

# Building physics

U-VALUE - COMPARATIVE EXAMPLES

04/2012

## CLT solid wood panels

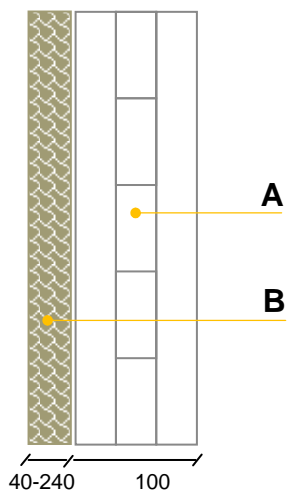
### CLT 100 3s + WLG 040 insulation

Heat transmission values used:

$$R_{si} = 0.13 \text{ m}^2 \text{ K/W}$$

$$R_{se} = 0.04 \text{ m}^2 \text{ K/W}$$

	Thickness [cm]	Building material [—]	$\lambda$ [W/m <sup>2</sup> K]	Insulation thickness [cm]	Total thickness [cm]	U-value W/(m <sup>2</sup> K)
<b>A</b>	10	<b>CLT</b>	0.11	0	9.7	<b>0.95</b>
<b>B</b>	4-24	WLG 040 insulation	0.04	4	14	<b>0.48</b>
			0.04	6	16	<b>0.39</b>
			0.04	8	18	<b>0.32</b>
			0.04	10	20	<b>0.28</b>
			0.04	12	22	<b>0.25</b>
			0.04	14	24	<b>0.22</b>
			0.04	16	26	<b>0.20</b>
			0.04	18	28	<b>0.18</b>
			0.04	20	30	<b>0.16</b>
			0.04	22	32	<b>0.15</b>
			0.04	24	34	<b>0.14</b>



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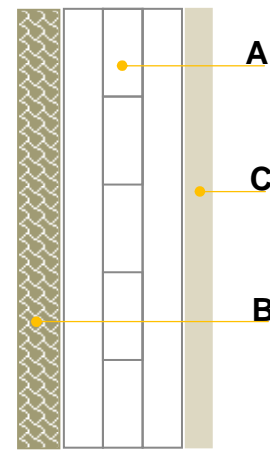
04/2012

**CLT 100 3s + WLG 040 insulation + 12.5 mm plasterboard**

Heat transmission values used:

$R_{si} = 0.13 \text{ m}^2 \text{ K/W}$

$R_{se} = 0.04 \text{ m}^2 \text{ K/W}$

	Thickness [cm]	Building material [—]	$\lambda$ [W/m <sup>2</sup> K]	Insulation thickness [cm]	Total thickness [cm]	U-value W/(m <sup>2</sup> K)
<b>A</b>	10	<b>CLT</b>	0.11	0	11	<b>0.90</b>
<b>C</b>	1.25	<b>Plasterboard</b>	0.21			
<b>B</b>	4-24	WLG 040 insulation	0.04	4	15	<b>0.47</b>
 <p>40-240 100 12.5</p> <p>exterior interior</p>			0.04	6	17	<b>0.38</b>
			0.04	8	19	<b>0.32</b>
			0.04	10	21	<b>0.27</b>
			0.04	12	23	<b>0.24</b>
			0.04	14	25	<b>0.22</b>
			0.04	16	27	<b>0.19</b>
			0.04	18	29	<b>0.18</b>
			0.04	20	31	<b>0.16</b>
			0.04	22	33	<b>0.15</b>
			0.04	24	35	<b>0.14</b>

# Building physics

## Timber frame building

Plasterboard panel, OSB board, WLG 040 insulation, upright, DHF (diffusible humid resistant fibreboard)

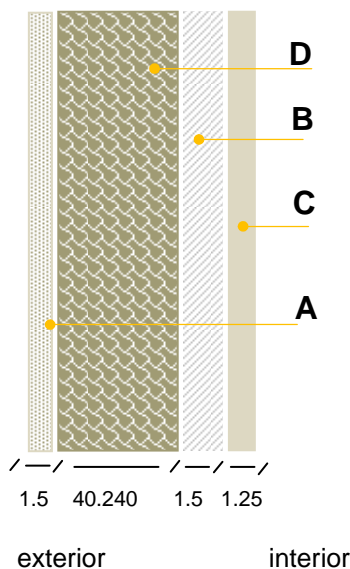
Calculated using solid wood uprights:

b = 6 cm

e = 62.5 cm

$\lambda$  = 0.13 W/(m<sup>2</sup>K)

	Thickness [cm]	Building material [—]	$\lambda$ [W/m <sup>2</sup> K]	Insulation thickness [cm]	Total thickness [cm]	U-value W/(m <sup>2</sup> K)
A	1.5	DHF	0.12	1.5	--	--
B	1.5	OSB board	0.13	1.5	--	--
C	1.25	Plasterboard	0.21	1.25	--	--
D	4-24	WLG 040 insulation + construction timber	0.049	4	8	0.78
			0.049	6	10	0.59
			0.049	8	12	0.48
			0.049	10	14	0.40
			0.049	12	16	0.34
			0.049	14	18	0.30
			0.049	16	20	0.27
			0.049	18	22	0.24
			0.049	20	24	0.22
			0.049	22	26	0.20
			0.049	24	28	0.19

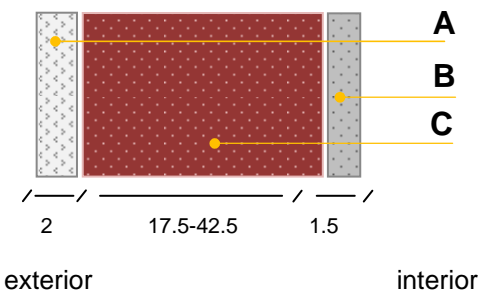


# Building physics

## Tile and insulation plaster

Lightweight mortar plaster, tile, lime plaster

NB: these values are taken from the company Wienerberger's brochure "POROTON 2011 product range" and relate to the "POROTON flat clay block" product range.

	Thickness [cm]	Building material [—]	$\lambda$ [W/m <sup>2</sup> K]	Insulation thickness [cm]	Total thickness [cm]	U-value W/(m <sup>2</sup> K)
A	2	Lightweight mortar plaster	0.31	--	--	--
B	1.5	Lime plaster	0.7	--	--	--
C	4-24	Tile	0.16	17.5	21	0.74
			0.12	24	28	0.44
			0.1	30	34	0.31
			0.09	36.5	40	0.23
			0.09	42.5	46	0.20
			0.09	42.5	46	0.20