

SAP 10 Calculations

SIPCO L1 + L3 + L5 (3 Bed housetype)

ECO					
	DER <ter %<="" th=""><th>DPER<tper %<="" th=""><th>DFEE<tfee %<="" th=""><th>SAP rating</th><th>CO2 emissions</th></tfee></th></tper></th></ter>	DPER <tper %<="" th=""><th>DFEE<tfee %<="" th=""><th>SAP rating</th><th>CO2 emissions</th></tfee></th></tper>	DFEE <tfee %<="" th=""><th>SAP rating</th><th>CO2 emissions</th></tfee>	SAP rating	CO2 emissions
Detached	50.04%	2.08%	1.81%	75 C	0.51 t/yr
Semi-Detached/ End-Terrace	50.14%	1.81%	-2.59%	77 C	0.46 t/yr
Mid-Terrace	50.26%	1.53%	-8.30%	80 C	0.40 t/yr

Specification based on East facing (worst case orientation)

External Walls - 0.16 W/m2K (based on 150mm SIP wall panel)

Ground Floor - 0.12 W/m2K (based on 150mm PIR) Roof - 0.15 W/m2K

Solid Door - 1.00 W/m2K Windows - 1.20 W/m2K Double glazed windows with low-e soft coating, g-value of >= 0.45 (BFRC, BSi or CERTASS data) Windows - 1.20 W/m2K Double glazed windows with low-e soft coating, g-value of >= 0.245 (BFRC, B Roof Windows - 1.10 W/m2K Double glazed windows with low-e soft coating, g-value of 0.63 Thermal Bridging - GTS calculated junctions details where applicable, otherwise default. Air Test Target - 3.00 m3/(h.m2) @ 50Pa blower door Mechanical Ventilation - Energisava 250 MVHR with efficiency of 89% and manufacturer SPF of 0.81 Lighting - All low energy lighting with a efficacy of 80 lm/W Main Heating - Electric Panel Heaters with appliance thermostats Hot Water - Dual Immersion Heater within 210L hot water cylinder (80mm foam insulation) Morte Midre Heat Reserve (MMHEP).

Waste Water Heat Recovery (WWHR) - Showersave QB1-21 linked to shower over bath

Photovoltaic Panels - 3.75 kWp based on East -facing (worst case) at 30° with none or little overshading

PERFORMANCE						
	DER <ter %<="" td=""><td>DPER<tper %<="" td=""><td>DFEE<tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee></td></tper></td></ter>	DPER <tper %<="" td=""><td>DFEE<tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee></td></tper>	DFEE <tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee>	SAP rating	CO2 emissions	
Detached	71.48%	21.18%	5.00%	81 B	0.23 t/yr	
Semi-Detached/ End-Terrace	73.97%	22.95%	0.23%	83 B	0.18 t/yr	
Mid-Terrace	76.58%	24.08%	-6.58%	85 B	0.13 t/yr	

Specification based on East facing (worst case orientation)

External Walls - 0.14 W/m2K (based on 175mm SIP wall panel) Ground Floor - 0.12 W/m2K (based on 150mm PIR)

Roof - 0.13 W/m2K

Solid Door - 1.00 W/m2K Windows - 1.20 W/m2K Double glazed windows with low-e soft coating, g-value of >= 0.45 (BFRC, BSi or CERTASS data) Roof Windows - 1.10 W/m2K Double glazed windows with low-e soft coating, g-value of 0.63

Thermal Bridging - GTS calculated junctions details where applicable, otherwise default.

Air Test Target - 3.00 m3/(h.m2) @ 50Pa blower door Mechanical Ventilation - Energisava 250 MVHR with efficiency of 89% and manufacturer SPF of 0.81

Lighting - All low energy lighting with a efficacy of 80 lm/W Main Heating - Electric Panel Heaters with appliance thermostats Hot Water - Dual Immersion Heater within 210L hot water cylinder (80mm foam insulation) Waste Water Heat Recovery (WWHR) - Showersave QB1-21 linked to shower over bath

Photovoltaic Panels - 4.50 kWp based on East -facing (worst case) at 30° with none or little overshading and export capable meter

NET ZERO					
	DER <ter %<="" td=""><td>DPER<tper %<="" td=""><td>DFEE<tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee></td></tper></td></ter>	DPER <tper %<="" td=""><td>DFEE<tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee></td></tper>	DFEE <tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee>	SAP rating	CO2 emissions
Detached	96.78%	64.78%	15.81%	92 A	-0.04 t/yr
Semi-Detached/ End-Terrace	98.63%	64.90%	11.28%	93 A	-0.05 t/yr
Mid-Terrace	101.97%	66.82%	4.54%	94 A	-0.08 t/yr

Specification based on East facing (worst case orientation)

External Walls - 0.12 W/m2K (based on 200mm SIP wall panel)

Ground Floor - 0.12 W/m2K (based on 150mm PIR)

Boof - 0.12 W/m2K (based on 150mm SIP roof panel)

Solid Door - 0.80 W/m2K Solid Door - 0.80 W/m2K Windows - 0.80 W/m2K Triple glazed windows with low-e soft coating, g-value of >= 0.45 (BFRC, BSi or CERTASS data) Nindows - 0.69 virtual: hipe glazed windows with low-e soft coating, g-value of >= 0.40 (Br Kc, Bst of Roof Windows - 1.10 WinZS Double glazed windows with low-e soft coating, g-value of 0.63 Thermal Bridging - GTS calculated junctions details where applicable, otherwise default. Air Test Target - 3.00 m3/th.m.2) (@ 30Pa blower door Mechanical Ventilation - Energisava 250 MVHR with efficiency of 89% and manufacturer SPF of 0.81 Lighting - All low energy lighting with a efficacy of 80 lm/W Main Heating - Air Source Heat Pump with how temperature of 45°C to Radiators and Time & Temp zone controls Hot Water - 210L hot water cylinder (80mm foam insulation) with supplementary top up

Photovoltaic Panels - 5.20 kWp based on East -facing (worst case) at 30° with none or little overshading and export capable meter

ULTIMATE						
	DER <ter %<="" td=""><td>DPER<tper %<="" td=""><td>DFEE<tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee></td></tper></td></ter>	DPER <tper %<="" td=""><td>DFEE<tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee></td></tper>	DFEE <tfee %<="" td=""><td>SAP rating</td><td>CO2 emissions</td></tfee>	SAP rating	CO2 emissions	
Detached	97.61%	76.49%	18.53%	95 A	-0.04 t/yr	
Semi-Detached/ End-Terrace	99.27%	77.29%	13.31%	96 A	-0.06 t/yr	
Mid-Terrace	102.28%	80.16%	5.61%	97 A	=0.09 t/vr	

Specification based on East facing (worst case orientation)

External Walls - 0.11 W/m2K (based on 225mm SIP wall panel)

Ground Floor - 0.12 W/m2K (based on 150mm PIR) Roof - 0.12 W/m2K (based on 150mm SIP roof panel)

Roof - 0.12 W/m2K (based on 150mm SIP roof panel) Solid Door - 0.80 W/m2K Windows - 0.80 W/m2K Triple glazed windows with low-e soft coating, g-value of >= 0.45 (BFRC, BSi or CERTASS data) Roof Windows - 1.10 W/m2K Double glazed windows with low-e soft coating, g-value of 0.63 Thermal Bridging - GTS calculated junctions details where applicable, otherwise default. Air Test Target - 3.00 m3/(h.m2) @ 50Pa blower door Mechanical Ventilation - Energisava 250 MVHR with efficiency of 89% and manufacturer SPF of 0.81 Lighting - All low energy lighting with a efficacy of 80 lm/W Main Heating - Air Source Heat Pump with flow temperature of 45°C to Radiators and Time & Temp zone controls Hot Water - 210L hot water cylinder (80mm foam insulation) with supplementary top up

Photovoltaic Panels - 5.20 kWp based on East -facing (worst case) at 30° with none or little overshading and export capable meter. PV linked to diverter and battery storage with 3kWh capacity