

SUMMARY FOR INPUT DATA

Calculation Type: Conversion (As Designed)

Property Reference	Flat 1 Derby Road				Issued on Date	19/07/2021
Assessment Reference	Notional		Prop Type Ref			
Property	Flat 1, 7 Derby Road, Leek, ST13 6HN					
SAP Rating	69 C	DER	N/A	TER	N/A	
Environmental	78 C	% DER<TER	N/A			
CO ₂ Emissions (t/year)	1.09	DFEE	N/A	TFEE	N/A	
General Requirements Compliance	N/A	% DFEE<TFEE	N/A			
Assessor Details	Mr. William Linley, A-Rated Energy Services, Tel: 07976 408446, info@-ratedenergy.co.uk				Assessor ID	p977-0001
Client						

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Orientation	South
Property Tenure	Owner-occupied
Transaction Type	New dwelling
Terrain Type	Urban
1.0 Property Type	Flat, Detached
2.0 Number of Storeys	1
3.0 Date Built	2021
4.0 Sheltered Sides	4
5.0 Sunlight/Shade	Average or unknown

6.0 Measurements

	Heat Loss Perimeter	Internal Floor Area	Average Storey Height
Ground Floor:	21.05 m	20.75 m ²	2.90 m

7.0 Living Area	15.03	m ²
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8.0 Thermal Mass Parameter	Precise calculation	
Thermal Mass	120.6	kJ/m ² K

9.0 External Walls

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Gross Area (m ²)	Nett Area (m ²)
External Wall 1	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.30	9.00	47.71	45.00
Wall To Corridor	Solid Wall	Solid wall : plasterboard on dabs, insulation, any outside structure	0.30	9.00	13.34	11.45

9.2 Internal Walls

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Internal Wall 1	Other	75.00	12.76

10.1 Party Ceilings

Description	Construction	Kappa (kJ/m ² K)	Area (m ²)
Party Ceilings 1	Timber I-joists, carpeted	20.00	20.75

11.0 Heat Loss Floors

Description	Type	Construction	U-Value (W/m ² K)	Kappa (kJ/m ² K)	Area (m ²)
Exposed	Exposed Floor - Timber	Timber exposed floor, insulation between joists	0.25	20.00	20.75

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12.0 Opening Types

Description	Data Source	Type	Glazing	Glazing Gap	Argon Filled	G-value	Frame Type	Frame Factor	U Value (W/m²K)
Door to Corridor	Manufacturer	Door to Corridor							1.80
New Glazing	Manufacturer	Window	Double Low-E Soft 0.05			0.63		0.70	1.60

13.0 Openings

Name	Opening Type	Location	Orientation	Curtain Type	Overhang Ratio	Wide Overhang	Width (m)	Height (m)	Count	Area (m²)	Curtain Closed
Front	Door to Corridor	[2] Wall To Corridor	South							1.89	
Rear	Window	[1] External Wall 1	North	None	0.00					1.75	
Side	Window	[1] External Wall 1	East	None	0.00					0.96	

14.0 Conservatory

None

15.0 Draught Proofing

100 %

16.0 Draught Lobby

Yes

17.0 Thermal Bridging

Default

Y-value

0.150 W/m²K

18.0 Pressure Testing

No

19.0 Mechanical Ventilation

Summer Overheating

Windows open in hot weather Windows fully open

Cross ventilation possible Yes

Night Ventilation Yes

Air change rate 6.00

Mechanical Ventilation

Mechanical Ventilation System Present No

20.0 Fans, Open Fireplaces, Flues

	MHS	SHS	Other	Total
Number of Chimneys	0		0	0
Number of open flues	0		0	0
Number of intermittent fans				2
Number of passive vents				0
Number of flueless gas fires				0

21.0 Fixed Cooling System

No

22.0 Lighting

Internal

Total number of light fittings 8

Total number of L.E.L. fittings 6

Percentage of L.E.L. fittings 75.00 %

External

External lights fitted Yes

Light and motion sensor Yes

23.0 Electricity Tariff

Standard

24.0 Main Heating 1

Manufacturer

Percentage of Heat 100 %

Main Heating BGB

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SAP Code	102	
Efficiency (Sedbuk 2009)	88.0	%
Model Name		
Manufacturer		
Controls	CBE Programmer, room thermostat and TRVs	
PCDF Controls	0	
Delayed Start Stat	Yes	
Sap Code	2106	
Burner Control	On/Off	
Flue Type	None or Unknown	
Fan Assisted Flue	Yes	
Is MHS Pumped	Pump in heated space	
Heat Emitter	Radiators	
Flow Temperature	Normal (> 45°C)	
25.0 Main Heating 2	None	

Community Heating	None
28.0 Water Heating	HES Instantaneous at point of use
Water Heating	Independent
Flue Gas Heat Recovery System	No
Waste Water Heat Recovery Instantaneous System 1	No
Waste Water Heat Recovery Instantaneous System 2	No
Waste Water Heat Recovery Storage System	No
Solar Panel	No
Water use <= 125 litres/person/day	No
SAP Code	909

29.0 Hot Water Cylinder	None
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Recommendations

Lower cost measures

None

Further measures to achieve even higher standards

None

U-VALUE CALCULATOR REPORT

Property Reference	Flat 1 Derby Road	Issued on Date	19/07/2021
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Assessor Details	Mr. William Linley, A-Rated Energy Services, Tel: 07976 408446, info@ratedenergy.co.uk	Assessor ID	p977-0001
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Building Elements

Wall 000002

Wall Type: Standard Wall

Layer	Description	Thickness (mm)	Conductivity (W/m ² K)	Resistance (m ² K/W)	Fraction (%)	Density (kg/m ³)	Heat Cap. (J/kgK)
Ext surface				0.0400			
Layer 1	Plaster, standard						
	Main construction	15	0.4000	0.0375	100.00		
Layer 2	Brick, outer leaf						
	Main construction	100	0.7700	0.1299	82.81		
	Main construction	100	0.9407	0.1063	17.19		
Layer 3	Plaster, standard						
	Main construction	15	0.4000	0.0375	100.00		
Layer 4	Celotex PL4065 [77.5mm]						
	Main construction	77.5	0.0258	3.0000	100.00	30	1400
	Corrections - Air Gap: Level 1, Fasteners: None or plastic						
Int surface				0.1300			

Total resistance: Upper limit = 3.371 m² K/W Lower limit = 3.370 m² K/W Average = 3.370 m² K/W
Total correction = 0.0079 m² K/W U-value (unrounded) = 0.3 W/m² K

Unheated space: None

Total thickness: 208 mm

U-value: 0.30 W/m² K

Kappa: 0.00 kJ/m² K

PREDICTED ENERGY ASSESSMENT

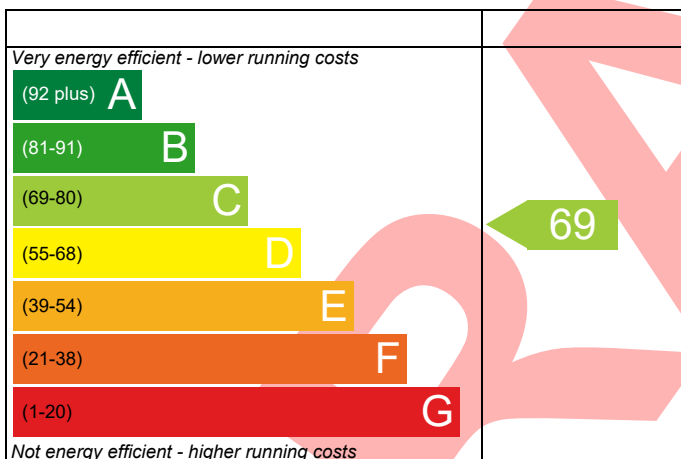
Flat 1, 7 Derby Road,
Leek,
ST13 6HN

Dwelling type: Flat, Detached
Date of assessment: 19/07/2021
Produced by: A-Rated Energy Services
Total floor area: 20.75 m²

This document is a Predicted Energy Assessment for properties marketed when they are incomplete. It includes a predicted energy rating which might not represent the final energy rating of the property on completion. Once the property is completed, this rating will be updated and an official Energy Performance Certificate will be created for the property. This will include more detailed information about the energy performance of the completed property.

The energy performance has been assessed using the Government approved SAP2012 methodology and is rated in terms of the energy use per square meter of floor area; the energy efficiency is based on fuel costs and the environmental impact is based on carbon dioxide (CO₂) emissions.

Energy Efficiency Rating

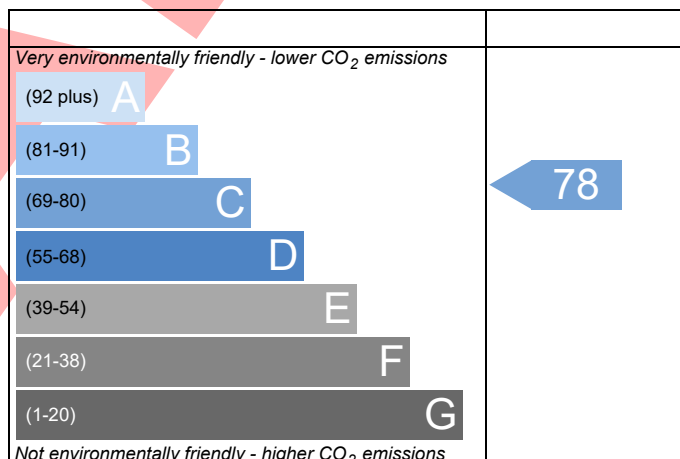


England

EU Directive
2002/91/EC

The energy efficiency rating is a measure of the overall efficiency of a home. The higher the rating the more energy efficient the home is and the lower the fuel bills are likely to be.

Environmental Impact (CO₂) Rating



England

EU Directive
2002/91/EC

The environmental impact rating is a measure of a home's impact on the environment in terms of carbon dioxide (CO₂) emissions. The higher the rating the less impact it has on the environment.

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

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CALCULATION OF HEAT DEMAND 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Designed) (Version 9.92, January 2014)
CALCULATION OF HEAT DEMAND 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	20.7500 (1b)	x 2.9000 (2b)	= 60.1750 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	20.7500		(3a)+(3b)+(3c)+(3d)+(3e)...(3n) = 60.1750 (5)
Dwelling volume			

2. Ventilation rate

	main heating	secondary heating	other	total	m3 per hour
Number of chimneys	0	0	0	0 * 40 =	0.0000 (6a)
Number of open flues	0	0	0	0 * 20 =	0.0000 (6b)
Number of intermittent fans				2 * 10 =	20.0000 (7a)
Number of passive vents				0 * 10 =	0.0000 (7b)
Number of flueless gas fires				0 * 40 =	0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =				20.0000 / (5) =	0.3324 (8)
Pressure test					No
Measured/design AP50					15.0000
Infiltration rate					1.0824 (18)
Number of sides sheltered					4 (19)
Shelter factor			(20) = 1 - [0.075 x (19)] =		0.7000 (20)
Infiltration rate adjusted to include shelter factor			(21) = (18) x (20) =		0.7577 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.1000	4.2000	4.1000	3.6000	3.7000	3.3000	3.1000	3.1000	3.2000	3.5000	3.7000	3.9000 (22)
Wind factor	1.0250	1.0500	1.0250	0.9000	0.9250	0.8250	0.7750	0.7750	0.8000	0.8750	0.9250	0.9750 (22a)
Adj infilt rate	0.7766	0.7955	0.7766	0.6819	0.7008	0.6251	0.5872	0.5872	0.6061	0.6629	0.7008	0.7387 (22b)
Effective ac	0.8016	0.8164	0.8016	0.7325	0.7456	0.6954	0.6724	0.6724	0.6837	0.7197	0.7456	0.7728 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Door to Corridor			1.8900	1.8000	3.4020		(26)
New Glazing (Uw = 1.60)			2.7100	1.5038	4.0752		(27)
Exposed			20.7500	0.1250	2.5938	20.0000	415.0000 (28b)
External Wall 1	47.7100	2.7100	45.0000	0.3000	13.5000	9.0000	405.0000 (29a)
Wall To Corridor	13.3400	1.8900	11.4500	0.2679	3.0670	9.0000	103.0500 (29a)
Total net area of external elements Aum(A, m ²)			81.8000				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =	26.6379			(33)
Party Ceilings 1			20.7500			20.0000	415.0000 (32b)
Internal Wall 1			12.7600			75.0000	957.0000 (32c)
Heat capacity Cm = Sum (A x k)					(28)...(30) + (32) + (32a)...(32e) =		2295.0500 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							110.6048 (35)
Thermal bridges (Default value 0.150 * total exposed area)							12.2700 (36)
Total fabric heat loss					(33) + (36) =		38.9079 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	15.9170	16.2127	15.9170	14.5455	14.8056	13.8082	13.3522	13.3522	13.5766	14.2926	14.8056	15.3470 (38)

FULL SAP CALCULATION PRINTOUT

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CALCULATION OF HEAT DEMAND 09 Jan 2014

Average =	Sum(39)m / 12 =	54.8249	55.1206	54.8249	53.4534	53.7135	52.7161	52.2601	52.2601	52.4845	53.2005	53.7135	54.2549 (39)
													53.5689 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
HLP (average)	2.6422	2.6564	2.6422	2.5761	2.5886	2.5405	2.5186	2.5186	2.5294	2.5639	2.5886	2.6147	(40)
Days in month													(40)
	31	28	31	30	31	30	31	31	30	31	30	31	(41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy													1.0375 (42)
Average daily hot water use (litres/day)													61.9373 (43)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	68.1310	65.6535	63.1760	60.6986	58.2211	55.7436	55.7436	58.2211	60.6986	63.1760	65.6535	68.1310	(44)
Energy content (annual)	101.0363	88.3670	91.1869	79.4989	76.2811	65.8248	60.9963	69.9942	70.8302	82.5457	90.1051	97.8483	(45)
Distribution loss (46)m = 0.15 x (45)m	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(46)
Water storage loss:													
Total storage loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(56)
If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(57)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(59)
Total heat required for water heating calculated for each month	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711	(62)
Solar input	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(63)
Solar input (sum of months) = Sum(63)m =													0.0000 (63)
Output from w/h	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711	(64)
Total per year (kWh/year) = Sum(64)m =													828.3377 (64)
RHI water heating demand													828 (64)
Heat gains from water heating, kWh/month	21.4702	18.7780	19.3772	16.8935	16.2097	13.9878	12.9617	14.8738	15.0514	17.5410	19.1473	20.7928	(65)

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	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	23.4523	20.8301	16.9402	12.8248	9.5867	8.0935	8.7453	11.3675	15.2574	19.3728	22.6109	24.1041	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	115.3395	116.5364	113.5203	107.0995	98.9944	91.3767	86.2876	85.0907	88.1068	94.5276	102.6328	110.2505	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	(71)
Water heating gains (Table 5)	28.8578	27.9434	26.0446	23.4632	21.7873	19.4275	17.4217	19.9916	20.9047	23.5766	26.5935	27.9473	(72)
Total internal gains	233.6619	231.3222	222.5174	209.3998	196.3806	184.9099	178.4668	182.4621	190.2812	203.4892	217.8494	228.3141	(73)

6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2		g Specific data or Table 6b		FF Specific data or Table 6c		Access factor Table 6d		Gains W
North				1.7500	10.1716		0.6300		0.7000		0.7700		5.4400 (74)
East				0.9600	18.8263		0.6300		0.7000		0.7700		5.5234 (76)
Solar gains	10.9634	21.6649	36.2096	57.8714	71.6591	77.5694	73.0912	59.8600	44.1414	26.6472	13.7175	9.4376	(83)
Total gains	244.6253	252.9871	258.7270	267.2712	268.0398	262.4793	251.5580	242.3221	234.4226	230.1364	231.5670	237.7517	(84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Th1 (C)													21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	11.6282	11.5658	11.6282	11.9265	11.8688	12.0934	12.1989	12.1989	12.1467	11.9832	11.8688	11.7503	
alpha	1.7752	1.7711	1.7752	1.7951	1.7913	1.8062	1.8133	1.8133	1.8098	1.7989	1.7913	1.7834	
util living area	0.9326	0.9262	0.9109	0.8785	0.8316	0.7543	0.6866	0.7088	0.8061	0.8823	0.9188	0.9352 (86)	
MIT	17.0653	17.2322	17.7547	18.5423	19.2868	19.9982	20.3637	20.3004	19.7516	18.8162	17.8553	17.0612 (87)	
Th 2	18.9396	18.9316	18.9396	18.9769	18.9698	18.9973	19.0100	19.0100	19.0038	18.9839	18.9698	18.9550 (88)	
util rest of house	0.9189	0.9109	0.8907	0.8471	0.7784	0.6574	0.5400	0.5711	0.7296	0.8467	0.8994	0.9220 (89)	
MIT 2	15.5946	15.7543	16.2740	17.0647	17.7734	18.4377	18.7460	18.7021	18.2357	17.3436	16.3950	15.6003 (90)	
Living area fraction									fLA = Living area / (4) =			0.7243 (91)	
MIT	16.6599	16.8247	17.3465	18.1350	18.8696	19.5681	19.9178	19.8598	19.3337	18.4103	17.4527	16.6585 (92)	
Temperature adjustment												-0.1500	
adjusted MIT	16.5099	16.6747	17.1965	17.9850	18.7196	19.4181	19.7678	19.7098	19.1837	18.2603	17.3027	16.5085 (93)	

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8. Space heating requirement

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Utilisation	0.8964	0.8877	0.8675	0.8270	0.7702	0.6818	0.6052	0.6283	0.7381	0.8299	0.8775	0.8999	(94)
Useful gains	219.2777	224.5840	224.4349	221.0315	206.4337	178.9561	152.2452	152.2403	173.0379	190.9937	203.1994	213.9530	(95)
Ext temp.	3.5000	4.0000	5.7000	8.2000	11.0000	13.8000	15.5000	15.3000	13.1000	9.7000	6.3000	3.5000	(96)
Heat loss rate W													
	713.2647	698.6393	630.2969	523.0407	414.6475	296.1621	223.0339	230.4560	319.3010	455.4103	590.9954	705.7752	(97)
Month fracti	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating kWh													
	367.5264	318.5652	301.9613	217.4466	154.9110	0.0000	0.0000	0.0000	0.0000	196.7259	279.2131	365.9157	(98)
Space heating													
RHI space heating demand												2202.2653	(98)
												2202	(98)

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF ENERGY RATINGS 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Designed) (Version 9.92, January 2014)
CALCULATION OF ENERGY RATINGS 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	20.7500 (1b)	x 2.9000 (2b)	= 60.1750 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	20.7500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 60.1750 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m ³ per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent fans					2 * 10 = 20.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans	= (6a)+(6b)+(7a)+(7b)+(7c) =				Air changes per hour
Pressure test					20.0000 / (5) = 0.3324 (8)
Measured/design AP50					No
Infiltration rate					15.0000
Number of sides sheltered					1.0824 (18)
					4 (19)
Shelter factor	(20) = 1 - [0.075 x (19)] =				0.7000 (20)
Infiltration rate adjusted to include shelter factor	(21) = (18) x (20) =				0.7577 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	5.1000	5.0000	4.9000	4.4000	4.3000	3.8000	3.8000	3.7000	4.0000	4.3000	4.5000	4.7000 (22)
Wind factor	1.2750	1.2500	1.2250	1.1000	1.0750	0.9500	0.9500	0.9250	1.0000	1.0750	1.1250	1.1750 (22a)
Adj infilt rate												
Effective ac	0.9660	0.9471	0.9281	0.8334	0.8145	0.7198	0.7198	0.7008	0.7577	0.8145	0.8524	0.8902 (22b)
	0.9666	0.9485	0.9307	0.8473	0.8317	0.7590	0.7590	0.7456	0.7870	0.8317	0.8633	0.8963 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Door to Corridor			1.8900	1.8000	3.4020		(26)
New Glazing (Uw = 1.60)			2.7100	1.5038	4.0752		(27)
Exposed			20.7500	0.1250	2.5938	20.0000	415.0000 (28b)
External Wall 1	47.7100	2.7100	45.0000	0.3000	13.5000	9.0000	405.0000 (29a)
Wall To Corridor	13.3400	1.8900	11.4500	0.2679	3.0670	9.0000	103.0500 (29a)
Total net area of external elements Aum(A, m ²)			81.8000				(31)
Fabric heat loss, W/K = Sum (A x U)				(26)...(30) + (32) =	26.6379		(33)
Party Ceilings 1			20.7500			30.0000	622.5000 (32b)
Internal Wall 1			12.7600			75.0000	957.0000 (32c)
Heat capacity Cm = Sum(A x k)						(28)...(30) + (32) + (32a)...(32e) =	2502.5500 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							120.6048 (35)
Thermal bridges (Default value 0.150 * total exposed area)							12.2700 (36)
Total fabric heat loss						(33) + (36) =	38.9079 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	19.1943	18.8345	18.4818	16.8254	16.5155	15.0727	15.0727	14.8056	15.6285	16.5155	17.1424	17.7979 (38)
Heat transfer coeff	58.1022	57.7424	57.3897	55.7333	55.4234	53.9806	53.9806	53.7135	54.5364	55.4234	56.0503	56.7058 (39)
Average = Sum(39)m / 12 =												55.7318 (39)
HLP	2.8001	2.7828	2.7658	2.6859	2.6710	2.6015	2.6015	2.5886	2.6283	2.6710	2.7012	2.7328 (40)
HLP (average)												2.6859 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												1.0375 (42)
Average daily hot water use (litres/day)												61.9373 (43)
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Daily hot water use	68.1310	65.6535	63.1760	60.6986	58.2211	55.7436	55.7436	58.2211	60.6986	63.1760	65.6535	68.1310 (44)
Energy conte	101.0363	88.3670	91.1869	79.4989	76.2811	65.8248	60.9963	69.9942	70.8302	82.5457	90.1051	97.8483 (45)
Energy content (annual)												974.5149 (45)
Distribution loss (46)m = 0.15 x (45)m												
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Water storage loss:												
Total storage loss												

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If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Total heat required for water heating calculated for each month	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Solar input	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711 (62)
Output from w/h	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Heat gains from water heating, kWh/month	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711 (64)
	21.4702	18.7780	19.3772	16.8935	16.2097	13.9878	12.9617	14.8738	15.0514	17.5410	19.1473	20.7928 (65)

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)
(66)m	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	23.4523	20.8301	16.9402	12.8248	9.5867	8.0935	8.7453	11.3675	15.2574	19.3728	22.6109	24.1041	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	115.3395	116.5364	113.5203	107.0995	98.9944	91.3767	86.2876	85.0907	88.1068	94.5276	102.6328	110.2505	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	(71)
Water heating gains (Table 5)	28.8578	27.9434	26.0446	23.4632	21.7873	19.4275	17.4217	19.9916	20.9047	23.5766	26.5935	27.9473	(72)
Total internal gains	233.6619	231.3222	222.5174	209.3998	196.3806	184.9099	178.4668	182.4621	190.2812	203.4892	217.8494	228.3141	(73)

6. Solar gains

[Jan]					Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b		FF Specific data or Table 6c	Access factor Table 6d		Gains W
North					1.7500	10.6334	0.6300		0.7000	0.7700		5.6870
East					0.9600	19.6403	0.6300		0.7000	0.7700		5.7622 (76)
Solar gains	11.4492	22.1402	37.0312	56.7376	73.1398	76.7437	72.2755	59.4631	43.7943	26.3124	14.2004	9.4795 (83)
Total gains	245.1111	253.4625	259.5486	266.1374	269.5204	261.6536	250.7423	241.9252	234.0754	229.8016	232.0499	237.7936 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (C)													21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	11.9643	12.0389	12.1128	12.4729	12.5426	12.8778	12.8778	12.9419	12.7466	12.5426	12.4023	12.2589	
alpha	1.7976	1.8026	1.8075	1.8315	1.8362	1.8585	1.8585	1.8628	1.8498	1.8362	1.8268	1.8173	
util living area	0.9356	0.9282	0.9129	0.8812	0.8275	0.7359	0.6324	0.6575	0.7882	0.8800	0.9206	0.9385	(86)
MIT	17.2763	17.4967	17.9855	18.7312	19.4866	20.1957	20.5848	20.5357	19.9974	19.0634	18.0935	17.2775	(87)
Th 2	18.8533	18.8626	18.8717	18.9152	18.9235	18.9625	18.9625	18.9698	18.9474	18.9235	18.9068	18.8895	(88)
util rest of house	0.9209	0.9114	0.8906	0.8464	0.7657	0.6155	0.4254	0.4628	0.6878	0.8380	0.8991	0.9246	(89)
MIT 2	15.7382	15.9604	16.4465	17.1980	17.9195	18.5709	18.8528	18.8323	18.4071	17.5325	16.5777	15.7608	(90)
Living area fraction	16.8523	17.0732	17.5612	18.3086	19.0546	19.7478	20.1073	20.0661	19.5590	18.6414	17.6756	16.8594	(92)
Temperature adjustment	16.7023	16.9232	17.4112	18.1586	18.9046	19.5978	19.9573	19.9161	19.4090	18.4914	17.5256	16.7094	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.9001	0.8902	0.8698	0.8299	0.7650	0.6601	0.5415	0.5681	0.7156	0.8264	0.8796	0.9044	(94)
Ext temp.	220.6361	225.6403	225.7675	220.8661	206.1826	172.7098	135.7847	137.4287	167.4974	189.9179	204.1093	215.0564	(95)
Heat loss rate W	4.3000	4.9000	6.5000	8.9000	11.7000	14.6000	16.6000	16.4000	14.1000	10.6000	7.1000	4.2000	(96)
Month fracti	720.6020	694.2505	626.1927	516.0101	399.3021	269.7831	181.2315	188.8634	289.5345	437.3665	584.3591	709.3567	(97)
Space heating kWh	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating	371.9746	314.9060	297.9163	212.5037	143.6809	0.0000	0.0000	0.0000	0.0000	184.1018	273.7799	367.7594	(98)
Space heating per m2												2166.6227	(98)
												104.4156	(99)

8c. Space cooling requirement

Not applicable

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CALCULATION OF ENERGY RATINGS 09 Jan 2014

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

Fraction of space heat from secondary/supplementary system (Table 11)	0.0000 (201)											
Fraction of space heat from main system(s)	1.0000 (202)											
Efficiency of main space heating system 1 (in %)	88.9000 (206)											
Efficiency of secondary/supplementary heating system, %	0.0000 (208)											
Space heating requirement	2437.1459 (211)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Space heating requirement	371.9746	314.9060	297.9163	212.5037	143.6809	0.0000	0.0000	0.0000	0.0000	184.1018	273.7799	367.7594 (98)
Space heating efficiency (main heating system 1)	88.9000	88.9000	88.9000	88.9000	88.9000	0.0000	0.0000	0.0000	0.0000	88.9000	88.9000	88.9000 (210)
Space heating fuel (main heating system)	418.4192	354.2250	335.1140	239.0367	161.6209	0.0000	0.0000	0.0000	0.0000	207.0886	307.9639	413.6776 (211)
Water heating requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (215)
Water heating requirement	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711 (64)
Efficiency of water heater (217)m	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000 (216)
Fuel for water heating, kWh/month	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711 (219)
Water heating fuel used												828.3377 (219)
Annual totals kWh/year												
Space heating fuel - main system												2437.1459 (211)
Space heating fuel - secondary												0.0000 (215)
Electricity for pumps and fans:												
central heating pump												30.0000 (230c)
main heating flue fan												45.0000 (230e)
Total electricity for the above, kWh/year												75.0000 (231)
Electricity for lighting (calculated in Appendix L)												165.6697 (232)
Total delivered energy for all uses												3506.1532 (238)

10a. Fuel costs - using Table 12 prices

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2437.1459	3.4800	84.8127 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	828.3377	13.1900	109.2577 (247)
Pumps and fans for heating	75.0000	13.1900	9.8925 (249)
Energy for lighting	165.6697	13.1900	21.8518 (250)
Additional standing charges			120.0000 (251)
Total energy cost			345.8147 (255)

11a. SAP rating - Individual heating systems

Energy cost deflator (Table 12):		0.4200 (256)
Energy cost factor (ECF)	[(255) x (256)] / [(4) + 45.0] =	2.2090 (257)
SAP value		69.1844
SAP rating (Section 12)		69 (258)
SAP band		C

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating - main system 1	2437.1459	0.2160	526.4235 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	828.3377	0.5190	429.9072 (264)
Space and water heating			956.3308 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	165.6697	0.5190	85.9826 (268)
Total kg/year			1081.2383 (272)
CO2 emissions per m2			52.1100 (273)
EI value			77.9641
EI rating			78 (274)
EI band			C

Calculation of stars for heating and DHW

Main heating energy efficiency	$3.48 \times (1 + 0.29 \times 0.00) / 0.8890 = 3.915$, stars = 4
Main heating environmental impact	$0.216 \times (1 + 0.29 \times 0.00) / 0.8890 = 0.2430$, stars = 4
Water heating energy efficiency	$13.19 / 1.0000 = 13.190$, stars = 1
Water heating environmental impact	$0.519 / 1.0000 = 0.5190$, stars = 2

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CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Designed) (Version 9.92, January 2014)
CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

1. Overall dwelling dimensions

	Area (m ²)	Storey height (m)	Volume (m ³)
Ground floor	20.7500 (1b)	x 2.9000 (2b)	= 60.1750 (1b) - (3b)
Total floor area TFA = (1a)+(1b)+(1c)+(1d)+(1e)...(1n)	20.7500		(4)
Dwelling volume		(3a)+(3b)+(3c)+(3d)+(3e)...(3n)	= 60.1750 (5)

2. Ventilation rate

	main heating	secondary heating	other	total	m3 per hour
Number of chimneys	0	+	0	=	0 * 40 = 0.0000 (6a)
Number of open flues	0	+	0	=	0 * 20 = 0.0000 (6b)
Number of intermittent fans					2 * 10 = 20.0000 (7a)
Number of passive vents					0 * 10 = 0.0000 (7b)
Number of flueless gas fires					0 * 40 = 0.0000 (7c)
Infiltration due to chimneys, flues and fans = (6a)+(6b)+(7a)+(7b)+(7c) =					20.0000 / (5) = 0.3324 (8)
Pressure test					No
Measured/design AP50					15.0000
Infiltration rate					1.0824 (18)
Number of sides sheltered					4 (19)
Shelter factor					(20) = 1 - [0.075 x (19)] = 0.7000 (20)
Infiltration rate adjusted to include shelter factor					(21) = (18) x (20) = 0.7577 (21)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Wind speed	4.1000	4.2000	4.1000	3.6000	3.7000	3.3000	3.1000	3.1000	3.2000	3.5000	3.7000	3.9000 (22)
Wind factor	1.0250	1.0500	1.0250	0.9000	0.9250	0.8250	0.7750	0.7750	0.8000	0.8750	0.9250	0.9750 (22a)
Adj infilt rate	0.7766	0.7955	0.7766	0.6819	0.7008	0.6251	0.5872	0.5872	0.6061	0.6629	0.7008	0.7387 (22b)
Effective ac	0.8016	0.8164	0.8016	0.7325	0.7456	0.6954	0.6724	0.6724	0.6837	0.7197	0.7456	0.7728 (25)

3. Heat losses and heat loss parameter

Element	Gross m ²	Openings m ²	NetArea m ²	U-value W/m ² K	A x U W/K	K-value kJ/m ² K	A x K kJ/K
Door to Corridor			1.8900	1.8000	3.4020		(26)
New Glazing (Uw = 1.60)			2.7100	1.5038	4.0752		(27)
Exposed			20.7500	0.1250	2.5938	20.0000	415.0000 (28b)
External Wall 1	47.7100	2.7100	45.0000	0.3000	13.5000	9.0000	405.0000 (29a)
Wall To Corridor	13.3400	1.8900	11.4500	0.2679	3.0670	9.0000	103.0500 (29a)
Total net area of external elements Aum(A, m ²)			81.8000				(31)
Fabric heat loss, W/K = Sum (A x U)			(26)...(30) + (32) =	26.6379			(33)
Party Ceilings 1			20.7500			30.0000	622.5000 (32b)
Internal Wall 1			12.7600			75.0000	957.0000 (32c)
Heat capacity Cm = Sum (A x k)							(28)...(30) + (32) + (32a)...(32e) = 2502.5500 (34)
Thermal mass parameter (TMP = Cm / TFA) in kJ/m ² K							120.6048 (35)
Thermal bridges (Default value 0.150 * total exposed area)							12.2700 (36)
Total fabric heat loss							(33) + (36) = 38.9079 (37)

Ventilation heat loss calculated monthly (38)m = 0.33 x (25)m x (5)												
(38)m	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Heat transfer coeff	15.9170	16.2127	15.9170	14.5455	14.8056	13.8082	13.3522	13.3522	13.5766	14.2926	14.8056	15.3470 (38)
Average = Sum(39)m / 12 =	54.8249	55.1206	54.8249	53.4534	53.7135	52.7161	52.2601	52.2601	52.4845	53.2005	53.7135	54.2549 (39)
												53.5689 (39)
HLP	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HLP (average)	2.6422	2.6564	2.6422	2.5761	2.5886	2.5405	2.5186	2.5186	2.5294	2.5639	2.5886	2.6147 (40)
Days in month	31	28	31	30	31	30	31	31	30	31	30	31 (41)

4. Water heating energy requirements (kWh/year)

Assumed occupancy												
Average daily hot water use (litres/day)												1.0375 (42)
												61.9373 (43)
Daily hot water use	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Energy conte	68.1310	65.6535	63.1760	60.6986	58.2211	55.7436	55.7436	58.2211	60.6986	63.1760	65.6535	68.1310 (44)
Energy content (annual)	101.0363	88.3670	91.1869	79.4989	76.2811	65.8248	60.9963	69.9942	70.8302	82.5457	90.1051	97.8483 (45)
Distribution loss (46)m = 0.15 x (45)m												974.5149 (45)
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (46)
Water storage loss:												
Total storage loss												

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If cylinder contains dedicated solar storage	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (56)
Primary loss	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (57)
Total heat required for water heating calculated for each month	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (59)
Solar input	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711 (62)
Output from w/h	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000 (63)
Heat gains from water heating, kWh/month	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711 (64)
	21.4702	18.7780	19.3772	16.8935	16.2097	13.9878	12.9617	14.8738	15.0514	17.5410	19.1473	20.7928 (65)

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)
(66)m	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	62.2495	(66)
Lighting gains (calculated in Appendix L, equation L9 or L9a), also see Table 5	23.4523	20.8301	16.9402	12.8248	9.5867	8.0935	8.7453	11.3675	15.2574	19.3728	22.6109	24.1041	(67)
Appliances gains (calculated in Appendix L, equation L13 or L13a), also see Table 5	115.3395	116.5364	113.5203	107.0995	98.9944	91.3767	86.2876	85.0907	88.1068	94.5276	102.6328	110.2505	(68)
Cooking gains (calculated in Appendix L, equation L15 or L15a), also see Table 5	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	42.2624	(69)
Pumps, fans	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	3.0000	(70)
Losses e.g. evaporation (negative values) (Table 5)	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	-41.4997	(71)
Water heating gains (Table 5)	28.8578	27.9434	26.0446	23.4632	21.7873	19.4275	17.4217	19.9916	20.9047	23.5766	26.5935	27.9473	(72)
Total internal gains	233.6619	231.3222	222.5174	209.3998	196.3806	184.9099	178.4668	182.4621	190.2812	203.4892	217.8494	228.3141	(73)

6. Solar gains

[Jan]				Area m2	Solar flux Table 6a W/m2	g Specific data or Table 6b	FF Specific data or Table 6c	Access factor Table 6d	Gains W			
North				1.7500	10.1716	0.6300	0.7000	0.7700	5.4400 (74)			
East				0.9600	18.8263	0.6300	0.7000	0.7700	5.5234 (76)			
Solar gains	10.9634	21.6649	36.2096	57.8714	71.6591	77.5694	73.0912	59.8600	44.1414	26.6472	13.7175	9.4376 (83)
Total gains	244.6253	252.9871	258.7270	267.2712	268.0398	262.4793	251.5580	242.3221	234.4226	230.1364	231.5670	237.7517 (84)

7. Mean internal temperature (heating season)

Temperature during heating periods in the living area from Table 9, Thl (C)													21.0000 (85)
Utilisation factor for gains for living area, nil,m (see Table 9a)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
tau	12.6795	12.6115	12.6795	13.0048	12.9419	13.1867	13.3018	13.3018	13.2449	13.0667	12.9419	12.8127	
alpha	1.8453	1.8408	1.8453	1.8670	1.8628	1.8791	1.8868	1.8868	1.8830	1.8711	1.8628	1.8542	
util living area	0.9389	0.9328	0.9182	0.8870	0.8410	0.7642	0.6962	0.7186	0.8159	0.8907	0.9259	0.9414	(86)
MIT	17.1977	17.3592	17.8672	18.6342	19.3556	20.0452	20.3978	20.3363	19.8052	18.8978	17.9655	17.1949	(87)
Th 2	18.9396	18.9316	18.9396	18.9769	18.9698	18.9973	19.0100	19.0100	19.0038	18.9839	18.9698	18.9550	(88)
util rest of house	0.9259	0.9182	0.8987	0.8563	0.7883	0.6666	0.5473	0.5789	0.7395	0.8560	0.9072	0.9288	(89)
MIT 2	15.7092	15.8637	16.3691	17.1399	17.8261	18.4690	18.7646	18.7226	18.2736	17.4084	16.4878	15.7161	(90)
Living area fraction	16.7874	16.9470	17.4542	18.2223	18.9339	19.6107	19.9476	19.8915	19.3830	18.4872	17.5582	16.7873	(92)
Temperature adjustment	16.6374	16.7970	17.3042	18.0723	18.7839	19.4607	19.7976	19.7415	19.2330	18.3372	17.4082	16.6373	(93)

8. Space heating requirement

Utilisation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Useful gains	0.9056	0.8973	0.8778	0.8384	0.7822	0.6936	0.6160	0.6394	0.7504	0.8413	0.8876	0.9090	(94)
Ext temp.	221.5337	227.0028	227.1028	224.0893	209.6664	182.0682	154.9580	154.9505	175.9022	193.6203	205.5313	216.1189	(95)
Heat loss rate W	3.5000	4.0000	5.7000	8.2000	11.0000	13.8000	15.5000	15.3000	13.1000	9.7000	6.3000	3.5000	(96)
Month fracti	720.2557	705.3758	636.2009	527.7068	418.1028	298.4108	224.5909	232.1115	321.8878	459.5055	596.6590	712.7611	(97)
Space heating kWh	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000	1.0000	1.0000	1.0000	(97a)
Space heating	371.0492	321.4666	304.3689	218.6046	155.0767	0.0000	0.0000	0.0000	0.0000	197.8185	281.6120	369.5018	(98)
Space heating per m2												2219.4982	(98)
												106.9638	(99)

8c. Space cooling requirement

Not applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

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

Fraction of space heat from secondary/supplementary system (Table 11)													0.0000 (201)
Fraction of space heat from main system(s)													1.0000 (202)
Efficiency of main space heating system 1 (in %)													88.9000 (206)
Efficiency of secondary/supplementary heating system, %													0.0000 (208)
Space heating requirement													2496.6234 (211)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Space heating requirement	371.0492	321.4666	304.3689	218.6046	155.0767	0.0000	0.0000	0.0000	0.0000	197.8185	281.6120	369.5018	(98)
Space heating efficiency (main heating system 1)	88.9000	88.9000	88.9000	88.9000	88.9000	0.0000	0.0000	0.0000	0.0000	88.9000	88.9000	88.9000	(210)
Space heating fuel (main heating system)	417.3781	361.6047	342.3722	245.8994	174.4394	0.0000	0.0000	0.0000	0.0000	222.5181	316.7739	415.6375	(211)
Water heating requirement	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	(215)
Water heating requirement	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711	(64)
Efficiency of water heater (217)m	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	(216)
Fuel for water heating, kWh/month	85.8809	75.1120	77.5088	67.5741	64.8389	55.9511	51.8469	59.4951	60.2056	70.1639	76.5893	83.1711	(219)
Water heating fuel used												828.3377	(219)
Annual totals kWh/year													
Space heating fuel - main system												2496.6234	(211)
Space heating fuel - secondary												0.0000	(215)
Electricity for pumps and fans:													
central heating pump												30.0000	(230c)
main heating flue fan												45.0000	(230e)
Total electricity for the above, kWh/year												75.0000	(231)
Electricity for lighting (calculated in Appendix L)												165.6697	(232)
Total delivered energy for all uses												3565.6308	(238)

10a. Fuel costs - using BEDF prices (479)

	Fuel kWh/year	Fuel price p/kWh	Fuel cost £/year
Space heating - main system 1	2496.6234	3.7400	93.3737 (240)
Space heating - secondary	0.0000	0.0000	0.0000 (242)
Water heating (other fuel)	828.3377	19.1200	158.3782 (247)
Pumps and fans for heating	75.0000	19.1200	14.3400 (249)
Energy for lighting	165.6697	19.1200	31.6760 (250)
Additional standing charges			94.0000 (251)
Total energy cost			391.7679 (255)

12a. Carbon dioxide emissions - Individual heating systems including micro-CHP

	Energy kWh/year	Emission factor kg CO2/kWh	Emissions kg CO2/year
Space heating - main system 1	2496.6234	0.2160	539.2707 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	828.3377	0.5190	429.9072 (264)
Space and water heating			969.1779 (265)
Pumps and fans	75.0000	0.5190	38.9250 (267)
Energy for lighting	165.6697	0.5190	85.9826 (268)
Total kg/year			1094.0855 (272)

13a. Primary energy - Individual heating systems including micro-CHP

	Energy kWh/year	Primary energy factor kg CO2/kWh	Primary energy kWh/year
Space heating - main system 1	2496.6234	1.2200	3045.8806 (261)
Space heating - secondary	0.0000	0.0000	0.0000 (263)
Water heating (other fuel)	828.3377	3.0700	2542.9966 (264)
Space and water heating			5588.8772 (265)
Pumps and fans	75.0000	3.0700	230.2500 (267)
Energy for lighting	165.6697	3.0700	508.6059 (268)
Primary energy kWh/year			6327.7331 (272)
Primary energy kWh/m2/year			304.9510 (273)

SAP 2012 EPC IMPROVEMENTS

Current energy efficiency rating: C 69
Current environmental impact rating: C 78

(For testing purposes):

A Not considered
B Not considered
C Not considered

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY 09 Jan 2014

D		Not considered
E	Low energy lighting	Already installed
F		Not considered
G		Not considered
H		Not considered
I		Not considered
J		Not considered
K		Not considered
M		Not considered
N	Solar water heating	Not applicable
O		Not considered
P		Not considered
R		Not considered
S		Not considered
T		Not considered
U	Solar photovoltaic panels	Not applicable
A2		Not considered
A3		Not considered
T2		Not considered
W		Not considered
X		Not considered
Y		Not considered
J2		Not considered
Q2		Not considered
Z1		Not considered
Z2		Not considered
Z3		Not considered
Z4		Not considered
Z5		Not considered
V2	Wind turbine	Not applicable
L2		Not considered
Q3		Not considered
O3		Not considered

Recommended measures: SAP change Cost change CO2 change
(none)

Recommended measures (none)	Typical annual savings	Energy efficiency	Environmental impact
	Total Savings £0		0.00 kg/m²

Potential energy efficiency rating: C 69
Potential environmental impact rating: C 78

Fuel prices for cost data on this page from database revision number 479 TEST (30 Jun 2021)
Recommendation texts revision number 4.9c (22 Feb 2014)

Typical heating and lighting costs of this home (per year, Thames Valley):			
	Current	Potential	Saving
Electricity	£204	£204	£0
Mains gas	£187	£187	£0
Space heating	£202	£202	£0
Water heating	£158	£158	£0
Lighting	£32	£32	£0
Total cost of fuels	£391	£391	£0
Total cost of uses	£392	£392	£0
Delivered energy	172 kWh/m²	172 kWh/m²	0 kWh/m²
Carbon dioxide emissions	1.1 tonnes	1.1 tonnes	0.0 tonnes
CO2 emissions per m²	53 kg/m²	53 kg/m²	0 kg/m²
Primary energy	305 kWh/m²	305 kWh/m²	0 kWh/m²

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Designed) (Version 9.92, January 2014)
CALCULATION OF ENERGY RATINGS FOR IMPROVED DWELLING 09 Jan 2014

No improvements selected / applicable

FULL SAP CALCULATION PRINTOUT

Calculation Type: Conversion (As Designed)

CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

SAP 2012 WORKSHEET FOR Conversion (As Designed) (Version 9.92, January 2014)
CALCULATION OF EPC COSTS, EMISSIONS AND PRIMARY ENERGY FOR IMPROVED DWELLING 09 Jan 2014

No improvements selected / applicable

CONDENSATION RISK ANALYSIS

Property Reference	Flat 1 Derby Road	Issued on Date	19/07/2021
Assessment Reference	Notional	Prop Type Ref	
Project	Flat 1, 7 Derby Road, Leek, ST13 6HN		
Calculation Type	Conversion (As Designed)		
SAP Rating	69 C	DER	N/A
Environmental	78 C	% DER<TER	N/A
CO ₂ Emissions (t/year)	1.09	DFEE	N/A
General Requirements Compliance	N/A	% DFEE<TFEE	N/A
Assessor Details	Mr. William Linley, A-Rated Energy Services, Tel: 07976 408446, info@ratedenergy.co.uk		Assessor ID
Client	p977-0001		

Wall - 000002

Environmental conditions

External conditions	Temperature:	5 °C	Relative Humidity:	95 %
Internal conditions	Temperature:	15 °C	Relative Humidity:	65 %

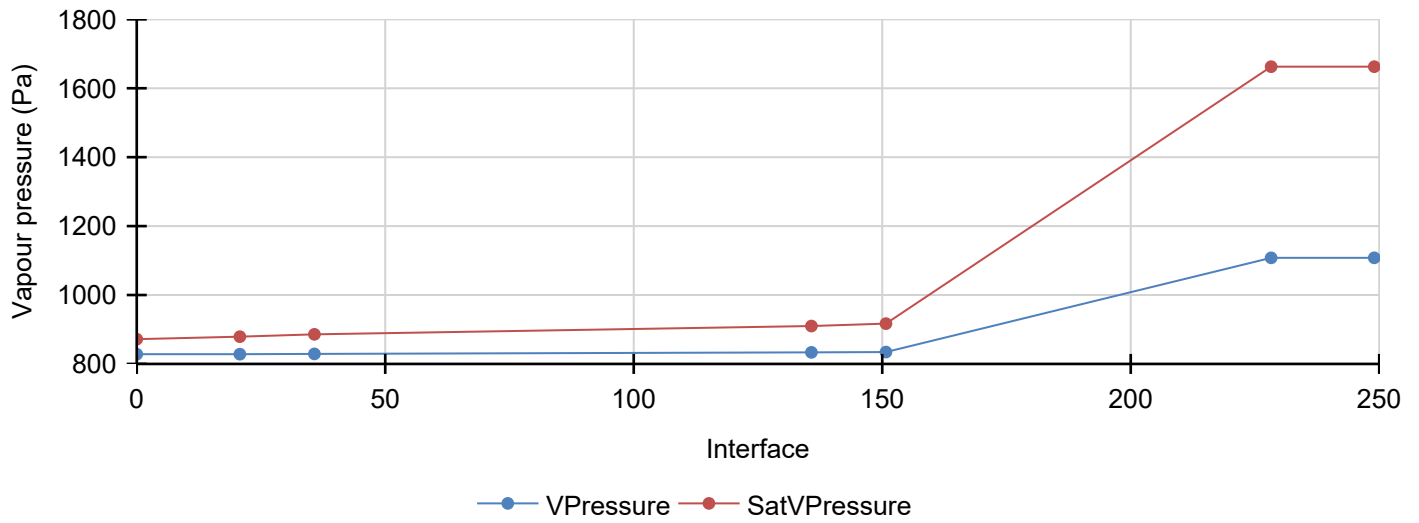
Table of layers

Layer	Thickness mm	Thermal conduct. W/m.K	Thermal resistance m ² .K/W	Cumulative thermal resistance m ² .K/W	Vapour resistivity GN.s/kg.m	Vapour resistance GN.s/kg.m	Cumulative vapour resistance GN.s/kg.m
External surface	-	0.0000	0.0400	0.0400	0.0	0.00	0.00
1.Plaster, standard	15.0	0.4000	0.0375	0.0775	60.0	0.90	0.90
2.Brick, outer leaf	100.0	0.7700	0.1299	0.2074	50.0	5.00	5.90
3.Plaster, standard	15.0	0.4000	0.0375	0.2449	60.0	0.90	6.80
4.Celotex PL4065 [77.5mm]	77.5	0.0000	3.0000	3.2449	0.000	300.00	306.80
Internal surface	-	0.0000	0.1300	3.2449	0.0	0.00	306.80

Vapour pressure table

Interface - between layers	Interface temp. °C	Vapour pressure Pa	Satur. vapour pressure Pa	Dew point °C	Cond. rate g/m ² h	Cond. rate 60 days g/m ² h	Cond. risk Y/N
External surface	5.00	828.3	871.9	4.27	0.00	0.00	No
1. External surface / Plaster, standard	5.12	828.3	879.1	4.3	0.00	0.00	No
2. Plaster, standard / Brick, outer leaf	5.23	829.1	885.9	4.3	0.00	0.00	No
3. Brick, outer leaf / Plaster, standard	5.61	833.6	910.0	4.4	0.00	0.00	No
4. Plaster, standard / Celotex PL4065 [77.5mm]	5.73	834.5	917.0	4.4	0.00	0.00	No
Celotex PL4065 [77.5mm] / Internal surface	14.61	1107.9	1662.6	8.5	0.00	0.00	No
Internal surface	15.00	1107.9	1662.6	8.48	0.00	0.00	No

CONDENSATION RISK ANALYSIS



Interface temperature / Dew point graphical representation

