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The Commercial Kitchen Filtration Experts



purified air®
since 1984



Some of our customers

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We are proud to have supplied our equipment into the Aqua Shard and Hutong restaurants in The Shard, the tallest building in the European Union.

About Us And Our Market

Since 1984, Purified Air Limited has been striving to find the best and most cost effective way to filter and control the oil, smoke, grease and odour produced by commercial kitchens.

With the majority of industry brands already using our systems, Purified Air covers the Fast Food, Casual Dining and Fine Dining markets by providing bespoke systems dependant on the type of food cooked, the type of cooking process used and the volume of air being extracted through the exhaust. By working with these variables we are able to design and supply some of the best commercial kitchen exhaust filtration and odour control systems in the world.

In 2004 Netcen was asked to produce a report on behalf of the Department for Environment, Food and Rural Affairs on Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems and in January 2005 the DEFRA Guide was published.

Our Managing Director, David Collins, was consulted extensively during the preparation of the DEFRA guide and was very pleased to be able to assist NETCEN and DEFRA. David has been working in this business since the early 1980's and is a world renowned expert in the field of commercial kitchen exhaust filtration.
Councils up and down the country have powers under the Environmental Protection Act 1990 to ensure that commercial kitchens comply with the DEFRA Guide and that is where Purified Air comes in, ensuring that the extract from commercial kitchens, when finally exhausted, is as clean and odourless as it possibly can be, keeping the kitchens open and their neighbours happy.

Commercial Kitchen Exhaust Filtration

At Purified Air we specialise in the filtration and control of commercial kitchen exhaust systems. To filter and control the exhaust pollution properly you have to understand the two distinct phases:

01 The particulate phase; oil, grease and smoke (carbon) particles.

02 The gaseous phase or odour.

Oil, Grease & Smoke Filtration

To effectively filter the particulate phase we manufacture and distribute a range of Electrostatic Precipitators or ESP's designed specifically for commercial kitchen application. These units utilise an ionisation process to filter particles down to submicron level, with an optimum efficiency of up to 98%.

Odour Control

To efficiently control the gaseous phase we manufacture a range of Ultra Violet Units or Ozone Generators as well as our Odour Neutraliser the ON100. We can also supply passive filtration, including Activated Carbon, Baffle, Mesh, HEPA, Bag and Panel filters.



Dubai Mall - Purified Air provided filtration for the food & beverage outlets



Hutong at the Shard, London



Harrods, London



The Particulate Phase

Our ESP Range



ESP 4500

- **ESP 1500E which can handle up to 0.7m³/sec of air flow**
- **ESP 3000E which can handle up to 1.4m³/sec of air flow**
- **ESP 4500E which can handle up to 2.1m³/sec of air flow**
- **ESP 6000E which can handle up to 2.8m³/sec of air flow**

Our ESP's have been specifically designed for kitchen extract systems; they have integral sumps to collect the oil, grease and smoke particles filtered out of the exhaust. This not only simplifies servicing but eradicates potentially dangerous spillage from the bottom of the units and greatly cuts down on build-ups of grease within the ducting.

The ionisation voltage has been designed to run at a negative potential which enhances the ionisation of particles and also produces more ozone which is helpful in reducing cooking odours.

Our ESP units fit in-line with the kitchen ducting and can be configured modularly to cope with all extract volume requirements.



KEY FEATURES

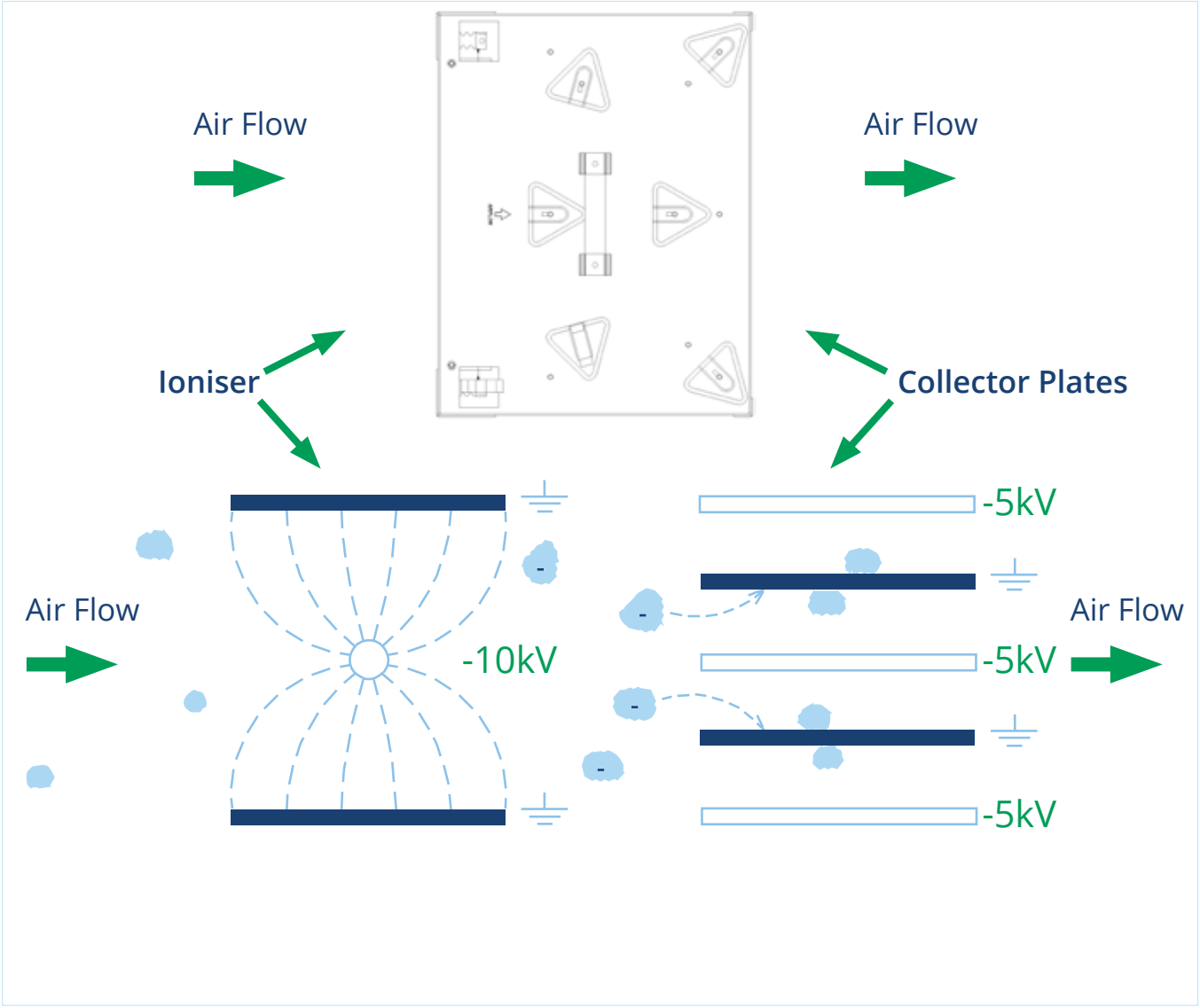
- Eliminates up to 98% of oil, grease and smoke particles
- Filters particles down to sub-micron levels
- Produces Ozone to help reduce malodours
- Designed with an integral sump
- Modular in design
- Specifically designed for commercial kitchen application
- Energy efficient: - uses no more than 50W
- Greatly reduces grease build-up within the duct run

Technical Specification

	ESP 1500E	ESP 3000E	ESP 4500E	ESP 6000E
Electrical Supply	220/240V 50Hz	220/240V 50Hz	220/240V 50Hz	220/240V 50Hz
Power Consumption	30 Watts	50 Watts	50 Watts	50 Watts
Max Air Volume	up to 0.7m³/sec	up to 1.4m³/sec	up to 2.1m³/sec	up to 2.8m³/sec
Dimensions W/H/D	450mm/630mm/ 640mm	900mm/630mm/ 640mm	1350mm/630mm/ 640mm	1800mm/630mm/ 640mm
Weight	55Kg	85Kg	118Kg	153Kg



1. Cooking particulates and odours
2. Canopy Grease Filter
3. ESP - Particulate Control Unit
4. Airflow



The above diagram shows, in a basic visual, how an electrostatic precipitator works. As air passes into the combined ioniser / collector cell, the particulates in the air stream are polarised to a negative potential. As they continue through the ioniser and between the collector cell plates, the polarised particulates are repelled away from the negatively charged plates and attracted to the earthed plates where they stick and so are filtered out of the air flow.

An Autowash option can be provided for our entire ESP range.

The autowash nozzle attachment sits inside our standard ESP units. Once connected to the control / wash station the collection cells can be automatically cleaned at regular frequency. The system is usually factory fitted but can also be retro fitted in existing installations, dependant on the generation of units installed.

Daily cleaning keeps the filters working at their optimum efficiency and will greatly reduce the number of service visits required through the year.

For more information please contact our sales team.



3 ESP Units Stacked in modular formation



4 ESP Units Stacked in modular formation with a double pass



The Gaseous Phase

UV-C Range

Our UV-C (short-wavelength ultraviolet radiation) technology is based on the synergy which occurs when ozone and ultra violet light are combined.

Each individual unit sits directly in the air stream of the kitchen extract duct and can feature from 8 to 24 high output UV-C lamps supplied in modules of 8.

The number of moduals specified will be dependent on the cooking process coupled with the air flow volume which will dictate the amount of ozone needed.

The ozone combined with hydroxyl free radicals, both highly reactive oxidants, act to oxidise odours and grease, permanently destroying and altering the molecular structure of the compounds.

Our UV-C range incorporates:

- **UV-C lamps shielded by their module to reduce the collection of grease on their surface thus extending their optimum efficiency.**
- **The ability to provide the units in simple format or fully monitored with each module of lamps able to provide a local alarm or a BMS signal if in fault.**
- **Exact sizing in line with our ESP range so that they can be bolted together for a uniform modular appearance.**



KEY FEATURES

- High efficiency UV-C technology
- Reduces the need for duct cleaning
- Can reduce cooking odours by up to 90%*
- Designed to complement our ESP system
- UV-C lamps last for up to 14,000 hours

Technical Specification

	UV-C 1500	UV-C 3000	UV-C 4500
Electrical Supply	220/240V 50Hz	220/240V 50Hz	220/240V 50Hz
Power Consumption *	560 Watts	560 to 1120 Watts	1120 to 1680 Watts
Max Air Volume	up to 0.7m³/sec	up to 1.4m³/sec	up to 2.1m³/sec
Dimensions	450 L 630 H 640 W	900 L 630 H 640 W	1350 L 630 H 640 W
Weight	43kg (APPROX)	66Kg (APPROX)	89Kg (APPROX)

**Each rack is 560W (8 lamps)*

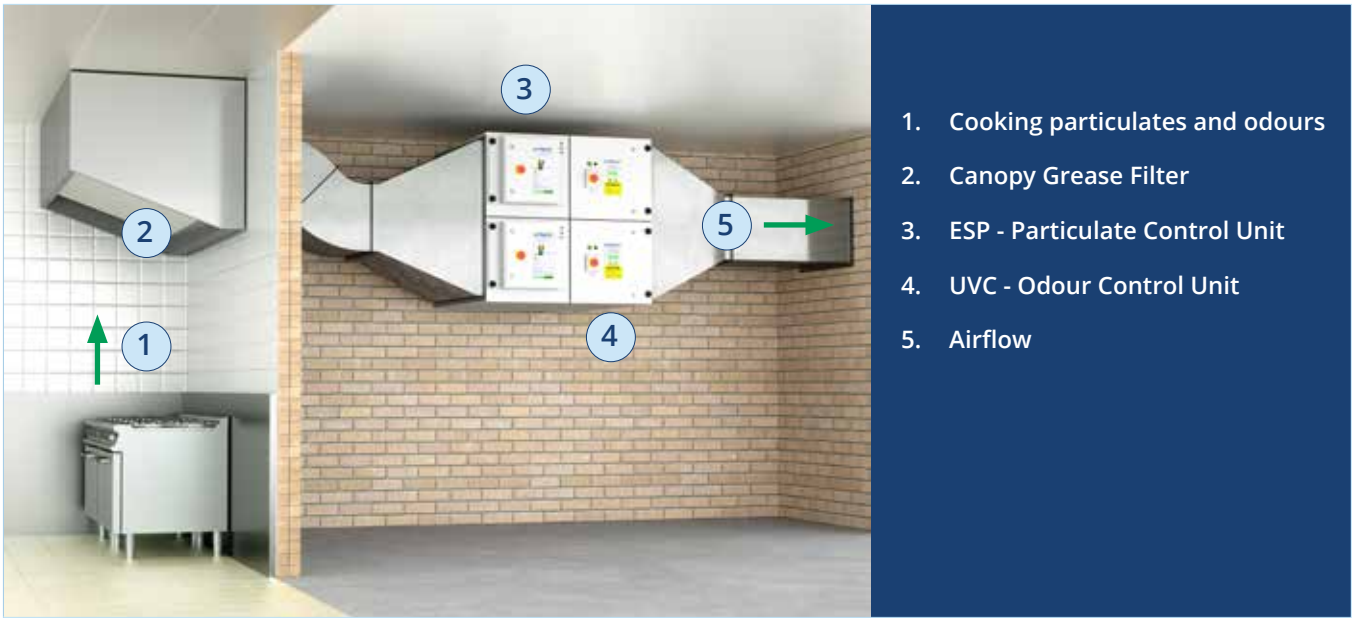
For optimum performance we would recommend between 2 & 6 seconds of dwell time to allow the ozone to work effectively upon the malodorous gasses within the duct.

When installed correctly our UV-C systems can reduce cooking odours by up to 90%*

** With high thresholds of odour, high levels of odour control are only achieved by using good quality particulate control systems (ESP's) as well as supplementary odour control systems.*

This unit's tried and tested UV-C technology allows for the siting of commercial kitchens in locations such as residential areas and shopping centres, where previously planning permission would not have been granted. After extensive research and development Purified Air are able to devise the best combination of lamps at different wave lengths, which when combined with the photo catalytic liner provides the most effective odour control.

Grease, Smoke and Odour



1. Cooking particulates and odours
2. Canopy Grease Filter
3. ESP - Particulate Control Unit
4. UVC - Odour Control Unit
5. Airflow



An urban rooftop scenario with double pass ESP and UV-C units

UV-O Range

Unlike other UV-C systems, our UV-O units are located outside of the kitchen extract duct and are connected via a spigot and spiral ducting.



Our UV-O range includes:-

- **UV-O 500 which handles up to 1 m^3/sec of air flow**
- **UV-C 1000 which handles up to 2 m^3/sec of air flow**

The UV-O 500 has been designed for smaller capacity commercial kitchens.

The UV-O range uses UV-C technology to produce ozone and hydroxyl free radicals to oxidise cooking odours through a process of ozonolysis.

Unlike other UV-C systems, our UV-O units are located outside of the kitchen extract duct and are connected via a spigot and small diameter ducting.

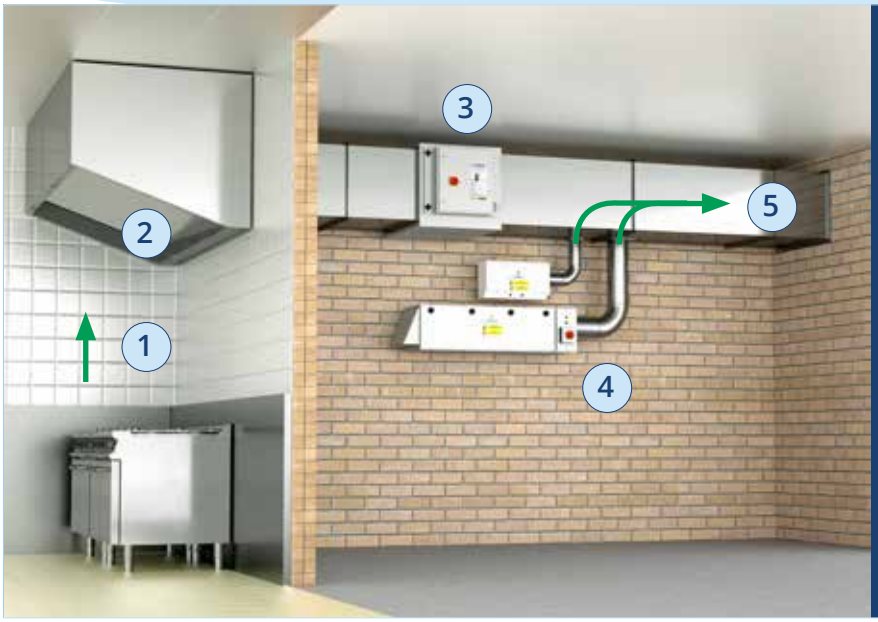
Although it is widely accepted that the best way to apply UV-C light is directly in-line with the air stream itself, performance will be impacted as the lamps get dirty.

With our UV-O units the air flow does not come from the exhaust duct but from the ambient air around the unit, which is filtered on entry. This means that it is able to provide a uniform supply of ozone and hydroxyl free radicals into the extract system with an extremely low pressure loss.

For optimum performance we would recommend between 2 & 6 seconds of dwell time to allow the ozone to work effectively upon the malodorous gasses within the duct.

Key Features

- **Easy to install**
- **Can be retro-fitted into existing duct**
- **Virtually no pressure loss**
- **No monthly maintenance needed**



1. Cooking particulates and odours
2. Canopy Grease Filter
3. ESP - Particulate Control Unit
4. UV-O 500 (above)
   UV-O 1000 (below)
   Odour Control Units
5. Ozone joins airflow

Technical Specification

	UV-O 500	UV-O 1000
Electrical Supply	220/240V 50Hz	220/240V 50Hz
Power Consumption	120 Watts	700 Watts
Max Air Volume	up to 1m³/sec	up to 2m³/sec
Dimensions	W 605mm H 300mm D 200mm	W 1568mm H 350mm D 363mm
Weight	10.5Kg	50Kg

This unit's tried and tested UV-C technology allows for the siting of commercial kitchens in locations such as residential areas and shopping centres, where previously planning permission may not have been granted. After extensive research and development Purified Air are able to devise the best combination of lamps to provide the most effective odour control.

Safety

Ultra-Violet band C light is the most powerful of the three bands, it is a very strong oxidant and as such exposure to UV-C light is dangerous. To ensure safety the UV-C lamps are secured behind locked panels and the system has been engineered to shut down automatically when these panels are unlocked. However, since the lamps typically have a minimum life of twelve months and with the system able to operate at optimum efficiency even if one lamp fails it is unlikely that, apart from routine servicing by experienced engineers, that the system will ever need to be opened.



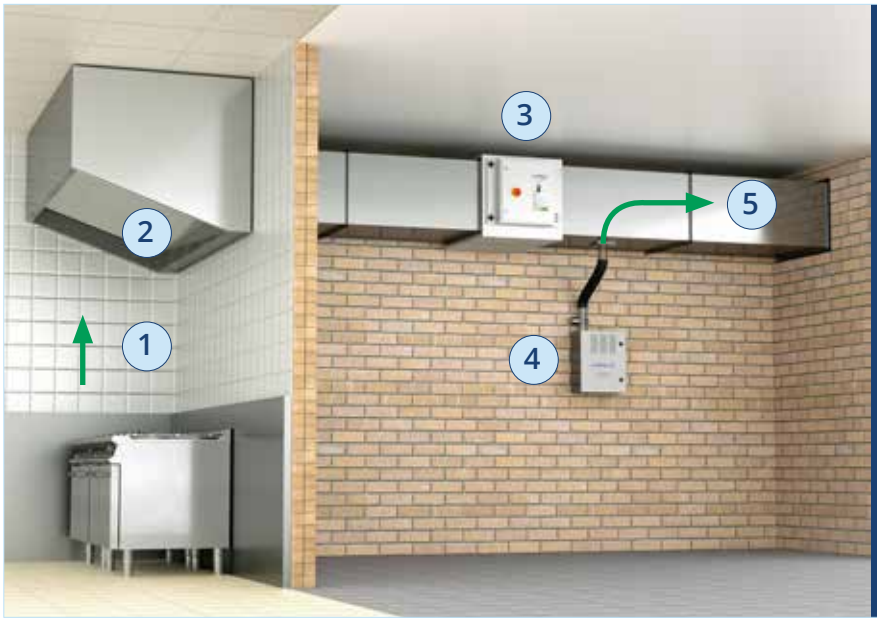
UV-O 500 Unit



UV-O 1000 Unit

ON100

Purified Air use patented technology to scientifically treat cooking odours emitted by commercial kitchen and restaurant exhausts.



1. Cooking particulates and odours
2. Canopy Grease Filter
3. ESP - Particulate Control Unit
4. ON100 Odour Control Unit
5. Eliminodor® joins airflow

Once the airstream in the exhaust duct has had the majority of the particulates removed by one of our ESP units the gaseous phase or malodour can then be treated by the ON 100.



The vapour from a specially blended neutralising agent, ELIMINODOR®, is mixed with ambient air drawn into the ON100 and ionised to a negative potential of 15,000 volts. This ionised vapour then passes along a nonconductive tube to be discharged into the centre of the duct via a venturi spigot, the metal ducting is earthed through the same high tension circuit which makes the contaminant at an opposite potential to the negatively charged ELIMINODOR® vapour. This then causes the negative and positive particles to combine, so treating the malodour by chemical reaction.

Key Features

- **Compact Design**
- **Easy to maintain**
- **Easy to install**
- **No airflow resistance**
- **Energy efficient - uses no more than 40W**

Technical Specification

Electrical Supply	220/240V 50Hz
Max Power Consumption	40 Watts
Ionisation voltage	15kV negative
Max Air Volume	up to 4.16**m³/sec**
Dimensions	W 400mm H 500mm D 200mm
Weight	12.25kg



ON100 Unit

ELIMINODOR®

This product has been specifically developed and blended for use in Purified Air's ON100 unit.

ELIMINODOR® is a finely balanced blend of essential oils and other chemicals which neutralise odorous gases found in the exhausts of commercial kitchens and restaurants.

Purified Air have designed this unique system to ensure that only minimal quantities of ELIMINODOR® are required for optimum results.

Approximate dosage: one litre every 2 - 4 weeks under normal conditions.



Guaranteed Process

Purified Air's ON100 unit in conjunction with ELIMINODOR® can reduce malodour in your commercial kitchen exhaust by up to 90%.

The contamination of ELIMINODOR® with any other ingredients will cause its blend to become unstable and could render ELIMINODOR® completely ineffective, it will also nullify all and any manufacturer's warranty supplied by Purified Air Limited for the ELIMINODOR® and the ON100 unit that it is used in.

Passive Filtration

At Purified Air we supply a range of passive filtration that can be used both in conjunction with our powered units or as standalone filters dependant on the situation.



The filters include:

01 **Carbon Filters**

02 **Absolute (HEPA) Filters**

03 **Bag Filters**

04 **Pleated Panels**

Carbon Filters

We manufacture Sitesafe carbon filters, these innovative carbon units measure 594x196x597mm, three combining to 594x594x597mm, directly replacing our original carbon blocks whilst providing exactly the same filter performance as an existing full size cell.

Their advantage is that they only weigh 18kg each against the 68kg of our original blocks. This takes the strain out of fitting and servicing, allowing only one engineer to complete the task where two had been previously required.

Our Sitesafe carbon filters use panels of activated carbon to remove the malodourous gases within the commercial kitchen extract duct through the process of chemical adsorption. By installing our ESP units before our Sitesafe filters, the carbon life span is greatly increased, allowing it to nullify malodours at optimum efficiency for much longer.

Will require two people plus lifting equipment to carry and install.





Carbon PA242424

Size	594 x 594 x 597
Gross Weight	68.2Kg
Carbon Weight	50Kg
Rated Airflow	3600m³/hr*
Pressure Drop	120Pa

Safe for one person to carry.

No special lifting equipment required.



Sitesafe PA240824

Size	594 x 196 x 597
Gross Weight	17.95Kg
Carbon Weight	16.6Kg
Rated Airflow	1200m³/hr*
Pressure Drop	120Pa



Sitesafe 3 x PA240824

Size	594 x 594 x 597
Gross Weight	53.85Kg
Carbon Weight	50Kg
Rated Airflow	3600m³/hr*
Pressure Drop	120Pa

*Rated Airflow based on a dwell time of 0.1 seconds. Available in all sizes to retrofit carbon cells

Carbon Filter Cell Part Number	Nominal Size (inches)	Height (mm)	Width (mm)	Depth (mm)	Weight of Encased Carbon (Kg)	Weight of Entire Cell (Kg)	Capacity @ 0.1 Second Dwell Time M3/h
PA-240824-7C "Site Safe"	24 x 08 x 24	594	196	597	17	18	1266
PA-242412-7C	24 x 24 x 12	594	594	297	25	36	1900
PA-242424-7C	24 x 24 x 24	594	594	597	50	61	3800

Please find our most popular sizes above, we do supply many different sizes and grades of carbon filters so please contact us with your requirements.

Absolute (HEPA) Filters

To qualify to be called a High-Efficiency Particulate Air or HEPA filter, the filter must be able to remove, from the air that passes through it, 99.97% of particles down to a sub-micron level. Our main use of HEPA filtration is the removal of smoke particles.

We do supply many different sizes and grades of HEPA filters so please contact us with your requirements.



Bag Filters

Our general purpose bag filters are manufactured using a galvanised steel header to retain the pocket sets. The pockets are produced from synthetic micro-fibres specifically designed for use in air filtration. They can be applied as a pre filter to carbon cells in malodour extraction, taking out oil and grease particles ahead of the carbon filter stage.



Pleated Panels

Our pleated panel filters are constructed using a core of pleated fibrous media designed specifically for use in air filtration. This is then thermally bonded onto a galvanised steel support mesh for maximum rigidity which is then fully bonded into a moisture resistant rigid white lined card frame. These filters are used as stand-alone pre filters or as a pre filter to bag filters filtering oil and grease particles.



Panel Filter Part Number	Nominal Size (inches)	Height (mm)	Width (mm)	Depth (mm)	Rated Airflow m3/s
FILTER 023	24 x 24 x 2	594	594	45	0.705
FILTER 024	24 x 24 x 4	594	594	95	0.945

Please find our most popular sizes above, we do supply many different sizes and grades of panel filters so please contact us with your requirements.

With all of our filter range we hold stock of our most commonly requested sizes but of course we can manufacture to order, given sufficient lead times.

Servicing & Maintenance

At Purified Air we pride ourselves on our excellent levels of customer service and maintenance.



Nationwide Coverage

We have hubs in both Manchester and London and can offer nationwide coverage with our teams of directly employed service engineers.



For all Service & Maintenance enquiries please contact via:

service@purifiedair.com

0800 018 4000

Service & Maintenance Contracts

With every installation we offer the opportunity to sign up for one of our service and maintenance contracts, these are structured to suit individual needs, on a post pay basis with the customer only being invoiced after each service, saving them both time and money against ad hoc servicing requests.

Dependability

So whether you have our commercial kitchen exhaust filtration equipment in your restaurant, café or take away, you can rest assured that we will always be there when you need us.



The DEFRA Guide

> *When the Environmental Protection Act 1990 was brought in, "an Act to make provision for the improved control of pollution arising from certain industrial and other processes", Councils up and down the country had the power to enforce pollution levels across their boroughs.*

In 2004 Netcen, an operating division of AEA Technology Plc was asked to produce a report on behalf of the Department for Environment, Food and Rural Affairs exclusively covering Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems and in January 2005 the DEFRA Guide was published.

Purified Air's Managing Director, David Collins, was consulted extensively during the preparation of the DEFRA guide and was very pleased to be able to assist NETCEN and DEFRA. David has been working in this business since the early 1980's and is a world renowned expert in the field of commercial kitchen exhaust filtration.

DEFRA Guide Risk Assessment for Odour Table 1

Criteria	Score	Score	Details
Dispersion	Very Poor	20	Low level discharge into courtyard or restriction on stack
	Poor	15	Not low level but below eaves, or discharge at below 10m/s
	Moderate	10	Discharging 1m above eaves at 10-15m/s
	Good	5	Discharging 1m above ridge at 15m/s
Proximity of receptors	Close	10	Closest sensitive receptor less than 20m from kitchen discharge
	Medium	5	Closest sensitive receptor between 20 and 100m from kitchen discharge
	Far	1	Closest sensitive receptor more than 100m from kitchen discharge
Size of Kitchen	Large	5	More than 100 covers or large sized take away
	Medium	3	Between 30 and 100 covers for medium sized take away
	Small	1	Less than 30 covers or small sized take away
Cooking Type (odour and grease loading)	Very High	10	Pub (high level of fried food), fried chicken, burgers or fish and chips
	High	7	Kebab, Vietnamese, Thai or Indian
	Medium	4	Cantonese, Japanese or Chinese
	Low	1	Most pubs, Italian, French, Pizza or Steakhouse

DEFRA Guide Risk Assessment for Odour Table 2

Impact Risk	Odour Control Requirement	Significance Score*
Low to Medium	Low level odour control	Less than 20
High	High level odour control	20 to 35
Very high	Very high level odour control	more than 35

*Based on the sum of contributions from dispersion, proximity of receptors, size of kitchen and cooking type

- **Annex B of the DEFRA Guide lays out the information required to support the planning application for a commercial kitchen.**
- **Annex C of the DEFRA Guide outlines risk assessment for odour control for a commercial kitchen.**

To establish what odour control equipment your premises may require, calculate your score from the Risk Assessment for Odour Table 1.

This score can then be applied to the Risk Assessment for Odour Table 2 which will dictate the broad level of control that you require.

These levels are expanded upon in the Risk Assessment for Odour Table 2 Notes.

Specifying the right equipment at the right level is not an exact science and takes years to perfect, our specialist field team are all highly experienced and only too pleased to give you a free site survey.

Risk Assessment for Odour Table 2 Notes

Low to medium level odour control may include:

01 **Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.1 second residence time).**

02 **Fine filtration followed by counteractant/ neutralising system to achieve the same level of control as 1.**

High level odour control may include:

01 **Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.2 – 0.4 second residence time).**

02 **Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.**

Very high level odour control may include:

01 **Fine filtration or ESP followed by carbon filtration (carbon filters rated with a 0.4 – 0.8 second residence time).**

02 **Fine filtration or ESP followed by carbon filtration and counteractant/neutralising system to achieve the same level of control as 1.**

03 **Fine filtration or ESP followed by UV ozone system to achieve the same level of control as 1.**

04 **Fine filtration or ESP followed by wet scrubbing to achieve the same level of control as 1.**

The above are excerpts from the DEFRA Guide, a full copy of the guide is available upon request

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