# ND NTech Villa Topswing reversible

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.
Head Office: NorDan AS, Stasjonsveien 46. 4460 Moi, Norway. Web: www.nordan.uk

## Report of standard model

Date: 14.10.2021
Version: TY/TG/BG 105 Passiv
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

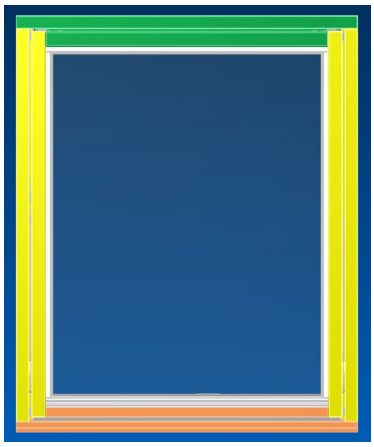
U-value: 0,78W/m²K
Width: 1230mm
Height: 1480mm
Area: 1,82m²
Percent glass: 71,4%
g-value: 0,53
LT-value: 0,74
Ug-value: 0,53W/m²K



# U-Verdi beregning - NTech Utadslående vindu



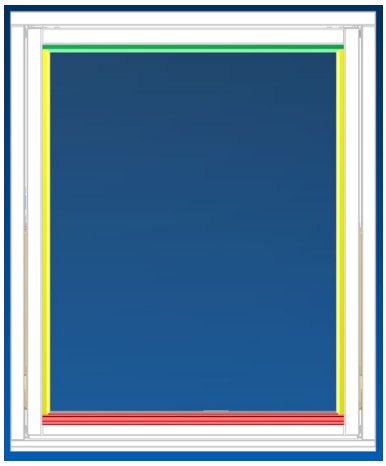
**Gjelder for produktkoder:**
BG, TG, TQ, TZ



| Colour | Uf (W/m²K) | Width (m) | Name |
|---|---|---|---|
| | 1,14 | 0,103 | Jamb profile |
| | 0,87 | 0,104 | Head profile |
| | 1,04 | 0,106 | Sill profile |

| Color | Uf (W/m²K) | Element area (m²) | *Percent element (%) |
|---|---|---|---|
| | 1,14 | 0,117 | 6,4 |
| | 0,87 | 0,142 | 7,8 |
| | 1,04 | 0,119 | 6,6 |
| | 1,14 | 0,142 | 7,8 |
| Sum | | 0,520 | 28,6 |

*: Figure in relation to the whole window



| Colour | PSI | Length (m) | Name |
|---|---|---|---|
| | 0,038 | 2,540 | TGI Jamb |
| | 0,038 | 1,024 | TGI Head |
| | 0,038 | 1,024 | TGI Sill |

| Color | Spacer length (m) | L Psi spacer (W/K) | *L Psi spacer (%) |
|---|---|---|---|
| | 1,270 | 0,048 | 27,7 |
| | 1,024 | 0,039 | 22,3 |
| | 1,024 | 0,039 | 22,3 |
| | 1,270 | 0,048 | 27,7 |
| Sum | 4,588 | 0,174 | 100 |

*: Figure in relation to the spacer

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

## ND NTech Villa Topswing Reversible Head

This example shows glas thicknes 39 - 51mm:

$U_t = 0{,}7608 \frac{W}{m^2K}$

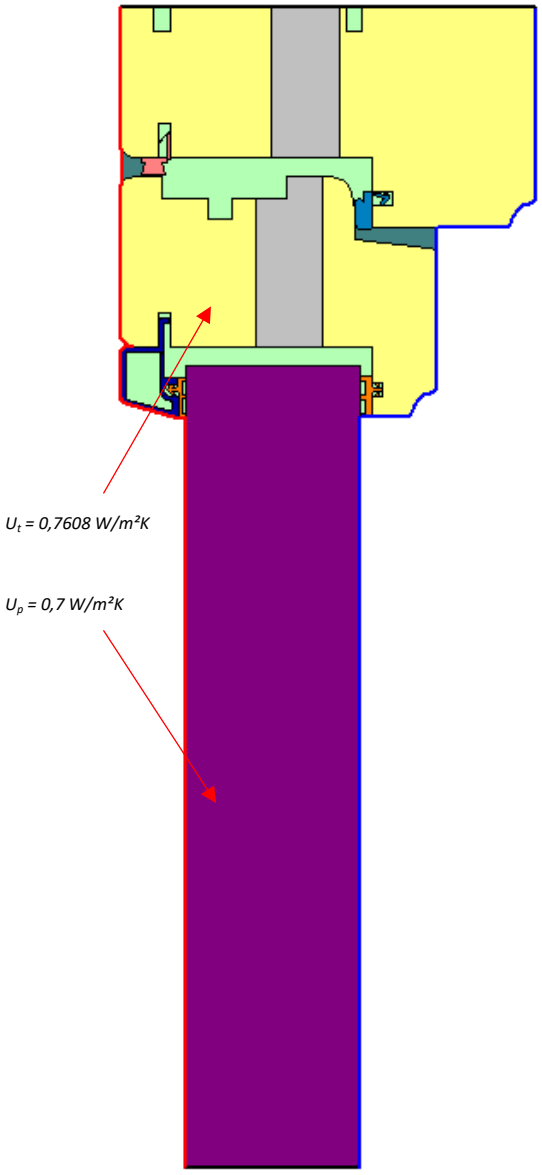
$B_f = 104\ mm$

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

$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 0{,}7608 * (0{,}104 + 0{,}19) = 0{,}2237\ W/mK$$

$$U_f = \frac{0{,}2237 - (0{,}7 * 0{,}19)}{0{,}104} = 0{,}87\ W/m^2K$$




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

| Material: | λ(W/mK) | ϱ |
|---|---|---|
| Pine | 0,12 | 0,9 |
| Insulation | 0,029 | 0,9 |
| Aluminium | 160 | 0,9 |
| Panel | 0,035 | 0,9 |
| Gasket EPDM | 0,25 | 0,9 |
| Gasket QL | 0,06 | 0,9 |
| Gasket DX 1466 | 0,15 | 0,9 |
| Frame cavity- Cen slightly ventilatet | | |
| 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 | | | |
| 0,7608 | 0,7 | 0,2237 | 0,87 |

## ND NTech Villa Topswing Reversible Jamb

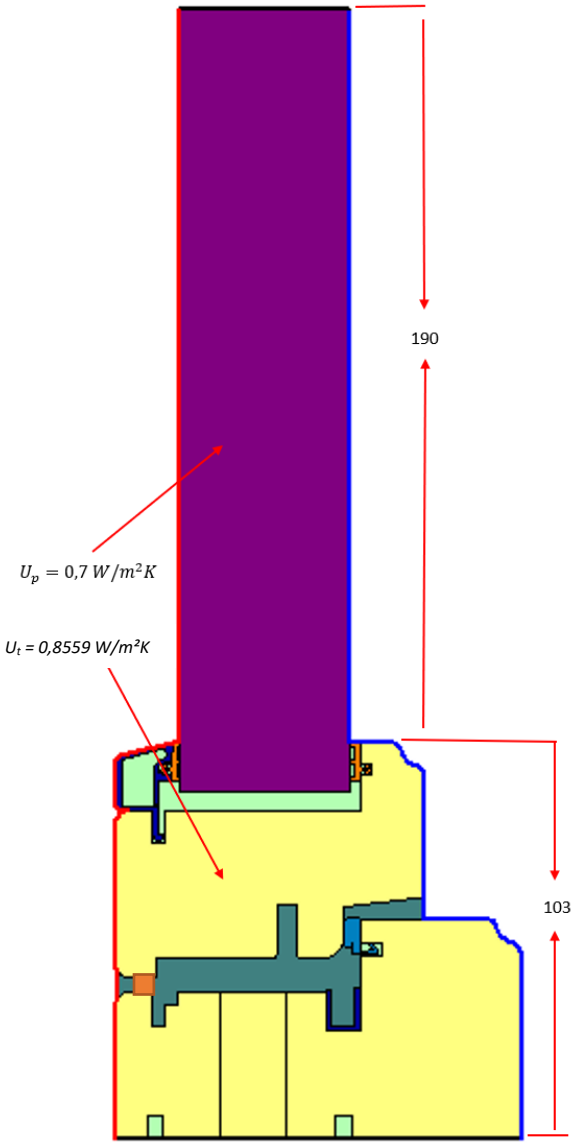
This example shows glas thicknes 39 - 51mm:

$U_t = 0{,}8559\ W/m^2K$
$B_f = 103\ mm$

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

$$L_f^{2D} = 0{,}8559 * (0{,}103 + 0{,}19) = 0{,}2508\ W/mK$$

$$U_f = \frac{0{,}2508 - (0{,}7 * 0{,}19)}{0{,}103} = 1{,}14\ W/m^2K$$




| 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 | 0,06 | 0,9 |
| Gasket DX 1466 | 0,15 | 0,9 |
| Frame cavity- Cen slightly ventilatet | | |
| 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 | | | |
| 0,8559 | 0,7 | 0,2508 | 1,14 |

## ND NTech Villa Topswing Reversible Sill

This example shows glas thicknes 39 - 51mm:

$U_t = 0{,}8214\ W/m^2K$

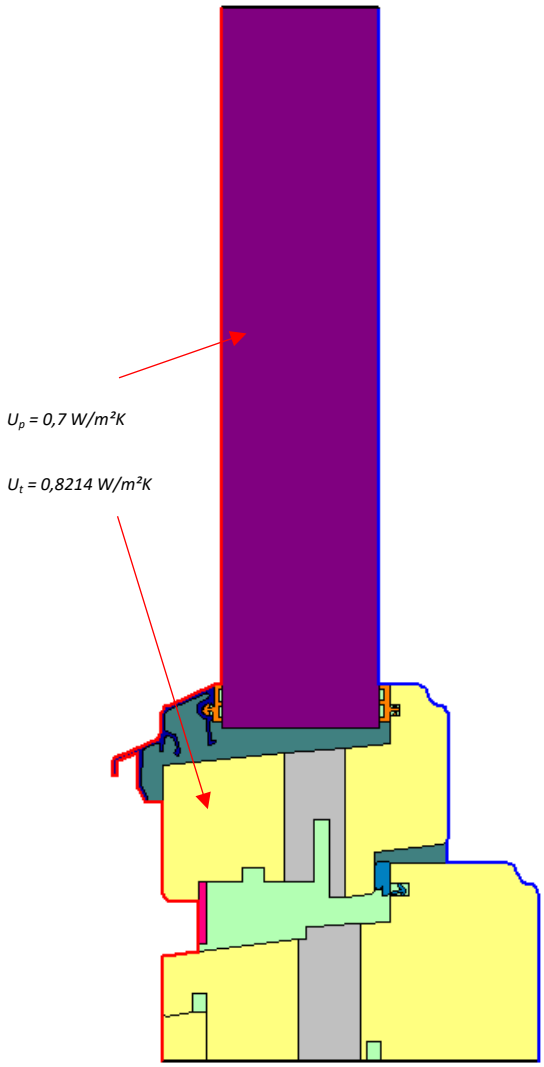
$B_f = 106\ mm$

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

$$L_f^{2D} = U_t * L$$

$$L_f^{2D} = 0{,}8214 * (0{,}106 + 0{,}19) = 0{,}2431\ W/mK$$

$$U_f = \frac{0{,}2431 - (0{,}7 * 0{,}19)}{0{,}106} = 1{,}04\ W/m^2K$$




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

| Material: | λ(W/mK) | ϱ |
|---|---|---|
| Pine | 0,12 | 0,9 |
| Insulation | 0,029 | 0,9 |
| Aluminium | 160 | 0,9 |
| Panel | 0,035 | 0,9 |
| Gasket EPDM | 0,25 | 0,9 |
| Gasket QL | 0,06 | 0,9 |
| Gasket DX 1466 | 0,15 | 0,9 |
| Frame cavity- Cen slightly ventilatet | | |
| 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 | | | |
| 0,8214 | 0,7 | 0,2431 | 1,04 |