

## Pitched roof - sdrhzi04a-05

pitched roof, timber frame construction, ventilated, with dry lining, not suspended, other surface

### Performance rating

**Fire protection performance** REI 30

maximum span = 5 m; maximum load  $E_{d,fi} = 2,62 \text{ kN/m}^2$  (rafter 60/200 without roofing, counter battens and battens)  
 Classified by IBS  
 Classified by HFA

#### Germany

F30

Load  $E_{d,fi}$  according to the German certification document

Corresponding proof: DIN 4102-4:2016-05, Tabelle 10.19, Zeile 1

**Thermal performance** U Diffusion 0.19  $\text{W}/(\text{m}^2\text{K})$  suitable

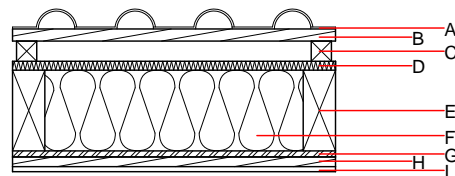
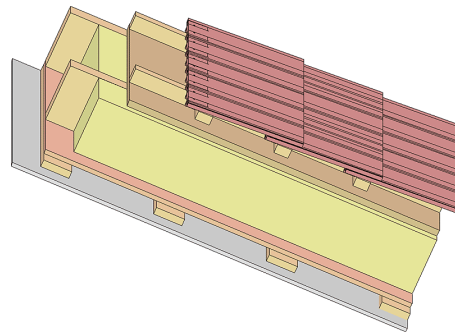
Calculated by HFA  
 Calculated by TUM

**Acoustic performance**  $R_w (C; C_{tr})$   $L_{n,w} (C_i)$  54(-2;-8) dB

with a tiled roof  $R_w = 52 (-2; -8)$  dB  
 Assessed by TGM  
 Assessed by Müller-BBM

**Mass per unit area** m 103.90  $\text{kg}/\text{m}^2$

Calculation based on gypsum plaster board type DF



**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 |
|---|-----------|----------------------------------------------------------------------------|---------------------|-----------------|--------|-------|---------------------|
|   |           |                                                                            | $\lambda$           | $\mu$ 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 | 22.0      | softboard [045; 250] - rigid underlay                                      | 0.045               | 5               | 250    | 2.100 | E                   |
| E | 200.0     | construction timber (80/..; e=625)                                         | 0.120               | 50              | 450    | 1.600 | D                   |
| F | 200.0     | cellulose fibre [040; E]                                                   | 0.040               | 1 - 2           | 55     | 2.000 | E                   |
| G | 15.0      | OSB (sealed with airtight tape)                                            | 0.130               | 200             | 600    | 1.700 | D                   |
| H | 24.0      | spruce wood cladding with spacing of cladding boards(24/100); a=400        | 0.120               | 50              | 450    | 1.600 | D                   |
| I | 12.5      | gypsum plaster board type DF or                                            | 0.250               | 10              | 800    | 1.050 | A2                  |
| I | 12.5      | gypsum fibre board                                                         | 0.320               | 21              | 1000   | 1.100 | A2                  |

Sustainability rating (per m<sup>2</sup>)

Database ecoinvent

|                    |      |
|--------------------|------|
| O13 <sub>Kon</sub> | 22.2 |
| Calculated by HFA  |      |

Database GaBi (ÖKOBAUDAT)

|                                           |                    |         |
|-------------------------------------------|--------------------|---------|
| Built-in renewable materials              | kg                 | 45.000  |
| Biogenic carbon in kg CO <sub>2</sub> -e. | kg CO <sub>2</sub> | 63.990  |
| Energy use of Primary Energy              | MJ                 | 729.590 |
| Share of renewable PE                     | %                  | 24.46   |
| 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            |                              | 0.108                       | 0.047                       | 2,47E-6         | 0.020              |  |

| Lifecycle (Phases) | PERE [MJ] | PERM [MJ] | PERT [MJ] | PENRE [MJ] | PENRM [MJ] | PENRT [MJ] |
|--------------------|-----------|-----------|-----------|------------|------------|------------|
| A1 - A3            | 99.915    | 623.844   | 723.760   | 377.200    | 19.362     | 396.561    |

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            |                              | 0.076                       | 0.013                       | 6,22E-7         | 0.019              |  |
| C1 - C4            |                              | 0.010                       | 0.007                       | 8,95E-8         | 0.001              |  |
| A1 - C4            |                              | 0.089                       | 0.021                       | 7,19E-7         | 0.020              |  |

| Lifecycle (Phases) | PERE [MJ] | PERM [MJ] | PERT [MJ] | PENRE [MJ] | PENRM [MJ] | PENRT [MJ] |
|--------------------|-----------|-----------|-----------|------------|------------|------------|
| A1 - A3            | 175.204   | 699.078   | 875.393   | 511.442    | 11.286     | 522.852    |
| C1 - C4            | 2.147     | -549.854  | -547.708  | 25.360     | -10.344    | 15.015     |
| A1 - C4            | 178.428   | 149.483   | 329.021   | 551.165    | 0.994      | 552.283    |