Specifying MVHR. What has been learnt from site experience and it's future in low energy buildings.

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MVHR – Green Building Store

- Passivhaus & low energy specialists
- High performance PAUL MVHR units
- Lindab Safe ducting system
- High quality air valves & peripherals
- From initial plans to commissioning

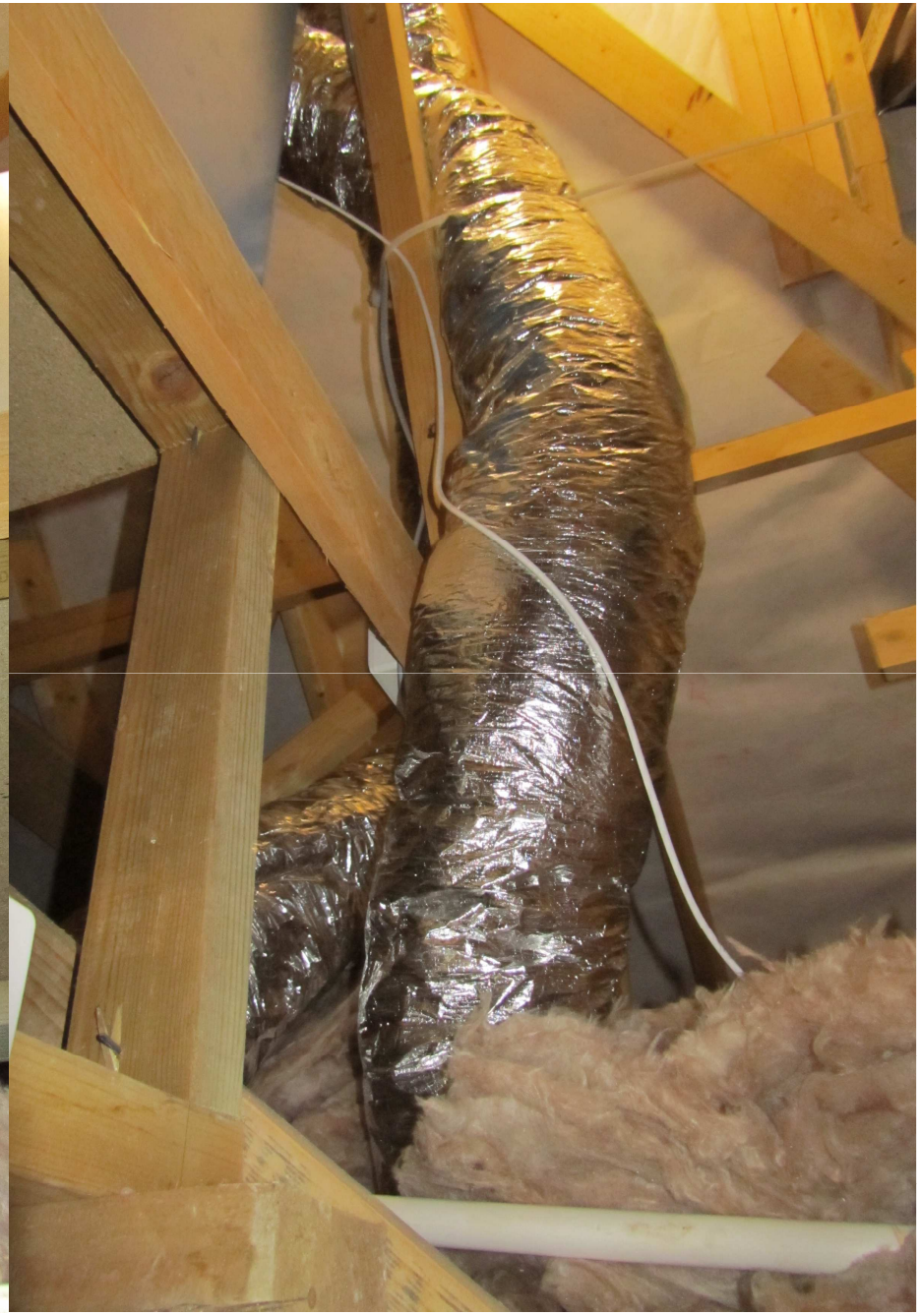
Passivhaus projects

MVHR - the new kid on the block

The context: The mainstream British building industry is still coming to terms with MVHR. The norm has been to place the MVHR unit outside thermal envelope in the attic.

- Using a ‘knitting’ of flexible ducting
- At best poorly insulated
- Making noise directly above bedrooms
- Due to inaccessibility filters don’t get changed
- Out of sight out of mind

2010/04/30



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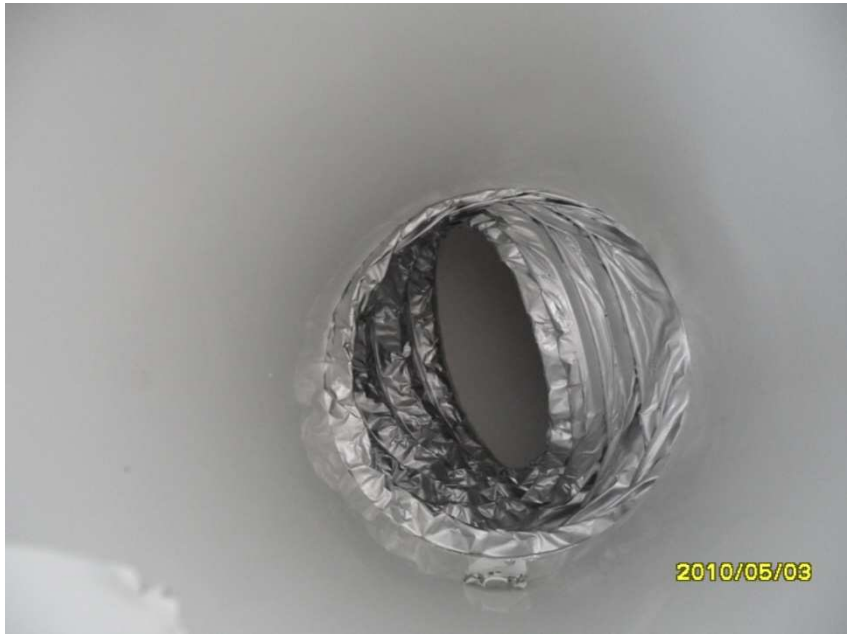


If you allow flexible duct to be used then it will be used in ways you don’t expect.

New kid turns into problem child

The impact of poor installation is:

- Much lower heat recovery efficiency than predicted.
- Higher energy consumption than predicted.
- Difficulty in commissioning to the correct airflows without some air valves getting noisy.
- Problems with damp/water from induct and on duct condensation in unexpected places.
- Filters don’t get changed. ‘Out of sight out of mind’
- Dirty filters = less / no air = mildew, raised CO2 etc
- Sound is disturbing

Dealing with the problem child?

- Human beings are intelligent = Where’s the off button?

Result of which is:

- All the good reasons why we the ventilation system was put in are not resolved.
- Mildew, damage to fabric, CO2 in bedrooms.

Well installed MVHR

- High air quality.
- Effectively imperceptible to the inhabitants.
- High thermal efficiency / low heat losses
- Low electricity consumption. £30/yr
- Easy to service

Architecture needs to informed by ventilation requirement.

- Just like windows & light, in airtight buildings ventilation is quality of life.
- Deliver air in the bedrooms, use it as it moves through the dwelling, extract out from the foul air spaces.
- Put the MVHR unit somewhere sensible.
- I often get asked to design after the layout is decided, and only properly involved when the appointed sub-contractor wants to purchase.

What are the specifications

- MVHR unit should not be in living space (or directly above it unless properly designed)
- Maximum sounds levels of 27dBA at 1m into living space & 30dBA at 1m into wet rooms.
- For a ‘normal’ house, a maximum of 100 Pascal pressure loss either side of the heat exchanger.
- All ducting should be ridged (some small exceptions)
- Cross talk attenuation.
- Air transfer paths should be specified. 1m/s max

If the company designing cannot answer all (or at least most) of the above go somewhere else.

Why quality ducting is important

- The ducting for MVHR systems is embedded in the building fabric.
- The product cost is a small part of the installation cost.
- The cost of replacement is many times that of the initial installation.
- The should be fit for purpose for the lifetime of the building.
- Double the pressure loss = double the energy consumption

Passivhaus encourages good MVHR design

- PHPP takes the thermal losses of the MVHR system into account.
- PH uses a realistic pressure loss external to the MVHR unit at certification. Ducting design = knowing the pressure loss. Installed value not carried forward.
- PH requires an ‘active’ means of frost protection.
- PH specifies maximum air transfer speed & thereby transfer route dimensions.
- PH commissioning compares the intake/exhaust with the supply/extract.

Delivery

- Building modelling needs to inform design.
- Good communication is essential, both between skills up and down the ladder and side ways.
- As the project moves forward, all new parties should be included, involved and informed. Plasterboarders.
- Partnership model or partnership mentality works best.

The worst enemy of good MVHR installation is poor communication and competitive tender.

Well installed MVHR


GYPSUM MF5 3600mm GYPFRAME
MF5 3600mm GYPFRAME
2010/01/0

Most common problems

- Wrong type of insulation on intake and exhaust ducts.
- Electrical installation requirements of the MVHR system not properly thought through. Poorly located controls.
- ‘Value engineering’, products being substituted.
- Use of flexible ducting to get round ‘problems’.
- Not reading the manual, frost protection on exhaust.
- Air valves not properly mounted or glued in place
- Wrong type of air valve for the situation.
- Filters impossible to change.

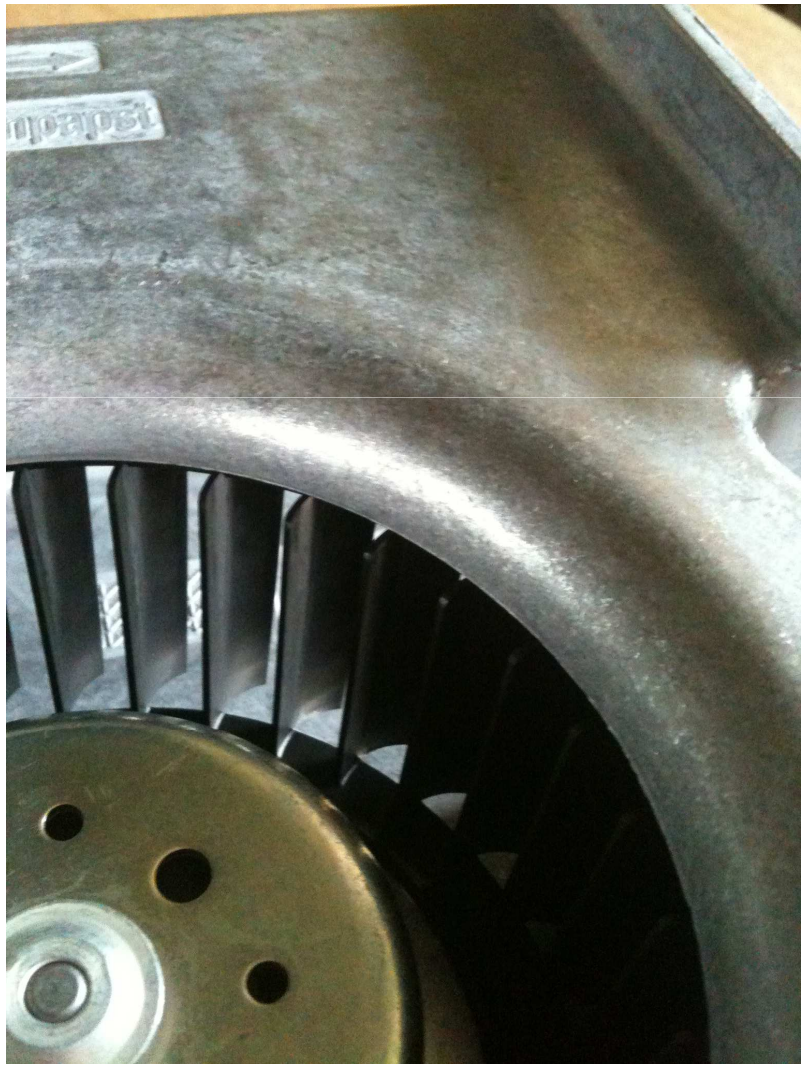
Commissioning MVHR Systems

- Essential that the system is properly commissioned.
- We should be measuring both airflow and energy.
- Measuring air is like chasing cats! Int & Exh
- Commissioning is effectively a quality control check on the MVHR installation.
- The commissioning should be carried out on behalf of the client or main contractor by an independent contractor.

Ongoing maintenance

- Accessibility issues for changing filters.
- Cost of filters: After market, legislation / standardisation?
- Importance of changing filters.

Fan types: Rpm verses constant volume flow fans.



What the difference?

RPM or energy in energy out

- Variable ventilation rates: Filters / Condensation.
- No noticeable effect or neglect???

Constant volume:

- Effort changes to compensate for filters and condensation.
- Fans get noisy when filters dirty.

There are other ways … Zzzzzzzzzz!

What do we need from the industry?

Informing the inhabitants.

- Living in a low energy or Passivhaus is different to traditional houses.
- Housing associations are paying attention to informing inhabitants.
- One onsite: All of the people who I spoke to had received different messages, told me what their neighbours has said and were confused.
- We need to keep the story simple.

- 2 speeds, loud or louder.
- Filter not clearly labelled.
- Energy consumption?
- Quality of life?

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