Technical Data Sheet
Super Passive Roof

The Super Passive Roof System isa 'fabric first' solution designed tomeetthe **rigorous Passivhaus standard**.

It features a multi-layered insulation strategy, including substantial over-rafter and in-rafter insulation, plus an internal service cavity with additional insulation.
This comprehensive approach is engineered to maintain a stable internal temperature with minimal energy input, potentially reducing energy use by up to 75%.
The system eliminates thermal bridging and prevents condensation and mould growth, ensuring the highest levels of performance, occupant comfort, and long-term sustainability.
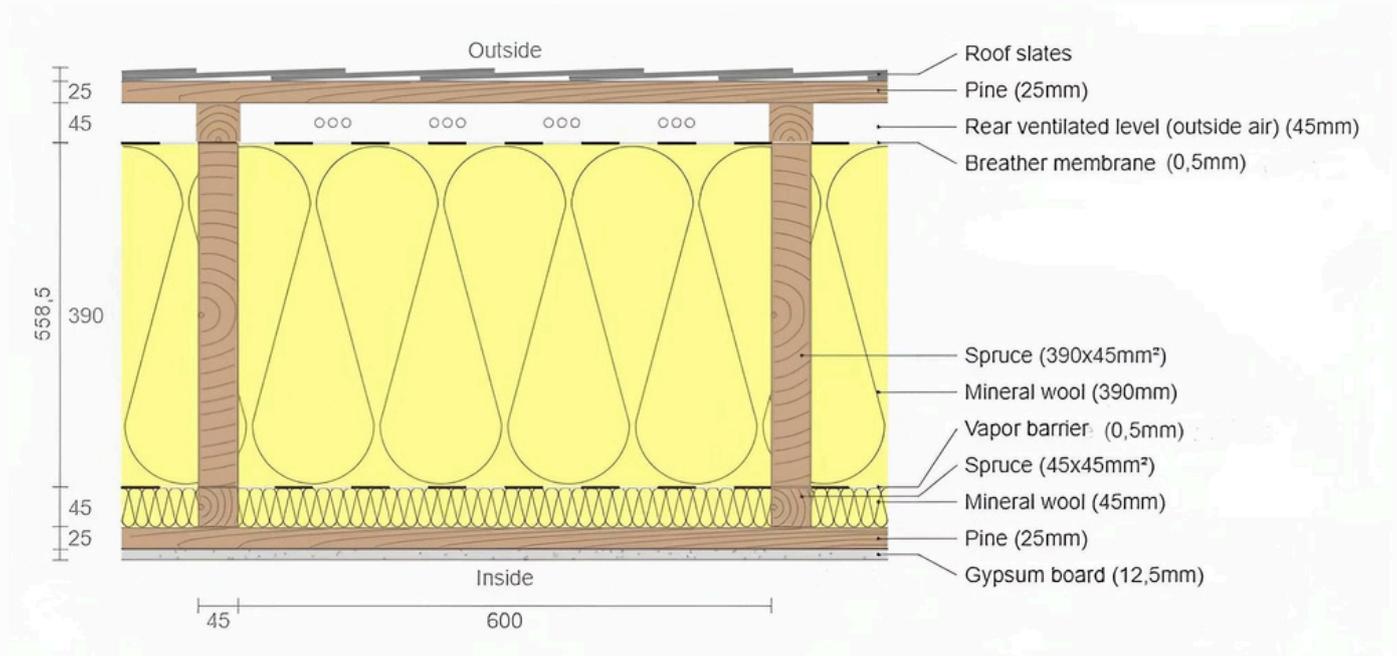
Roof Assembly Composition

SENMAR

SUPER-PASSIVE PRESET / Thickness: 506mm

1. Battens	25x95 mm
2. Counter Battens	45x45 mm
3. Wind-Moisture / Diffusion Membrane	0.2 mm
4. Primary Insulation / Soft Mineral Wool	400 mm
5. Rafters	45x390 mm
6. Vapor Barrier / Diffusion Membrane	0.2 mm
7. Internal Insulation / Soft Mineral Wool	50 mm
8. Horizontal Timber Lathing	45x45 mm
9. Closing Boards And Tie Boards	45x195 mm
10. Purlins	195x195mm

CONSTRUCTION SYSTEM / Roof Presets

Thermal Performance Metrics

		25	Roof slates
			Pine (25mm)
		45	Rear ventilated level (outside air) (45mm)
			Breather membrane (0,5mm)
	558,5	390	Spruce (390x45mm²)
			Mineral wool (390mm)
			Vapor barrier (0,5mm)
			Spruce (45x45mm²)
		45	Mineral wool (45mm)
		25	Pine (25mm)
			Gypsum board (12,5mm)

Outside — Inside

45 — 600

U-Value: Thermal Transmittance

U-value measures how well a building component (like a wall, roof, or window) prevents heat from passing through it. It indicates the rate of heat transfer through a material or assembly for a given temperature difference. A lower U-value signifies better insulation, meaning less heat loss or gain.

U-Value: 0,095 W/(m²K)

Contribution to the greenhouse effect:

insufficient   excellent

Condensate: 100kg/m²

Moisture content of wood: + 100,0 %

Drying time: -

insufficient   excellent

Thickness: 55,85 cm
Weight: 85 kg/m²

Interior surface 19,2ºC (53%)

Drying reserve: 9063 g/m²a

insufficient   excellent

Temp. amplitude damping (1/TAV): 31,3

Phase shift: 9.8h

Heat storage capacity: 43 kJ/m²K

insufficient   excellent

R-Value: Thermal Resistance

R-value measures how well a material resists heat flow. A higher R-value indicates better insulation, meaning the material is more effective at preventing heat from passing through it. This is crucial for building insulation, where it helps to keep homes warmer in the winter and cooler in the summer, reducing energy consumption and costs.

R-Value: 10,25 m²KW

Contribution to the greenhouse effect:

insufficient   excellent

Condensate: 100 kg/m²

Moisture content of wood: + 100,0 %

Drying time: -

insufficient   excellent

Thickness: 55,85 cm
Weight: 85 kg/m²

Interior surface 19,2ºC (53%)

Drying reserve: 9063 g/m²a

insufficient   excellent

Temp. amplitude damping (1/TAV): 31,3

Phase shift: 9.8h

Heat storage capacity: 43 kJ/m²K

insufficient   excellent

Hygrothermal Analysis
Relative Humidity & Moisture Control
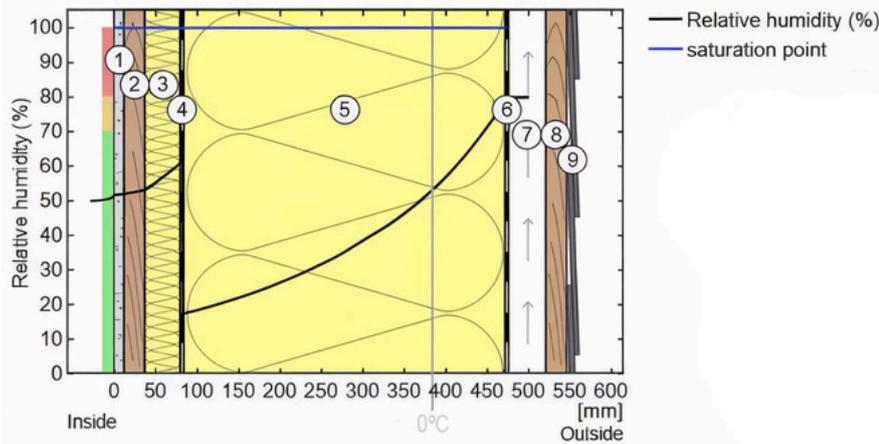
Legend:
— Relative humidity (%)
— saturation point

① Gypsum board (12,5 mm)
② Pine (25 mm)
③ Mineral wool (45 mm)
④ Vapor barrier
⑤ Mineral wool (390 mm)
⑥ Breather membrane

Drying reserve Drying reserve according

to DIN 4108-3:2018: **9063 g/(m²a)**
At least required by DIN 68800-2: **100 g/(m²a)**
Mould protection The temperature of

the inside surface is
19,2 °C leading to a relative humidity on the surface of 53 %.
Mould formation **is not expected** under these conditions.

Temperature & Condensation Risk

Temperature profile

— Temperature at 3pm, 11am and 7am
— Temperature at 7pm, 11pm and 3am

① Gypsum board (12,5 mm)
② Pine (25 mm)
③ Mineral wool (45 mm)
④ Vapor barrier
⑤ Mineral wool (390 mm)
⑥ Breather membrane
⑦ Rear ventilated level (45 mm)
⑧ Pine (25 mm)
⑨ Roof slates (15 mm)
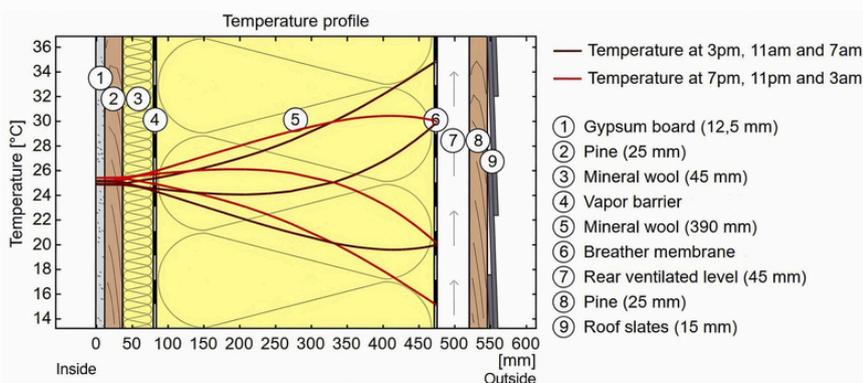
The following results are properties of the tested component alone and do not make any statement about the heat protection of the entire room.

Surface Temperature Analysis

— Outside
— Inside

The Surface temperature during the day
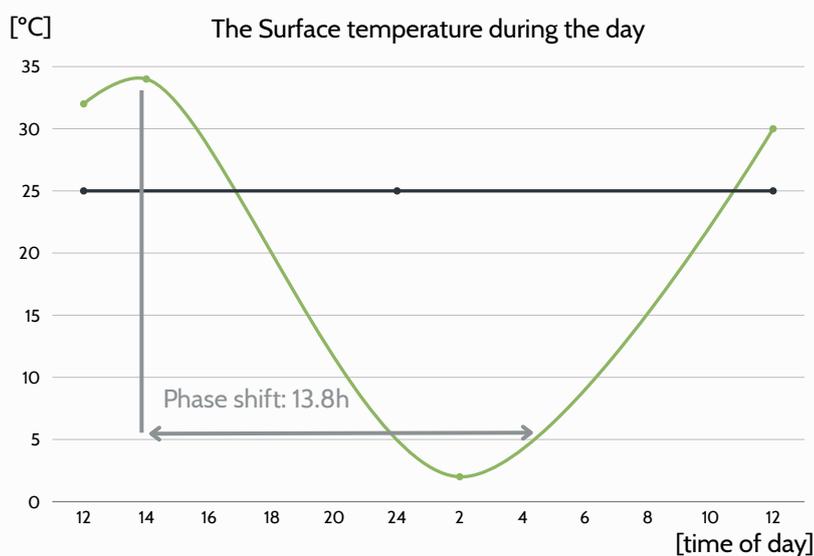
Phase shift: 13.8h

- phase shift: **13,8 h**
- Heat storage capacity (whole component): **58 kJ/m²K**
- Amplitude attenuation: **31,3**
- Thermal capacity of inner layers: **43 kJ/m²K**
- TAD: **0,032**