

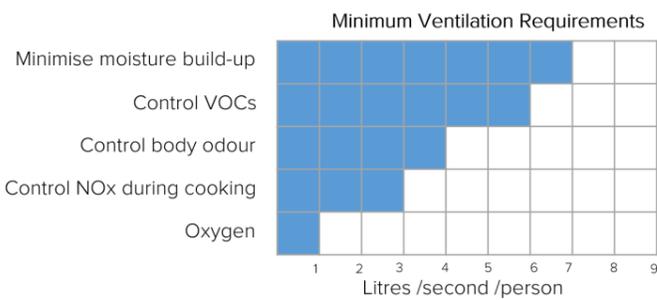
1 Ventilation vs Infiltration

There are two main types of heat loss due to air- 1) intended ventilation through opening windows or a mechanical ventilation system and 2) unintended air leakage, called air infiltration, through the building fabric. The intention is to minimise the air infiltration by making an air tight building whilst controlling the ventilation by allowing plenty of fresh air.

"Air tight, Vent right"

Traditional buildings tend to be more leaky hence there are more draughts. Often ventilation grills are blocked off to stop the cold air however, this can then lead to damp and mould growth which is equally not desirable.

3 Why do we need ventilation?



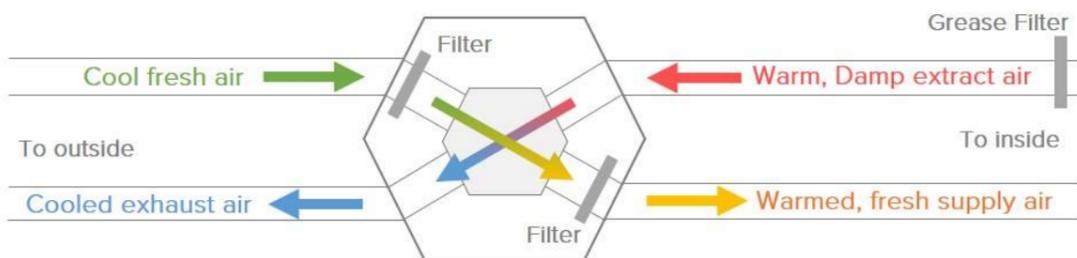
Fresh air is vital for:

- good indoor air quality
- providing oxygen
- removing smells
- minimising moisture
- build-up removing VOCs

Around 8l/s/person fresh air is needed to provide good indoor air quality.

*data from Passivhaus course

4 What does an MVHR do?



MVHR units use the heat from extract air to heat up cold incoming fresh air i.e. heat is recycled/recovered but not air so there is constantly pre-warmed fresh air for ventilation. MVHR units work best in an air tight building and as part of a wider energy efficiency strategy- see below.

Energy Hierarchy:

Reduce air leakage and measure/control ventilation required for good indoor air quality

Install efficient equipment e.g. good MVHR unit and heating system

Use heat recovery to recycle heat e.g. air and water

Once the energy demand is as low as possible then use renewables

5 Thermal comfort

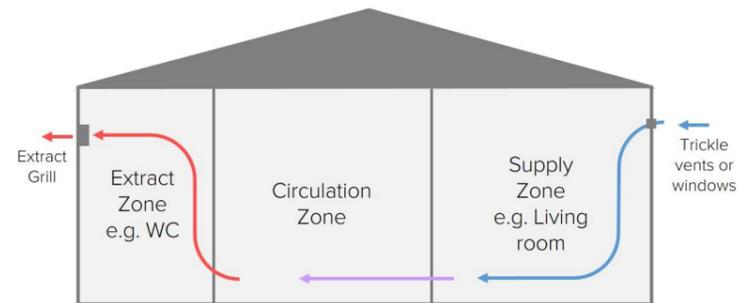
Ventilation Type	Air Quality	Thermal Comfort	Heating Energy
Natural (Opening windows)	★ OK if properly ventilated (can vary)	★ Poor if properly ventilated- draughty	★ Poor with large heat loss
Extract Only (Intermittent)	★★★ OK in combination with larger trickle vents	★ Poor- High temperature swing- draughty	★ Poor with large heat loss
Extract Only (Continuous)	★★★ OK greater control (needs trickle vents)	★★★ OK- Less noticeable temperature swing	★ OK- Controllable heat loss
Mechanical Vent (with heat recovery)	★★★★★★ Very Good- no trickle vents required and Filtration provided*	★★★★★★ Very good- if efficient heat recovery unit. Constant temperature	★★★★★★ Very good- if efficient heat recovery unit. No trickle vents required

*Filtration provides good indoor air quality especially good for asthma sufferers

2 Types of Ventilation

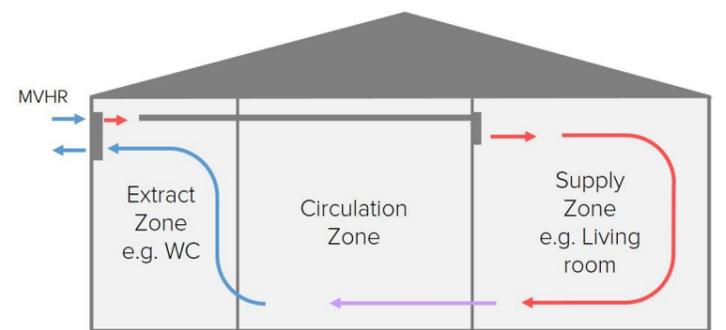
Extract Only:

Most homes use extract only ventilation or LEV (Local extract ventilation). The extract is taken from rooms which create moisture i.e. bathrooms (wet areas), kitchen, utility rooms and the incoming air is pulled through trickle vents, windows and holes in the building fabric.



Mechanical Ventilation with heat recovery:

As per extract only, air is taken from wet areas but a heat exchanger is used so that the heat from the extract air is used to heat up the fresh incoming air. n.b. air is not recirculated- just the heat recycled.



By recovering the warm stale air this allows the fresh air to be pre-heated creating a thermally comfortable space with no cold draughts. (MVHR)

6 Overview

- ★ Good indoor air quality- controlled humidity, heavy particles, CO₂, NOx and Radon.
- ★ Reduces heating energy and bills ~80% heat recovery
- ★ Ideal for allergies- can include Pollen filters G4/F7
- ★ Demand controlled e.g. minimum rate, normal rate and boost rate
- ★ Less drafts- no trickle vent required
- ★ Secure- opening windows not required for fresh air
- ★ Quiet- less need for windows to be open at night, quite units and silencers can be selected to further reduce noise
- ★ Pre-heated fresh air
- ★ Improved climate control- Can be bypassed in summer to assist in reducing overheating risk
- ★ Very high levels of thermal comfort (works best with an air tight building and highly efficient unit)
- ★ Minimises moisture build-up
- ★ Controls CO₂, VOCs, and NOx
- ★ More uniform temperature in whole house
- ★ Filtration required- ideal for asthma sufferers

7 More Info...

If you would like to know more, have any questions or comments get in touch....give us a ring on 01225 862605 or e-mail info@ggbec.co.uk or drop in to our offices: Greengauge Building Energy Consultants, 54 Frome Rd, Bradford-on-Avon BA15 1LA.