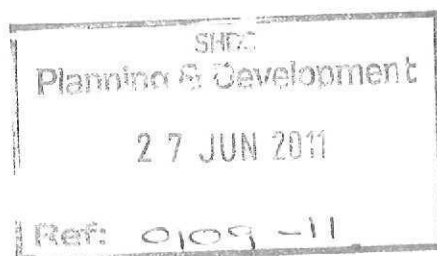


Supplementary report No 3: Extraction Systems.





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Proposed Kiremko Frying Equipment and Extract System for 'Jacks Fish Bar' Camelgate Spalding.

The Kiremko Frying Range.

The Kiremko deep fat frying range is recognised for its advanced technology and consistently features in the equipment used by winners of prestigious events such as Fish and Chip Shop of the Year. The computer controlled burner system enables the fryers to achieve a remarkable 94% efficiency on energy usage and with the extremely clean combustion results make this machine more environmentally friendly than any other machine in the market place.

The frying range has an integrated internal extract system that removes odour and cooking emulsions (a combination of oil, fat and water vapour) from above the open pans. The position of the impact filters and the extract rate ensures that cooking vapour does not rise into the shop/kitchen.

The stainless steel impact filters are designed to slow the extracted air as it passes through two 90 degree turns and thus depositing the heaviest of the emulsion particles into a stainless steel plenum used to collect and solidify them. This removes approximately 60% of the emulsion particles and prevents them entering the extract system. It is however inevitable that most of the remaining particles are deposited within the extract system and it is for this reason that grease traps are installed at the base of each primary riser. The grease traps generally have large inspection hatches and collection drawers to facilitate cleaning and disposal of resultant grease.

A washable stainless steel mesh filter (Jasun Filtration GF1-2424) is fitted to the grease trap prior to the fan unit. This will further reduce the amount of particulate in the system.

An integrated oil filtration system allows the cooking medium to be filtered without disrupting the cooking process and therefore ensures that cooked product particles are removed from the cooking medium regularly and reduces the amount of odour passing into the extracted air.

The associated extract system comprises a Novenco York CNA400 fan unit, odour and grease control and site specific terminations.

The Fan Unit. The fan unit to be used is the CNA400 which is powered by a 1.1Kw motor and runs at 1450rpm. Primarily this unit is being used because of the blade type and direct drive which allows easy and regular maintenance in a potentially greasy and difficult environment. The unit is balanced to achieve minimal noise levels and is mounted on anti-vibration mounts to minimise noise transfer. To minimise noise transfer through the ductwork the inlet and outlet to the fan are connected by

flexible couplings. The unit is mounted on anti-vibration blocks to eliminate structure borne noise and vibration.

It is proposed, in this case, to install the fan unit into the roof space which will totally eliminate any noise transfer to adjoining properties.

Noise Control. The aim is to prevent an increase in the background noise level at the site boundaries, and to prevent structure borne noise and vibration transmission to adjoining premises.

The airborne noise from the terminal can be reduced by installing an attenuator and can therefore easily achieve the requirement of not exceeding the background noise levels.

In general, the adjacent domestic properties will not be affected at sensitive times (late at night and in early mornings).

Odour Control. The aim is to prevent odour nuisances to neighbours, when equipment is operating under normal circumstances.

It is proposed to install a Plasma Clean Xtract 2100 and an Electrostatic Precipitator to combat the cooking odours and grease from the frying range. In conjunction with the high impact plenum filters, stainless steel mesh filter and high volume ambient air being drawn across the top of the frying pans to dilute the odour laden air, the ozone and ions produced by the Plasma unit assist in neutralising the odours. The type and number of units installed depend on the severity of odour nuisance and the volume of air being extracted.

The ESP unit will remove any grease not trapped by filters in extract system.

It is also proposed that the termination of the system be a vertical discharge terminal to ensure a unrestricted exit from the riser.

Maintenance of the extract System.

The Kiremko Frying Range is delivered with full cleaning and maintenance instructions. Special attention is indicated to the regular (daily) cleaning routine for all grease filters.

Full extract system cleaning is instructed as being at least every 12 months and is dependent on the volume of product being cooked on a regular basis.

The plasma system and ESP unit should be serviced every 12 months as per the manufacturers instructions.

The Principle of Electrostatic Precipitators

ESP units are used to clean the airstream of grease and hydrocarbons (smoke) in kitchen exhaust systems. They are efficient and can remove particulate down to sub-micron (0.01micron) sizes. The filter efficiency of up to 98% is achieved during a single pass through the ESP, based on the charging of particles by an ionisation section [2] which are trapped on the earth plates in the collector cell [3]. Larger particulate in the airstream would be removed by the filter [1] and lastly through an afterfilter [4] to prevent any re-entrainment and provide good air distribution.

Construction

Air cleaners are precision engineered to current industrial standards.

Case is of galvanised steel, spot welded and with heavy duty hinges and on door equipped with pressure locks.

Internal neoprene seals fitted all round.

Efficiency Achievable

Unit Efficiency

up to 98%
up to 97%
up to 98%

Efficiency varies with different unit and air volumes.

Maintenance

Air cleaners require only little maintenance as all filter elements are cleanable by means of steam, detergent, or water jet.*

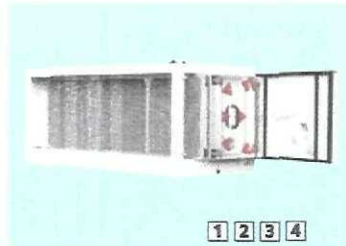
Using media filters where

Controls

Control enclosure houses the HT supply, and operating lights, with dual indication of mains and operation.

Filter Technology

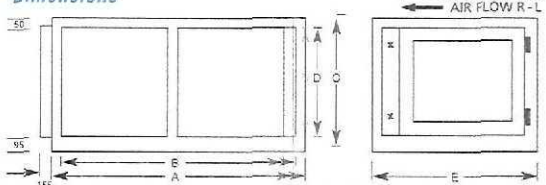
- 1 Pre-filter
Eurovent Class 2
- 2 Ionisation section
- 3 Collector section
Eurovent class 9
Filter surface 28,4m²
- 4 Final filter
Eurovent Class 2



Standards

The ESP Units comply with current IEEE, CE and other European standards, including the Health and Safety at Work Act. Rated to IP 53.

Dimensions



	ESP 1500 E	ESP 3000 E	ESP 4500 E
A - Width	450mm	900mm	1350mm
B - Width	350mm	800mm	1250mm
C - Height	630mm	630mm	630mm
D - Height	485mm	485mm	485mm
E - Depth	660mm	660mm	660mm

VOLUME MAX	2500m ³ /h 1500cfm	5000m ³ /h 3000cfm	7500m ³ /h 4500cfm
TRICAL SUPPLY	220/240V 50Hz 1ph	220/240V 50Hz 1ph	220/240V 50Hz 1ph
POWER CONSUMPTION	30W	50W	140kg
HT	60kg	100kg	140kg
MAX WORKING TEMP	4/56°C	4/56°C	4/56°C
RELATIVE HUMIDITY	75%	75%	75%

Design of cooking exhaust control varies. Different types of cooking extraction have separate requirements and require additional equipment. The unit in this brochure is designed to be in conjunction with other items of furniture. Purified Air Limited offer a consultation service and will assist in design, please discuss your project before selecting equipment.

purified air
providing a better environment

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Electrostatic Precipitator



purified air
providing a better environment

solution to grease and smoke pollution...

Local Legislation

Local Legislation requires increasingly that the amount of grease and smoke in kitchen exhaust fumes is reduced to lessen the nuisance of smells to the neighbourhood. Our ESP system gives the restaurant a clean, non-polluting system, while complying with local legislation.

Risk Reduction

Grease build up in the ducting is significantly reduced with an ESP. This reduces the risk of fire in the ducts and spreading from the source to different parts of the building.

Efficiency

ESP system is a very efficient means for removing particles and it can remove particles down to sub-micron size (0.1). When installed correctly, the unit can achieve an efficiency up to 98%.

Before and After Filters and Oil Drain

The unit is provided with standard mesh filters designed to protect the electrostatic filter section. We can also provide specialist oil demisters and other pre filters for different applications. The units are all fitted with an angled drip tray and an oil drain to allow collected waste grease and oil to be drained away.

Applications

ESP is installed inline in the ducting. The unit should be located as close as possible to the extraction hood to reduce grease build up within the ducting. This reduces the need for regular duct cleaning. If space is limited in kitchen then the unit(s) can also be installed outside, upstream of the extraction fan. Several ESP units can, instead of modules, be used as a central filter installation with a virtually unlimited capacity.

Pressure Loss

ESP is characterised by a remarkably low pressure drop (120-170 Pa). The advantage is that existing extract fans often do not need to be replaced.

Maintenance

Regular cleaning of the filters, ioniser and collector cells with warm water and detergents is needed. Purified offer a cleaning and maintenance service operating on an exchange system. This is a cost effective service available in the UK direct from the manufacturer and in other selected countries via our agents. Taking out a maintenance contract ensures that your system is in full working condition at all times. This assures an appropriate maintenance frequency and professional cleaning. The maintenance of the ducting and any other filter present in the ducting can be reduced (lower frequency) because of the effectiveness of the ESP.

Electrostatic Precipitator is suitable for the removal of all grease and odour emissions from commercial kitchens

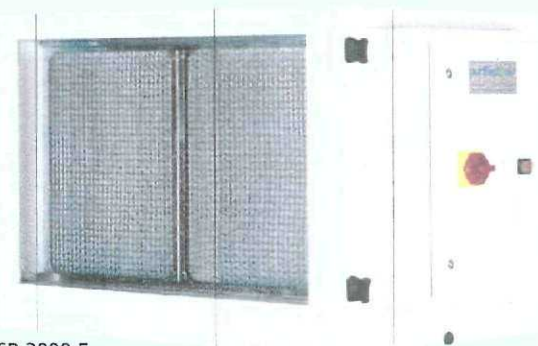


The amount of grease and smoke can be eliminated. Purified Air has the complete solution for any kitchen or catering method. The ESP system is supplemented by a number of other technologies manufactured by Purified Air designed to combat cooking odours, these systems comprise UV-C, electronic and chemical neutralising specially designed media and micro porous filters.

Solving kitchen emission problems

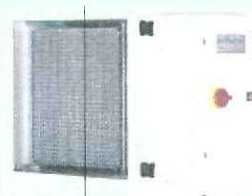
When fume problems are not exclusively about the nuisance of grease or exclusively about odours. Both elements need to be solved 'at source'. The ESP system is the second stage of a sacrificial system, the first being canopy filters and the third being methods for gaseous or odour control. The ESP is part of a family of products designed to eliminate grease, smoke and odour problems from commercial kitchens. The duct-installed ESP systems remove the smaller grease particles and other contaminant that pass the grease filters in the cooker hood.

The ESP Modular System

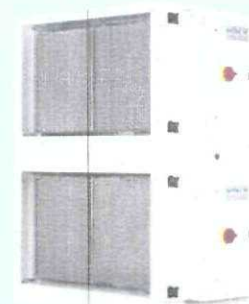


ESP 3000 E

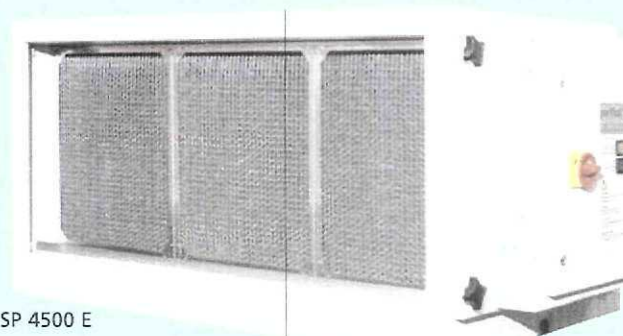
All units can be used individually or combined for greater air flows.



ESP 1500 E



Two ESP 3000E in modular format



ESP 4500 E



Plasma Clean Xtract 2100

The Plasma Clean Xtract uses ozone - a well known disinfectant and odour neutralizer - which is released directly into the kitchen ventilation canopy. Here it immediately starts to act on cooking odours, grease and smoke.

Simple to install, with low maintenance and running costs, this versatile modular solution provides affordable and reliable odour control and grease reduction in one unit, making it the perfect partner for a wide range of cooking applications.

The compact and lightweight units have been designed for modern kitchens, where space is at a premium, and are an ideal solution for fast food bars, pubs and restaurants.

Plasma Clean Xtract versus conventional odour control solutions:

- Low capital and running costs
- Simple installation and maintenance
- No consumable chemicals
- Compact and lightweight
- Quiet operation
- Environmentally friendly
- Tested to EN13725:2003

Product Specification | Xtract 2100

Volume Flow rate	Up to 1 m ³ /s per unit
Power consumption	130 W
Power supply	230V/ 1 ph / 50Hz
Size HxDxL	307x185x343 mm
Weight	12kg
Safety	Circuit breaker 5A required Air flow proving switch installed Fan power supply interlock



Oxidation using ozone and activated oxygen ions is used to treat odour emissions from commercial and industrial kitchen processes (DEFRA, 2005: Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems). The Plasma Clean Xtract injects ozone into the kitchen extraction canopy where it reacts with odour, grease and smoke. These are oxidized in a chemical reaction which results in the production of carbon dioxide and water vapour. The ozone itself is consumed during the process and is converted back into oxygen.

Compact and Lightweight

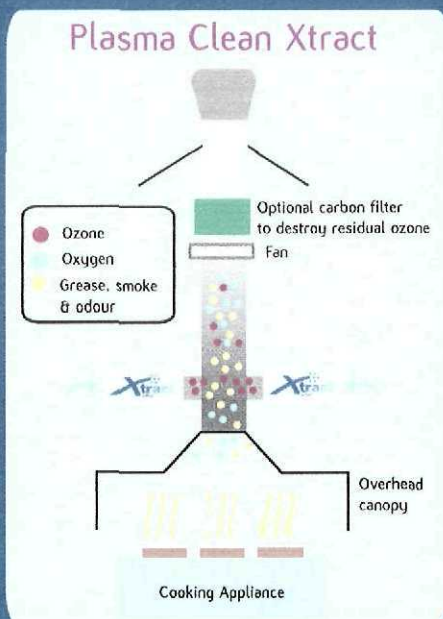
The unit has been designed to be compact (343mm(L)X185mm(D)X307mm(H)) and lightweight (12kg) so that it can be installed in kitchen areas where space is at a premium and / or where there is little load bearing capacity.

Installation

The unit has been designed to attach to the wall adjacent to the kitchen canopy. The outlet is then connected into the kitchen canopy and the unit is plugged in or hardwired into mains electricity (230V / single phase / 50Hz) via a main fan control box. Full installation and operating instructions are provided.

Silent Operation

The unit sits outside of the kitchen extraction canopy and ozone is drawn into the kitchen canopy by the existing fans. There is no need to upgrade the existing fan and the unit operates silently.



Servicing

Plasma Clean recommends a yearly service to ensure efficient operation, and can offer a planned maintenance contract.

Additional Options

A fan can be fitted in the unlikely event that the kitchen extraction fan can not draw air through the unit. A site survey option is available, as is a planned maintenance contract.