

The Croft, 1 House Development – ASHP and MVHR Sustainability report

Air Source Heat Pump

Low energy consumption

We have proposed one of the most efficient heat pumps on the market, the Vaillant AroTHERM plus. It is capable of providing energy savings with a SCOP (seasonal coefficient of performance) of up to 4. (4 kWh of delivered energy for every 1 kWh of energy generated).

Heat pump efficiency is measured by its Coefficient of Performance (CoP), which shows how efficiently the heat pump system can heat your home under the best possible conditions. Using this scale, heat pump efficiency can be as high as 4. This means that for every unit of electricity you put in, heat pumps have the potential to produce 4 units of heat. To put this into perspective, electric heaters operate at around 100% efficiency (1 unit of electricity produces 1 unit of heat), and even brand-new oil and gas boilers only function at an efficiency of around 90%.

R290 refrigerant

Low Global warming potential (GWP)

Vaillant AroTHERM plus uses monobloc technology with a hermetically sealed refrigerant circuit using natural refrigerant R290 to deliver the one of the lowest GWPs of just 3. R32 refrigerant in comparison has a GWP of 675.

The natural refrigerant R290 for this heat pump has other advantages over alternative refrigerants: approx. 75% less filling quantity is needed; it has low GWP and provides significant product benefits for your customers. Using R290 means Vaillant heat pumps can achieve a high flow temperature of up to 75°C if required. Setting the flow to this maximum temperature for hot water means that an electric immersion heater for legionella protection isn't always necessary.

Compared to the installation of a Natural Gas Boiler the expected CO₂ will be reduced by approx. 50 – 55%

MVHR

MVHR helps them to cost effectively contribute towards the improvements in CO2 emissions required by Building Regulations. With MVHR, the incoming air is filtered, improving internal air quality and it also negates the need for window trickle vents. The benefit of MVHR is that it is much more controllable, it's a fully balanced system and has a larger impact on the energy efficiency of the dwelling. With an MEV system, window trickle vents are required to meet the whole building ventilation rate.

Recovering over 90 per cent of the heat that would normally be lost to the outside via trickle vents or extract fans, and feeding it back into the house as warm fresh air, MVHR provides a sustainable ventilation system and ensures the ability to reduce the overall energy requirement of the building. There are obvious benefits to homeowners looking to reduce their energy bills.

Where housebuilders are looking to build to greater levels of air tightness (of 3m3h/m2 or below) MVHR is often specified to achieve a larger percentage reduction between the DER and TER (Target Emission Rate). A high performing MVHR system through SAP (Standard Assessment Procedure) may lower the DER by 7-8 per cent.

Another reason for the increasing adoption of MVHR by the new build sector is the ErP Directive, which rates ventilation systems according to their energy efficiency. This is encouraging a move to a more systems-based approach to ventilation, as it mainly impacts MEV and MVHR systems and requires all ventilation units, except dual use versions to be equipped with a multi-speed or variable speed drive. In addition, all bi-directional units are required to have a thermal by-pass facility as an essential part of the design criteria, which prevents warm air being recovered in warmer weather. Due to the high thermal efficiency of MVHR systems, these typically achieve an ErP rating of A or A+.