

To help you with all the issues discussed in this guide, here is a list of contacts you might like to keep for future reference:

**Building Regulations Part F – Ventilation (England & Wales)**

[http://www.planningportal.gov.uk/uploads/br/BR\\_PDF\\_ADF\\_2010.pdf](http://www.planningportal.gov.uk/uploads/br/BR_PDF_ADF_2010.pdf)

**Building Regulations Part L – Conservation of fuel & power (New Dwellings) (England & Wales)**

[http://www.planningportal.gov.uk/uploads/br/BR\\_PDF\\_ADL1A\\_2010.pdf](http://www.planningportal.gov.uk/uploads/br/BR_PDF_ADL1A_2010.pdf)

**Build Regulations 3.14 – Ventilation (Scotland)**

<http://www.scotland.gov.uk/Resource/Doc/217736/0097977.pdf>

**Building Regulations Part F – Ventilation (Republic of Ireland)**

<http://www.environ.ie/en/Publications/DevelopmentandHousing/BuildingStandards/FileDownload,1647,en.pdf>

**Building Regulations– Ventilation (Northern Ireland)**

<http://www.dfpni.gov.uk/ventilation.pdf>

**Code for Sustainable Homes (New-Builds) (England & Wales)**

<http://www.communities.gov.uk/documents/planningandbuilding/pdf/codesustainhomesstandard.pdf>

**Cracking the Code – Helping you understand the Code for Sustainable Homes (England & Wales)**

[http://www.housingcorp.gov.uk/upload/pdf/Cracking\\_the\\_Code\\_20080528102051.pdf](http://www.housingcorp.gov.uk/upload/pdf/Cracking_the_Code_20080528102051.pdf)

**Ecohomes – A version of BREEAM for Homes, providing a rating for all new-builds (Scotland)**

<http://www.breeam.org/page.jsp?id=21>

**SAP (Standard Assessment Procedure) Appendix Q – Highlights the most efficient ventilation products**

<http://www.sap-appendixq.org.uk>

**Energy Saving Trust - Guide to ventilation**

[http://www.greenspec.co.uk/documents/refurb/Efficient\\_ventilationGPG268.pdf](http://www.greenspec.co.uk/documents/refurb/Efficient_ventilationGPG268.pdf)

**Asthma- Information to help people affected by Asthma**

<http://www.asthma.org.uk>

**Passivhaus – A specific construction standard for energy efficient homes**

<http://www.passivhaus.org.uk>

**TrustMark - Advice on trustworthy tradesmen**

<http://www.trustmark.org.uk>

**AECB - Sustainable Building Association**

<http://www.aecb.net>

**BRE - Provide consultation on achieving better buildings**

<http://www.bre.co.uk>

**NASBA - National Self Build Association**

<http://www.nasba.org.uk>

**NHBC - The National House-Building Council**

<http://www.nhbc.co.uk>

**HVCA - Heating and Ventilation Contractors Association**

<http://www.hvca.org.uk>

**SIPS – An advanced method of construction**

<http://www.uksips.org>



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# Guide to Ventilation

for self-builders and renovators





## Who is this guide for?

If you are thinking about or are in the process of building a new home or renovating an existing property, then this guide is for you. We will talk you through the different ventilation solutions available as well as highlighting the main benefits to you, the consumer.

### Don't be put off

Unless you're an experienced self-builder or a building services engineer, sometimes the science and technology behind ventilation systems can seem a little daunting. At ADM we know that some first-time self-builders feel overwhelmed by the prospect of understanding, choosing and overseeing the installation of a suitable system. In fact, the basic principles are surprisingly simple, and with the right help and support, there's no reason why choosing and installing a system shouldn't be a smooth, rewarding and entirely hassle-free part of the self-build process.

#### Did you know...

On average, self-builders build greener homes than volume builders.

#### According to...

The World Health Report, 2002, an estimated 1.6 million premature deaths were caused by poor indoor air pollution.

#### Did you know...

We spend 75% of our lives in the home.

## Why ventilate your property?

Good ventilation helps to create a healthier environment for you and your family. It works by removing polluted and moisture-rich air found in the home, and replaces it with fresh air taken from outside.

Effective ventilation is vital not only because it helps to protect your home's fixtures, fittings and internal structure, it also safeguards the health, comfort and long-term well-being of its occupants. Ventilation also helps to minimise or even eliminate the effects of dust mites for those who suffer with asthma and other respiratory problems.

Ventilation is a requirement of Part F & Part L of the Building Regulations (England & Wales) and Government initiatives like the Code for Sustainable Homes (Ecohomes in Scotland) and SAP. They are in place to ensure that your new-build is airtight, thermally efficient and adequately ventilated.

**Heating, insulation and ventilation must work together in order to provide a balance between energy efficiency and good indoor air quality.**

### Common problems

- Moisture in the air can lead to condensation and mould growth. House dust mites flourish in damp conditions, which can lead to asthma and other health issues.
- Construction materials, paint, cleaning products and carpets all used in the home give off harmful Volatile Organic Compounds (VOCs).
- Radon is an odourless gas that comes from water, soil and rocks. It is harmless in the outdoor air, but when trapped within a dwelling can be extremely dangerous to your health.
- Everyday odours from cooking, domestic pets, our bodies, toilets, Environmental Tobacco Smoke (ETS), circulate around the home.
- Potentially dangerous gasses, including carbon dioxide and carbon monoxide, together with ETS, pose serious health risks.
- Modern homes are designed to be airtight, creating an almost complete seal, which leads to the internal air being stale, unpleasant and polluted.
- Airborne pollen from trees, grass and flowers, which circulate around the home, can cause debilitating symptoms for hay fever sufferers.

#### Did you know...

A typical family of four produce as much as 18 litres of moisture per day from cooking, breathing & washing!

#### Fact...

There are around 1,500 asthma related deaths in the UK per year, 60% of these are attributed to dust mite allergies!

#### Fact...

Radon exposure is the biggest cause of lung cancer after smoking.

[Cancerresearch.org.uk](http://Cancerresearch.org.uk)

# What ventilation options are available?

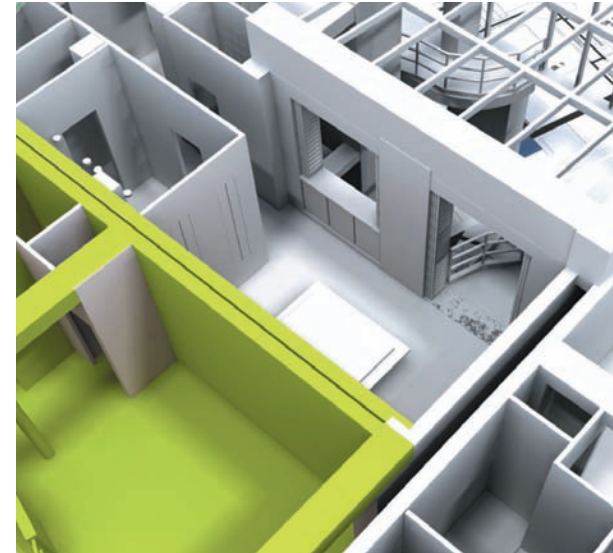
Because ventilation plays such an important role in your home and will do for many years to come, it is worth taking your time to consider what will best suit your needs.

Here we'll guide you through the different options available to you:

## Some key questions to consider when choosing your ventilation system:

Key Questions	A system which doesn't need trickle vents?	Does the system work 100% effectively throughout the house, with the window shut? *	Does the system have a low operating noise level?	Is fresh, filtered air spread evenly throughout the house?	Does the system recover heat and reduce the demand for energy?
Open Window	X	X	X	X	X
Extractor Fans	X	X	X	X	X
Passive Stack Ventilation (PSV)	X	X	✓	X	X
Central Extract Ventilation (MEV)	X	X	✓	X	X
Whole House Mechanical Ventilation with Heat Recovery (MVHR)	✓	✓	✓	✓	✓

\* Being able to keep the window shut means that you can exclude noise, dirt, dust, pollen and potential intruders.



**Did you know...**  
Open windows, trickle vents and extractor fans can cost you 40% of your heating bills!

**Fact...**  
Open windows do not satisfy building regulations as your only form of ventilation.

## Why can't I just open my window?

Although it's true that open windows do let in fresh air, not only does this compromise your home's security and possibly invalidate your household insurance, it isn't actually effective. With no filtration system at work, pollens and allergens enter the property and are likely to cause problems for allergy sufferers. What's more, because fresh, dry air isn't properly circulated, condensation from 'wet rooms' is likely to remain a problem and pose a serious risk to fixtures and fittings. Increased noise pollution is another drawback of trying to ventilate your property with an open window.

In terms of financial and environmental costs, leaving windows open is highly inefficient, wastes heat and will dramatically increase your household's energy consumption, carbon footprint and monthly utility bills.

## What are the major benefits for a Whole House Mechanical Ventilation with Heat Recovery System (MVHR)?

These systems provide the ideal ventilation solution. Not only are they energy efficient and highly reliable, they are also surprisingly affordable in both the short and long-term.

The principles of heat recovery are simple: contaminated stale air is continuously replaced by warmed, fresh, filtered air. Importantly, a highly efficient heat exchanger is used to recover over 90% of the stale air's heat and transfers it to the incoming air. In the summer months a bypass system allows fresh, filtered air to be introduced without being heated by the heat exchanger.

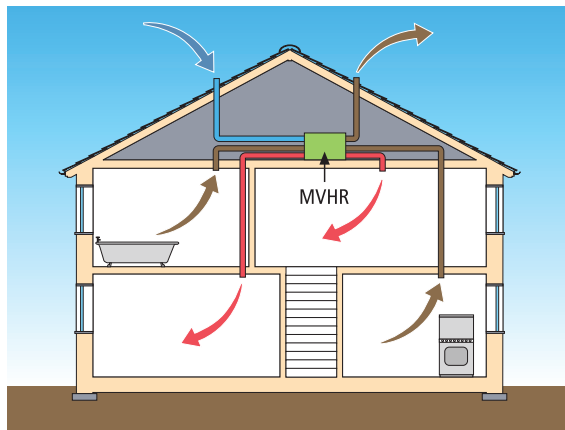
The end result is a high performance ventilation system that keeps your home supplied with clean, fresh air. Recovering and re-using existing heat also results in cost savings, whilst the fact that trickle vents aren't necessary makes this system particularly suitable where planning regulations don't allow for their use on buildings that have noisy neighbours such as major roads, railways etc.

### Fact...

With an MVHR system you can recover over 90% of your heat.

### Fact...

No need for trickle vents or extractor fans with an MVHR.



### Go to...

[www.admsystems.co.uk](http://www.admsystems.co.uk) for the latest statistics on the ground-to-air heat exchanger.

So, if you would like to lower your carbon footprint, have a constant flow of fresh air, control condensation, increase your security and benefit from less noise then perhaps a heat recovery system is the solution for you. It's also likely to increase your property value and certainly reduce your running costs.

## Ground-to-air heat exchanger (GAHX)

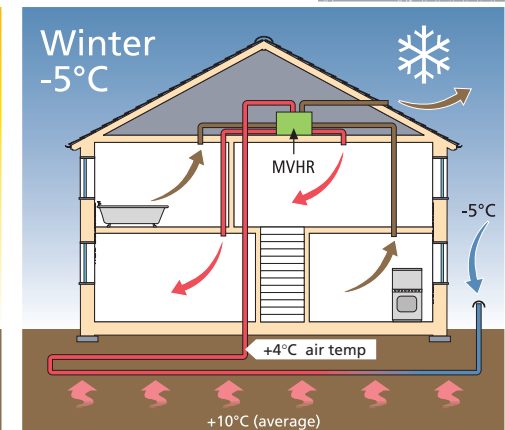
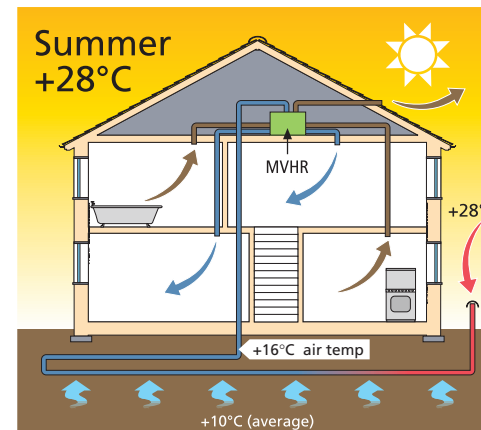
A ground to air heat exchanger works in conjunction with the MVHR to really make the most of your natural surroundings.

By drawing air through an underground network of pipes, the GAHX provides an extremely cost effective source of renewable energy by using the temperature of the ground. At depths of 1.5 to 2 metres, the earth's temperature, in the UK, is a constant 8-12 °C regardless of the time of year or the outside air temperature.

This significantly reduces your heating and cooling bills as well as providing long-term environmental benefits.

"We are delighted with the energy efficiency of our new home. We wanted to make it as sustainable as possible, which meant making full use of our natural resources. It is wonderful to know that with the GAHX we are using the ground around us to make our MVHR system even more efficient."

*Geoff Spence*



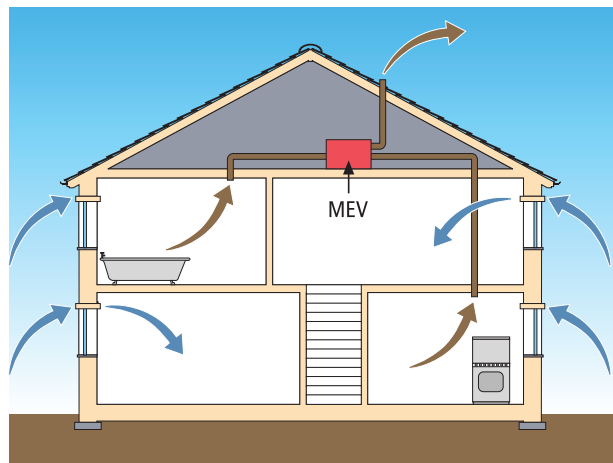


## Central Extract Ventilation

Often referred to as MEV or Mechanical Extract Ventilation, contaminated air is removed from the 'wet rooms' – bathrooms, kitchens, utility rooms – and replaced with fresh air from trickle vents together with air leakage in the habitable rooms.

The advantages include straightforward installation, quiet operation and continuous, low-level background ventilation, with a boost facility, for example when cooking. Typically only one power supply and one penetration through the buildings envelope.

The main disadvantages are that the system wastes heat as well as creating draughts and requiring trickle vents.



*"We are delighted with the MVHR system as it has helped alleviate our asthma and made the whole family much less allergic."*  
*Denise Gaydon*

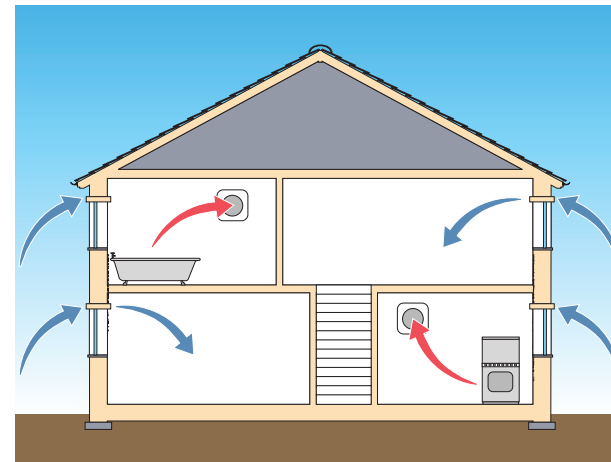
**Go to...**  
[www.admsystems.co.uk](http://www.admsystems.co.uk)  
to read all our case studies in full.

## Extractor Fans

These fans operate intermittently and can be controlled by the occupant; they are installed in a property's 'wet rooms'.

The advantages they offer include easy installation coupled with the ability to remove pollutants quickly.

The main disadvantages are that they waste heat, require trickle vents, are noisy and create draughts. They are sometimes overlooked by occupants who forget to switch them on or off and are also prone to tampering. Installing each fan requires holes to be made in the building's external fabric, it is unlikely that these will be finished with a truly airtight seal, leading to further heat loss. Extractor fans are considered by many to not be very aesthetically pleasing.



*"We have been delighted with the energy efficiency of the MVHR system and when you consider the acoustic benefits, it is now one of the most useful features of our new home."*  
*Dr Edworthy*



## Passive Stack Ventilation

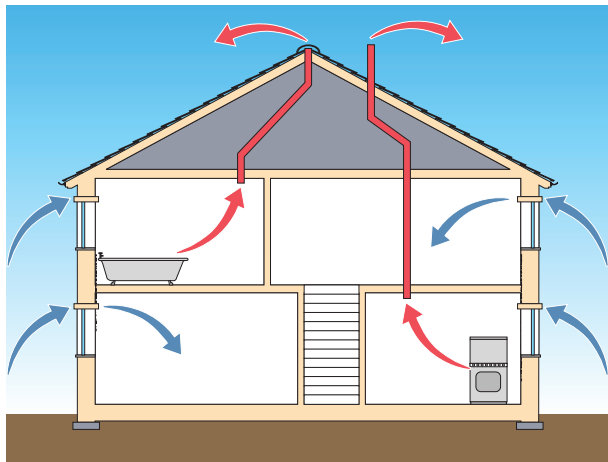
PSV systems avoid using electric fans by employing a 'stack' effect to draw warm air up from 'wet rooms' through ducts. Fresh, replacement air is brought into the property through window trickle vents and wall inlets within the building's habitable rooms, whilst humidity controls ensure supply always matches demand.

The two main advantages are that it's silent in operation and has no running costs.

The disadvantages are that the ducts must be near vertical to the ridge or roof terminals, and that the lack of pressure differences affecting airflow might mean it's necessary to use an open window or additional central fan during warmer weather. This system also wastes heat and may cause draughts, whilst humidity controlled inlets will require extra ventilation when low humidity occurs. Finally, window trickle vents and wall inlets are required.

**"We are highly delighted with the efficiency of the MVHR system as it saves us a huge amount on our heating bills by cutting the wasteful loss of heat. It was an added advantage that it avoided the need for trickle vents in our beautiful oak windows."**

**Anthony Robinson**



## What are the key considerations when planning for your new system?

Following these tips will help you to avoid some of the expenses, delays and pitfalls experienced by self-builders and renovators who embark on projects unprepared.

### Start as early as possible

The best way to ensure the smooth integration of an appropriate ventilation system into your self-build is to consult a specialist team as early as possible, preferably during the planning process.

### Consider the system location

As well as considering which ventilation system you might use, you should think about where it will be positioned within your property, especially since planning regulations might dictate that certain conditions are met, such as the position of external terminals. Although modern systems are highly reliable and need very little maintenance, it's necessary to have access to the system for routine cleaning and servicing.

### Know the rules

Although the legislation surrounding emissions and sustainability sometimes seems complicated and changeable, it's vital that you know your legal obligations and familiarise yourself with the latest or imminent legislation that might affect your self-build. Think carefully about issues like planning permission, and remember that in built-up areas, near busy roads or airports the use of trickle vents may not be allowed. A reputable consultancy can help you navigate the rules and regulations relevant to your situation.

**Did you know...**  
By 2013, privately built dwellings will need to attain a minimum level 4 in the Code for Sustainable Homes.



*"Since fitting the MVHR system we have virtually eliminated the problem of condensation, which means we no longer get black mildew on the walls. That has created a much more pleasant and healthier environment for my family."*

*Phil Smith*

### Strive for airtight and energy efficiency

If your aim is to create an airtight, energy efficient and well-insulated building, your biggest potential source of heat loss is your ventilation system. It's imperative, therefore, that you recover the maximum amount of heat that you would otherwise lose. Without an effective ventilation system, most new-build properties are prone to relative humidity levels of more than 70% - increasing your risk of house dust mites, condensation and mould growth. Compromising on your system will seriously jeopardise the overall performance, healthiness and cost-efficiency of your new home.



### Choose carefully

Whoever you choose to supply your ventilation system, make sure you have chosen them carefully. It's worth remembering that an experienced and reputable team won't just design and install the very best system for your particular brief, they'll also project manage the process and ensure that the job's completed on time and on budget.

### Some key questions to ask include:

- Are they accredited by TrustMark to guarantee you a job well done?
- Can they offer installation and commissioning of the system?
- Do they specialise in working with self-builders and renovators?
- Will they provide truly impartial information and advice, or will they only recommend products and systems from a single manufacturer?
- Are they members of HVCA, an association who monitor operating procedures and standards?
- Do they know all the rules of ventilation? Too little ventilation leads to poor air quality and inadequate removal of pollutants and condensation. Excessive ventilation can cause discomfort through cold draughts and lead to increased heating costs.
- Have they specified good quality ducting & accessories? The ductwork is an essential part of the system and must be of a standard that does not adversely affect its performance or lower your SAP rating.



**Don't forget...**  
Pay careful attention to the installation and commissioning, so that the system operates efficiently without compromise.

## What makes ADM the perfect self-build partner?

Being a self-builder you'll need advice on a lot of issues, and ventilation is no exception. As technology doesn't stand still it is our job to make sure we keep up-to-date with the advances that are being made. We are not tied to any supplier or manufacturer so we can offer you independent advice on a whole range of different systems that are not only right for your house but right for you.

**Don't forget...**  
Free, no-obligation design when you send in your plans

### Specialist

Being at the forefront of the development of heat recovery ventilation in the UK, we have over 30 years experience in working with self-builders. We truly specialise in this field and encourage you to have an informal chat with one of our designers, so you can find out exactly what works for you. You would be very welcome to visit our showrooms, in Skipton or Swindon (Buildstore), alternatively we can call and see you, whichever is convenient – there is no obligation.

As soon as you send in your plans, leave the rest to us. From the initial design stage through to installation, commissioning and balancing, we'll be with you every step of the way. Should you decide to install the system yourself, we'll help you through the process. After your system is up and running you won't be forgotten, we offer maintenance and servicing on all products. No matter how big, small or how long you've had the system we'll be on call to help with any issue.



*"We were very impressed with the expertise offered by ADM Systems. They were able to recommend a selection of appropriate systems from the SAP Appendix Q website, along with providing a complete supply, installation and commissioning service to the client."*

*Elaine Graham, Architect*

### True independence

We recommend products from a wide range of respected brands without any bias towards one supplier. Every system is unique, rather than off-the-peg from a single manufacturer. Our custom designed and tailor-made solutions utilise the best handpicked components for a given application. In practice this means you end up with a system that has been built without compromise. Our buying power enables us to provide you with a cost effective competitive solution.

### Quality assurance guaranteed

All our systems are covered by full manufacturers' warranties and will be properly installed, commissioned, tested and serviced by our qualified and approved technicians. We are also TrustMark Accredited.

