

CHOOSING AND INSTALLING THE CORRECT DUCTING

Because it is normally hidden, a ducting system is often not considered an important part of the construction or refurbishment of a building. However, the importance of the correct ducting is becoming recognised by the building industry.

It is not always the fault of the cooker hood/fan manufacturer when dreams of fresh rooms and low noise fans are not achieved. It can often be that the wrong size or configuration of ducting has been selected by the installer or system designer.

As it cannot be seen, air movement is often made more complicated than it actually is. Air moves just as water moves and it is sometimes useful to visualise a problem by substituting air with water.

In ventilation installations the aim is normally to move the air from its source to the outside of the house as efficiently and quietly as possible. It is, therefore, common sense that to do this effectively, the shorter the distance the air has to travel, the quicker the aim is achieved. It is also common sense that if an obstacle is put in the way, such as a bend, the process will become more difficult as the air will lose its momentum and may require more powerful assistance in order to achieve the aim.

Extractor fans vary in power just as cars do and the results are reflected in much the same way. A high performance/specification car should be quieter, last longer and generally provide the driver with more comfortable and satisfactory results. However, to ensure this, the car needs a straight smooth road on which to travel effectively. The road for the air to travel when using an extractor fan is the ducting. Again, it is common sense that a more powerful fan would need a more efficient duct - a Rolls Royce owner would not consider driving their car in off-road conditions! It is worth remembering that many cooker hood manufacturers' guarantees will be invalidated if

the correct size or an inferior specification of ducting is not used to match the power of the hood.

A few key installation guidelines can be applied to help ensure that the ducting selection is correct and installed in a way that optimises the extractor's performance.

- Choose the shortest and most direct route to the outside or the point where the air is to be released. Do not expect too much of your extraction unit - try blowing at a friend 3 or 4m away and see if they can feel anything!
- Ensure that bends are kept to a minimum.
- If the duct system is boxed in or completely inaccessible for maintenance, it is recommended that all joints are secured, using Domus Plastic Ventilation Duct Sealant, for increased peace of mind.
- Check the extraction capability and connection size of the fan and choose an appropriate size duct. Be sure to verify the whole system performance.
- Air travels better through a round duct, as the air will travel at a lower speed, resulting in less turbulence, vibration, noise and energy loss. However, the installation space available may prevent this ideal.
- A rigid duct is more efficient than a flexible duct and should be used when possible.
- If flexible hose is used, the hose should remain taut and as straight as possible.
- Special consideration should also be given to the selection of the wall terminal and the use of back draft dampers, as these also increase air resistance.
- See Building Regulations (see pages 4 & 5).

In practice, the actual installation may mean that all the above points cannot be adhered to, but Polypipe Ventilation has the products to provide the best solution.

TYPES OF DUCT SYSTEMS

Round Pipe

A round duct provides optimum airflow performance and should be used if installation space allows. Polypipe Ventilation has a selection of bends and adapters to meet most installation requirements.

Rectangular (Flat Channel)

Rectangular or flat channel ducting is an excellent alternative when space is restricted. Its low profile enables the ducting to be easily concealed in the ceiling void or along the top of wall units. Polypipe Ventilation has a selection of bends and adapters, including the new Universal Duct to meet most installation requirements.

Flexible Hose

Flexible hose is available in round and rectangular form, to complement the rigid systems. It provides a solution to overcome awkward situations where a rigid system cannot be installed. Flexible hose is most effective for slow moving air, such as with tumble dryers, but can be used with higher volume appliances (with due care taken to ensure that its use is limited and that the hose is kept as taut and straight as possible).

The next page details the Domus duct systems.



System 100

(110 x 54mm)

Particularly suitable for applications requiring lower extraction rates, such as the ventilation of domestic bathrooms and internal toilets. Provides efficient ducting for short simple runs.

Cooker hoods up to 250m³/hr



PolyVent 300

(308 x 29mm)

Ideal for the ducting of bathrooms, toilets and kitchens where space is very restricted. It is easily concealed and is an effective choice if other systems cannot be fitted.

Cooker hoods up to 250m³/hr

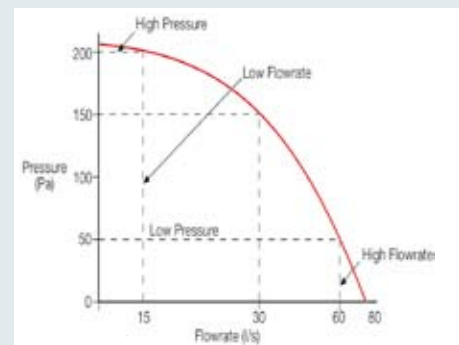


UNDERSTANDING DUCTING PERFORMANCE FIGURES

The performance of the fan is dependent on the performance capability of the fan itself, the size of the duct, the ducting configuration and the type of wall terminal installed.

Each ducting run can be planned in advance and its performance levels evaluated so it can be ascertained if the desired installation will meet the required level.

Technical data is available for the extractor fan/cooker hood installer or system designer in order to achieve the optimum overall extraction rate. This data highlights how much pressure (measured in Pascals) is generated in the ducting run and will show if the required airflow rate can be achieved.



The diagram above shows a typical pressure-flowrate curve for an extractor fan or cooker hood (flow rate information should be available from the fan/cooker hood manufacturer). The information it contains is obtained by a series of laboratory measurements starting with free flow at zero pressure, then, by steadily increasing the pressure that the fan has to operate against, the volume flow and pressure at each point is derived in order to plot the curve.

Supertube 125

(204 x 60mm)

Ideal for the ducting of kitchen cooker hoods and fans with 100, 125 and 150mm round exhaust spigots. Highly efficient even for long runs and with appliances of a high extraction rate.

Cooker hoods up to 500m³/hr



EasiPipe

(100, 125 & 150mm)

A round pipe is the most efficient airflow conduit as minimum air turbulence occurs. Consequently, EasiPipe is ideal for larger fans, cooker hoods, whole house ventilation systems, stack ventilation and air conditioning systems.

100mm - Cooker hoods up to 250m³/hr
125mm - Cooker hoods up to 500m³/hr
150mm - Cooker hoods up to 1000m³/hr



MegaDuct 220

(220 x 90mm)

Ideal for the ducting of kitchen cooker hoods, especially with 150mm exhaust spigots - can also be connected to 100 and 125mm spigots. This highly efficient rectangular duct has comparable airflow performance to a 150mm round duct but with a lower profile.

Cooker hoods up to 1000m³/hr



ThermaPipe

(100, 125 & 150mm)

ThermaPipe is an insulated pipe system that is 'ready to install', providing excellent protection against condensation and enabling a high level of temperature control to be achieved.

Suitable for whole house ventilation, passive stack and air conditioning systems.

100mm - Cooker hoods up to 250m³/hr
125mm - Cooker hoods up to 500m³/hr
150mm - Cooker hoods up to 1000m³/hr



PolyVent 225

(234 x 29mm)

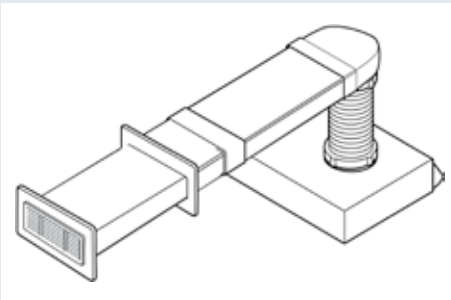
Ideal for the ducting of bathrooms and toilets where space is very restricted. It is easily concealed and is an effective choice if other systems cannot be fitted.



As detailed in the diagram, in order to achieve the current UK Building Regulation flow rate requirement for a kitchen of 60 l/s (or 216m³/hr, 30 l/s or 108m³/hr, for a hood within 300mm of hob centreline), the maximum duct system resistance when using this particular cooker hood can be no greater than 150 Pascals (Pa). Therefore, it can be readily seen that by reducing the resistance of the duct system, the extract performance of the fan or cooker hood is increased. Furthermore, it can be stated that a ducting system with a low resistance is a duct system with a good performance.

The performance of a ducting system is greatly affected by both the overall length of the ducting, the number of bends contained within it and the type of outlet. The system fit is also vital, as incompatible and poorly-fitting duct increases the risk of air and condensation leakage. Therefore, it is important to have a single source of supply for your ducting products. The total resistance of the duct system can be calculated by simply adding up the resistance of each component. Each product within the Domus range has a measured resistance value for the three UK Building Regulation flow rates. These figures are detailed within this catalogue.

Note: For every extractor fan or cooker hood installation, provision should be made for make-up or return air. In most dwellings this is catered for by natural leakage. However, some high performance products may require the installation of an air supply set (see page 24).



The following is a calculation example using the typical ducting layout shown in the diagram.

Therefore the airflow performance of the cooker hood connected should exceed 39 Pa @ 30 l/s.

System Configuration (as Kit 227)

Product	Description	Resistance (Pa) @ 30l/s
2 x 510	1m Flat Channel (2 off)	3.0
1 x 520	Flat Channel Connector	0.4
1 x 541	Elbow Bend with 25mm Spigot	11.1
1 x 561	125mm Flexible Hose, 1m	0.7*
1 x 501	Airbrick with Damper	23.8
	TOTAL	39.0

* Based on a 1m length of 125mm pipe, presuming that the hose is pulled taut.

TECHNICAL ADVICE

Polypipe Ventilation offers expert technical advice on all ventilation installations and has individual dimensioned drawings available on request.

Our technical support service allows you to specify with confidence, reducing sourcing, design and administration time and cost.

If you cannot find the product you are looking for, we may still be able to assist you due to our bespoke design capability. Contact us as help is only a phone call away.

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Sealing Duct Systems

Domus duct systems are primarily of a simple and easy to install push-fit design to suit low pressure ventilation systems and to provide an airtight seal that reduces air leakage, which then results in improved performance.

Push-fit solutions are suitable for the majority of traditional kitchen (e.g. on the top of wall units) and bathroom installations using Domus duct systems. However, increasingly there is a requirement to either permanently or semi-permanently seal joints in certain instances.

The greater need for possible sealing of joints has come about due to:

- Increased number of duct systems being installed in ceiling voids and roof spaces
- Increased number of systems being boxed in and inaccessible

- Increased power of extraction units putting greater pressure on the ducting leading to increased risk of air leakage
- Better sealed and insulated houses increasing condensation and moisture levels
- Increased understanding of the importance and benefits of correct ventilation

When should a duct joint be sealed?

- When a duct system carries high levels of moist air, it is recommended that a permanent seal is applied as excess condensation could occur and bleed around joints by capillary action, leading to staining on adjacent surfaces. This is particularly the case if the system is installed adjacent to a porous surface, as the leakage could create problems such as damp surface ceiling patches

- Sealing of joints is recommended for installations where performance levels are critical and any potential for air leakage needs to be eliminated
- If the duct system is boxed in or completely inaccessible for maintenance, it is recommended that all joints are secured, for increased peace of mind
- Sometimes sealing simply secures a connection or maintains the integrity of the system configuration
- In applications where it is necessary to regularly dismantle or remove the ducting for maintenance cleaning purposes NO permanent sealing measures should be applied

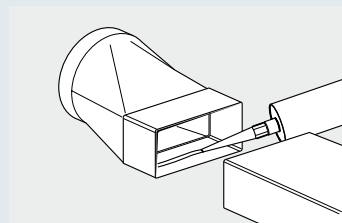
Deciding on the most appropriate method of duct sealing

Sealing rigid ducting systems

Solution: Domus Plastic Ducting Sealant
Code: DDSEAL (page 17)

If a round or rectangular rigid duct system needs to be permanently sealed, the recommended solution would be to use **NEW** Domus Plastic Ducting Sealant. It has been designed specifically to provide a professional airtight and secure seal between plastic ventilation ducts and fittings.

It has a high quality acrylic polymer base providing a low shrinkage flexible seal. Importantly, it is solvent-free and will not attack adjacent sensitive surfaces.



Domus Plastic Ducting Sealant incorporates non-hazardous, mould-resistant fungicides and also being a water-based formulation, any excess can be easily wiped away with a sponge and warm water.

In some situations it may be prudent to provide greater mechanical strength to a joint by using a combination of Domus Plastic Ducting Sealant and Domus PVC Ducting Sealing Tape.

Sealing insulated ducting systems

Solution: Domus Aluminium Duct Sealing Tape (page 21)
Code: 50TP45

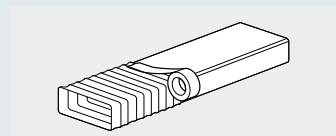


To ensure a suitable seal on a Domus ThermaPipe or Domus Insulated Hose connection, Domus Aluminium Duct Sealing Tape should be used to maintain a seamless surface and joint in order to retain the thermal integrity of the duct system.

Sealing PVC flexible hoses or semi-permanent rigid duct seals

Solution: Domus PVC Duct Sealing Tape (page 23)
Code: 123 (33m), 123-4 (4.6m), 40123 (4.6m pre-packed)

When a semi-permanent seal is required or it is not practical to use a sealant, such as when making a rectangular flexible hose joint, Domus PVC Duct Sealing Tape should be applied.



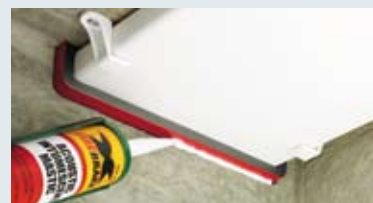
It has been designed to offer both good mechanical strength and a clean, white, tidy finish.

Sealing Domus FireBrake ducting systems

Solution: Domus FireBrake Acoustic Intumescent Mastic (page 30)
Code: MAS87

In order to effectively seal a Domus intumescent FireBrake into a fire partition wall, Domus FireBrake Acoustic Intumescent Mastic must be used.

Gaps in the wall around Domus FireBrake of up to 12mm can be made good with Domus FireBrake Acoustic Intumescent Mastic, to provide both a complete smoke seal and a reduction in sound transmission through the duct system.



Further Information

If in doubt about your method of sealing, please contact our technical advice department.