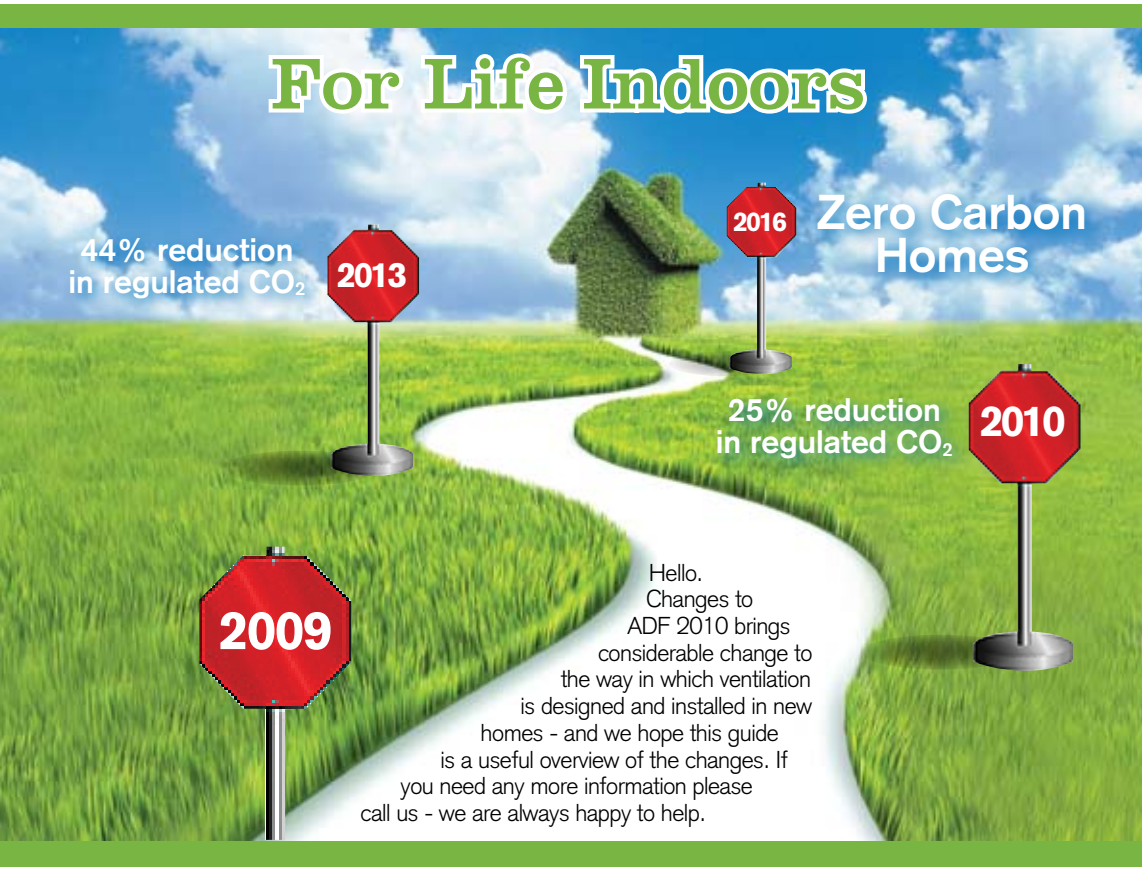
Greenwood AIRVAC

Building Regulations 2010

Changes and impacts of the new ventilation regulations


For Life Indoors
44% reduction in regulated CO_2
2013
2016
Zero Carbon Homes
25% reduction in regulated CO_2
2010
2009
Hello.
Changes to ADF 2010 brings considerable change to the way in which ventilation is designed and installed in new homes - and we hope this guide is a useful overview of the changes. If you need any more information please call us - we are always happy to help.

Build Tight Ventilate Right

The changes to the 2010 Building Regulations bring a completely new focus to the way in which ventilation is specified and installed in new and existing dwellings.

Airtight properties with low levels or even zero infiltration mean that ventilation is now high on the agenda. With people spending up to **70%** of their life indoors, ensuring **what is designed, is installed, and works** for the house and the homeowner is not only crucial, but will also need to be approved and signed off.

2010 = 25% CO_2 Reduction based on 2006 levels
= Guaranteed Installed Performance
= Controlled Service

Two new documents have been published for the 2010 revisions:
ADF 2010: Means of Ventilation &
Domestic Ventilation Compliance Guide.
For the first time Ventilation is moving away from 'design only' to include installation testing and commissioning and takes the first steps to become a controlled service.

With the new extension of scope, there is a considerable amount of information to be understood. We see three key areas that are now key to Building Regulations Compliance:

Design Performance Criteria	+	Installation and Commissioning	+	Operation and Maintenance
The methods and airflow rates based on design air permeability		Guaranteed installed performance achieved through competent person installation		End user information to ensure effective use of system

Design

One of the most important changes is the introduction of TWO Air Permeability Designs.

For ventilation rates, The DEFAULT option is assumed to be < 5ach @ 50Pa in SAP 2009.

Design: > 5ach @ 50Pa

Design: < 5ach @ 50Pa

Design Performance Criteria

ADF 2010 Means of Ventilation

England & Wales

Ventilation is required for one or more of the following purposes

- Provision of outside air for breathing
- Dilution and removal of airborne pollutants including odours
- Control of excess humidity (arising from water vapour in the indoor air)
- Provision of air for fuel-burning appliances (which is covered under Part J of the Building Regulations)

Buildings are ventilated through a combination of ***infiltration*** and ***purposely provided ventilation;***

Infiltration is the uncontrollable air exchange between the inside and outside of the a building through a wide range of air leakage paths in the building structure.

Purposely provided ventilation is the controllable air exchange between the inside and outside of a building by means of a range of natural and/or mechanical devices

It is important to minimise the uncontrollable infiltration and supply sufficient purpose-provided ventilation during the design stages.

Ventilation Provision for New Dwellings

Ventilation rates are set out in the document under the 4 standard methodologies;

1. **System 1:** Background Ventilators and Intermittent Extract Fans
2. **System 2:** Passive Stack Ventilation
3. **System 3:** Continuous Mechanical Extract Ventilation
4. **System 4:** Continuous Supply and Extract Ventilation with Heat Recovery

Each of the methodologies has a specific calculation to determine the required air flow rates based on dwelling size, number of bedrooms and occupancy levels.

A worked example for a house and an apartment are provided over the next few pages.

The ventilation provisions recommended for new dwellings have been specified for two standard designs of air permeability.

The default option assumes zero air permeability and therefore zero infiltration. This means the building is therefore entirely dependent on purpose provided ventilation.

Airflow Rates

Table 5.1a **Extract ventilation rates**

Please refer to ADF 2010 for the full calculation requirements for system 1-4

Room	Intermittent extract	Continuous extract	
	Minimum rate	Minimum high rate	Minimum low rate
Kitchen	30 l/s adjacent to hob; or 60 60 l/s elsewhere	13 l/s	Total extract rate should be at least the ***whole dwelling ventilation*** rate given in Table 5.1b
Utility room	30 l/s	8 l/s	
Bathroom	15 l/s	8 l/s	
Sanitary accommodation	6 l/s	6 l/s	

Table 5.1b **Whole dwelling ventilation rates**

	Number of bedrooms in dwelling				
	1	2	3	4	5
Whole dwelling ventilation rate [a, b] (l/s)	13	17	21	25	29

Notes:

a. In addition, the minimum ventilation rate should be not less than 0.3 l/s per m^2 of internal floor area. (This includes all floors, e.g. for a two-storey building add the ground and first floor areas).

b. This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. This should be used as the default value. If a greater level of occupancy is expected add 4 l/s per occupant.

Background Ventilation

Table 5.2a

A - Total equivalent ventilator area [a] (mm^2) for a dwelling with any design air permeability.

Total floor area (m^2)	Number of bedrooms[b]				
	1	2	3	4	5
≤50	35000	40000	50000	60000	65000
51-60	35000	40000	50000	60000	65000
61-70	45000	45000	50000	60000	65000
71-80	50000	50000	50000	60000	65000
81-90	55000	60000	60000	60000	65000
91-100	65000	65000	65000	65000	65000
>100	Add 7000 mm^2 for every additional 10 m^2 floor area				

B - Alternative guidance on total equivalent area [a] (mm^2) for a dwelling with a designed air permeability leakier than (>) 5 $m^3/(h.m^2)$ at 50 Pa

Total floor area (m^2)	Number of bedrooms[b]				
	1	2	3	4	5
≤50	25000	35000	45000	45000	55000
51-60	25000	30000	40000	45000	55000
61-70	30000	30000	30000	45000	55000
71-80	35000	35000	35000	45000	55000
81-90	40000	40000	40000	45000	55000
91-100	45000	45000	45000	45000	55000
>100	Add 5000 mm^2 for every additional 10 m^2 floor area				

Notes:
a. The equivalent area of a background ventilator should be determined at 1 Pa pressure difference.
b. This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. For a greater level of occupancy, assume a greater number of bedrooms (i.e. assume an extra bedroom per additional person). For more than five bedrooms, add an additional 1000 mm^2

Remember: Two design air permeabilities now exist

- For ventilation rates, The DEFAULT option is assumed to be < 5ach @ 50Pa in SAP 2009
- Ventilation airflow rates DIFFER between the two air permeability designs.

New Domestic Building Services Guide

In addition to ADF, ADL (Part L) Conservation of Fuel and Power has also been revised. ADL also has an associated document - Domestic Building Services Guide - which also details ventilation.

The document provides detailed guidance for persons designing and installing fixed building services in both new and existing domestic dwellings.

Mechanical ventilation specification is referenced in relation to energy efficient performance. The guidance recommends minimum standards for mechanical ventilation systems.

Recommended minimum standards for mechanical ventilation systems

	New and replacement systems
1.0 Fan power	a. Mechanical ventilation systems should be designed to minimise electric fan power. Specific fan power (SFP) should not be worse than: i. 0.5 W/(l/s) for intermittent extract ventilation systems; ii. 0.7 W/(l/s) for continuous extract ventilation systems; iii. 0.5 W/(l/s) for continuous supply ventilation systems; iv. 1.5 W/(l/s) for continous supply and extract with heat recovery ventilation systems.
2.0 Heat recovery efficiency	a. The heat recovery efficiency of balanced mechanical ventilation systems incorporating heat recovery should not be worse than 70%
3.0 Controls	a. Intermittent mechanical extract ventilation systems should be operated by local manual switches or automaticaly by a presence sensor. b. All other mechanical ventilation systems should have manual or automatic control of the boost

Design: > 5ach @ 50Pa

Design: < 5ach @ 50Pa

Design Performance Criteria

System 1

Background Ventilators and Intermittent Extract Fans

The Approach:

- Traditional 'room based' ventilation
- Extract fans located in all wet rooms including bathroom, kitchen, utility & wc
- Background Ventilators located in all rooms

What's new for ADF 2010?

Background Ventilation

Whilst the mechanical intermittent extract rates per room remain unchanged, background ventilation rates have been increased by up to 40% for the default infiltration design criteria (< 5ach @ 50Pa)

Key increase mm²	5000
Increases from the requirements of ADF 2006	10000
	15000
	20000

Table 5.2a

Total equivalent ventilator area [a] (mm²) for dwellings with any design air permeability leakier than (<) 5m³/(h.m²)@50Pa					
Total floor area (m²)	**Number of bedrooms[b]**				
	1	**2**	**3**	**4**	**5**
<50	35000	40000	50000	60000	65000
51-60	35000	40000	50000	60000	65000
61-70	45000	45000	50000	60000	65000
71-80	50000	50000	50000	60000	65000
81-90	55000	60000	60000	60000	65000
91-100	65000	65000	65000	65000	65000
>100	Add 7000 mm² for every additional 10 m² floor area				

Notes:

a. The equivalent area of a background ventilator should be determined at 1 Pa pressure difference, using the appropriate test method given in Table 5.3.

b. This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. For a greater level of occupancy, assume a greater number of bedrooms (i.e. assume an extra bedroom per additional person). For more than five bedrooms, add an additional 10000mm² per bedroom.

Example 1:

2 Bedroom Apartment 65m²

- Dual Façade with total of 3 windows
- 45000mm² equivalent area = 15,000mm² per window

This is a high performance to achieve over a small number of windows. Based on the ventilators available in the market, there are likely to be 3 vents per window to be installed and therefore may not be achievable within the window sizes. Remember: Single Façade also requires ventilation at BOTH top and bottom of the window. The requirement for the dwelling would increase to 90000mm² (30,000mm² per window).

Example 2:

4 Bedroom Property 95m²

- Total of 9 windows
- 65,000mm² equivalent area = 7222mm² per window

With a higher number of windows, the background ventilation requirements may easily be met, however may still result in 2 or 3 vents per window needing to be installed.

What's the impact?

In both apartments and houses, the increased background ventilation rates may result in this ventilation system being unable to be installed effectively. This is especially relevant to apartments with single facades that require background ventilators at both the top and bottom of the window to ensure cross ventilation.

Refer to ADF 2010 for full details.

Working Examples

House Specification

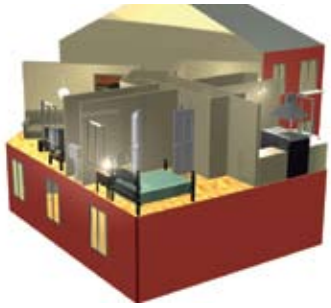
4 Bedrooms, Open Plan Living (Kitchen, Living & Dining), WC, Bathroom +1 En-Suite

Floor Area: 95m²

Apartment Specification

2 Bedrooms, Bathroom, En-Suite, Open Plan Living (Kitchen, Living & Dining)

Floor Area: 62.5m²



Design: > 5ach @ 50Pa

Mechanical Ventilation

Local Extract Fans	Airflow in litres per second
Kitchen	30/60
Bathroom	15
En-Suite	15
WC	6
Total	**66/96 l/s**

Mechanical Ventilation

Local Extract Fans	Airflow in litres per second
Kitchen	30/60
Bathroom	15
En-Suite	15
Total	**60/90 l/s**

Background Ventilation

Open Plan Living Area	10000mm²
Bathroom	5000mm²
En-Suite	5000mm²
Bedroom 1	6250mm²
Bedroom 2	6250mm²
Bedroom 3	6250mm²
Bedroom 4	6250mm²
Total	**45000mm²**

Background Ventilation

Open Plan Living Area	3000mm²
Bathroom	3000mm²
En-Suite	3000mm²
Bedroom 1	6000mm²
Bedroom 2	6000mm²
Total	**30000mm²**

Design: < 5ach @ 50Pa

Mechanical Ventilation

Local Extract Fans	Airflow in litres per second
Kitchen	30/60
Bathroom	15
En-Suite	15
WC	6
Total	**66/96 l/s**

Mechanical Ventilation

Local Extract Fans	Airflow in litres per second
Kitchen	30/60
Bathroom	15
En-Suite	15
Total	**60/90 l/s**

Background Ventilation

Open Plan Living	15000mm²
Bathroom	5000mm²
En-Suite	5000mm²
Bedroom 1	10000mm²
Bedroom 2	10000mm²
Bedroom 3	10000mm²
Bedroom 4	10000mm²
Total	**65000mm²**

Background Ventilation

Open Plan Living	15000mm²
Bathroom	6000mm²
En-Suite	6000mm²
Bedroom 1	10000mm²
Bedroom 2	8000mm²
Total	**45000mm²**

Background ventilation has been allocated as per Greenwood's design. Background ventilation must be assigned to each room but not necessarily at the stated levels - allocations can change as long as overall equivalent area is achieved.

Design
Performance
Criteria

System 3

Continuous Mechanical Extract Ventilation

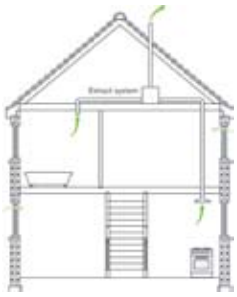
The Approach:

Continuous extract ventilation can be either centralised (one unit ducted throughout the dwelling) or de-centralised (room based e.g. kitchen/bathroom).

- Extract points located in all wet rooms
- Background ventilators located in all habitable rooms*
- Controls located within the dwelling for centralised systems

* For air permeability < 5ach @ 50Pa only

De-Centralised dMEV



Centralised MEV

What's new for ADF 2010?

Control Locations

The Regulations (ADF: 2010 and Domestic Ventilation Compliance Guide) highlight the importance of the end user in respect of ensuring a ventilation system is used correctly and well maintained.

"Manual controls for boost speeds should be sited locally to the spaces being served as the provision of a centrally mounted switch (e.g. just in the kitchen or hallway) may result in fans being left in an inappropriate mode of operation."

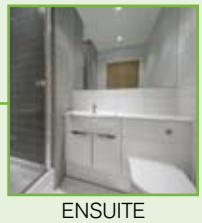
With controls being required for each space, wireless radio frequency switches will reduce on site installation time and cost. Alternatively, sensor to boost (e.g. humidity and light switch to boost) can be used.

Contact us for full details.

KITCHEN

UTILITY ROOM

BATHROOM



ENSUITE

Noise

Noise from continuously running systems has moved up the agenda and the document discusses the need for careful design and specification of quieter products whilst minimising the disturbances to people outside the building as well.

The document suggests the following sound power levels where normally continuously running systems should not exceed these levels:

Bedrooms/Living Rooms
An upper limit of 30dB (A) weighted sound power level

Kitchens/Bathrooms
An upper limit of 35dB (A) weighted sound power level

Background Ventilation

Design: > 5ach @ 50Pa

Background Ventilators are no longer required

Design: < 5ach @ 50Pa

2500mm² per habitable room is required

Working Examples

House Specification

4 Bedrooms, Open Plan Living (Kitchen, Living & Dining), WC, Bathroom +1 En-Suite

Floor Area: 95m²

Design: > 5ach @ 50Pa

Mechanical Ventilation

MEV Central System	Airflow in litres per second	
	Trickle	Boost
Kitchen	10	13
Bathroom	8	8
En-Suite	6	8
WC	5	6
Total	**29 l/s**	**35 l/s**

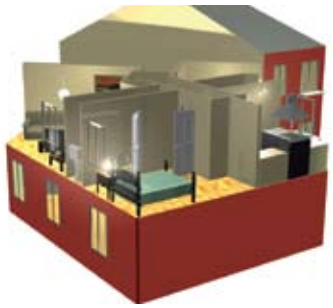
Background Ventilation

Open Plan Living (Living/Dining Area)	2500mm²
Bedroom 1	2500mm²
Bedroom 2	2500mm²
Bedroom 3	2500mm2
Bedroom 4	2500mm²
Total	**12500mm²**

Apartment Specification

2 Bedrooms, Bathroom, En-Suite, Open Plan Living (Kitchen, Living & Dining)

Floor Area: 62.5m²



Mechanical Ventilation

MEV Central Systetm	Airflow in litres per second	
	Trickle	Boost
Kitchen	7	13
Bathroom	6	8
En-Suite	6	8
Total	**19 l/s**	**29 l/s**

Design: < 5ach @ 50Pa

Mechanical Ventilation

MEV Central System	Airflow in litres per second	
	Trickle	Boost
Kitchen	10	13
Bathroom	8	8
En-Suite	6	8
WC	5	6
Total	**29 l/s**	**35 l/s**

Background Ventilation

Open Plan Living (Living/Dining Area)	2500mm²
Bedroom 1	2500mm²
Bedroom 2	2500mm²
Bedroom 3	2500mm2
Bedroom 4	2500mm²
Total	**12500mm²**

Mechanical Ventilation

MEV Central System	Airflow in litres per second	
	Trickle	Boost
Kitchen	7	13
Bathroom	6	8
En-Suite	6	8
Total	**19 l/s**	**29 l/s**

Background Ventilation

Open Plan Living (Living/Dining Area)	2500mm²
Bedroom 1	2500mm²
Bedroom 2	2500mm²
Total	**7500mm²**

Extract Rates have been allocated as per Greenwood's design. Ventilation (trickle rate) must be assigned to each room but not necessarily at the stated levels - allocations can change as long as overall equivalent area is achieved.

Design Performance Criteria

System 4

Continuous Supply & Extract Ventilation with Heat Recovery

The Approach:

- Balanced whole house ventilation system
- Recovers heat from exhaust air and transfers to filtered supply air for habitable rooms
- Central system located in cupboard or loft and ducted throughout the dwelling
- No background ventilators required

What's new for ADF 2010?

Infiltration

With the introduction of two air permeability designs, infiltration levels have changed:

Design Air Permeability	> 5ach@50Pa	< 5ach@50Pa
Infiltration	**Deemed to be 0.15ach***	**Assumed to be ZERO**

*It is unlikely that System 4 methodology would be applied in a building with this level of air permeability.

How does this impact ventilation rates?

Infiltration allowances are usually subtracted from the whole building ventilation rates that are set out in Table 5.1b (page 4).
Without this airflow subtraction, the airflow rates required will be higher as purposely provided ventilation will be the only source of air extract and supply for the dwelling.

Note: The infiltration calculation has also been changed for apartments. Both houses and apartments use 0.04 x gross internal volume (instead of 0.06 for apartments), this again means that ventilation rates for apartments will be slightly increased.

Control Location

The Regulations highlight the importance of the end user in respect of ensuring a ventilation system is used correctly and well maintained.

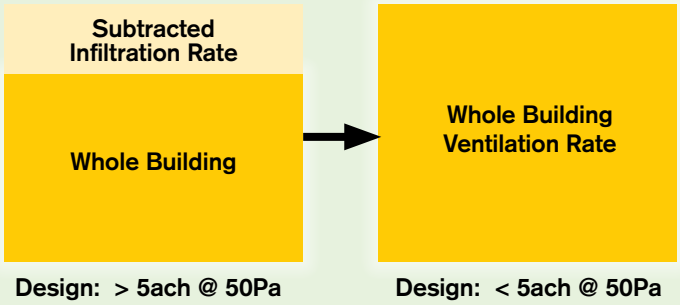
"Manual controls for boost speeds should be sited locally to the spaces being served as the provision of a centrally mounted switch (e.g. just in the kitchen or hallway) may result in fans being left in an inappropriate mode of operation."

Noise

Noise from continuously running systems has moved up the agenda and the document discusses the need for careful design and specification of quieter products whilst minimising the disturbances to people outside the building as well.

The document suggests the following sound power levels where normally continuously running systems should not exceed these levels:
Bedrooms/Living Rooms
An upper limit of 30dB (A) weighted sound power level
Kitchens/Bathrooms
An upper limit of 35dB (A) weighted sound power level

Product Specification



When applying the design air permeability > 5ach @ 50 Pa, the infiltration factor reduces the total ventilation rate and therefore the airflow requirements for the specified product.

Without infiltration being subtracted, **higher** airflow rates may not be able to be achieved effectively with the same products in the same size properties (based on 2006 requirements).

With higher airflow requirements, some products designed to fulfil SAP Appendix Q performance points may now not be suitable (see page 14-15), as running a product at a higher performance may also increase noise for end users.

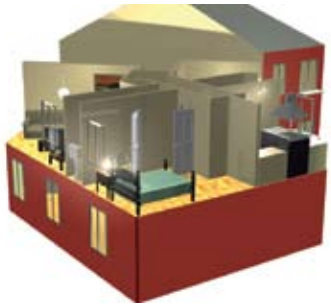
Working Examples

House Specification

4 Bedrooms, Open Plan Living (Kitchen, Living & Dining), WC, Bathroom +1 En-Suite
Floor Area: 95m²

Apartment Specification

2 Bedrooms, Bathroom, En-Suite, Open Plan Living (Kitchen, Living & Dining)
Floor Area: 62.5m²



Design: > 5ach @ 50Pa

Mechanical Ventilation

MVHR Heat Recovery	Airflow in litres per second	
EXTRACT	Trickle	Boost
Kitchen	8	13
Bathroom	5	8
En-Suite	4	8
WC	3	6
Total	**20 l/s**	**35 l/s**

SUPPLY		
Open Plan Living (Living/Dining)	4	7
Bedroom 1	4	7
Bedroom 2	4	7
Bedroom 3	4	7
Bedroom 4	4	7
Total	**20 l/s**	**35 l/s**

Mechanical Ventilation

MVHR Heat Recovery	Airflow in litres per second	
EXTRACT	Trickle	Boost
Kitchen	5	13
Bathroom	4	8
En-Suite	4	8
Total	**13 l/s**	**29 l/s**

SUPPLY		
Open Plan Living (Living/Dining)	5	10
Bedroom 1	4	10
Bedroom 2	4	10
Total	**13 l/s**	**29 l/s**

Design: < 5ach @ 50Pa

Mechanical Ventilation

MVHR Heat Recovery	Airflow in litres per second	
EXTRACT	Trickle	Boost
Kitchen	10	13
Bathroom	7	8
En-Suite	7	8
WC	5	6
Total	**29 l/s**	**35 l/s**

SUPPLY		
Open Plan Living (Living/Dining)	6	7
Bedroom 1	6	7
Bedroom 2	6	7
Bedroom 3	6	7
Bedroom 4	5	7
Total	**29 l/s**	**35 l/s**

Mechanical Ventilation

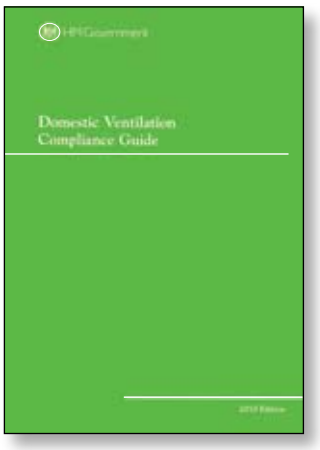
MVHR Heat Recovery	Airflow in litres per second	
EXTRACT	Trickle	Boost
Kitchen	7	13
Bathroom	6	8
En-Suite	6	8
Total	**19 l/s**	**29 l/s**

SUPPLY		
Open Plan Living (Living/Dining)	7	10
Bedroom 1	6	10
Bedroom 2	6	9
Total	**19 l/s**	**29 l/s**

Installation and Commissioning

Operation and Maintenance

Guaranteed Installed Performance - GIP

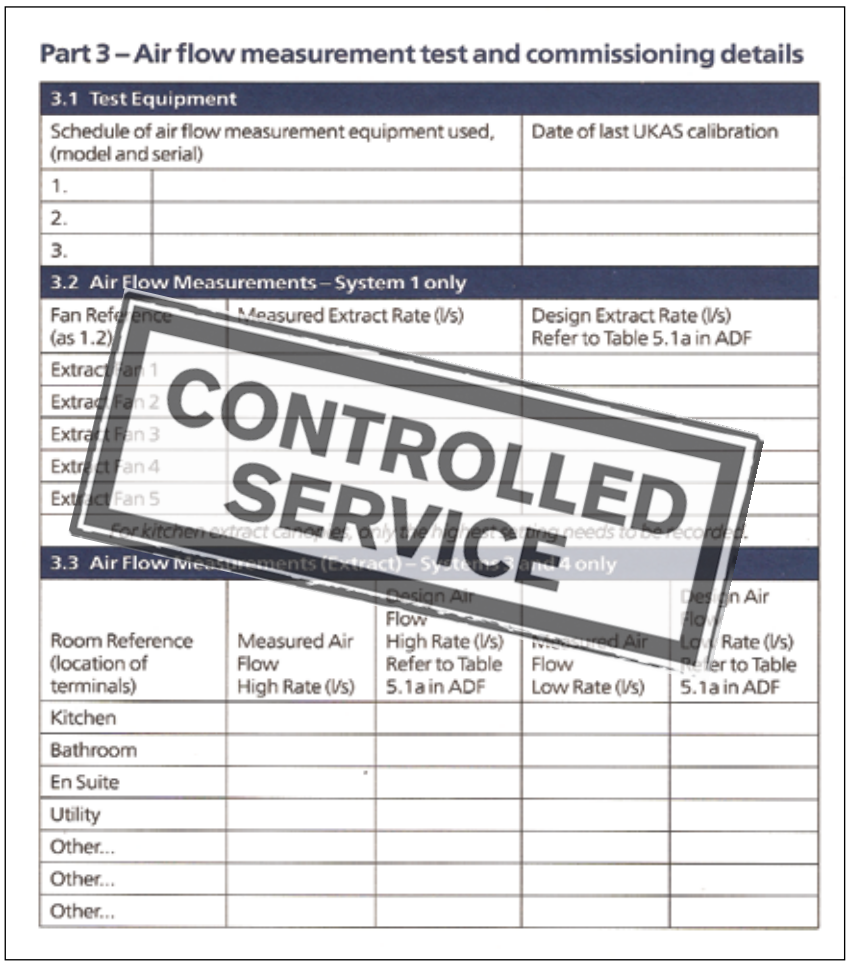


One of the most important changes to the Building Regulations is the new focus on **what happens after the planning and design work has been completed.**

The Domestic Ventilation Compliance Guide (an associated document of ADF 2010) sets out the new requirements for onsite installation and commissioning and is an important step in the approach to classifying ventilation as a controlled service. Its aim is to reduce energy consumption for ventilation and ensure that what is supposed to be achieved, is. Consideration has also been given to end users and information they will require to operate and maintain their ventilation system effectively.

In total the document requirements/guidance covers:

Installation → Inspection → Air Flow Testing & Commissioning → Provision of Information for the end user



Part 3 – Air flow measurement test and commissioning details

3.1 Test Equipment		
Schedule of air flow measurement equipment used, (model and serial)		Date of last UKAS calibration
1.		
2.		
3.		

3.2 Air Flow Measurements – System 1 only		
Fan Reference (as 1.2)	Measured Extract Rate (l/s)	Design Extract Rate (l/s) Refer to Table 5.1a in ADF
Extract Fan 1		
Extract Fan 2		
Extract Fan 3		
Extract Fan 4		
Extract Fan 5		

For kitchen extract cannot be only ventilation, boost needs to be recorded.

3.3 Air Flow Measurements (Extract) – System 2, 3 and 4 only

Room Reference (location of terminals)	Measured Air Flow High Rate (l/s)	Design Air Flow High Rate (l/s) Refer to Table 5.1a in ADF	Measured Air Flow Low Rate (l/s)	Design Air Flow Low Rate (l/s) Refer to Table 5.1a in ADF
Kitchen				
Bathroom				
En Suite				
Utility				
Other...				
Other...				
Other...				

Process

Notice of confirmation of installation inspection, airflow testing and commissioning need to be provided to Building Control within 5 days of completion of work.

ALL ventilation methodologies are required to be commissioned and details provided

Airflow testing and notice required for mechanical ventilation systems in **NEW BUILD ONLY**

ALL homeowners should be provided with information about the ventilation system and maintenance requirements

Best Practise Guidance for onsite processes is provided within the document for both installation/ inspection and airflow testing.

For full explanation please refer to: Domestic Ventilation Compliance Guide or download at www.greenwood.co.uk

Additional Information

The Compliance Guide also makes reference to a number of installation practises that must be adhered to which all promote achieving good installed performance and end-user control.

- Continuous ventilation systems should not allow the occupier to turn it off – except at the main isolator switch
- Only sensors specified by the fan manufacturer may be used
- If the ventilation system speed control is undertaken manually;
  i. the boost mode must be obvious to the end user
  ii. controls/switches should be provided locally to the areas being served rather than a central switch
- No use of duct tape in ventilation installations

How is this going to be delivered?

Installation & Testing -Who can deliver GIP?

2006 Design only for compliance

Design Performance Criteria
The methods and airflow rates based on design air permeability

Whole dwelling tested for SAP and Part L.

Ventilation installed by skilled tradesmen with no formal domestic ventilation certification and training. Once installed, no testing completed.

2010 Design + Install & Commission + Maintain

Design Performance Criteria	+	Installation and Commissioning	+	Operation and Maintenance
The methods and airflow rates based on design air permeability		Guaranteed installed performance achieved through competent person installation		End user information to ensure effective use of system

With the increased focus on effective ventilation as a result of tighter building designs, Ventilation must be installed by a competent person who has undertaken a third party training and assessment programme specifically for domestic ventilation.

In SAP 2009 there is a proposed 50% reduction of 'in use' factors that can be applied if the installer has been trained and certified.

Greenwood Airvac, in conjunction with industry bodies, has contributed to developing the domestic ventilation installation training schemes.

Please contact Greenwood for further details on installer and airflow testing requirements.

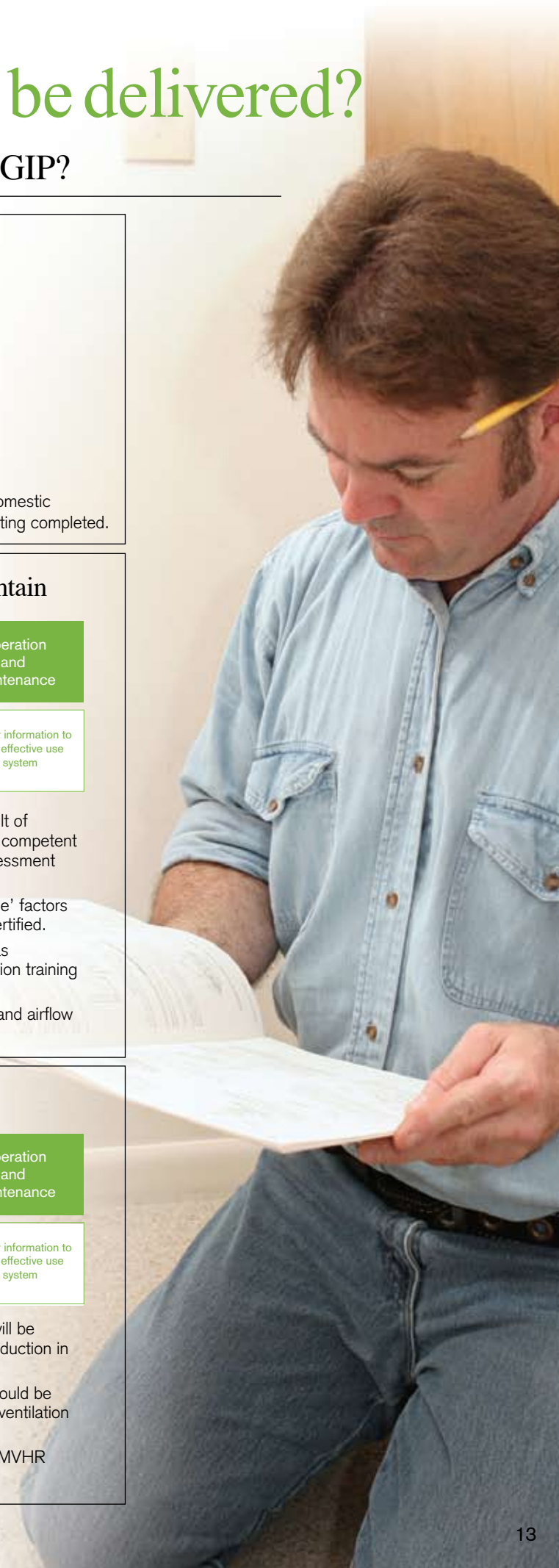
2013 Controlled Service

Design Performance Criteria	+	Installation and Commissioning	+	Operation and Maintenance
The methods and airflow rates based on design air permeability		Guaranteed installed performance achieved through competent person installation		End user information to ensure effective use of system

By the next revisions to Building Regulations, where we will be taking the next step toward Zero Carbon Homes (44% reduction in CO_2), ventilation will be a crucial building service.

A fully operational training and certification programme should be available and installers will be qualified to install domestic ventilation systems that are signed off and reported to BCB.

In SAP – it is proposed that 'in use' factors for MEV and MVHR will be further reduced.



SAP Appendix Q+GIP

- Launched in 2006, SAP Appendix Q enabled energy efficient ventilation systems to be rewarded in SAP calculations, using specific performance data for a **specific installation scenario**.
- Simply taking a performance point figure e.g. SFP (Specific Fan Power) will not guarantee compliance.
- There are many variables to consider and SFP is just one of them.
- If the installation does not comply with the DER design or the requirements of Building Regulations, this will impact on cost.

What needs to be considered?

Design Criteria 1: SFP Figure

SFP is determined from product test data on the SAP Appendix Q website or by using the default rates in SAP. For SAP Appendix Q, all products have been tested at various performance points and installation applications (e.g. Kitchen plus 1 wet room with rigid ducting) and a SFP is given.

- To ensure G.I.P (Guaranteed Installed Performance) it is crucial that **the correct installation application is chosen for the dwelling design.**
- A TER (Target Emission Rate) will have been calculated based on the ventilation product included in **design.** Installing a different product **onsite** may result in non-compliance.
- **Note therefore that SAP Appendix Q is not a design tool** and SFP should just be viewed as one variable in the specification process.

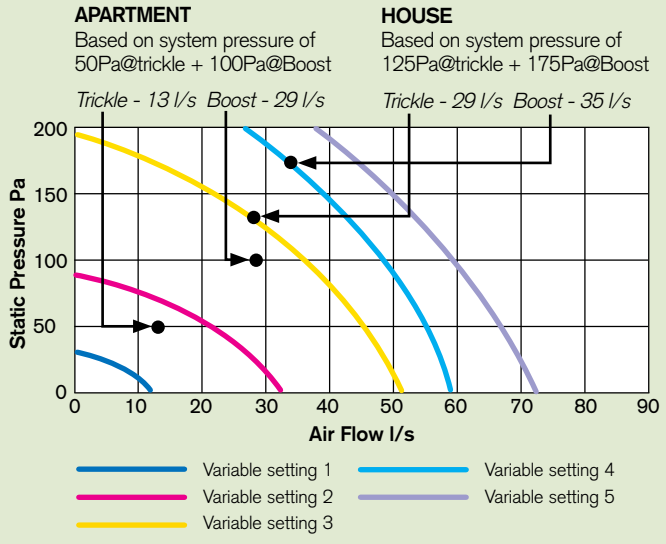
SAP Appendix Q Performance*

Exhaust terminal configuration	Specific fan power (W/l/s)	Heat exchanger efficiency (%)	Energy saving trust best practice performance compliant
Kitchen + 1 additional wetroom	0.48	93	YES
Kitchen + 2 additional wetrooms	0.47	93	YES
Kitchen + 3 additional wetrooms	0.51	92	YES
Kitchen + 4 additional wetrooms	0.6	92	YES
Kitchen + 5 additional wetrooms	0.7	91	YES
Kitchen + 6 additional wetrooms	0.85	90	YES

Criteria 2: Airflow Performance

In designing ventilation systems, ducting resistances, dwelling type and layout all impact on airflow performance, noise and hence G.I.P (Guaranteed Installed Performance)

- Products with similar Specific Fan Powers can have very different airflow capacities and so may not be suitable for all house types and designs
- The graph data illustrates how differently a product can perform in an apartment versus a house **when designing airflow rates for compliance**. The airflow performance is **achievable in both property types** however the unit would have to work much harder to achieve the rates in the house. The resulting impact for the house owner would be increased operational noise.



Sound Pressure Level @3m dB(A) Variable Settings				
1	2	3	4	5
16	27	33	37	39.5

The graph is for illustrative purposes only.

Did you know... Greenwood Airvac lead in the design of the best performing SAP Q products in the UK?

Design Criteria 3: Size/Application

Once the variables of Specific Fan Power and Airflow Performance have been understood, the final consideration should be the physical size of the unit and its suitability for use in the specified property type;

- Small units running at a high level can offer the same performance as large units running at a low level but size constraints offered by the property type can influence final specification e.g. Does the product fit in a cupboard or go through a loft hatch? Is there easy access for maintenance and replacement?

What is the size of the unit?
Can it fit into the property type effectively?

Usually installed in cupboard →

Usually installed in loft space →

Usually installed in loft space →

Fusion HRV2

- Heat Recovery Ventilation
- SFP as low as 0.47 W/l/s with 93% Heat Recovery

Fusion HRV95

- Heat Recovery Ventilation
- Suitable for larger properties
- Integrated Grade G4 filters

Centair CMEV.4e

- Continuous Extract Ventilation
- SFP as low as 0.16W/l/s

Unity CV100

- De-centralised Continuous Extract Ventilation
- One fan, any room, all installations
- Aesthetic, discreet design

Coming Soon...

- A unique G.I.P. proposition from Greenwood Airvac designed for simple onsite installation, testing and commissioning and providing, once again, the best SAP Appendix Q figures for its classification.

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