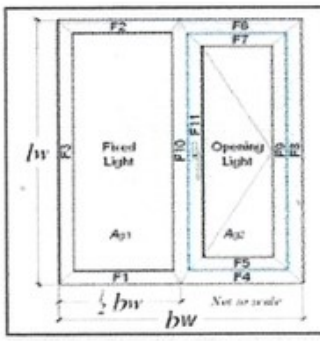


**Sample Style:**

**Casement**

**Fixed Light / Side Hung**

*Blue line illustrates opening light length (air leakage)*

Report Number: W3429 Rev A  Issue No 22.3: 04/01/2016

Report Date: 08 August 2024

Project Details: Sculp EP, Planiclear, Argon, Planitherm Total+ FG, Thermobar, Butyl

**THIS SPREADSHEET IS THE PROPERTY OF THE BFRC AND CAN ONLY BE USED IN CONJUNCTION WITH A BFRC LICENCE APPLICATION**

**Input Values:**

Yellow input, green intermediary, blue finals  X' DP is no.of decimal places to enter

| Parameter | Symbol | | Units |
|---|---|---|---|
| Total window height *0DP* | $l_w$ | 1480 | mm |
| Total window width *0DP* | $b_w$ | 1230 | mm |

| Frame offset: | No |
|---|---|

Nominal 4mm etc to *0DP*, others *1DP*

| Glazing dimensions and properties: | | | |
|---|---|---|---|
| Thickness of pane 1 | | 4 | mm |
| Pane 1/2 distance | | 20 | mm |
| Gas fill (1/2) | | Argon 90% | |
| Thickness of pane 2 | | 4 | mm |
| Complete next 3 cells for TG IGU | | | |
| Pane 2/3 distance | | | mm |
| Gas fill (2/3) | | | |
| Thickness of pane 3 | | | mm |
| Glazing Trans. - *3DP* | $U_g$ | 1.219 | W/(m²-K) |
| *g*-value - *2DP* | $g_\perp$ | 0.71 | |

| Thermal transmittance of window from hot box test | | |
|---|---|---|
| $U_w$ - *2DP* | | W/(m²-K) |

| Frame dimensions: | ($b_f$) | Frame width, $b_f$ (mm) | Gasket protrusion, $b_{gf}$ (mm) | Frame & gasket widths (mm) | |
|---|---|---|---|---|---|
| All frame values round to nearest 1mm, gaskets to *1DP* | F1 fixed sill | 57 | | 57.0 | |
| | F2 fixed head | 57 | | 57.0 | |
| | F3 fixed jamb | 57 | | 57.0 | Total |
| F4 + F5 sash sill | F4 fixed sash sill | 57 | n/a | 57.0 | 104.0 |
| | F5 moving sash sill | 47 | | 47.0 | |
| F6 + F7 sash head | F6 fixed sash head | 57 | n/a | 57.0 | 104.0 |
| | F7 moving sash head | 47 | | 47.0 | |
| F8 + F9 sash jamb | F8 Fixed sash jamb | 57 | n/a | 57.0 | 104.0 |
| | F9 moving sash jamb | 47 | | 47.0 | |
| F10 + F11 mullion | F10 fixed mullion | 67 | | 67.0 | 114.0 |
| | F11 moving mullion | 47 | | 47.0 | |
| | Total gasket area | | 0 | $m^2$ | |

| Window Dimensions: | | | Area | |
|---|---|---|---|---|
| Section | Length (m) | Width (m) | No gasket ($m^2$) | With gasket ($m^2$) |
| Fixed Light | 1.3660 | 0.5245 | 0.7165 | 0.7165 |
| Opening light | 1.2720 | 0.4305 | 0.5476 | 0.5476 |
| Total glazing, $A_g$ | | | 1.2641 | 1.2641 |
| Frame | (m) | (m) | ($m^2$) | ($m^2$) |
| F1 | 0.6150 | 0.0570 | 0.0325 | 0.0325 |
| F2 | 0.6150 | 0.0570 | 0.0325 | 0.0325 |
| F3 | 1.4800 | 0.0570 | 0.0811 | 0.0811 |
| F4 | 0.6150 | 0.0570 | 0.0325 | 0.0325 |
| F5 | 0.5245 | 0.0470 | 0.0224 | 0.0224 |
| F6 | 0.6150 | 0.0570 | 0.0325 | 0.0325 |
| F7 | 0.5245 | 0.0470 | 0.0224 | 0.0224 |
| F8 | 1.4800 | 0.0570 | 0.0811 | 0.0811 |
| F9 | 1.3660 | 0.0470 | 0.0620 | 0.0620 |
| F10 | 1.4800 | 0.0670 | 0.0953 | 0.0953 |
| F11 | 1.3660 | 0.0470 | 0.0620 | 0.0620 |
| Total Frame | | | 0.5563 | 0.5563 |
| Total Window, $A_w$ | | | 1.8204 | 1.8204 |
| Percentage fixed light glass area | | | 39.36% | 39.36% |
| Percentage opening light glass area | | | 30.08% | 30.08% |
| Percentage glass area (total) | | | 69.44% | 69.44% |

Where a *Uw* value from hot box testing is available, no $L_f^{2D}$ or $L_\psi^{2D}$ values need to be entered

| Frame conductance: | All *L* values to *4DP*. All b values to *0DP* | | | |
|---|---|---|---|---|
| | $L_f^{2D}$ W/(m·K) | $b_f$ (mm) | $L_\psi^{2D}$ W/(m·K) | $b_\psi$ (mm) |
| F1 fixed sill | 0.2557 | 190 | 0.3172 | 190 |
| F2 fixed head | 0.2557 | 190 | 0.3172 | 190 |
| F3 fixed jamb | 0.2557 | 190 | 0.3172 | 190 |
| F4 + F5 sash sill | 0.3191 | 190 | 0.3802 | 190 |
| F6 + F7 sash head | 0.3191 | 190 | 0.3802 | 190 |
| F8 + F9 sash jamb | 0.3191 | 190 | 0.3802 | 190 |
| F10 + F11 mullion | 0.5437 | 380 | 0.6666 | 380 |

| Frame: | Frame width, $b_f$ | Frame U-value, $U_f$ | Frame areas, $A_f$ | Frame heat flow, HU | Linear trans, $\Psi$ | Linear length, $l_g$ | Junction heat flow, $H\psi$ |
|---|---|---|---|---|---|---|---|
| Section | (m) | (W/(m²-K)) | ($m^2$) | (W/K) | (W/(m·K)) | (m) | (W/K) |
| F1 fixed sill | 0.0570 | 1.0487 | 0.0325 | 0.0341 | 0.0258 | 0.5245 | 0.0135 |
| F2 fixed head | 0.0570 | 1.0487 | 0.0325 | 0.0341 | 0.0258 | 0.5245 | 0.0135 |
| F3 fixed jamb | 0.0570 | 1.0487 | 0.0811 | 0.0851 | 0.0258 | 1.3660 | 0.0353 |
| F4 + F5 sash sill | 0.1040 | 1.1844 | 0.0549 | 0.0650 | 0.0254 | 0.4305 | 0.0109 |
| F6 + F7 sash head | 0.1040 | 1.1844 | 0.0549 | 0.0650 | 0.0254 | 0.4305 | 0.0109 |
| F8 + F9 sash jamb | 0.1040 | 1.1844 | 0.1431 | 0.1695 | 0.0254 | 1.2720 | 0.0323 |
| F10 + F11 mullion | 0.1140 | 1.3324 | 0.1573 | 0.2096 | 0.0514 | 1.3190 | 0.0678 |
| Totals | | | 0.5563 | 0.6624 | | Total | 0.1843 |

Other parameters needed for calculation, taken from simulations:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| $\lambda_p$ = | 0.035 | W/(m·K) | $R_{se}$ = | 0.04 | m²-K /W | $d_p$=$d_g$ = | 0.028 | m |
| $R_p$ = | 0.8000 | m²-K /W | $R_{tot}$ = | 0.9700 | m²-K /W | $R_{se}$ = | 0.13 | m²-K /W |
| | | | | | | $U_p$ = | 1.0309 | W/(m²-K) |

| Solar Factor, *g*-value: | | |
|---|---|---|
| | $F_w$ | 0.9 |
| | $g_w$ | 0.44 |

| $U_{window}$ | | | |
|---|---|---|---|
| | No bars; or attached bars | 1.31 | W/(m²-K) |
| | Single cross bar in IGU | 1.4 | |
| | Multiple cross bar in IGU | 1.5 | |
| | Glazing bar (Georgian bar) | 1.7 | |

**Air Leakage loss:**

Air leakage at 50 Pa per hour & per unit length of opening light (BS 6375-1) - *2DP*: 0.00 m³/(m·h)

| Opening light length | 3.7810 | m | Total air leakage | 0.000 | m³/h |
|---|---|---|---|---|---|
| $L_{50}$ | 0.00 | m³/(m²·h) | Heat loss = 0.0165 $L_{50}$ | 0.00 | W/(m²-K) |

Energy Window

Energy Index

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Window Rating

A

**BFRC Rating** kWh/(m²-yr)

| | | |
|---|---|---|
| ≥20 | A | ++ |
| >10 to 20 | A | + |
| 0 to <10 | A | ✓ |
| -10 to <0 | B | |
| -20 to <-10 | C | |
| -30 to <-20 | D | |
| -50 to <-30 | E | |

| BFRC Rating = 218.6$g_{window}$ - 68.5 x ($U_{window}$ + Effective $L_{50}$) = | 7.26 |
|---|---|
| Climate zone is: | UK |

| Thermal transmittance, W/(m²-K) | $U_{window}$ | 1.3 |
|---|---|---|
| Solar factor | $g_{window}$ | 0.44 |
| Window air leakage heat loss, W/(m²-K) | $L_{factor}$ | 0.00 |

BFRC

**BFRC Certified Simulator No**

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Simulator Name: Joshua Wong