

Approved and Issued by:

I. Critchley

Date: 22nd September
2020 (update)

Acoustic Report.

Noise assessment for:
MSV Offices, Great Western Street, Manchester

Dates of Survey: 17th to 20th July 2020



Peninsular Acoustics Ltd
114 Shrewsbury Road
Birkenhead
Wirral
CH43 8SP
Tel: 0151 652 6270



A Member of The Association of Noise Consultants

Acoustic Report

Site: 101 Great Western Street
Moss side
Manchester
M14 4AA

Client: Mosscaire St. Vincents Housing Group
7th Floor,
Trafford House,
Chester Road,
Stretford,
Manchester
M32 0RS

Dates of Survey: 17th to 20th July 2020

Acoustic Consultant: *Iain Critchley MIOA MInstSCE for Peninsular Acoustics Ltd*

1. Introduction.

This assessment and report was instructed by Bernard Taylor Partnership Ltd (architects) and will be informed by the recommendations for indoor and outdoor noise levels defined in BS8233:2014 and The World Health Organisation (WHO) Guidelines for Community Noise 1999, so as to comply with the principles of the National Planning Policy Framework for England (the NPPF), which became effective on the 27th March 2012. *(It should be noted that Planning Policy Guidance 24: 'Planning and Noise', more commonly known as PPG 24, is now withdrawn).*

The purpose of this survey and assessment is to assist the developer in the discharge of planning condition 7, under Planning Approval Number: 126405/P3OPA/2020 for conversion of existing office premises to residential use.

Description: CDN/20/0433 | Discharge of Conditions 7 (acoustic insulation) attached to 126405/P3OPA/2020 | 101 Great Western Street Manchester M14 4AA

An extended noise survey was carried out at the site during stable weather conditions, in accordance with BS 7445. The survey period commenced on the morning of Friday 17th July 2020 and terminated on the morning of Monday the 20th July 2020. The survey period therefore includes a busy Friday and Saturday night and will include noise associated with activity from nearby retail premises as well as passing road traffic.

Weather conditions were mild (about 13° to 15° Celsius), dry and stable with only light wind over the survey period.

2. Site Description.

The proposed development site is a two-storey office building on the corner of Great Western Street and Barnhill Street. The area is predominantly residential with a row of small retail units located on the opposite side of Great Western Street.

The proposed conversion works includes conversion of the existing ground and first floor office areas into seventeen apartments, including two duplex apartments which extend into the second floor roof space.

Floor plans of the proposed development are included in Annex A. An aerial view of the site is shown in Figure 1 (from a licensed copy of Google Earth).

Figure 1 - aerial view of site showing monitoring location A.

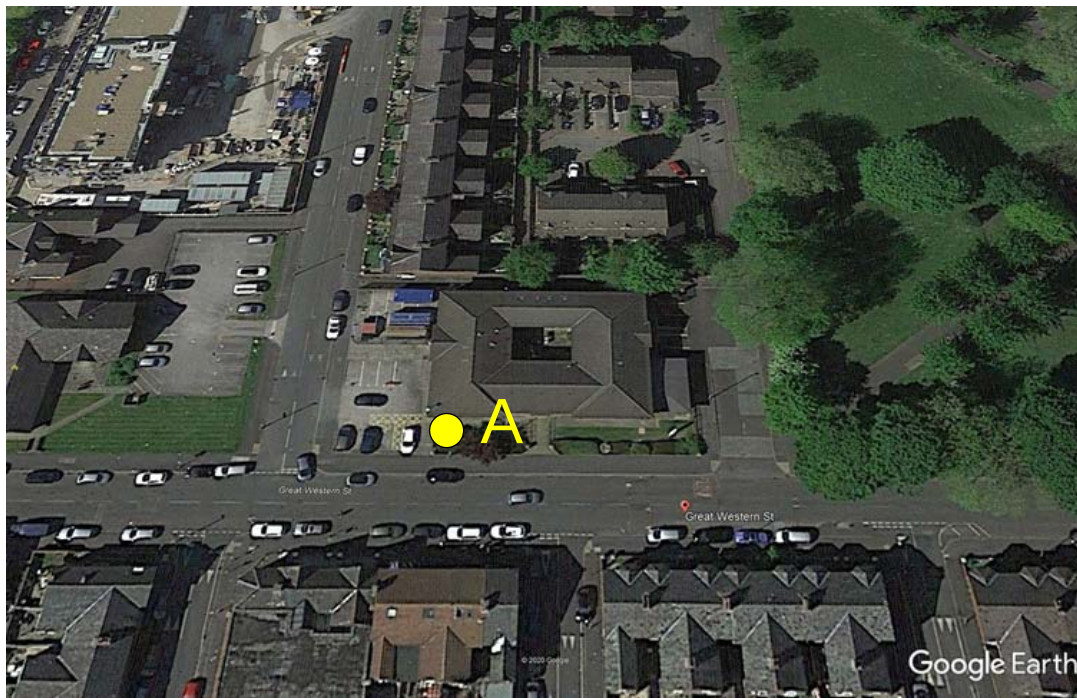


Figure 2- microphone location.



Figure 3 - local shops opposite site.



3. **Survey Procedure and Results.**

3.1 Measurement locations

An outdoor, weatherproof measurement microphone was attached to a long extension pole and passed through a partially-opened first floor window. This placed the microphone 1 metre from the building facade and affected by reflections off the building so a facade correction is applied to resulting measurements.

This measurement location is also considered to be representative of noise levels at ground floor and second floor level.

The equipment comprised a Norsonic 118 sound level meter (Serial number 31454) fitted with a GRAS 41AL weatherproof microphone via an extension cable. Calibration certificates for the equipment are available for inspection if required.

3.2 Site conditions

Weather conditions were mild and dry with no significant wind over the survey period.

Site works had not yet started so there were no other trades in or near the building during the survey period.

It will be noted that the survey was carried out during the Covid-19 Pandemic. By the date of the survey, however, traffic conditions had just about returned to normal and local shops were open as the lockdown restrictions were just being eased.

3.3 Results of noise measurements from fixed location A.

Noise levels were recorded in 5 minute periods and the parameters LAeq, LAf,max and LA90 logged continuously.

The noise records for location A are illustrated by the level/time graphs in Annex B. This data is further analysed and the daytime and night time summary noise levels presented in Table 1, with a -3 dB facade correction applied.

Location A had a clear view of road traffic passing along Great Western Street, in both directions, and also a clear view of the retail outlets on the opposite side of the road.

Table 1 - Summary noise data for Location A (Great Western Street elevation)

Location A	Daytime $LA_{eq(16)}$	Night time $LA_{eq(8)}$	Highest $LA_{f,max}$ (night)*	Max events > 80 dBA
Friday 17th July	60.2 dBA	54.7 dBA	80.6 dBA	3
Saturday 18th July	58.5 dBA	55.4 dBA	84.8 dBA	6
Sunday 19th July	64.1 dBA	56.5 dBA	83.0 dBA	3
Monday 20th July	56.8 dBA	Not recorded	Not recorded	n/a

* Note regarding $LA_{f,max}$.

There were relatively few night time L_{max} events which exceeded 80 dB $LA_{f,max}$ over the survey period.

The design criteria, in terms of glazing and to achieve the 45 dB night time criterion for bedrooms, is therefore reasonably assumed to be 80 dB $LA_{f,max}$.

4. Plotting noise levels on other elevations.

4.1 Road traffic noise.

The noise data for the fixed location A was used to ‘calibrate’ a CADNA noise model of the site, with a ‘building evaluation’ model for the proposed apartments. The ‘worst case’ noise levels were used for this assessment i.e. 64 dBA (day) and 57 dBA (night).

This enables ‘free-field’ equivalent noise levels to be plotted on all elevations of the building.

The CADNA plots are included in Figures 4 and 5 with a 3D view shown in Figure 3.

Figure 4 - 3D view of CADNA model, from the south-west.

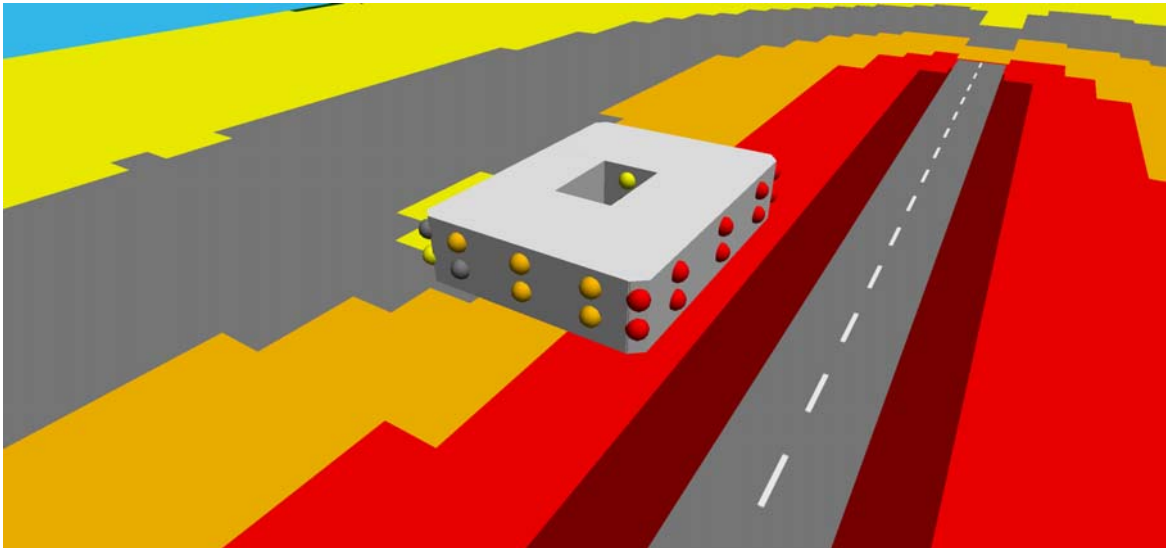


Figure 5 - resulting noise level plot around building (daytime).



Figure 6 - resulting noise level plot around building (night time).



The external noise levels affecting all rooms on the Great Western Road elevation are up to 64 dBA (day) and 56 dBA (night) due to road traffic and including noise associated with the retail outlets nearby.

In the absence of specific measurement data for the west elevation, it will be assumed that external noise levels are 2 dB less than the Great Western Street elevation, i.e. 62 dBA (day) and 54 dBA (night).

On the north (sheltered from traffic noise) elevation, the external noise levels are up to 43 dBA (day) and 35 dBA (night)

The above levels are quoted as the daytime 16 hour energy averaged sound pressure level (LA_{eq16}) and the night time 8 hour energy averaged sound pressure level (LA_{eq8}).

Values of $LA_{f,max}$ are assumed to be 80 dBA on the Great Western Road elevation.

5 Achieving acceptable indoor noise levels.

5.1 Noise Criteria

The noise levels stipulated in the planning conditions are the same as are required in BS8233:2014, which is concerned only with ‘average’ internal noise levels in bedrooms, dining rooms and living rooms, in dwellings, as summarised by the table below.

Indoor ambient noise levels for dwellings (BS8233:2014)			
Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hour}$	
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

There is an additional requirement of the planning conditions, which is not explicit in BS8233:2014, that “*individual noise events shall not exceed 45dBLA_{max}*”. This is commensurate with World Health Organisation Guidelines and is a limit recommended for restful sleep.

5.2 Great Western Street elevation.

Sample calculations of noise ingress are based on the one-bedroom flat on the south-west corner, which is located on the first floor. The bedroom has a floor area of approximately 12 m² and a volume of approximately 25 m³. The total window area of the two windows is approximately 3.0 m². The RT is assumed to be 0.5 seconds.

The living room has a floor area of approximately 15 m² and a volume of approximately 37 m³. The total window area is approximately 4.5 m². The RT is assumed to be 0.5 seconds.

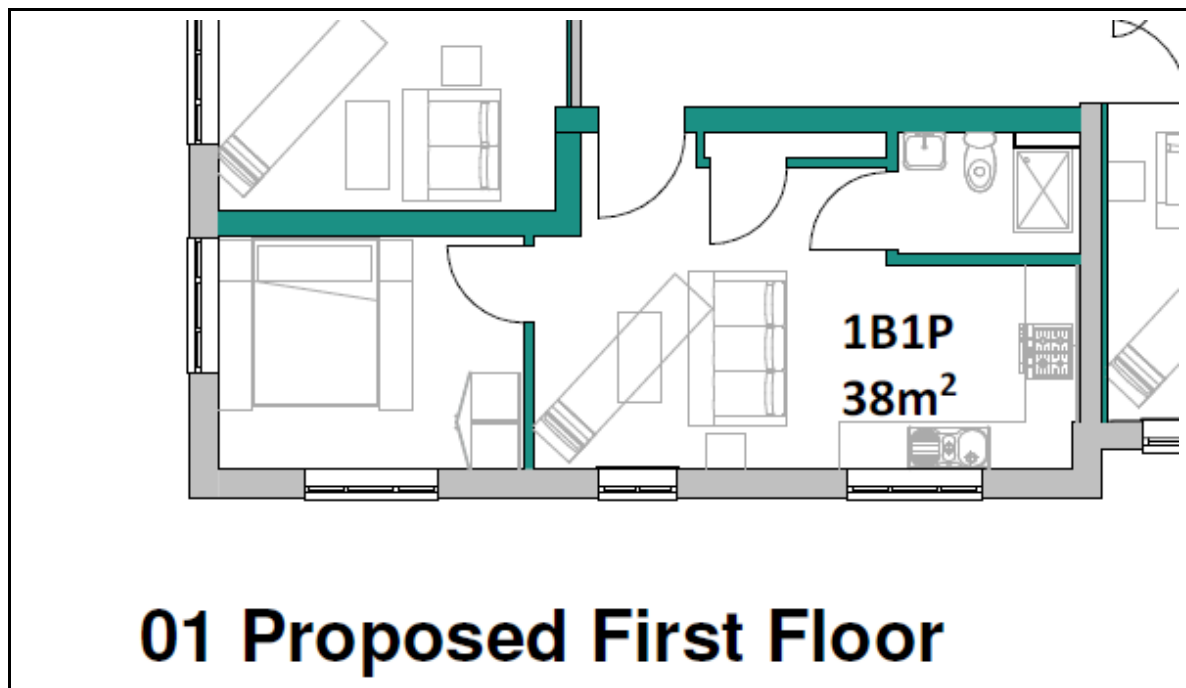
Calculations using the BRE ‘Building Envelope Insulation’ model show that satisfactory noise levels can be achieved in the living room using 10/12/6 ‘acoustic’ double glazing, or equivalent, in well-sealed frames without trickle vents. The glazing should be rated at least 32 dB R_{TR} .

For the bedroom, the more critical night time criteria, where the driving factor is the LA_{max}, can also be achieved using 10/12/6 ‘acoustic’ double glazing, or equivalent, in well-sealed frames without trickle vents.

Table 2 - Worst-case internal noise levels Great Western Street elevation

Room	Worst case external noise levels from survey.			Internal level*
	Daytime $LA_{eq(16)}$	Night time $LA_{eq(8)}$	$LA_{f,max}$ (night)	
Living room (day)	64 dBA	-	-	31 dBA
Bedroom (night)	-	56 dBA	-	23 dBA
Bedroom (night)	-	-	80 dBA	41 dBA

*Calculated using BRE Building Envelope Calculation model.

Figure 7 - floor plan of corner flat.

5.3 West elevation.

Similar calculations of noise ingress, based on the north/west corner flat, which has a bedroom overlooking Barnhill Street, show that the noise criteria can be achieved with 10/12/6 acoustic double glazing, or equivalent, (without trickle vents) to all windows.

5.4 Internal Courtyard.

Noise levels here as a result of road traffic noise are very low, typically 46 dBA (day) and 37 dBA (night) and normal thermal double-glazing would be adequate. However, if it is proposed to install any mechanical services plant (heat pumps, A/C units etc) in this area then these can generate significant noise levels when in an enclosed space so additional protection against noise should be considered.

At the time of drafting this report, we have no information regarding mechanical services plant and its location but this will be reviewed in due course.

5.5 Skylights to 2nd floor duplex units.

It is recommended that these are also glazed using 10/12/6 modules, or equivalent.

6 Outdoor noise levels.

There are no designated outdoor amenity spaces for this development other than the central courtyard. Noise levels here during the day are typically 45 to 46 dBA so are below the recommended level of 50 dBA, as specified in WHO Guidelines.

The grassed areas to the front of the building exceed the upper limit of 55 dBA so would be unsuitable for use as outdoor amenity space.

There is, however, a large public open space in close proximity to the development site which should serve the requirements of the residents.

7. Ventilation.

Ventilation to habitable rooms for fresh air and summer cooling cannot be achieved using opening windows, except for rapid or 'purge' ventilation. This is due to high external noise levels which would give rise to unacceptably high internal noise levels.

Some alternative means of providing fresh air to habitable rooms should therefore be considered, e.g. Mechanical ventilation.

If the mechanical ventilation is a commercial 'extract-only' system, such as the Passivent 'iMEV Local', then the outside to inside air-supply vents to each room must have an acoustic rating of at least 43 dB $D_{n,e,w}$ when open.

Update: It has been confirmed that the Passivent iMEV 'permanent background extraction' system will be installed in all flats and that the fresh air will be drawn from outside by means of Greenwood 2500EA acoustic ventilators (one per room). These are rated at 45 dB $D_{n,e,w}$, when open, if fitted with the AC2 internal cowl.

8. Summary Recommendations and Conclusion.

1. The apartments in the former MSV office building can be protected from both road traffic noise and from general street noise using acoustic double glazing for living rooms and bedrooms, with windows tightly closed and with no trickle vents. Glazing requirements are:

Bedroom windows (all elevations) - 10/12/6 acoustic double-glazing
Living room windows (all elevations) - 10/12/6 acoustic double-glazing
Skylight windows - 10/12/6 acoustic double-glazing
Inner courtyard - 4/20/4 thermal double-glazing (subject to review).

Note: as an alternative to 10/12/6, which uses float glass, glazing modules which incorporate laminated glass can provide a similar acoustic performance with a reduced weight. An equivalent laminated glass specification is Saint Gobain 6.4/16/6. This is rated 39 (-2,-6) dB so has a 'traffic' rating of 33 dB R_{TR} . The module consist of 6.4 mm Stadip Silence, a 16 mm Argon-filled cavity and 6 mm Planitherm. Traditional 10/12/6 glazing is 32 dB R_{TR} as a comparision.

2. Mechanical ventilation will be adopted as a practical means for ventilating and cooling habitable rooms while also reducing noise from outside. Incoming air will be provided using Greenwood 2500EA trickle vents. (see 'update' note on Page 10).
3. Planning condition 7 can therefore be discharged if the recommendations in this report are adopted.
4. This report concludes that the site is suitable for residential development.

This concludes the report.

Peninsular Acoustics Ltd, 114 Shrewsbury Road, Prenton
Birkenhead, Wirral, Merseyside, CH43 8SP

Tel: 0151 652 6270
E: noise@btconnect.com

9. Definitions.

1. LAeq (t)

This is a measure of the ‘average’ noise level, in decibels, which has occurred over a given time period (t) e.g. LAeq (8 hours). The ‘eq’ stands for equivalent level as its proper definition is *“the equivalent steady sound level containing the same energy as the fluctuating sound level over the same time period”*. The ‘A’ means that the quoted sound level is ‘A’ - weighted.

2. ‘A’ - weighting e.g. in dBA.

The sound level has been measured with an instrument whose sensitivity has been ‘tailored’ to match the typical frequency response of the human ear. Nearly all environmental noise measurements are expressed in dBA.

3. LA90.

This is the sound level, in decibels (dBA), which is exceeded for 90% of the measurement period. LA90 is used to determine the background noise level of an area.

4. LA10.

This is the sound level which is exceeded for 10% of the measurement period and is a traditional unit for the measurement of road traffic noise.

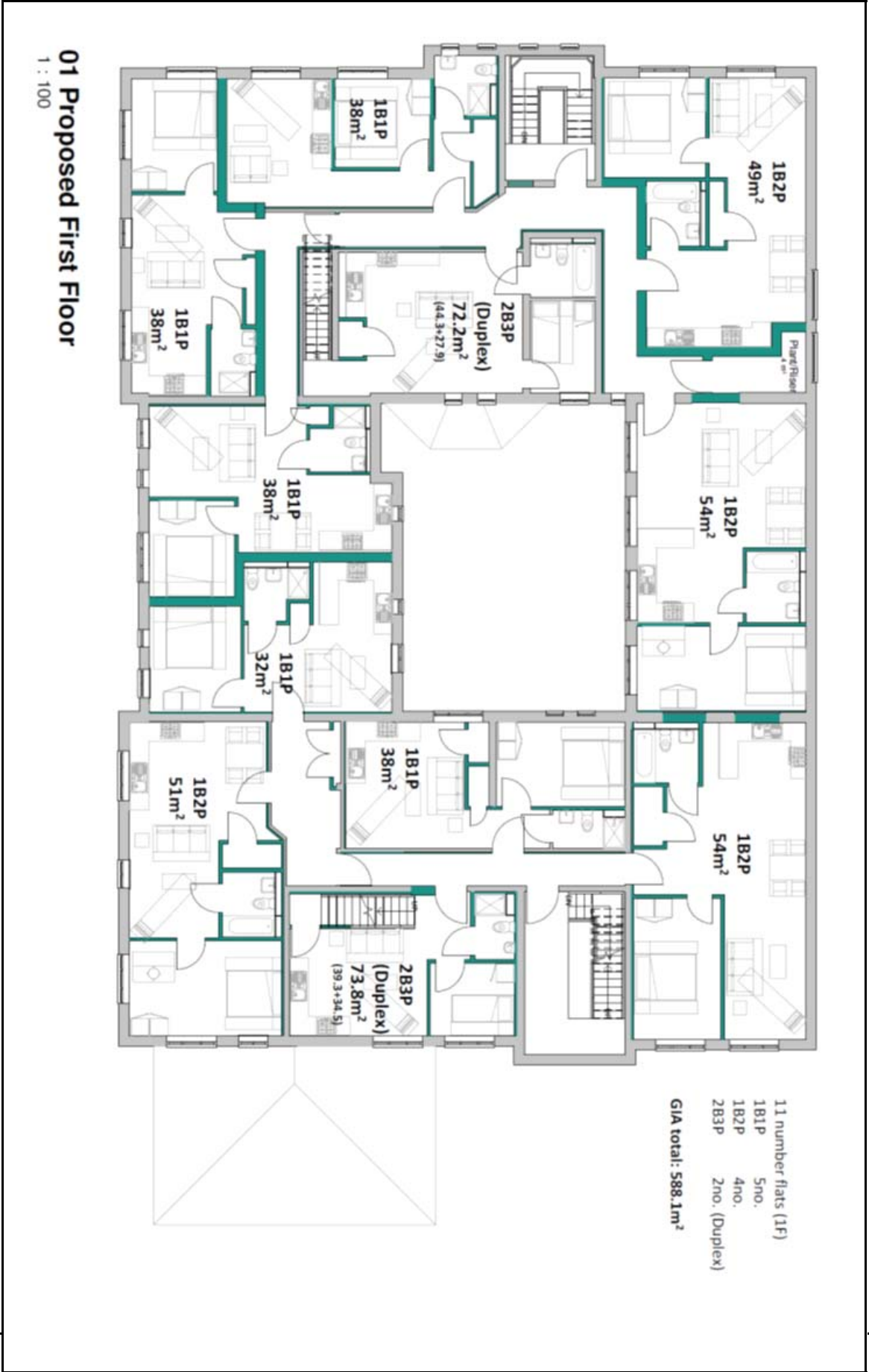
5. LAf,max.

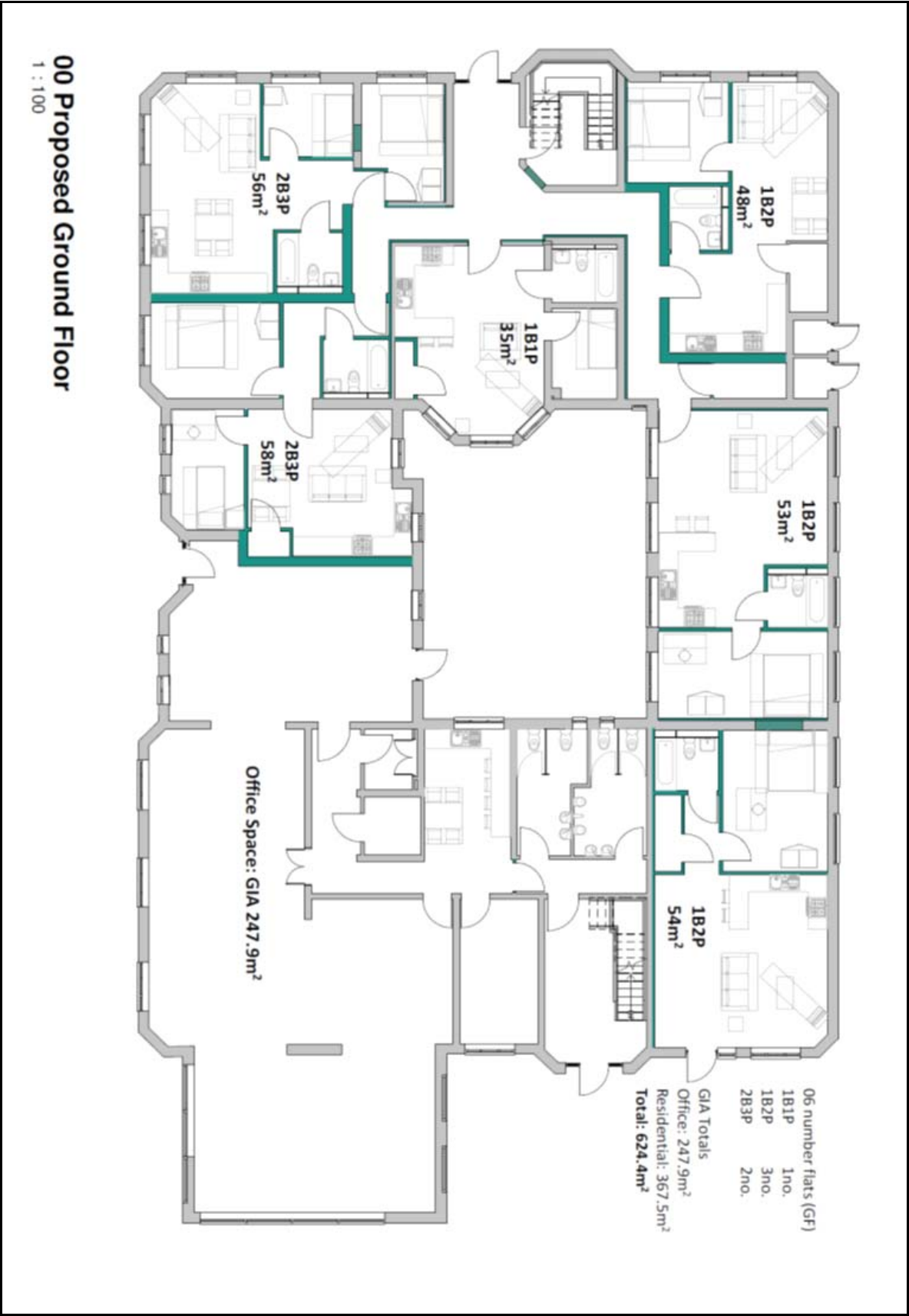
This is the highest level or ‘peak’ level*, measured with ‘fast’ time weighting, which is reached by the fluctuating noise level over the stated time period, even if it is only reached for a fraction of a second. Used to describe the highest sound level of short duration individual events such as a vehicle pass-by, which might cause disturbance or wake someone from sleep. It is possible to have high values of LAf,max even where the ‘average’ noise level, the LAeq, is relatively low.

* Technically, the term ‘peak noise level’ refers to a different parameter which is not measured as part of a normal noise survey. It is occasionally used in this report as a convenient shorthand for LAf,max as it is a concept which is more easily understood by people who do not have a knowledge of acoustics theory.

Annex A.

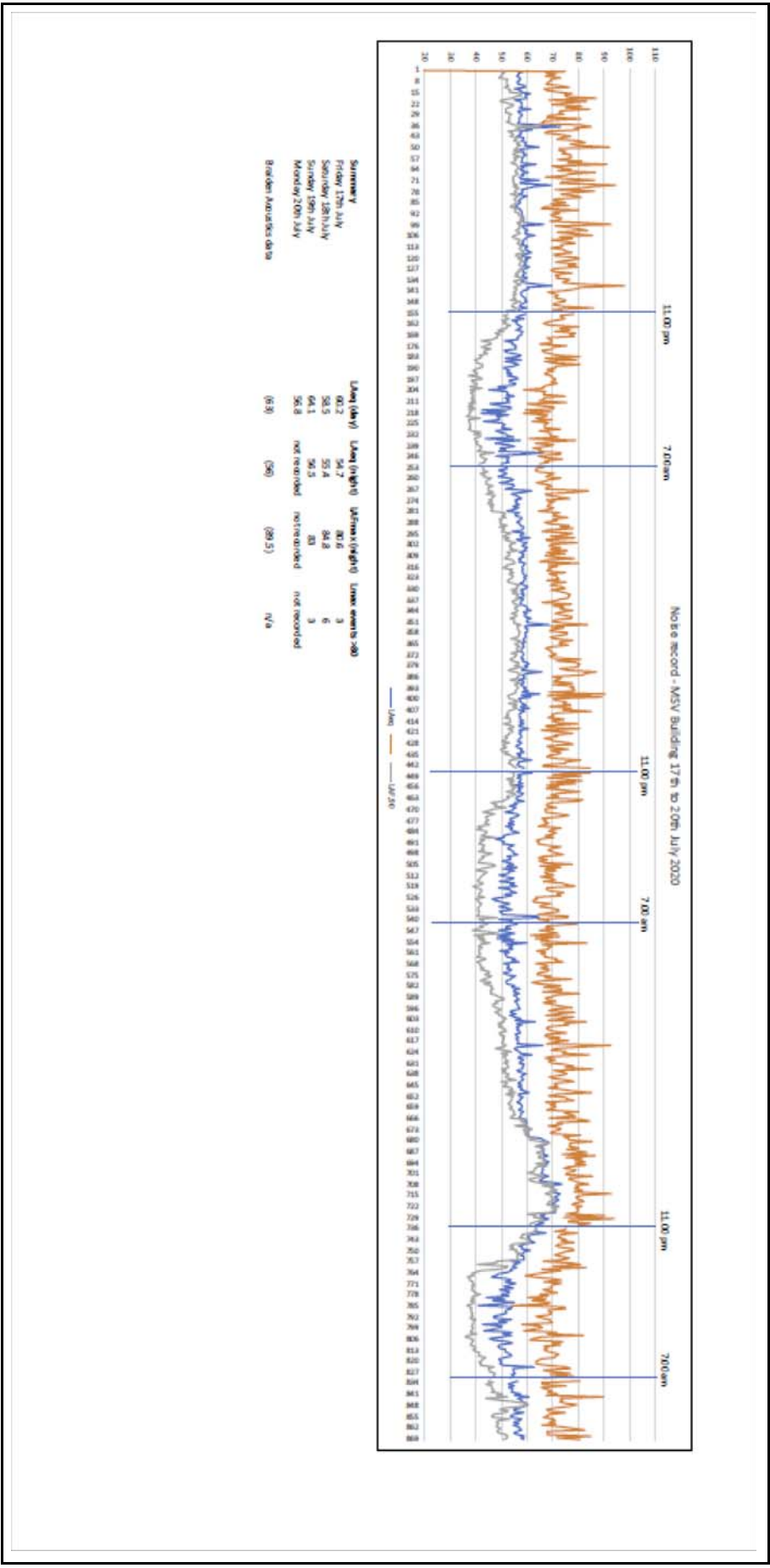
Proposed floor plans.





Annex B

Graphs of level vs time at location A
Glazing calculations.



Bedroom Lmax (night)

BRE		Building Envelope Insulation		Switch to Reverberation Time Calculation		4) Select exterior sound level type	
1) Enter room dimensions or volume		2) Select elements of facade structure, and enter corresponding internal surface area in m ² OR enter number of vents.		HELP		Option (A) ☒ User defined spectrum	
☐ Use dimensions x: 4.6 m y: 4.2 m z: 2.5 m Volume: - m ³ OR ☒ Use volume 25 m ³		Wall 1: Brick/block cavity Wall 2: None Window 1: 10/12/6 double glazing Window 2: 10/12/6 double glazing Door: None Roof/Ceiling: None Vent 1: None Vent 2: None		Surface area OR number of vents 6 m ² 1.5 m ² 1.5 m ² 12 m ² 2		Great Western St max View/Edit Data Option (B) ☐ Spectrum shape Select spectrum shape and enter free field exterior sound level, L _{Aeq} (considering only the octave bands between 125Hz and 2kHz) L _{Aeq} : 56 dB ISO 717 - 1 (Ctr) View Data	
		3) Enter reverberation time of the room.		.3 seconds		Internal sound level	
						L _{Aeq} : 40.9 dB	

Living room LAeq (day)

BRE		Building Envelope Insulation		Switch to Reverberation Time Calculation		4) Select exterior sound level type	
1) Enter room dimensions or volume		2) Select elements of facade structure, and enter corresponding internal surface area in m ² OR enter number of vents.		HELP		Option (A) ☒ User defined spectrum	
☐ Use dimensions x: 4.6 m y: 4.2 m z: 2.5 m Volume: - m ³ OR ☒ Use volume 37 m ³		Wall 1: Brick/block cavity Wall 2: None Window 1: 10/12/6 double glazing Window 2: None Door: None Roof/Ceiling: None Vent 1: None Vent 2: None		Surface area OR number of vents 6 m ² 4.5 m ² 12 m ² 2		Great Western St View/Edit Data Option (B) ☐ Spectrum shape Select spectrum shape and enter free field exterior sound level, L _{Aeq} (considering only the octave bands between 125Hz and 2kHz) L _{Aeq} : 56 dB ISO 717 - 1 (Ctr) View Data	
		3) Enter reverberation time of the room.		.5 seconds		Internal sound level	
						L _{Aeq} : 23.0 dB	

Annex C.

Details of mechanical ventilation system.

2500EA / 5000EA

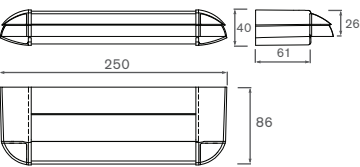
Acoustic window ventilator

Physical specification

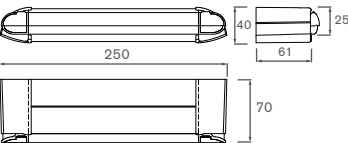
All measurements in millimetres unless otherwise indicated

Materials: Aluminium Alloy

2500EA Acoustic



External



Internal

2500EA Acoustic slot size

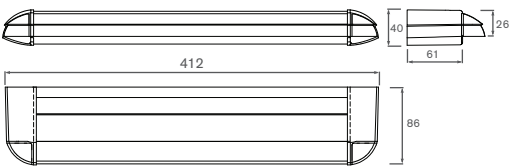
Height: 13mm

Length
192mm

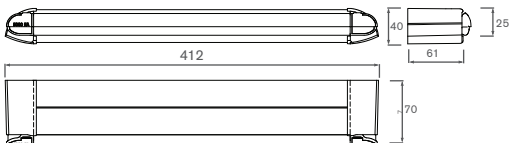
Installation

1. Prepare the window frame with the correct slot sizes.
2. Use the self tapping screws to install the acoustic parts.
3. Use standard pyramid vent screws to install the canopy and vent.

5000EA Acoustic



External



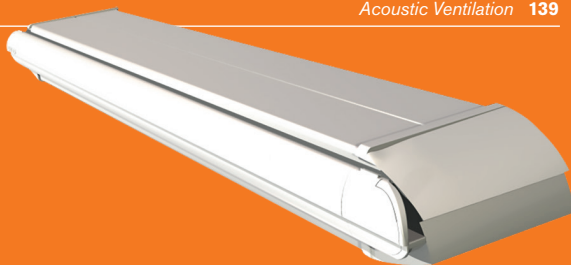
Internal

5000EA Acoustic slot size

Height: 13mm

Length	Central gap	Length
172mm	10mm	172mm

The best of both worlds... achieves Building Regulations' EA requirements along with fantastic acoustic performances up to 45dB(A)



Features and benefits

- Smallest acoustic window vents providing 2500mm² or 5000mm² equivalent area ventilation on the market
- Achieves the best acoustic performance for window ventilators available within the UK – up to 45dB(A)
- A simple, yet adaptable, solution to meet required specification/ Building Regulation requirements incorporating both high levels of equivalent area ventilation and acoustic noise reduction
- Modularity of acoustic sets provides flexibility for installation and acoustic performance
- Aesthetically pleasing design which is easy to open and control by the homeowner
- Excellent airtightness performance with upward air deflection to reduce the risk of draughts
- May require add on section in some window installations

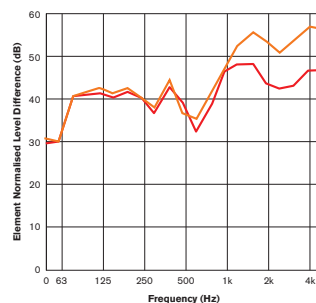
Sets comprise of:

1 EA vent + 1 external acoustic module – providing noise reduction with discreet internal aesthetics.

1 EA vent + 2 acoustic modules (for internal and external install) – providing maximum noise reduction.

Performance

2500EA acoustic performance

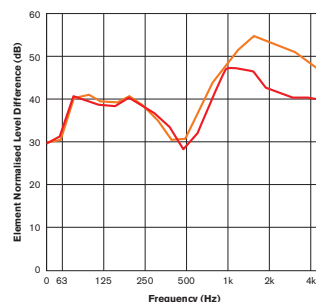


Key

2500EAW.AC1

2500EAW.AC2

5000EA acoustic performance



Key

5000EAW.AC1

5000EAW.AC2

Models, control options and key data

Product code	Description	Controls	Acoustic performance			Equivalent area mm ²	Colour
			Dn,e,w	Dn,e,w (C)	Dn,e,w (Ctr)		
2500EAW.AC1 *	Vent + 1 Acoustic External Module	Front	42dB(A)	41dB	40dB	2670	White
2500EAW.AC2 *	Vent + 2 Acoustic Modules	Front	45dB(A)	43dB	42dB	2670	White
5000EAW.AC1 *	Vent + 1 Acoustic External Module	Front	39dB(A)	38dB	37dB	5350	White
5000EAW.AC2 *	Vent + 2 Acoustic Modules	Front	42dB(A)	40dB	38dB	5350	White

* Pricing is variable depending on quantity ordered - please call for details

passivent

*i*MEV

INTELLIGENT MECHANICAL EXTRACT VENTILATION





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iMEV - INTELLIGENT MECHANICAL EXTRACT VENTILATION

Whole-house ventilation

Passivent intelligent Mechanical Extract Ventilation (iMEV) offers effective whole-house ventilation for residential and similar buildings.

- *Energy savings*

All Passivent iMEV systems use constantly running low-power fans which reduce energy bills and the carbon footprint of the building.

- *Demand control*

Systems automatically respond to the need for ventilation, increasing effectiveness and energy efficiency.

- *Complete solutions*

Every Passivent iMEV system provides a complete ventilation solution which is individually tailored to a particular project by our expert design team.

- *Flexible*

Our flexible range of systems is suitable for a wide variety of projects, no matter the type of usage. They can be installed in single houses and apartments; multi-occupancy dwellings such as care homes, student accommodation and hotels; changing rooms and toilet blocks.

- *Compliant*

All our iMEV systems are compliant with Building Regulations Part F for England and Wales and Building Standards Section 3 for Scotland.

- *Positive airflow direction*

The design of the air circulation means that all parts of the property are properly ventilated. The positions of the inlets and extracts ensure that air always moves from dry rooms to wet rooms, where it is extracted.

- *Discreet*

With their compact size and quiet motors all our fans can easily be placed within a cupboard or roof space.

- *Simple installation*

Full fitting instructions are supplied with every system, with additional technical support if required.

PASSIVENT iMEV SYSTEMS

Need for ventilation

Everyday activities such as cooking and bathing, and even breathing, can cause internal humidity levels to rise. Without ventilation this stale air has no way to be removed, trapping potential pollutants and causing a stuffy unpleasant atmosphere.

How traditional MEV works

A typical traditional MEV system works by drawing this moist stale air from 'wet' rooms such as kitchens and bathrooms, through ducts via a central fan and exhausting it through a roof-mounted terminal. Extraction happens at all times due to the continuously running fan.

To ensure the moist stale air is replaced, through-wall and window vents allow fresh air from outside to enter. These vents are typically placed within habitable rooms such as living rooms and bedrooms.

This cycle of stale air out and fresh air in ensures good indoor air quality and a fresh clean environment. Importantly, it also removes moisture which can otherwise lead to damp and mould.

Shortcomings of traditional MEV

Traditional MEV systems rely on occupants to recognise the need for increased ventilation and use a manual switch to increase extraction when required. There are a number of issues with this that can lead to over- or under-ventilation and increased energy costs:

- Users can forget to boost the system which means moist stale air is not removed effectively.
- When the system is boosted, extraction is increased in all wet rooms, leading to unnecessary heat loss.
- Fan speed can be increased for longer periods than required, leading to higher energy usage.

Passivent iMEV

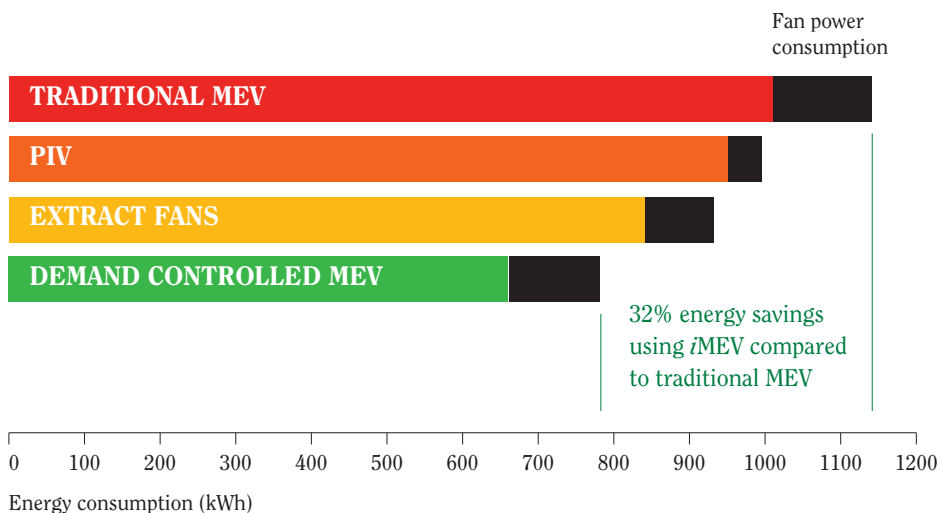
Passivent iMEV is 'intelligent', in that it removes the need for any occupant interaction, automatically detecting rises in humidity and responding accordingly.

The system only increases extraction when required, so it uses much less energy as the central fan is not running at a higher speed unnecessarily. Heat loss is also reduced as iMEV relies on demand control (extraction when and where required); extraction is only increased in the areas where humidity has risen. Alternatively, extraction control can be via PIR activation based on occupancy levels allowing automatic energy saving intelligent control.

This has many additional benefits including:

- Lower energy usage due to lower overall fan speeds.
- Fit and forget solution, as rate of ventilation is not controlled by the user.
- No switches to worry about as the system provides efficient whole-house ventilation at all times.

Energy use of ventilation systems in a typical three-bedroom house (based on CIBSE data)



System selection

Passivent offer two main types of iMEV system to support the whole-house ventilation requirements of any dwelling. Whilst both are based on the same principles, each system has features which are particularly suited to the needs of different types of project.

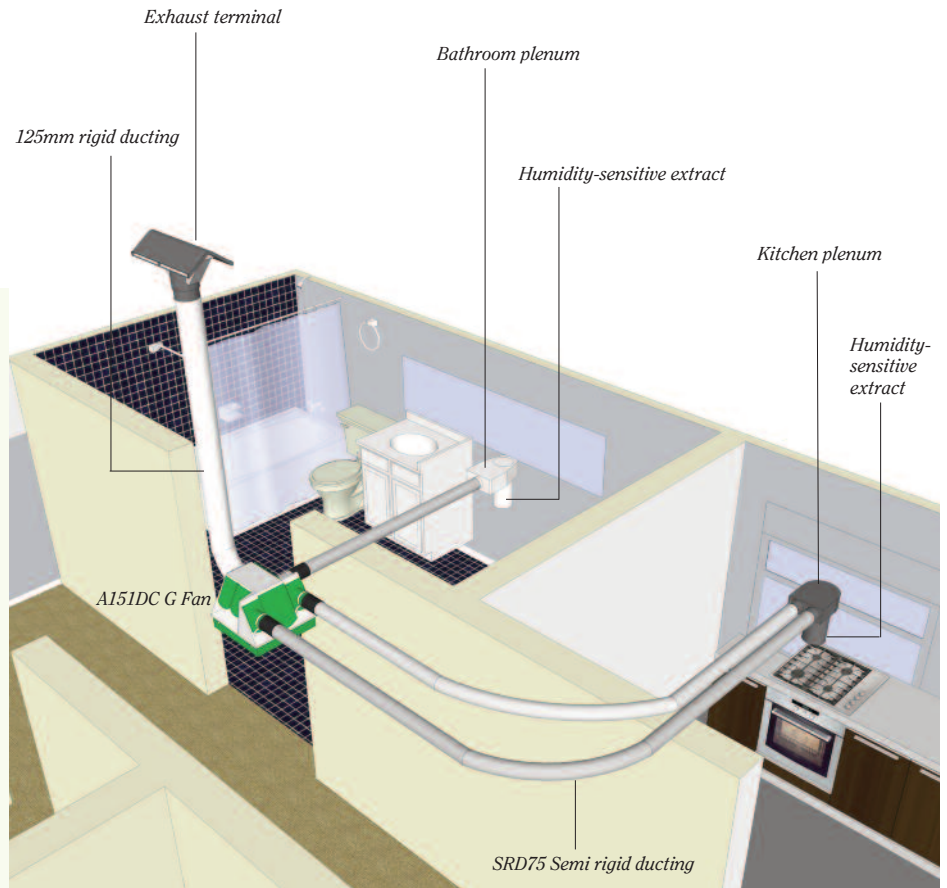
Passivent iMEV Local

A constant speed fan provides continuous low level extraction.

Extraction is boosted automatically in rooms where needed by means of humidity-sensitive extracts in each wet room (bathroom, kitchen etc), i.e. locally to the source of humidity.

Main applications

Individual houses, apartments with one system per flat.

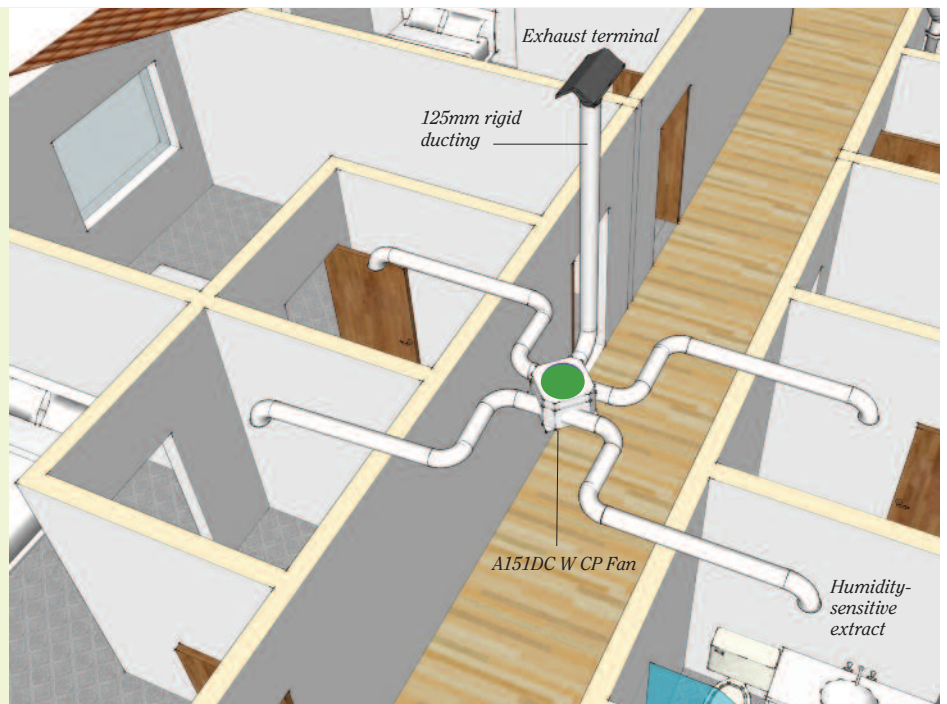


Passivent iMEV Total

Automatically controlled by humidity-sensitive extracts locally in wet rooms (kitchens, bathrooms etc), plus a fan pressure sensor which maintains the overall system pressure by adjusting the fan speed. This increases extraction in the area(s) where required, whilst keeping a sufficient level of ventilation in other rooms. At night time when there is low humidity and low demand the fan speed reduces to the quietest minimum setting. This provides a system of total control.

Main applications

Multi-occupancy buildings such as care homes, student accommodation and hotels where individual rooms may require different extraction rates.



PASSIVENT iMEV LOCAL

1

An intelligent mechanical extract system to provide effective whole building ventilation with low energy costs and automatic control of operation.

Uses

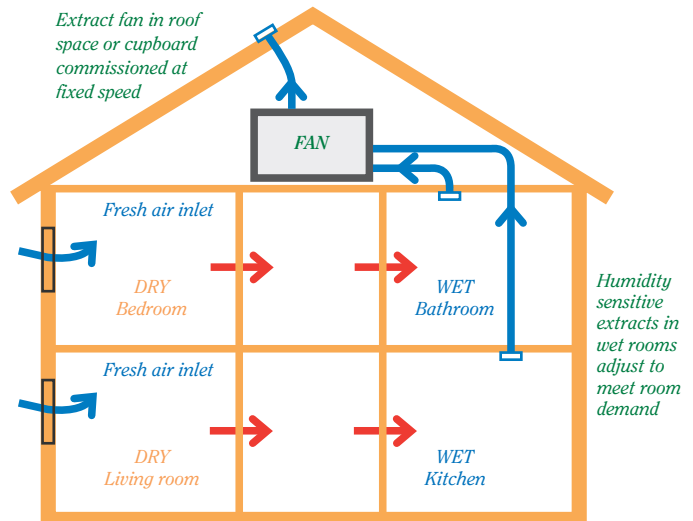
Individual houses, apartments with one fan unit per flat, care homes and student accommodation.

Key benefits

- Constant fan speed means lower energy costs.
- Local automatic control keeps system working as it should – extracting at high levels where needed.
- Quiet fan means less occupant disturbance.

How it works

The system uses a low power constant-speed fan, discreetly installed in a roof space or cupboard. Humidity-sensitive extracts located in wet rooms remove moisture-laden air.



Air circulation provides whole-house ventilation

iMEV Local

Ventilation automatically matches demand in individual wet rooms using humidity-sensitive extracts. Total extraction rate for the building is constant, avoiding over-ventilation (example scenario only).

	Kitchen	Bathroom	En-suite
You're at work and the kids are at school - home is unoccupied	Normal	Normal	Normal
You're home from work and start cooking dinner	Boost	Normal	Normal
Dinner is cooking whilst it's bathtime for the kids	Boost	Boost	Normal

As humidity increases in a wet room, the humidity-sensitive extract within that room opens to allow more air to be extracted. The fan speed remains constant, so at the same time the extraction rate in other (unoccupied) areas decreases, maintaining the overall system extraction rate.

Fresh air is provided by either through-wall or window tricklevents. Humidity sensitive versions are available which operate automatically.

Acoustic options for these inlets can reduce noise ingress.



PASSIVENT iMEV TOTAL

2

A constant pressure system is ideally suited to provide effective ventilation for larger buildings.

Uses

Premises where individual spaces may require different controlled extraction rates, such as large dwellings, care homes or student accommodation.

Key benefits

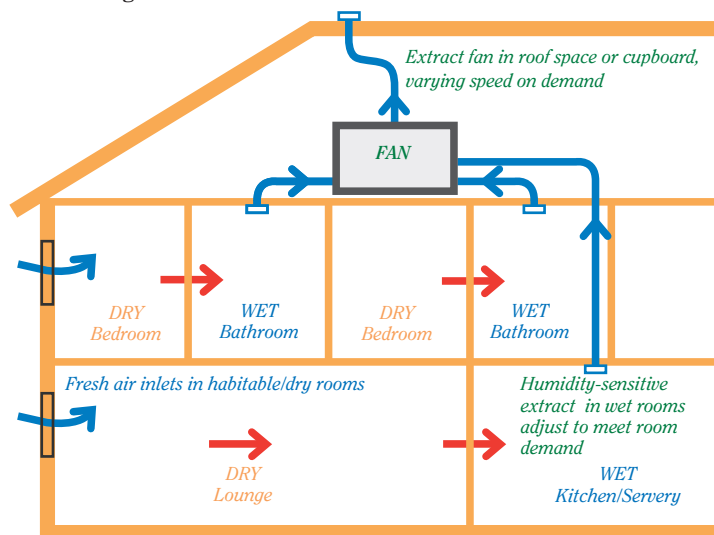
- Fully automatic control maintains effective ventilation throughout a building.
- Ventilation is tailored to the needs of individual rooms or spaces.
- Zonal control minimises heat loss from areas where additional extraction is not required.
- Quiet fan that reduces speed at night eliminates occupant disturbance.

iMEV Total

Ventilation automatically matches demand in individual wet rooms using humidity-sensitive extracts. Total extraction rate for the building is variable, avoiding over-ventilation (example scenario only).

How it works

The system uses constant pressure and humidity-sensitive extracts which control the extraction rate in different areas according to need.



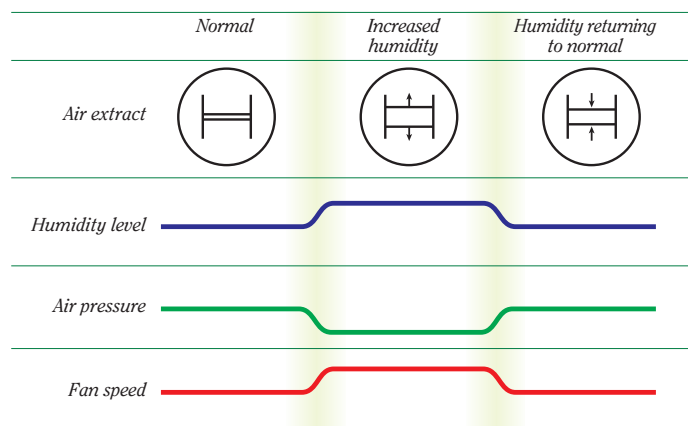
Air circulation provides whole-house ventilation

A sensor in the fan monitors the pressure within the system. As humidity increases in one area the humidity-sensitive extract opens; the pressure sensor detects the resulting pressure drop and increases the fan speed to bring the overall system pressure back to the preset level.

This operation increases extraction only in the area(s) where it is required, whilst maintaining a sufficient level of extraction in other rooms.

This provides a guaranteed performance, unlike other constant pressure systems which are based on the fan performance.

	Communal Lounge/Servery	En-suite 1	En-suite 2
Residents are waking up and using bathrooms	Normal	Boost	Boost
General activity time	Normal	Normal	Normal
Mealtime when food is being prepared and eaten	Boost	Normal	Normal
Night time all asleep	Normal	Normal	Normal



FANS

It is important to choose the right fan for a project. The descriptions shown indicate the main uses for each fan type, but Passivent can advise on the most suitable for any given project.

A151DC E fan

Main uses: Passivent iMEV Local and standard MEV

Capacity: 350m³/hr @ 120Pa

The A151DC E fan incorporates one of the lowest energy motors on the market, despite it being one of the most powerful. It can be commissioned as fixed speed or with a manual boost control that can be easily commissioned during installation.

For MEV systems, the controller options are either a three-position switch or remote radio frequency controller with three settings: low, medium and boost, as well as a timer, meaning the occupant has full control of the ventilation in the home.



Key features

- To further enhance occupier comfort the fan is fitted with an internal silencer, reducing mechanical noise and allowing the fan to be placed within a cupboard space near habitable rooms.
- The A151DC E is eligible for energy use calculations under Appendix Q of SAP (Standard Assessment Procedure for Energy Rating of Dwellings) and has a Specific Fan Power as low as 0.17W/l/s.



A151DC G fan

Main use: Passivent iMEV Local with semi-rigid ducting system

Capacity: 275m³/hr @ 120Pa

The A151DC G is the most flexible fan we offer for single homes and apartments (one fan per dwelling), providing the perfect balance of size and power.

Designed with a flat pressure curve to be used with humidity-sensitive extracts as part of a Passivent iMEV Local system.

It typically utilises Passivent's SRD75 semi-rigid ducting, helping to reduce installation time by 50%.

Key Features

- Eligible for energy use calculations under Appendix Q of SAP (Standard Assessment Procedure for Energy Rating of Dwellings).
- Energy efficient.
- Can be mounted in various different profiles eg on the floor, wall or ceiling.
- Spigot orientation can be changed for even more installation possibilities.
- Rear facing fan blades improve acoustic performance, and reduce air resistance which will improve longevity.
- Flat fan curve to mimic a small constant pressure system.

A151DC W CP fan (constant pressure)

A151DC W fan

Main use: Passivent iMEV Total

Capacity: 350m³/hr @ 120Pa

The A151DC W fan is perfect for large multi-residential properties which require individual areas to be monitored and ventilated separately, without the need for occupant involvement.

The constant pressure version is designed to be used with humidity-sensitive extracts as part of a Passivent iMEV Total system.

Its compact size and range of fixing positions means it can be concealed within a roof or cupboard space, with one fan serving multiple dwellings. This fan is especially useful for care homes and student accommodation where extraction may need to increase in different areas at different times, without affecting other areas where additional ventilation is not required.



Key features

- Energy efficient.
- Can be mounted in various different profiles eg on the floor, wall or ceiling.
- Spigot orientation can be changed for even more installation possibilities.
- Fan blade orientation improves acoustic performance and reduces air resistance which improves longevity.
- Constant pressure version features a malfunction warning light to easily identify issues with individual units when multiple fans are used. Great for care homes where multiple fan units may be clustered together.

AIR EXTRACTS

Passivent have a wide range of extract options available for use in the different applications. They are located in wet rooms such as bathrooms, WCs and kitchens.

Each extract provides a level of control that is suitable for the room and activity at any time. Each room has different requirements from the ventilation system; Passivent provides a truly adaptive solution for each.

For example, a WC is not permanently occupied and so does not need such a high level of permanent extraction. However, once occupied a boost rate is required.



A121



A141 PIR

Extract type	Model	Airflow performance (m ³ /hr) @ 80Pa		Typical applications
		Normal	Boost	
Automatic humidity-sensitive, some with switched boost				
Used to provide fully automatic extraction based on humidity levels within wet rooms (kitchens and bathrooms). Can also be boosted by the user if additional extraction is required (switch located in the vicinity causes extract to open further, increasing the level of extraction). Suitable for use within residential and care multi-occupancy buildings where individual users may be unable to control the system effectively.	A121	15 - 75	-	Bathroom, kitchen/utility
	A133	20 - 75	30 mins @ 150	Bathroom, kitchen/utility
	A133C	20 - 75	constant @ 150	Bathroom, kitchen/utility
	A133SH	10 - 45	30 mins @ 90	Bathroom, en suite
Constant volume with switched boost				
The A141E is particularly suited as part of a dwelling house ventilation solution whereby a constant level of ventilation is wanted for the majority of the time, whilst still offering occupants the option to boost ventilation.	A141E	25	30 mins @ 90	Bathroom, kitchen
	A141EWC	15	30 mins @ 30	WC, store
	A142E	25	30 mins @ 120	Bathroom, kitchen/utility
	A142C	20	constant @ 120	Bathroom, kitchen
Constant volume with passive infra-red boost				
Provides constant extraction at a relatively low level but boosts automatically for 30 minutes upon detecting a presence within the room. This is has added advantages within bathrooms as it can be used to tackle odour as well as humidity.	A141PIR	15	30 mins @ 65	Bathroom, kitchen/utility
	A141PIRWC	15	30 mins @ 30	WC
Constant volume				
Extract is set at a constant level so extraction is always the same. Increased extraction is regulated by fan speed rather than the extract itself. Suitable for when similar levels of extraction are always required (kitchens, store rooms).	A141/15	15	-	Store
	A141/30	30	-	WC
	A141/45	45	-	WC
	A141/60	60	-	Bathroom, kitchen
Boost switch (timed for 30 minutes)	A132	Use with A133, A133SH, A141E, A142E		
Constant boost switch	A134	Use with A133C, A142C		

SUPPLY AIR

Supply air

When using mechanical extract systems, fresh air vents must be provided to replace the extracted air.

Inlet vents are usually located within habitable rooms such as living rooms, bedrooms etc.

Passivent have various inlet vent options available to provide sufficient levels of background air but at the same time ensure that resident comfort is maintained.



Benefits

- Supply of sufficient fresh air.
- Controlled air distribution so do not cause draughts.
- Automatic humidity-sensitive control if required.
- Acoustic vents minimise noise ingress.

Comfort

Passivent window and wall vents are designed to direct air flow around the outside of the room and not into the occupied areas. This stops draughts but also allows the fresh air to mix with the warm air from the central heating, creating comfortable conditions.

Window vents

These are incorporated within the head of the window. There are various types available with different controls, from manual cord operated units to fully automatic humidity-sensitive versions.

These units are usually installed by the window manufacturer at the time of making the windows. Each is designed to ensure that airflow is not directed into the centre of the room which residents mainly occupy, but is directed upwards, reducing the effect of draughts.

There are also acoustic options including either manual or automatic control. These can give sound reduction of up to 42dB $D_{n,e,w}$ providing a quieter, peaceful living environment.

Wall vents

A range of through-wall vents is also available, which can be used where it is not possible or desirable to fit a window vent or where a greater control of supply air is required.

Wall vents are infinitely adjustable between open and closed, so allow close control of how much air is allowed in.

Humidity-sensitive options are also available where manual control is not required.

The acoustic range can also provide substantial sound reduction of up to 50dB $D_{n,e,w}$.



TLF vent

DUCTING and TERMINALS

DUCTING

Plastic rigid circular ducting

Can be used to connect all parts of a Passivent system including extract to fan and fan to roof terminals. Available with a number of different connection pieces to navigate different project layouts. Insulation is available to prevent heat loss and condensation.

Plastic rigid flat channel ducting

Flat channel ducting is suitable for extraction from wet rooms such as bathrooms and kitchens (including cooker hoods). Its low profile enables ducting to be concealed. The various different types of ducting available mean that it can easily be incorporated into different types of project.

SRD75 semi-rigid ducting

SRD75 semi-rigid ducting provides a flexible option to connect the central fan to the extracts. Its construction allows it to bend around obstacles without the need for additional joints. Supplied in 50m lengths it can be cut to accommodate single ducting runs, reducing the chance of air leakage and cutting installation times.

Benefits

- Can reduce installation time by up to 50%.
- Allows for installation between narrowly spaced joists and within stud walls.
- No air leakage as joints are not usually required.
- Suffers very little pressure loss compared to flexible ducting.
- Ductwork can easily be cleaned.

Easier installation

The ducting is cut on site so each duct can be run as a single length; joints and separate bends are not usually required. Thus installation is quicker and more efficient.

TERMINALS

Exhaust air terminals

Tile and ridge terminals are designed to blend with most available manufacturers' roof tiles, and to weather to match the surrounding tiles over time.

Wall terminals are also available.

Terminal	Duct/spigot diameter	Air flow performance
Versa-Tile TT9	125mm	50m ³ /hr at 1.1Pa
		100m ³ /hr at 4.1Pa
		200m ³ /hr at 16.8Pa
Versa-Tile TT13	150mm	50m ³ /hr at 0.3Pa
		100m ³ /hr at 1.0Pa
		200m ³ /hr at 4.2Pa
		300m ³ /hr at 9.5Pa
		500m ³ /hr at 27.4Pa
Ridge PRT	125mm	50m ³ /hr at 2.1Pa
		100m ³ /hr at 7.0Pa
		200m ³ /hr at 25.1Pa



Semi-rigid ducting

FURTHER INFORMATION

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Services

Passivent has its own in-house research team dedicated to developing techniques and products for natural ventilation, and is a leading partner in some of the most important research projects in this field including NatVent™, a consortium of European organisations headed by BRE.

We offer a comprehensive design and advisory service tailored to your specific project, covering both natural ventilation design and product selection. Advanced Airsoft™ software based on CIBSE AM10 is used to calculate sizes of air inlets and outlets on commercial projects to achieve optimum performance.

Names of approved installers can be provided on request.

Quality assurance

Passivent products are designed, developed and manufactured under a BS EN ISO 9001 quality management system, giving an independently audited assurance that the products will fulfil their intended purpose.

Environment

Passivent conducts all business processes under a BS EN ISO 14001 quality management system, giving an assurance that all activities are carried out having minimal impact upon the environment.

Other products

Passivent sells a range of other ventilation and daylighting products for commercial and domestic buildings including:

Natural ventilation systems.

Aircool® ventilators for windows, curtain walling and walls.

Airstract® roof terminals for passive stack and other natural ventilation systems.

Airscoop® wind-driven ventilation terminals.

Litevent combined ventilator and rooflight.

iMEV intelligent mechanical extract ventilation.

Hybrid Plus2 Aircool® ventilators.

Hybrid Plus Airstract ventilators.

SoundScoop® acoustic transfer ventilation products.

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PASSIVENT

North Frith Oasts, Ashes Lane, Hadlow, Kent TN11 9QU Tel: 01732 850770 Fax: 01732 850949
Email: projects@passivent.com Web: www.passivent.com

Passivent maintains a policy of continuous development and reserves the right to amend product specifications without notice.



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