Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.5.60
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Project Information:

Assessed By: Liam Mason (STRO033679) **Building Type:** Flat

Dwelling Details:

NEW DWELLING AS BUILT Total Floor Area: 69.97m²

Site Reference : Willingale Road **Plot Reference:** 04-19-75435 PL1 P5 (apt)

Address : 1 Middleton Court, 90 Willingale Road, Loughton, IG10 2DA

Client Details:

Name: Galldris Group

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.37 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	18.24 kg/m²	OK

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	53.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	43.9 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.17 (max. 0.30)	0.17 (max. 0.70)	OK
Floor	0.10 (max. 0.25)	0.10 (max. 0.70)	OK
Roof	(no roof)		
Openings	1.29 (max. 2.00)	1.30 (max. 3.30)	OK

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	2.13	
Maximum	10.0	OK

4 Heating efficiency

Main Heating system: Database: (rev 512, product index 018907):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar 4000
Model qualifier: GR4700iW 30 C NG
(Combi)
Efficiency 89.3 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder		

6 Controls

Space heating controls	Programmer, room thermostat and TRVs		OK
Hot water controls:	No cylinder thermostat No cylinder		
Boiler interlock:	Yes		OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous extract system (decentralised)		
Specific fan power:	0.16 0.18	
Maximum	0.7	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: North West	7.72m²
Windows facing: South East	4.01m²
Ventilation rate:	3.00
Blinds/curtains:	Dark-coloured curtain or roller blind Closed 100% of daylight hours

10 Key features

Air permeablility	2.1 m³/m²h
Floors U-value	0.1 W/m²K

SAP Input

Property Details: 04-19-75435 PL1 P5 (apt)

Address:	1 Middleton Court, 90 Willingale Road, Loughton, IG10 2DA
Located in:	England
Region:	Thames valley
UPRN:	
Date of assessment:	09 September 2024
Date of certificate:	09 September 2024
Assessment type:	New dwelling as built
Transaction type:	New dwelling
Tenure type:	Unknown
Related party disclosure:	No related party
Thermal Mass Parameter:	Indicative Value Medium
Water use <= 125 litres/person/day:	True
PCDF Version:	512

Property description:

Dwelling type:	Flat	
Detachment:		
Year Completed:	2024	
Floor Location:	Floor area:	Storey height:
Floor 0	69.97 m²	2.4 m
Living area:	26.13 m² (fraction 0.373)	
Front of dwelling faces:	North West	

Opening types:

Name:	Source:	Type:	Glazing:	Argon:	Frame:
Entrance	Manufacturer	Solid			PVC-U
Front	Manufacturer	Windows	low-E, En = 0.05, soft coat	Yes	Wood
Rear	SAP 2012	Windows	low-E, En = 0.05, soft coat	Yes	Wood

Name:	**Gap:**	**Frame Factor:**	**g-value:**	**U-value:**	**Area:**	**No. of Openings:**
Entrance	mm	0.7	0	1.2	2.01	1
Front	16mm or more	0.7	0.63	1.3	7.72	1
Rear	16mm or more	0.7	0.63	1.3	4.01	1

Name:	Type-Name:	Location:	Orient:	Width:	Height:
Entrance		Brick	North West	0	0
Front		Brick	North West	0	0
Rear		Brick	South East	0	0

Overshading: Average or unknown

Opaque Elements:

Type:	Gross area:	Openings:	Net area:	U-value:	Ru value:	Curtain wall:	Kappa:
External Elements							
Brick	69.92	13.74	56.18	0.17	0	False	N/A
Corridor	14.54	0	14.54	0.16	0	False	N/A
Ground floor	69.97			0.1			N/A
Internal Elements							
Internal wall	142						N/A
Party Elements							
Party ceiling	69.97						N/A

Thermal bridges:

SAP Input

Thermal bridges:	User-defined (individual PSI-values) Y-Value = 0.0772			
	Length	**Psi-value**		
[Approved]	7.07	0.3	E2	Other lintels (including other steel lintels)
[Approved]	1.77	0.04	E3	Sill
[Approved]	22.13	0.05	E4	Jamb
[Approved]	33.52	0.16	E5	Ground floor (normal)
[Approved]	33.52	0.07	E7	Party floor between dwellings (in blocks of flats)
[Approved]	10.08	0.09	E16	Corner (normal)

Ventilation:

Pressure test: Yes (As built)

Ventilation: Decentralised whole house extract
Number of fans in Wetroom: Kitchen 1 Other 1
Ductwork: ,
Approved Installation Scheme: True

Number of chimneys: 0

Number of open flues: 0

Number of fans: 0

Number of passive stacks: 0

Number of sides sheltered: 3

Pressure test: 2.13 (Assessed dwelling is tested)

Main heating system:

Main heating system: Boiler systems with radiators or underfloor heating
Gas boilers and oil boilers
Fuel: mains gas
Info Source: Boiler Database
Database: (rev 512, product index 018907) Efficiency: Winter 87.6 % Summer: 90.2
Brand name: Worcester
Model: Greenstar 4000
Model qualifier: GR4700iW 30 C NG
(Combi boiler)
Systems with radiators
Central heating pump : 2013 or later
Design flow temperature: Unknown
Room-sealed
Boiler interlock: Yes
Delayed start

Main heating Control:

Main heating Control: Programmer, room thermostat and TRVs
Control code: 2106

Secondary heating system:

Secondary heating system: None

Water heating:

Water heating: From main heating system
Water code: 901
Fuel :mains gas
No hot water cylinder
Solar panel: False

Others:

Electricity tariff: Standard Tariff

In Smoke Control Area: Unknown

Conservatory: No conservatory

Low energy lights: 100%

Terrain type: Low rise urban / suburban

EPC language: English

SAP Input

Wind turbine:	No
Photovoltaics:	None
Assess Zero Carbon Home:	No

SAP WorkSheet: New dwelling as built

User Details:

Assessor Name:	Liam Mason	**Stroma Number:**	STRO033679
Software Name:	Stroma FSAP 2012	**Software Version:**	Version: 1.0.5.60

Property Address: 04-19-75435 PL1 P5 (apt)

Address : 1 Middleton Court, 90 Willingale Road, Loughton, IG10 2DA

1. Overall dwelling dimensions:

	Area(m²)		Av. Height(m)		Volume(m³)	
Ground floor	69.97	(1a) x	2.4	(2a) =	167.93	(3a)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)+.....(1n)	69.97	(4)				
Dwelling volume				(3a)+(3b)+(3c)+(3d)+(3e)+.....(3n) =	167.93	(5)

2. Ventilation rate:

	main heating		secondary heating		other		total		m³ per hour	
Number of chimneys	0	+	0	+	0	=	0	x 40 =	0	(6a)
Number of open flues	0	+	0	+	0	=	0	x 20 =	0	(6b)
Number of intermittent fans							0	x 10 =	0	(7a)
Number of passive vents							0	x 10 =	0	(7b)
Number of flueless gas fires							0	x 40 =	0	(7c)

Air changes per hour

Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =	0	÷ (5) =	0	(8)

If a pressurisation test has been carried out or is intended, proceed to (17), otherwise continue from (9) to (16)

Number of storeys in the dwelling (ns)		0	(9)
Additional infiltration	[(9)-1]x0.1 =	0	(10)
Structural infiltration: 0.25 for steel or timber frame or 0.35 for masonry construction		0	(11)

if both types of wall are present, use the value corresponding to the greater wall area (after deducting areas of openings); if equal user 0.35

If suspended wooden floor, enter 0.2 (unsealed) or 0.1 (sealed), else enter 0		0	(12)
If no draught lobby, enter 0.05, else enter 0		0	(13)
Percentage of windows and doors draught stripped		0	(14)
Window infiltration	0.25 - [0.2 x (14) ÷ 100] =	0	(15)
Infiltration rate	(8) + (10) + (11) + (12) + (13) + (15) =	0	(16)
Air permeability value, q50, expressed in cubic metres per hour per square metre of envelope area		2.13000011444092	(17)
If based on air permeability value, then	(18) = [(17) ÷ 20]+(8), otherwise (18) = (16)	0.11	(18)

Air permeability value applies if a pressurisation test has been done or a degree air permeability is being used

Number of sides sheltered		3	(19)
Shelter factor	(20) = 1 - [0.075 x (19)] =	0.78	(20)
Infiltration rate incorporating shelter factor	(21) = (18) x (20) =	0.08	(21)

Infiltration rate modified for monthly wind speed

Monthly average wind speed from Table 7

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
(22)m=	5.1	5	4.9	4.4	4.3	3.8	3.8	3.7	4	4.3	4.5	4.7

Wind Factor (22a)m = (22)m ÷ 4

(22a)m=	1.27	1.25	1.23	1.1	1.08	0.95	0.95	0.92	1	1.08	1.12	1.18

SAP WorkSheet: New dwelling as built

Adjusted infiltration rate (allowing for shelter and wind speed) = (21a) x (22a)m

0.11	0.1	0.1	0.09	0.09	0.08	0.08	0.08	0.08	0.09	0.09	0.1

Calculate effective air change rate for the applicable case

If mechanical ventilation: 0.5 (23a)

If exhaust air heat pump using Appendix N, (23b) = (23a) × Fmv (equation (N5)) , otherwise (23b) = (23a) 0.5 (23b)

If balanced with heat recovery: efficiency in % allowing for in-use factor (from Table 4h) = 0 (23c)

a) If balanced mechanical ventilation with heat recovery (MVHR) (24a)m = (22b)m + (23b) × [1 – (23c) ÷ 100]

(24a)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24a)

b) If balanced mechanical ventilation without heat recovery (MV) (24b)m = (22b)m + (23b)

(24b)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24b)

c) If whole house extract ventilation or positive input ventilation from outside

if (22b)m < 0.5 × (23b), then (24c) = (23b); otherwise (24c) = (22b) m + 0.5 × (23b)

(24c)m=	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	(24c)

d) If natural ventilation or whole house positive input ventilation from loft

if (22b)m = 1, then (24d)m = (22b)m otherwise (24d)m = 0.5 + [(22b)m² x 0.5]

(24d)m=	0	0	0	0	0	0	0	0	0	0	0	0	(24d)

Effective air change rate - enter (24a) or (24b) or (24c) or (24d) in box (25)

(25)m=	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	(25)

3. Heat losses and heat loss parameter:

ELEMENT	Gross area (m²)	Openings m²	Net Area A ,m²		U-value W/m2K		A X U (W/K)	k-value kJ/m²·K	A X k kJ/K	
Doors			2.01	x	1.2	=	2.412			(26)
Windows Type 1			7.72	x1/[1/(1.3)+ 0.04]		=	9.54			(27)
Windows Type 2			4.01	x1/[1/(1.3)+ 0.04]		=	4.96			(27)
Floor			69.97	x	0.1	=	6.997			(28)
Walls Type1	69.92	13.74	56.18	x	0.17	=	9.55			(29)
Walls Type2	14.54	0	14.54	x	0.16	=	2.33			(29)
Total area of elements, m²			154.43							(31)
Party ceiling			69.97							(32b)
Internal wall **			142							(32c)

** for windows and roof windows, use effective window U-value calculated using formula 1/[(1/U-value)+0.04] as given in paragraph 3.2*

*** include the areas on both sides of internal walls and partitions*

Fabric heat loss, W/K = S (A x U) (26)…(30) + (32) = 35.78 (33)

Heat capacity Cm = S(A x k) ((28)…(30) + (32) + (32a)…(32e) = 12868.05 (34)

Thermal mass parameter (TMP = Cm ÷ TFA) in kJ/m²K Indicative Value: Medium 250 (35)

For design assessments where the details of the construction are not known precisely the indicative values of TMP in Table 1f can be used instead of a detailed calculation.

Thermal bridges : S (L x Y) calculated using Appendix K 11.92 (36)

if details of thermal bridging are not known (36) = 0.05 x (31)

Total fabric heat loss (33) + (36) = 47.7 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 × (25)m x (5)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(38)m=	27.71	27.71	27.71	27.71	27.71	27.71	27.71	27.71	27.71	27.71	27.71	27.71	(38)

Heat transfer coefficient, W/K (39)m = (37) + (38)m

(39)m=	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	75.4	

Average = $Sum(39)_{1…12}$ /12= 75.4 (39)

Heat loss parameter (HLP), W/m²K (40)m = (39)m ÷ (4)

(40)m=	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08

Average = Sum(40)$_{1…12}$ /12= 1.08 (40)

Number of days in month (Table 1a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(41)m=	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirement: kWh/year:

Assumed occupancy, N 2.25 (42)
if TFA > 13.9, N = 1 + 1.76 x [1 - exp(-0.000349 x (TFA -13.9)2)] + 0.0013 x (TFA -13.9)
if TFA £ 13.9, N = 1

Annual average hot water usage in litres per day Vd,average = (25 x N) + 36 87.53 (43)
Reduce the annual average hot water usage by 5% if the dwelling is designed to achieve a water use target of not more that 125 litres per person per day (all water use, hot and cold)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Hot water usage in litres per day for each month Vd,m = factor from Table 1c x (43)												
(44)m=	96.28	92.78	89.28	85.78	82.28	78.78	78.78	82.28	85.78	89.28	92.78	96.28

Total = Sum(44)$_{1…12}$ = 1050.34 (44)

Energy content of hot water used - calculated monthly = 4.190 x Vd,m x nm x DTm / 3600 kWh/month (see Tables 1b, 1c, 1d)

(45)m=	142.78	124.88	128.86	112.35	107.8	93.02	86.2	98.91	100.1	116.65	127.33	138.28

Total = Sum(45)$_{1…12}$ = 1377.16 (45)

If instantaneous water heating at point of use (no hot water storage), enter 0 in boxes (46) to (61)

(46)m=	21.42	18.73	19.33	16.85	16.17	13.95	12.93	14.84	15.01	17.5	19.1	20.74	(46)

Water storage loss:

Storage volume (litres) including any solar or WWHRS storage within same vessel 0 (47)

If community heating and no tank in dwelling, enter 110 litres in (47)

Otherwise if no stored hot water (this includes instantaneous combi boilers) enter '0' in (47)

Water storage loss:

a) If manufacturer's declared loss factor is known (kWh/day): 0 (48)

Temperature factor from Table 2b 0 (49)

Energy lost from water storage, kWh/year (48) x (49) = 0 (50)

b) If manufacturer's declared cylinder loss factor is not known:

Hot water storage loss factor from Table 2 (kWh/litre/day) 0 (51)

If community heating see section 4.3

Volume factor from Table 2a 0 (52)

Temperature factor from Table 2b 0 (53)

Energy lost from water storage, kWh/year (47) x (51) x (52) x (53) = 0 (54)

Enter (50) or (54) in (55) 0 (55)

Water storage loss calculated for each month ((56)m = (55) × (41)m

(56)m=	0	0	0	0	0	0	0	0	0	0	0	0	(56)

If cylinder contains dedicated solar storage, (57)m = (56)m x [(50) – (H11)] ÷ (50), else (57)m = (56)m where (H11) is from Appendix H

(57)m=	0	0	0	0	0	0	0	0	0	0	0	0	(57)

Primary circuit loss (annual) from Table 3 0 (58)

Primary circuit loss calculated for each month (59)m = (58) ÷ 365 × (41)m

(modified by factor from Table H5 if there is solar water heating and a cylinder thermostat)

(59)m=	0	0	0	0	0	0	0	0	0	0	0	0	(59)

Combi loss calculated for each month (61)m = (60) ÷ 365 × (41)m

(61)m=	28.44	25.69	28.43	27.51	28.42	27.5	28.42	28.42	27.51	28.43	27.52	28.44	(61)

Total heat required for water heating calculated for each month (62)m = 0.85 × (45)m + (46)m + (57)m + (59)m + (61)m

(62)m=	171.22	150.57	157.3	139.86	136.22	120.52	114.61	127.33	127.6	145.08	154.85	166.72	(62)

Solar DHW input calculated using Appendix G or Appendix H (negative quantity) (enter '0' if no solar contribution to water heating)

(add additional lines if FGHRS and/or WWHRS applies, see Appendix G)

(63)m=	0	0	0	0	0	0	0	0	0	0	0	0	(63)

Output from water heater

(64)m=	171.22	150.57	157.3	139.86	136.22	120.52	114.61	127.33	127.6	145.08	154.85	166.72	

Output from water heater (annual)$_{1...12}$ 1711.89 (64)

Heat gains from water heating, kWh/month 0.25 ´ [0.85 × (45)m + (61)m] + 0.8 x [(46)m + (57)m + (59)m]

(65)m=	54.59	47.94	49.96	44.23	42.95	37.81	35.76	39.99	40.16	45.89	49.22	53.09	(65)

include (57)m in calculation of (65)m only if cylinder is in the dwelling or hot water is from community heating

5. Internal gains (see Table 5 and 5a):

Metabolic gains (Table 5), Watts

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(66)m=	134.72	134.72	134.72	134.72	134.72	134.72	134.72	134.72	134.72	134.72	134.72	134.72	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5													
(67)m=	45.45	40.37	32.83	24.86	18.58	15.69	16.95	22.03	29.57	37.55	43.82	46.72	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5													
(68)m=	294.37	297.42	289.73	273.34	252.65	233.21	220.22	217.17	224.87	241.25	261.94	281.38	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5													
(69)m=	50.72	50.72	50.72	50.72	50.72	50.72	50.72	50.72	50.72	50.72	50.72	50.72	(69)
Pumps and fans gains (Table 5a)													
(70)m=	3	3	3	3	3	3	3	3	3	3	3	3	(70)
Losses e.g. evaporation (negative values) (Table 5)													
(71)m=	-89.82	-89.82	-89.82	-89.82	-89.82	-89.82	-89.82	-89.82	-89.82	-89.82	-89.82	-89.82	(71)
Water heating gains (Table 5)													
(72)m=	73.37	71.34	67.14	61.43	57.73	52.51	48.07	53.76	55.78	61.69	68.36	71.35	(72)
Total internal gains = (66)m + (67)m + (68)m + (69)m + (70)m + (71)m + (72)m													
(73)m=	511.81	507.76	488.33	458.25	427.58	400.03	383.87	391.58	408.84	439.11	472.74	498.08	(73)

6. Solar gains:

Solar gains are calculated using solar flux from Table 6a and associated equations to convert to the applicable orientation.

Orientation:	Access Factor Table 6d		Area m²		Flux Table 6a		g_ Table 6b		FF Table 6c		Gains (W)	
Southeast 0.9x	0.77	x	4.01	x	36.79	x	0.63	x	0.7	=	45.09	(77)
Southeast 0.9x	0.77	x	4.01	x	62.67	x	0.63	x	0.7	=	76.81	(77)
Southeast 0.9x	0.77	x	4.01	x	85.75	x	0.63	x	0.7	=	105.09	(77)
Southeast 0.9x	0.77	x	4.01	x	106.25	x	0.63	x	0.7	=	130.21	(77)
Southeast 0.9x	0.77	x	4.01	x	119.01	x	0.63	x	0.7	=	145.85	(77)

Southeast 0.9x	0.77	x	4.01	x	118.15	x	0.63	x	0.7	=	144.79	(77)
Southeast 0.9x	0.77	x	4.01	x	113.91	x	0.63	x	0.7	=	139.6	(77)
Southeast 0.9x	0.77	x	4.01	x	104.39	x	0.63	x	0.7	=	127.93	(77)
Southeast 0.9x	0.77	x	4.01	x	92.85	x	0.63	x	0.7	=	113.79	(77)
Southeast 0.9x	0.77	x	4.01	x	69.27	x	0.63	x	0.7	=	84.89	(77)
Southeast 0.9x	0.77	x	4.01	x	44.07	x	0.63	x	0.7	=	54.01	(77)
Southeast 0.9x	0.77	x	4.01	x	31.49	x	0.63	x	0.7	=	38.59	(77)
Northwest 0.9x	0.77	x	7.72	x	11.28	x	0.63	x	0.7	=	26.62	(81)
Northwest 0.9x	0.77	x	7.72	x	22.97	x	0.63	x	0.7	=	54.19	(81)
Northwest 0.9x	0.77	x	7.72	x	41.38	x	0.63	x	0.7	=	97.63	(81)
Northwest 0.9x	0.77	x	7.72	x	67.96	x	0.63	x	0.7	=	160.33	(81)
Northwest 0.9x	0.77	x	7.72	x	91.35	x	0.63	x	0.7	=	215.52	(81)
Northwest 0.9x	0.77	x	7.72	x	97.38	x	0.63	x	0.7	=	229.76	(81)
Northwest 0.9x	0.77	x	7.72	x	91.1	x	0.63	x	0.7	=	214.94	(81)
Northwest 0.9x	0.77	x	7.72	x	72.63	x	0.63	x	0.7	=	171.35	(81)
Northwest 0.9x	0.77	x	7.72	x	50.42	x	0.63	x	0.7	=	118.96	(81)
Northwest 0.9x	0.77	x	7.72	x	28.07	x	0.63	x	0.7	=	66.22	(81)
Northwest 0.9x	0.77	x	7.72	x	14.2	x	0.63	x	0.7	=	33.5	(81)
Northwest 0.9x	0.77	x	7.72	x	9.21	x	0.63	x	0.7	=	21.74	(81)

Solar gains in watts, calculated for each month (83)m = Sum(74)m …(82)m

(83)m=	71.71	130.99	202.72	290.54	361.36	374.56	354.53	299.28	232.75	151.11	87.5	60.33	(83)

Total gains – internal and solar (84)m = (73)m + (83)m , watts

(84)m=	583.53	638.76	691.04	748.8	788.95	774.59	738.4	690.86	641.59	590.22	560.25	558.4	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (°C) | 21 | (85)

Utilisation factor for gains for living area, h1,m (see Table 9a)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(86)m=	0.99	0.98	0.97	0.91	0.79	0.6	0.45	0.5	0.74	0.93	0.98	0.99	(86)

Mean internal temperature in living area T1 (follow steps 3 to 7 in Table 9c)

(87)m=	20.07	20.2	20.42	20.69	20.89	20.98	21	20.99	20.94	20.68	20.32	20.03	(87)

Temperature during heating periods in rest of dwelling from Table 9, Th2 (°C)

(88)m=	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	20.02	(88)

Utilisation factor for gains for rest of dwelling, h2,m (see Table 9a)

(89)m=	0.99	0.98	0.96	0.88	0.73	0.52	0.35	0.39	0.66	0.91	0.98	0.99	(89)

Mean internal temperature in the rest of dwelling T2 (follow steps 3 to 7 in Table 9c)

(90)m=	19.19	19.32	19.53	19.78	19.95	20.01	20.02	20.02	19.99	19.78	19.44	19.15	(90)

fLA = Living area ÷ (4) = | 0.37 | (91)

Mean internal temperature (for the whole dwelling) = fLA × T1 + (1 – fLA) × T2

(92)m=	19.52	19.65	19.86	20.12	20.3	20.37	20.38	20.38	20.34	20.12	19.77	19.48	(92)

Apply adjustment to the mean internal temperature from Table 4e, where appropriate

SAP WorkSheet: New dwelling as built

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
(93)m=	19.37	19.5	19.71	19.97	20.15	20.22	20.23	20.23	20.19	19.97	19.62	19.33	(93)

8. Space heating requirement

Set Ti to the mean internal temperature obtained at step 11 of Table 9b, so that Ti,m=(76)m and re-calculate the utilisation factor for gains using Table 9a

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Utilisation factor for gains, hm:														
(94)m=	0.99	0.98	0.95	0.88	0.74	0.54	0.37	0.42	0.68	0.91	0.97	0.99		(94)
Useful gains, hmGm , W = (94)m x (84)m														
(95)m=	575.08	623.24	657.15	661.24	583.82	415.85	273.08	287.29	434.15	534.89	545.32	551.85		(95)
Monthly average external temperature from Table 8														
(96)m=	4.3	4.9	6.5	8.9	11.7	14.6	16.6	16.4	14.1	10.6	7.1	4.2		(96)
Heat loss rate for mean internal temperature, Lm , W =[(39)m x [(93)m– (96)m]														
(97)m=	1136.39	1100.86	996.3	834.63	637.34	423.91	273.98	288.96	459.52	706.43	943.97	1140.74		(97)
Space heating requirement for each month, kWh/month = 0.024 x [(97)m – (95)m] x (41)m														
(98)m=	417.62	320.96	252.32	124.84	39.82	0	0	0	0	127.62	287.03	438.14		
										Total per year (kWh/year) = Sum(98)$_{1...5,9...12}$ =			2008.35	(98)

Space heating requirement in kWh/m²/year | 28.7 | (99)

9a. Energy requirements – Individual heating systems including micro-CHP)

Space heating:

Fraction of space heat from secondary/supplementary system		0	(201)
Fraction of space heat from main system(s)	(202) = 1 – (201) =	1	(202)
Fraction of total heating from main system 1	(204) = (202) × [1 – (203)] =	1	(204)
Efficiency of main space heating system 1		90.2	(206)
Efficiency of secondary/supplementary heating system, %		0	(208)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	kWh/year	
Space heating requirement (calculated above)														
	417.62	320.96	252.32	124.84	39.82	0	0	0	0	127.62	287.03	438.14		
(211)m = {[(98)m x (204)] } x 100 ÷ (206)														(211)
	462.99	355.83	279.74	138.41	44.15	0	0	0	0	141.49	318.22	485.74		
									Total (kWh/year) =Sum(211)$_{1...5,10...12}$=				2226.55	(211)
Space heating fuel (secondary), kWh/month = {[(98)m x (201)] } x 100 ÷ (208)														
(215)m=	0	0	0	0	0	0	0	0	0	0	0	0		
									Total (kWh/year) =Sum(215)$_{1...5,10...12}$=				0	(215)

Water heating

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
Output from water heater (calculated above)														
	171.22	150.57	157.3	139.86	136.22	120.52	114.61	127.33	127.6	145.08	154.85	166.72		
Efficiency of water heater													87.6	(216)
(217)m=	89.43	89.35	89.18	88.81	88.17	87.6	87.6	87.6	87.6	88.8	89.27	89.47		(217)
Fuel for water heating, kWh/month (219)m = (64)m x 100 ÷ (217)m														
(219)m=	191.47	168.51	176.37	157.48	154.49	137.58	130.84	145.36	145.66	163.38	173.46	186.34		
									Total = Sum(219a)$_{1...12}$ =				1930.95	(219)

Annual totals	**kWh/year**	**kWh/year**
Space heating fuel used, main system 1		2226.55

SAP WorkSheet: New dwelling as built

Water heating fuel used			1930.95	
Electricity for pumps, fans and electric keep-hot				
mechanical ventilation - balanced, extract or positive input from outside		43.71		(230a)
central heating pump:		30		(230c)
boiler with a fan-assisted flue		45		(230e)
Total electricity for the above, kWh/year	sum of (230a)…(230g) =		118.71	(231)
Electricity for lighting			321.08	(232)
Total delivered energy for all uses (211)...(221) + (231) + (232)...(237b) =			4597.29	(338)

10a. Fuel costs - individual heating systems:

	Fuel kWh/year	**Fuel Price** (Table 12)		**Fuel Cost** £/year	
Space heating - main system 1	(211) x	3.48	x 0.01 =	77.48	(240)
Space heating - main system 2	(213) x	0	x 0.01 =	0	(241)
Space heating - secondary	(215) x	13.19	x 0.01 =	0	(242)
Water heating cost (other fuel)	(219)	3.48	x 0.01 =	67.2	(247)
Pumps, fans and electric keep-hot	(231)	13.19	x 0.01 =	15.66	(249)

(if off-peak tariff, list each of (230a) to (230g) separately as applicable and apply fuel price according to Table 12a

Energy for lighting	(232)	13.19	x 0.01 =	42.35	(250)
Additional standing charges (Table 12)				120	(251)

Appendix Q items: repeat lines (253) and (254) as needed

Total energy cost	(245)...(247) + (250)…(254) =	322.69	(255)

11a. SAP rating - individual heating systems

Energy cost deflator (Table 12)		0.42	(256)
Energy cost factor (ECF)	[(255) x (256)] ÷ [(4) + 45.0] =	1.18	(257)
SAP rating (Section 12)		83.56	(258)

12a. CO2 emissions – Individual heating systems including micro-CHP

	Energy kWh/year	**Emission factor** kg CO2/kWh		**Emissions** kg CO2/year	
Space heating (main system 1)	(211) x	0.216	=	480.94	(261)
Space heating (secondary)	(215) x	0.519	=	0	(263)
Water heating	(219) x	0.216	=	417.09	(264)
Space and water heating	(261) + (262) + (263) + (264) =			898.02	(265)
Electricity for pumps, fans and electric keep-hot	(231) x	0.519	=	61.61	(267)
Electricity for lighting	(232) x	0.519	=	166.64	(268)
Total CO2, kg/year		sum of (265)…(271) =		1126.27	(272)
CO2 emissions per m²		(272) ÷ (4) =		16.1	(273)

SAP WorkSheet: New dwelling as built

EI rating (section 14)				87	(274)

13a. Primary Energy

	Energy kWh/year	**Primary** factor		**P. Energy** kWh/year	
Space heating (main system 1)	(211) x	1.22	=	2716.39	(261)
Space heating (secondary)	(215) x	3.07	=	0	(263)
Energy for water heating	(219) x	1.22	=	2355.76	(264)
Space and water heating	(261) + (262) + (263) + (264) =			5072.16	(265)
Electricity for pumps, fans and electric keep-hot	(231) x	3.07	=	364.43	(267)
Electricity for lighting	(232) x	0	=	985.71	(268)
‘Total Primary Energy		sum of (265)…(271) =		6422.3	(272)
Primary energy kWh/m²/year		(272) ÷ (4) =		91.79	(273)

SAP 2012 Overheating Assessment

Calculated by Stroma FSAP 2012 program, produced and printed on 09 September 2024

Property Details: 04-19-75435 PL1 P5 (apt)

Dwelling type:	Flat
Located in:	England
Region:	Thames valley
Cross ventilation possible:	Yes
Number of storeys:	1
Front of dwelling faces:	North West
Overshading:	Average or unknown
Overhangs:	None
Thermal mass parameter:	Indicative Value Medium
Night ventilation:	False
Blinds, curtains, shutters:	Dark-coloured curtain or roller blind
Ventilation rate during hot weather (ach):	3 (Windows open half the time)

Overheating Details:

Summer ventilation heat loss coefficient:	166.25	**(P1)**
Transmission heat loss coefficient:	47.7	
Summer heat loss coefficient:	213.95	**(P2)**

Overhangs:

Orientation:	**Ratio:**	**Z_overhangs:**
North West (Front)	0	1
South East (Rear)	0	1

Solar shading:

Orientation:	**Z blinds:**	**Solar access:**	**Overhangs:**	**Z summer:**	
North West (Front)	0.85	0.9	1	0.76	**(P8)**
South East (Rear)	0.85	0.9	1	0.76	**(P8)**

Solar gains:

Orientation		**Area**	**Flux**	**g_**	**FF**	**Shading**	**Gains**	
North West (Front)	0.9 x	7.72	98.85	0.63	0.7	0.76	231.69	
South East (Rear)	0.9 x	4.01	119.92	0.63	0.7	0.76	146.01	
						Total	377.71	**(P3/P4)**

Internal gains:

	June	**July**	**August**	
Internal gains	397.03	380.87	388.58	
Total summer gains	800.43	758.57	714.34	**(P5)**
Summer gain/loss ratio	3.74	3.55	3.34	**(P6)**
Mean summer external temperature (Thames valley)	16	17.9	17.8	
Thermal mass temperature increment	0.25	0.25	0.25	
Threshold temperature	19.99	21.7	21.39	**(P7)**
Likelihood of high internal temperature	**Not significant**	**Slight**	**Slight**	

Assessment of likelihood of high internal temperature: Slight