ND NTech Villa Balcony door

Calculation of U-value in avordance to NS-EN ISO 10077-1, 10077-2 and the programme “Therm”.
Centre U-value of glass is calculated in accordance to NS-EN 673.
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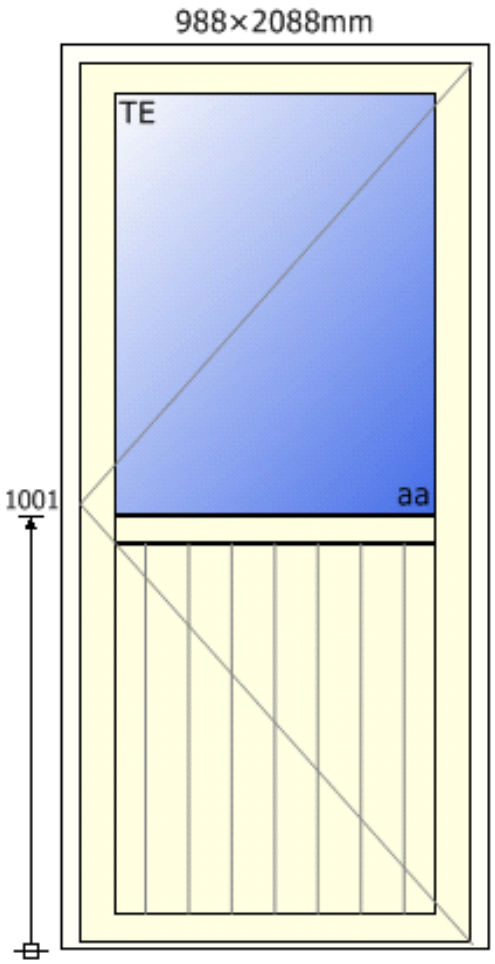
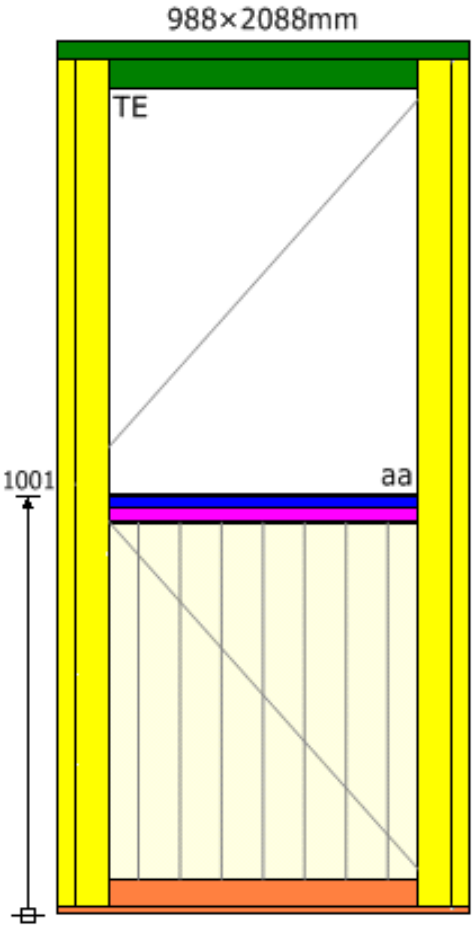
Report of standard model

Date: 05.09.2022
Version: TE/BE 105
Type: Outward opening sash
Model: ND NTech Villa 105
Glass configuration: 4E+18G+4+18G+4E Planitherm Ultra N*, TGI*, Argon

Main results and dimensions

U-value: 0,89W/m²K
Width: 988mm
Height: 2088mm
Area: 2,063m²
Percent glass: 34,5%
Percent panel: 30,2%
g-value: 0,53
LT-value: 0,74
Ug-value: 0,53W/m²K
Up-value: 0,63W/m²K

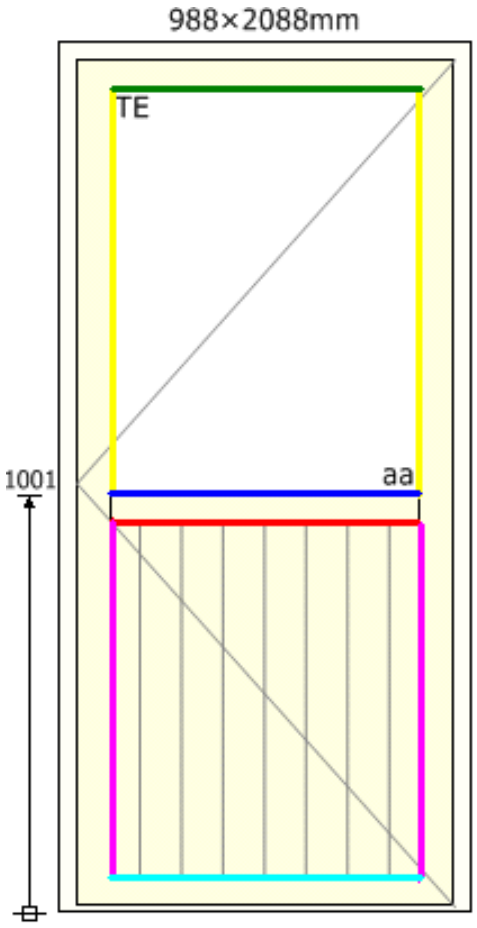




Colour	Uf (W/m²K)	Width (m)	Name
	1,12	0,124	Jamb profile
	1,12	0,125	Head profile
	1,73	0,031	Midtrail profile
	0,92	0,031	Midtrail profile
	1,80	0,096	Sill profile

Color	Uf (W/m²K)	Element area (m²)	*Percent element (%)
	1,12	0,245	11,90
	1,12	0,107	5,20
	1,12	0,245	11,90
	1,73	0,023	1,15
	0,92	0,023	1,15
	1,80	0,083	4,00
Sum		0,726	35,30

*: Figure in relation to the whole window



Colour	PSI	Length (m)	Name
	0,038	1,924	TGI Jamb
	0,038	0,740	TGI Head
	0,038	0,740	TGI Sill
	0,000		Ins.Panel

Color	Spacer length (m)	L Psi spacer (W/K)	*L Psi spacer (%)
	0,962	0,037	28,5
	0,740	0,028	21,5
	0,962	0,037	28,5
	0,740	0,028	21,5
Sum	3,404	0,130	100

*: Figure in relation to the spacer

U-Value window frame (Uf) Calculation according to EN ISO 10077-2

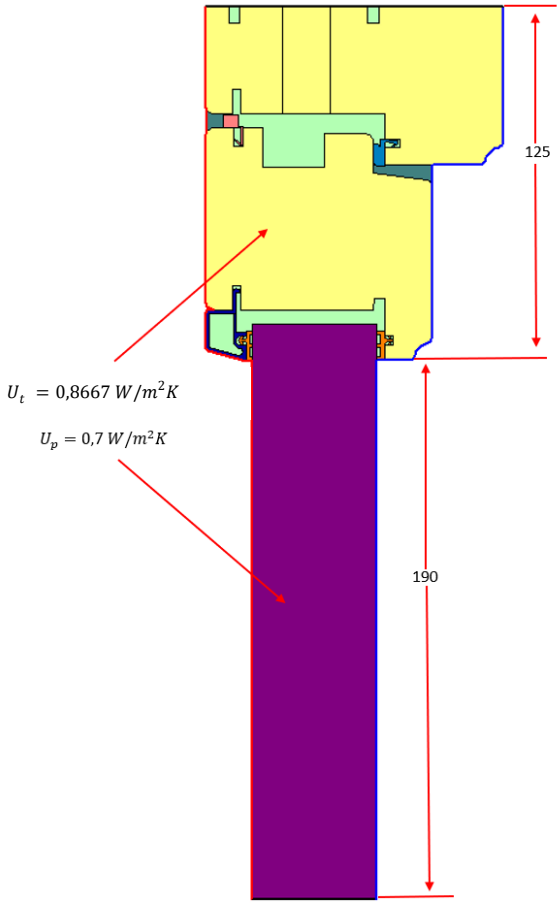
ND NTech Villa Balcony door
Head

This example shows glas thicknes 39 - 51mm:

$U_t = 0{,}8667\ W/m^2K$
$B_f = 125\ mm$

$$U_f = \frac{L_f^{2D} - U_p * b_p}{b_f}$$
$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 0{,}8667 * (0{,}125 + 0{,}19) = 0{,}273\ W/mK$$
$$U_f = \frac{0{,}273 - (0{,}7 * 0{,}19)}{0{,}125} = 1{,}12\ W/m^2K$$



Boundary Conditions	Temp: °C	Hc: W/m²K
Exterior	0	25
Interior	20	7,69

Material:	λ(W/mK)	ρ
Pine	0,12	0,9
Aluminium	160	0,9
Panel	0,035	0,9
Gasket EPDM	0,25	0,9
Brush gasket DX1466	0,15	0,9
Gasket QL	0,03	0,9
Frame cavity- Cen slightly ventilated		
Frame cavity-Cen Simplified		

U_t	U_p	L_f^{2D}	U_f
Glas thicknes 20-32mm			
Glas thicknes 33-38mm			
Glas thicknes 39-51mm			
0,8667	0,70	0,273	1,12

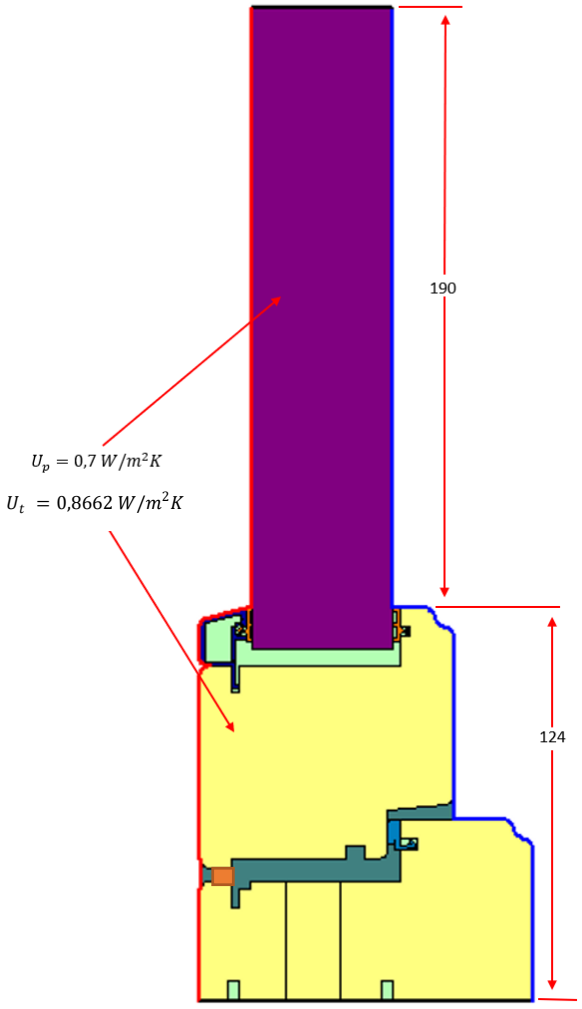
ND NTech Villa Balcony door
Jamb by glass

This example shows glas thicknes 39 - 51mm:

$U_t = 0{,}8662\ W/m^2K$
$B_f = 124\ mm$

$$U_f = \frac{L_f^{2D} - U_p * b_p}{b_f}$$
$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 0{,}8662 * (0{,}124 + 0{,}19) = 0{,}272\ W/mK$$
$$U_f = \frac{0{,}272 - (0{,}7 * 0{,}19)}{0{,}124} = 1{,}12\ W/m^2K$$



Boundary Conditions	Temp: °C	Hc: W/m²K
Exterior	0	25
Interior	20	7,69

Material:	λ(W/mK)	ϱ
Pine	0,12	0,9
Aluminium	160	0,9
Panel	0,035	0,9
Gasket EPDM	0,25	0,9
Gasket QL	0,03	0,9
Frame cavity- Cen slightly ventilated		
Frame cavity-Cen Simplified		

U_t	U_p	L_f^{2D}	U_f
Glas thicknes 20-32mm			
Glas thicknes 33-38mm			
Glas thicknes 39-51mm			
0,8662	0,70	0,272	1,12

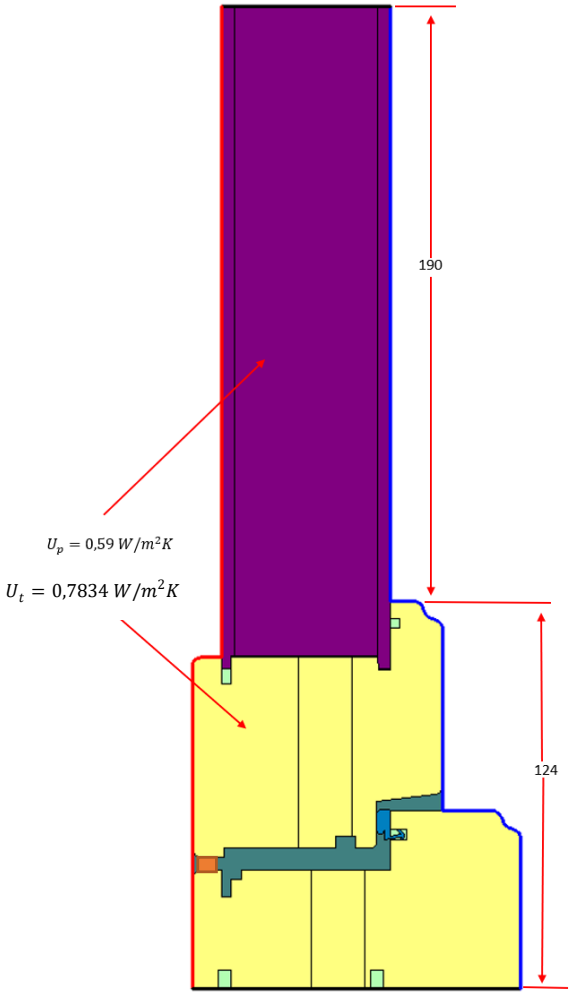
ND NTech Villa Balcony door
Jamb by panel

This example shows glas thicknes 39 - 51mm:

$U_t = 0{,}7834\ W/m^2K$
$B_f = 124\ mm$

$$U_f = \frac{L_f^{2D} - U_p * b_p}{b_f}$$
$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 0{,}7834 * (0{,}124 + 0{,}19) = 0{,}246\ W/mK$$
$$U_f = \frac{0{,}246 - (0{,}59 * 0{,}19)}{0{,}124} = 1{,}08\ W/m^2K$$



Boundary Conditions	Temp: °C	Hc: W/m²K
Exterior	0	25
Interior	20	7,69

Material:	λ(W/mK)	ϱ
Pine	0,12	0,9
Aluminium	160	0,9
Panel	0,035	0,9
Gasket EPDM	0,25	0,9
Gasket QL	0,03	0,9
Frame cavity- Cen slightly ventilated		
Frame cavity-Cen Simplified		

U_t	U_p	L_f^{2D}	U_f
Glas thicknes 20-32mm			
Glas thicknes 33-38mm			
Glas thicknes 39-51mm			
0,7834	0,59	0,246	1,08

ND NTech Villa Balcony door
OVer panel

This example shows glas thicknes 39 - 51mm:

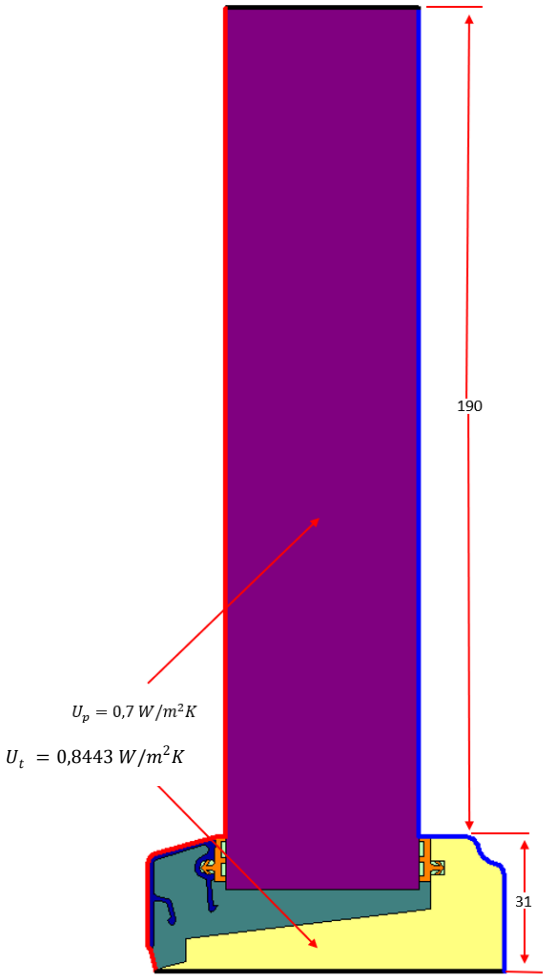
$U_t = 0{,}8443\ W/m^2K$
$B_f = 31\ mm$

$$U_f = \frac{L_f^{2D} - U_p * b_p}{b_f}$$
$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 0{,}8443 * (0{,}031 + 0{,}19) = 0{,}1866\ W/mK$$
$$U_f = \frac{0{,}1866 - (0{,}7 * 0{,}19)}{0{,}031} = 1{,}73\ W/m^2K$$

Boundary Conditions	Temp: °C	Hc: W/m²K
Exterior	0	25
Interior	20	7,69

Material:	λ(W/mK)	ϱ
Pine	0,12	0,9
Aluminium	160	0,9
Panel	0,035	0,9
Gasket EPDM	0,25	0,9
Frame cavity- Cen slightly ventilated		
Frame cavity-Cen Simplified		



U_t	U_p	L_f^{2D}	U_f
Glas thicknes 20-32mm			
Glas thicknes 33-38mm			
Glas thicknes 39-51mm			
0,8443	0,70	0,1866	1,73

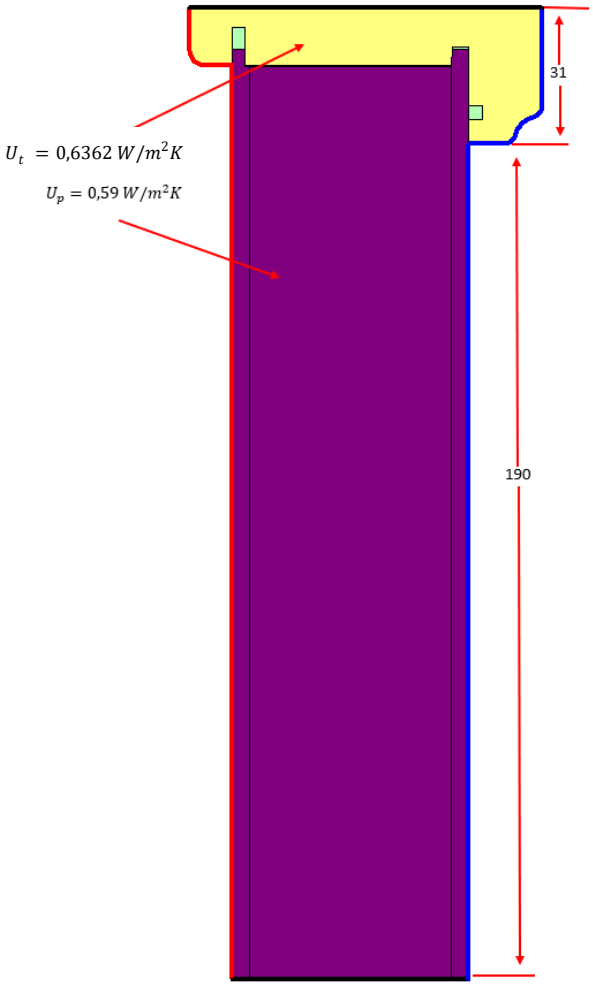
ND NTech Villa Balcony door
Under panel

This example shows glas thicknes 39 - 51mm:

$U_t = 0{,}6362\ W/m^2K$
$B_f = 31\ mm$

$$U_f = \frac{L_f^{2D} - U_p * b_p}{b_f}$$
$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 0{,}6362 * (0{,}031 + 0{,}19) = 0{,}1406\ W/mK$$
$$U_f = \frac{0{,}1406 - (0{,}59 * 0{,}19)}{0{,}031} = 0{,}92\ W/m^2K$$



Boundary Conditions	Temp: °C	Hc: W/m²K
Exterior	0	25
Interior	20	7,69

Material:	λ(W/mK)	ϱ
Pine	0,12	0,9
Aluminium	160	0,9
Panel	0,035	0,9
Gasket EPDM	0,25	0,9
Frame cavity- Cen slightly ventilated		
Frame cavity-Cen Simplified		

U_t	U_p	L_f^{2D}	U_f
Glas thicknes 20-32mm			
Glas thicknes 33-38mm			
Glas thicknes 39-51mm			
0,6362	0,59	0,1406	0,92

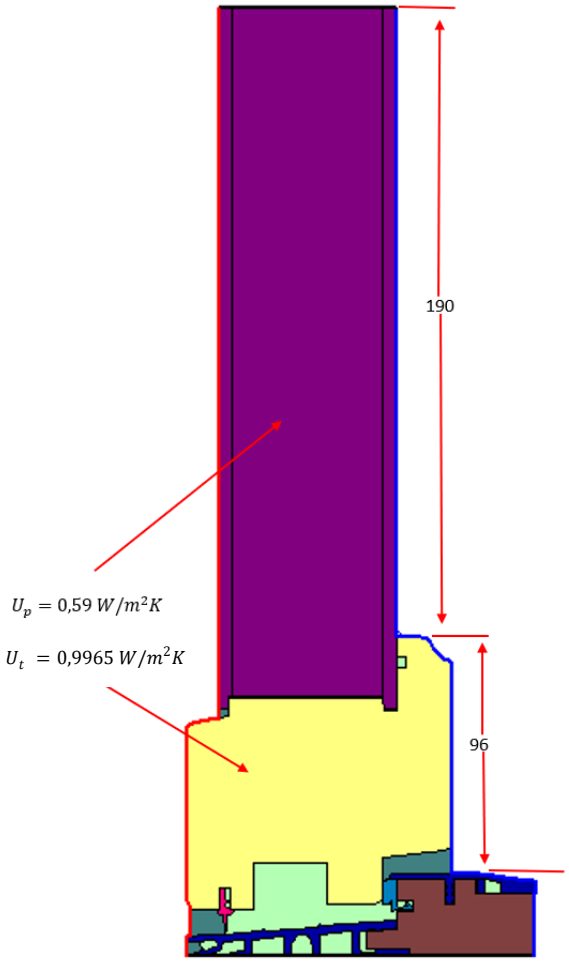
ND NTech Villa Balcony door
Cill panel

This example shows glas thicknes 39 - 51mm:

$U_t = 0{,}9965\ W/m^2K$
$B_f = 96\ mm$

$$U_f = \frac{L_f^{2D} - U_p * b_p}{b_f}$$
$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 0{,}9965 * (0{,}096 + 0{,}19) = 0{,}285\ W/mK$$
$$U_f = \frac{0{,}285 - (0{,}59 * 0{,}19)}{0{,}096} = 1{,}80\ W/m^2K$$



Boundary Conditions	Temp: °C	Hc: W/m²K
Exterior	0	25
Interior	20	7,69

Material:	λ(W/mK)	ϱ
Pine	0,12	0,9
Aluminium	160	0,9
Panel	0,035	0,9
Gasket EPDM	0,25	0,9
Gasket QL	0,03	0,9
Climate gasket DX1466	0,15	
Frame cavity- Cen slightly ventilated		
Frame cavity-Cen Simplified		

U_t	U_p	L_f^{2D}	U_f
Glas thicknes 20-32mm			
Glas thicknes 33-38mm			
Glas thicknes 39-51mm			
0,9965	0,59	0,285	1,80

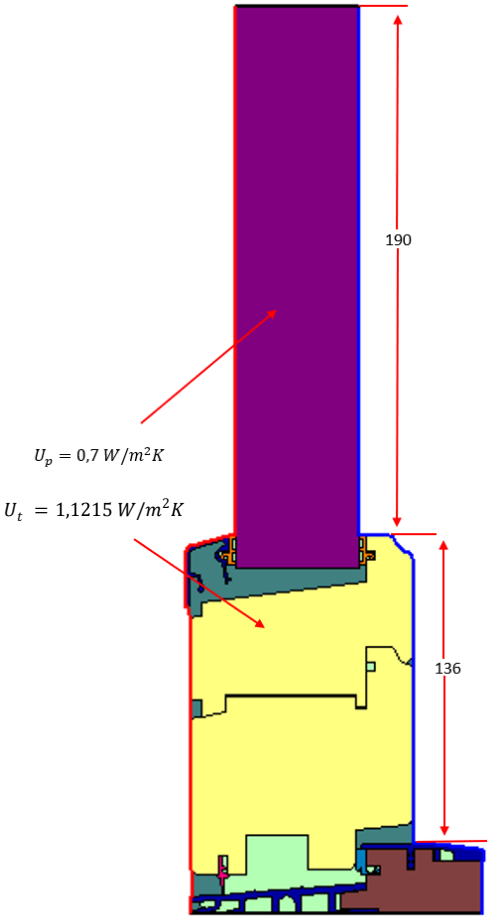
ND NTech Villa Balcony door
Cill MP

This example shows glas thicknes 39 - 51mm:

$U_t = 1{,}1215\ W/m^2K$
$B_f = 136\ mm$

$$U_f = \frac{L_f^{2D} - U_p * b_p}{b_f}$$
$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 1{,}1215 * (0{,}136 + 0{,}19) = 0{,}3656\ W/mK$$
$$U_f = \frac{0{,}3656 - (0{,}7 * 0{,}19)}{0{,}136} = 1{,}71\ W/m^2K$$



Boundary Conditions	Temp: °C	Hc: W/m²K
Exterior	0	25
Interior	20	7,69

Material:	λ(W/mK)	ϱ
Pine	0,12	0,9
Aluminium	160	0,9
Panel	0,035	0,9
Gasket EPDM	0,25	0,9
Gasket QL	0,03	0,9
Climate gasket DX1466	0,15	0,9
Frame cavity- Cen slightly ventilated		
Frame cavity-Cen Simplified		

U_t	U_p	L_f^{2D}	U_f
Glas thicknes 20-32mm			
Glas thicknes 33-38mm			
Glas thicknes 39-51mm			
1,1215	0,70	0,3656	1,71