BuildDesk U 3.3

Documentation of the component
Thermal transmittance (U-value) according to BS EN ISO 6946
Source: **own catalogue - Accurate bare units**
Component: **D170-CA**

18. August 2008

OUTSIDE INSIDE

This illustration of inhomogeneous layers is provided only to assist in visualising the arrangement.

Assignment: External wall

		Manufacturer	Name	Thickness [m], number	Lambda [W/(mK)]	Q	R [m²K/W]
		Rse					0.04
☑	1	Durisol	Durisol Canadian	0.025	0.083	E	0.30
☑	2	Inhomogeneous material layer	consisting of:	0.120	ø 1.431		0.08
	2a	Durisol	Durisol Canadian	14.00 %	0.083	E	-
	2b	BS EN 12524	Concrete, Medium density 2200	86.00 %	1.650	D	-
☑	3	Durisol	Durisol Canadian	0.025	0.083	E	0.30
		Rsi					0.13
				0.170			

$R_T = (R_T' + R_T'')/2 = 0.89$ m²K/W

$U = 1/R_T = 1.12$ 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.

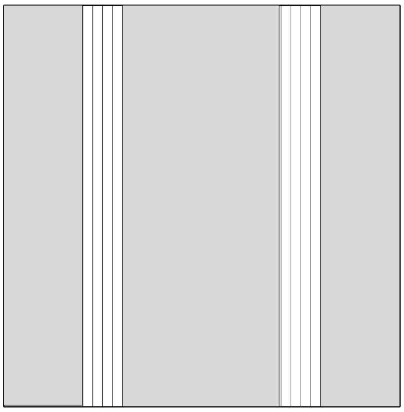
U_{max} = 0.35 W/(m²K) U = 1.12 W/(m²K) R_T= 0.89 m²K/W

Source of Umax value: England, Wales: Approved Document L1A (2006), Table 2 - New Build Dwellings

Documentation of the component
Thermal transmittance (U-value) according to BS EN ISO 6946
Source: **own catalogue - Accurate bare units**
Component: **D170-CA**

Draft of the component (portion in %):

3.50 43.00 7.00 43.00 3.50



The inhomogeneous layer consists of two zones (A, B).
The portion is given in %.

A	3.50 + 7.00 + 3.50 consisting of material layers: 1, 2a, 3	= 14.00%
B	43.00 + 43.00 consisting of material layers: 1, 2b, 3	= 86.00%

Upper limit of the thermal transfer resistance R

U_A [W/(m^{2}K)] = $\frac{1}{(\Sigma R_{i,A}) + R_{si} + R_{se}}$ = $\frac{1}{2.05 + 0.13 + 0.04}$ = 0.45

U_B [W/(m^{2}K)] = $\frac{1}{(\Sigma R_{i,B}) + R_{si} + R_{se}}$ = $\frac{1}{0.68 + 0.13 + 0.04}$ = 1.18

$$R_T' = \frac{1}{A * U_A + B * U_B} = 0.93\ m^2K/W$$

Lower limit of the thermal transfer resistance R

R_{se} [m^{2}K/W]		= 0.04
R_1'' [m^{2}K/W] = d_1 / λ_1 =	0.025 / 0.083	= 0.30
R_2'' [m^{2}K/W] = $d_2/(\lambda_{2a} * A + \lambda_{2b} * B)$ =	0.120 /(0.083 * 14.00% + 1.650 * 86.00%)	= 0.08
R_3'' [m^{2}K/W] = d_3 / λ_3 =	0.025 / 0.083	= 0.30
R_{si} [m^{2}K/W]		= 0.13

$$R_T'' = \Sigma R_i'' + R_{si} + R_{se} = 0.86\ m^2K/W$$

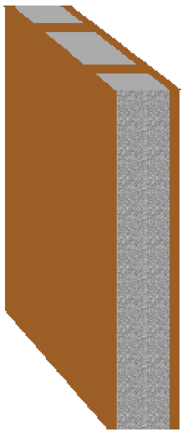
BuildDesk U 3.3

Documentation of the component
Thermal transmittance (U-value) according to BS EN ISO 6946

Source: **own catalogue - Accurate bare units**

Component: **D250-CA**

OUTSIDE INSIDE



This illustration of inhomogeneous layers is provided only to assist in visualising the arrangement.

Assignment: External wall

		Manufacturer	Name	Thickness [m], number	Lambda [W/(mK)]	Q	R [m²K/W]
		Rse					0.04
☑	1	Durisol	Durisol Canadian	0.035	0.083	E	0.42
☑	2	Inhomogeneous material layer	consisting of:	0.180	ø 1.337		0.13
	2a	BS EN 12524	Concrete, Medium density 2200	80.00 %	1.650	D	-
	2b	Durisol UK	Durisol Inner leaf	20.00 %	0.083	E	-
☑	3	Durisol	Durisol Canadian	0.035	0.083	E	0.42
		Rsi					0.13
				0.250			

$R_T = (R_T' + R_T'')/2 = 1.22$ m²K/W

$U = 1/R_T = 0.82$ 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.

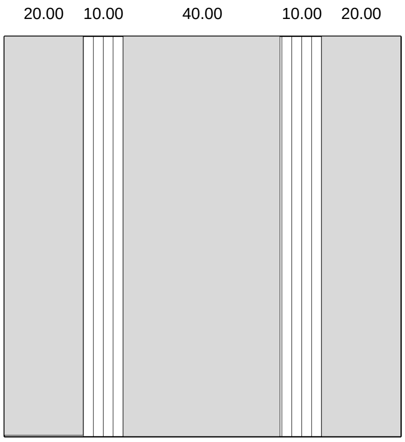
U_{max} = 0.35 W/(m²K) U = 0.82 W/(m²K) R_T= 1.22 m²K/W

Source of Umax value: England, Wales: Approved Document L1A (2006), Table 2 - New Build Dwellings

Documentation of the component
Thermal transmittance (U-value) according to BS EN ISO 6946
Source: **own catalogue - Accurate bare units**
Component: **D250-CA**

18. August 2008

Draft of the component (portion in %):



The inhomogeneous layer consists of two zones (A, B).
The portion is given in %.

A	20.00 + 40.00 + 20.00 consisting of material layers: 1, 2a, 3	= 80.00%
B	10.00 + 10.00 consisting of material layers: 1, 2b, 3	= 20.00%

Upper limit of the thermal transfer resistance R

U_A [W/(m²K)] = $\frac{1}{(\Sigma R_{i,A}) + R_{si} + R_{se}}$ = $\frac{1}{0.95 + 0.13 + 0.04}$ = 0.89

U_B [W/(m²K)] = $\frac{1}{(\Sigma R_{i,B}) + R_{si} + R_{se}}$ = $\frac{1}{3.01 + 0.13 + 0.04}$ = 0.31

$$R_T' = \frac{1}{A * U_A + B * U_B} = 1.29\ m^2K/W$$

Lower limit of the thermal transfer resistance R

R_{se} [m²K/W]		= 0.04
R_1'' [m²K/W] = d_1 / λ_1 =	0.035 / 0.083	= 0.42
R_2'' [m²K/W] = $d_2 / (\lambda_{2a} * A + \lambda_{2b} * B)$ =	0.180 /(1.650 * 80.00% + 0.083 * 20.00%)	= 0.13
R_3'' [m²K/W] = d_3 / λ_3 =	0.035 / 0.083	= 0.42
R_{si} [m²K/W]		= 0.13

$$R_T'' = \Sigma R_i'' + R_{si} + R_{se} = 1.15\ m^2K/W$$

BuildDesk U 3.3

Documentation of the component — 18. August 2008
Thermal transmittance (U-value) according to BS EN ISO 6946

Source: **own catalogue - Accurate bare units**
Component: **D300-CA**

OUTSIDE INSIDE

This illustration of inhomogeneous layers is provided only to assist in visualising the arrangement.

On the basis of the given information about the inhomogeneous layers, it is not possible to estimate how and where bearing elements intersect each other. It was assumed that the layers intersect crosswise. The size of the areas was calculated corresponding to their percentage of the whole area.

Assignment: External wall

		Manufacturer	Name	Thickness [m], number	Lambda [W/(mK)]	Q	R [m²K/W]
		Rse					0.04
☑	1	Durisol	Durisol Canadian	0.040	0.083	E	0.48
☑	2	Inhomogeneous material layer	consisting of:	0.100	ø 0.045		2.20
	2a	Durisol	Durisol Canadian	24.00 %	0.083	E	-
	2b	Rockwool	DUK-RW-165	76.00 %	0.034	E	-
☑	3	Inhomogeneous material layer	consisting of:	0.120	ø 1.768		0.07
	3a	Durisol	Durisol Canadian	24.00 %	0.083	E	-
	3b	BS EN 12524	Concrete, Reinforced (with 1% of steel)	76.00 %	2.300	D	-
☑	4	Durisol	Durisol Canadian	0.040	0.083	E	0.48
		Rsi					0.13
				0.300			

$R_T = (R_T' + R_T'')/2 = 3.73$ m²K/W

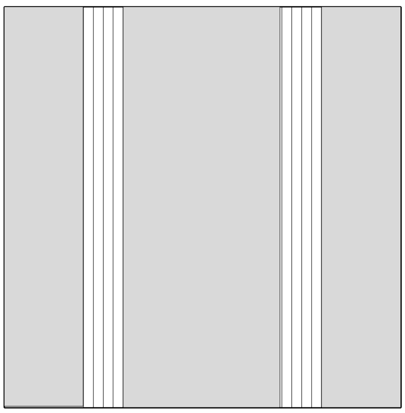
$U = 1/R_T = 0.27$ W/(m²K)

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} = 0.35 W/(m²K) U = 0.27 W/(m²K) R_T= 3.73 m²K/W

Source of Umax value: England, Wales: Approved Document L1A (2006), Table 2 - New Build Dwellings

Draft of the component (portion in %):



The inhomogeneous layer consists of two zones (A, B).
The portion is given in %.

A	6.00 + 12.00 + 6.00 consisting of material layers: 1, 2a, 3a, 4	= 24.00%
B	38.00 + 38.00 consisting of material layers: 1, 2b, 3b, 4	= 76.00%

Upper limit of the thermal transfer resistance R

U_A [W/(m²K)] = $\frac{1}{(\Sigma R_{i,A}) + R_{si} + R_{se}} = \frac{1}{3.61 + 0.13 + 0.04}$ = 0.26

U_B [W/(m²K)] = $\frac{1}{(\Sigma R_{i,B}) + R_{si} + R_{se}} = \frac{1}{3.99 + 0.13 + 0.04}$ = 0.24

$$R_T' = \frac{1}{A * U_A + B * U_B} = 4.06\ m^2K/W$$

Lower limit of the thermal transfer resistance R

R_{se} [m²K/W]		= 0.04
R_1'' [m²K/W] = d_1 / λ_1 =	0.040 / 0.083	= 0.48
R_2'' [m²K/W] = $d_2/(\lambda_{2a} * A + \lambda_{2b} * B)$ =	0.100 /(0.083 * 24.00% + 0.034 * 76.00%)	= 2.20
R_3'' [m²K/W] = $d_3/(\lambda_{3a} * A + \lambda_{3b} * B)$ =	0.120 /(0.083 * 24.00% + 2.300 * 76.00%)	= 0.07
R_4'' [m²K/W] = d_4 / λ_4 =	0.040 / 0.083	= 0.48
R_{si} [m²K/W]		= 0.13

$$R_T'' = \Sigma R_i'' + R_{si} + R_{se} = 3.40\ m^2K/W$$

BuildDesk U 3.3

Documentation of the component
Thermal transmittance (U-value) according to BS EN ISO 6946
Source: **own catalogue - Accurate bare units**
Component: **D365-CA**

18. August 2008
Page 1/2

OUTSIDE INSIDE

This illustration of inhomogeneous layers is provided only to assist in visualising the arrangement.

On the basis of the given information about the inhomogeneous layers, it is not possible to estimate how and where bearing elements intersect each other. It was assumed that the layers intersect crosswise. The size of the areas was calculated corresponding to their percentage of the whole area.

Assignment: External wall

		Manufacturer	Name	Thickness [m], number	Lambda [W/(mK)]	Q	R [m²K/W]
		Rse					0.04
☑	1	Durisol	Durisol Canadian	0.040	0.083	E	0.48
☑	2	Inhomogeneous material layer	consisting of:	0.165	ø 0.044		3.79
	2a	Durisol	Durisol Canadian	20.00 %	0.083	E	-
	2b	Rockwool	DUK-RW-165	80.00 %	0.034	E	-
☑	3	Inhomogeneous material layer	consisting of:	0.120	ø 1.857		0.06
	3a	Durisol	Durisol Canadian	20.00 %	0.083	E	-
	3b	BS EN 12524	Concrete, Reinforced (with 1% of steel)	80.00 %	2.300	D	-
☑	4	Durisol	Durisol Canadian	0.040	0.083	E	0.48
		Rsi					0.13
				0.365			

$R_T = (R_T' + R_T'')/2 = 5.35$ m²K/W

$U = 1/R_T = 0.19$ W/(m²K)

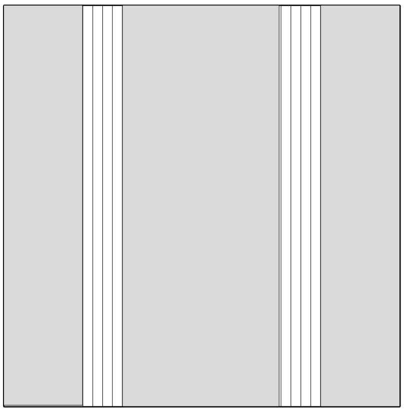
Q .. The physical values of the building materials has been graded by their level of quality. These 5 levels are the following
A .. A: Data is entered and validated by the manufacturer or supplier. Data is continuously tested by 3rd party.
B .. B: Data is entered and validated by the manufacturer or 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} = 0.35 W/(m²K) U = 0.19 W/(m²K) R_T = 5.35 m²K/W

Source of Umax value: England, Wales: Approved Document L1A (2006), Table 2 - New Build Dwellings

Draft of the component (portion in %):

5.00 40.00 10.00 40.00 5.00



The inhomogeneous layer consists of two zones (A, B).
The portion is given in %.

A	5.00 + 10.00 + 5.00 consisting of material layers: 1, 2a, 3a, 4	= 20.00%
B	40.00 + 40.00 consisting of material layers: 1, 2b, 3b, 4	= 80.00%

Upper limit of the thermal transfer resistance R

$U_A\,[W/(m^2K)] = \frac{1}{(\Sigma R_{i,A}) + R_{si} + R_{se}} = \frac{1}{4.40 + 0.13 + 0.04} = 0.22$

$U_B\,[W/(m^2K)] = \frac{1}{(\Sigma R_{i,B}) + R_{si} + R_{se}} = \frac{1}{5.92 + 0.13 + 0.04} = 0.16$

$$R_T' = \frac{1}{A * U_A + B * U_B} = 5.71\ m^2K/W$$

Lower limit of the thermal transfer resistance R

$R_{se}\,[m^2K/W]$		= 0.04
$R_1''\,[m^2K/W] = d_1/\lambda_1 =$	0.040 / 0.083	= 0.48
$R_2''\,[m^2K/W] = d_2/(\lambda_{2a} * A + \lambda_{2b} * B) =$	0.165 /(0.083 * 20.00% + 0.034 * 80.00%)	= 3.79
$R_3''\,[m^2K/W] = d_3/(\lambda_{3a} * A + \lambda_{3b} * B) =$	0.120 /(0.083 * 20.00% + 2.300 * 80.00%)	= 0.06
$R_4''\,[m^2K/W] = d_4/\lambda_4 =$	0.040 / 0.083	= 0.48
$R_{si}\,[m^2K/W]$		= 0.13

$$R_T'' = \Sigma R_i'' + R_{si} + R_{se} = 4.99\ m^2K/W$$