

## External wall - awrhh04a-09

external wall, timber frame construction, ventilated, with dry lining, with cladding, other surface

### Performance rating

**Fire protection performance** REI from inside 60  
REI from outside 30  
maximum ceiling height = 3 m; maximum load  $E_{d,fi}$  = 19,2 kN/m  
Classified by MA39  
Classified by HFA

#### Germany

F60 (from inside)/F30 (from outside)  
Load  $E_{d,fi}$  according to the German certification document  
Corresponding proof: manufacturer-specific

**Thermal performance** U 0.21 W/(m<sup>2</sup>K)  
Diffusion suitable

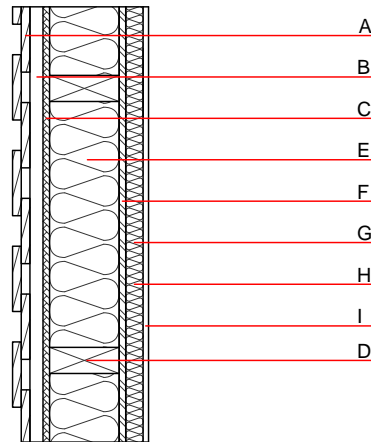
Calculated by TUM

**Acoustic performance**  $R_w$  (C;C<sub>tr</sub>) 50(-3;-10) dB  
 $L_{n,w}$  (C<sub>i</sub>)

Battens for the ventilation space screwed onto the structural timber together with vertical battens for the dry lining screwed directly onto the ledger beams will result in  $R_w$ (C;C<sub>tr</sub>)=43(-1;-5)  
Assessed by MA39  
Assessed by Müller-BBM

**Mass per unit area** m 62.00 kg/m<sup>2</sup>

Calculation based on gypsum plaster board type DF



### 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	24.0	larch wood external wall cladding	0.155	150	600	1.600	D
B	30.0	spruce wood battens offset (30/50; 30/80) - ventilation	0.120	50	450	1.600	D
C	15.0	fibreboard (MDF)	0.140	11	600	1.700	D
D	160.0	construction timber (60/-; e=625)	0.120	50	450	1.600	D
E	160.0	Cellulose fibre [040; 50]	0.040	1	50	2.000	E
F	15.0	OSB	0.130	200	600	1.700	D
G	40.0	spruce wood cross battens (a=400) ≥ 40mm	0.120	50	450	1.600	D
H	40.0	Cellulose fibre [040; 50]	0.040	1	50	2.000	E
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> 16.2  
Calculated by HFA

#### Database GaBi (ÖKOBAUDAT)

Built-in renewable materials kg 57.500  
Biogenic carbon in kg CO<sub>2</sub>-e. kg CO<sub>2</sub> 80.990  
Energy use of Primary Energy MJ 553.670  
Share of renewable PE % 34.95

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		0.106	0.045	1,60E-6	0.021	
Lifecycle (Phases)	PERE [MJ]	PERM [MJ]	PERT [MJ]	PENRE [MJ]	PENRM [MJ]	PENRT [MJ]
A1 - A3	125.852	805.605	931.456	319.718	28.891	348.610

### 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		0.074	0.015	1,45E-6	0.022	
C1 - C4		0.006	0.007	1,23E-7	0.001	
A1 - C4		0.081	0.022	1,58E-6	0.023	
Lifecycle (Phases)	PERE [MJ]	PERM [MJ]	PERT [MJ]	PENRE [MJ]	PENRM [MJ]	PENRT [MJ]
A1 - A3	192.340	920.354	1112.589	340.314	22.342	362.730
C1 - C4	0.805	-754.509	-753.705	14.606	-21.400	-6.790
A1 - C4	193.524	166.104	359.523	360.150	0.994	361.220