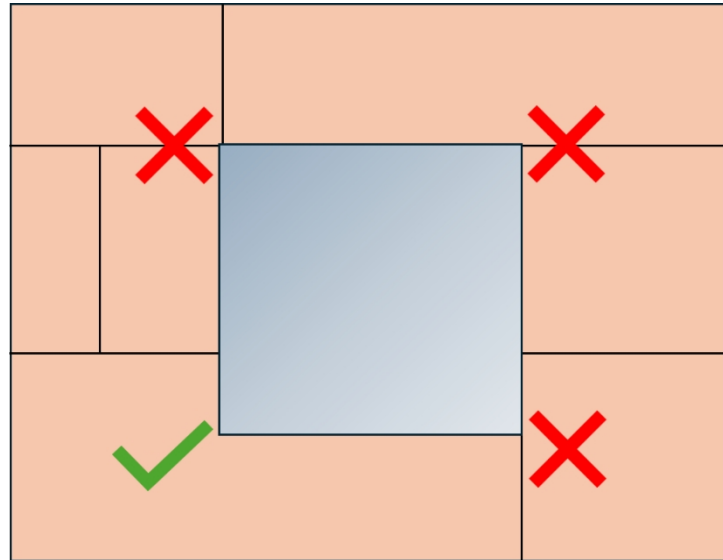
If joints occur when laying Naturheld insulation panels, proceed as follows:

- Joints up to 2 mm are acceptable
- Joints measuring 2–5 mm must be sealed with a suitable joint sealant (e.g. OTTOSEAL® M 360).
- Joints wider than 5 mm must be filled with suitable pieces of insulating material, which are glued in place with a suitable joint sealant.

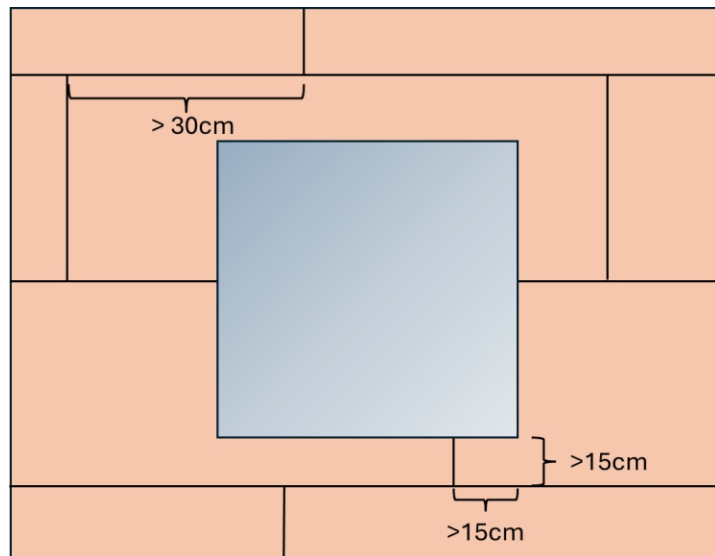
Facade openings

Tension often builds up in the corners of façade openings, which can later lead to cracks in the plaster. To prevent this, the following points must be observed when creating façade openings:

The panel joints and the corners of the façade openings must not coincide. If this cannot be avoided due to the layout of the building, the seal the joints with a suitable joint sealant (e.g. OTTOSEAL® M 360)



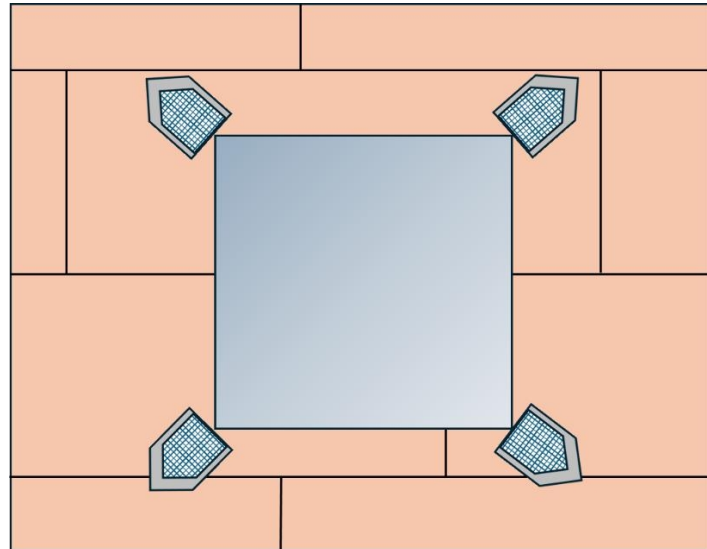
Ideally, all corners should be covered with notched insulation boards. carried out. The pieces of board should be at least 15 cm wide at least 15 cm wide and extend at least 15 cm into the opening level.



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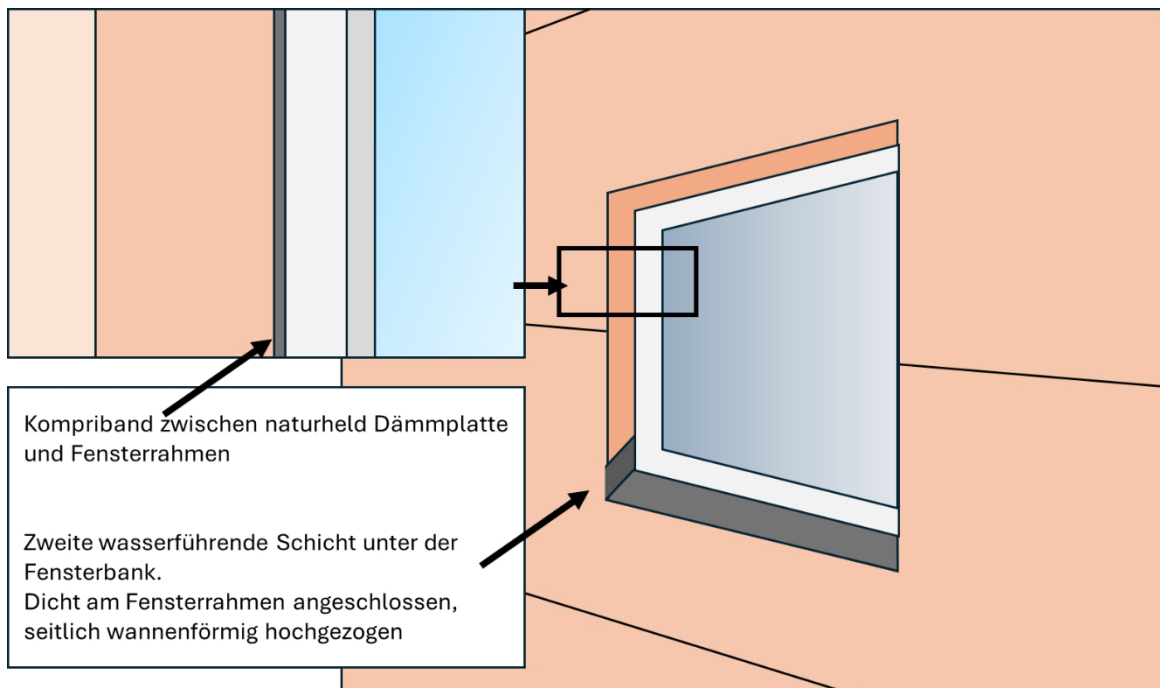
Before plastering the façade, all corners of the façade openings must be reinforced with fabric corner angles with diagonal fabric, in addition to the continuous reinforcement in a horizontal-vertical direction.

The specifications of the system provider must be observed.



Driving rain-proof window connections

Window connections must be designed to be driving rain-proof. To achieve this, the joints between the insulation boards and the window, as well as between the plaster and the window, must be sealed twice so that rain-proof joints are created in both the insulation layer and the plaster layer. This can be ensured by using Kompriband or suitable sealants in the insulation layer **and additional** suitable plaster connection profiles in the plaster layer.



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The window sill must have a second water-draining layer that runs in a trough shape under the actual window sill. This must be connected tightly to the window and extend upwards in a trough shape on the sides of the window reveal by about 50 mm. This water-bearing layer should have a gradient of approximately 5% and feature a drip edge towards the plaster façade.

For implementation, sealing materials such as foils, adhesive tapes or spray or paintable sealants or window sill systems such as those from Pflüger TOB®:



Naturheld WDVS with approved coatings

Approvals are available with coatings from Knauf, ST. Gobain Weber and Maxit. You can download the approvals at <https://www.naturheld.global/downloadbereich/>.

Franken Maxit Mauermörtel GmbH & Co. is the holder of two general type approvals for the WDVS type with insulation boards from Naturheld GmbH & Co. KG. Approval numbers Z-3343-1488 and Z-3347-1749. The following insulation boards are included:

Naturheld 110 under the designation Wall 110

Naturheld 140 under the designation Wall 140




Naturheld 180 under the designation Wall 180

The boards are identical; only the designation and, in some cases, the edge profile and format have been updated with Generation 2. The changes have no effect on the approval and will be listed at the latest when the approvals are renewed. The DIBT has a declaration of concordance for the insulation boards.

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The approved coatings can be found in the following lists:

Wood substrates			
Approval number	Z-33.47-1760	Z-33.47-1749	Z-33.47-1749
Insulation boards	Naturheld 110 (80–160 mm) Naturheld 140 (80–140 mm) Naturheld 180 (60–120 mm)	Naturheld 110 (80–200 mm) Naturheld 140 (80–140 mm) Naturheld 180 (40–60 mm)	Naturheld 110 (80–200 mm) Naturheld 140 (80–140 mm) Naturheld 180 (40–60 mm)
Fastening materials	ejotherm STR-H Fischer Termofix 6H-NT Screw anchors EJOT HFS Clamps in accordance with DIN EN 14592	maxit screw dowel STR H A2 maxit screw anchor STR H E maxit screw dowel STR H Clamps according to DIN EN 14592	maxit screw anchor STR H A2 maxit screw anchor STR H E maxit screw anchor STR H Clamps according to DIN EN 14592
Adhesive mortar		weber.therm 309 weber.therm 301	maxit multi 272 maxit multi 285
Reinforcement	Reinforcement mesh 4 x 4 mm Reinforcement mesh 5 x 5 mm	weber.therm 310 weber.therm 311	maxit reinforcement mesh MW maxit reinforcement mesh PS
Undercoat	SM700 Pro Luis	weber.therm 301	maxit multi 285
Final coat	SP260 Pro (grain size 2–5 mm) RP240 (grain size 3–5 mm) Noblo (grain size 1.5–3 mm) SM 700 Pro Conni S (grain size 1.5–3 mm) Noblo Felt 1.0 Noblo Felt 1.5 Addi S MineralAktiv disc plaster MineralAktiv dry disc plaster	weber.star 224 AQUABALANCE weber.star 281	maxit ip colour 44K maxit ip artista maxit silco A 9030 maxit solar plaster
Coating	MineralAktiv facade paint		



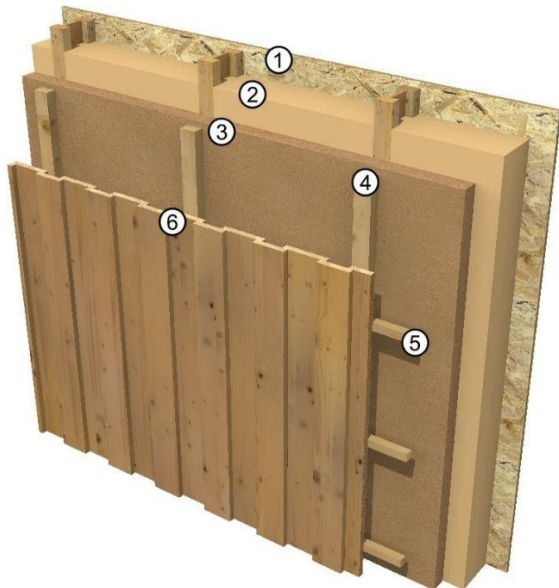
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Mineral substrates		
Approval number	Z-33.43-1488	Z-33.43-1488
Insulation boards	Naturheld 110 (80–200 mm) Naturheld 140 (80–140 mm)	Naturheld 110 (80–200 mm) Naturheld 140 (80–140 mm)
Fastening materials	maxit screw anchor STR-U 2G maxit hammer-in anchor H2 eco	maxit screw anchor STR-U 2G maxit hammer-in anchor H2 eco
Adhesive mortar	weber.therm 301	maxit multi adhesive and reinforcement mortar E maxit multi 292 maxit multi 285
Reinforcement	maxit reinforcement mesh MW	maxit reinforcement mesh MW
Undercoat	weber.therm 301	maxit multi adhesive and reinforcement mortar E maxit multi 292 maxit multi 285
Final coat	weber.star 224 AQUABALANCE weber.star 281	maxit ip colour plus maxit ip fine plaster maxit silco A silicone resin plaster maxit solar plaster maxit ip colour 44K maxit ip artista
Coating	maxit silicone resin paint A maxit solar paint	maxit silicone resin paint A maxit solar paint

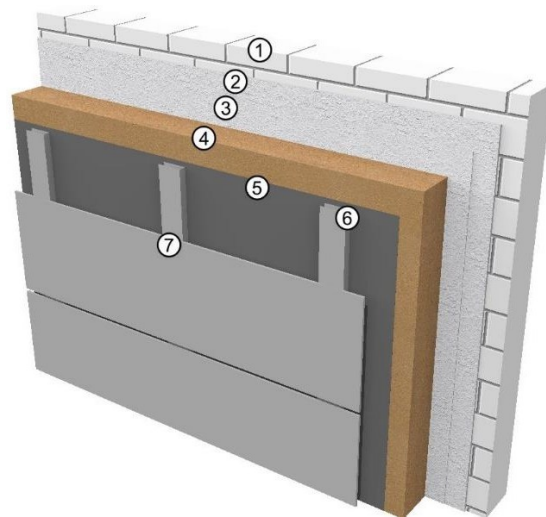
Ventilated facades

Instead of a plaster coating, rear-ventilated façade cladding can also be installed. For dense façade cladding without joints, such as floor-to-ceiling formwork, Naturheld 140 or Naturheld 180 can be used under the cladding without a façade membrane. For Naturheld 110 and for façade solutions with visible joints, such as façade panels or rhombus strips, a suitable façade membrane must be installed over the insulation material.

Insulation material without facade membrane under floor-cover formwork



Naturheld insulation under a facade membrane and cladding made of façade panels



Small animal protection

Small animals such as sparrows or wasps can damage all common insulation materials. Therefore, suitable small animal protection must be ensured for rear-ventilated façades. In the base and ridge area, this is usually achieved by means of perforated sheets, wire or plastic mesh.

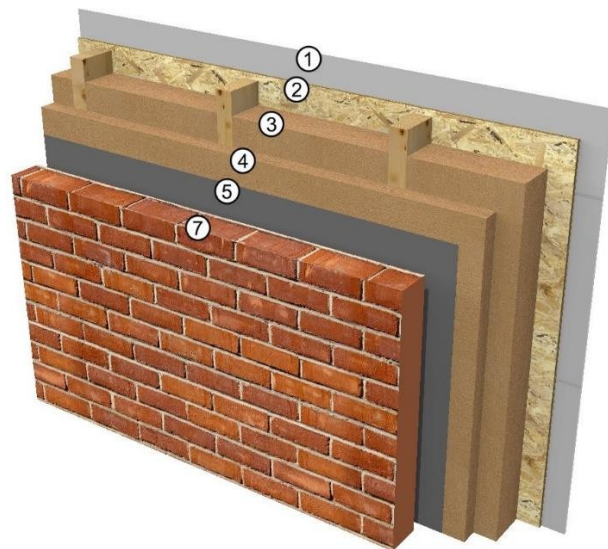
Naturheld insulation behind masonry facing

Clinker brick façades are particularly popular in northern Germany as cladding for timber-framed buildings.

Insulation materials from Naturheld can contribute to an efficient and durable building

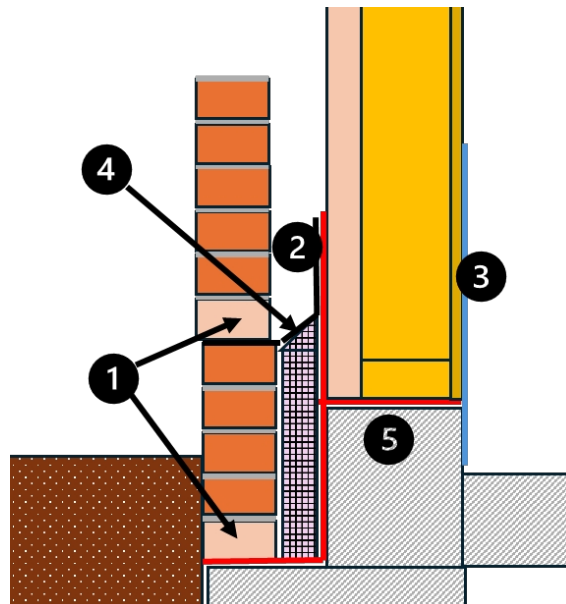
, but there are a few special features to consider:

Typical timber frame construction with masonry cladding. The air layer behind the masonry shell must be at least 40 mm deep and ventilated via unmortared cross joints above the base and below the roof connection. Nevertheless, high humidity can develop in this cavity due to weather conditions, which is why DIN 68800 requires a water-repellent layer (5) with an sd value of 0.3–1 m over the entire insulation.



Schematic representation of a base solution, please note:

- 1) Ventilation and drainage openings between the stones
- 2) Sealing in front of the insulation up to 300 mm above ground level
- 3) Vapour barrier up to 400 mm above ground level
- 4) Perimeter insulation with a second sealing layer through the wall joint, bevelled
- 5) Base at least 50 mm above ground level





Wall installation instructions

Exposed timber framing with naturheld

It is possible to preserve the beams of exposed timber framing and still renovate it to be energy efficient by using Naturheld insulation materials.

Connecting the insulation in the compartments to the beams is the most time-consuming step. The joint must be carefully sealed with a permanently elastic sealant; high-quality,

Kompriband tape with a width of 30 mm or more. Compared to ETICS, the plaster layer must be thick, as the connections

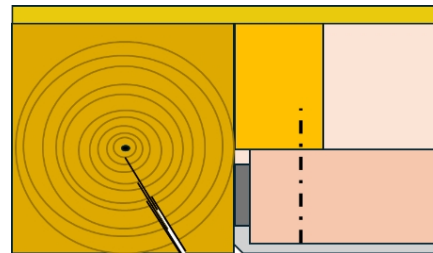
Carefully apply the plaster to the beams using a trowel. A plaster thickness of 10–15 mm is recommended, and the plaster must be reinforced. Plaster systems approved for external thermal insulation composite systems are suitable.

Illustration of the joint between the half-timbered beams and Naturheld

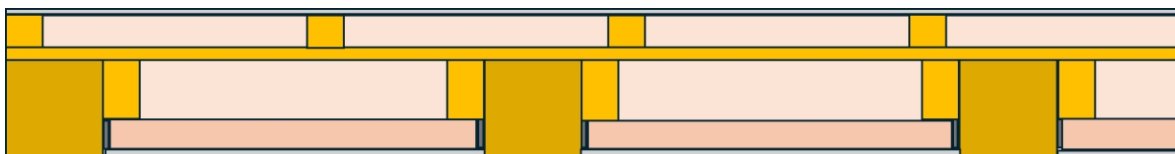
140 or 180. A joint of approximately 5 mm is planned around the perimeter and Kompriband is glued to the beams around the perimeter with an offset of approximately 20 mm before the panel is inserted. For wider and deeper joints between the insulation and the beams, these can be filled from the inside with hemp or

insulation strips. The edge distance and the number of fasteners for the

insulation boards. The trowel cut in the plaster layer to the beam is also indicated.



Cross-section of a half-timbered wall with Naturheld insulation materials. Naturheld 180 is used as a plaster base board on the outside and Naturheld FLEX is used for the cavity insulation. An installation level provides additional insulation thickness and allows for easy cable routing. An OSB board on the inside of the half-timbered beams acts as a continuous vapour barrier.

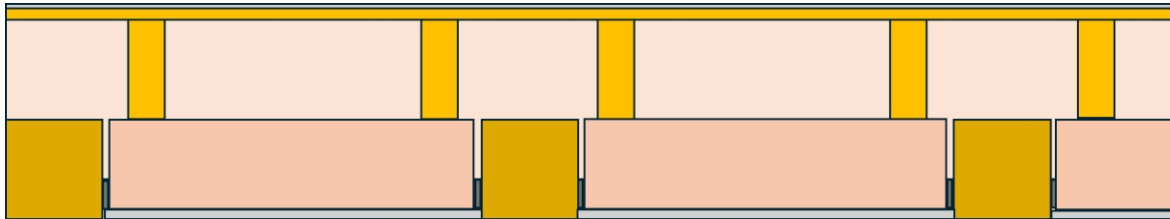




Wall installation instructions

Horizontal cross-section through a half-timbered wall with additional insulation on the inside. Naturheld 140 is

is used between the beams and Naturheld FLOW or FLEX as insulation in the inner compartments. The inner studs must be positioned so that they function as a substructure for the Naturheld 140 pieces.



Fire protection and fire resistance times

The new edition of DIN 4102-4, which regulates the fire behaviour of building materials and components, was published at the beginning of 2025. Numerous timber frame walls are now classified in this standard, meaning that

fire resistance times can be verified.

Standard timber frame walls with Naturheld 180 in 60 mm comply in most cases with F 30-B and, when plastered, with F 60-B, so that fire-retardant components can be easily implemented and verified.

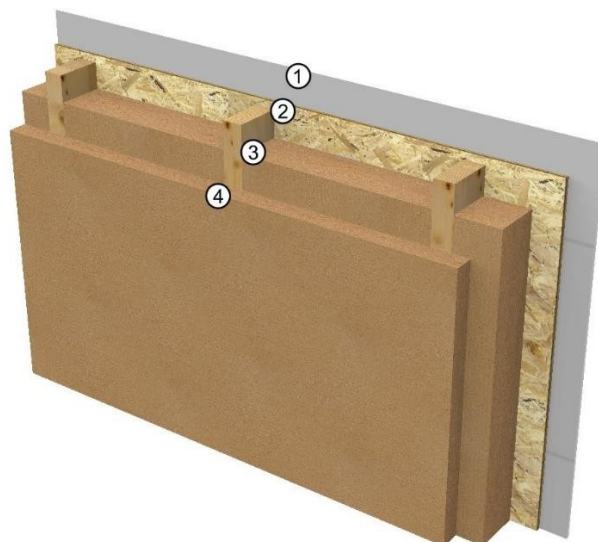
The following exterior wall variants up to F 90-B are possible with Naturheld insulation materials:

according to DIN 4102-4:2025-06, p. 270f. Tables 56, 59 and 62

Fire resistance	Interior cladding Thickness in mm Variants depending on compartment Depth			Cavity insulation Stud frame, minimum depth Fully insulated	External cladding	Plaster minimum thickness	
	Wood-based material <600kg/m³	e.g. Fermacell Board GF or GKF	Std Plasterboard GKB				
F 30-B	25			Naturheld FLEX or Naturheld FLOW min. 45kg Blow-in density	60x140 Solid wood	Naturheld 180, min. 60 mm thickness	-
	15		9.5				
			12.5				
	12		12.5				
					60x160 Solid wood	Naturheld 220, 35 mm thick	-
F 60-B	22		18		60x160 Solid wood	Naturheld 180, min. 60 mm thickness	5
		2x15					
	15	18			60x140		
Interior F 30-B	15		9.5		60x140	2x18mm GKF or GF + any	-
		12.5			60x120	Naturheld Plaster base board	
Exterior F90-B	Due to the additional external cladding, F 90 -B constructions must be checked for condensation resistance in terms of building physics, see p. 23.						

A typical timber frame wall with Naturheld FLEX and Naturheld 180 insulation materials, 60 mm thick, achieves a fire resistance rating of 30 minutes even without plaster and is therefore classified as **F 30-B**.

- 1: 9.5 mm GKB board
- 2: 15 mm OSB board
- 3: 140 mm Naturheld FLEX
- 4: 60 mm Naturheld 180





Wall installation instructions

Overhead installation of Naturheld insulation boards

It is possible to install Naturheld insulation boards overhead as plaster base boards, for example on interior roof slopes or as insulation for basement ceilings. Installation is also possible on the ceiling side of balconies or floor projections.

It should be noted that the amount of fasteners required is higher than for wall installation.

The following information regarding fasteners and substructures must be observed:


Tongue-and-groove insulation boards for fastening under rafters or wooden ceilings	Naturheld 180	Naturheld 140
Maximum distance between substructures	420 mm	
Required fasteners per m ²		
STRH dowels per m ²	8	10
HFS dowels per m ²	10	12
Wide-back staples	15	18

Insulation boards with blunt edges for insulating of ceilings made of CLT or concrete from below	Naturheld 140 install	Naturheld 110
Required fasteners per m ² , evenly distributed across the panel surface		
STRH/STRU dowels per m ²	10	12
HFS dowels per m ²	12	14
Wide-back staples	18	20

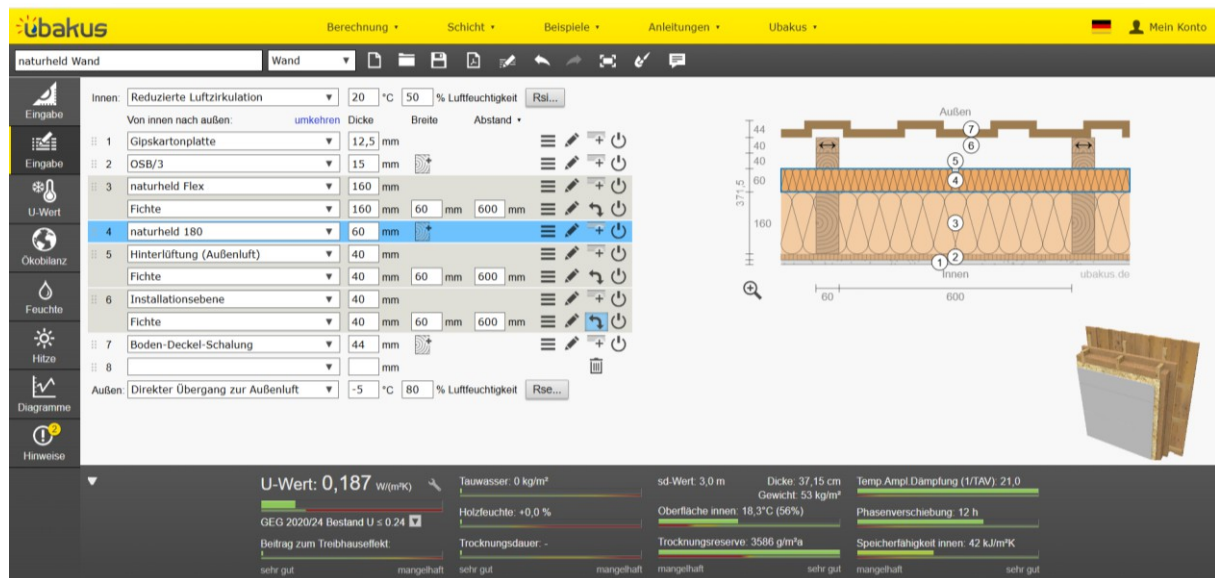


Wall installation instructions

Building physics and component testing

All naturheld insulation materials are registered with , where proof of the U-value and moisture protection in accordance with DIN EN 4108-3 can be easily generated for individual roof structures:

www.ubakus.de/u-wert-rechner/



	Innen:	Reduzierte Luftzirkulation	20 °C	50 %	Luftfeuchtigkeit	Rsl...	
		Von innen nach außen:	umkehren	Dicke	Breite	Abstand	
1	Gipskartonplatte	12,5	mm				
2	OSB/3	15	mm				
3	naturheld Flex	160	mm				
4	naturheld 180	60	mm	60	mm	600	mm
5	Hinterlüftung (Außenluft)	40	mm				
6	Installationsebene	40	mm				
7	Boden-Deckel-Schalung	44	mm				
8							
	Außen:	Direkter Übergang zur Außenluft	-5 °C	80 %	Luftfeuchtigkeit	Rse...	

U-Wert: 0,187 W/(m²K) Tauwasser: 0 kg/m² sd-Wert: 3,0 m Dicke: 37,15 cm Temp. Ampl. Dämpfung (1/TAV): 21,0

GEG 2020/24 Bestand U < 0,24 Holzfeuchte: +0,0 % Oberfläche innen: 18,3°C (56%) Phasenverschiebung: 12 h

Beitrag zum Treibhauseffekt: Trocknungsdauer: - Trocknungsreserve: 3586 g/m²a Speicherfähigkeit innen: 42 kJ/m²K

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Contact naturheld Technology

Do you have any questions about our products? We are happy to help.

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Design and implementation by Naturheld GmbH & Co KG. Printing errors, mistakes and ongoing changes are reserved.

Version 004, 01.08.2025



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