

Steco STANDARD Inside wall Final

internal wall
 created on 23.1.2018

Thermal protection

$U = 0,53 \text{ W}/(\text{m}^2\text{K})$

Beidseitig beheizt: Keine Anforderung*



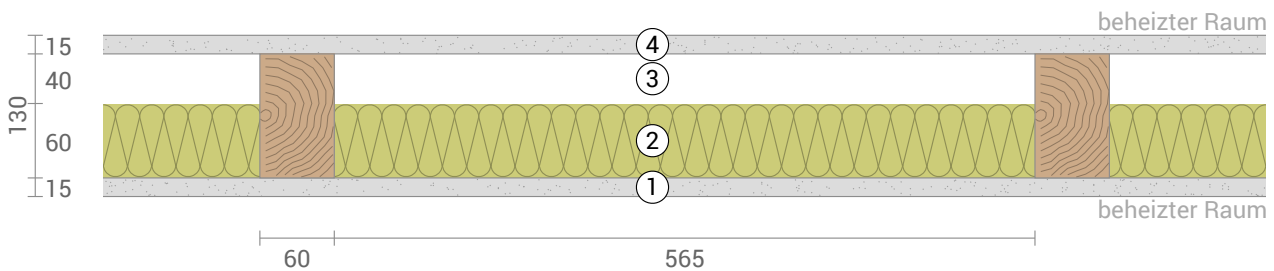
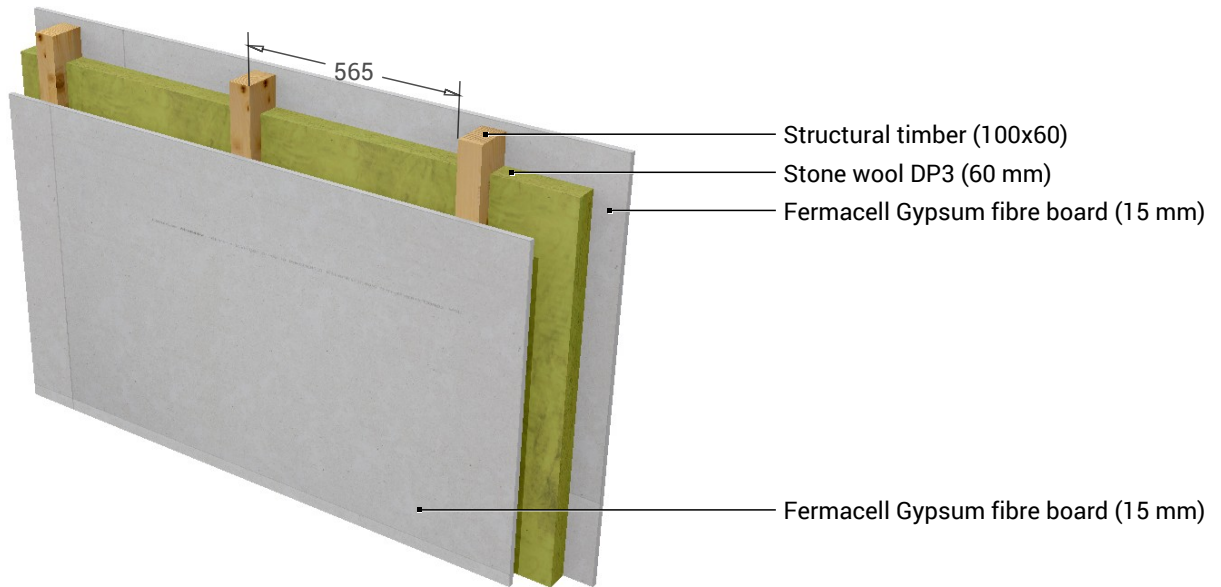
Moisture proofing

Drying reserve: 3571 g/m²a
 No condensate



Heat protection

Temperature amplitude damping: 2,7
 phase shift: 4,8 h
 Thermal capacity inside: 21 kJ/m²K



- ① Fermacell Gypsum fibre board (15 mm)
- ② Stone wool DP3 (60 mm)
- ③ Instalation gap (40 mm)
- ④ Fermacell Gypsum fibre board (15 mm)

Inside air : 20,0°C / 50%
 Inside air 2: 20,0°C / 50%
 Surface temperature.: 20,0°C / 20,0°C

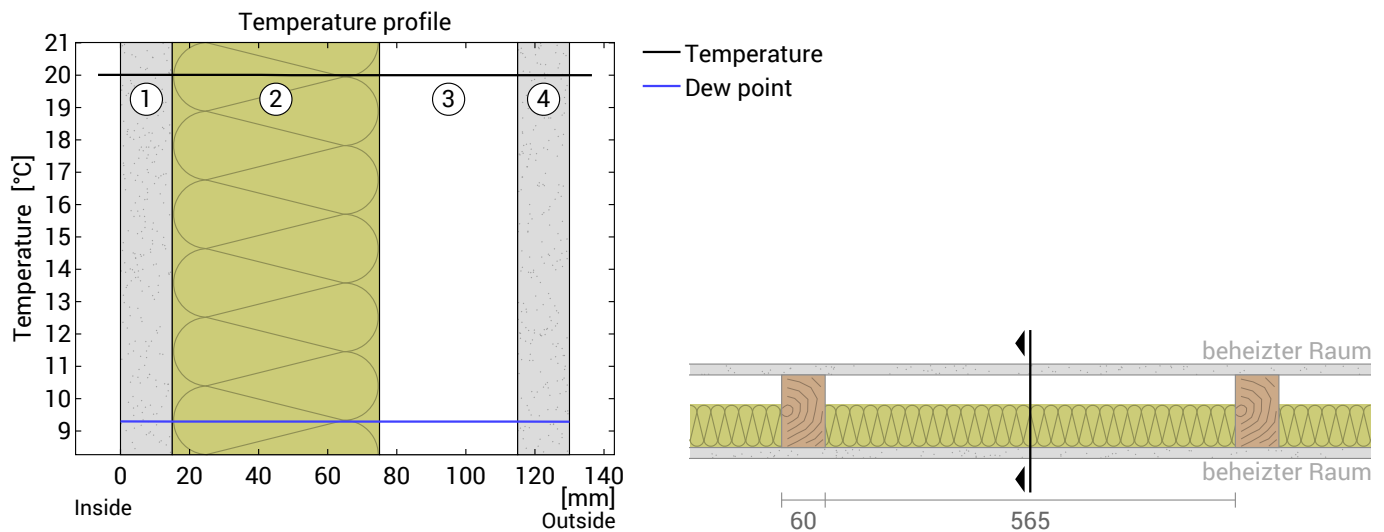
sd-value: 0,5 m
 Drying reserve: 3571 g/m²a

Thickness: 13,0 cm
 Weight: 40 kg/m²
 Heat capacity: 47 kJ/m²K

EnEV Bestand EnEV16 Neubau EnEV14 Neubau EnEV Bestand (Nichtwohngeb.)

Steco STANDARD Inside wall Final, U=0,53 W/(m²K)

Temperature profile



- ① Fermacell Gypsum fibre board (15 mm)
- ② Stone wool DP3 (60 mm)
- ③ Instalation gap (40 mm)
- ④ Fermacell Gypsum fibre board (15 mm)

Left: Temperature and dew-point temperature at the place marked in the right figure. The dew-point indicates the temperature, at which water vapour condensates. As long as the temperature of the component is everywhere above the dew point, no condensation occurs. If the curves have contact, condensation occurs at the corresponding position.

Right: The component, drawn to scale.

Layers (from inside to outside)

#	Material	λ [W/mK]	R [m ² K/W]	Temperatur [°C]		Weight [kg/m ²]
				min	max	
	Thermal contact resistance*		0,130	20,0	20,0	
1	1,5 cm Fermacell Gypsum fibre board	0,320	0,047	20,0	20,0	17,3
2	6 cm Stone wool DP3	0,039	1,538	20,0	20,0	1,6
	10 cm Structural timber (Width: 6 cm)	0,130	0,769	20,0	20,0	4,3
3	4 cm Instalation gap	0,222	0,180	20,0	20,0	0,0
4	1,5 cm Fermacell Gypsum fibre board	0,320	0,047	20,0	20,0	17,3
	Thermal contact resistance*		0,130	20,0	20,0	
	13 cm Whole component		1,871			40,5

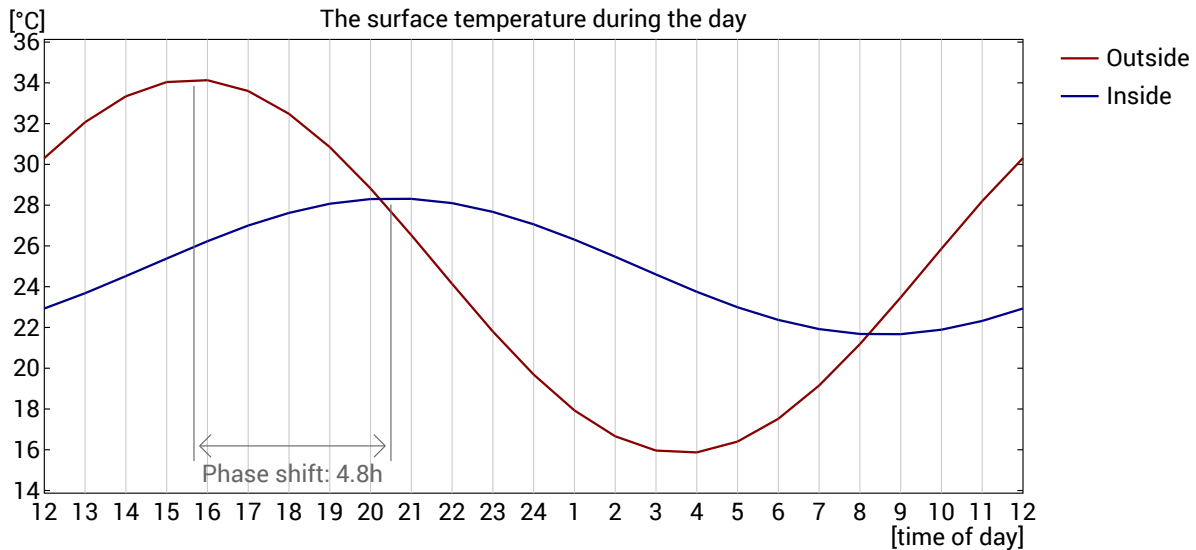
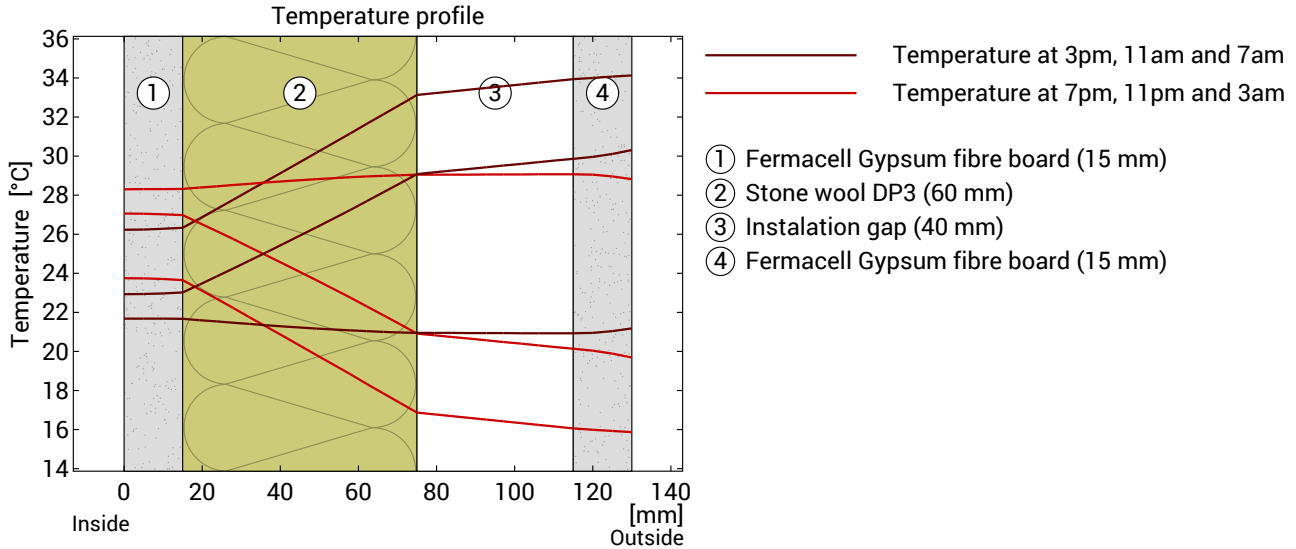
*Thermal contact resistances according to DIN 6946 for the U-value calculation. R_{si}=0,25 and R_{se}=0,04 according to DIN 4108-3 were used for moisture proofing and temperature profile.

Surface temperature inside (min / average / max): 20,0°C 20,0°C 20,0°C
Surface temperature outside (min / average / max): 20,0°C 20,0°C 20,0°C

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Heat protection

For the analysis of the heat protection, the temperature changes within the component were simulated during a hot summer day:



Top: Temperature profile within the component at different times. From top to bottom, brown lines: at 3 pm, 11 am and 7 am and red lines at 7 pm, 11 pm and 3 am.

Bottom: Temperature on the outer (red) and inner (blue) surface in the course of a day. The arrows indicate the location of the temperature maximum values . The maximum of the inner surface temperature should preferably occur during the second half of the night.

Phase shift*	4,8 h	Time of maximum interior temperature	20:30
Amplitude attenuation **	2,7	Thermal fluctuation on exterior surface:	18,3°C
TAV ***	0,365	Temperature fluctuation on interior surface	6,7°C

* The phase shift is the time in hours after which the temperature peak of the afternoon reaches the component interior.

** The amplitude attenuation describes the attenuation of the temperature wave when passing through the component. A value of 10 means that the temperature on the outside varies 10x stronger than on the inside, e.g. outside 15-35 °C, inside 24-26 °C.

*** The temperature amplitude ratio TAV is the reciprocal of the attenuation: $TAV = 1 / \text{amplitude attenuation}$

The calculations presented above have been created for a 1-dimensional cross-section of the component.