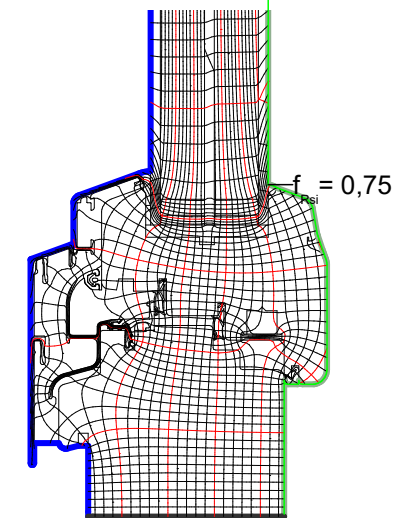


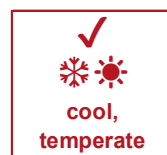
Material

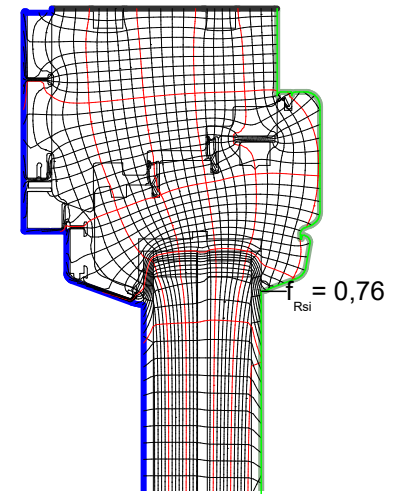
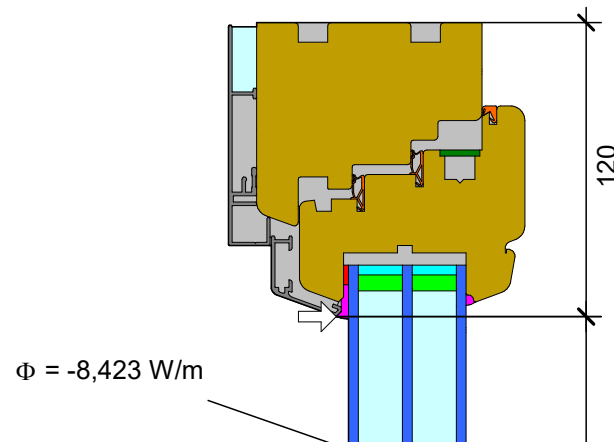
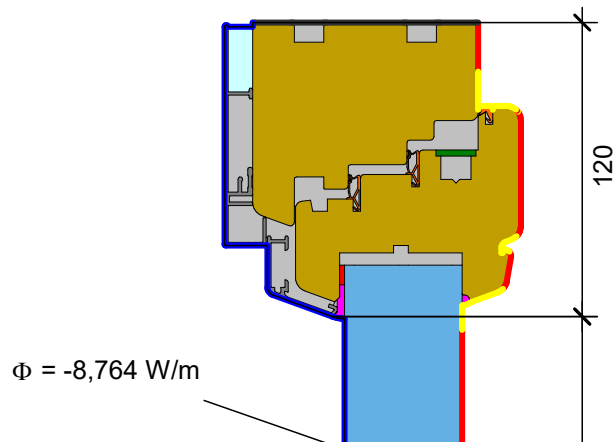
- Aluminium (Si-Legierungen)
 - Argon (5)
 - EPDM (Ethylenpropylen diener monomer) (1500 kg/m³)
 - Hart-Butyl (Isobuten), heissgeschmolzen
 - Kalk-Natronsilicatglas
 - Light White Seraya, Waldkiefer (Föhre), Douglasie (8)
 - Multitech G Spacer
 - Neopren (Polychloropren)
 - PVC-weich (PVC-P), 40% Weichmacher
 - Silikon, rein
 - Slightly ventilated air cavity *
 - Stahl
 - Unventilated air cavity *
- * EN ISO 10077-2:2017, 6.4.3

λ [W/(m·K)]	ϵ
160,000	0,900
0,021	0,900
0,250	0,900
0,240	0,900
1,000	0,900
0,110	0,900
0,125	0,900
0,230	0,900
0,140	0,900
0,350	0,900
50,000	0,900



Recommended for climate zone

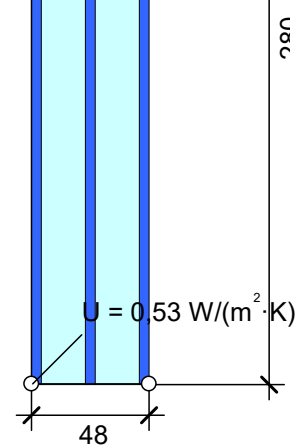
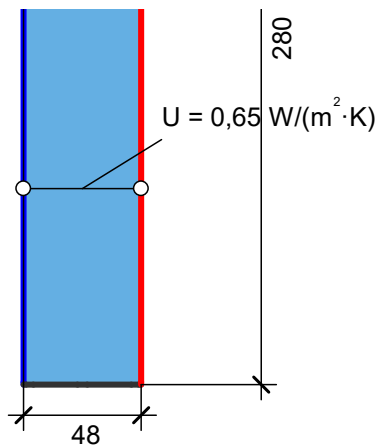




Boundary Condition	q[W/m ²]	θ[°C]	R[(m ² ·K)/W]	ε	φ[%]
Adiabatic	0,000				
Exterior Außen		-10,000	0,040		
Interior, frame, normal		20,000	0,130		
Interior, frame, reduced		20,000	0,200		
e 0,9 Cavity Hohlraum				0,900	

Material	λ[W/(m·K)]	ε
Aluminium (Si-Legierungen)	160,000	0,900
Argon (5)	0,021	0,900
Hart-Butyl (Isobuten), heissgeschmolzen	0,240	0,900
Kalk-Natronsilicatglas	1,000	0,900
Light White Seraya, Waldkiefer (Föhre), Douglasie (6)	0,110	0,900
Multitech G Spacer	0,125	0,900
Neopren (Polychloropren)	0,230	0,900
PVC-weich (PVC-P), 40% Weichmacher	0,140	0,900
Silikon, rein	0,350	0,900
Slightly ventilated air cavity *		
Stahl	50,000	0,900
Unventilated air cavity *		

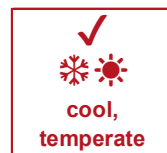
* EN ISO 10077-2:2017, 6.4.3

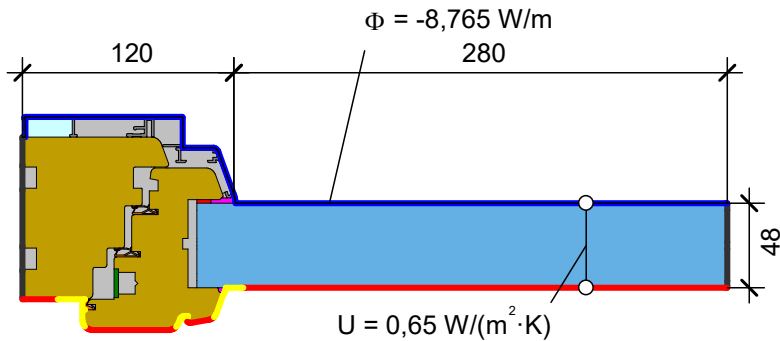


U_f = 0,92 W/(m²·K)

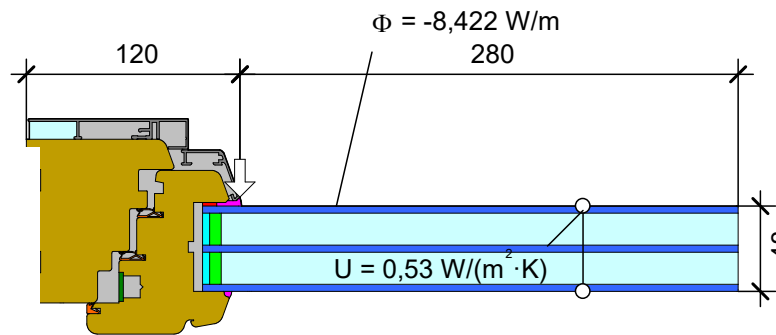
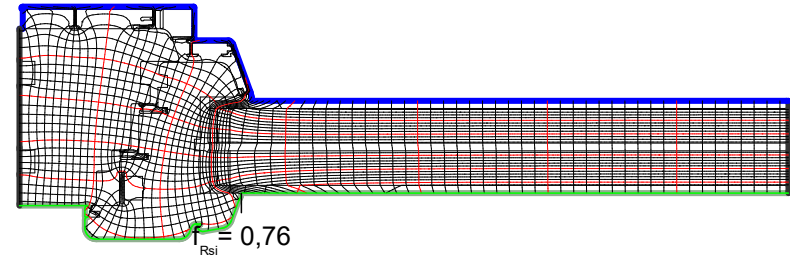
ψ_{ed} = 0,022 W/(m·K)

Recommended for climate zone





$$U_f = 0,92 \text{ W/(m}^2 \cdot \text{K)}$$



$$\psi_{ed} = 0,022 \text{ W/(m} \cdot \text{K)}$$

Material

Material	λ [W/(m·K)]	ϵ
Aluminium (Si-Legierungen)	160,000	0,900
Argon (5)	0,021	0,900
Hart-Butyl (Isobuten), heissgeschmolzen	0,240	0,900
Kalk-Natronsilicatglas	1,000	0,900
Light White Seraya, Waldkiefer (Föhre), Douglasie (7)	0,110	0,900
Multitech G Spacer	0,125	0,900
Neopren (Polychloropren)	0,230	0,900
PVC-weich (PVC-P), 40% Weichmacher	0,140	0,900
Silikon, rein	0,350	0,900
Slightly ventilated air cavity *		
Stahl	50,000	0,900
Unventilated air cavity *		

* EN ISO 10077-2:2017, 6.4.3

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]	ϵ	ϕ [%]
Adiabatic	0,000				
Exterior Außen		-10,000	0,040		
Interior, frame, normal		20,000	0,130		
Interior, frame, reduced		20,000	0,200		
e 0,9 Cavity Hohlraum				0,900	

Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]	ϵ	ϕ [%]
Adiabatic	0,000				
Exterior Außen		-10,000	0,040		
e 0,9 Cavity Hohlraum				0,900	
fRsi: Interior Innen		20,000	0,250		

Recommended for climate zone

❄️❄️
arctic

❄️
cold

❄️☀️
cool, temperate

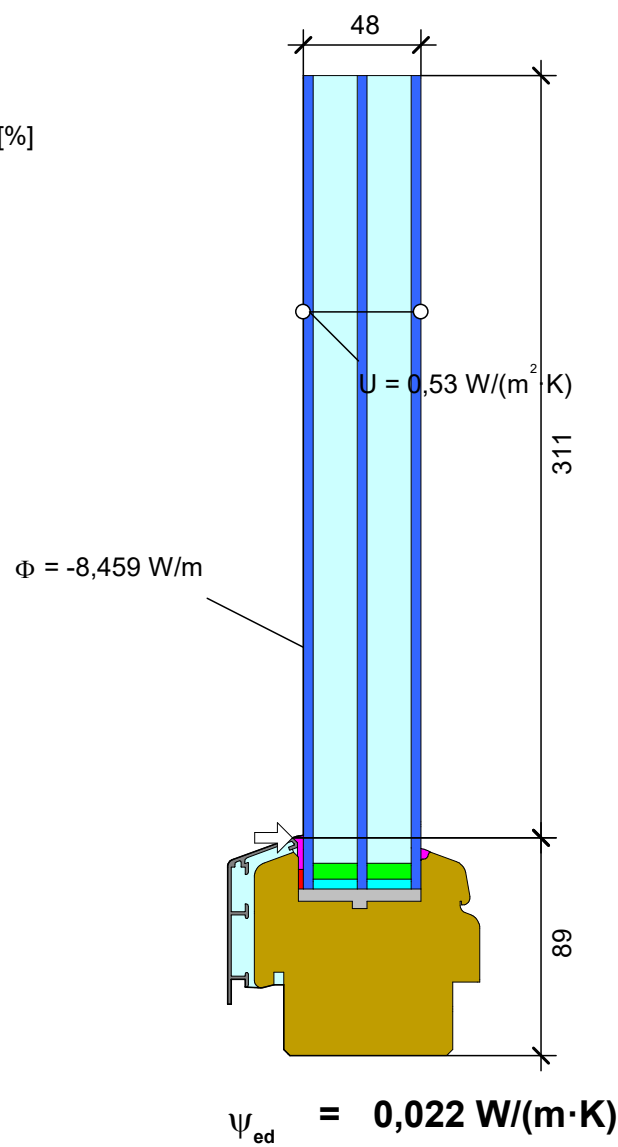
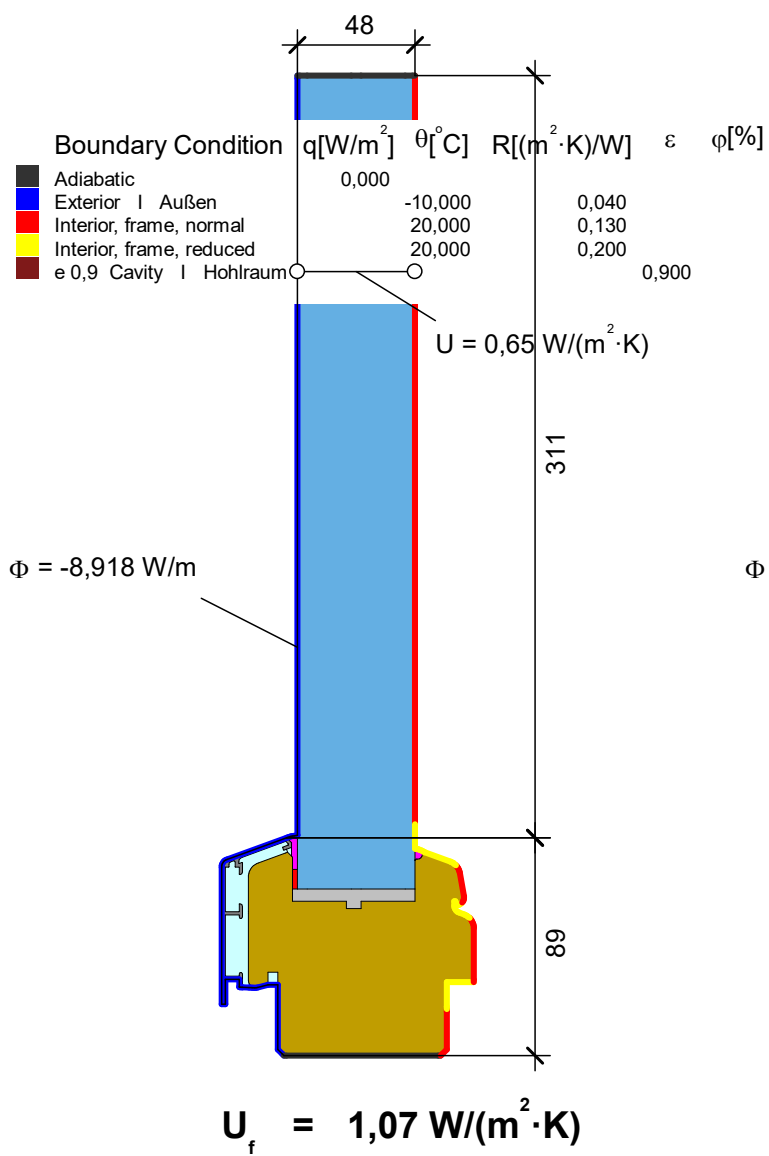
☁️☀️
warm, temperate

☀️
warm

☀️☀️
hot

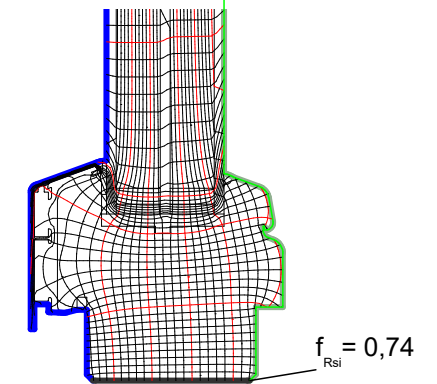
☀️☀️☀️
very hot

🌍



- Material
- Aluminium (Si-Legierungen)
 - Argon (5)
 - Hart-Butyl (Isobuten), heissgeschmolzen
 - Kalk-Natronsilicatglas
 - Light White Seraya, Waldkiefer (Föhre), Douglasie (4)
 - Multitech G Spacer
 - Neopren (Polychloropren)
 - Silikon, rein
 - Slightly ventilated air cavity *
 - Unventilated air cavity *
- * EN ISO 10077-2:2017, 6.4.3

λ [W/(m·K)]	ε
160,000	0,900
0,021	0,900
0,240	0,900
1,000	0,900
0,110	0,900
0,125	0,900
0,230	0,900
0,350	0,900



Recommended
for climate zone



arctic



cold



cool,
temperate



warm,
temperate



warm

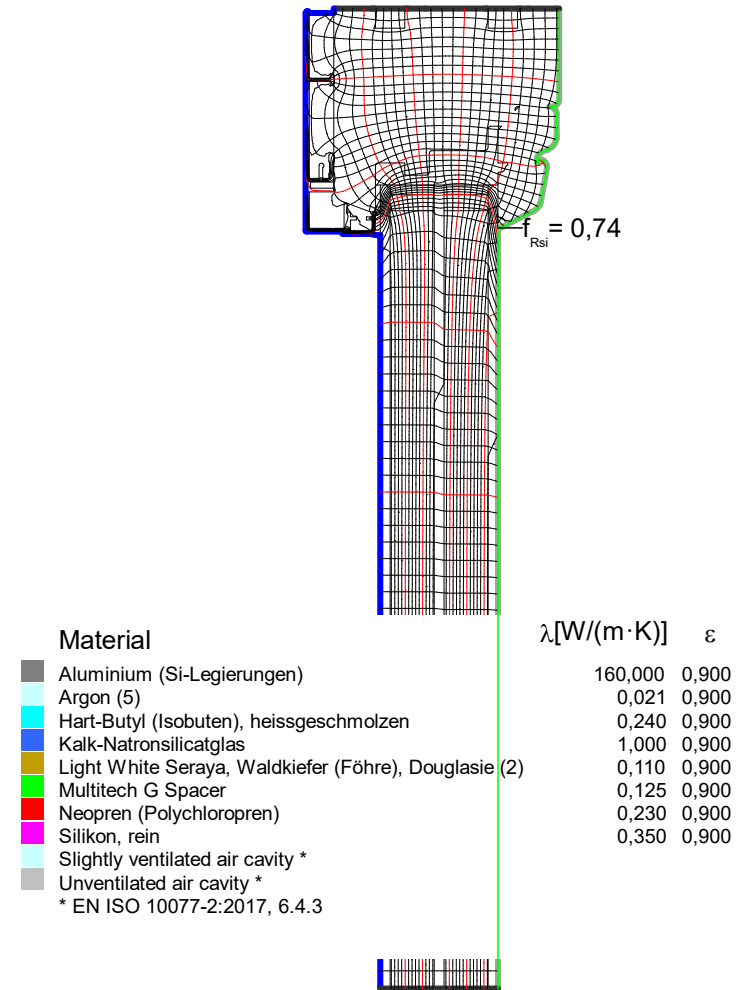
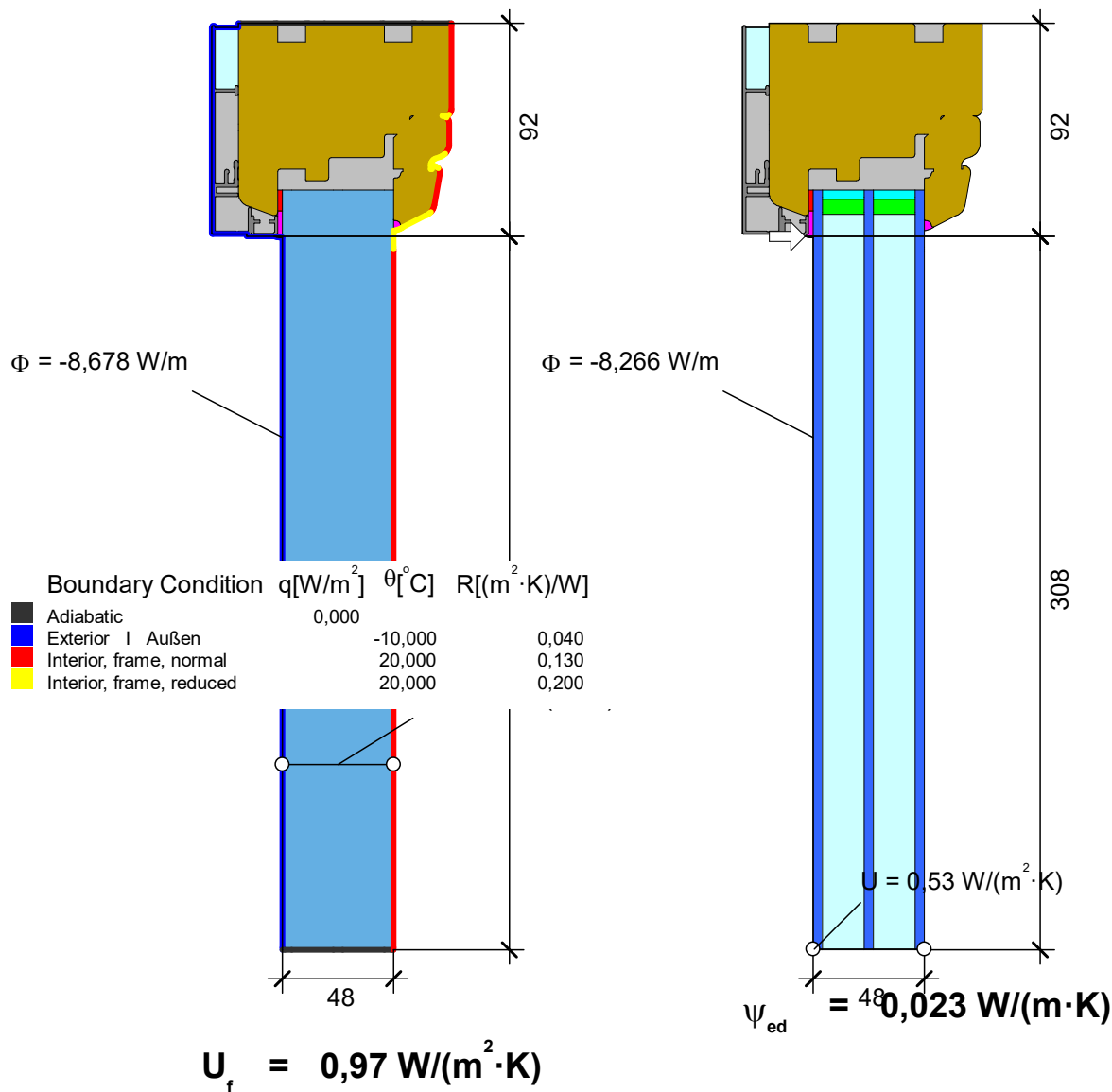


hot

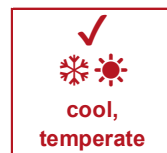


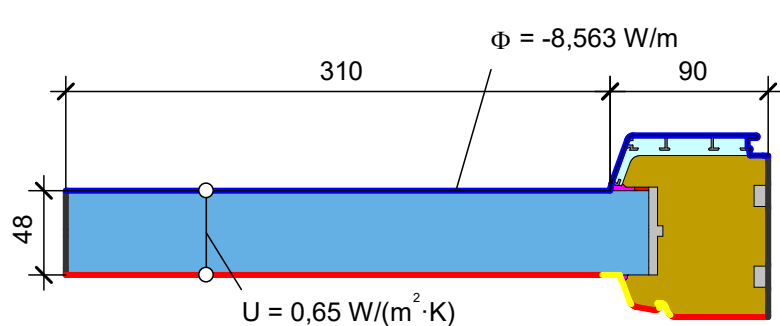
very hot



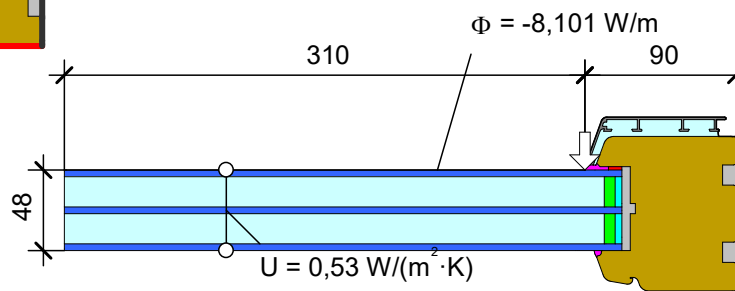
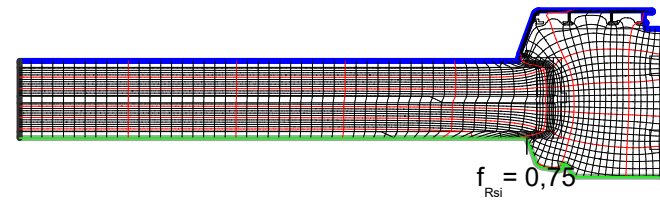


Recommended for climate zone





$$U_f = 0,94 \text{ W}/(\text{m}^2 \cdot \text{K})$$



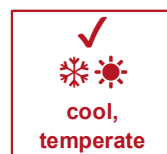
$$\psi_{ed} = 0,022 \text{ W}/(\text{m} \cdot \text{K})$$

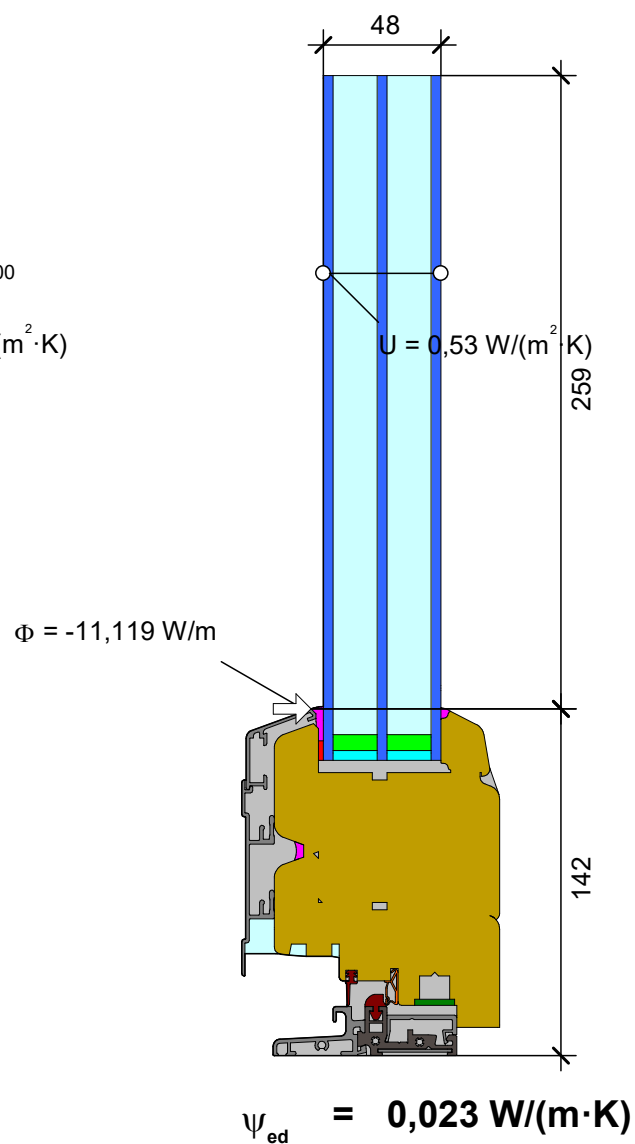
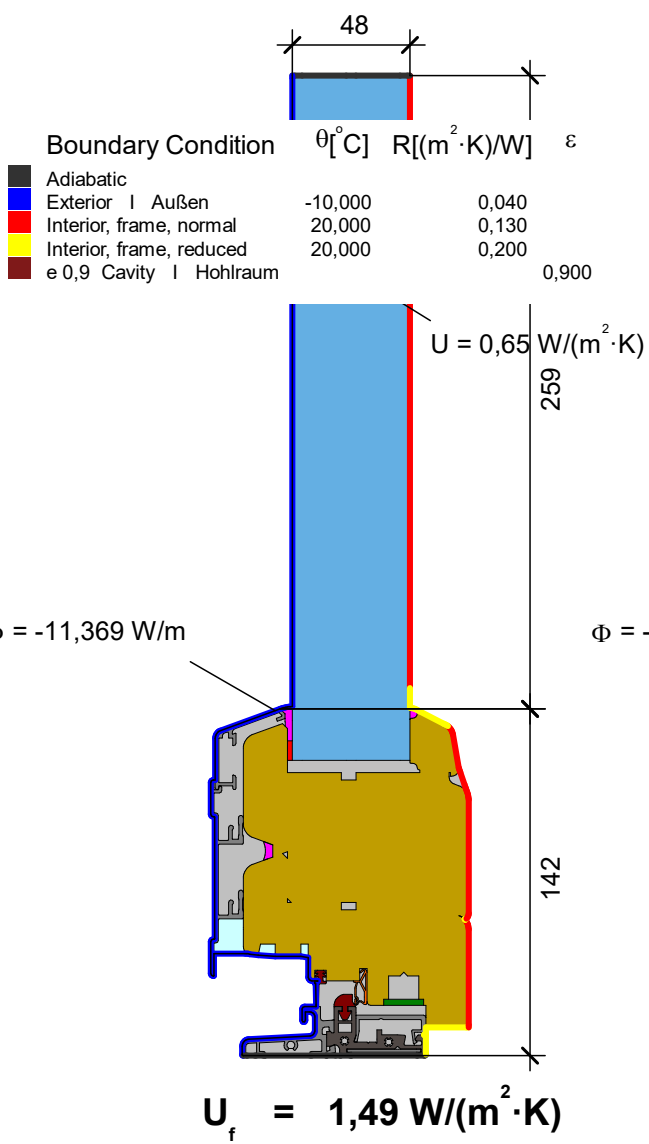
Boundary Condition	$\theta [^\circ\text{C}]$	$R [(\text{m}^2 \cdot \text{K})/\text{W}]$
Adiabatic		
Exterior Außen	-10,000	0,040
Interior, frame, normal	20,000	0,130
Interior, frame, reduced	20,000	0,200

Material	$\lambda [W/(\text{m} \cdot \text{K})]$	ε
Aluminium (Si-Legierungen)	160,000	0,900
Argon (5)	0,021	0,900
Hart-Butyl (Isobuten), heissgeschmolzen	0,240	0,900
Kalk-Natronsilicatglas	1,000	0,900
Light White Seraya, Waldkiefer (Föhre), Douglasie (3)	0,110	0,900
Multitech G Spacer	0,125	0,900
Neopren (Polychloropren)	0,230	0,900
Silikon, rein	0,350	0,900
Slightly ventilated air cavity *		
Unventilated air cavity *		

* EN ISO 10077-2:2017, 6.4.3

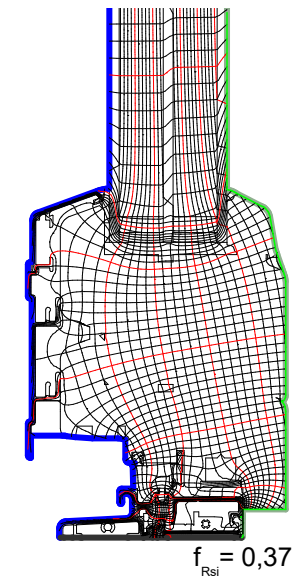
Recommended for climate zone





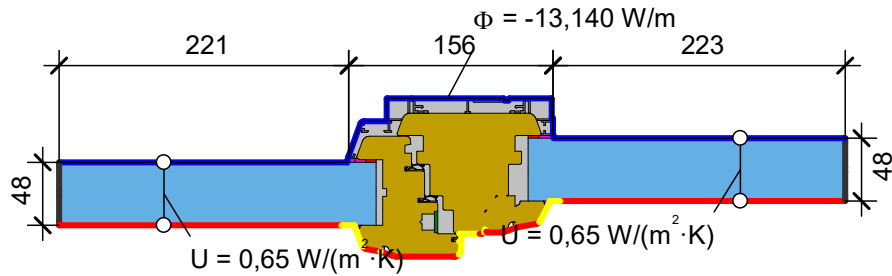
Material	$\lambda [W/(m \cdot K)]$	ε
Aluminium (Si-Legierungen)	160,000	0,900
Argon (5)	0,021	0,900
EPDM (Ethylenpropylen dien monomer) (1500 kg/m³)	0,250	0,900
Hart-Butyl (Isobuten), heissgeschmolzen	0,240	0,900
Hart-Polyvinylchlorid (PVC)	0,170	0,900
Kalk-Natronsilicatglas	1,000	0,900
Light White Seraya, Waldkiefer (Föhre), Douglasie (2)	0,110	0,900
Multitech G Spacer	0,125	0,900
Neopren (Polychloropren)	0,230	0,900
PVC-weich (PVC-P), 40% Weichmacher	0,140	0,900
Silikon, rein	0,350	0,900
Slightly ventilated air cavity *		
Stahl	50,000	0,900
Unventilated air cavity *		

* EN ISO 10077-2:2017, 6.4.3

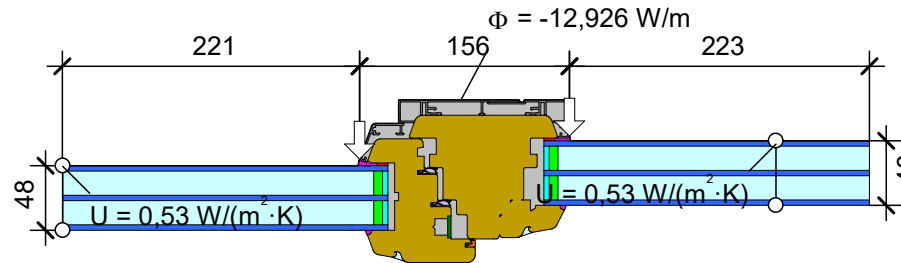
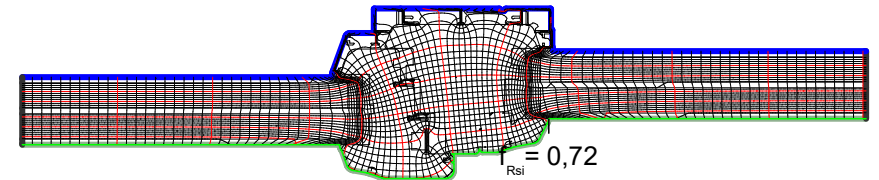


Recommended
for climate zone





$$U_f = 0,96 \text{ W}/(\text{m}^2 \cdot \text{K})$$



$$\Psi_{ed,} = 0,023 \text{ W}/(\text{m} \cdot \text{K})$$

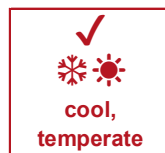
Material

Material	λ [W/(m·K)]
Aluminium (Si-Legierungen)	160,000
Argon (5)	0,021
Glass I Glas	1,000
Hart-Butyl (Isobuten), heissgeschmolzen	0,240
Kalk-Natronsilicatglas	1,000
Light White Seraya, Waldkiefer (Föhre), Douglasie (1)	0,110
Multitech G Spacer	0,125
Neopren (Polychloropren)	0,230
PVC-weich (PVC-P), 40% Weichmacher	0,140
Silikon, rein	0,350
Slightly ventilated air cavity *	
Stahl	50,000
Unventilated air cavity *	

* EN ISO 10077-2:2017, 6.4.3

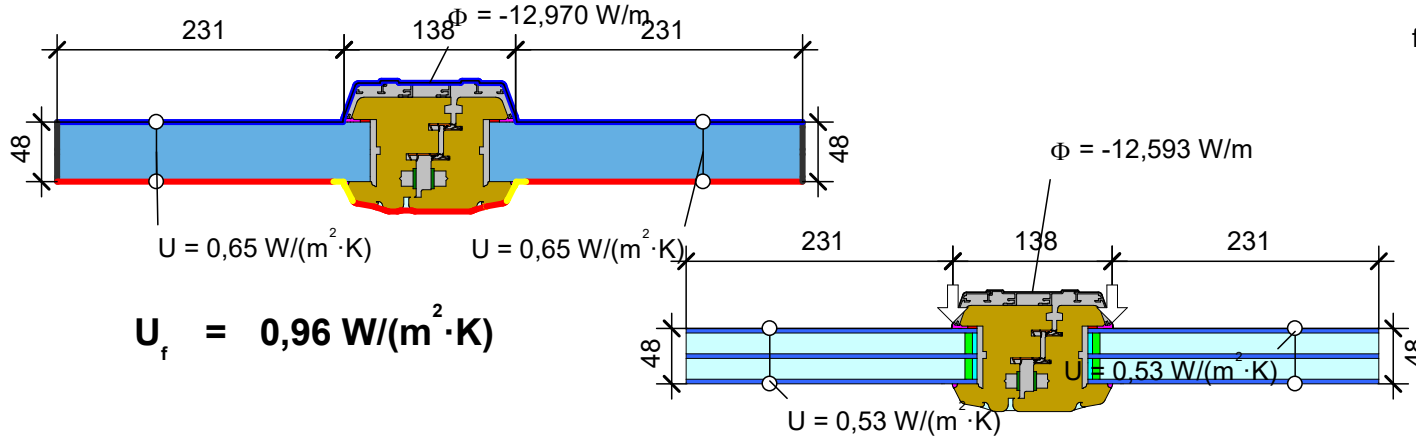
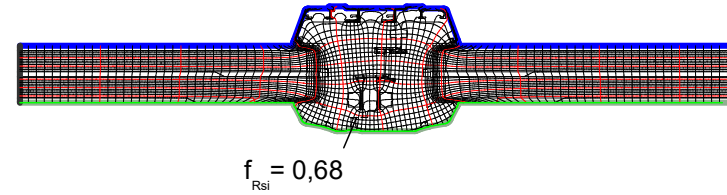
Boundary Condition	q [W/m ²]	θ [°C]	R [(m ² ·K)/W]	ϵ	ϕ [%]
Adiabatic	0,000				
Exterior Außen		-10,000	0,040		
Interior, frame, normal		20,000	0,130		
Interior, frame, reduced		20,000	0,200		
e 0,9 Cavity Hohlraum				0,900	

Recommended for climate zone



Boundary Condition $q[W/m^2]$ $\theta[^\circ C]$ $R[(m^2 \cdot K)/W]$

Adiabatic	0,000		
Exterior Außen	-10,000	0,040	
Interior, frame, normal	20,000	0,130	
Interior, frame, reduced	20,000	0,200	

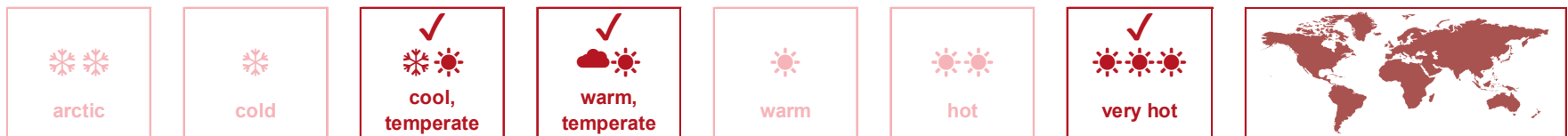


$$\Psi_{ed} = 0,022 W/(m \cdot K)$$

Material	$\lambda[W/(m \cdot K)]$	ϵ
Aluminium (Si-Legierungen)	160,000	0,900
Argon (5)	0,021	0,900
Glass Glas	1,000	0,900
Hart-Butyl (Isobuten), heissgeschmolzen	0,240	0,900
Kalk-Natronsilicatglas	1,000	0,900
Light White Seraya, Waldkiefer (Föhre), Douglasie (2)	0,110	0,900
Multitech G Spacer	0,125	0,900
Neopren (Polychloropren)	0,230	0,900
PVC-weich (PVC-P), 40% Weichmacher	0,140	0,900
Silikon, rein	0,350	0,900
Slightly ventilated air cavity *		
Stahl	50,000	0,900
Unventilated air cavity *		

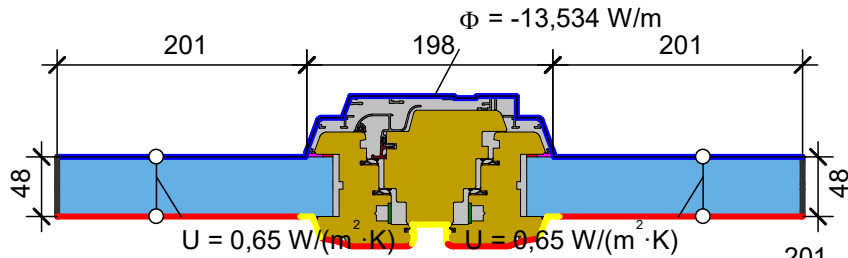
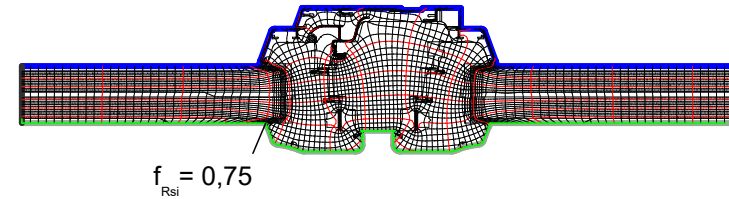
* EN ISO 10077-2:2017, 6.4.3

Recommended for climate zone

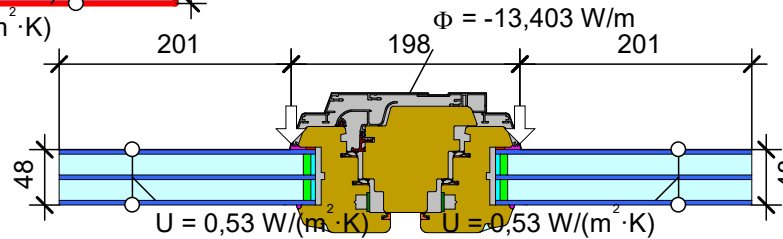


Boundary Condition $q[W/m^2]$ $\theta[^\circ C]$ $R[(m^2 \cdot K)/W]$

Adiabatic	0,000	
Exterior Außen	-10,000	0,040
Interior, frame, normal	20,000	0,130
Interior, frame, reduced	20,000	0,200



$$U_f = 0,96 \text{ W}/(\text{m}^2 \cdot \text{K})$$

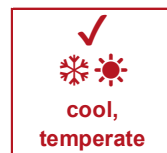


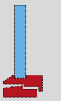





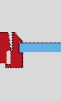


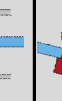
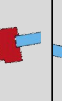


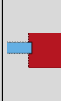
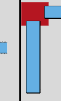

$$\Psi_{ed,} = 0,022 \text{ W}/(\text{m} \cdot \text{K})$$

Material	$\lambda[W/(m \cdot K)]$	ϵ
Aluminium (Si-Legierungen)	160,000	0,900
Argon (5)	0,021	0,900
EPDM (Ethylenpropylen diener monomer) (1500 kg/m ³)	0,250	0,900
Hart-Butyl (Isobuten), heissgeschmolzen	0,240	0,900
Kalk-Natronsilicatglas	1,000	0,900
Light White Seraya, Waldkiefer (Föhre), Douglasie (5)	0,110	0,900
Multitech G Spacer	0,125	0,900
Neopren (Polychloropren)	0,230	0,900
PVC-weich (PVC-P), 40% Weichmacher	0,140	0,900
Silikon, rein	0,350	0,900
Slightly ventilated air cavity *		
Stahl	50,000	0,900
Unventilated air cavity *		

* EN ISO 10077-2:2017, 6.4.3

Recommended for climate zone



Vetta Building Technologies E92 Spacer Abstandhalter: Multitech G		Bottom	Top	Side	Bottom fixed	Top fixed	Side fixed	Thres-hold	Side door	Flying mullion	Mullion	Mullion	Mullion fixed	Corner	Transom	Transom	Transom fixed
		Unten	Oben	Seitl.	Unten fest	Oben fest	Seitl. fest	Schwelle	Seite Tür	Stulp	Pfosten	Pfosten	Pfosten fest	Ecke	Kämpfer	Kämpfer	Kämpfer fest
																	
Temperaturefactor Temperaturfaktor	$f_{Rsi=0,25m^2k/W}$	0.75	0.76	0.76	0.74	0.74	0.75	0.37		0.68	0.75	0.72			0.75		
Frame width Rahmenbreite	b_f [mm]	140	120	120	89	92	90	142		0.138	198	156			198		
U-value frame Rahmen-U-Wert	U_f [W/(m ² K)]	1.04	0.92	0.92	1.07	0.97	0.94	1.49		0.96	0.96	0.96			0.96		
Ψ-glass edge Glasrand-Ψ-Wert	Ψ_g [W/(mK)]	0.022	0.022	0.022	0.022	0.023	0.022	0.023		0.022	0.022	0.023			0.022		
U-value window Fenster-U-Wert	U_w [W/(m ² K)] @ $U_g = 0,53$ W/(m ² K)	0.725			0.699			The threshold and flying mullion profiles do not achieve the hygiene requirements									
Ψ_{opaque} Ψ_{opak}	Ψ_{opaque} W/(mK)	0.154			0.118												
Passive House efficiency class Passivhaus Effizienzklasse		phB			phB												