

FINNISH SAUNA

SIMPLE IN APPEARANCE.
COMPLEX IN ENGINEERING.

A traditional Finnish sauna is an integral part of a hydrothermal area and is characterized by dry heat that typically ranges from 80°C to 105°C (176°F to 221°F) with low humidity (<10% RH). Heated stones and correctly engineered airflow deliver an authentic löyly experience—high heat, low humidity and deeply satisfying sweat.



TEMPERATURE
80–105°C
(176–221°F)
EN 18164 RANGE:
80–105°C



HUMIDITY
<10% RH
Briefly increases
during löyly



EXPERIENCE
HIGH HEAT
LOW HUMIDITY
DEEP SWEAT

HOW DOES A SAUNA WORK?



1. HEAT

The sauna heater and carefully selected stones absorb and radiate thermal energy, warming the air and the wood-clad surfaces.



2. AIRFLOW

Correctly engineered supply and extract air distribution provides fresh air to occupants, supports the heater and creates even temperature throughout the cabin.



3. LÖYLY

Water applied to the heated stones briefly increases humidity and intensifies the perceived heat.



2–3 BENCH LEVELS CREATE TEMPERATURE ZONES: HIGHER BENCHES = HIGHER HEAT.
Wide gaps between bench slats allow air to circulate and heat to distribute evenly.

01



CALCULATE THE HEAT LOAD

- Heater output shall be selected according to cabin volume, construction, glazing / uninsulated surfaces, required heat-up time and manufacturer requirements.
- The sauna shall reach the specified operating condition within 60 minutes (EN 18164).

02



ENGINEER THE AIRFLOW

- Minimum 5 air changes per hour (ACH), or CO₂-controlled ventilation in accordance with EN 18164.
- Supply air low near the heater.
- Extract air low on the opposite side.
- Avoid short-circuiting between supply and extract.
- Provide effective drying after operation.

03



SELECT THE RIGHT MATERIALS

- Minimum 65% of wall and ceiling surfaces shall be timber, in accordance with EN 18164.
- Use low-resin, stable timber: Nordic spruce, aspen, alder, hemlock or cedar.
- Avoid treated or oily woods.
- Use stainless steel fixings and corrosion-resistant components.

04



DESIGN THE GEOMETRY

- Ascending stepped benches for different temperature zones.
- Coordinate bench heights and depths for comfort and thermal stratification.
- Coordinate ceiling height with heater selection, bench geometry and required thermal stratification.

05



DETAIL FOR SAFETY & DURABILITY

- Maintain manufacturer-required safety clearances and provide protection against accidental contact with hot surfaces.
- Use components suitable for sauna conditions.
- Provide cleanable, slip-resistant surfaces.
- Lighting and components suitable for sauna environment.

06



PLAN ACCESS & MAINTENANCE

- Provide access to heater, controls and ventilation components.
- Design for cleaning, inspection and future service.
- Ensure doors open outward and have a proper latch.

SAUNA AIRFLOW SECTION (PRINCIPLE)

EXHAUST / WASTE AIR OUT

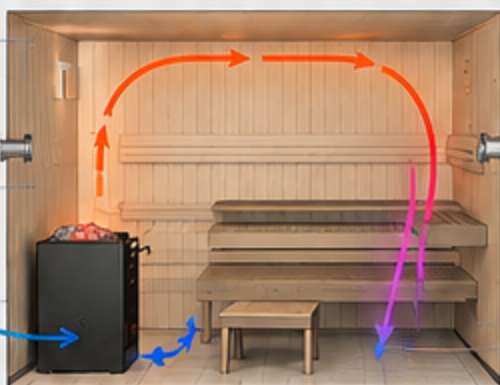
Low level between first and second bench on opposite side.

CLIMATE REFERENCE POINT

1 m above top bench

SUPPLY AIR INLET (FRESH AIR IN)

Low level adjacent to or below the heater.



HOT AIR RISES

Heated by the stones, air rises and travels across the upper zone.

DESCENDING AIR

As air cools, it descends through and around the benches.

HEATER WITH STONES



All dimensions and details to be coordinated with project requirements and local building / safety codes.

COMMON MISTAKES IN SAUNA BUILDS

- ✗ Undersized or oversized heater for the room volume.
- ✗ Incorrect supply / extract arrangement causing poor air distribution or short-circuiting.
- ✗ Insufficient ventilation / failure to achieve the required air replacement rate.
- ✗ No temperature sensor or incorrect sensor position.
- ✗ Glass and other high-heat-loss surfaces not accounted for in heat load.
- ✗ Using non-sauna timber or materials that warp, crack or off-gas.
- ✗ Insufficient clearances around the heater and hot surfaces.
- ✗ Installing lighting or components not suitable for sauna conditions.
- ✗ Door opens inward or has gaps that cause heat loss.
- ✗ Not accounting for disabled access in a commercial project.

ADDITIONAL DESIGN

BEST PRACTICES



VENTILATION

Balance supply, extract and drying to maintain fresh air and protect the cabin.



HEATING RECOVERY

Allow adequate time for the heater to recover after löyly. Do not exceed manufacturer limits.



LIGHTING

Use warm, dimmable lighting. Locate drivers / control gear outside the hot cabin where possible.



CONTROL & SAFETY

Use certified controls with temperature limit (EN 60335). Provide shut-off accessible from outside the sauna.



WATER QUALITY

Use clean water on stones. Avoid chlorinated, salty or soapy water.



ACCESSIBILITY

Provide level access, adequate turning space and clear circulation per EN 17210.

