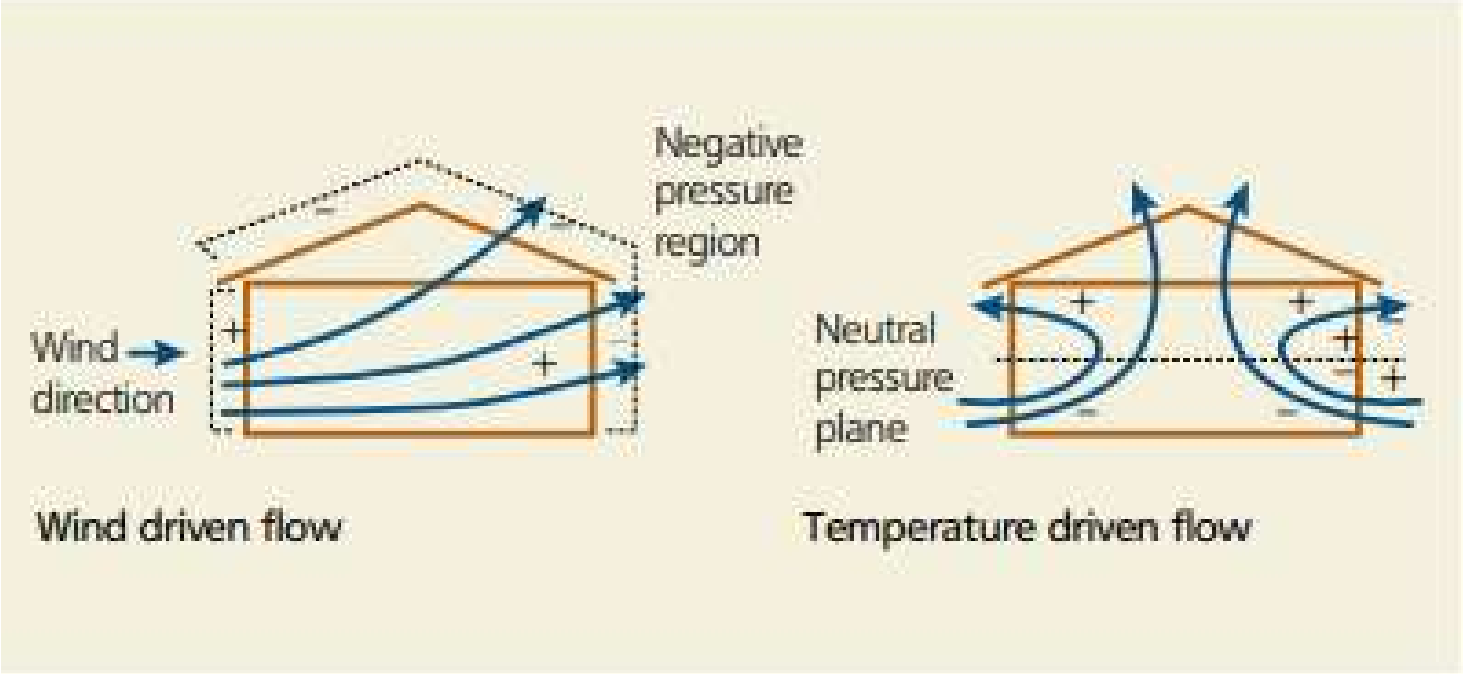
VENTILATION, AIR TIGHTNESS AND INSULATION

We all want to make our homes consume less energy and help decarbonise domestic heating. However there can be risks and the arrival of signs of dampness can be one of them.

Why might this occur?

HOW HOMES USED TO BE VENTILATED

Until the 1970s, homes in the UK were mostly ventilated by wind-driven air infiltration and air leakage, supplemented by the opening of windows. This brought in fresh air and removed moisture.



WHY MAY THERE BE PROBLEMS IF WE MAKE HOMES MORE ENERGY EFFICENT?

The old method of ventilating our homes no longer works when we fit better windows, draught stripping, remove chimneys and insulate walls, roofs and floors.

Fresh air is no longer introduced and moisture can build up inside. Families tend to have more problems than single people.

NO INSULATION WITHOUT VENTILATION

Therefore, if we retrofit any insulation or airtightness measures it is wise to compensate for the lost infiltration and air leakage by assessing the existing ventilation and upgrading, if necessary, to an adequate system.

If we don’t do this, there is a chance black mould may appear on the coldest parts of our homes, the internal air quality will be poor and respiratory problems may be worse.

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CURRENT BUILDING REGULATIONS

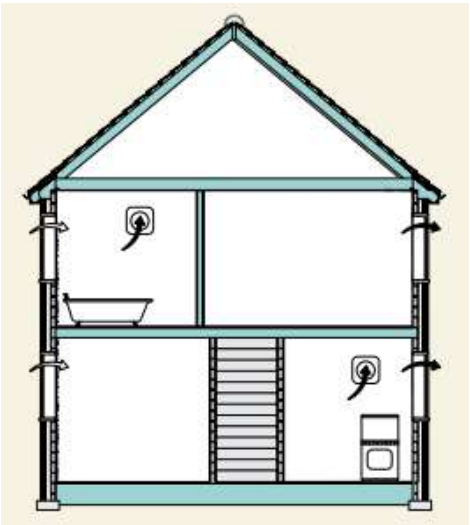
To avoid these problems Building Regulations since June 2022 require you to install a ventilation system when you make one major energy efficiency change or four or more minor changes.

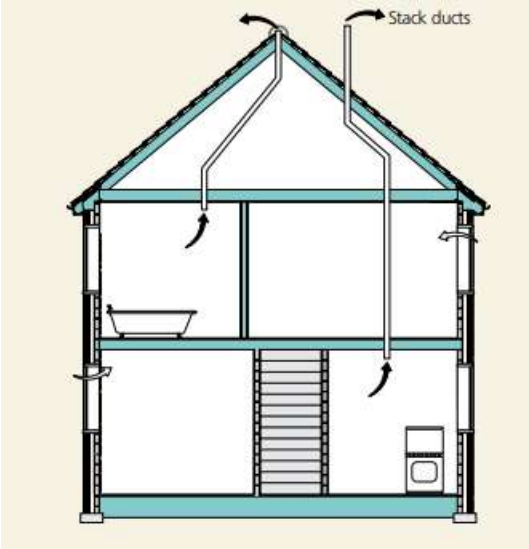
Examples are:

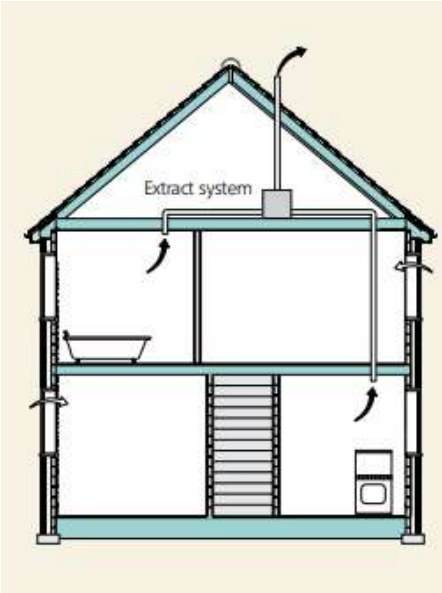
- **Major changes**: external or internal wall insulation to more than 50% of external walls, changing more then 30% of windows, insulating a suspended ground floor, sealing or removing a chimney etc
- **Minor changes**: loft insulation, cavity wall insulation, draught proofing measures

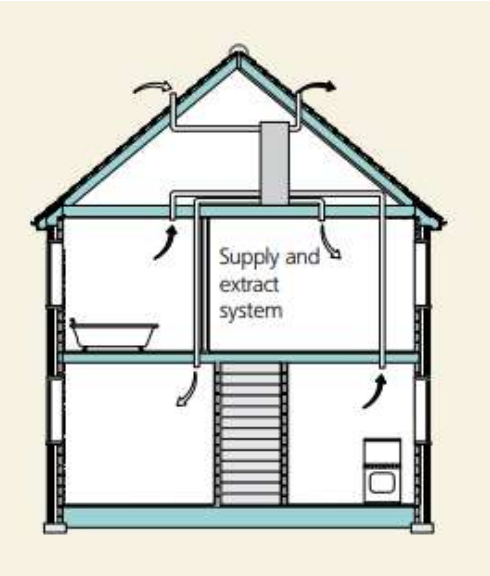
WHAT ARE THESE VENTILATION SYSTEMS?

"Systems" vary but can be as simple as fitting extract fans in all kitchens, bathrooms and utility rooms together with adequate trickle vents in all the windows. As the house becomes more airtight more complex systems are recommended.









Simple > > > > Complex

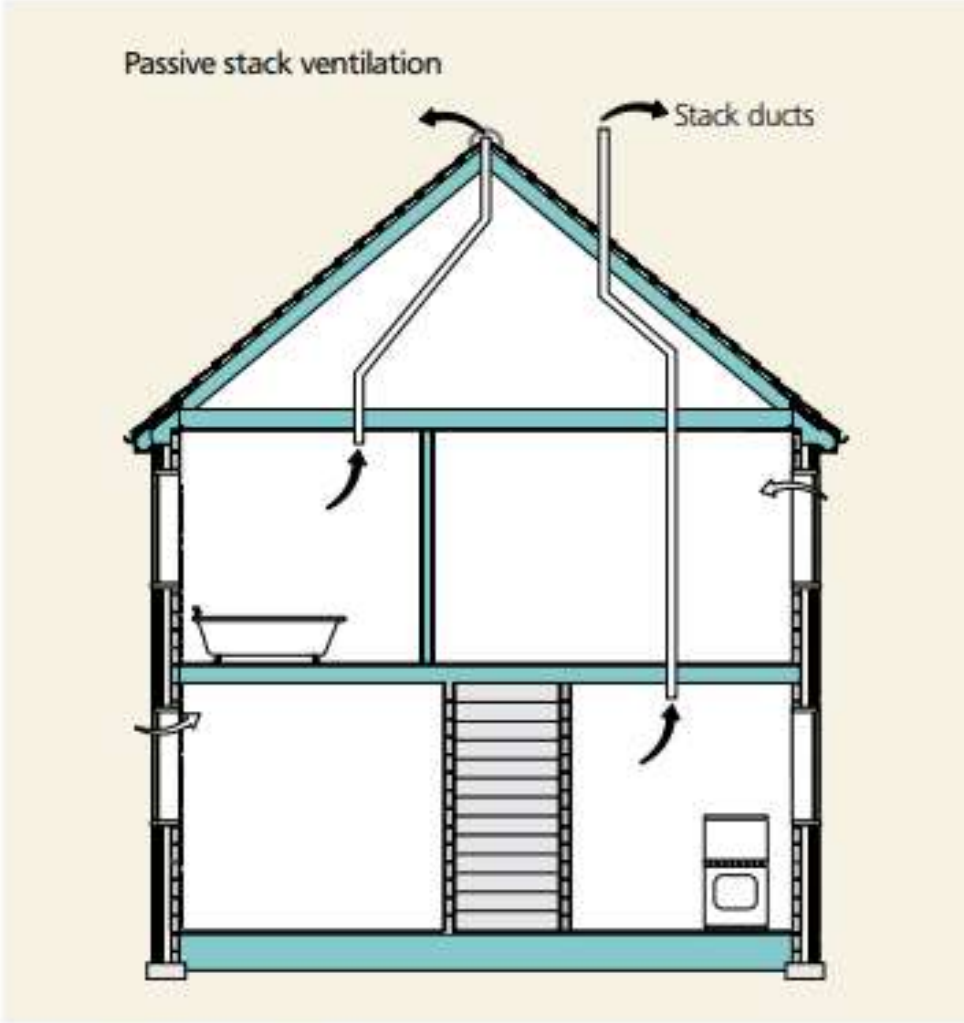


Figure 6 Passive stack ventilation

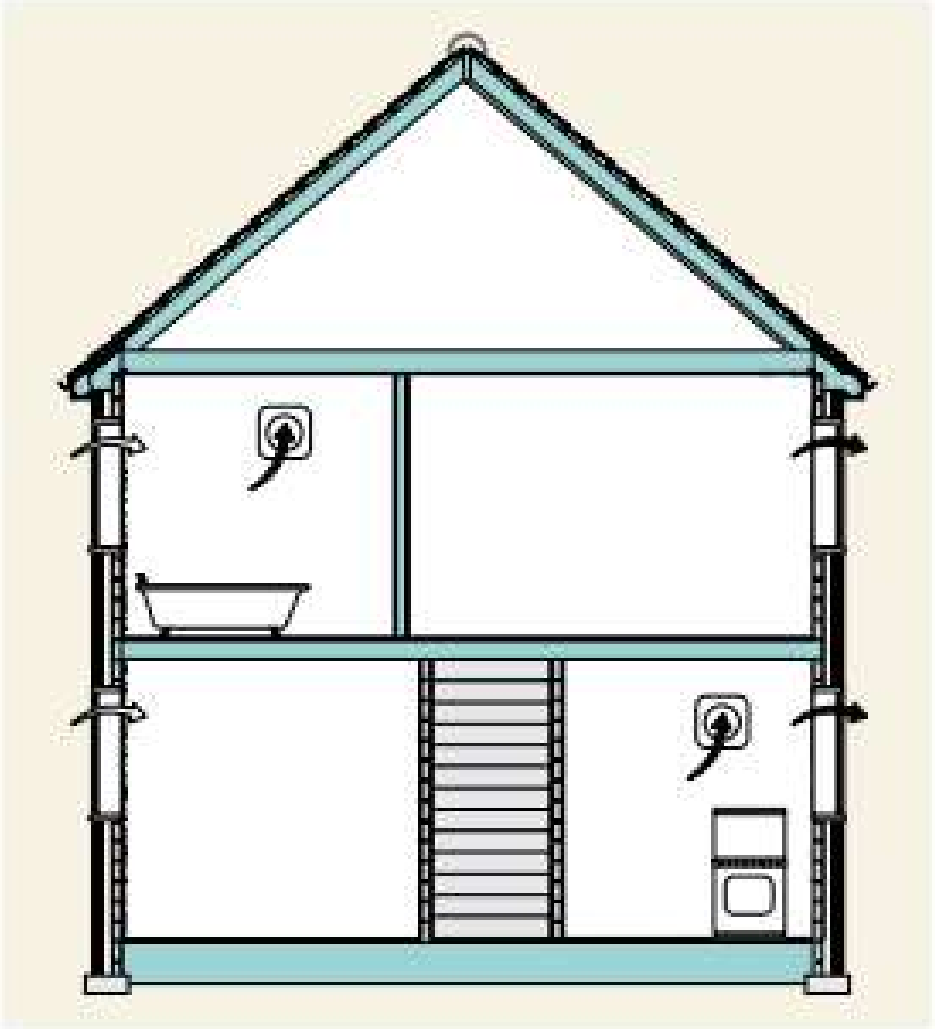


Figure 8 Intermittent extract fans

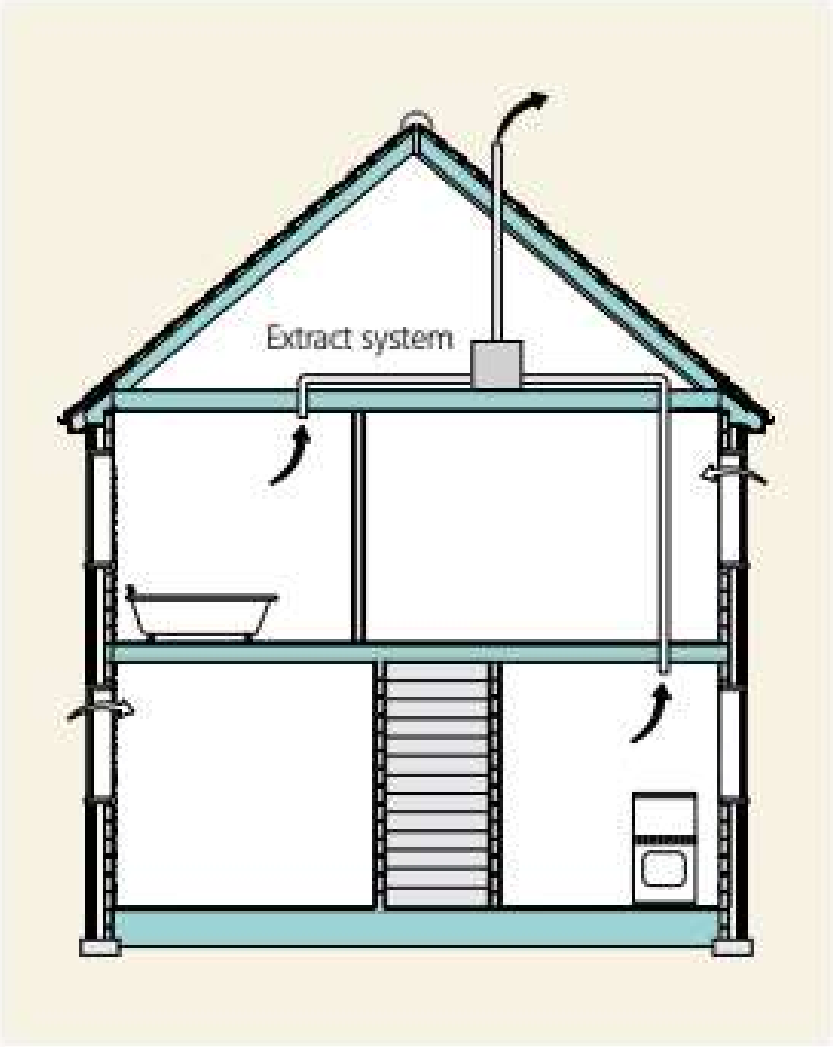


Figure 9 Mechanical extract ventilation (MEV)

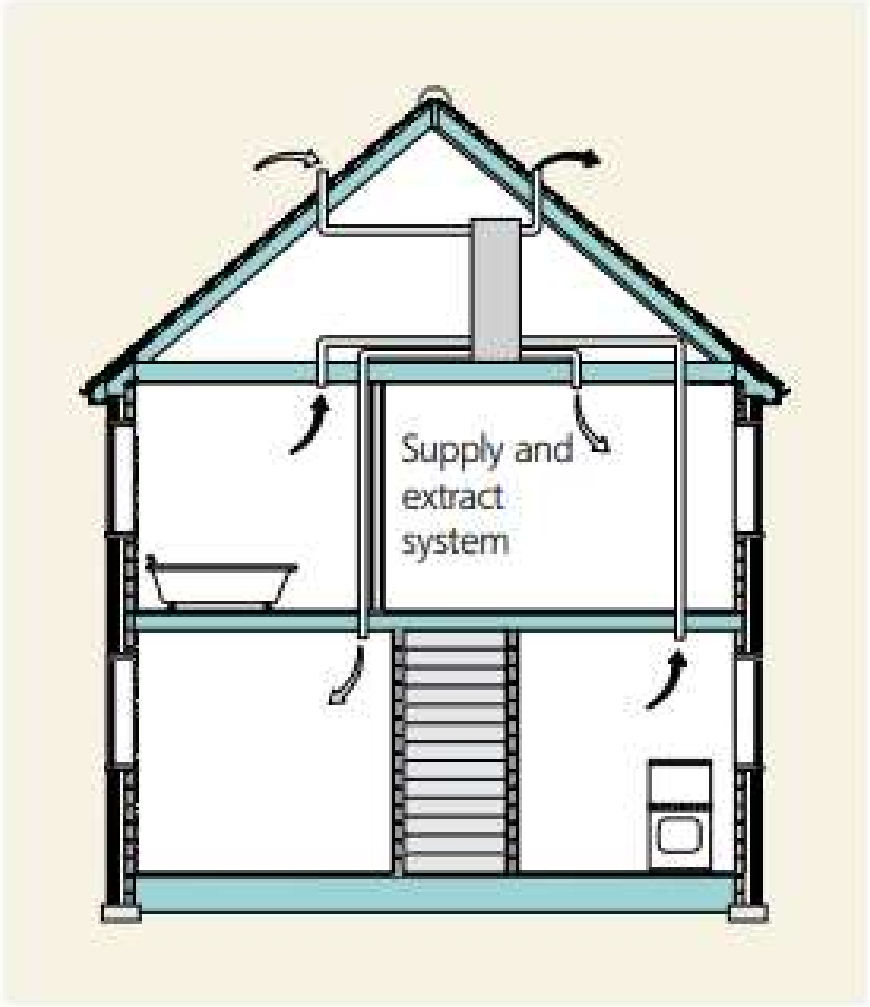


Figure 10 Whole house mechanical ventilation with heat recovery (MVHR)

Table 3.1 Energy efficiency measures

	Category of measure
Roof insulation	
a. Renewing loft insulation, including effective edge sealing at junctions and penetrations	Minor
b. Loft conversions or works that include changing a cold loft (insulation at ceiling level) to a warm loft (insulation at roof level)	Minor
Wall insulation	
c. Installing cavity wall insulation to any external wall	Minor
d. Installing external or internal wall insulation to less than or equal to 50% of the external wall area	Minor
e. Installing external or internal wall insulation to more than 50% of the external wall area	Major
Replacement of windows and doors[1]	
f. Replacing less than or equal to 30% of the total existing windows or door units	Minor
g. Replacing more than 30% of the total existing windows or door units	Major
Draught-proofing (other than openings)[2]	
h. Replacing a loft hatch with a sealed/insulated unit	Minor
i. Sealing around structural or service penetrations through walls, floors or ceiling/roof	Minor
j. Sealing and/or insulating a suspended ground floor	Major
k. Removing chimney or providing another means of sealing over chimney, internally or externally	Major

NOTES:

1. If the energy efficiency works involve only replacing windows, then the guidance in paragraphs 3.14 to 3.16 may be followed as an alternative means of demonstrating compliance.
2. Draught-proofing measures might not, on their own, constitute building work. This work may be controllable under the Building Regulations if carried out as part of other building work.

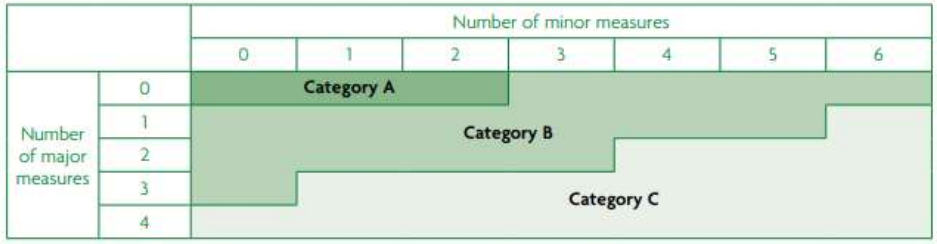


Diagram 3.1 Chart for categorising impact on ventilation when carrying out works in existing dwellings