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Documentation of the component — 6. December 2008
Thermal transmittance (U-value) according to BS EN ISO 6946 —
Source: **own catalogue - External walls**
Component: **150 mm log with 100 mm wood fibre loose infill**

OUTSIDE INSIDE

Assignment: External wall

		Manufacturer	Name	Thickness [m], number	Lambda [W/(mK)]	Q	R [m²K/W]
		Rse					0.04
☑	1	Generic Building Materials	Softwood Timber [500 kg/m³]	0.125	0.130	D	0.96
☑	2	CIBSE 2006	Wood Fibre Loose Infill	0.100	0.043	E	2.33
		Air gaps	Level 1: dU'' = 0.01 W/(m²K)				
☑	3	BS EN 12524	Polyethylene 0.15 mm	0.000	0.170	D	0.00
☑	4	Generic Building Materials	Softwood Timber [500 kg/m³]	0.025	0.130	D	0.19
		Rsi					0.13
				0.250			

$R_T = R_{si} + \Sigma R_i + R_{se} = 3.65$ m²K/W

Correction to U-value for	according to	delta U [W/(m²K)]
Air gaps	BS EN ISO 6946 Annex D	~~0.004~~
Air gaps and fixings corrections need not be applied, as their total effect is less than 3% (Annex D BS 6946:1996).		
		0.000

$U = 1/R_T + \Sigma\Delta U = 0.27$ W/(m²K)

Q .. The physical values of the building materials has been graded by their level of quality. These 5 levels are the following
A .. A: Data is entered and validated by the manufacturer or supplier. Data is continuously tested by 3rd party.
B .. B: Data is entered and validated by the manufacturer or supplier. Data is certified by 3rd party
C .. C: Data is entered and validated by the manufacturer or supplier.
D .. D: Information is entered by BuildDesk without special agreement with the manufacturer, supplier or others.
E .. E: Information is entered by the user of the BuildDesk software without special agreement with the manufacturer, supplier or others.

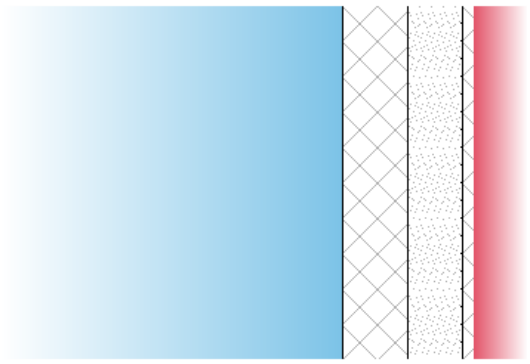
U_{max} = **0.30** W/(m²K) — U = **0.27** W/(m²K) — R_T = **3.65** m²K/W

Source of Umax value: Scotland: Approved Document J (2001), Table 1 to J3.2 - dwellings, column A
Gas or oil central heating with boiler SEDBUK not less than the relevant entry in Table 2 to J3.2

Source: **own catalogue - External walls**

Component: **150 mm log with 100 mm wood fibre loose infill**

OUTSIDE INSIDE



The list of material layers shown below may differ from those in the U-value calculation print out. Only material layers which are used in the Condensation Risk Analysis are listed.

Assignment: External wall

Name	Thickn. [m]	lambda [W/(mK)]	Q	μ [-]	Q	sd [m]	R [m²K/W]
Softwood Timber [500 kg/m³]	0.125	0.130	D	20.00	D	2.50	0.96
Wood Fibre Loose Infill	0.100	0.043	E	1.00	E	0.10	2.33
Polyethylene 0.15 mm	0.000	0.170	D	300000.00	D	45.00	0.00
Softwood Timber [500 kg/m³]	0.025	0.130	D	20.00	D	0.50	0.19

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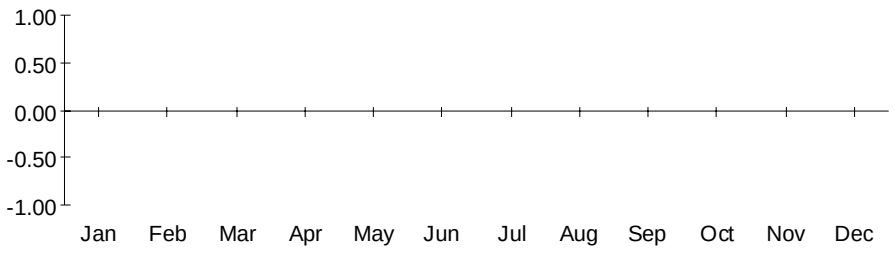
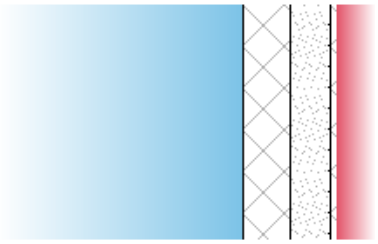
Condensation risk analysis - summary of main results
Calculation according BS EN ISO 13788

Surface temperature to avoid critical surface moisture:
No danger of mould growth is expected.

Interstitial condensation:
No condensation is predicted at any interface in any month.

Interstitial condensation and evaporation per month gc [g/m²]





Component, condensation range

Surface temperature to avoid critical surface humidity
Calculation according BS EN ISO 13788

Location: Prestwick; Humidity class according BS EN ISO 13788 annex A: Dwellings with low occupancy

		1	2	3	4	5	6	7	8	9	10	11	12
	Month	Te	phi_e	Ti	phi_i	pe	delta p	pi	ps(Tsi)	Tsi,min	fRsi	Tsi	Tse
		[°C]	---	[°C]	---	[Pa]	[Pa]	[Pa]	[Pa]	[°C]	---	[°C]	[°C]
●	January	4.3	0.840	20.0	0.598	697	699	1397	1746	15.4	0.705	19.0	4.5
	February	4.4	0.810	20.0	0.587	677	695	1372	1715	15.1	0.686	19.0	4.6
	March	5.9	0.800	20.0	0.587	743	628	1371	1713	15.1	0.651	19.1	6.0
	April	7.4	0.760	20.0	0.575	782	561	1344	1679	14.8	0.585	19.2	7.5
	May	10.5	0.740	20.0	0.583	939	423	1362	1703	15.0	0.472	19.4	10.6
	June	12.9	0.780	20.0	0.632	1160	316	1476	1845	16.2	0.471	19.5	13.0
	July	14.9	0.790	20.0	0.670	1338	227	1565	1956	17.2	0.443	19.7	15.0
	August	14.2	0.800	20.0	0.665	1295	258	1553	1942	17.0	0.490	19.6	14.3
	September	12.1	0.820	20.0	0.646	1157	352	1509	1886	16.6	0.568	19.5	12.2
	October	9.6	0.830	20.0	0.623	992	463	1455	1819	16.0	0.617	19.3	9.7
	November	6.4	0.840	20.0	0.605	807	606	1413	1766	15.6	0.673	19.1	6.5
	December	5.5	0.850	20.0	0.605	767	646	1413	1767	15.6	0.694	19.0	5.7

- The critical month is January with $f_{Rsi,max}$ = 0.705
  f_{Rsi} = 0.934

$f_{Rsi} > f_{Rsi,max}$, the component complies.

Nr Explanation

1 External temperature
2 External rel. humidity
3 Internal temperature
4 Internal relative humidity
5 External partial pressure $p_e = \phi_e * p_{sat}(T_e)$; $p_{sat}(T_e)$ according formula E.7 and E.8 of BS EN ISO 13788
6 Partial pressure difference. The security factor of 1.10 according to BS EN ISO 13788, ch.4.2.4 is already included.
7 Internal partial pressure $p_i = \phi_i * p_{sat}(T_i)$; $p_{sat}(T_i)$ according formula E.7 and E.8 of BS EN ISO 13788
8 Minimum saturation pressure on the surface obtained by $p_{sat}(T_{si}) = p_i / \phi_{si}$,
where ϕ_{si} = 0.8 (critical surface humidity)
9 Minimum surface temperature as function of $p_{sat}(T_{si})$, formula E.9 and E.10 of BS EN ISO 13788
10 Design temperature factor according 3.1.2 of BS EN ISO 13788
11 Internal surface temperature, obtained from $T_{si} = T_i - R_{si} * U * (T_i - T_e)$
12 External surface temperature, obtained from $T_{se} = T_e + R_{se} * U * (T_i - T_e)$

Interstitial condensation - main results
Calculation according BS EN ISO 13788

No condensation is predicted at any interface in any month.

Climcatic conditions
Location: Prestwick; Humidity class according BS EN ISO 13788 annex A: Dwellings with low occupancy

		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Internal temperature [°C]	Ti	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Internal rel. humidity [%]	phi_i	59.8	58.7	58.7	57.5	58.3	63.2	67.0	66.5	64.6	62.3	60.5	60.5
External temperature [°C]	Te	4.3	4.4	5.9	7.4	10.5	12.9	14.9	14.2	12.1	9.6	6.4	5.5
External rel. humidity [%]	phi_e	84.0	81.0	80.0	76.0	74.0	78.0	79.0	80.0	82.0	83.0	84.0	85.0