By: Rubén Darío Uriza Escobar

1.

	U factor (W/m2)	Difference with benchmark	%
2 panels	2.8		
2 panels gas	2.6	0.2	7.14%
2 panels with air and coating	1.8	1	35.71%
2 panels with gas and coating	1.5	1.3	46.42%
3 panels air	1.8	1	35.71%
3 panels gas	1.6	1.2	42.85%
3 panels with air and coating	1.0	1.8	64.28%
3 panels with gas and coating	0.75	2.05	73.21%

2.

West Fixed Wooden Cooling

CFwindow = U window (T Cooling – 0.46DR) = 2.84 (7.9 – 0.46 * 11.9) = 6.9 W/m2

CFwindow = U window (T Cooling – 0.46DR) + PXI * SHGS * IAC * FFs

PXI = ED + Ed=559 + 188=747

SHGC= 0.54

IAC= 1

FFs=0.56

CFwindow = 6.9 * 747 * 0.54 * 1 *0.56 = 224.72

WindowWest= CFwindow * Awindowwest = 224.72 * 14.4 = 3235.96 W

West Fixed Aluminium Cooling

CFwindow = U window (T Cooling – 0.46DR) = 3.61 (7.9 – 0.46 * 11.9) = 8.75 W/m2

CFwindow = U window (T Cooling – 0.46DR) + PXI * SHGS * IAC * FFs

PXI = ED + Ed=559 + 188=747

SHGC= 0.54

IAC= 1

FFs=0.56

CFwindow = 8.75 + (747 * 0.56 *1 * 0.56) = 243 W/m2

Windowwest = CFwindow * Awindowwest = 243 * 14.4 = 3499.33 W

West Fixed Wooden Heating

HFwindowwest = Uwindowwest + T Heating = 2.84+24.8 = 70.4 W/m2

Qwindowwest= HFwindowwest + Awindowest = 70.4 * 14.4 = 1014.2 W/m2

West Fixed Aluminum Heating

HFwindowwest = Uwindowwest + T Heating =3.61 + 24.8 =89.5 W/m2

Qwindowwest = HFwindowwest + Awindowwest =89.5 * 14.4 =1289 W

South fixed Wooden Cooling

CFwindow = Uwindow (T Cooling – 0.46DR) = 2.84 (7.9 – 0.46 * 11.9) = 6.9 W/m2

CFwindow = Uwindow (T Cooling – 0.46DR) + PXI * SHGS * IAC * FFs

SHGC= 0.54

IAC= 1

PXI = ED + Ed=348 + 209=557

FFs=0.47

CFwindow = 6.9 + (557 * 0.54 * 1* 0.47) =148.26 * 3.6 = 533.73 W

South fixed aluminum cooling

CFwindow = Uwindow (T Cooling – 0.46DR) =3.61 (7.9 – 0.46 * 11.9) =8.75 W/m2

CFwindow = Uwindow (T Cooling – 0.46DR) + PXI * SHGS * IAC * FFs

SHGC= 0.54

IAC= 1

PXI = ED + Ed=348 + 209=557

FFs=0.47

CFwindow = 8.75 + (557 * 0.56* 1 * 0.47) = 155.35 W/m2

WindowWest = CFwindow * Awindowwest = 155.35 * 3.6 = 559.2 W

South Fixed wooden heating

HFwindow south = Uwindow south * T Heating =2.84 *24.8 =70.4 W/m2

Qwindow south = HFwindow south + Awindow South = 70.4 * 3.6 = 253.4 W

South fixed aluminum heating

HFwindow south = Uwindow south * T Heating =3.61 * 24.8 =89.5 W/m2

South fixed wooden cooling

CFwindow = Uwindow (T Cooling – 0.46DR) = 2.87 (7.9 – 0.46 * 11.9) = 6.96 W/m2

CFwindow = Uwindow (T Cooling – 0.46DR) + PXI * SHGS * IAC * FFs

SHGC= 0.54

IAC= 1

PXI = ED + Ed=348 + 209=557

FFs=0.47

CFwindow = 6.96 + (557 * 0.46 * 1 * 0.47) = 127.38 W/m2

Window South = CFwindow * Awindow South = 127.38 * 3.6 = 45.58 W

South Operable Aluminum Cooling

CFwindow = Uwindow (T Cooling – 0.46DR) = 4.62 (7.9 – 0.46 * 11.9) = 11.2 W/m2

CFwindow = Uwindow (T Cooling – 0.46DR) + PXI * SHGS * IAC * FFs

SHGC= 0.54

IAC= 1

PXI = ED + Ed=348 + 209=557

FFs=0.47

CFwindow =11.2 + (557 * 0.55 * 1 * 0.47) = 155.18 W/m2

Window south = CF Window * Awindow South = 155.18 * 3.6 = 558.66 W

South Operable Wooden Heating

HFwindow south = Uwindow south * T Heating = 2.81 * 24.8 =71.17 W/m2

Qwindow south = HFwindow south + A window south = 71.17 * 3.6 = 256.2 W

South Operable Aluminum Heating

HF window south = Uwindow south * T Heating = 4.62 * 24.8 = 114.57 W/m2

Qwindow south = HF window south + Awindow south = 114.57 * 3.6 = 412.45 W