

# TYLÖ



## GUIDE - HOW TO BUILD A SAUNA

When installing sauna products from Tylö, the installation instructions should always be followed. "How to build a sauna" generally applies to Tylö's products. When installing, the instructions for the specific product should always be followed.



## DIFFERENT TYPES OF SAUNA?

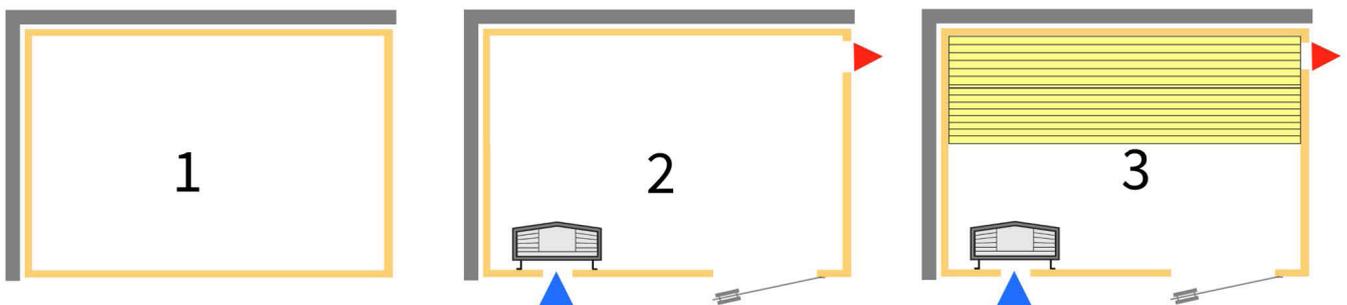
Bathing form	Traditional sauna	Soft sauna	Steam bath
Definitions	Temperature 75–90 °C Humidity 5-15% RH	Temperature 45–65 °C Humidity 30-65% RH	Temperature 40–45 °C Humidity 100% RH
Suitable sauna heater	Traditional sauna heater such as Sense Sport, Sense Pure, Sense Elite, Sense Commercial or Sense Combi.  Power is selected in relation to room volume.*	Sense Combi or Tylarium** Traditional sauna heater + steam generator e.g. Sense Commercial (with relay box) + steam generator Commercial  Power is selected in relation to room volume. *	Steam generator Steam Home or Steam Commercial.  Power depending on the volume and material in the room.
Appropriate materials in a sauna	Wood and glass sections. Other materials on wall surfaces, such as stone* or tiles* may be used, but to a limited extent.  Seating areas and other surfaces should be made of wood.	Wood and glass sections. Other materials on wall surfaces, such as stone* or tiles* may be used, but to a limited extent.  Seating areas and other surfaces should be made of wood.	Tiles, plastic or glass. It is important that all floors, walls and ceiling surfaces, as well as floor drains, are well-sighted.  The materials in a steam bath must withstand a high moisture load.

\*If the room is built with a wall covering made of stone, glass or tile, the increased power requirement must be considered to heat the sauna. For each m<sup>2</sup> "heavy material" you should add 1 m<sup>3</sup> to the room volume.

\*\*Tylarium means combining a sauna heater and a steam generator with a common control panel Elite in order to control the temperature and humidity of the sauna.

# PLAN THE SAUNA STEP BY STEP

- Where should the sauna be placed in the house? Is the sauna going to be placed against an outside wall?
- What are the possibilities to solve the ventilation to the sauna? The ventilation determines where the heater is conveniently placed in the sauna.
- Placement of the door? The door shall be placed on the same wall as the heater or on the adjacent side wall as close as possible to the heater.
- Keep in mind that the ceiling height in the sauna should preferably not exceed 220 cm, the minimum ceiling height is 190 cm but, in some cases, may be higher depending on the sauna heater.
- Glass sections? Keep in mind that the sauna must be airtight so that glass sections that have gaps are not inserted. Also consider that the sauna requires more power to heat with large glass surfaces.
- Placement of interior (benches and backrests). The interior design should be planned only when you know where the heater, door, glass sections and ventilation will be placed.
- The power of the heater? The volume of the sauna (floor area x ceiling height) determines the effect together with the choice of material in the sauna. If you deviate from wood paneling as a wall covering in the sauna, you must put 1 m<sup>3</sup> on the sauna volume for each m<sup>2</sup> glass, tile or stone on the wall or ceiling in the sauna. If the sauna is built with solid concrete or stone walls, the sauna volume should be increased by 2 m<sup>3</sup> each m<sup>2</sup> wall surface.
- Lighting in the sauna? There are different types of lighting that have different limitations regarding where the lighting can be placed. Also keep in mind that some models of sauna heaters can control (turn the lights on/off) via the control panel.



## **Good to know about sauna building, installation and ventilation.**

Building a sauna "board by board" with regulations, insulation, door, complete interior, moldings, and more, requires good carpentry skills. The option to choose a ready-to-install sauna room from the wide range of Tylö's range is a wise shortcut, which is also cost-wise comparable to a professional site constructed sauna.

The time for building a ready-to-install Tylö sauna obviously varies depending on the model, but detailed instructions and well-thought-out designs make the work straightforward. At the same time, you get a sauna with the artisanal finish that characterizes a quality product to be used for many, many years.

### **Location of the sauna room**

Independent studies show that of the energy the sauna heater consumes, all the thermal energy of the house will benefit. This means that the house's thermostat-controlled heating radiators gets a break, which saves the same amount of energy as the sauna consumes. If the sauna is placed in a corner against the exterior walls, the house also gets an additional insulation that saves up to 500 kWh per year. When positioning against a corner, you also save the cost of external upholstery of two walls.

### **Ceiling height and layout**

The ceiling height of the sauna must not be less than 190 cm. However, there is no need to build the room too high, as much of the heat ends up in the ceiling. For a normal family sauna, a ceiling height between 190 - 220 cm is just right. Only if the benches are in more than two levels there is a reason to build higher. Benches that do not rest between two walls shall be provided with armrests/bench supports. If the ceiling height exceeds 220 cm, it may be difficult to get the temperature to the lower levels of the sauna when heated from top to bottom.

### **Calculate the number of panels to walls and ceilings**

If you choose to build your sauna with vertical panels, you take the width of the wall in mm and parts with the selected panel's building dimensions. This will give you the number of panels required to cover the wall. Do not forget to consider the length of the panel as the ceiling height cannot exceed this measurement. With horizontal panels, the interior height of the sauna is divided with the building dimensions of the panel. To figure out how much paneling is required for the ceiling, there are two options.

Option 1: Mount the panels continuously.

Option 2: Fit the panels equally far from the walls and get a visible joint in the center covered with molding. Ex: The wall has a width of 2000 mm and a height of 2200 mm. A panel 12 x 95 x 2400 with building dimensions 85 mm has been selected.

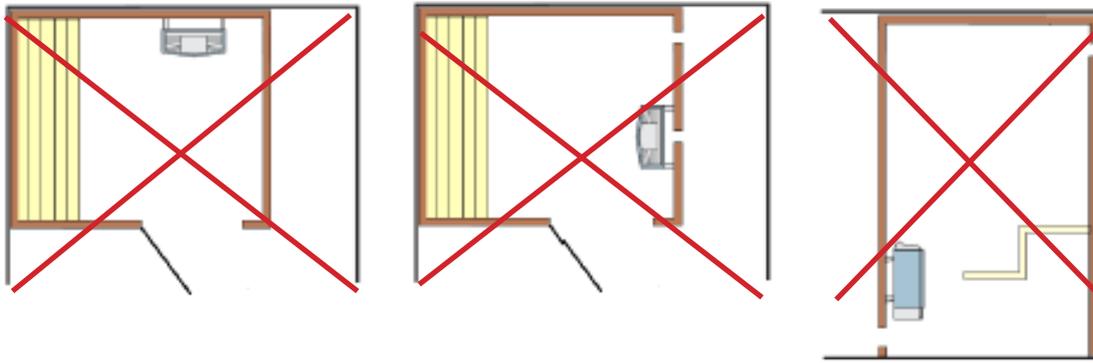
For vertical panels:  $2000/85 = 24$  panels. For horizontal panels:  $2200/85 = 26$  panels.

### **Sauna floor**

The floor must be non-slip and must be able to withstand a certain moisture load that may occur during bathing and may have a drain (so-called scupper) that leads to a floor drain with a water lock outside the sauna room. The drain must not be placed directly under the sauna heater. The reason why you do not want a floor drain inside the sauna is the risk that the water trap dries out and causes a bad smell. A possible wooden decking on the floor is decorative and pleasant to walk on but makes cleaning the sauna more difficult.

### **Sauna heater and door always on the same wall!**

The air circulation of the door shall cooperate with the hot air from the sauna heater. Therefore, the heater should always be placed on the same wall as the door (only as an emergency solution on the side wall, but then completely close to the door). Follow the instructions supplied with the sauna heater. The specified minimum distance to materials must be considered.



### Ventilation is important!

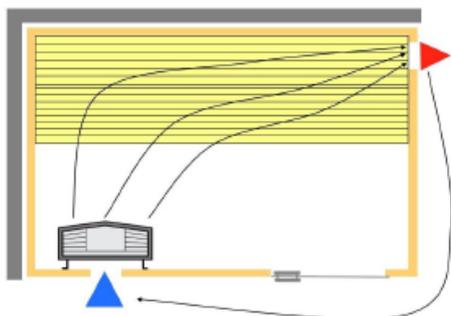
Among the most important things to consider when planning your sauna is ventilation. Incorrect ventilation means that the overheating protection on the sauna heater can trigger. In some cases, there may also be a fire hazard due to dry distillation of the wood panel in the sauna. A sauna should be ventilated with self-draught (so-called thermal ventilation) by taking in the air directly under the sauna heater. The exhaust air outlet shall be placed as far away from the heater and inlet air as high up in the room as possible and ventilated to the same space from where the inlet air is taken. It is important that there is the same air pressure, both where the inlet air is taken and where the exhaust air flows. Otherwise, the ventilation will not work. The size of inlet air and exhaust air should be at least 125 cm<sup>2</sup> for heaters up to 8 kW and 300 cm<sup>2</sup> for 10 - 20 kW.

### The exhaust air should not flow outdoors!

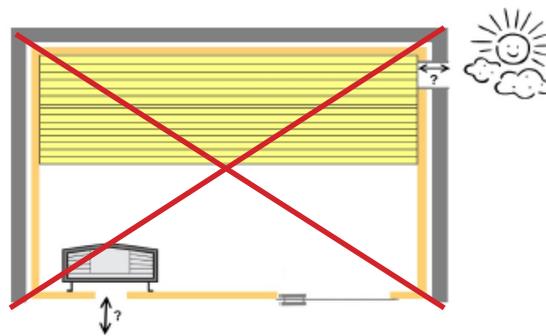
Diverting the exhaust air from the sauna outdoors can often lead to the ventilation not working or going in the wrong direction. In many modern houses with mechanical exhaust air, a wall outlet that leads out into the open air can direct the air in the wrong direction in the sauna. It is also affected, for example, by wind that may push onto the outlet.

### Mechanical exhaust air

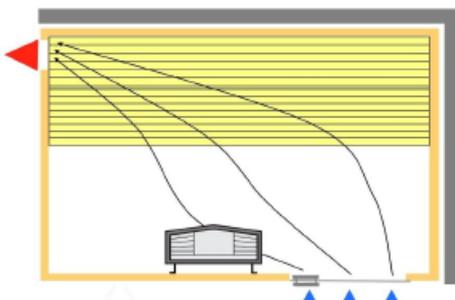
We recommend avoiding mechanical exhaust air from the sauna as it is difficult to adapt the air flows to a specific sauna. When self-drawn, the ventilation adapts so that in most cases it is optimal for the sauna in all conditions. However, there are no obstacles to having mechanical exhaust air in the room in which the sauna is, if you follow the rule that both the inlet air and exhaust air flow into the same space.



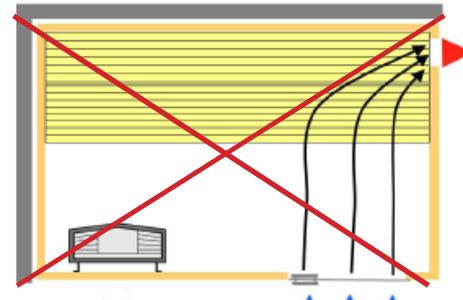
Properly ventilated sauna



If the sauna is ventilated directly into the open air, there is no guarantee that the air will go in the right direction.

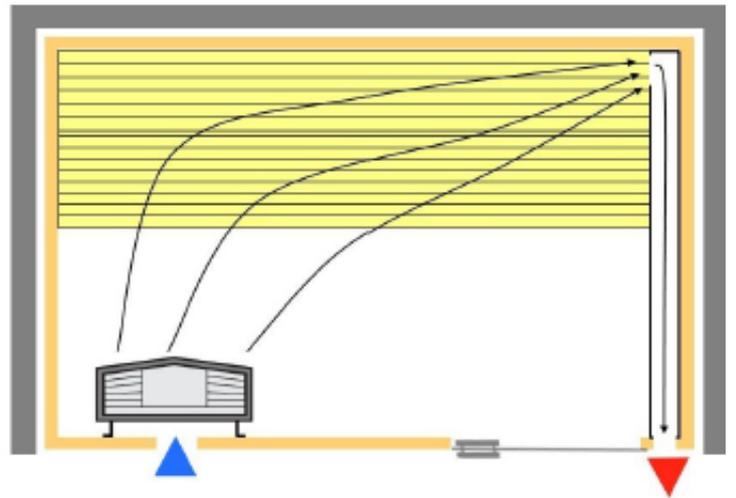
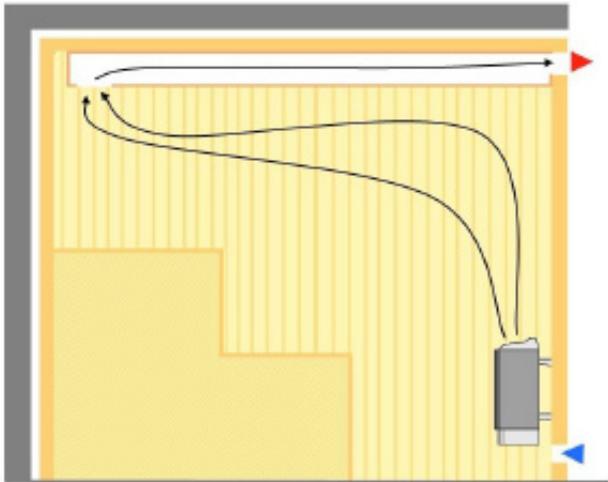


If you have the heater near the door and the exhaust air on the opposite side, you can in some cases take the inlet air under the door. However, it is recommended to take the inlet air directly under the heater.

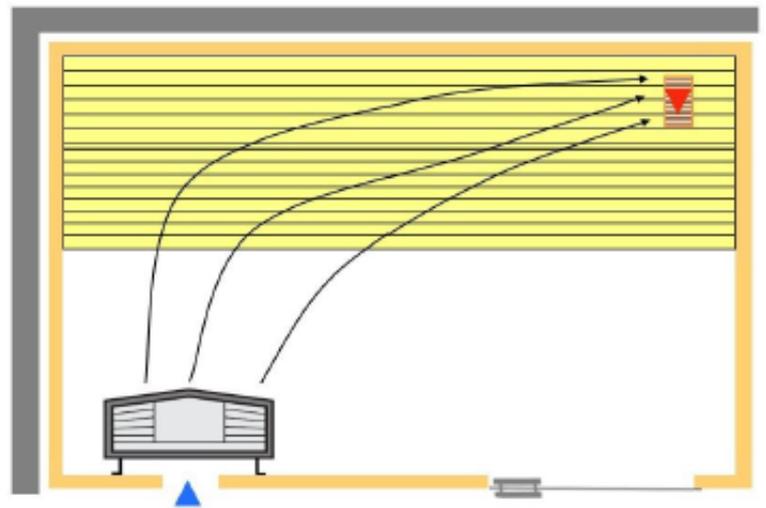
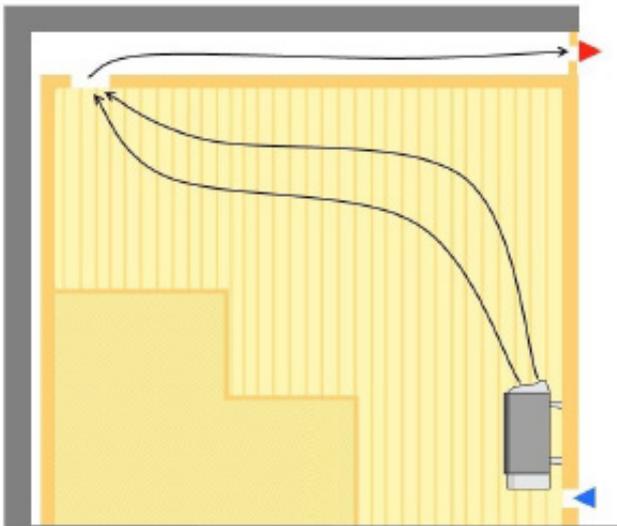


This solution does **not work**, the inlet air will not pass through the heater but goes directly out without helping the heater spread the heat in the sauna.

## The ventilation can be solved in several ways!



You can also solve the ventilation with a duct inside the sauna if there is no other possibility. It is still important that inlet air and exhaust air flows into the same space and that it is the same dimension on both inlet air and exhaust air.

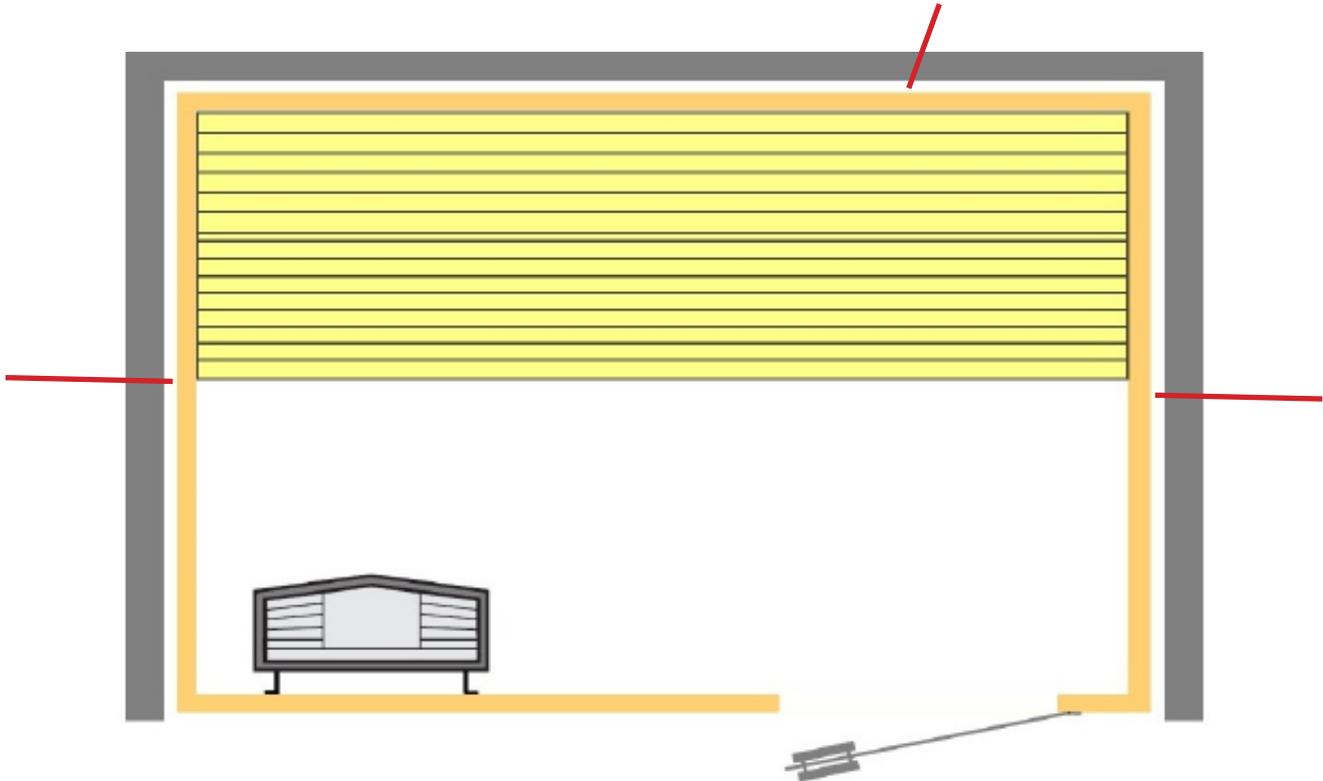


If you lower the ceiling in the sauna, you can use the space between the ceilings to ventilate the sauna. Make sure that the dimensions of inlet air and exhaust air are the same and that the air emitted from the sauna can flow into the same space from which the air is brought in!

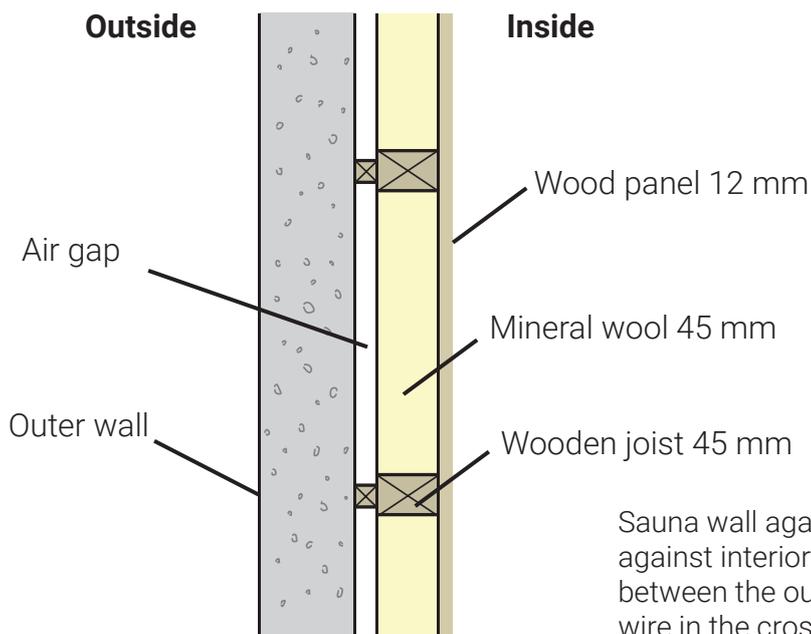
**Regardless of the type of sauna, the installation instructions for Tylö's sauna heaters must be followed.**

## Air gap/moisture barrier

Always leave a ventilated air gap of about 20 mm between the outer wall of the sauna and any existing wall construction. This is especially important if the sauna room is placed against a cold outer wall. The sauna should always be built as a "room in the room". There is no need for a moisture barrier between the outer walls of the sauna room and the interior walls of the house.



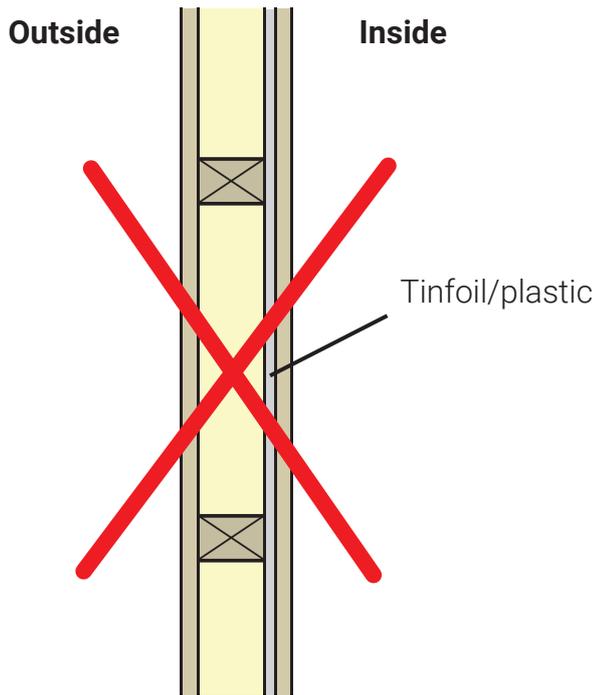
## Sauna wall against outer wall



Sauna wall against outer wall should have an air gap. Sauna wall against interior wall does not need an air gap. To obtain an air gap between the outer wall and the insulation, you can attach a steel wire in the cross or put masonite (wood fiber board) to keep the insulation in place.

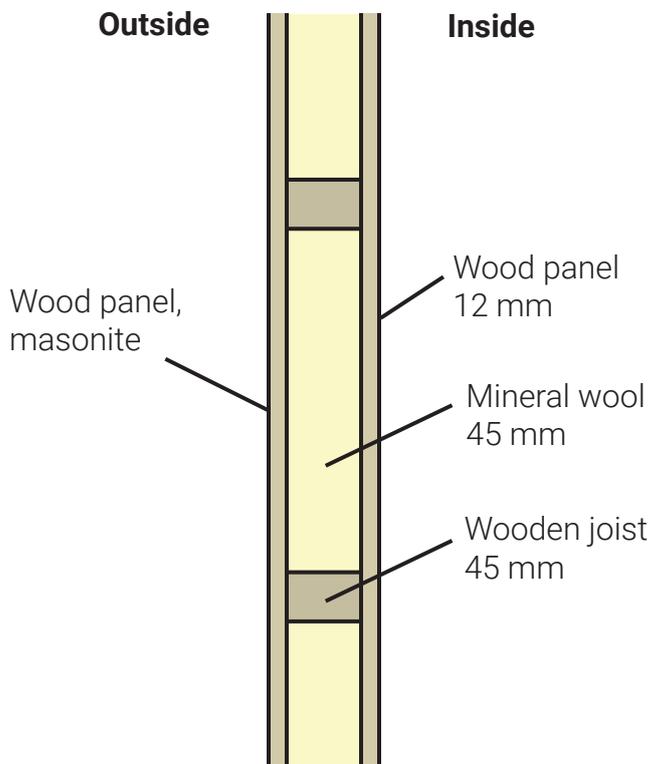
On the joists against the outer wall you can put blocks of the appropriate dimension to keep the distance in the air gap to about 20 mm.

## Unrecommended design



Tylö does not recommend the use of foil or plastic in the wall as a moisture barrier. There should also be no air gap, plaster\*, particleboard\* or OSB disk\* directly behind the wood panel.

\*Plasterboard has a maximum temperature recommended by the manufacturers of about 45 degrees. If plaster is exposed to higher temperatures for a long time, the disc drops into strength. Glued wooden boards are unsuitable because there is a risk that the glue will give off a bad smell and that unhealthy substances are released when heated.



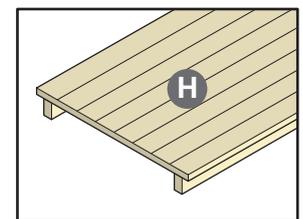
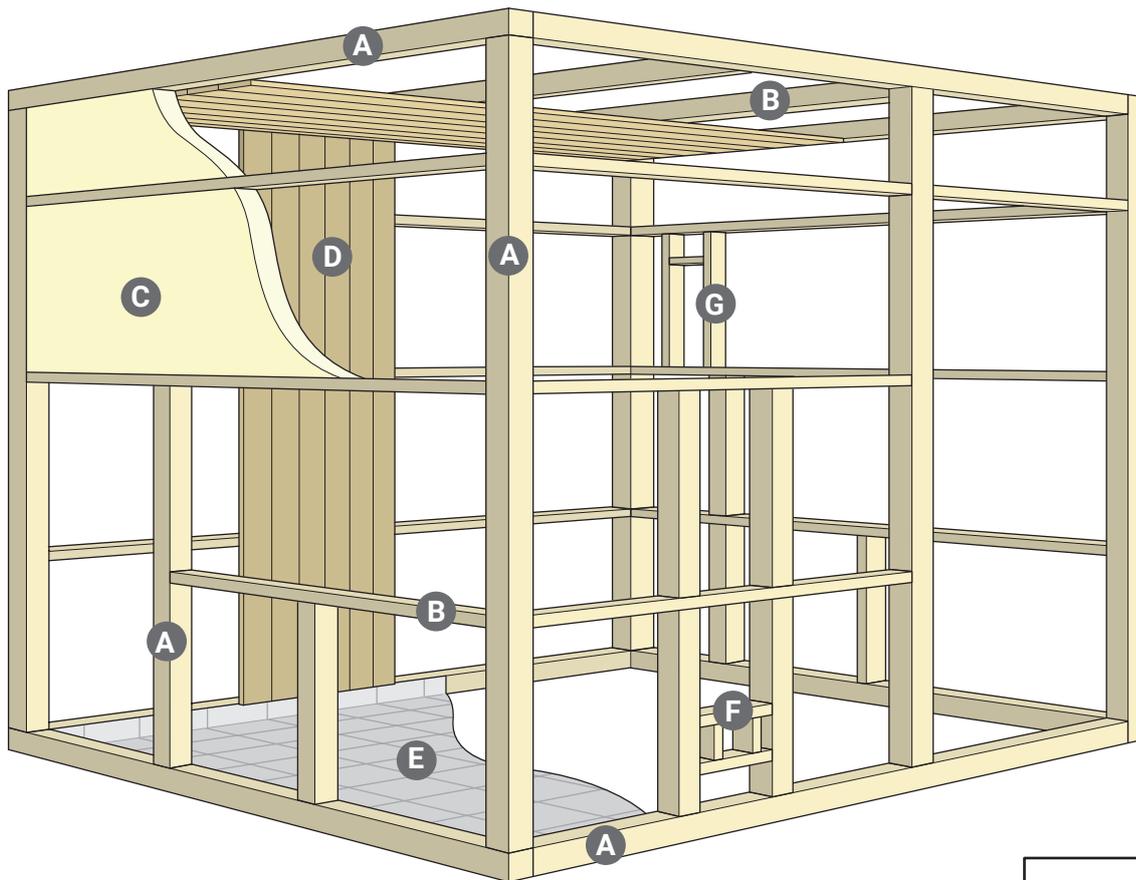
Inside, the wall should be covered with wood paneling\*\*. Directly adjacent to the wood panel, at least 45 mm mineral wool or fiberglass insulation (in public facilities at least 95 mm) is added. Be careful with the insulation when you get a fast and economical heating.

\*\*If materials other than wood paneling are used as wall coverings, such as tiles, stones or glass, this need to be taken into account when calculating the power of the heater. The effective volume of the sauna must be increased by 1 m<sup>3</sup> for each m<sup>2</sup> tile as much more energy is required to heat a heavy wall. For solid walls, the volume of the sauna should be increased by 2 m<sup>3</sup> for each m<sup>2</sup>.

Heavy materials are used in structures where you want a great thermal inertia where the temperature should be stable, in a sauna it is the exact opposite, where should preferably be as light and as little material as possible between the warm air and the insulation to get a quick heating on the sauna and a reasonable power requirement. You should warm the air in the sauna, not lots of materials in the wall and ceiling. There is a big difference in how much power is needed if you are just going to heat air and wood paneling or if there are massive concrete or brick walls that can weigh several tons.

If you are going to put tiles or the like on the outside of the sauna, you can replace the wood panel with suitable sheet material, e.g. plaster. If it is a ready-made sauna room from Tylö, plaster can be fixed directly on the wall outside the panel.

## Recommendations for sauna room building



- A.** Floor frame, posts, standing joists, ceiling frame. Wood 45x45, alt 45x95 (or more) for public use.
- B.** Landscape joists, ceiling joists, valves. Wood 45x22 or adapted to dimension on A.
- C.** 45 mm mineral wool (at least 95 mm in public use) as thermal insulation in walls and ceilings, hold about 20 mm air gap against the outer wall.
- D.** 12 mm wood panel\* in walls and ceilings. Behind the wood panel there should always be at least 45 mm insulation, no other material such as chipboard or plaster may be present.
- E.** Floors made of tiles or fully welded plastic mat. The floor must be able to withstand a certain moisture load that may occur during bathing. In public use, floors must be carried out according to current wet room standards.
- F.** In-air valve, which should always be fully open, must not be able to be closed. Can be fitted with grilles but it should then be so that the air flow is prevented minimally. Dimensioning depending on the power of the heater.
- G.** Exhaust vent. Can be equipped with sliding door for adjustment of ventilation. Should be of the same dimension as inlet air.
- H.** Sauna benches should be of at least 22 mm, woods such as aspen or alder, recommended.

Scuppers should be available in all public saunas. The scupper or drain should not be placed directly under the sauna heater. In private use there is no requirement for drains or scuppers in the sauna but can still be good to have.

\*If the room is built with a wall covering made of stone, glass or tile, the increased the power requirement to heat the sauna. For each m<sup>2</sup> of heavy material, add 1 m<sup>3</sup> to the volume of the room.

**TYLÖ**

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