

Dwelling details

Covered in this section:

- § Recording general information about the property
- § Survey conventions

Type of assessment and location.

From 18th October 2009, all domestic EPCs will additionally show the “Type of Assessment” on page 1. The three possible types are:

- SAP, new dwelling.
- SAP, existing dwelling.
- RdSAP, existing dwelling.

When producing an existing dwellings EPC using approved RdSAP software the last of these options ‘RdSAP, existing dwelling’ will be automatically included on the EPC.

You must also record the location of the survey (England & Wales or Northern Ireland) and if the EPC is to be issued in English or Welsh (England & Wales only).

A Region code was added to the software in April 2011, this is automatically generated from the dwelling postcode.

Related party disclosure

The DEA must declare any relationship with the parties referred to below:

1. No related party.
2. Relative of homeowner or occupier of the property.
3. Residing in the property.
4. Financial interest in the property.
5. Owner or Director of the organisation dealing with the property transaction.
6. Employed by the professional dealing with the property transaction.
7. Relative of the professional dealing with the property transaction.

Transaction type

The transaction type indicates the reason why the EPC was initially undertaken. This is for statistical purposes only and does not affect the calculated results or restrict the use of the EPC. Select the most appropriate type for an existing dwelling:

Transaction Type	Description
1 – marketed sale	Properties sold through conventional means. This includes all EPC commissions from estate agents and similar.
2 – non marketed sale	Change of ownership but not through marketed sale. This includes right-to-buy and the large scale voluntary transfer of local authority housing stock to a registered social landlord. Otherwise this option should rarely be used.
3 – rental (social)	Properties owned by local authorities, social landlords that are registered with the Housing Corporation (most are housing associations, but there are also trusts and co-operatives).
4 – rental (private)	Rented properties not owned by organisations at 3.

5 – not sale or rental	Property not being sold and not for rental market. For example, a house owner might have improved the property and wants to lodge an improved EPC. An EPC is not required by the regulations under these circumstances and so lodgements under this category are expected to be extremely rare. Note that if the property is a rented one, it should always be transaction type 3 or 4 irrespective of the circumstances.
6 – new dwelling	A dwelling that has not previously been occupied. Mainly newly construction homes assessed off-plan using SAP. This will also apply if a building is converted into more or less parts, where changes are also made to the heating, hot water provision or air conditioning / ventilation. If a non-domestic property, such as a barn or warehouse, is converted into a home or homes, this is classified as a new dwelling. In these circumstances a full SAP EPC will be required.

Option **6** is only available for new dwellings using full SAP software.

Terrain type

The terrain surrounding the property is used for evaluation of wind turbines. It must be entered in all cases to enable consideration of a wind turbine as a possible further improvement measure.

- **Dense urban** – dwellings located in city centres with mostly closely spaced buildings of four storeys or higher.
- **Suburban** – dwellings located in low rise areas of a city with buildings well spaced. Also applies to towns and villages.
- **Rural** – dwellings located in open country side with occasional houses and trees.



Built form

The built form classifications are self-explanatory and you should select the option that most closely describes the built form of the property.

A flat or maisonette are treated the same in terms of the EPC assessment, but the option selected should best fit the description of the marketed sale.

RdSAP Convention 1.02

A dwelling that does not extend to all storeys of the building is a flat or maisonette. RdSAP makes no distinction between flats and maisonettes as regards calculations; it is acceptable to select either type as definitions vary across the UK.

These different features are modelled within the energy calculations so choosing the wrong classification will estimate the heat loss incorrectly and could also cause problems with data entry/processing of the Energy Performance Certificate.

Bungalows are generally more expensive to heat as they have a greater amount of heat loss area per m² of useful floor space.

Detachment

- Detached.
- Semi-detached.
- Mid-terrace
 - o has two external walls (front and back).
- Enclosed mid-terrace
 - o has an external wall on one side only (typical for back-to-back terraces).
- End-terrace
 - o has three external walls.
- Enclosed end-terrace
 - o has two adjacent external walls.

Terraced dwellings with a passage way is not an explicit option – if a passage way is present it is actually accounted for within the floor area measurements (the first floor area will be greater than the ground floor area – the difference is an exposed floor for the upper storey, which the program will account for).

Staggered terraces, or link detached, should be recorded as the most appropriate of the above detachment options with the true exposed wall area being accounted for within the heat loss perimeter measurement for each storey.

Also note the differentiation between an end-terrace and a semi-detached property. Whilst these are, on sight, of the same built form, there is a difference in the way in which the RdSAP software calculates window areas for the two built forms since end-terrace houses are often built to the same specification as the associated mid-terrace properties and therefore have either less or no window area on the extra exposed wall.

Flats and maisonettes

Additional questions are asked for flats and maisonettes only:

Q. Floor level?

i.e. which storey is the flat located on such as second storey flat, or ground floor flat?

A ground floor is recorded as '0'.

If the property is a maisonette with a ground floor entrance the rules for porches/draught lobbies should be followed.

Basement flats should be entered as per ground floor flats (i.e. recorded as '0', and the other floors from 1 upwards.).

Q. Lowest floor?

Select from:

- Basement
- Ground floor
- Mid floor
- Top floor.

This question is asked because the higher the flat is located the greater the exposure and heat loss. If dwelling is over more than one level, select the option that reflects the location of the lower level, unless the dwelling includes the 'Top floor'.

Q. Heat loss corridor?

Select from:

- No corridor
- Heated corridor
- Unheated corridor – additionally record the length of the sheltered wall.

For 'Unheated corridors' additionally record the length of the adjacent corridor.

Record as a 'heated corridor' if the corridor adjacent to the dwelling is heated by a heating system not linked to the flat.

However, if a heated corridor is present and the heat is provided by the heating system of the flat/maisonette (i.e. a radiator fed by that particular flats boiler, or a on-peak room heater which the flat occupant pays for) then the adjacent area of the corridor is included within the main dwelling's area with any heat loss perimeters measured and recorded appropriately.

RdSAP Convention 2.03 – Sheltered wall length (unheated corridors)

Include in the heat loss perimeter.

When a dwelling (flat or maisonette) has a sheltered wall to an unheated corridor on more than one storey the sheltered length is the total for all storeys with a sheltered wall (example: 2 storeys with sheltered wall on each storey, length of sheltered wall is 5 m on each storey: enter 10 m for the sheltered length).

Floor perimeter

- For flats & maisonettes always take internal measurements (for obvious reasons)
- Don't mix measurements – take measurements all internally or all externally (the floor area and perimeter of room(s)-in-roof are always measured internally - irrespective of the dimensions basis for other storeys).

Number of habitable rooms

This is a simple count of the number of habitable rooms in the dwelling and any extensions:

- **Include** any living room, sitting room, dining room, bedroom, study and similar; and also a non-separated conservatory. A kitchen/diner having a discrete seating area also counts as a habitable room.
- **Excluded** from the room count are any rooms used solely as a kitchen, utility room, bathroom, cloakroom, en-suite accommodation and similar; any hallway, stairs or landing; and also any room not having a window.

A lounge/dining room where the door was temporarily removed (i.e. architrave and hinges still there) is counted as two habitable rooms.

For open plan dwellings count all spaces thermally connected to the main living area (e.g. a living/dining room) as one room. For example, a lounge/dining room with the door permanently removed (hinge holes filled etc...) is 1 habitable room. A lounge/dining room where the door was temporarily removed (i.e. architrave and hinges still there) is two habitable rooms.

For a kitchen to be a kitchen/diner it must have space for a table and 4 chairs.

For rooms to be counted as habitable they must have a permanent means of access within the dwelling i.e. a doorway or stairs (so for rooms within a loft conversion to be counted a permanent set of stairs is required, as per building regulations), with natural light and means of ventilation (i.e. the presence of a window).

A heated room is one with a fixed heat emitter within the room.

In addition to the above:

- The number of habitable rooms which have a fixed heater emitter should be recorded on the survey form (for inadequate heating purposes).

Background information

The habitable rooms questions are important as they are used to define the 'living area fraction' of the dwelling which is calculated internally within RdSAP software.

RdSAP assumes that the living area fraction is heated to 21°C (i.e. living rooms etc.) and with all other areas being heated to 18°C (i.e. bedrooms). These values are the demand heating temperatures which RdSAP uses to calculate fuel use and running costs for the EPC (among other things, such as fabric heat loss).

Assessment of building parts

The dwelling can be divided into five parts, the main part and up to four extensions or other parts.

For each part separately identified a full set of characteristics must be entered:

- Age band,
- Highest 'roof' type, presence of insulation and thickness,
- Lowest 'floor' type, construction and if insulated,
- Wall construction and if insulated.
- Measurements for floor area, ceiling height and Heat Loss Perimeter (HLP),
- If upper storey is a 'room-in-roof':
 - o Age band,
 - o Floor area,
 - o Location of any insulation and insulation thickness.

The highest level is assessed as having:

- pitched roof (slates or tiles), access to loft
- pitched roof (slates or tiles), no access
- pitched roof (thatch)
- flat roof
- same dwelling above
- another dwelling above.

Here 'access to loft' refers to the physical presence of a loft hatch or other access way within the dwelling to this part – for the purpose recommending any potential improvement in insulation.

The floor of the lowest level is assessed as being or having:

- ground floor
- above partially/intermittently heated space (commercial premises)
- above unheated space
- to external air
- same dwelling below
- another dwelling below.

The software now allows the DEA to describe the adjacency of each extension/part of the dwelling in relation to the same or other dwellings.

RdSAP Convention 2.11 – Vertical extensions:

Enter the new upper floor as an extension with "same dwelling below" and the original part with "same dwelling above" for the roof description.

Where an extension has been built over part of the existing dwelling, divide the part built over into two, one of which has "same dwelling above" and for the other describe the roof construction and insulation.

It is possible for an extension to be both above and alongside the rest of the dwelling. Such a building part is not defined in RdSAP and in this case divide the extension into two, one above and the other alongside.

RdSAP Convention 2.21 – Dwelling adjacent to commercial premises:

If a dwelling or part of a dwelling has commercial premises below record as partially heated space below.

If a dwelling or part of a dwelling has commercial premises above record as another dwelling above.

If a dwelling has commercial premises alongside it, treat as non-heat loss wall.

Extensions

**Extension age band?**

- Ask the occupier
- Contact local building control
- Informed estimate based on style
- If same age, wall and roof type then record as main dwelling.

Extensions with different insulation standards or different characteristics (e.g. wall or roof) from the main dwelling are recorded separately. The extension must also be a **heated** and **occupied area of the house** to be recorded.

Recording the different characteristics will then allow the RdSAP software to assign the correct U-values and attributes. If an extension has the same age, construction and insulation as the main dwelling, then you don't need to record it separately – treat it as a part of the main dwelling.

Tips

- Sketch details of all levels and extension(s) on the field sheet and add up areas separately.
- 'Sun rooms' should be recorded as extensions.

RdSAP Convention 2.12 – More than four extensions:

Add together floor areas and exposed perimeters of extensions (or add extension to main dwelling) to reduce to four extensions. Combine parts having the most similar age bands (refer to SAP **Appendix S** for U-values of relevant constructions).

Use alternative wall where appropriate.

RdSAP Convention 2.19 – Store rooms and utility rooms:

If heated always include.

If accessible only via a separate external door and not heated, disregard

If directly accessible, not heated and thermally separated, disregard.

Porches/draught lobby

A draught lobby/porch is an arrangement of two doors that forms an airlock on the main entrance to the dwelling.

	RdSAP Convention 2.09 If heated always include (if separated or not) If external and not heated, disregard. If internal, not heated and thermally separated, disregard.
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Conservatories

A conservatory is a structure with at **least three-quarters of its roof and at least half its external walls glazed**.

A conservatory	Not a conservatory
	 The above is commonly referred to as a 'sun room'.

Q. Conservatory Type?

All conservatories must be recorded whether they are thermally separated from the main dwelling or not by answering this new question.

Select one of the four possible options:

- No conservatory
- Separated, no fixed heaters
- Separated, fixed heaters
- Not separated.

If a conservatory is thermally separated, the presence of fixed heaters is recorded by selecting either 'separated, no fixed heaters' or 'separated with fixed heaters'. This will influence the inclusion of additional text in the final EPC but not any calculations.

A non-thermally separated conservatory is also included in the calculation by recording its floor area and perimeter.

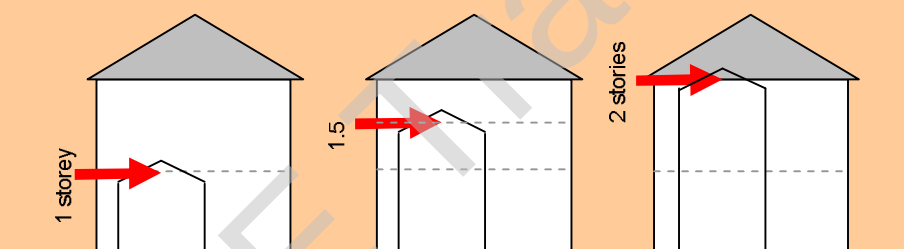
Q. Non-separated Conservatory?

Thermal separation between a dwelling and a conservatory means that they are divided by walls, floors, windows and doors which are of external quality (i.e. same performance as other exposed elements within the dwelling).

Where no thermal separation is present the floor area, presence of double glazing, glazed perimeter and conservatory room height must be recorded on the 'Non-separated Conservatories' section of the survey form.

Tips for completing the non-separated conservatory data collection:

- Floor area – should be based on either internal or external dimensions – consistent with what the inspector has chosen earlier in the survey.
- The glazed perimeter for the conservatory should be measured in the same way as measuring the heat loss perimeter for the main house or extension.
- The conservatory room height is estimated from the equivalent number of storey heights of the dwelling to the nearest half storey (based on average internal height within the conservatory). Example of room heights for a conservatory on a side of a building:



Great accuracy is not required as this is a visual estimation of conservatory height - but in the above diagram the arrow is in the correct position of the average storey height (taking into account the ridge/pitch of the roof).

RdSAP Convention 2.17 – Sun room

For a highly glazed part of the dwelling, such as a sun room, which does not meet the criteria for a conservatory (50% of walls and 75% of roof glazed), in most cases use the glazing option of "more than typical". That adds 25% to the total glazed area of the dwelling. If you deem that this is not appropriate, assess window area by either:

- a) measuring all windows and roof windows throughout the dwelling, or
- b) measuring all windows and roof windows in the sun room, and use Table S4 to obtain the window area of remaining part of dwelling which is entered as a single window.

Record method used in site notes.

Rooms in the roof

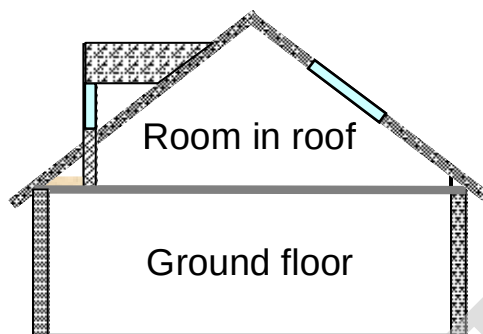
Rooms in roof can be either an original feature or a subsequent loft conversion. To be included within the assessment they must have a permanent fixed staircase such as one is able to walk downwards facing forward (i.e. stairs, not a ladder).

Different types of room in roof can be found:

1. True room in roof
2. A separate storey with continuous external walls which are less than 1.8m in height
3. Combination of both

True room in roof. These can be of different construction, but they are always built into a roof. Floor area of a “true room in roof” is normally smaller than floor area of the storey below. Walls are normally of a different construction than the main walls.

Example: True room in roof – Floor area of a “true room in roof” is normally smaller than floor area of the storey below.



Typical constructions of **true room in roof**



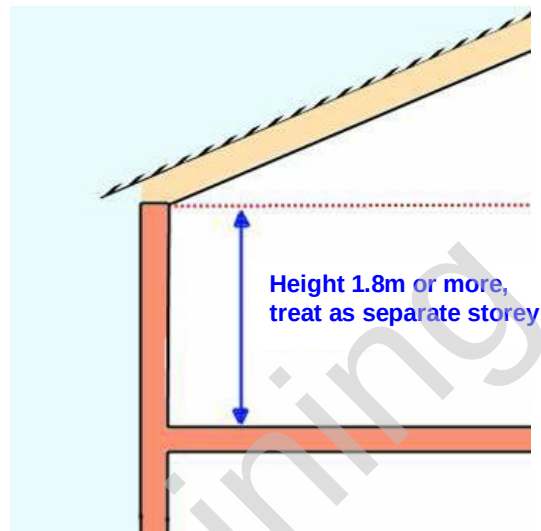
True room in roof is always entered as “Room in roof”.

- The extra heat loss due to dormer windows is disregarded, but the floor area measurements should take into account any extra floor area provided by the inclusion of dormers.
- Disregard party walls for the purpose of defining rooms in the roof
- Remember to record a separate age-band for the room in the roof.
- Always measure internally.

A separate storey with continuous external walls.

A storey which has continuous external walls, but the external walls are not of the full height (i.e. 2.4 m). Such storeys normally have pitched roof. Floor area of storeys with continuous external walls is normally the same as the floor area of the storey below.

Example: Separate storey – external wall or stud wall is 1.8m or more in height.



Continuous external walls may be quite high (e.g. about 2 m) or very low (e.g. 1 m). If continuous external walls are low, then most of the storey performs like “room in roof”. The following “1.8m rule” should be used to decide whether the upper most occupied level should be entered as a “room in roof” or as a “separate storey”.

Record the storey in question as a ‘**room in roof**’ if it has external walls or stud walls of internal height less than 1.8m (this refers to walls toward eaves, not gable ends or party walls).

Record the storey in question as a ‘**separate storey**’ if it has external walls or stud walls of internal height 1.8m or more (this refers to walls toward eaves, not gable ends or party walls).

Remember to record a separate age-band for the room in roof.

The 1.8m rule is not applicable in the case of a “true room in roof”

RdSAP Convention 2.06

Include when accessed via a permanent fixed staircase such that one is able to walk downwards facing forwards. Does not necessarily contain habitable rooms.

For a roof room to be classed as such and not a separate storey, the height of the common wall must be less than 1.8 m for at least 50% of the common wall (excluding gable ends or party walls). The common wall is a vertical continuation of the external wall of the storey below.

There is no explicit allowance for dormer windows except to include in the floor area of the roof rooms. See diagrams at end of Conventions.

In many cases it is not straight forward to make a decision on how to record a storey in question. In such cases the following recommendations should be used:

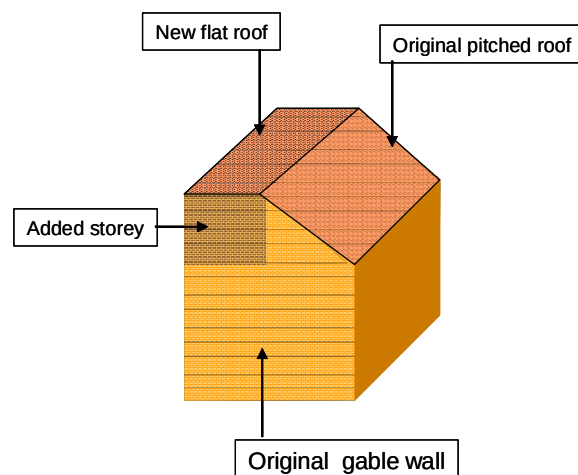
Recommendation 1.

If a flat is solely a type of 'room in roof' then it must be recorded as the lowest occupied level, with the room height being specified as 2.20m and the heat loss perimeter recorded as it exists. The wall construction will usually be selected as timber frame, with any significant gable wall or 'cold' party wall of a different construction type recorded using the alternative wall type. This approach is necessary because the RdSAP software can only process a room in roof when it is accessed from another storey.



Recommendation 2.

Full storey height room built into front or rear part of roof, so that it extends half of the dwelling to an additional storey while half of roof space remains as roof space or is converted into room in roof with sloping ceiling (see photo below).



Treat as a separate storey with a room height of 2.20 m.
Record floor areas measured internally.

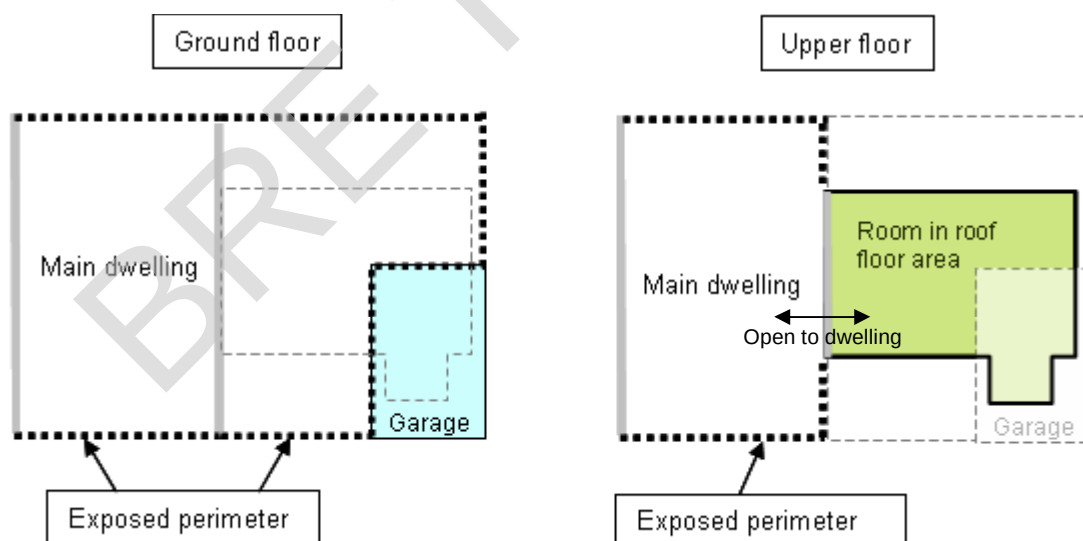
Recommendation 3.

Where an upper storey in a dwelling is part a 'room in roof' and part a full-height storey (as shown below), it is better to split the dwelling in to two parts even if they are the same age and otherwise have the same thermal characteristics.



The floor area of the room in roof is always measured internally and recorded in the 'room in roof' sections of the software.

The heat loss perimeter of the main dwelling is the perimeter of walls excluding length of wall between main dwelling and room in roof.



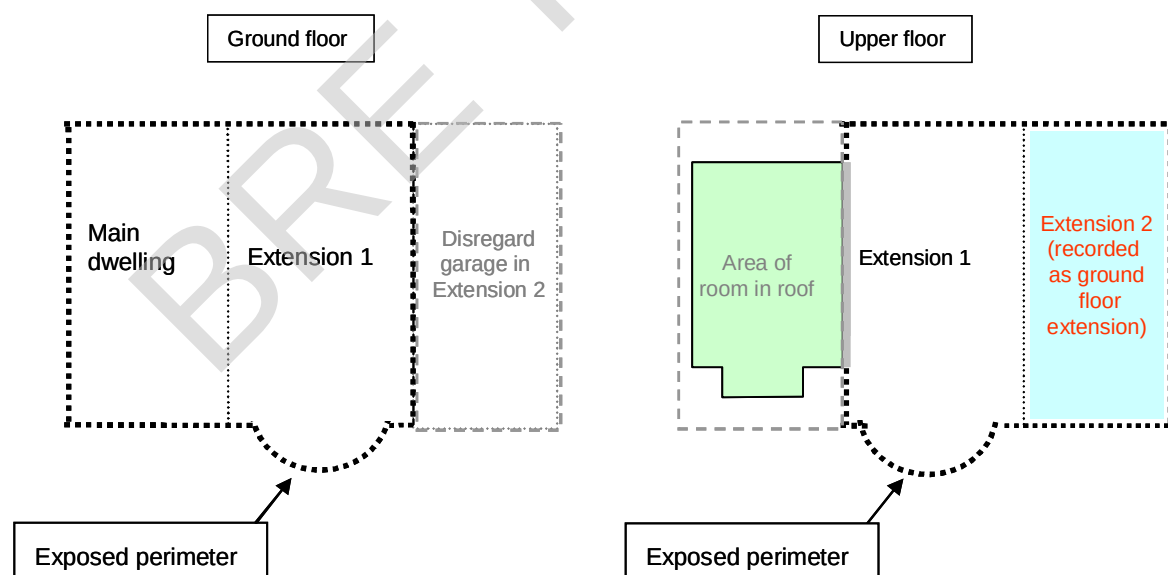
Recommendation 4.



Record the part of the house with the room in roof as the main dwelling with a room in roof – remember to age both parts.

Record the two storey part of the house as a two storey addition (Extension 1 – same age as main).

Record the part of dwelling above the garage as a ground floor extension (Extension 2 – with relevant age).



Floor area

The floor area for each storey of the dwelling and that of any extension should be recorded on the survey form.

Horizontal dimensions can be measured either internally or externally. Internal dimensions are permissible in all cases. In the case of a house or bungalow external dimensions are usually more convenient, except where access to all sides of the building is not possible or where there are differing wall thicknesses or other aspects that would make the dimensional conversion unreliable. When using external measurements for a dwelling joined onto another dwelling (semi-detached and terraced houses) the measurement is to the midpoint of the party wall.

Flats and maisonettes are usually measured internally (although it is not a requirement of the specification that internal measurements are always used). The floor area heated basements are always measured internally – thus in dwellings with a basement all measurements must be taken internally.

When undertaking internal dimensions measure between the inner surfaces of the external or party walls. Any internal elements (partitions, internal floors, walls, roofs) are disregarded.

In general, rooms and other spaces, such as built-in cupboards, should be included in the calculation of floor area where these are directly accessible from the occupied area of the dwelling. However, unheated spaces clearly divided from the dwelling should not be included.

The floor area **must not** include any:

- (a) Integral or adjoining garage (unheated)
- (b) Stores, coal sheds or other unheated spaces
- (c) Conservatories which are thermally separated from the main dwelling by an external door
- (d) Roof voids, such as lofts accessed through a loft hatch or storage spaces behind stud-work in rooms in the roof (even though within the insulated envelope i.e. where the roof insulation is provided at rafter level).

No special treatment should be given in cases where a central heating boiler is located in an unheated garage (i.e. just because the boiler is located in an unheated space you wouldn't therefore count the space as heated despite the garage receiving some background heat due to the operation of the boiler).

On the survey form, the floor area for rooms in the roof is differentiated from that of other storeys as the room height and heat loss perimeter are not required for rooms in the roof.

The floor area is important for providing the client with guide costs for improvements and savings.

Heat loss perimeter (HLP)

- **Exposed wall perimeter length for each storey** including those adjacent to unheated corridors, service or lift shafts, conservatories which are thermally separated from the dwelling, integral or adjoining garages, car ports etc.
- The heat loss perimeter length is used to calculate the wall areas.
- It must be measured accurately so that wall areas can be calculated (to nearest 0.1m or better).
- If surveying a flat or maisonette don't forget the heat loss corridor questions.
- Perimeter lengths adjacent to soil receive no special treatment and are included within the heat loss perimeter (see 'basements' section for more information).

RdSAP Convention 2.01

Measure all perturbations (e.g. bay windows) but disregard chimney breasts unless assessor considers significant e.g. large inglenook.

Room height

The measurement should always be taken internally from floor surface to ceiling surface. For dwellings with more than one storey the RdSAP software will automatically add 0.25m per storey (for the intermediate floor), this intermediate floor area is then used within the RdSAP software to calculate the total heat loss through the exposed façade (the room height is multiplied by the heat loss perimeter).

The room height is important for distinguishing between buildings with high and low ceilings; they have very different external wall areas and total volume for the same floor area.

- Where the upper rooms extend into the roof space then the wall height is defined up to the level of the wall plate or the internal angle between the wall and sloping ceiling/roof
- Measure to the nearest 0.1m or better.

Where both the main dwelling and the extensions have varying ceiling heights you should record them separately with the correct room heights.

Where there are more than 4 extensions, or the room heights vary throughout the dwelling (as shown in the large complex house pictured) - due to the fact that only 4 extensions can be recorded - a 'weighted average' room height will need to be calculated. The extensions with the most similar age bands and construction types being modelled as one part (use **Appendix S** as a guide).



Most modern dwellings will have a height of 2.40m.
Older properties may have ceiling heights up to 2.90m or as low as 2.30m.

RdSAP Convention 2.10 – Mezzanine floor

Enter the part of the property above and below the mezzanine deck as a two storey extension. Treat the remaining part as a single level with the full floor to ceiling/roof height.

If the mezzanine is located such that it has no heat loss perimeter then assign a nominal 1 m perimeter to each floor of the mezzanine part and deduct 1 m from the heat loss perimeter of the other part.

Basements

Include when accessed via a permanent fixed staircase such that one is able to walk downwards facing forwards and either:

- Basement is heated via fixed heat emitters, or
- Basement is open to the rest of the dwelling.

Measurements are recorded on the survey form as per a normal storey – ensure you do not mix internal and external measurements.

If the basement is unheated and closed off from the main dwelling, then it must be disregarded.

Perimeter lengths adjacent to soil (for example in the case of basements) receive no special treatment and are included within the heat loss perimeter, the wall length adjacent to any basement next door should be assessed according to whether the adjacent basement is heated (usual in the case of a basement flat) or unheated.

Houses which are built into a hill side, with walls adjacent to soil rather than air, receive no special treatment and are recorded as if they were fully exposed to air.

RdSAP Convention 2.18

Do not mix internal and external measurements. If a basement is included in the assessment, it is likely that internal dimensions will be used throughout the dwelling.

Garages

Garages are disregarded if they are thermally separated from the dwelling and unheated. However, you should remember to include any semi-exposed wall length to unheated garages within the heat loss perimeter of the main dwelling.

Consider the construction of the wall area separating the dwelling from an unheated garage. If a different construction to the main dwelling and of sufficient size, include as an alternative wall type.

RdSAP Convention 2.20

If heated from main heating system, always include. The presence of a boiler within the garage does not make it heated.

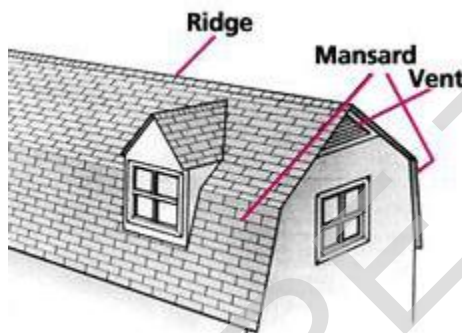
Roof types

To be recorded separately for the main dwelling and any extensions. In most cases it is easy to identify the roof type:

- Pitched (slates or tiles) with or without access to loft - includes hipped ends and 'lean to' roofs and pitched roofs where the two slopes are shared between neighbouring properties. DEAs must also specify whether it was possible to access the loft space
- Mansard roofs are modelled as pitched
- Thatched
- Flat
- if an equal mixture of pitched and flat roofing is present you could choose to record an extension as being present to allow this to be modelled
- Small areas of roof coverings (e.g. over a bay window) which differ from the main roof type can be disregarded.

Mansard - This is a dual pitched roof, with the steepest pitch (non-vertical walls of at least 70° pitch) which frequently contains windows at the lower section. If the upper section of a mansard roof is flat, this is not treated as a separate part of the roof structure. This is all part of the mansard roof component but when completing the roof covering, part can be made up of a different material, i.e. felt or metal.

A mansard roof type:



RdSAP Convention 2.07 – Mansard roof

A storey having non-vertical walls of at least 70° pitch constitutes a separate storey; it is not treated as roof rooms. Use alternative wall if appropriate.

Thatched roofs –

There is a separate entry for thatched roofs that takes into account the insulating benefits of the thatch. If insulation is present at joist or rafter level, then this should also be recorded.



Flat – if the pitch is 10° or less.

Same dwelling above – this option should be used when other parts of the same dwelling are directly above this part.

Another dwelling above – this option should be used when there is another property directly above this part of the dwelling.

Tips

A 'Chalet' roof is a pitched roof where the eaves come down to the ceiling height of ground floor level rooms. It often contains purpose designed rooms in the roof space and should be recorded as such if it meets the definition of a true room-in-roof.

Roof insulation

Recording the level of roof insulation is very important as it has a significant effect on energy use. There must be evidence for joist, rafter or flat roof insulation; otherwise "unknown" should be selected.

Pitched roofs

Insulation can be present at either rafter, joists or both. There must be evidence of insulation, either measured if the loft space is accessible or documentary if loft space is inaccessible.

- If accessible, the thickness of joist insulation should be measured. A weighted average should be taken if the insulation is uneven or missing in some parts.
- If joist and rafter insulation is present record the joist insulation only.
- Rafter insulation and the thickness should be measured if the only form of insulation in the loft.
- When inaccessible, or loft is boarded out, insulation should be recorded as 'unknown' unless there is documentary evidence.
- For rigid insulation boards & other insulant types, enter as equivalent amount of mineral wool (see equivalent thickness note below)

Flat roof

Flat roof insulation is often inaccessible and therefore cannot be measured.

- DEA should record insulation as 'unknown' unless there is documentary evidence. The software will assume the thickness of insulation based on the age band of the property.
- If there is documentary evidence to prove that the flat roof has been replaced or retro-fitted with insulation, then 'flat roof insulation' should be selected and the appropriate thickness recorded.

RdSAP Convention 3.04 – Loft insulation

If joist and rafter insulation are both present record joist insulation only.

If loft is fully boarded enter unknown unless householder has documentary evidence (maximum thickness is depth of joists) or is prepared to lift the boards.

If the property has modern foil or foam insulation at joists or rafters the depth of the insulation is entered as double its actual thickness.

If varying levels, apply an area-weighted average. However if there is an area with no insulation the dwelling should be split to give different roof scenarios.

Room in roof

Room in roof insulation can apply to the vertical timber stud walls, the sloping ceiling and any flat part of the ceiling. RdSAP assumes the level of insulation based on the room in roof age-band if level is unknown, however in some instances retro fit insulation can be added to the whole room in roof envelope or in some instances only to the flat part of the ceiling. In order to take into account the correct insulation levels, the following rules should apply.

- If the room in roof is an original feature of the property or is a loft conversion, the age-band of the room in roof should be entered and the insulation selected as 'unknown'. The software will assume the level of insulation based on the age-band of the room in roof.
- When only the flat part of the ceiling is insulated, usually ascertained by way of a loft hatch, the option 'flat ceiling only' should be selected and the insulation thickness entered.
- If retro fit insulation has been installed on all of the room in roof elements then select the 'all elements' option and enter both insulation thicknesses. If there is no flat ceiling, such as in the case of a cathedral type roof, 'not applicable' should be selected for the flat roof insulation thickness.
- The insulation thickness for options 'flat ceiling only' and 'other elements' must be measured or have supporting documentary evidence that proves insulation has been installed.

Notes

A weighted average is calculated as follows:

1. 70% of the loft space has 100mm of mineral wool
2. 30% of the loft space has 50mm of mineral wool

= [(percentage of loft area1 * depth of insulation1) + (percentage of loft area2 * depth of insulation2)] / 100

= [(70*100)+(30*50)]/100

= 85mm (however only 75mm can be selected in the survey, so round down to this)

The weighted average is quite crude, but a pragmatic approach.

Equivalent thickness

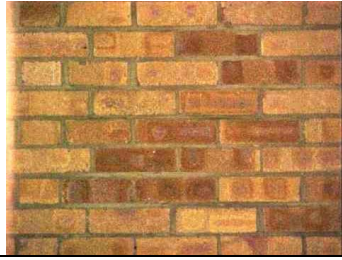
Please see the Energy Saving Trust guide

'CE71 - Insulation Materials Chart - Thermal Properties and Environmental Ratings' available from www.energysavingtrust.org.uk

Documentary evidence

Acceptable documentary evidence includes certificates, warranties, guarantees and building regulation submissions. The assessor should be confident that the installation was installed and that the documentation relates to the actual property being assessed.

Wall types

	Solid wall (pre 1850 – 1950) Recognised by the pattern of brickwork: the bricks are placed both head-on and lengthways (including Flemish, English, garden wall etc. bond types). The total thickness of the wall is usually about 225mm.
	Cavity wall (1935 – present) Stretcher bond. Total thickness about 300mm.

- Solid wall category assumes a 9" brick
 - o Single brick should be recorded as a solid wall (i.e. record according to wall type irrespective of wall thickness)
- Stone wall category assumes a 20" to 36" thickness.
- 3 different types of stone wall can be selected
 - o 'Granite or whinstone'.
Whinstone is common in Scotland it is a quartz-dolerite, which looks very similar to basalt and is grey or black. Granites are volcanic rocks as well and can be pink to dark grey or even black.
 - o 'Sandstone'
Like sand, sandstone may be any color, but the most common colours are tan, brown, yellow, red, grey and white.
 - o 'Cob wall'
Cob wall consists of a mixture of earth, straw and sand that can be sculpted similar to that of clay. Due to its sculpting properties, cob walls can be curved with arches and niches. Unrendered cob walls are generally an orange/ brown colour.

Timber frame

Disregard the cladding type when recording timber frame dwellings. Timber framed dwellings can be clad in timber, brick or a variety of other façade material, however each of these façades has very little effect on the thermal performance – this is why they are disregarded. Now possible to enter with internal wall insulation.

Timber frame can be identified by:

- *Looking inside meter boxes*
- *Looking at the gable whilst in the loft space*
- *Presence of plasterboard on internal wall (if dabs are present, then it is not a timber frame wall)*

System build/non-traditional/modern methods

- Select 'system built', if the structure has a cavity that is filled or unfilled this can be recorded.
- BRE's Non-traditional handbook can be consulted.

RdSAP Convention 3.02

If there is a system built wall that has evidence of retro cavity fill, record as system build with internal insulation and include **Addendum 1**.

When faced with a mixture of wall types:

Many dwellings have an extension either added onto the main part, or built at the same time but of different construction or insulation. In these cases, dimensions and constructional details of the main part of the dwelling and the extension are recorded separately, to allow the assignment of different U-values to the original and to the extension based on the age band and features recorded.

Occasionally there may be two or more extensions whose details need each to be recorded separately. In addition, dwellings can have a different construction for some parts of the walls (for example, a bay window which incorporates a large area timber frame wall in otherwise masonry construction). These are recorded as a separate constructional element, termed "alternative wall".

If an alternative wall is present, the area of the alternative wall is recorded excluding any openings in it and the alternative wall is identified as part of the main wall or extension wall, so that it may be subtracted from that wall area prior to the calculation of wall heat losses.

If more than two alternative walls are present, assume the majority type.

RdSAP Conventions 2.13

Disregard when less than 10% of total exposed wall area of the whole dwelling (including windows and doors). When entering alternative wall area into software exclude the area of any windows and doors contained in the alternative wall.

Consolidate walls of same type.

If there are two areas of external wall of different construction types that should be regarded as alternative wall, use the one with the larger area.

Addenda

The DEA must ensure that the following addendum is selected in RdSAP software so the EPC produced will clearly state how a wall type has been dealt with if it does not match one of the wall options in RdSAP:

1. Wall type does not correspond to options available in RdSAP.

"The dwelling has a type of wall that is not included in the available options. The nearest equivalent type was used for the assessment."

Wall insulation

Record separately for main dwelling and any extensions.

- The internal dry-lining and external cladding options assume that a layer of insulation has been added to a wall which originally didn't have it, otherwise 'As built' should be recorded.

Identifying internal and external insulation

Internal insulation is difficult to identify as it will be covered by plasterboard – internal insulation will only be applied to the external or heat loss walls, so it should be possible to see where the insulation (either rigid foam boards or timber/steel studwork) have been returned against a party wall.

Other giveaways could be the fact that the wall thickness internally is now thicker. Obviously anything which is wet plastered is unlikely to be internally insulated, as plasterboard will always be used.

Internal insulation in a bay window, comprising 2 rigid insulation boards which makes the window sill thicker.

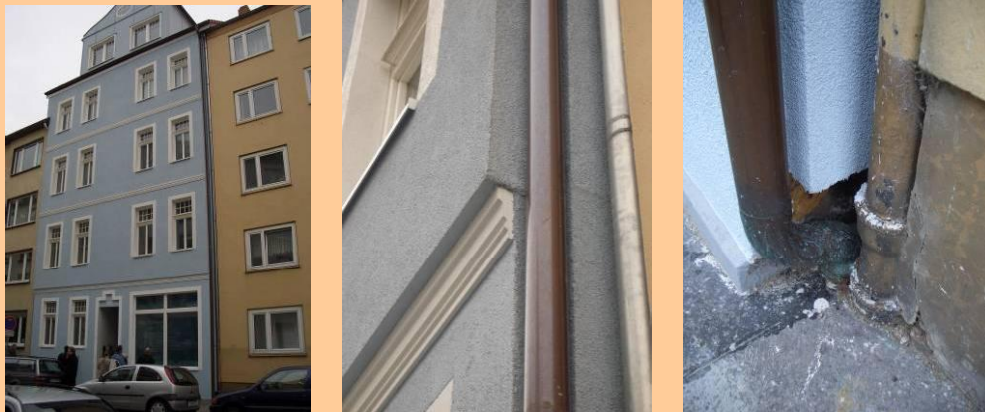
Note junction with wall.



An example of internal insulation (mineral wool batts) being applied between steel C-sections and plasterboard being fixed to the steel studs.



External insulation is relatively easy to identify, it will usually be wet rendered, dry clad (i.e. timber) or more recently perhaps even have brick slips applied.



An example of a block of apartments which have been externally insulated (in Germany but the same principles apply in the UK). Note that the dwelling stands proud of the other adjoining properties and also has a higher roof due to the incorporation of external insulation. External insulation is usually visible at points around the dwelling (in this case around a soil pipe).

Please visit www.energysavingtrust.org.uk/housingbuildings/ and read the publication CE184 'Solid wall insulation of existing dwellings' for further guidance

- Select 'filled cavity' if cavity wall insulation is present (as indicated by presence of injection holes in mortar joints, or mineral wool/urethane foam visible in meter box, air bricks etc...)
- When cavity wall insulation is not a retro-fit measure – select 'as built'.

RdSAP Convention 3.03

Do not use the "unknown" option for wall insulation inappropriately as this automatically suppresses any insulation recommendation; assume as-built if no evidence of retro-fitted insulation.

"Unknown" should be used only in exceptional circumstances, e.g. when there is conflicting evidence (inspection and/or documentary) of added insulation whose presence cannot be ascertained conclusively. In these cases clarification must be provided in site notes.

Examples of cavity wall insulation drill holes





Where it can be established that a building element has insulation beyond what would normally be assumed for the age band, this can be indicated if adequate evidence exists. Evidence can be:

- what is observed in the site inspection (e.g. loft insulation, rafter insulation, cavity wall insulation), and/or
- on the basis of documentary evidence.

Acceptable documentary evidence includes certificates, warranties, guarantees, building regulation submissions. The assessor should be confident that the insulation was installed and that any documentation relates to the actual property being assessed.

Swimming pools

Indoor swimming pools cannot be modelled in SAP. However, if the pool is within the main area of the dwelling, this should be recorded and treated as a habitable room. If the pool is located in a conservatory or extension then you record these parts as per usual. Outdoor swimming pools and swimming pools external to the thermal envelope of the building are not considered.

Addenda

The DEA must select the following addendum within the RdSAP software so the EPC produced will clearly state how the swimming pool has been treated:

4. Dwelling has a Swimming pool.

Text included on EPC "The energy assessment for the dwelling does not include the energy used to heat the swimming pool".

Floor types

Floor heat loss type

The floor of the lowest level is assessed as being or having:

- ground floor
- above partially/intermittently heated space (commercial premises)
- above unheated space
- to external air
- same dwelling below
- another dwelling below.

The first four options are all considered as heat loss floors for which the floor construction and presence of insulation are also required.

Floor construction

The DEA should try to identify construction of a ground floor during the survey where possible. The three floor types that can be entered are solid, suspended timber, and suspended (not timber). If the DEA is unable to establish the floor construction then 'unknown' should be entered.

- Solid – consists of a concrete slab with a concrete screed finish.
- Suspended timber – consists of timber floor boards supported on timber floor joists with a ventilated air space below.
- Suspended (not timber) – Any other type of suspended floor with a ventilated underfloor air space. For example a concrete beam and block floor.

There are several methods that a DEA can apply to identify the floor construction, one of which is to look under areas of carpet or linoleum, that are not fixed down, to see if the floor surface is solid concrete or timber floor boards.

A common place where floor coverings are not secured down are in cupboards, particularly in the case of suspended timber floors where there will be a hatch leading down to the under floor space. If the floor coverings are fixed down and cannot be easily lifted, the DEA must not attempt to pull the coverings up.



Suspended timber and concrete floors will also have under floor vents located on the external walls, just above ground level.

It is also possible to identify a suspended timber floor by the presence of creaking floor boards.

Floor insulation

To be recorded separately for main dwelling and any extensions.

There are three options that can be entered for ground floor insulation, these being unknown, as built and retro-fitted.

- Unknown – in most cases this will be selected.
- As built – confirms that no additional insulation has been added to the original floor construction.
- Retro-fitted- allows for situations where insulation is present in a floor, either added subsequently to its construction, or incorporated in the floor when not required by building regulations during its construction. Documentary evidence is required.

Retro-fitted floor insulation is usually done by either suspending mineral wool in-between floor joists using netting whilst the floor boards are up, or in the case of a solid concrete floor insulation is commonly laid onto of the existing screed – this creates a rise in floor height.



Solid floor insulation raises the floor height – in this picture a raised area at the bottom of the stairs makes up the difference between the new finished floor level and the first tread of the original staircase

Often internal doors will also be of different heights to incorporate the raised floor level.

When unknown or as built are selected, the insulation levels for the floor are based on the age band of the property.

External Doors

The area of an external door is assumed by RdSAP software to be 1.85 m² and as being in the main part of the dwelling.

The number of external doors is calculated based upon the built form:

- Flat/maisonette with heated corridor: 0
- Flat/maisonette with unheated corridor or no corridor: 1
- House/bungalow, enclosed mid-terrace or enclosed end-terrace: 1
- House/bungalow, not enclosed type: 2

RdSAP Convention 2.14

In RdSAP the definition of what is a window and what is a door is defined by the area of glazing in relation to the area of the whole opening, i.e. door and frame. To be classed as a window a glazed door and frame must contain glazing amounting to 60% or more of its surface area.

Windows

Information on window area, type of glazing and the proportion that is multi glazed is gathered for the whole dwelling, including any extensions and rooms in the roof, **but not** for conservatories which are dealt with separately – see **Conservatories** section for how to record separated and non-separated conservatories.

Dormer windows, Velux type windows and glazed roofs in extensions or 'sun rooms' are included within the estimation of window area and type.

You need to record the percentage of windows which have multiple glazing. This is a simple visual estimation, with no need to take measurements unless there is a mixture of glazing types.

Window area

"Typical" refers to normal construction for the property type and age band concerned.

By selecting 'less than' or 'more than typical' the RdSAP software will adjust the window area by +/- 25%. Window areas more or less than typical arise when windows have been added or blocked up subsequent to the dwelling's original construction.

Window areas may be measured and entered individually in 'extreme' cases when:

- A dwellings window area is more than +/- 25% from the norm (ignoring the presence of any conservatory),
- This option can also be used if more than one type of multiple glazing is present, or
- If the orientation of the windows is massively different from typical arrangements (e.g. a house incorporating passive solar features where there is only a large amount of windows present on the south façade).

RdSAP Convention 2.15

Consider the whole dwelling (windows, glazed doors and roof lights), including any extensions (**but not conservatories**).

Typical applies if the surface area of the glazing in the dwelling is essentially as would be expected of a typical property of that age, type, size and character. Even if there is slightly more or less glazing than would be expected, up to 10% more or less.

More than typical applies if there is significantly more surface area of glazing than would be expected (15%-30% more), perhaps because there is a large sun room or numerous patio doors have been added.

Less than typical applies if there is significantly less glazing than would be expected. This is rare as homeowners tend not to take out windows, but a property may have an unusual design with few windows.

Much more than typical and **Much less than typical** should be used for those dwellings with very unusual amounts of glazing; such as a glass walled penthouse flat or a Huff Haus. Due to this option allowing measurements of each window to be accounted for, it should also be used if a dwelling has a mixture of glazing types e.g. single, double, secondary and triple.

Some examples of when the window areas should be measured are:



An example of a low energy passive solar house where the typical areas and orientations of glazing assumed would be dramatically wrong.

A penthouse flat may also have large window area and require the assessor to measure the windows.



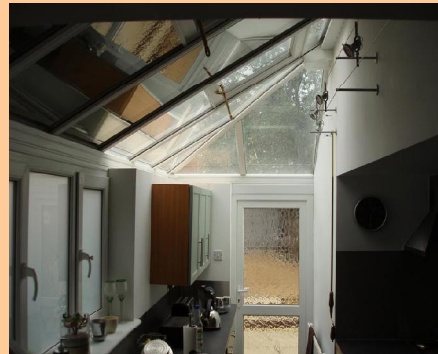
A 'black house' on the Isle of Lewis, Outer Hebrides, Scotland— no windows whatsoever! Therefore record as '0 m²' (doors are not counted, only windows).

This case may also arise when windows have been added or blocked up subsequent to the dwellings original construction, or change of use.

When faced with some of these extreme cases each of the windows and roof windows should be measured individually for the main dwelling and any extensions recording:

- area (including frame)
- glazing type (as above)

Note



The above is commonly referred to as a 'sun room' – follow the conventions defined earlier in this manual to determine if it should be classed as an extension or a conservatory. The DEA will then need to record the correct window area (if the windows, including the glazed roof, are greater than the 'much more than average' category the windows may need to be measured for the dwelling as a whole).

Multiple glazing type:

The DEA must record whether any double-glazed window units are pre 2002, or during or post-2002 (in Scotland the age band is post-2003, in Northern Ireland it is post-2006), the presence of secondary glazing and triple glazing can also be recorded (no age band is required for these).

If more than one age band of window is present the DEA should select the type according to the most prevalent in the dwelling. If unsure of the age band then 'unknown' can be selected.

Only one glazing type can be recorded, if there is a mixture of triple, double or secondary glazing present then the glazing type which makes up the majority should be recorded, or use the measured windows option. Temporary glazing products, such as cling film should be disregarded.

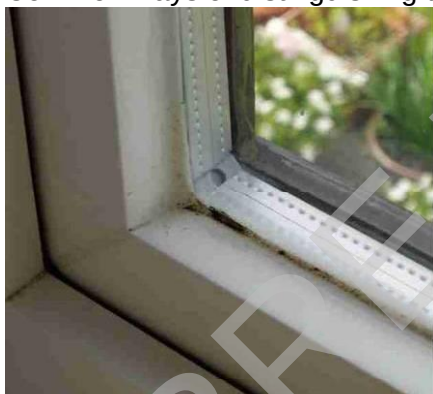
RdSAP Convention 2.16

If single glazing with secondary glazing, record as secondary glazing.

If double glazing with secondary glazing, record as newer* double glazing.

If secondary glazing has been removed in summer, enter as above only if assessor can confirm that the panels exist and can be re-fitted. Evidence to be recorded on site notes.

Common ways of distinguishing the newer* doubled glazed units are:



Via the presence of gas fill (normally argon) – look for drill holes.



Via a wide gap >12mm



The presence of low-e glass which can be detected using a laser gauge.

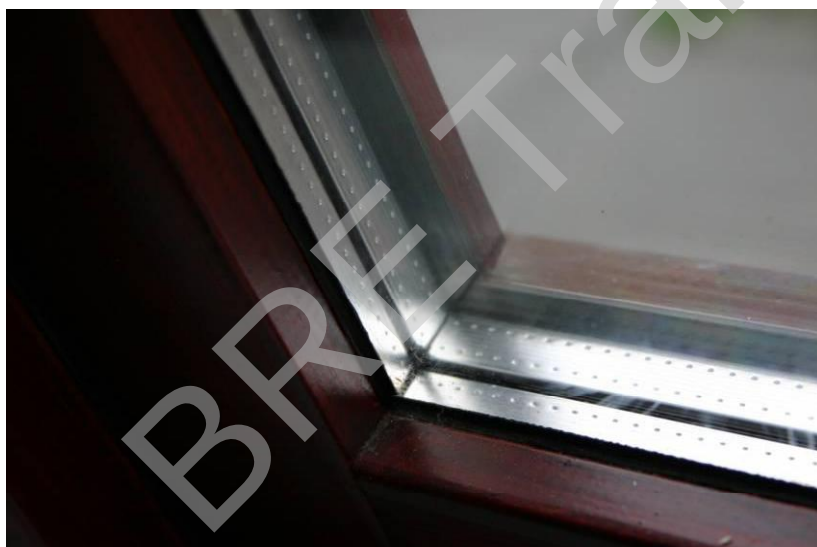
* Newer double glazing means 2002 or later in E&W, 2003 or later in Scotland, 2006 or later in N. Ireland



Label may indicate date or presence of low-e/K glass

Triple Glazing

Triple glazing should be selected when there are three glass panes within the glazing unit. If there is a mixture of triple and double glazing, the majority should be entered or the details of each window entered separately.



Triple glazing will have two aluminium spacer bars within the glazing unit.

RdSAP Convention 2.14

In RdSAP the definition of what is a window and what is a door is defined by the area of glazing in relation to the area of the whole opening, i.e. door and frame. To be classed as a window a glazed door and frame must contain glazing amounting to 60% or more of its surface area.

Ventilation

The DEA is required to determine if the dwelling is reliant upon 'Natural', 'MEV' (extract only) or 'MVHR' (balanced, both supply and extract, with heat recovery) ventilation and also record the number of open fireplaces which influences the amount of background heat loss.

Remaining information is assumed based on age, number of habitable rooms, the built form and construction type etc. (further information can be sourced from Section S4 in SAP 2009).

Natural ventilation

The following ventilation strategies are classed as 'natural':

- Where no other purpose provided ventilation system is present (i.e. the occupant can only open and close windows)
- Properties with local extract fans (in kitchens and bathrooms etc.) and trickle vents located within window frames
- Passive stack ventilation (PSV)

Further information is provided below, but full descriptions can be sourced for the freely available Energy Saving Trust publication 'Energy efficient ventilation in dwellings' (GPG268 / CE124) from www.energysavingtrust.org.uk

Intermittent extract fans with background ventilators



A trickle vent built into a window (with cover removed)



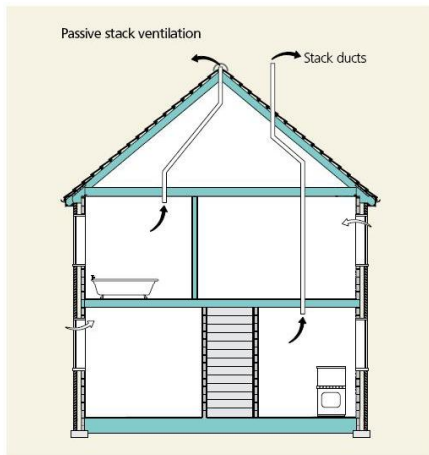
An extractor fan – can be manually controlled, switch on with the lighting circuit, have time delay and sometimes humidity sensors.

Local extract fans are installed in 'wet' rooms and provide rapid extraction of moisture and other pollutants. They operate intermittently under either occupant or automatic control.

The fans can be either mounted in a window, ceiling or external wall.

When ceiling-mounted, the extract should be ducted to outside. Replacement dry air is provided via background ventilators (e.g. trickle ventilators) and air leakage. In addition, as these fans do not run continuously, the background ventilators should be sized to provide adequate continuous whole house ventilation. Providing a gap at the bottom of the internal doors will allow the free passage of air through the property.

Passive stack ventilation



A PSV system comprises vents located in 'wet' rooms, connected via near-vertical ducts to ridge or other roof terminals. Warm, moist air is drawn up the ducts by a combination of the stack effect and wind effect. Replacement dry air is drawn into the property via background ventilators (e.g. trickle ventilators) located in the habitable rooms, and by air leakage. Providing a gap at the bottom of the internal doors will allow the free passage of air through the property.

A passive stack vent:

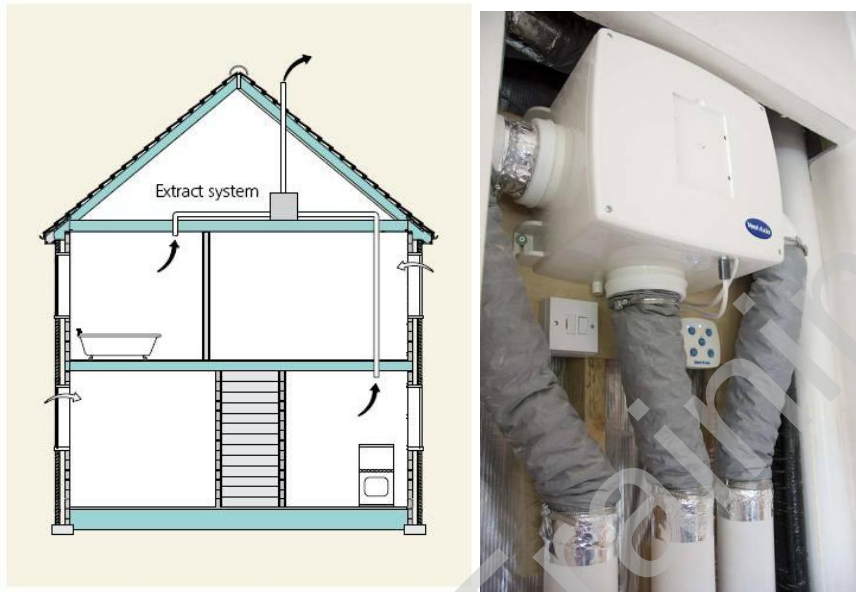


Air bricks may be present in naturally ventilation dwellings to provide a source of fresh air for combustion appliances.

Mechanical Extract Ventilation (MEV)

A mechanical extract ventilation (MEV) system continually extracts air from 'wet' rooms. It usually consists of a central ventilation unit positioned in a cupboard or loft space ducted throughout the dwelling to extract air from the wet rooms. (Other configurations do exist, including the use of continuously running individual room fans, although with the latter, care must be taken to minimise the effects of wind pressure on the flow.)

An MEV system (pictured right):



The system is typically dual speed, providing low-speed continuous 'trickle' ventilation, and high-speed 'boost' flow. Replacement dry air is drawn into the property via background ventilators (e.g. trickle ventilators) located in the habitable rooms, and by air leakage. Providing a gap at the bottom of the internal doors will allow the free passage of air through the property.

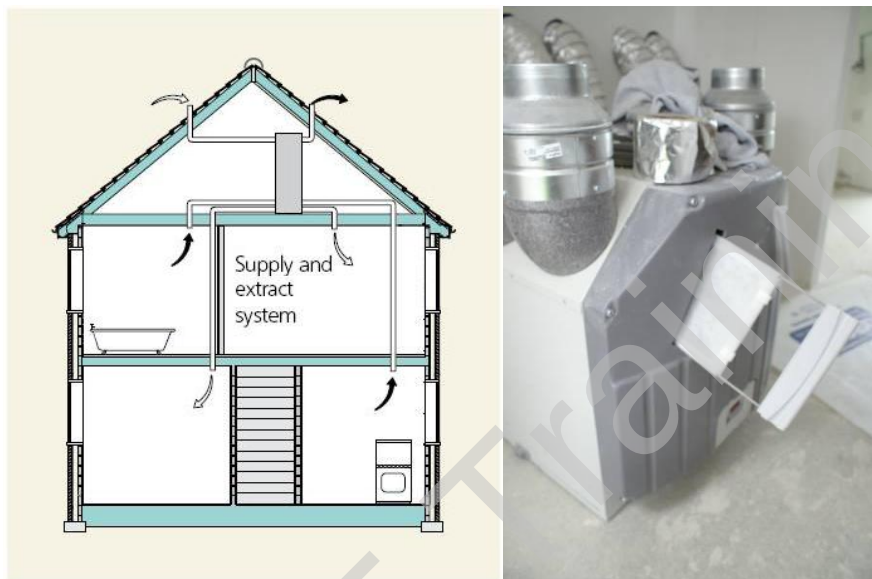
If a 'Positive input ventilation' system is encountered the assessor should record it as MEV.

Whole House Mechanical Ventilation with Heat Recovery (MVHR)

A whole house mechanical ventilation (MVHR) system usually combines supply and extract ventilation in one system. Systems considered here incorporate a heat exchanger.

Typically, warm, moist air is extracted from 'wet' rooms via a system of ducting and is passed through a heat exchanger before being exhausted to outside. Fresh incoming air is preheated via the exchanger and ducted to the living room and other habitable rooms.

An MVHR system (pictured right) – note the 4 vents on the top – every MVHR system has these. Washable filter is also shown:



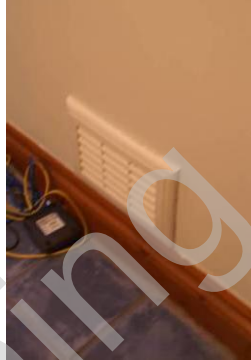
These systems can be effective at meeting part of the heating load in energy efficient dwellings, and helping to adequately distribute the heat. The system is typically dual speed, providing low-speed continuous 'trickle' ventilation, and high-speed 'boost' extract flow.

These systems can provide the ideal ventilation system, delivering the required ventilation rate almost independently of the weather conditions. However, the energy saving benefits are only realised for airtight properties (i.e. new-build dwelling or low-energy properties) when almost all ventilation air passes through the heat exchanger.

Number of open fireplaces

The count of open fireplaces is used to calculate ventilation heat losses due to their presence, this question does not relate to the heating system present.

The definition of an open fireplace is one with either an open chimney or a flue duct of 200mm or wider in diameter. All fireplaces which meet this definition should be included in the count.

		
A fireplace with an open fire, or fire in grate, would qualify as an open fireplace.	A fireplace with a heating appliance which incorporates a closing door is not included in the count of open fireplaces.	Permanently sealed chimney should not be counted as an open fireplace.

Any temporary blocking of flues e.g. cardboard, newspaper bungs or similar should be disregarded as they are not a permanent means of controlling ventilation.

RdSAP Convention 9.01

Include all open chimneys/fireplaces in the fireplace count (both downstairs and upstairs). The definition is a vertical duct with a flue diameter of at least 200 mm or its equivalent. The following are not counted as open fireplaces:

- Any open flue that is less than 200 mm diameter
- A permanently blocked up fireplace, even if fitted with an airbrick
- Any heating appliance with controlled flow of air supply i.e. appliance has closing doors
- A flexible gas flue liner sealed into the chimney (because the diameter is less than 200 mm)
- A chimney fitted with a damper enabling the flue to be mechanically closed when not in use

Temporary means of blocking a flue, e.g. cardboard, newspaper bungs and similar, are not a permanent means of controlling ventilation and therefore the chimney is counted as an open fireplace.

Note that this relates only to the number of open fireplaces (it affects the ventilation rate assumed for the calculation). Other rules apply when considering the choice of main or secondary heating systems.