



# Grease Smoke & Odour Control

Controlling emissions from  
commercial cooking processes

# UK Controls

## The UK Control of Pollution Act 1974

- Grease
- Smoke

Odour could not be classed as a nuisance under this act.

## UK Environmental Protection Act 1990 Section 79 Part (D)

- This Act makes it possible for odour to be construed as a nuisance.
- Environmental Health Officers are able to serve notice on premises causing odour nuisance and have the power to require that the nuisance is abated. In extreme cases failure to comply could lead to closure of the premises.



# DEFRA Report

Guidance on the Control of Odour and Noise  
from Commercial Kitchen Exhaust Systems –  
published January 2005

Covers both new and existing premises:

- Grease filtration
- Odour control

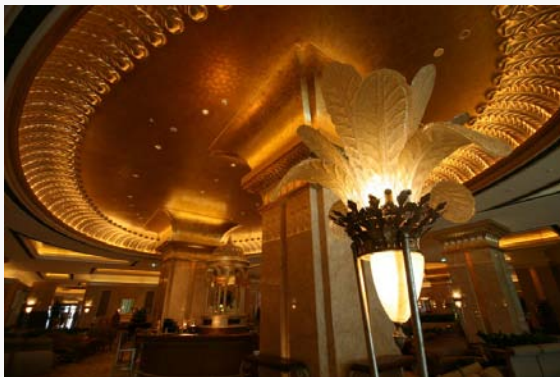
# A FEW OF OUR BETTER KNOWN CUSTOMERS



# Projects

Al Ghurair Giga Gold Refinery  
Al Marsa Tower Dubai Marina  
Al Murooj Complex  
ARenco Tower  
Bin Hendi Centre  
Burj Al Arab  
Capital Towers  
Carrefour  
Coco Restaurant  
Crown Plaza Hotel  
Deira City Centre Food Court  
Dubai Festival City  
Dubai Health Care City Hotel  
Dubai Internet City Phase IV Siemens Building  
Dubai Marina Point Restaurant  
Dubai Silicon Oasis  
Dubai Sky Gardens Phase II  
DWTC – IBIS Extension  
Embassy Night Club  
Emirates Crew Training College  
Emirates Hills Golf Academy  
Emirates Tower  
Golf Tower III

Goodies Restaurant  
Hakawati Café  
Hilton Hotel  
Ismaili Centre  
Jumeirah Beach Hotel  
Kamat Restaurant  
Le Meridien Hotel  
Mall of the Emirates  
Marina Heights  
Metropolitan Hotel  
Metropolitan Resort Beach Club  
Miramin Restaurant  
More Restaurant  
Nandos Restaurant  
New Holiday Inn  
New Medical Center Hospital  
Palace Restaurant  
Rose Rotana Suites  
Shangri La Hotel  
Sky Walk Towers  
The Fairmont  
Traders Hotel  
Villa Complex at Umm Saquim for HE Shk Sultan Bin Khalifa Bin Zayed Al Nahyan  
World Trade Centre Residences



# The Pollutants

## Particulate



- Smoke
- Grease
- Hydrocarbons

## Gaseous



- Mercaptans
- Combusted Gases
- Food Flavourings

# Requirements for a Good Control System

- Low capital cost
- Low maintenance and repair costs
- High operation efficiency
  - Minimal reinstatement costs
  - Maintained efficiency during service cycles
  - Low constant pressure loss
  - Low energy consumption

# How Do We Solve the Problems of Grease, Smoke and Odour

- Electrostatic Precipitation
- Electronic Odour Control
- UV-C Technology
- Carbon and Mixed Media Filters

# Electrostatic Precipitators

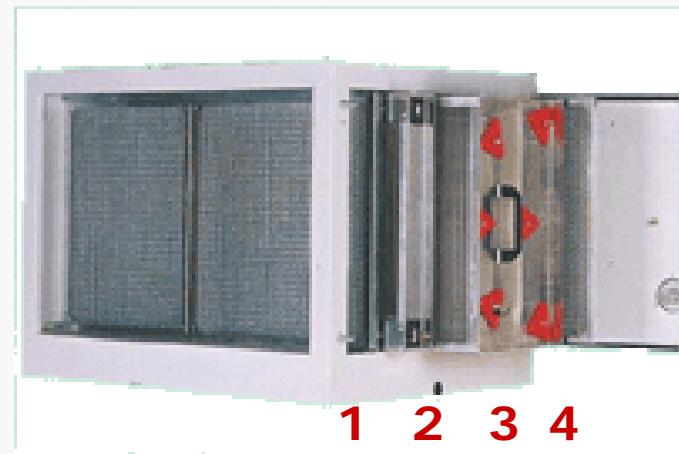
- These devices have been used since the late 19<sup>th</sup> C.
- The Electrostatic Precipitator is used to remove the particulate phase of the contaminant.
- The process electrically charges pollutants to one potential then collects them on a surface with the opposite electrical potential- similar to the way a magnet works



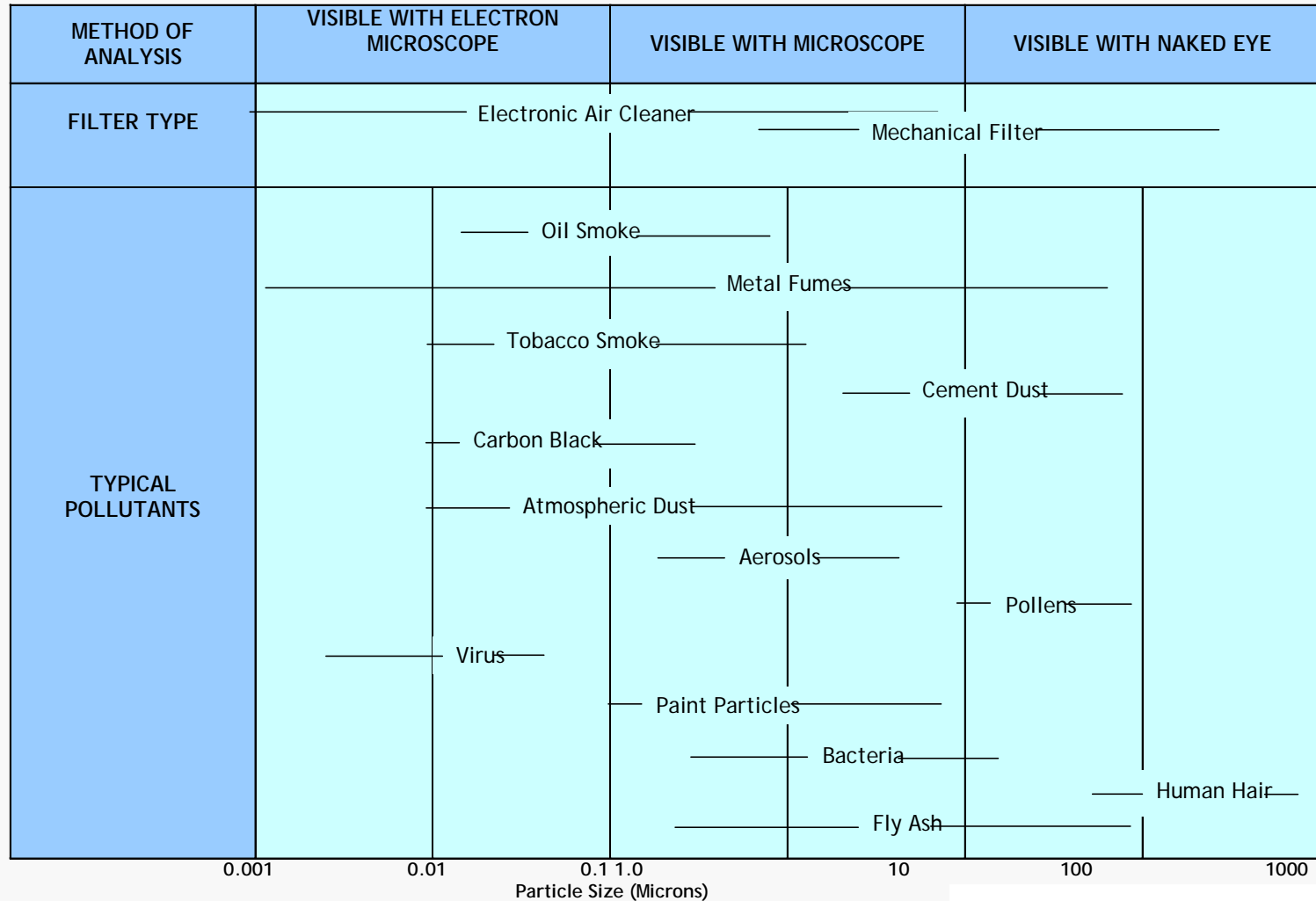
# Electrostatic Filtration System

## Filter Technology

1. Pre-Filter Eurovent Class 2
2. Ionisation selection
3. Collector section Eurovent Class 9. Filter surface 28.4 metre's square.
4. Final filter Eurovent Class 2



# Particles Removed by Electrostatic Air Filters



# The Facts about Electrostatic Precipitators

- Highly efficient - removes particles down to sub micron sizes.
- Metal components – cleaned rather than replaced.
- Uniform pressure loss/resistance.
- Units specifically designed for use in kitchen environments with large sump to collect grease.
- Reliable established technology.
- Modular system – can deal with all airflow levels.

# Maintenance

- All components must be washed regularly in hot water with chemicals or detergent to remove contaminants.
- Preferred method is to exchange component parts with cleaned ones.

# Maintenance



Removing a dirty cell.



Dirty cells going into the washing machine.



Clean cells coming out of the washing machine.

# Maintenance

## Consequence of poor maintenance

Time Frame	Performance of System
New installed or maintained ESP	Optimal particulate removal.
Period 1 – continued operation	Coating of charged plates resulting in reduced particulate removal efficiency.
Period 2 – continued operation and equipment failure.	Coating of internal surfaces continues until particulate removal efficiency drops significantly. Other maintenance issues such as shorting of electrical equipment will occur.

# Odour Control using the Purified Air ON 100

- Combines physics and chemistry.
- Can reduce odours by up to 90%.
- Easy to install and maintain.

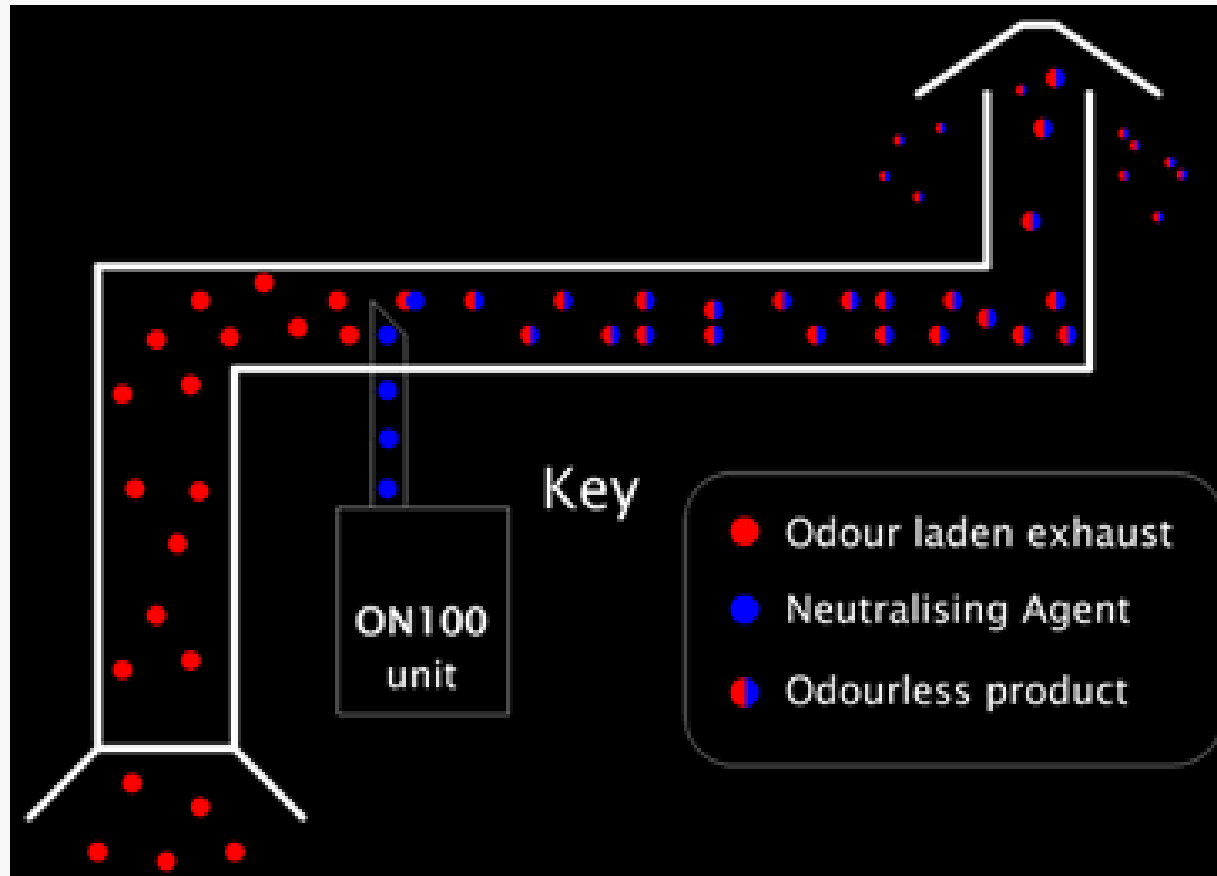


# ON 100



Adding Eliminator

# ON 100 – How it Works



# The Facts about the ON 100

- Low cost.
- Can operate with air volumes up to 15,000m<sup>3</sup>/hr.
- No air flow resistance.
- Self balancing system.
- Easy and economic to service – top up fluid.



# Maintenance

- Unit needs to be topped up with chemical.
- Operations require checking to an agreed service cycle.

# Odour Control using Purified Air's UV-C Technology

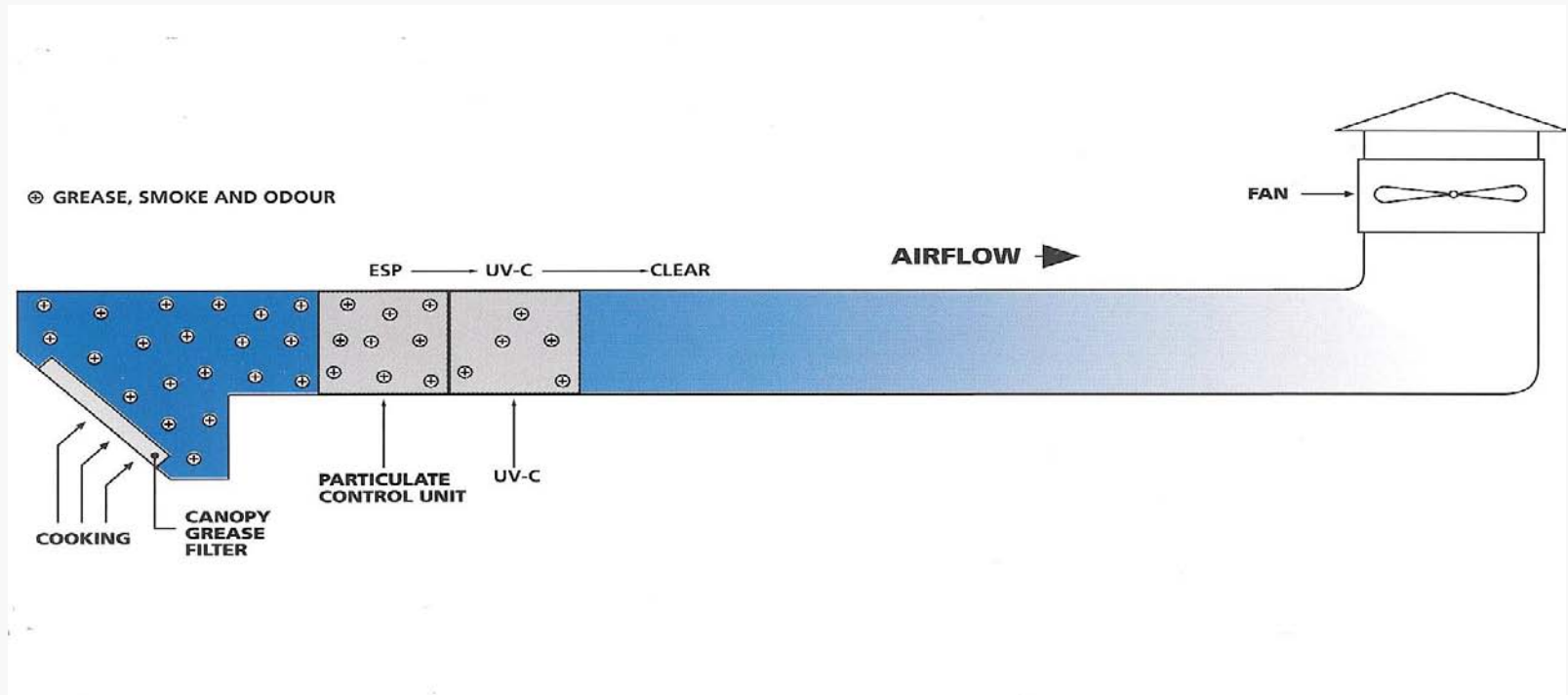
- Based on the synergy, which occurs when ozone and ultra-violet light are combined.
- High output UV-C lamps oxidise odours and grease.
- Some lamps produce UV light at 185nm, converting ozone from the oxygen present in the air.
- Other lamps produce UV light at 254nm, which converts the ozone to hydroxyl free radicals – natural air cleansing agents.



# Odour Control using UV-C Technology

- Some companies put UV lamps into the cooking hood – this is flawed. UV light does not function well under high humidity or heat.
- They also promote that UV light destroys airborne grease – it does not.
- We introduce the UV light into the duct where the temperature and humidity are controlled and uniform.

# UV-C Technology – How it Works



# Six ESP and Three UV-C Modules Installed as an Integrated System



# The Facts about UV-C Technology

- Low uniform air resistance.
- Easy to maintain, lamps need periodical cleaning and replacement.
- Designed to complement ESP system.
- Modular system capable of dealing with all airflow levels.

# Maintenance

- During routine maintenance lamps to be cleaned.
- Lamps to be changed once a year by a specialist.



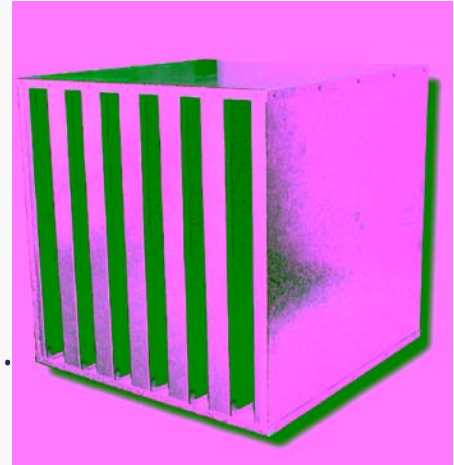
# Carbon Filters

Activated carbon has been used for many years to reduce fumes and gases from the air.

- Ideal for use in light cooking environments.

Or

- Where there is a secondary treatment for grease and smoke i.e. an ESP.
- If a carbon filter is not adequately protected it will quickly fail and can even off gas, adding to odours.





# Maintenance

Filters need to be exchanged every six to twelve months.

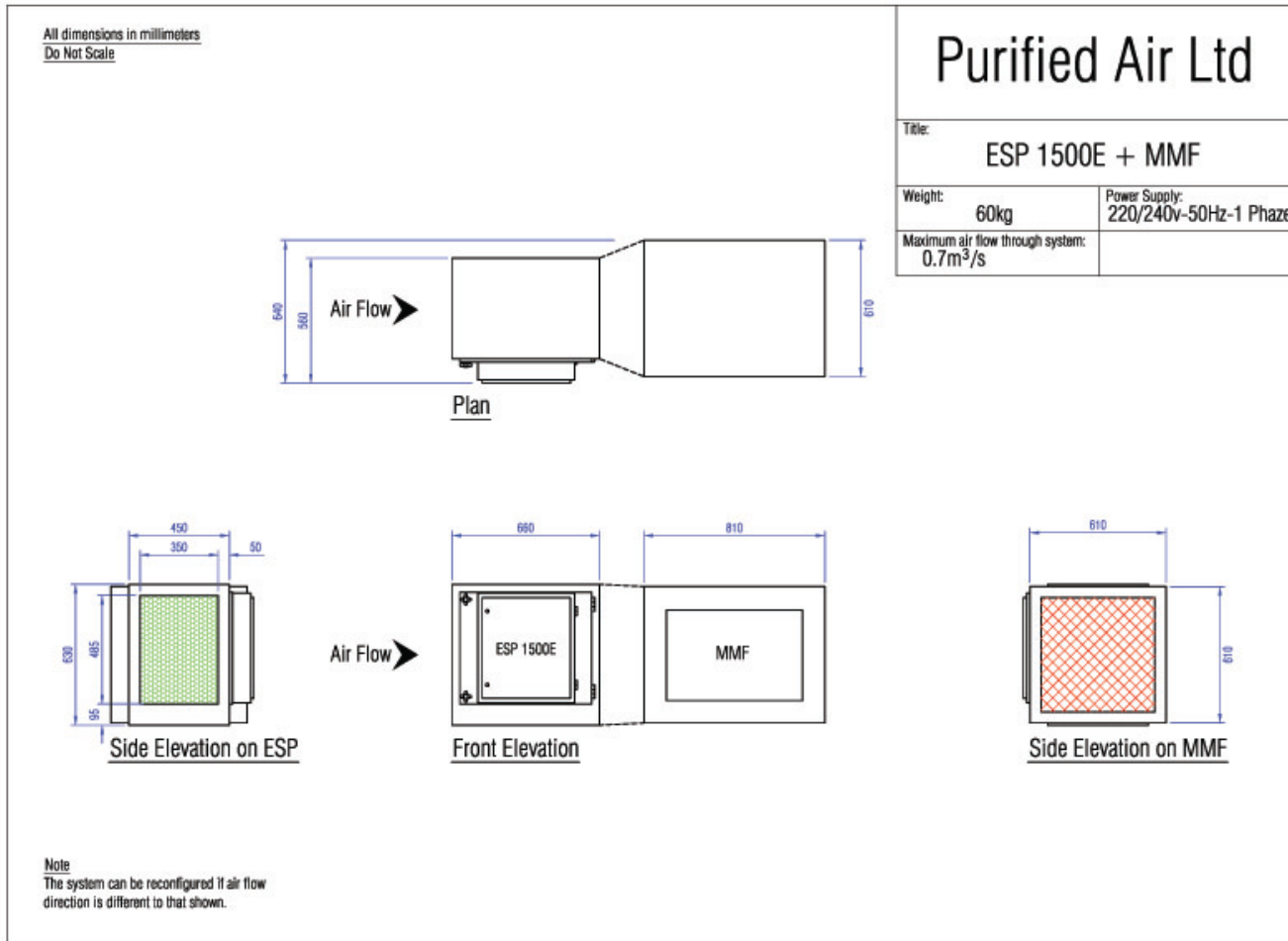
# Specifying A Control System

## All Purified Air systems are modular

What we need to know:

- Extract air volume. This is measured in different values Cubic Feet Per minute, Cubic Metres per hour, Cubic Meters per second and Litres per second.
- The model numbers on our products indicate the amount of extract air they can handle as a maximum in cubic feet per minute.
- Type or cooking – E.g. for char grilling we recommend a double pass system.

# Control System Using ESP and Multi Media Filtration





TYPE OF CUISINE	SMOKE SCORE	GREASE SCORE	ODOUR SCORE	AGGREGATE
African	2	3	3	8
American	2	4	4	10
Caribbean	2	3	3	8
Char Grilling	5	4	4	13
Chinese	2	5	3	10
European	2	2	3	7
Fish & Chips	1	4	3	8
French	1	3	3	7
Fried Chicken	2	4	4	10
Greek	4	3	3	10
Indian	2	4	5	11
Japanese	4	3	3	10
Korean	4	3	3	10
Lebanese	5	4	4	13
Malaysian	2	4	4	10
Mexican	2	3	4	9
Pizzeria	1	2	2	5
Pub Fayre	3	3	3	9
Seafood	1	2	4	7
Spanish	2	1	3	6
Thai	3	4	4	11
Traditional Italian	2	2	3	7
Turkish	4	3	3	10
Vietnamese	3	4	4	11
Warmed Food	0	1	2	3

Extract Air volume	ESP	ON 100	UV-C	Mixed Media
0.3 to 0.7 M <sup>3</sup> /Sec	1 No ESP 1500E	1 No	1 No ESP UVC 3000 1 Rack	1 No 451 Cube
0.7 to 1.4 M <sup>3</sup> /Sec	1 No ESP 3000E	1 No	1 No UVC 3000 2 or 3 Rack	1 to 2 No 597 Cube
1.4 to 2.1 M <sup>3</sup> /Sec	1 No ESP 4500E or 2 No ESP 3000E	1 No	1 No UVC 4500 3 Rack or 2 No UVC 3000 2 Rack	2 to 3 No 597 Cube
2.1 to 2.8 M <sup>3</sup> /Sec	2 No ESP 3000E	1 No	2 No UVC 3000 2 or 3 Rack	2 to 4 No 597 Cube
2.8 to 4.2 M <sup>3</sup> /Sec	2 No ESP 4500E or 3 No ESP 3000E	1 No	2 No UVC 4500 3 Rack or 3 No UVC 3000 2 Rack	3 to 4 No 597 Cube
4.2 to 5.4 M <sup>3</sup> /Sec	3 No ESP 4500E or 4 No ESP 3000E	2 No	3 No UVC 4500 2 or 3 Rack or 4 No UVC 3000 2 or 3 Rack	4 to 6 No 597 Cube
5.4 to 6.8 M <sup>3</sup> /Sec	3 No ESP 4500E or 5 No ESP 3000E	2 No	3 No UVC 4500 2 or 3 Rack or 5 No UVC 3000 2 or 3 Rack	6 to 8 No 597 Cube
6.8 to 8.2 M <sup>3</sup> /Sec	4 No ESP 4500E or 6 No ESP 3000E	2 No	4 No UVC 4500 3 Rack or 6 No UVC 3000 2 or 3 Rack	8 to 10 No 597 Cube

**NB FOR SENSITIVE SITES ADD 5 TO THE AGGREGATE SCORE BEFORE CHOOSING EQUIPMENT**

Score 3 to 5	ON 100 or Mixed Media Filter designed with dwell time of 0.1 seconds
Score 6 to 10	Single Pass ESP with ON 100 or Mixed Media Filter or UV-C designed with dwell time of 0.15 seconds
Score 11	Single Pass ESP with Mixed Media Filter or UV-C designed with dwell time of 0.25 seconds
Score 12 to 13	Double Pass ESP with UV-C designed with dwell time of 0.25 seconds
Score 13 plus	Double Pass ESP at 2.3rds design with UV-C and Mixed Media Filters with dwell time of 0.25 seconds.

PLEASE NOTE THIS SHEET IS INTENDED AS AN INDICATIVE GUIDE, ODOUR CONTROL IS NOT AN EXACT SCIENCE, WE HAVE ENGINEERS ON HAND TO ASSIST WITH DESIGN AND EQUIPMENT SELECTION SO PLEASE CONTACT US ON 0800 0184000