The HETAS Guide

to Approved Solid Fuel,
Wood and Biomass
Products and Services

List no. 25

2019

HETAS

PERMANENT VENTILATORS (FOR SUPPLY OF COMBUSTION AIR)

ESSENTIALS

All heating appliances that produce heat from the combustion of carbon based fuels such as gas, oil and solid fuels including wood, require enough fresh air from outside for complete combustion and to enable the flue/chimney to function correctly to remove the combustion products safely to the outside. Solid Fuel, Wood and Biomass burning Appliances that draw their combustion air from within the dwelling are required by Building Regulations to have installed a fixed permanently open ventilator to provide this air from the outside of the dwelling. Without adequate ventilation there is a danger that the combustion process will be incomplete producing large amounts of carbon monoxide and also that the function of the flue will be impaired. This combination can cause emissions of poisonous gases to the room resulting in sickness and ultimately death to the occupants.

AIR REQUIREMENTS FOR SOLID MINERAL FUEL & WOOD BURNING APPLIANCES

Building Regulations (*Approved Document J*) give guidance that should be followed on the amount of air that solid fuel appliances require. For closed appliances this is based mainly on their rated heat output. Less efficient appliances such as simple open fires require more air than closed appliances because of the additional air that enters the appliance above the firebed and the regulations give separate guidance on this. The information given below is for quick reference and is extracted from Table 1, Section 2 of the Building Regulations *Approved Document J: 2010; Combustion Appliances and Fuel Storage Systems*.

Please Note: The air requirement for other fuels (e.g. oil and gas) will be different.

CLOSED APPLIANCES E.G. STOVES, RANGE COOKERS OR INDEPENDENT BOILERS

For closed appliances without any draught stabilizer fitted installed in a building where the design air permeability is greater than 5.0 $m^3/h.m^2$, the air requirement is 550 mm^2 per kW of rated output above 5kW e.g. for 8 kW this would be:

(8-5) x 550 = 3 x 550 = 1,650 mm^2/16.5cm^2. If the building's design air permeability is less than 5.0 m3/h.m^2 the air requirement is 550mm^2 per kW of rated output.

If the appliance has a flue draught stabilizer fitted then the following air requirements apply:

Installations in buildings where the design air permeability is greater than 5.0 $m^3/h.m^2$; For the first 5 kW of rated output add 300mm^2 per kW and then from 5 kW upwards, add 850mm^2 per kW. e.g. for 8 kW the air requirement would be:

(5x300) + (3x850) = 4,050 mm^2/40.5cm^2. If the building's design air permeability is less than 5.0 $m^3/h.m^2$; add 850mm^2 per kW of rated output.

Please Note: A dwelling constructed before 2008 is unlikely to have an air permeability less than 5.0 $m^3/h.m^2$ at 50Pa unless extensive measures have been taken to improve air tightness. Appendix F of *Approved Document J* gives additional details.

OPEN FIRES

If the open fire is the simple inset type incorporating a throat forming lintel or gather then the air requirement would be 50% of the cross-sectional area of the throat opening. If the open fire is the free-standing type which does not incorporate a throat then the air requirement would be 50% of the cross-sectional area of the flue. Detailed guidance with examples is given in *Approved Document J.*

For simple inset open fires with a throat the guidance states that the following air requirement is necessary based on the width of the fire opening:

- 350mm fire opening = 14,500 mm^2/145cm^2
- 400mm fire opening = 16,500 mm^2/165cm^2

For fireplace openings greater than 500mm in width or freestanding open fires that are open to the room on more than one side please see the additional guidance given in *Approved Document J*.

DETERMINING THE SIZE OF THE VENTILATOR

Reference should be made to the Building Regulations and appliance manufacturer's instructions to determine the output of the appliance and the amount of ventilation required before any installation. Having established how much ventilation is required for the appliance to operate effectively, selecting the correctly sized ventilator to provide adequate combustion air is essential. For anything other than simple ventilators such as air bricks, geometrically measuring the free area on a ventilator's grille may not always be an accurate way to determine the ventilator's true air intake capacity, although this may be the only method available when checking an existing installation.

A value, determined by dynamic testing called the "equivalent area" is considered to be the only true value for a complex ventilator to show how much air it is effectively providing. Things such as internal baffles, the length of the connecting duct or fitment of a weather cowl may affect the equivalent area and only dynamic testing can ascertain a precise "equivalent area". Although the regulations give guidance on how to measure geometrically the free area of any ventilator grille, when considering the size of a new vent to install it is recommended that the value of the equivalent free area should be used and not any stated nominal heat input of the appliance as this may be for another fuel or appliance type. The ventilators listed in this Guide will all clearly specify the equivalent area tested either to *BS EN 13141-1:2004* or a dynamic test method developed by Advantica Technology and referenced in *BS 5440:Part 2:2000*. Additional detailed guidance is given in *Approved Document J* paragraphs 1.10 to 1.23.

GENERAL INFORMATION

There are currently no British Standards covering the design or production of proprietary complex air vents however they should generally comply and be installed with the following guidelines taken into consideration:

- *BS 493:1995; Specification for airbricks and gratings for wall ventilation.*
- Vents for combustion appliances should be non-closable and should not incorporate any additional screens or gauze.
- The size of ventilator openings should be between 9.5mm and 5mm
- Vents should not be located externally where they can easily become blocked or flooded or in positions where contaminated air may become entrained e.g. in a car port or near a flue terminal from a gas or oil fired appliance.
- Air vents in internal walls should be located no higher than 450mm from floor level to reduce the spread of smoke and fumes in the event of a fire. These internal ventilators should be 50% greater in free area than the vent which must also be installed in the external wall to bring in the fresh air from outside.
- Air vents installed in cavity walls should not be staggered and should include a duct or sleeve across the cavity.
- The ducts or sleeves should also have water baffles incorporated to prevent water transfer from the outside across the cavity, otherwise this can cause damp on internal walls. This duct should be of cross-sectional area no less than the opening required.
- In noisy areas acoustic ventilation will be beneficial in reducing transmission of external noise to inside a property.
- *BS EN 13141-1:2004; Ventilation for buildings. Performance testing of components/products for residential ventilation.*

Air vents should not communicate with the following:

- Protected areas such as lift shafts or stairwells
- Bathrooms/shower rooms
- Ventilated roof or underfloor areas that connect with other properties

In affected areas, consideration should be given to the presence of radon gas particularly when intending to supply air from an underfloor space.

MAINTENANCE OF PERMANENT VENTILATORS

Although generally ventilators require little maintenance they should be subject to a regular inspection as part of the maintenance programme of the appliance and chimney to ensure that the ventilation remains free of obstruction both from external influences such as vegetation growth or other obstacles and also internally, for example insect nesting or general airborne dust accumulation. When visiting an existing installation, the permanent ventilation should be the subject to a check to ensure that it complies with Building Regulations and the guidelines given above.

WARNING NOTICE TO THE CONSUMER

PERMANENT VENTILATION PROVIDED FOR SUPPLYING COMBUSTION APPLIANCES WITH AIR MUST NEVER BE BLOCKED OR RESTRICTED.

See also the note titled *'Permanent Air Vents'* on page page 144 of *Important Installation, Safety & Maintenance Notes* of this Guide.

PURPOSE-MADE VENTILATORS FOR SUPPLYING COMBUSTION AIR

TYPES

These ventilators are manufactured from a variety of materials such as ceramics and UV stable thermo-plastics. They are preferably supplied as boxed sets complete with inner and outer grilles with connecting duct-work for bridging cavity walls and/or making the connection between the two ventilator openings through solid walls. They may incorporate internal baffles to reduce sound transmission and draughts created by sudden changes in air pressure, and weather cowls on the external grille that help also to reduce the effects of draughts and rain ingress.

APPROVALS

Ventilators should comply with Building Regulations & BSI standards. This is normally achieved through BBA certification or a test report from an appropriately accredited laboratory to ensure they meet the applicable aspects of the relevant approved Building Regulations. The equivalent area for complex ventilators should always be specified by the manufacturer, determined using either *BS EN 13141-1:2004* or a dynamic test method developed by Advantica Technology & referenced in *BS 5440:Part 2:2000* or for simple ventilators be covered under the *BS 493:1995* standard. The equivalent area must be given in an unambiguous, easily read manner. Only this equivalent area should be used when specifying the required sizes of ventilators.

PURPOSE-MADE VENTILATORS FOR SUPPLYING COMBUSTION AIR

PRODUCT NAME	APPROVAL STATUS	EQUIVALENT AREA MM²/CM²	PRODUCT IMAGE
Rytons Building Products Ltd Design House, Kettering Business Park Kettering, Northants NN15 6NL	RYTONS BUILDING PRODUCTS INNOVATION IN VENTILATION	01536 511874 admin@rytons.com www.vents.co.uk	
AC3LP – Rytons Mini LookRyt Aircore	*Equivalent Area Value given by BRE test report ref. 299723 dated 15-October 2014*	3168/31.68	
AC7TUBE – Rytons 125mm Baffled AirCore® Tube (358mm L)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	15500/155	
AC7LP – Rytons Baffled LookRyt® AirCore®	*Equivalent Area Values determined by Rytons & witnessed & confirmed by BRE ref. CV5192 dated 21 March 2012*	7900/79.0	
AC7LPCWL – Rytons Cowled Baffled LookRyt® AirCore®	*Equivalent Area Values determined by Rytons & witnessed & confirmed by BRE ref. CV5192 dated 21 March 2012*	8100/81.0	
AC10TUBE – Rytons 125mm AirCore® Tube (358mm L)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	23900/239	
AC10LP – Rytons LookRyt® AirCore®	*Equivalent Area Values determined by Rytons & witnessed & confirmed by BRE ref. CV5192 dated 21 March 2012*	10400/104.0	
AC10LPCWL – Rytons Cowled LookRyt® AirCore®	*Equivalent Area Values determined by Rytons & witnessed & confirmed by BRE ref. CV5192 dated 21 March 2012*	11100/111.0	
ACH75LP – Rytons High Rise LookRyt® AirCore®	*Equivalent Area Values determined by Rytons & witnessed & confirmed by BRE ref. CV5192 dated 21 March 2012*	6800/68.0	
AAC125LP – Rytons Super Acoustic LookRyt® AirCore® (44 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	7400/74	

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Rytons Building Products Ltd Design House, Kettering Business Park Kettering, Northants NN15 6NL	RYTONS BUILDING PRODUCTS INNOVATION IN VENTILATION	01536 511874 admin@rytons.com www.vents.co.uk	
AAC125LPCWL - Rytons Cowled Super Acoustic LookRyt® AirCore® (45 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	7200/72	
AAH125LP - Rytons High Rise Super Acoustic LookRyt® AirCore® (44 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	6600/66	
TCL8 – Rytons 9×3 Ventilation Set with Flush Louvre Ventilator	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	9400/94	
TCL8CWL – Rytons 9×3 Cowled Ventilation Set with Flush Louvre Ventilator	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	9100/91	
TAL4000 – Rytons 9×3 Acoustic AirLiner®	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	17500/175	
TAL4SET - Rytons 9x3 Acoustic AirLiner® Set with Flush Louvre Ventilator (38 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	5800/58	
TAL4CWL – Rytons 9x3 Cowled Acoustic AirLiner® Set with Flush Louvre Ventilator (39 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	5800/58	
TCL18 – Rytons 9×6 Ventilation Set with Flush Louvre Ventilator	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	17500/175	
TCL18CWL – Rytons 9×6 Cowled Ventilation Set with Flush Louvre Ventilator	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2014*	17200/172	
TAL8000 – Rytons 9×6 Acoustic AirLiner®	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	13500/135	
TALSET – Rytons 9x6 Acoustic AirLiner® Set with Flush Louvre Ventilator (39 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	6300/63	
TALCWL –Rytons 9x6 Cowled Acoustic AirLiner® Set with Flush Louvre Ventilator (42 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	5500/55	
TCL20 – Rytons 9×9 Ventilation Set with Louvre Ventilator	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	26500/265	
TCL20CWL – Rytons 9×9 Cowled Ventilation Set with Louvre Ventilator	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	24000/240	
TAL9900 – Rytons 9×9 Acoustic AirLiner®	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	19100/191	

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Rytons Building Products Ltd Design House, Kettering Business Park Kettering, Northants NN15 6NL	RYTONS BUILDING PRODUCTS INNOVATION IN VENTILATION	01536 511874 admin@rytons.com www.vents.co.uk	
TAL9SET – Rytons 9×9 Acoustic AirLiner® Set with Louvre Ventilator (39 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref. 283-275 dated 01-March 2013*	13100/131	
TAL9CWL – Rytons 9×9 Cowled Acoustic AirLiner® Set with Louvre Ventilator (40 dB $D_{n,e,w}$)	*Equivalent Area Values given by BRE test memorandum ref 283-275 dated 01-March 2013*	12200/122	

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