

## Pitched roof - sdshzx01-04

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

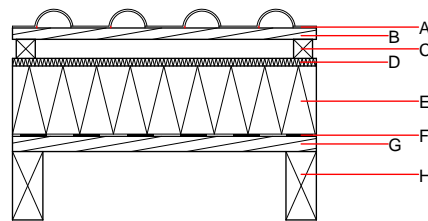
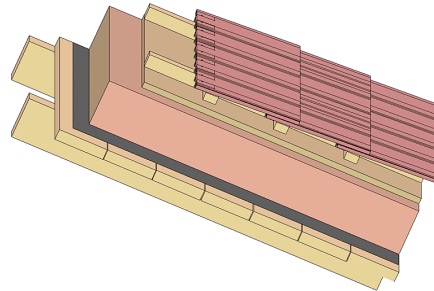
**Thermal performance** U Diffusion 0.14  $\text{W}/(\text{m}^2\text{K})$  suitable

Calculated by TUM

**Acoustic performance**  $R_w (C; C_{tr})$  44(-3;-8) dB  
 $L_{n,w} (C_i)$

Assessed by Müller-BBM

**Mass per unit area** m 132.70  $\text{kg}/\text{m}^2$



**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.

### 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
			$\lambda$	$\mu \text{ min} - \text{max}$	$\rho$	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	22.0	softboard [045; 250] - rigid underlay	0.045	5	250	2.100	E
E	240.0	mineral wool [040; 180; $\geq 1000^\circ\text{C}$ ] - insulation placed on top of the rafters	0.040	1	180	1.030	A1
F		vapour barrier $s_d \geq 1 \text{ m}$				1000	
G	40.0	spruce wood tongue and groove, fire protection cladding (Germany minimum 50 mm)	0.120	50	450	1.600	D
H		construction timber in acc. with structural design	0.120	50	450	1.600	D

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

#### Database ecoinvent

$\text{O}13_{\text{kon}}$  107.4

Calculated by HFA

#### Database GaBi (ÖKOBAUDAT)

Built-in renewable materials	kg	57.570
Biogenic carbon in $\text{kg CO}_2\text{-e.}$	$\text{kg CO}_2$	82.450
Energy use of Primary Energy	MJ	1267.050
Share of renewable PE	%	22.44

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		0.504	0.147	4,32E-6	0.206	

Lifecycle (Phases)	PERE [MJ]	PERM [MJ]	PERT [MJ]	PENRE [MJ]	PENRM [MJ]	PENRT [MJ]
A1 - A3	140.748	664.661	805.409	1065.956	37.094	1103.051

**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		0.331	0.050	3,29E-6	0.032	
C1 - C4		0.013	0.011	1,37E-7	0.002	
A1 - C4		0.346	0.062	3,43E-6	0.034	

Lifecycle (Phases)	PERE [MJ]	PERM [MJ]	PERT [MJ]	PENRE [MJ]	PENRM [MJ]	PENRT [MJ]
A1 - A3	280.625	970.390	1250.881	934.186	75.208	1009.533
C1 - C4	2.985	-966.267	-963.282	38.025	-22.146	15.879
A1 - C4	284.317	4.123	288.306	982.730	53.062	1035.931