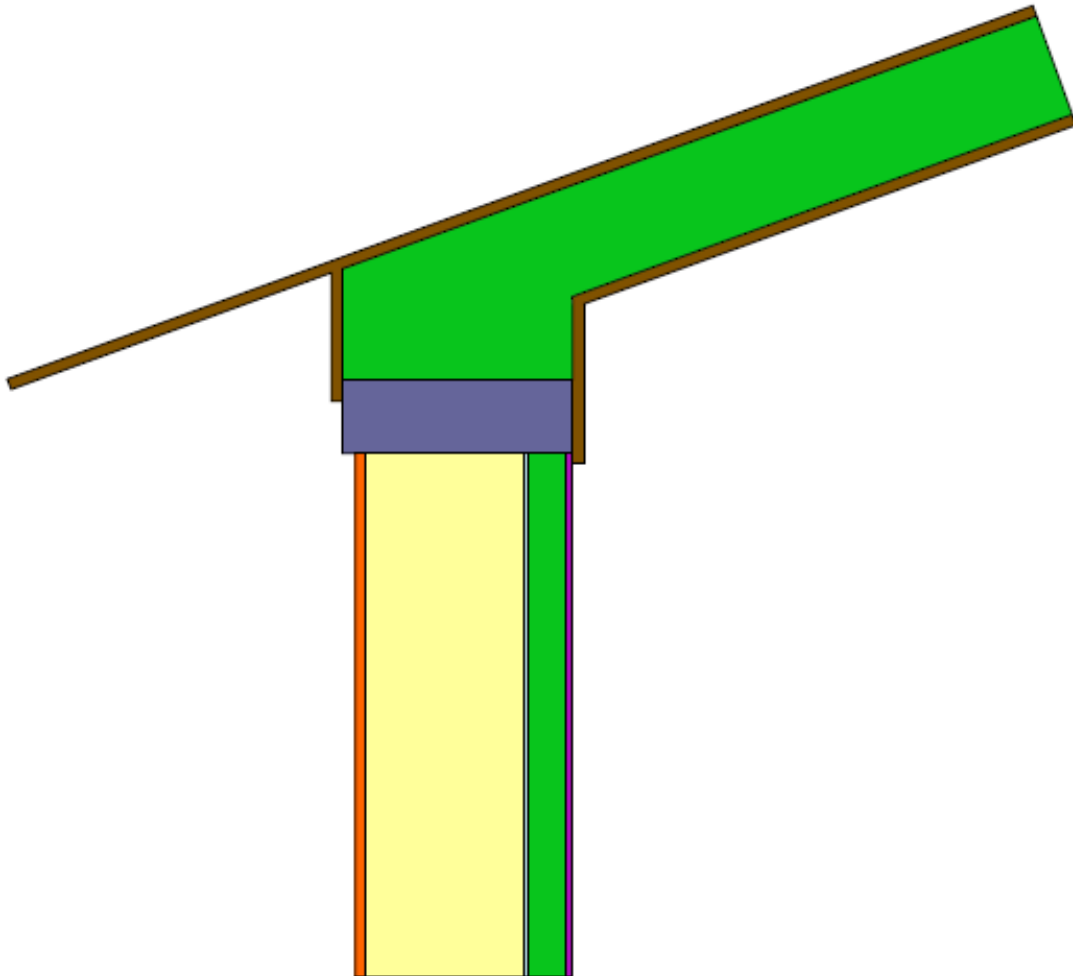


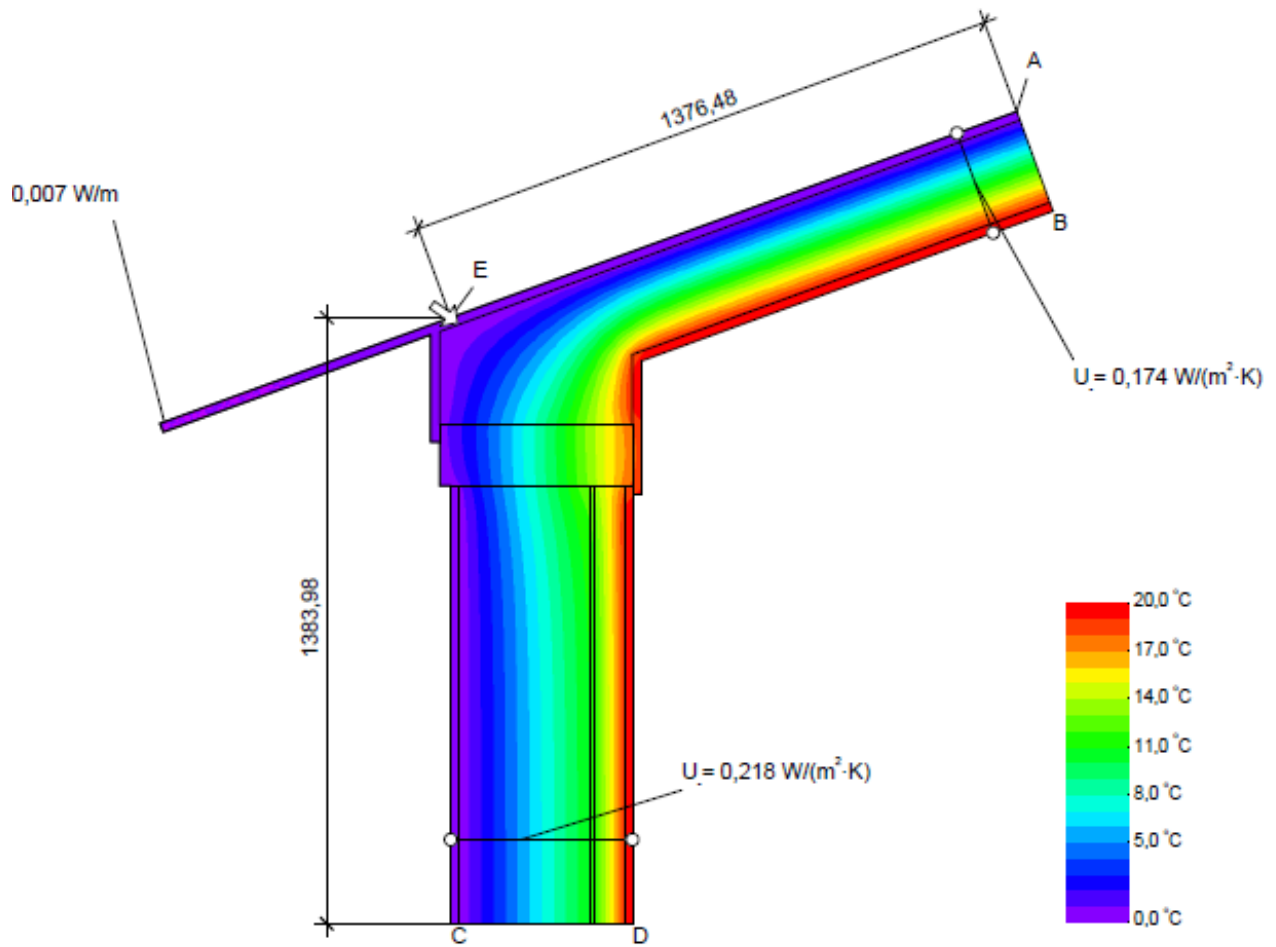
## ANEXO 1

i) Peto de cubierta inclinada



Material	$\lambda$ [W/(m·K)]	$\epsilon$
Air layer, unventilated, horizontal, thickness: 10 mm	0,067	
Gypsum plasterboard (1)	0,250	
Mineral Wool (0,037)	0,037	
Plaster, cement, sand LAMBA 1,4	1,400	
Plywood 500 kg/m <sup>3</sup> (0.15*2.2)	0,330	
Plywood 500 kg/m <sup>3</sup> (1.14*2.2)	0,308	
WWW (0.11 + 0.13)	0,110, 0,130	

Figura 1: geometría y materiales



$$\psi_{\text{acc}} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{10,007}{20,000} - 0,174 \cdot 1,376 - 0,218 \cdot 1,384 = -0,040 \text{ W}/(\text{m} \cdot \text{K})$$

Figura 2: cálculo del puente térmico

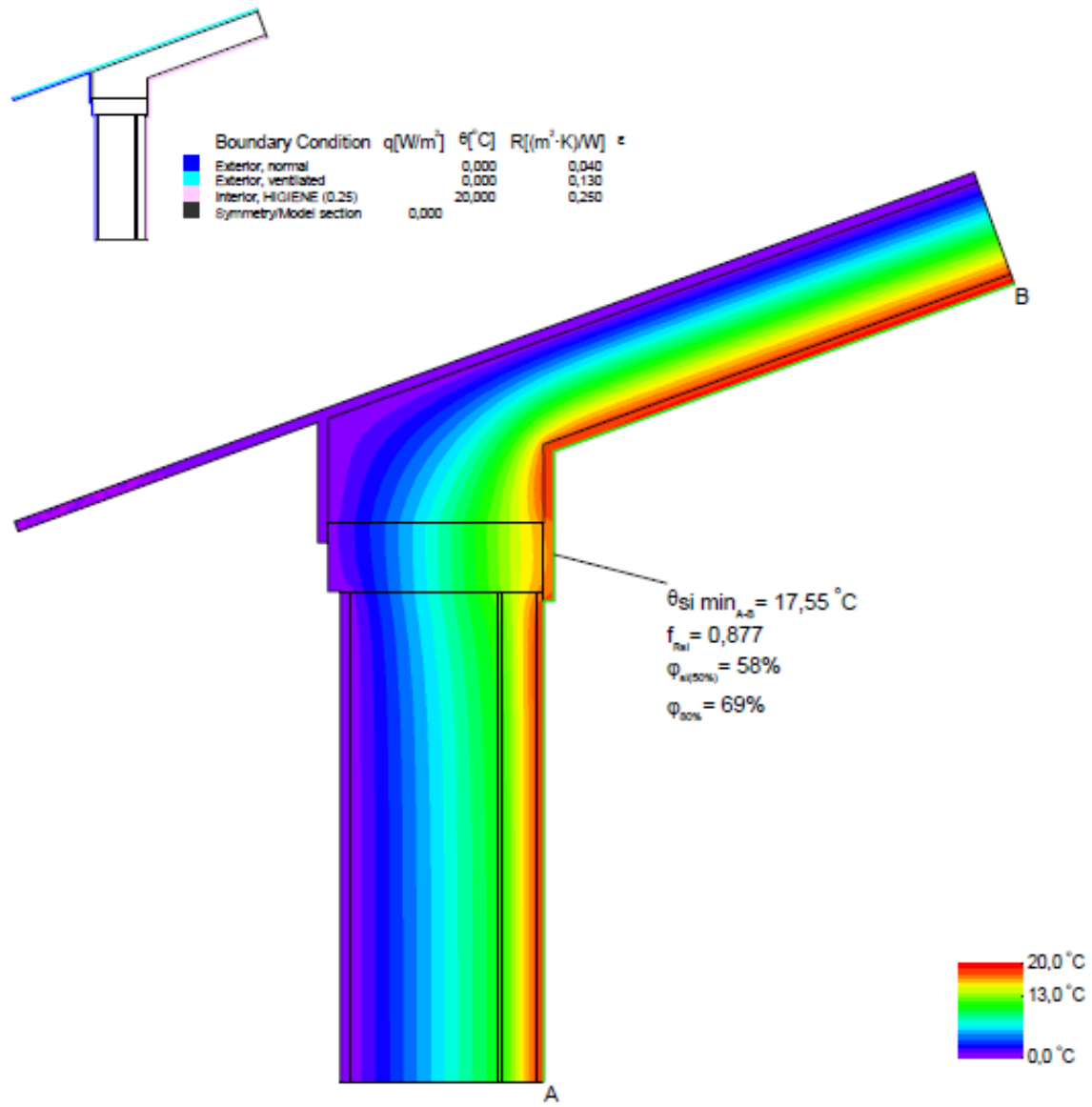
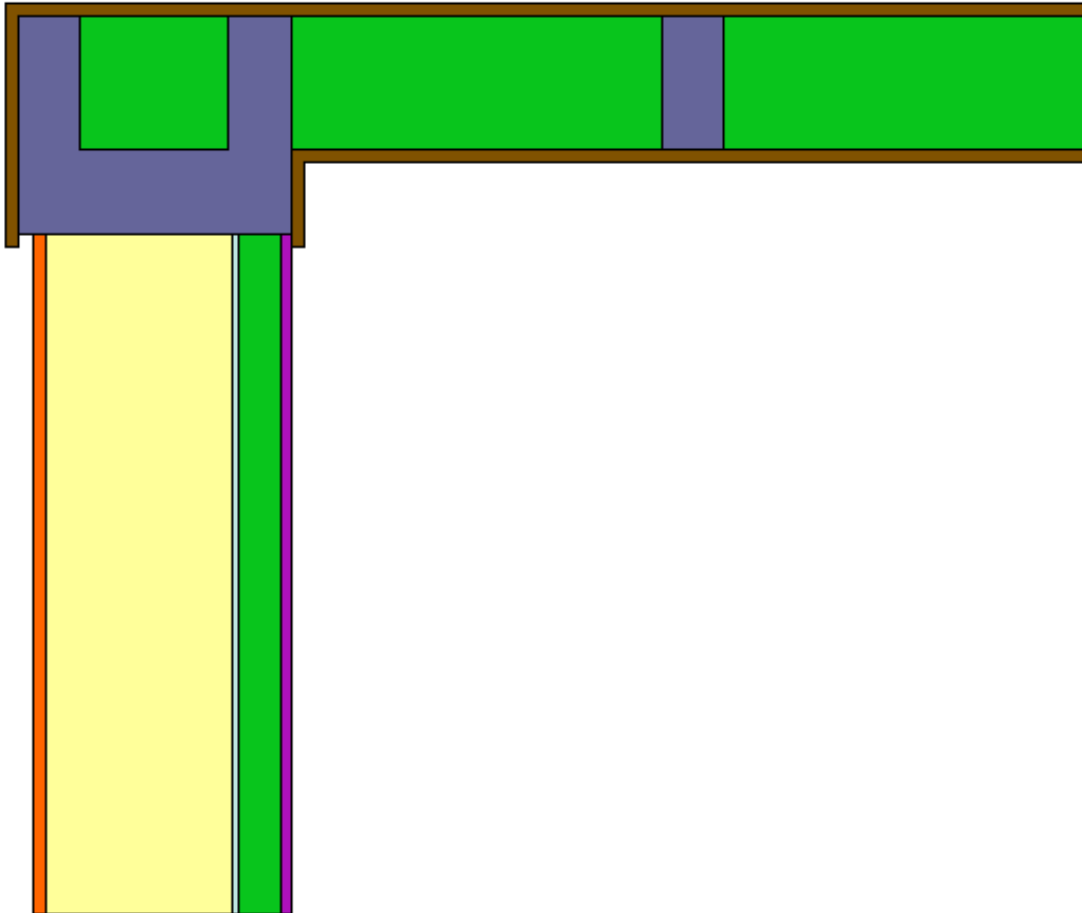


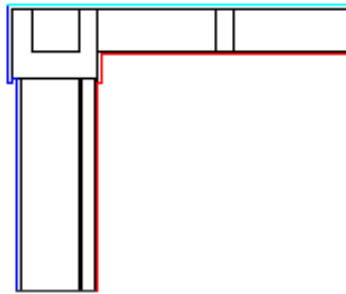
Figura 3: criterio de higiene

ii) Peto de cubierta de agua sección opuesta

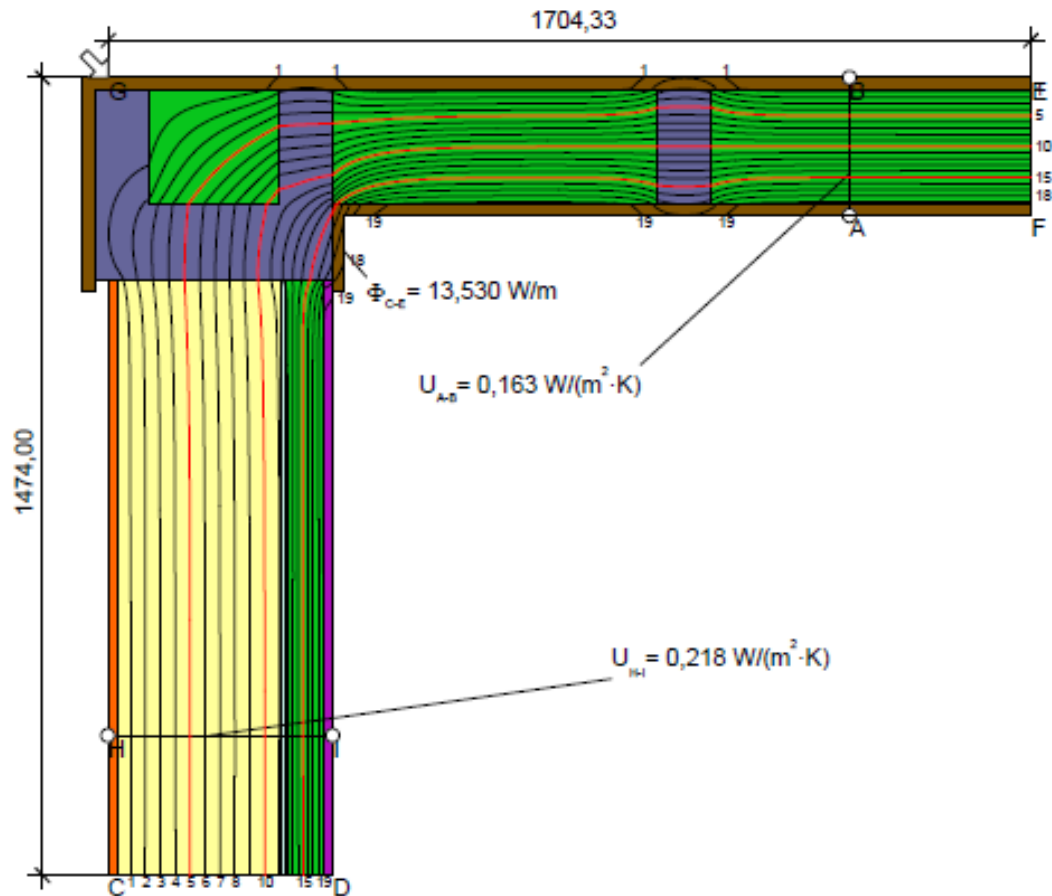


Material	$\lambda$ [W/(m·K)]	$\epsilon$
Air layer, unventilated, downwards, thickness: 10 mm	0,067	
Gypsum plasterboard (1)	0,250	
Mineral Wool (0,037)	0,037	
Plaster, cement, sand LAMBA 1,4	1,400	
Plywood 500 kg/m3 (0.15*2.2)	0,330	
Plywood 500 kg/m3 (1.14*2.2)	0,308	
WWW (0.11 + 0.13)	0,110, 0,130	

Figura 4: geometría y materiales

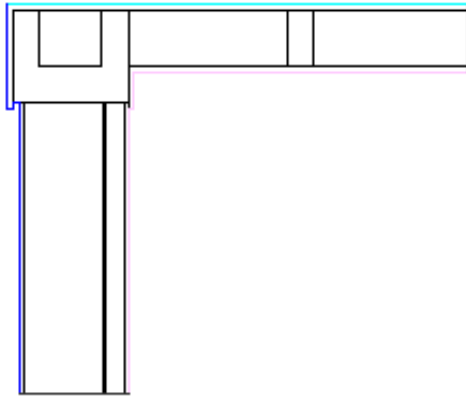


Boundary Condition	q[W/m <sup>2</sup> ]	θ[°C]	R[(m <sup>2</sup> ·K)/W]	ε
Exterior, normal	0,000	0,000	0,040	
Exterior, ventilated	0,000	0,000	0,130	
Interior, normal, horizontal	20,000	20,000	0,130	
Symmetry/Model section	0,000			



$$\Psi_{\text{caet.}} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{13,530}{20,000} - 0,218 \cdot 1,474 - 0,163 \cdot 1,704 = 0,078 \text{ W/(m} \cdot \text{K)}$$

Figura 5: cálculo del puente térmico



Boundary Condition	$q$ [W/m <sup>2</sup> ]	$\theta$ [°C]	$R$ [(m <sup>2</sup> ·K)/W]
Exterior, normal	0,000	0,040	0,130
Exterior, ventilated	0,000	20,000	0,250
Interior, normal(0,25)	0,000		
Symmetry/Model section	0,000		

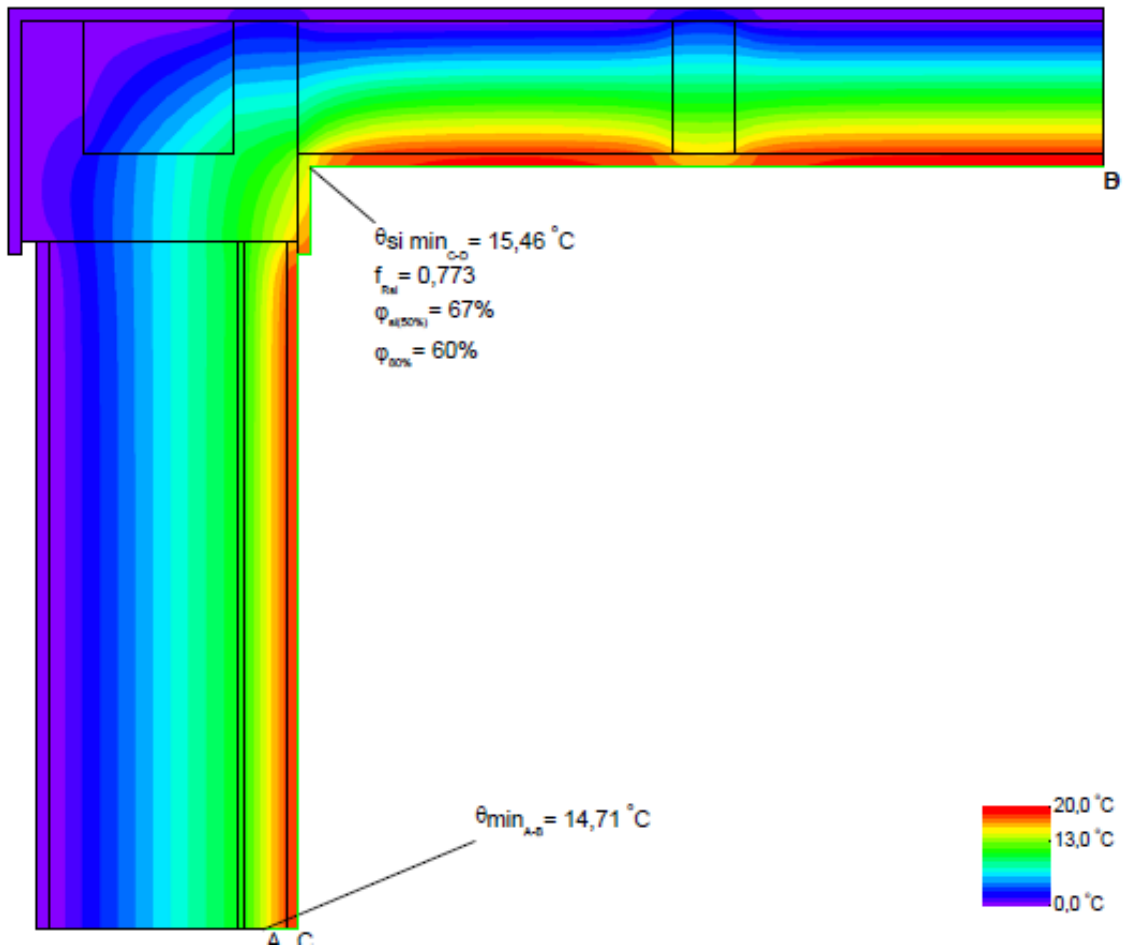
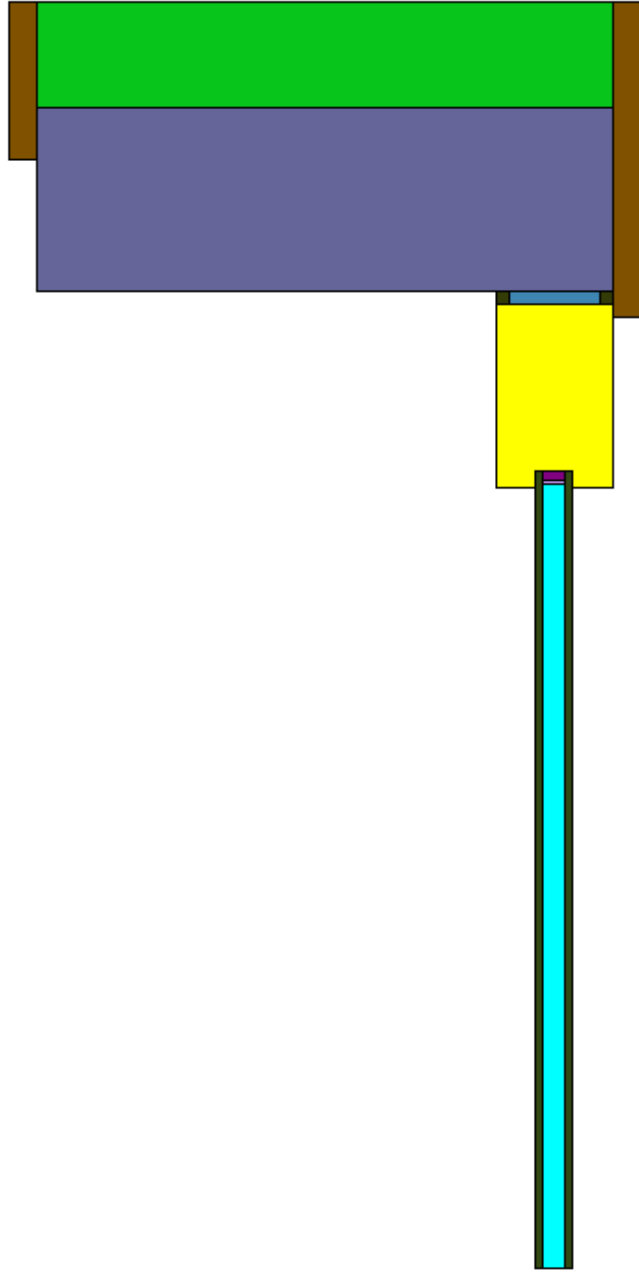












Figura 6: criterio de higiene

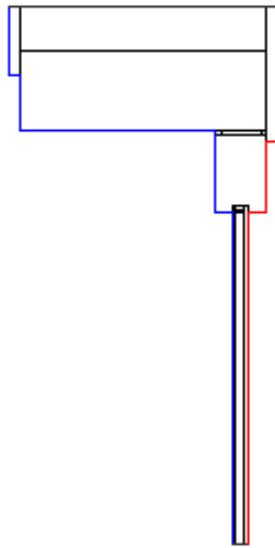
iii) Ventana superior



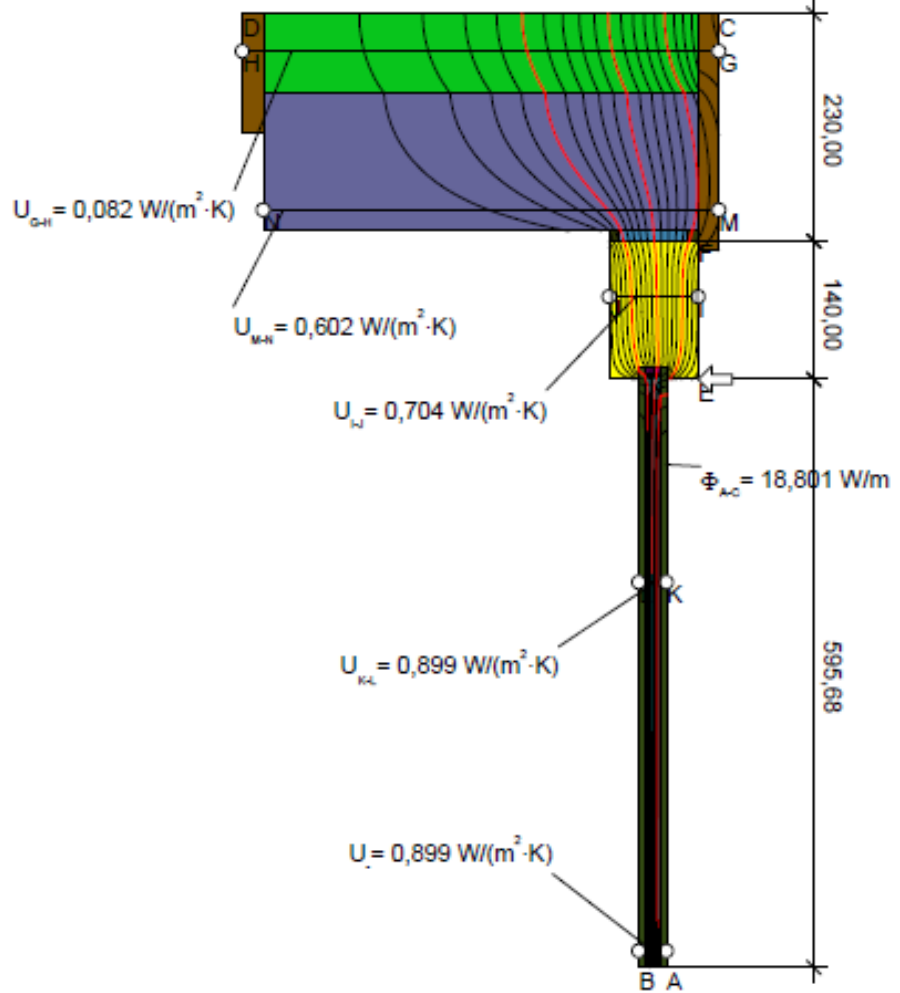


Material	$\lambda$ [W/(m·K)]	$\epsilon$
 Air for Testwindow (0,0172)	0,017	
 Compression Band Polyurethane	0,250	
 Frame 90mm-lambda 0,7	0,072	
 Mineral Wool (0,037)	0,037	
 Plywood 500 kg/m3 (0.15*2.2)	0,330	
 Plywood 500 kg/m3 (1.14*2.2)	0,308	
 Silicone, pure	0,350	
 Soda lime	1,000	
 TGI Spacer part A 0,45	0,450	
 TGI Spacer part B 0,4	0,400	

*Figura 7: geometría y materiales*



Boundary Condition	q[W/m <sup>2</sup> ]	θ[C]	R[(m <sup>2</sup> ·K)/W]	ε
Exterior, normal	0,000	0,000	0,040	
Interior, normal, horizontal	20,000	20,000	0,130	
Symmetry/Model section	0,000			



$$\Psi_{Acc.} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 - U_3 \cdot b_3 = \frac{18,801}{20,000} - 0,899 \cdot 0,596 - 0,704 \cdot 0,140 - 0,082 \cdot 0,230 = 0,287 \text{ W/(m}^2\text{·K)}$$

Figura 8: cálculo del puente térmico

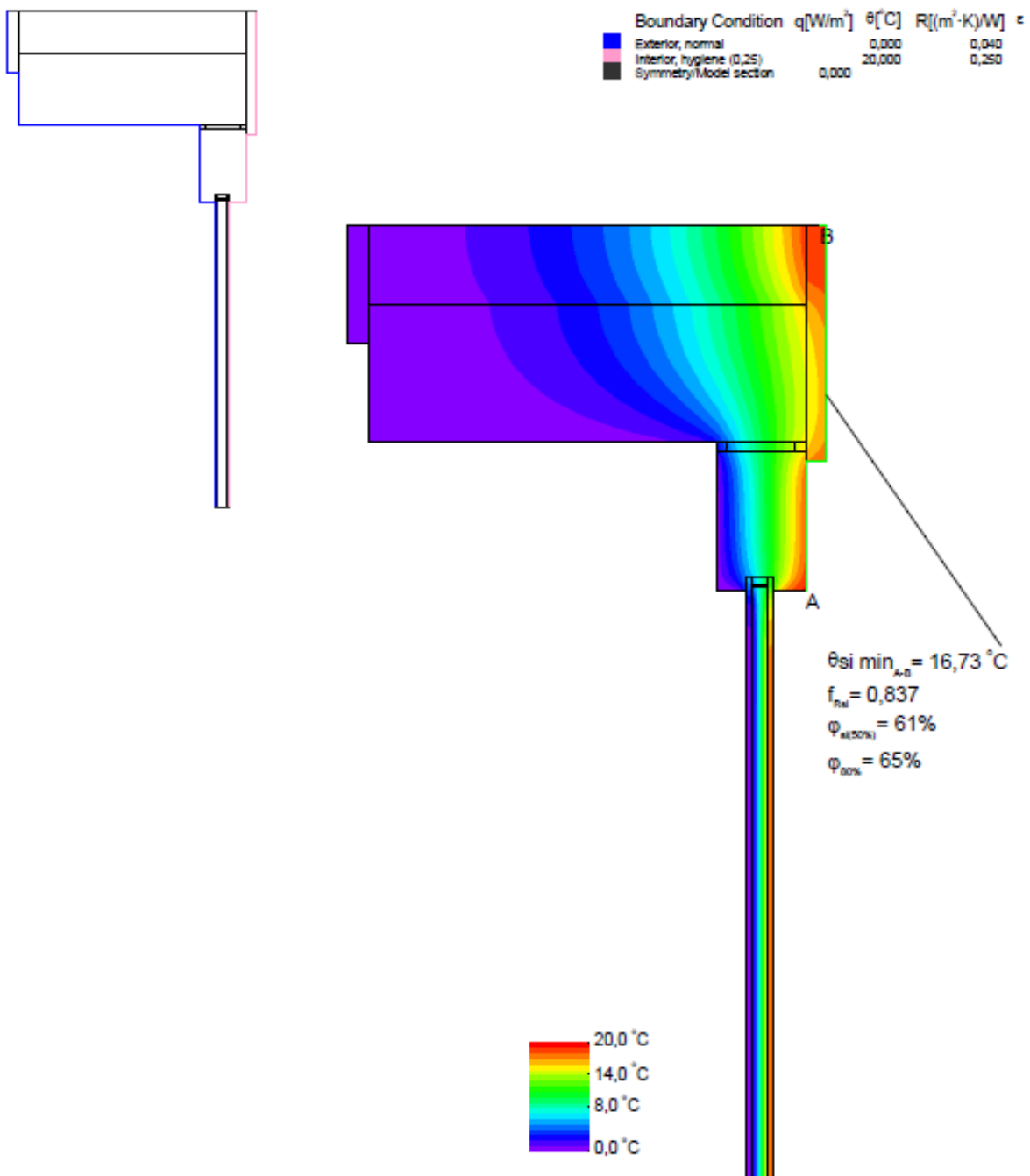
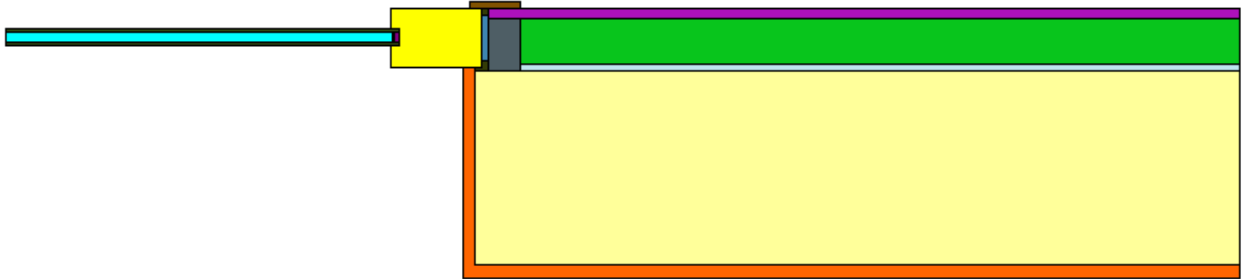


Figura 9: criterio de higiene

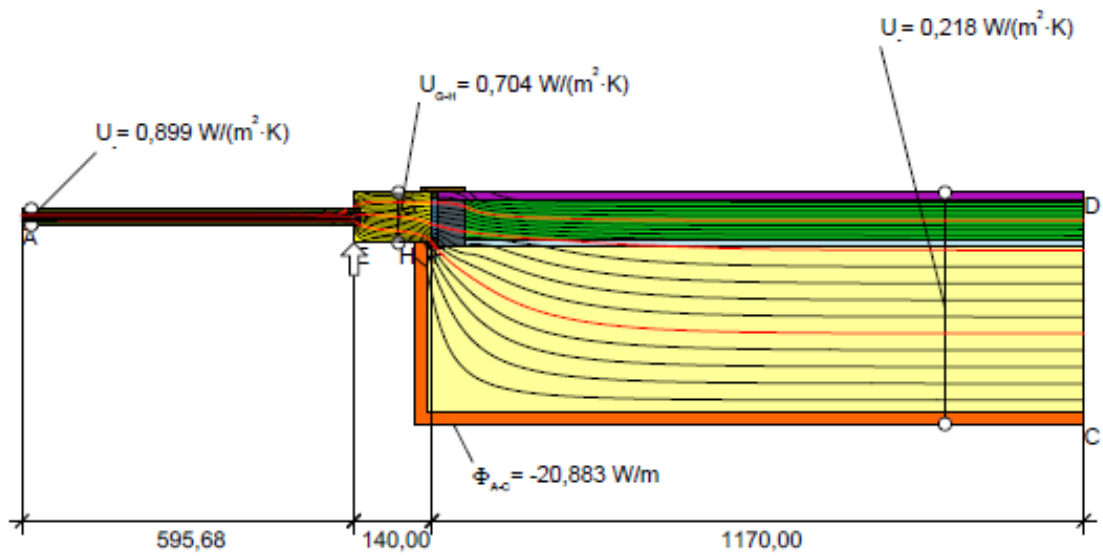
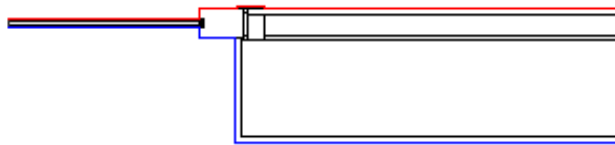
iv) Ventana sección lateral



Material	$\lambda$ [W/(m·K)]	$\epsilon$
Air for Testwindow (0,0172)	0,017	
Air layer, unventilated, horizontal, thickness: 10 mm	0,067	
Compression Band Polyurethane	0,250	
Frame 90mm-lambda 0,7	0,072	
Gypsum plasterboard (1)	0,250	
Mineral Wool (0,037)	0,037	
Plaster, cement, sand LAMBA 1,4	1,400	
Plywood 500 kg/m3 (0.15*2.2)	0,330	
Silicone, pure	0,350	
Soda lime	1,000	
TGI Spacer part A 0,45	0,450	
TGI Spacer part B 0,4	0,400	
Timber 500 kg/m3 (0.13*2.2)	0,268	
WWW (0.11 + 0.13)	0,110, 0,130	

Figura 10: geometría y materiales

Boundary Condition	q[W/m <sup>2</sup> ]	θ[C]	R[(m <sup>2</sup> ·K)/W]	ε
Exterior, normal	0,000	20,000	0,040	
Interior, normal, horizontal	0,000	20,000	0,130	
Symmetry/Model section	0,000			



$$\psi_{Acc.} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 - U_3 \cdot b_3 = \frac{20,883}{20,000} - 0,899 \cdot 0,596 - 1,160 \cdot 0,140 - 0,218 \cdot 1,170 = 0,091 \text{ W/(m} \cdot \text{K)}$$

Figura 11: cálculo del puente térmico

Boundary Condition	$q[W/m^2]$	$\theta[^\circ C]$	$R[(m^2 \cdot K)/W]$	$\epsilon$
Exterior, normal	0,000	0,040		
Interior, hygiene (0,25)	20,000	0,250		
Symmetry/Model section	0,000			

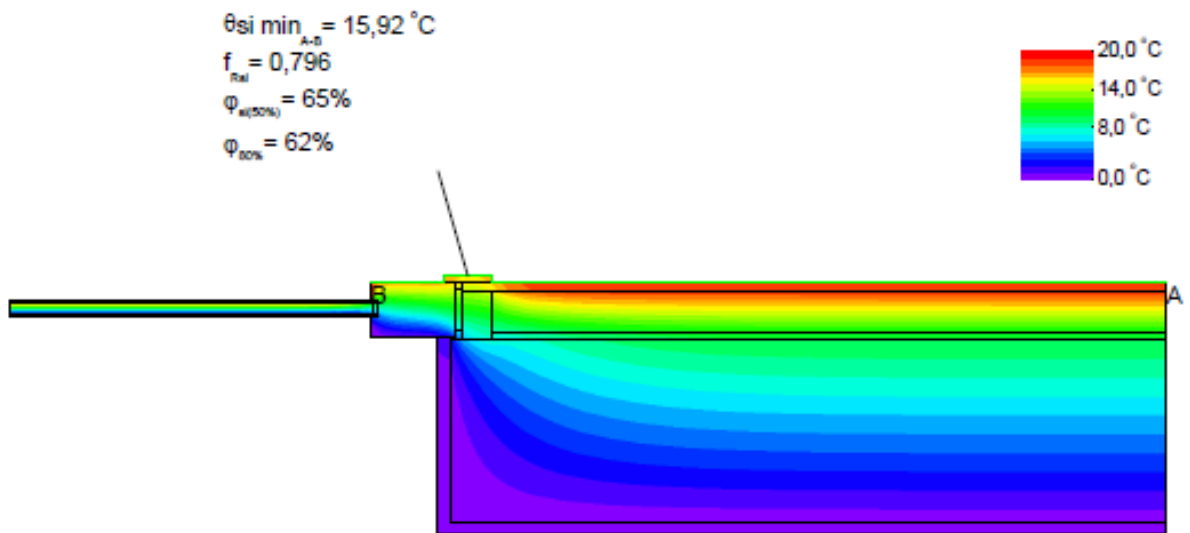
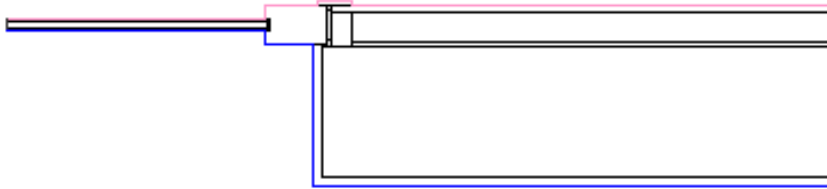
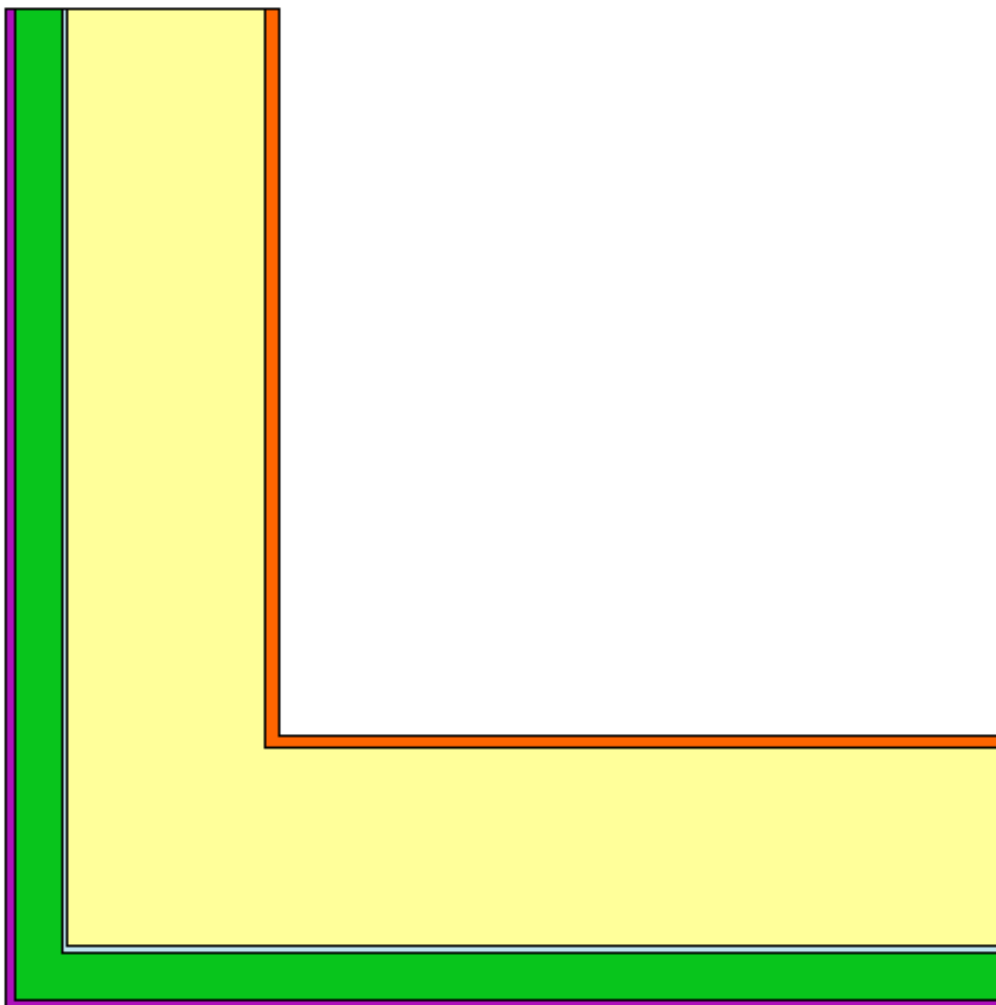







Figura 12: criterio de higiene

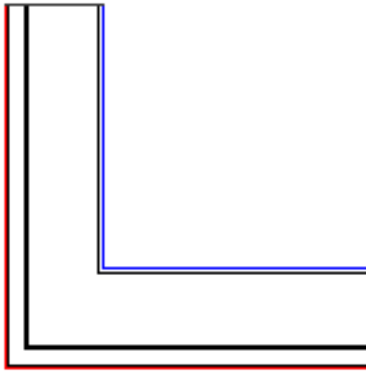
v) Esquina entrante



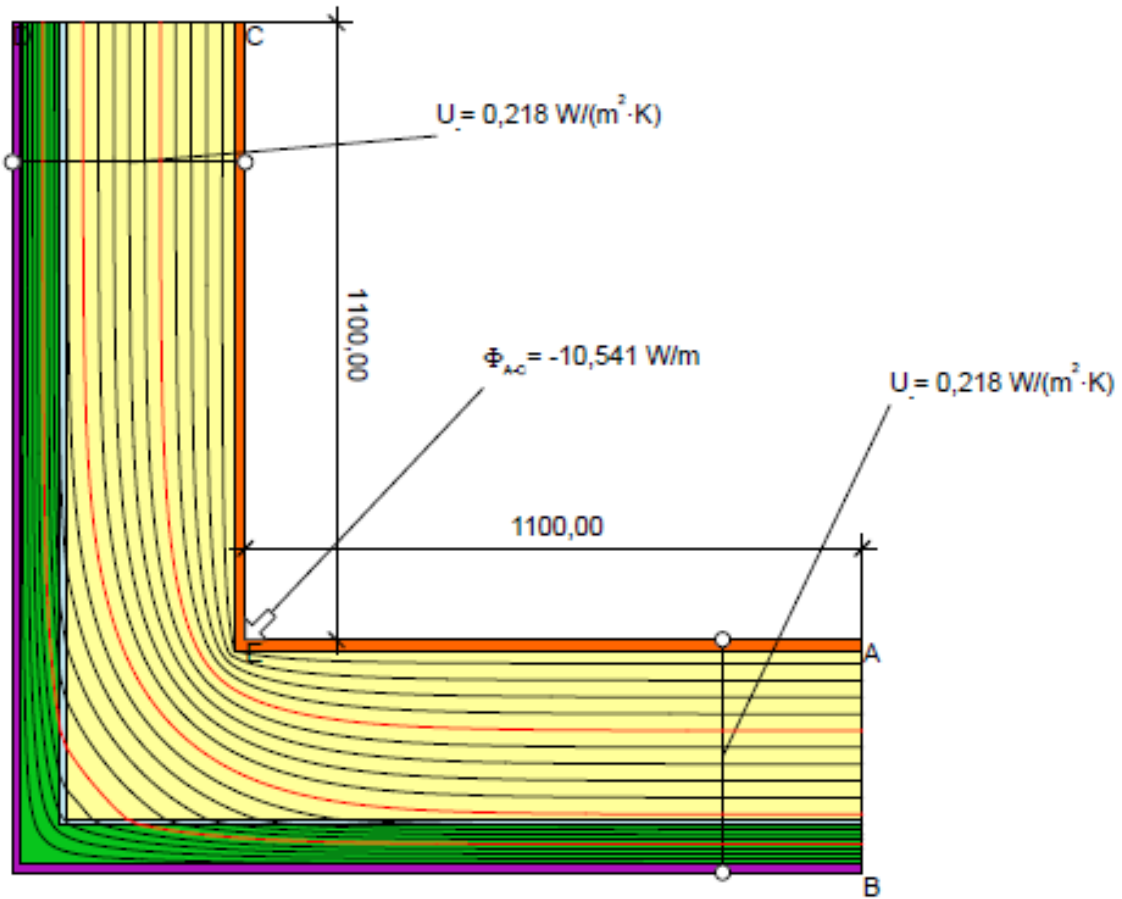
Material	$\lambda$ [W/(m·K)]	$\epsilon$
 Air layer, unventilated, horizontal, thickness: 10 mm	0,067	
 Gypsum plasterboard (1)	0,250	
 Mineral Wool (0,037)	0,037	
 Plaster, cement, sand LAMBA 1,4	1,400	
 WWW (0.11 + 0.13)	0,110, 0,130	

*Figura 13: geometría y materiales*



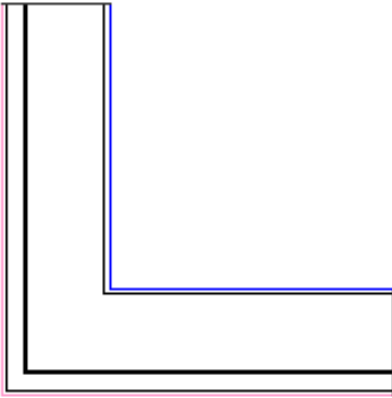


Boundary Condition	$q$ [W/m <sup>2</sup> ]	$\theta$ [°C]	$R$ [(m <sup>2</sup> ·K)/W]	$\epsilon$
Exterior, normal	0,000	20,000	0,040	
Interior, normal, horizontal	0,000		0,130	
Symmetry/Model section				

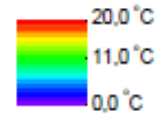
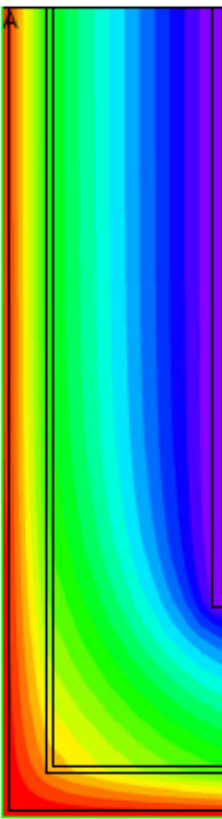


$$\psi_{A-C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{10,541}{20,000} - 0,218 \cdot 1,100 - 0,218 \cdot 1,100 = 0,048 \text{ W/(m·K)}$$

Figura 14: cálculo del puente térmico



Boundary Condition	$q$ [W/m <sup>2</sup> ]	$\theta$ [°C]	$R$ [(m <sup>2</sup> ·K)/W]
Exterior, normal	0,000	20,000	0,040
Interior, hygiene (0,25)	0,000	20,000	0,250
Symmetry/Model section	0,000		

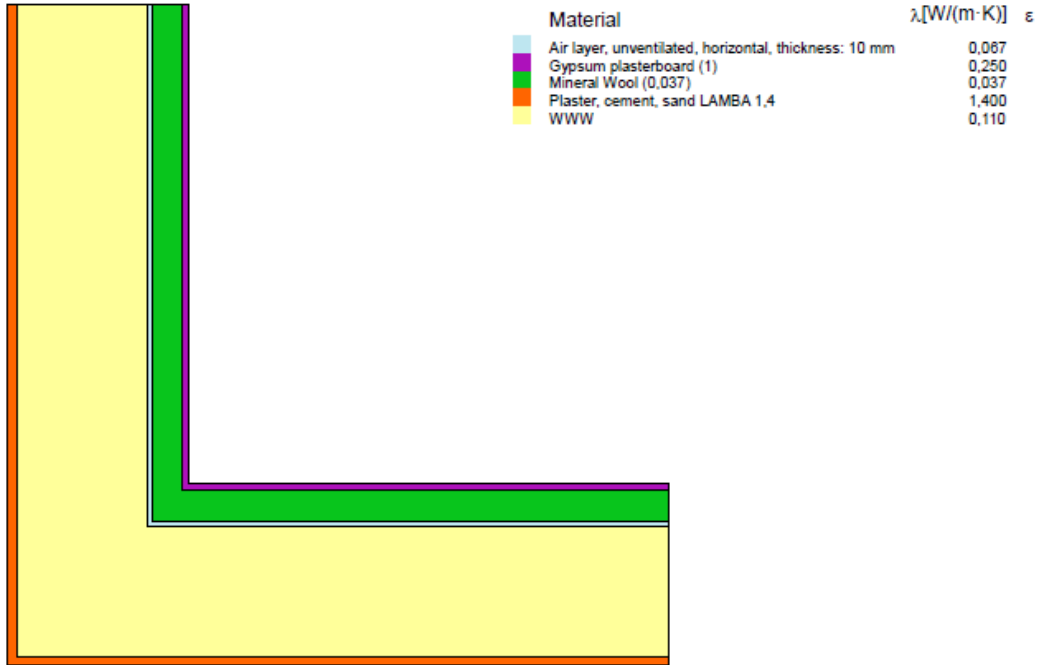


$\theta_{si \text{ min. } A_{a,d}} = 18,94 \text{ °C}$   
 $f_{Rsi} = 0,947$   
 $\phi_{A(50\%)} = 53\%$   
 $\phi_{30\%} = 75\%$

R

Figura 15: criterio de higiene

vi) Esquina saliente



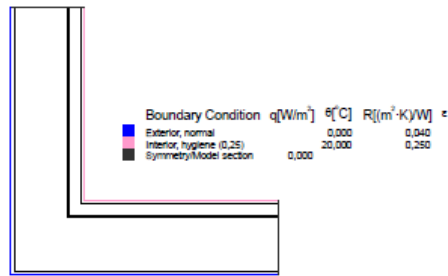
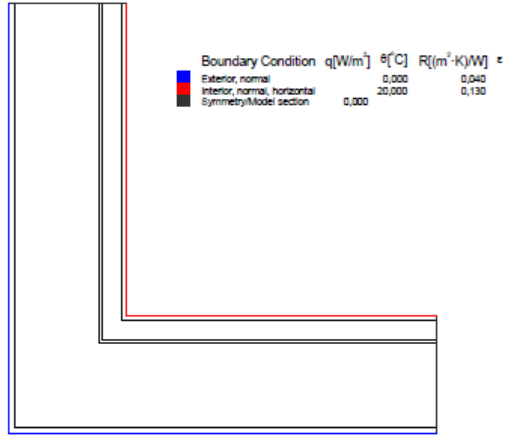
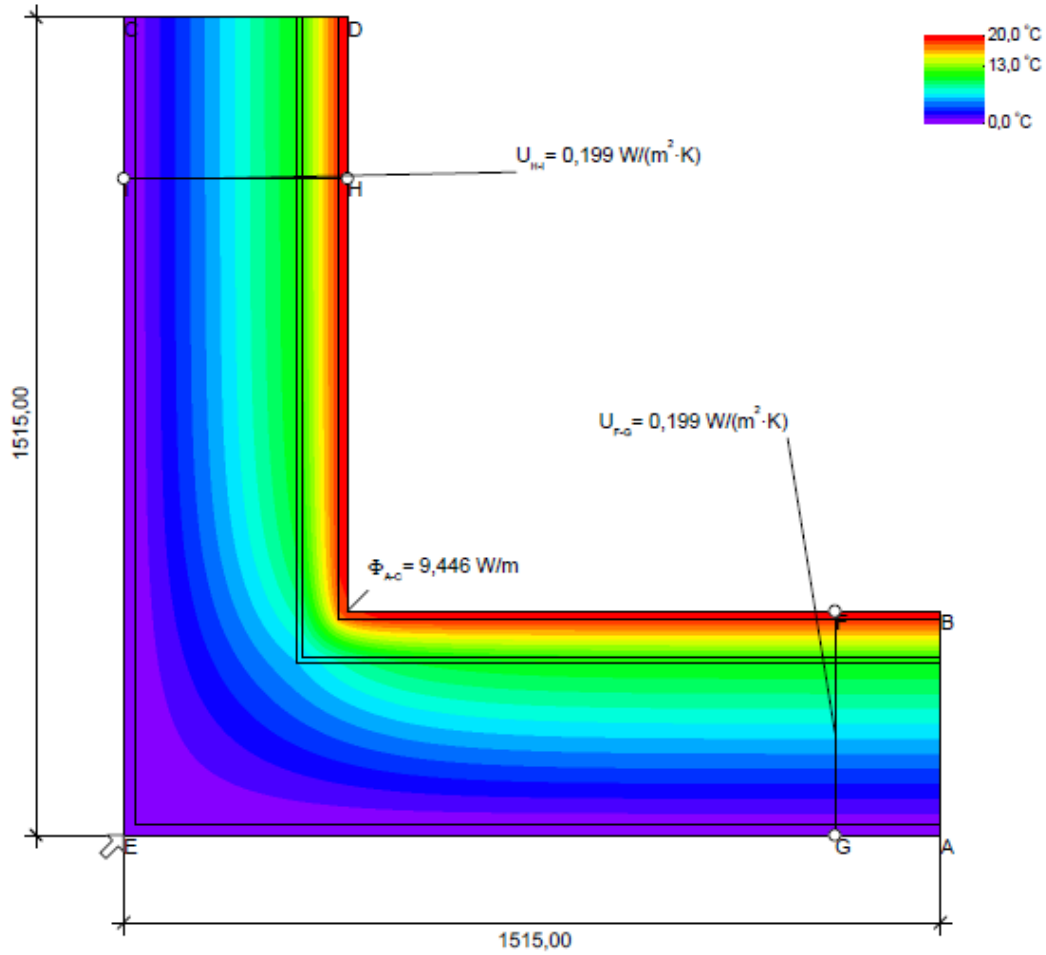


Figura 16: geometría y materiales



$$\psi_{A \leftarrow C} = \frac{\Phi}{\Delta T} - U_1 \cdot b_1 - U_2 \cdot b_2 = \frac{9,446}{20,000} - 0,199 \cdot 1,515 - 0,199 \cdot 1,515 = -0,132 \text{ W/(m}\cdot\text{K)}$$

Figura 17: cálculo del puente térmico

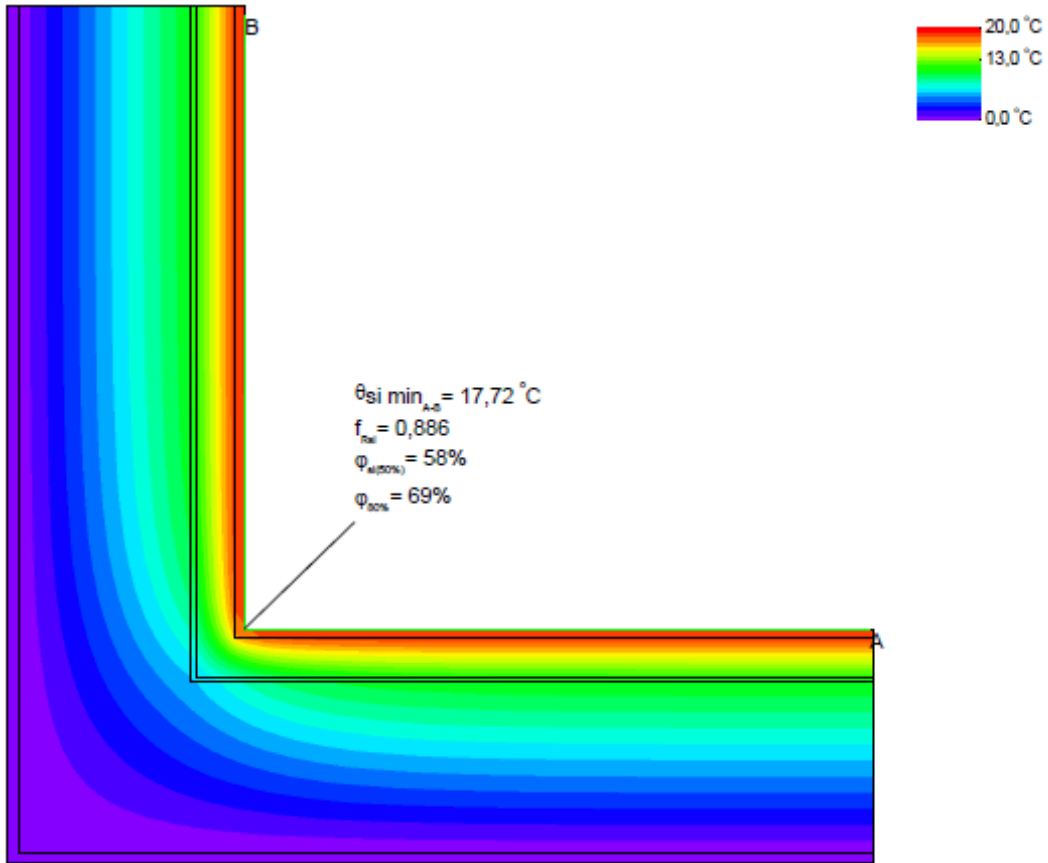


Figura 18: criterio de higiene