A manual for the home builder

How to build it

It's easy to build a house if you buy a construction kit from Polhus AB. If this is the first time you're building a house, questions and doubts may still come up. We have compiled our experience, and this manual has advice for those just getting started.

GOOD LUCK!

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My notes

MY ID NUMBER:

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Dear customer,

Thanks for giving us here at Polhus the confidence to provide you with a kit for your house.

Please READ THROUGH THE INCLUDED MANUAL CAREFULLY before starting construction! You'll save time and avoid making mistakes, which could otherwise be difficult to fix afterwards.

Recommendations:

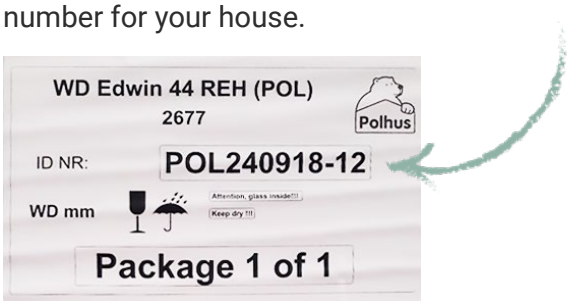
- Store the package containing the kit in a dry and cool place until you're ready to start construction. Don't store it in a damp or heated area. If the package is stored outdoors, protect it from rain and direct sunlight with a tarp. Water can get into the smallest of holes, and if the house is exposed to moisture, there's a risk of mould growing. Also, make sure that the package is placed flat on a pair of stable studs and doesn't come into direct contact with the ground. Don't unpack the package until you start building the house, as there is a risk that the wood will bend/warp.

- When choosing a construction site for your house, make sure there is air and light around the house. Try to avoid places where the house might be exposed to extremely strong winds.

- Keep the wood dry and clean during the construction phase, even if it rains.

PLEASE NOTE!
Save this manual, as it contains valuable information about your house. Our website has other manuals you can print out for each house, but we manufacture our houses in production series, which means that the manual on the website may differ slightly from the specific series in which your house was manufactured.

PLEASE NOTE! Without your house's ID Number, it is not possible to complain about any potential errors. Make sure you note down the ID number for your house.

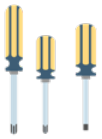


Preparations before starting

To assemble the house you'll need the following tools:

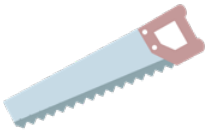
MANUAL

ELECTRIC SCREWDRIVER



SCREWDRIVER

PEN/PENCIL

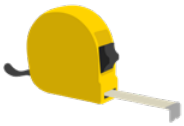


SAW

LADDER

HAMMER

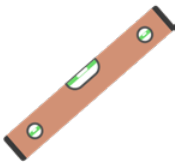
PLIERS



MEASURING TAPE

KNIFE

GLOVES



SPIRIT LEVEL

Use work gloves to reduce the risk of splinters
And other damage/injury to your hands.

Now that you have the right tools, you can being construction. You should start with the basics:

Foundations

Good foundations are a guarantee that your house will work properly and last for many years. Make sure that the foundations are laid on a stable surface.

You can find suggestions in our manuals for how to lay traditional foundations with concrete supports. On the final pages you will find what we call 'concrete support plans/diagrams'. But there are a number of different ways to build good foundations. Start by making sure that the construction site is drained and dry. You can choose from all the usual methods. You can cast an entire concrete slab on a gravel bed under the house. You can also use concrete beams that run across the floor joist, cast concrete plinths or use lightweight concrete elements. All methods work well, but remember that the surface must be dry and stable. You always need to remove the top layer of topsoil so that you get down to solid ground - rock, gravel, sand or rock. If you're building directly onto bare rock, you'll need to anchor your foundation with rebar or something else that's suitable. When you've finished digging, level the pit by laying a gravel bed of about 10 cm. Once that's done, you can start on the foundations themselves. Always try to make sure that there's room for the air to circulate under the floor joists, so that any moisture can escape.

In all foundation work it's essential that your foundations are level over the entire surface, otherwise you'll have difficulty assembling the house. Completely flat foundations are also necessary so that windows and doors can be opened and closed without any problems.

Check the parts

Read the manual and the table of contents carefully before you begin construction. Keep the manual in a plastic sleeve if it's raining. This might sound silly if you're good at DIY, but you'll avoid a lot of potential mistakes if you always have the manual to hand. You should also familiarise yourself with the various steps before you start construction. All the parts are pre-sawn and should fit as per the plans.

Check your package and make sure that all the parts have been included by looking at the enclosed material specifications found in the manual. Sort all the parts into different piles around the construction site, so you have them on hand and in the right place when they're needed for construction. Don't place the parts directly on the ground - they might get dirty, and if you lay untreated wood on a lawn, it can get stained.

PLEASE NOTE:

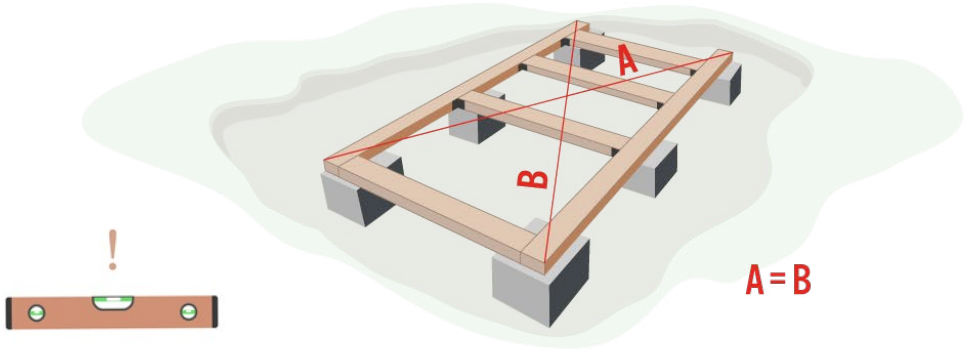
- There's an extra wooden wall part included in the package as a spare part if needed (it's always the longest wall plank).
- There should also be an extra floorboard included in the package to serve as a spare part if needed (the longest floorboard).
- The package also includes a small board (a short section of a wall board) for protecting the tongue and groove boards when assembling the wall profiles.
- Each part is marked with a position number and is specified in the list of material specifications! The parts also have an exact position as indicated in the manual.

Assembling your house

Prepare the parts:
Sort the parts and place them around all the sides in the assembly sequence specified in the Construction Description.

PLEASE NOTE:
Never place the parts directly on the grass or ground! Untreated wood discolours easily and can be difficult to clean.

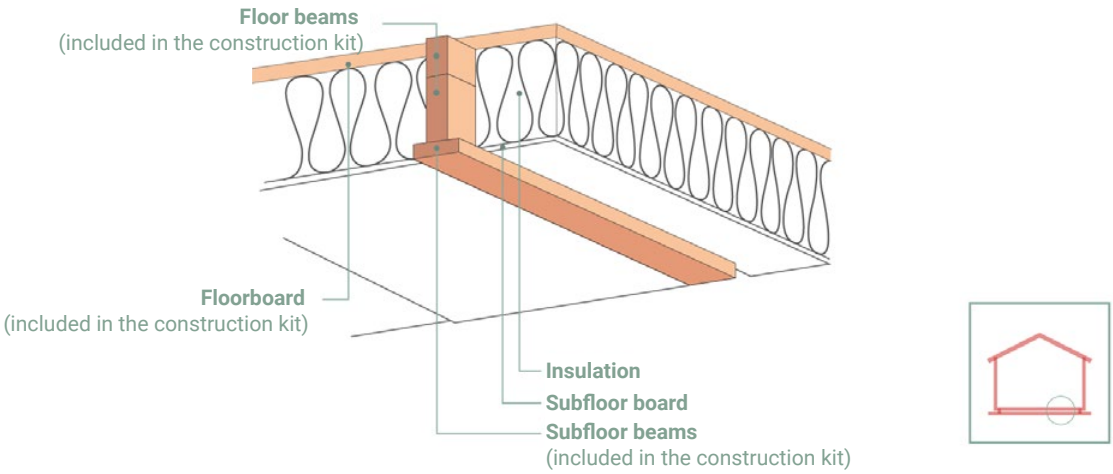
The floor joist (base frame)
It's important that the floor joists are completely level, so that the construction work is as easy and hassle-free as possible. Position the parts in the frame according to the instructions and nail them together. Place underlayment between the wood and the concrete support to prevent moisture from coming up into the wood from the concrete surface. It's a good idea to pre-drill holes in the ends of the surface-mounted beams for the nails, as the rough nails can otherwise crack the wood at the far end. Check that the base frame that the floor joists now form is resting properly on the foundations in all areas.



If there are gaps, you can fill them with a small board or a piece of roofing felt. The beams shouldn't give way anywhere when you walk on them. It's important that you check that the diagonals are exactly the same length. (A=B)

TIP:
To secure the house against wind and storms, we recommend anchoring the floor to the foundations with bolts or brackets. If you use precast concrete supports, attach the beams to them with brackets. If you're not using concrete supports with brackets, you can add some sheet metal brackets. (These parts are not included in your package).

PLEASE NOTE! If you want to insulate the floor, nail the planks (sub-floor planks) under the floor joist in order to have something to put the sub-floor board on. The sub-floor planks must be treated (varnished). Use the sub-floor boards that are included in our insulation packages. It's important that it's the moisture-repellent boards that withstand the environment under the foundations.



You can read more about additional insulation in a separate chapter later in this guide.

Walls

It's important to remember the following when assembling the walls:

- The wall joists should always be mounted with the spring facing upwards!
- If you need to hammer a wall plank into the lower part,
  NEVER hit the tongue or groove with a hammer! Always use the protective board that's included in your pack!

The first row of the walls always consists of a half plank on 2 of the outer walls. Which wall should have the first half plank is stated in the installation instructions for each house.

Now check once more using measuring tape that the diagonals between the notches are correct.

Screw the first set into the base frame through the notch socket on the wall joists.

The wall joists should be approx. 3-5 mm outside the floor joist. This is so that the rainwater can drain off the wall and doesn't flow into the floor joist.

Now it's just a matter of adding row after row, according to the building specifications for your particular house. Make sure to push each row down into the previous one, so that there are no gaps.

Windows and doors

There are two options when it comes to installing the windows and doors.

1. If the windows and door frames come without a lining board on the inner side But don't worry, this will go smoothly once you've finished the construction..Where that's the case, you can continue until the walls are finished and then put in windows and doors with their frames in the spaces.

2. If the windows and door frames have lining boards on both sides of the frame and form a 'U' shape, you should be a little more careful during construction. The U-legs hold the planks and the frame slides down into the space for the window and door, respectively.

At the fifth row of planks, maximum, the door must be put in place so that it's easy to get it in. At this stage it's not yet possible to open and close the door, as it hasn't been secured to the wall. But don't worry, this will go smoothly once you're done with the construction. Keep following the instructions for assembling your house, so that the windows are done at the right phase of the construction.

PLEASE NOTE:
It isn't necessary to screw the windows and door frames to the wall! If you still want to do that, only fix the frame in the bottom plank. This is so that the house can sit loosely when it dries together.

The final adjustment of the windows and door can only be carried out after two to three weeks when the house has settled. As the timber shrinks a little when drying, you'll also need to adjust the window and door again after about a year. You can do this by removing the screws from the frame, checking with a spirit level that the frames are level and fastening the screws again. When putting up the walls of the house, check at regular intervals that all the walls are the same height. Use the protective board and a hammer to bang together any wall parts that are too high or uneven.

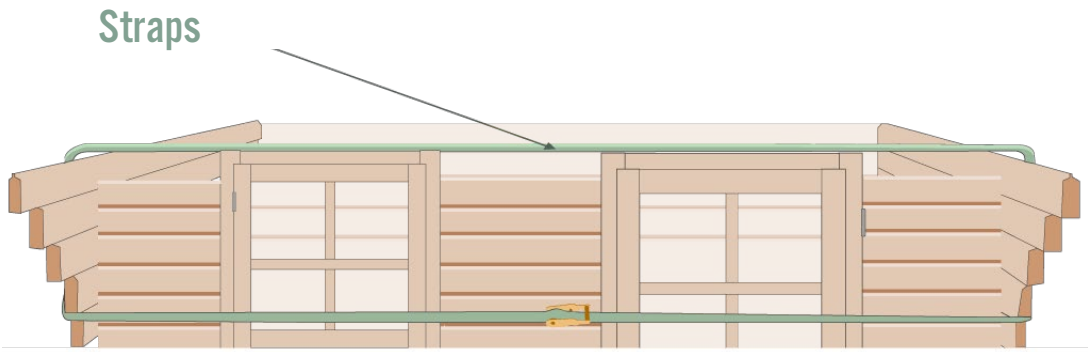
It's very difficult to take the planks apart once they have been assembled. If you've made a mistake, try to loosen by the required number of turns, by taking one turn at a time and forcing them apart evenly in all areas over the entire length of the plank. Hit them with a protection board from below, on the inside of the notch (not at the far end as the short notch can crack). Place a thin board between the layers when you've removed a notch.

Glue any damaged areas with wood glue - don't worry, the joint won't be visible later and it has no effect on the durability of the house.

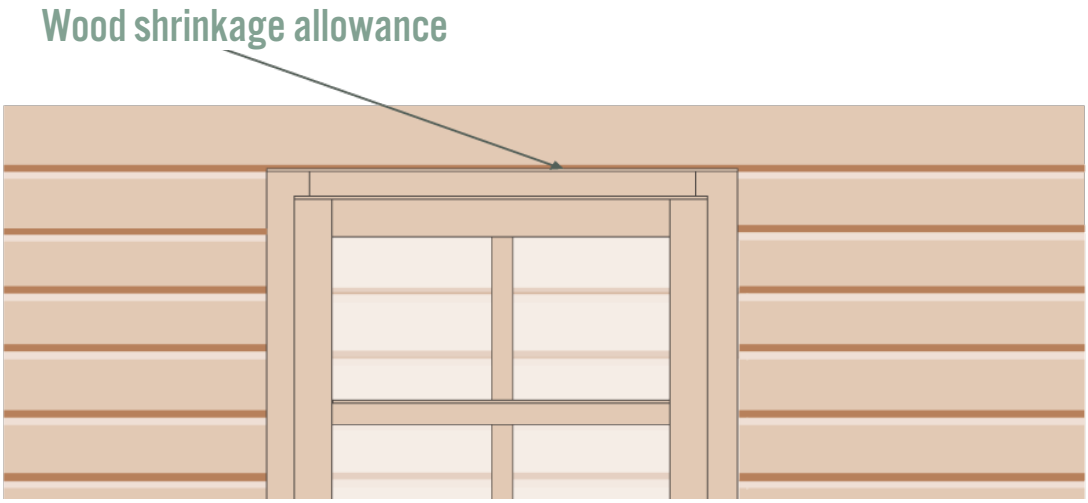
In order to reach more easily when the walls start to get high, it might be a good idea to start laying the floor at this stage. Read the next chapter about the flooring if you want to lay it now.

You're now assembling the notched timber row by row, and then hammering in the boards, so that all the corners are tight. Wood is an organic material and some boards may be a little uneven. This can easily happen if the package holding the kit has been left unpacked for a while before you started to build the house. In general, it's fairly easy to bend the board into the tongue by hand, but there may be times when you need to use a tool. If you have a screw clamp, this can help you get more force when you put in the board/plank. Remember not to place it too close to the edge or end of the wall as there is a risk of it cracking. When the board/plank is in place, it will automatically sit in place by the wall again, because it will be held in place by its upper and lower neighbours.
You can tighten planks/boards that have cracked by moistening them and leaving them under pressure for a few hours.

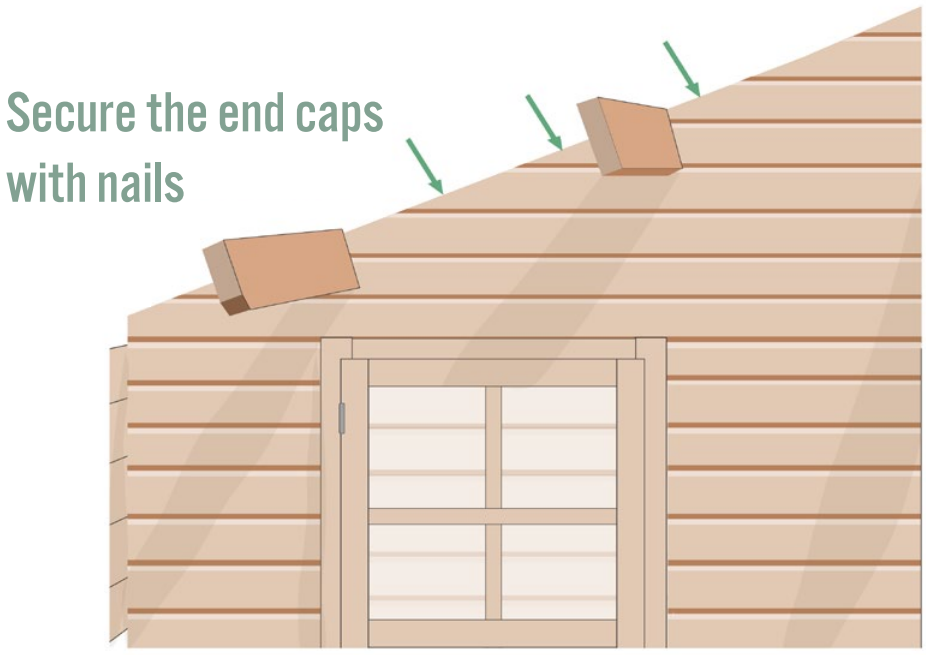
When you have reached the set above the window and door, put in the plank/ board that holds the wall together. Now you might find that you have a problem, as the walls might be sloping outwards. STAY CALM – it's completely normal and can easily be fixed.



You can support the walls from the sides so that you get the plank in place. Another way is to tighten the side walls with a strap. If you use the second method, place a board under the strip on the side walls so that you don't break the tongue.



Now that you have the planks over all the windows and doors, you will see that there's a gap above the frame. This is the room for shrinkage that must be left on a notched timber house. When the house has been standing for a while, it will dry out and the wood will move. So that the upper part of the house doesn't stick out at the door and window frames, there's a built-in space that allows the planks to settle. The gap will then be covered by the strips that come with the house, which are included in the material list. Fill the gaps with some mineral wool or other insulation (DO NOT use polyurethane foam).



The obliquely sawn gable tips are mounted and nailed by sawing in the underlying plank. Mount the roof trusses as you get higher up on the gables. The roof trusses stabilise the gables and the house will be fully stable when the tongue and groove boards are nailed to the roof. It's a good idea to have two people lifting the roof trusses in place.

On the larger Polhus houses, the trusses are in the other direction, and here they're screwed together in the ridge with an iron strip (hoop iron) or metal brackets.

The roof

It's important to get the roof up as soon as possible, to protect the house from the rain. Start at the rear edge or one end of the house, by temporarily nailing windbreakers to the roof trusses. This makes it easier to get the first board completely straight or at a 90 degree angle to the roof trusses. Then nail the pre-sawn boards alternately on the left and right side. Check that the lower edge, at the eaves, is even. Use a string or a straight plank to check that the eave planks are straight.

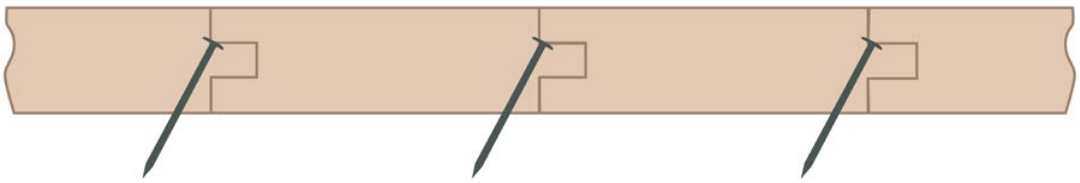
When the tongue and groove boards cover the entire roof, the wind protection planks are nailed in place before the roofing felt or other type of roof protection is laid. You can mount sheet metal profiles over the windscreens to protect against the rain.

By letting the roofing felt go over the wind protection planks, you'll create a drip edge so that the water does not flow into the wood or run down the walls. It's a great idea to install gutters and downpipes on your house, as that will give more protection against the damp.

The floor

The floorboards are pre-sawn to the right lengths. The floorboards will shrink slightly as the house heats up and dries. To avoid cracks in the floor, you can choose to hold off on nailing the boards until they have reached their width when dry. This takes a few months. Most people nail down the floor straight away. If you're going to insulate the floor, remember to have the sub-floor boards and insulation in place before you start nailing the floorboards.

The floor is nailed with nails of about 5x50 mm. Hammer the nail into the tongue of the board, so that it isn't visible. Nail as far into the board as possible, to prevent the tongue from splitting.



TIP:
When nailing closest to the end of the board,
you need to make the tip of the nail blunt, to reduce the risk of the board splitting. You can do this by hammering the tip of the nail, while resting the head of the nail against a hard surface.

Storm protection

In our houses that have widths of 70 mm or more, storm protection is included. This is in the form of a metal bracket that's mounted using pre-drilled holes at the four corners of the house.

In some types of houses, internal storm protection is included in the form of a board. This is mounted in the inner corners, by screwing in the lower edge and in the long narrow prefabricated holes in the upper edge of the board.

If your house doesn't come with storm protection, we recommend that you protect it by screwing a vertical board from the base all the way up to the top wall.

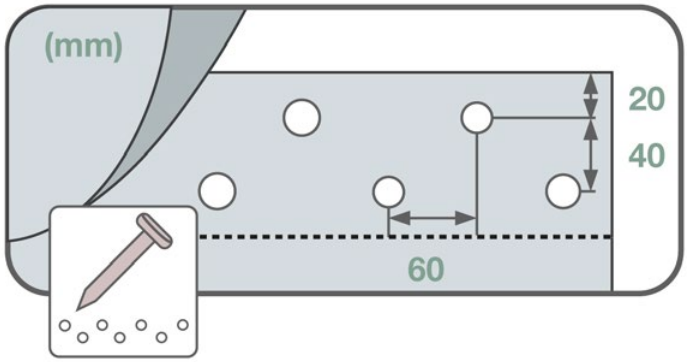
Only two attachment points are needed - at the bottom and at the top. PLEASE NOTE: you should only screw the windbreak permanently into the floor joists. In order for the house to be able to settle when the wood dries, the screw at the top must be able to be loosened and readjusted as the wood shrinks.

TIP:
After some time, check that the housing can settle while it dries. Adjust it once a month during the first half of the year. After that you can adjust it at increasingly longer intervals.

Roofing felt and roofing nails
The thickness of the roof boards can vary for the different houses. The most common thickness for the boards is 19 mm, but in our smaller houses such as playhouses or small storage rooms, we sometimes use 15 mm roof boards.

When you're going to nail the roofing felt for your house, we want you to use the right nail lengths. That's why we've adapted our optional packages (roofing felt) to the number of layers of roofing felt and the thickness of the boards. If you don't choose to buy roofing felt through us, please pay attention to this when making your own purchases. The roofing underlay (the first layer) always needs to be secured using 15 mm flat head nails, so that the nail doesn't go through the roof boards and show on the inside. The outer roofing felt that's thicker than the underlay, needs to be secured using 20 mm flat head nails. They need to go through two layers of roofing felt and go deep enough into the roofing boards so that the roofing felt is firmly attached. Likewise, roof shingles must always be laid using 20 mm nails. Roofing felt must always be nailed down with a maximum distance of 60 mm between the nails, and the nails must be hammered in a zigzag pattern as in the image below.

Nailing



General advice for notched timber

FAQ:
Why are there gaps between the planks after I've finished the house?

Cause: The frame can't settle when the wood is drying.

Solution: If the windows and door frames were screwed in places other than at the bottom - remove the screws. If the storm protection has been screwed in to too tightly - loosen the bolts. If you have screwed down the gutters or mounted fixed furniture onto the walls so that the wood can't settle in a natural way - loosen the object for a while and let the house settle.

FAQ 2:
Why are the windows and doors hard to open and close?

Cause: The original adjustment of the frames has moved.

Solution: Check if the foundations on which the house was built have moved. If so, adjust the foundations so that the house is level again. Check that the frame is still rectangular and adjust the lower screws as needed. Check that the window or door hasn't swollen due to moisture. If it has, wait until it has dried. Wood shrinks very little in length, so the shape of the frame (which is made up of longitudinal parts) won't change. That's why it's very unlikely that the frame has shrunk and become too small for its window or door - it usually just needs adjusting. A planer or grinder should only be used in extreme emergencies to correct a jammed window or door - it will always result in a larger crack somewhere else.

See also the manual on our website: "Manual - Adjusting the doors"

FAQ 3:
Why are there now cracks in the planks?

Cause: Wood is an organic material that interacts with its surroundings. When the weather is dry, the wood dries out - if the weather is wet, the wood absorbs moisture.

Solution: This is natural and requires no action - when the weather becomes wet again, the wood will swell and the cracks will become smaller.

Painting and maintenance of your house.

Immediately after your house is finished, you should treat it with a water-repellent and moisture-repellent product. Be careful to treat the ends of the wood. Many of the problems with wooden houses are caused by moisture. Since moisture enters much more easily along than across the grain, it's important to 'seal' the ends with the primer treatment (primer oil and primer).

It's best to paint in several layers (using a paint system), as that will give the most durability. A paint system can include primer oil, primer paint and two coats of top paint.

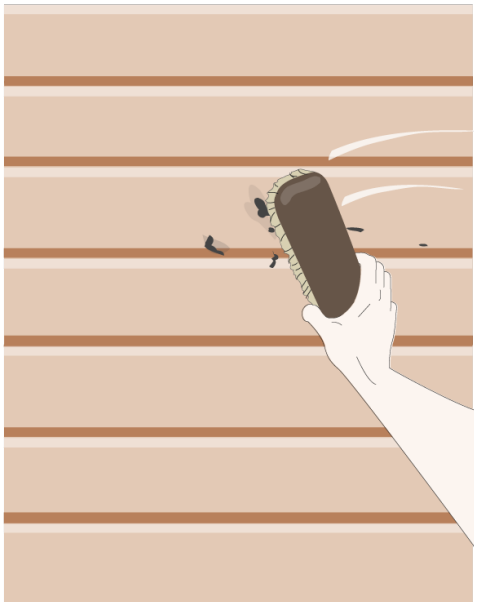
Choose proven products from a reputable manufacturer. The wood should be as dry as possible when it's being painted. Our houses have a moisture ratio in the wood of about 17% when they are delivered to you.

It's a great idea to use scaffolding and the best tools. Make sure you don't risk falling and injuring yourself or others.

The colour you choose will have an effect on the wood. If you choose black paint the house will get warmer in the summer, so the wood will dry quickly and cracks might form in the surface. The advantage of dark paint is that any discolouration is less visible and moss doesn't grow quickly on warmer surfaces. A light or white surface results in a lower temperature of the wood. Also, cracks in the wood or between the wall planks will be less visible than they are with a dark paint. You'll need to paint your house again after a few years when the house has dried out and the wood has shrunk to its correct dimensions.

Choose environmentally friendly products where possible to reduce the environmental impact.

Don't let plants grow too close to the facade, as this creates a detrimental microclimate. Remember to leave a drip edge on the roof covering and install gutters and downpipes to divert the water and prevent it from running down the facade.



Don't neglect the facade. It needs to be checked at least a couple of times a year so that any problems can be caught early. If the house develops a mould problem, you can wash off the discolouration with bleach or use special products that you can find at your nearest paint shop. Be sure to ventilate the house. Wooden houses that are unheated over the winter can develop mould infestations indoors if there isn't proper air circulation. Install ventilation valves at the floor, and higher up on the walls to let the air out.

Indoors you can treat the walls with water-soluble panel varnish, for example. The varnish stops the walls absorbing any dirt.

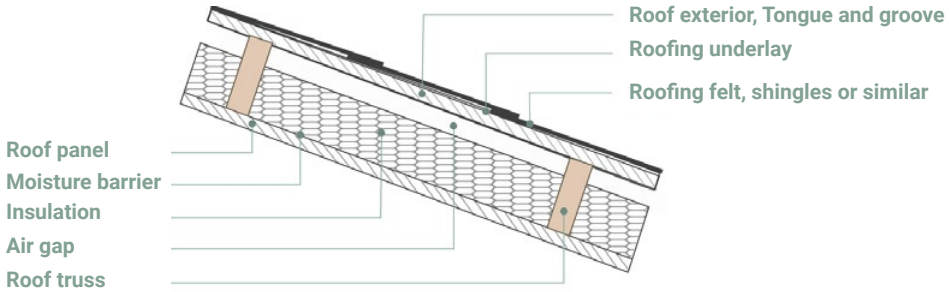
Additional insulation

The construction kits from Polhus come without insulation, because not everyone plans to use their house in colder temperatures. Extra insulation can of course be added to all our houses, and in the following sections we have some advice on what to remember when insulating a house.

Roof insulation
The most important part to insulate is the roof, because heat always rises upwards. Warm air is lighter than cold air. You have two main options when insulating the roof of our houses. You can either use the trusses that are built-in, or you can build an extra roof and insulate it from the outside.

In general, the roof should be constructed as follows: Inside and out:

1. Ceiling of panels or boards
2. Moisture/vapour barrier (diffusion tight), usually polyethylene foil (at least 0.15 mm)
3. Insulation, mineral wool
4. Air gap with wind underlay or masonite board
5. Roof truss
6. Roof exterior, Tongue and groove
7. Roofing underlay
8. Roofing felt, Shingles, Metal edge trim, Bricks, etc



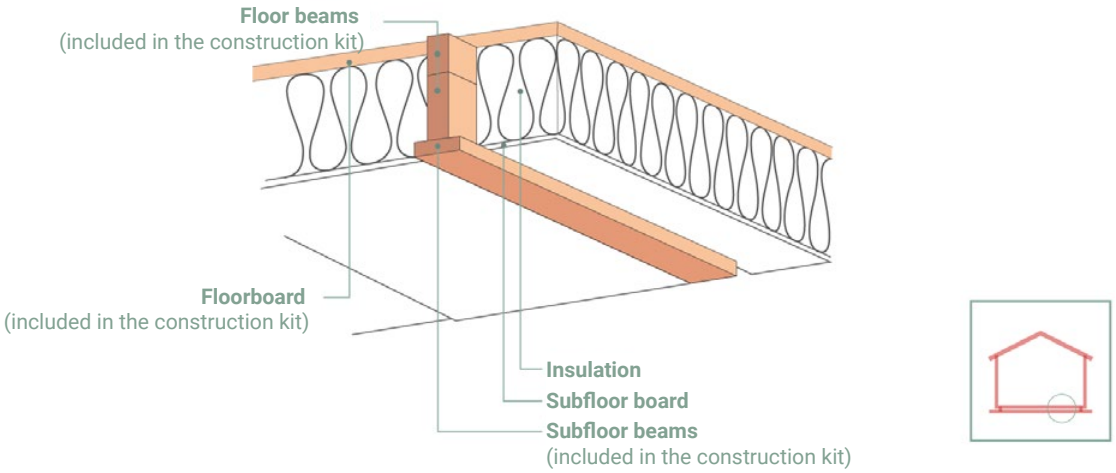
It's important that you seal the vapour barrier well with a 200 mm overlap and tape over the seals and nail holes. PLEASE NOTE: you must leave an air gap between the insulation and the roof. It's important that the space has ventilation holes so that any moisture can escape. Install insect nets at the eaves or where holes have been drilled for ventilation. This is to protect against insect infestations in the hidden parts of the construction.

Floor insulation
An uninsulated floor can make your feet cold even in the summer, so it's worth starting to think about insulation during the construction phase.

The floor insulation is built up in principle in the same way as the roof insulation. However, we don't recommend placing a vapour barrier in the floor construction as in certain climates the moisture can come into the construction from the outside. When this happens, the moisture is stopped at the vapour barrier next to the wood, and the risk of mould can increase.

Inside and out, the floor insulation looks like this:

1. Flooring Material
2. Flooring of tongue and groove boards on floor beams
3. Insulation/mineral wool
4. Floor beams
5. Sub-floor boards/Underside
6. Sub-floor plank, support for the sub-floor boards



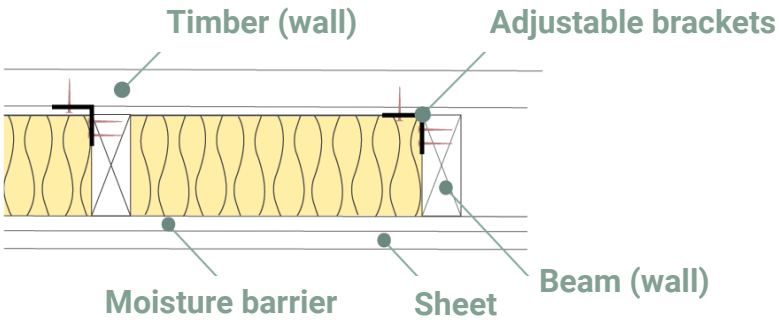
Wall insulation
Insulation of the walls in a wooden house is usually done last.
It's important to ensure that windows and doors are insulated and that the roof and floors are insulated. Generally, the wall insulation works in the same way as in the roof.

An important difference is that the walls of a timbered house can move and mustn't be locked in place. Wood dries over time and the largest volume reduction occurs across the grain. This phenomenon is called settling.

A house can settle between 10-30 mm per metre of wall height, depending on how damp the wood was when the house was built. Polhus uses saw-dried wood, ie. about 17% moisture content, and this means that our houses are on the lower end. That's why it's important that there is settling room for all the timber, or any materials that are attached to the walls. PLEASE NOTE: we have allowed for shrinkage in the walls for the windows and door frames. To have something to nail the inner wall to, adjustable brackets are used.

Attach the upright stud/plank to the side with the 4 holes and screw in the grooved side of the bracket to the top of the groove. Attach adjustable bracket with a c/c of approx. 600 mm and you will create an excellent attachment for your wall studs. Remember to leave a few cm of space between the stud and the ceiling. If settling is not taken into account, the walls will hang on the inner wall studs, so cracks will appear between the wall planks, which can cause them to twist or warp. Fixing an error later can be hard work.

View from above



Guarantee

Our products are made from quality selected timber from Northern Europe's largest manufacturer. Before the products leave the factory, all packages and their contents are checked for quality.

Polhus systematically works with quality control, and pursues continuous development and improvement. Despite this, it can happen that a customer is not satisfied and has reason to complain about the product. It's important that we fix the error as soon as possible. A complaint that's handled well by us is a guarantee that you will be satisfied and want to shop with us again. In order to be able to help you as quickly as possible, it's important that we get all the information we need to know which part of the kit your complaint refers to.

Polhus AB is responsible for any already present errors or damage discovered on opening the package of the construction kit. Damaged parts will be replaced with new ones at no cost. Mould damage that can occur due to incorrect storage by the customer or after the cottage has been built is not included in the guarantee. Any subsequent costs that arise due to a part being damaged, incorrect or missing will not be reimbursed.

PLEASE NOTE THAT IT'S EXTREMELY IMPORTANT THAT YOU KEEP THE MANUAL AND YOUR ID NUMBER WHICH COMES WITH THE DELIVERY. IN THE EVENT OF ANY COMPLAINT OR EXTRA PARTS, THIS INFORMATION IS NEEDED FOR THE RIGHT PARTS TO BE PRODUCED! WE ONLY APPROVE CLAIMS THAT HAVE A PRODUCT WARRANTY.

You can read our terms and conditions at polhus.se/polhus.no/hytteogbolig.no

The guarantee does not include:

- Changes that are a result of wood being a natural material.
- Parts that have already been painted or otherwise treated.
- Parts that do not structurally weaken the construction.
- Colour variations in the wood that don't affect the lifespan of the wood.
- Small drying cracks in the wood that are not continuous and don't affect the house's functionality or lifespan.
- Twisted or skewed wood which, with a minor correction, can still be used for its original purpose.
- Colour variations, irregularities, blemishes and poor planing on tongue and groove boards for roofs and floors on the side that isn't visible once assem bled.
- Complaints that arise due to non-expert construction or due to the foundations not being laid flat and/or professionally.
- Complaints that arise due to self-made changes to parts in the kit, or due to the manual not being followed correctly.

We'll help you all the way, and wish you good luck with the installation of your house. We hope that you will have a lot of fun there and make wonderful memories in it.


Polhus