

**Pitched roof - sdshzx02-00**

pitched roof, exposed rafter, ventilated, -, without lining, wooden surface

**Performance rating**

**Fire protection performance** REI 30  
 maximum span = 5 m; maximum load  $E_{d,fi} = 5,29 \text{ kN/m}^2$  (with exposed beams 180/240 and fire protection cladding)  
 Classified by HFA  
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**Germany**  
 F30  
 Load  $E_{d,fi}$  according to the German certification document  
 Corresponding proof: DIN 4102-4:2016-05, Tabelle 10.24, Zeile 1

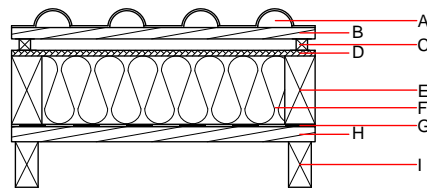
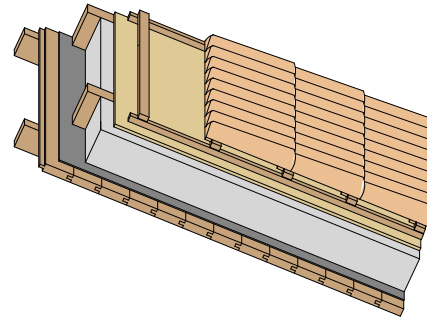
**Thermal performance** U Diffusion 0.22  $\text{W}/(\text{m}^2\text{K})$  suitable

Calculated by TUM

**Acoustic performance**  $R_w (C; C_{tr})$  42(-2;-8) dB  
 $L_{n,w} (C_i)$

Assessed by Müller-BBM

**Mass per unit area** m 109.20  $\text{kg}/\text{m}^2$



**Note:** The design of the under-roof construction and of the counter-battens have to be specified according to the roof pitch and the national requirements. Depending on the requirements (eg increased rainproof under-roof), an additional underlay is required.

**Register of building materials used for this application, cross-section** (from outside to inside, dimensions in mm)

	Thickness	Building material	Thermal performance				Reaction to fire EN
			$\lambda$	$\mu$ min - max	$\rho$	c	
A		concrete roof tile or tiled roof				2100	A1
B	30.0	spruce wood battens (30/50)	0.120	50	450	1.600	D
C	50.0	spruce wood counter battens (Austria: minimum height 50 mm), Germany 30 mm	0.120	50	450	1.600	D
D	15.0	fibreboard (MDF)	0.140	11	600	1.700	D
E	180.0	construction timber (80/...; e=800)	0.120	50	450	1.600	D
F	180.0	Cellulose fibre [040; 50]	0.040	1	50	2.000	E
G		vapour barrier $s_d \geq 2\text{m}$				1000	
H	40.0	spruce wood tongue and groove, fire protection cladding (Germany Minimum 50 mm)	0.120	50	450	1.600	D
I		construction timber in acc. with structural design	0.120	50	450	1.600	D

**Sustainability rating** (per  $\text{m}^2$ )

**Database ecoinvent**

$OI3_{kon}$  19.0

Calculated by HFA

**Database GaBi (ÖKOBAUDAT)**

<b>Built-in renewable materials</b>	kg	74.800
<b>Biogenic carbon in <math>\text{kg CO}_2\text{-e}</math>.</b>	kg $\text{CO}_2$	106.020
<b>Energy use of Primary Energy</b>	MJ	836.310
<b>Share of renewable PE</b>	%	33.18

Calculated by TUM

## Details of sustainability rating

### Database ecoinvent

Lifecycle (Phases)	GWP [kg CO <sub>2</sub> -e.]	AP [kg SO <sub>2</sub> -e.]	EP [kg PO <sub>4</sub> -e.]	ODP [kg R11-e.]	POCP [kg Ethen-e.]	
A1 - A3		0.117	0.050	2,10E-6	0.029	

Lifecycle (Phases)	PERE [MJ]	PERM [MJ]	PERT [MJ]	PENRE [MJ]	PENRM [MJ]	PENRT [MJ]
A1 - A3	147.124	959.827	1106.952	374.034	46.624	420.658

### Database GaBi (ÖKOBAUDAT)

Lifecycle (Phases)	GWP [kg CO <sub>2</sub> -e.]	AP [kg SO <sub>2</sub> -e.]	EP [kg PO <sub>4</sub> -e.]	ODP [kg R11-e.]	POCP [kg Ethen-e.]	
A1 - A3		0.094	0.018	2,05E-6	0.020	
C1 - C4		0.010	0.006	1,67E-7	0.001	
A1 - C4		0.105	0.025	2,22E-6	0.020	

Lifecycle (Phases)	PERE [MJ]	PERM [MJ]	PERT [MJ]	PENRE [MJ]	PENRM [MJ]	PENRT [MJ]
A1 - A3	274.781	1225.169	1500.580	521.882	22.965	545.094
C1 - C4	1.994	-1096.455	-1094.461	27.818	-15.265	12.553
A1 - C4	277.472	128.714	406.816	558.834	7.700	566.781