

Planning Consent Information

Mechanical Ventilation & Environmental Control Equipment



Chopstix Wrexham Standard Ventilation System

INDEX

Section 1: Kitchen Extract System Details

Section 2: Odour Abatement System

Section 3: External Plant Noise Criteria

SECTION 1: KITCHEN EXTRACT SYSTEM DETAILS

1.01	GENERAL
1.02	OBJECTIVES
1.03	ODOURS
1.04	NOISE
1.05	LOCATION
1.06	SIZE
1.07	FIRE SUPPRESSION
1.08	CANOPY CONSTRUCTION
1.09	SPLASH BACKS
1.10	LIGHTING
1.11	FAN EQUIPMENT
1.12	GREASE FILTERS
1.13	DISTRIBUTION DUCTWORK
1.14	PARTICULAR SYSTEM DESCRIPTION
1.15	PARTICULAR MAIN CANOPY ARRANGEMENT
1.16	PARTICULAR FRYER CANOPY ARRANGEMENT
1.17	SUPPORTING DOCUMENTATION

1.01 GENERAL

This specification covers standards for the selection, supply, delivery, installation, testing and commissioning of Kitchen ventilation in accordance with HVCA Specification DW/172 for Restaurant developments. The cooking of food involves appliances releasing heat, steam, fumes and airborne grease.

The cooking process requires extract ventilation for the removal of fumes, smoke and vapours generated by the cooking activity.

1.02 OBJECTIVES

To provide an acceptable working environment for all kitchen staff by the extraction / removal of heated air, fumes, steam and cooking smells, as well as preventing condensation. The extract canopies are designed to enable ease of access for cleaning throughout the system and distribution ductwork and primary fan equipment.

1.03 ODOURS

All fumes and odours from the food preparation areas of the kitchens shall be mechanically extracted utilizing an extract canopy specifically designed and installed by a nominated specialist to remove all cooking odours. This will take into account the dimensions of the kitchens in question, the type of grease filters used in the application and the cooking equipment within the grouped cooking range.

1.04 NOISE

All fan equipment, ductwork and filter housing shall be so mounted and installed so as not to give rise to a noise nuisance. Any noise generated by the extraction or supply systems as a whole shall not exceed the pre-existing hourly background noise level at nearby residential accommodation by more than 5dB(A). When measured and rated in accordance with BS 4142, entitled Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas 1997

1.05 LOCATION

The canopies will be sited over the grouped cooking equipment, or any heat, steam or grease producing equipment.

1.06 SIZE

The canopies shall overhang the grouped cooking range by not less than 250mm and will be mounted at a height no lower than 2000mm from the finished floor level to the underside of the canopy.

1.07 FIRE SUPPRESSION (NOT APPLICABLE ON FREE STANDING BUILDINGS)

Were specifically required or instructed, an automatic fire suppression system will be installed to protect the cooking appliances, extract canopies and associated distribution ductwork. Fire suppression systems will be of the “Amerex” type, tested and approved to UL 300 specification with automatic and manual activation. Fire suppression systems will be designed, installed and commissioned by LPC1204 approved installers.

1.08 CANOPY CONSTRUCTION

The extract canopies shall be constructed from 18 swg (1.22mm thick) stainless steel type 304. All visible surfaces shall be ultra fine grain satin polished to 280 grit, and Polythene protected during installation. All constituent parts must be suitable for use in a working kitchen environment.

The canopies shall be cut, punched and folded into sub sections of up to 6000mm in length and factory assembled by means of computer controlled seam welds, and non visible mechanical fixings. All joints shall be formed to enable ease of cleaning with no cut edges or corners, which shall become an encumbrance to cleaning requirements. All metal edges shall be rolled smooth and shall be free from any sharp edges or projections.

The canopy lower edge at each end and the rear shall be formed into a condensation channel with inclined internal elevation to simplify cleaning requirements, the inner edges having crush folded safety finish.

When constructed, the canopies should be flush with sealing surface as should any ducting within the kitchen itself. This is to prevent the creation of a shelf which would permit the collection of dust etc. where this is not possible infill panels are to be fitted so there are no dust traps. All infill panel requirements shall be constructed from the same material as the canopy.

1.09 SPLASHBACKS

Stainless steel sheets of the same grade and polish finish should be fitted to the rear and side walls below the canopy. This should be, as a minimum, the width of the canopy and should be flush with the base of the canopy, the wall and down to the floor. All joints between the splash back, cooking equipment and the canopy should be sealed with a silicone sealant. Silicone sealant should be applied only when absolutely necessary to joints in a neat finish not protruding the metal surface. Silicone joints will not be accepted as an alternative for a welded or poor constructed joint.

1.10 LIGHTING

The canopies shall be fitted with vapour proof lamps suitable for use in damp atmospheres. The lamps should have a diffuser, which can also withstand high temperature. Recess lighting is preferred to bulkhead fittings. Lighting within the canopies shall provide a minimum of 500 lux at the working surface.

1.11 FAN EQUIPMENT

All fans are to adequately sized to overcome the system resistance and to provide the required extraction/supply rate specified. Multiple fans rather than single units should be used to reduce noise in instances when the system resistance is inherently high.

All fan motors are to be totally enclosed, air cooled, class F rated, with motor protection IP55. All single phased motors are to have “sealed for life” bearings. The fan motor should have an operating temperature of -40 deg. Cent. to +50 deg. Cent.

All fans will be provided with suitably rated on/off variable speed controllers, and all fan equipment having local isolators and emergency stops fitted adjacent to the applicable equipment. Fans should be fitted with necessary resilient mounting to prevent noise and vibration transfer to the kitchen, other unit rooms and the external environment.

The Contractor will ensure that the fans are capable of producing the required air volumes as specified. All fans and motors arrangements shall be capable of running at 10% over the maximum specified duty.

The Contractor shall ensure that fan motors are suitable for the electrical supply available to the building.

Casing mounted fans shall have internal vibration isolation. Duct mounted fans shall have flexible duct connections consisting of or be externally protected by material having a fire penetration time of at least 15 minutes when tested in accordance with BS 476 Part 8 and shall comply with BS 476 Part 7, Section 2, Clause 2.8 (Class 1: surface of a very low flame spread properties).

Fans shall be selected to meet the specified noise criteria.

The construction of the fan shall be such that is capable of withstanding the pressures and stresses experienced under continuous operation.

Fan casings shall be constructed such that access can easily be gained to motors and impellers, and that these can be removed if required for maintenance or replacement.

1.12 GREASE FILTERS

The canopies should be fitted with internal extract plenum(s) with grease filters cells across its length. The filters should be of a sufficient size and number to ensure that the velocity through them does not lead to grease “carry over” into the ductwork and onto the extract fan.

The grease filters should have rigid frames in stainless steel baffle filters of sufficient density to capture and hold airborne grease. Filters shall fit correctly into holding frames to eliminate any extracted air passing around the filter.

The extracted fumes shall first be passed through these filters designed to remove the grease entrained in the fumes; the filters shall be removed and cleaned of their deposits at the end of each working day.

The grease filters should be easily removed and should be adequately sized to fit easily within dishwashers to facilitate easy cleaning.

The location of the filters should be such that the heat of wall-mounted equipment, such as grills, does not affect it. This is particularly important with replaceable filter fittings, which carbonize at high temperature.

1.13 DISTRIBUTION DUCTWORK

Kitchen canopy exhaust ductwork shall be constructed and installed in accordance with HVCA Specification DW/172 and HVCA Specification DW/144. Ductwork shall be routed to external source in the shortest possible route, without excessive use of bends and horizontal ductwork installation. Vertical discharge with high velocity terminal to 15m/s

Ductwork shall be suitable for kitchen extract systems, with smooth internal surfaces that facilitate easy removal of grease deposits.

1.14 PARTICULAR MAIN CANOPY ARRANGEMENT

The kitchen area shall have a mechanical forced air system, with a side-wall mounted canopy arrangement over the main grouped cooking equipment, and supply air system with spot coolers fitted to the underside of the canopy for the cooking operatives benefit. The extract system shall have an on/off speed controller sited away from the kitchen area to suit site and operatives requirements. The canopy shall be a "Capture Jet" type canopy with 10% of the overall extract air from the canopy, supplied through an insulated plenum fitted integrally to the canopy.

The supply air shall then be discharged through personal spot ventilators, with each spot coolers having internal volume control. . The canopy shall constitute 45% (85% room total) of the extract air volume to achieve a negative pressure within the kitchen area. The canopy shall be sited over the grouped cooking range of equipment as per tender drawings. The canopy arrangement shall be as follows:

- a) Dimensions to be checked prior to site start) 5500mm long x 1350mm wide x 550mm high
- b) Four sided outer valance casing.
- c) The canopy lower edge at each end shall be formed into a condensation channel with inclined internal elevation to simplify cleaning requirements.
- d) Full area horizontal ceiling plate, manufactured in tray form, fixed and sealed into the outer valance casing.
- e) Full length single sided extract plenum, fixed and sealed to the canopy outer structure and complete with: -
 - 12 No. 500 x 330 x 50mm stainless steel baffle filters
 - 3 No. 500 x 300mm extract factory fitted duct connection collars.
- g) 3 No. Bank of 8 LED recessed luminaires manufactured to IP65, steam heat and grease proof to give an average level of illumination of 500 Lux upon the working surfaces.
- h) Grease collection tray's
- i) Full Length stainless steel splash back, 5500mm x 2000mm and side splash backs of 1500mm x 2000mm.



DUTIES: Canopy Extract volume 1.8m³/sec. at a constant pressure drop of 140 pascals all duties to be checked against the manufacturers filter performance data.

1.17 SUPPORTING DOCUMENTATION



TYPICAL KFC CANOPY DESIGN

2.01 GENERAL

As part of the Choptix commitment to the brand, an odour control system will be installed to serve the kitchen extract system on the project.

2.03 SYSTEM DESCRIPTION

The system configuration shall be;

Stage 1 - Baffle style grease filters

For use in commercial kitchens and ventilation to extract grease laden air and act as a fire barrier. The high efficiency baffle filters are a positive flame barrier having been tested to European DIN Standard 18869-5 & American 1046 & ASTM2519.

This has developed for customers who wish to extract more grease from the air stream, following prolonged R&D we have designed a baffle filter with a micro screen on the exit to increase grease extraction.

The result of this is a retrofit baffle filter that removes 75% of the grease at 8 microns. Tested to ASTM2519 this product significantly reduces duct cleaning, saving customers expenditure on ongoing cleaning costs. Conventional baffle filters extract grease in the region of 20 to 35% efficiency at 8 microns depending on the product design, the HE75 offers over twice the extraction rate.

HE75 HIGH PERFORMANCE BAFFLE FILTER FEATURES:

- High Performance Baffle Filter 75% Grease efficiency at 8 micron
- 100% Flame barrier protection to DIN 18869-5
- Cutsafe safety edges
- Fully welded construction – all stainless steel construction
- Meets insurance requirements
- Meets HVCA DW172 requirements
- Folding handles and drain holes as standard
- Robust baffle filter construction – built to last
- Tested & certified to European standard DIN 18869-5
- Tested to American standard UL1046
- Tested & certified to ASTM 2519



SECTION 3: EXTERNAL PLANT NOISE CRITERIA

- 3.01 GENERAL
- 3.02 RESTAURANT ENVIRONMENTAL CONTROL SYSTEM DESCRIPTION
- 3.03 RESTAURANT ENVIRONMENTAL CONTROL SYSTEM PARTICULARS
- 3.04 KITCHEN & STAFF AREA ENVIRONMENTAL CONTROL SYSTEM DESCRIPTION
- 3.05 KITCHEN & STAFF AREA ENVIRONMENTAL CONTROL SYSTEM PARTICULARS
- 3.06 KITCHEN EXTRACT FAN EQUIPMENT PARTICULARS
- 3.07 KITCHEN SUPPLY FAN EQUIPMENT PARTICULARS
- 3.08 GENERAL EXTRACT FAN EQUIPMENT PARTICULARS
- 3.09 FOSTER REFRIGERATION LTD COLDROOM PLANT PARTICULARS

NOTE: Items detailed within this section are external plant items only

3.01 RESTAURANT ENVIRONMENTAL CONTROL

SYSTEM PARTICULARS The units serving the Trade

Restaurant area shall be as follows: -

AC 1 & AC2

2no Mitsubishi PLA-RP125
ceiling cassettes 31KG
33/36/40DBA

CU 1

1no Mitsubishi PUHZ-
ZRP250YKA3 outdoor
unit
1050 X 330 X 1338 High
1338KG
55DBA

**This is existing system
already installed on site**



3.04 KITCHEN EXTRACT FAN EQUIPMENT PARTICULARS

The main extract system within the kitchen shall serve the single wall mounted canopy arrangements as described in earlier sections of this document. The main extract fan shall also serve both the Main Canopy and Chip Fryer Canopy. The fan is mounted internally within the kitchen-ceiling void.

The extract fan equipment shall be as follows: -



Fan Code	63 MaXfan Compac
Fan Diameter / Size	630 Size / mm
Fan Speed	2910 rpm
Velocity	4.5 m/s
Blade Angle	12°
Installation Type / Form of Running	C / AB
Fan Casing	Long
Requested Duty	1.4m³/s @ 816 Pa (static)
Outlet Dynamic Pressure	12 Pa
Duty Shaft Power	2.50 kW
Max Shaft Power	2.61 kW
Total Efficiency	46.8 %
Motor Frame	90L [Class F]
Motor Rating	2.64 kW [IE2]
Full Load Current	9.36 A
Starting Current	52.8 A
Motor Mounting	Pad
Electrical Supply	220-240 Volts 50 Hz 1 Phase
Start Type	DOL
Motor Winding	Standard
Enclosure	Standard All
ErP [FMEG] Rating	N S2 (ErP Compliant 2015)
ErP [FMEG] Target	N 40
FMEG Blade Angle [Range]	0° [0° - 0°]
Measurement Category	C (Static)
VSD	N
Fan + Motor Efficiency	48.9% (2.6 m³/s @ 591 Pa)
Motor Input Power (ErP)	3.14 kW
SFP value	2.14 W/(l/s) @ Requested Duty
Power from mains	3.01 kW
Energy Consumption	9032 kWh (3000 h/year)
Running Cost / Year	£1084
Air Density	1.2 kg/m³ / 20 °C / 0 m / 50% RH
Smoke Venting	Non Smoke Venting
Product Number	EJ623236

Performance data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with ISO 5801 and is specifically applicable for Ducted installations. When an electronic controller is incorporated, enhanced motor noise can occur - particularly when the operating speed is well below maximum. FWL therefore recommend using an auto transformer speed controller for noise sensitive applications. Bifurcateds are Erp exempt when used continuously at >100C. They are not for use in the EEA at lower temperatures.

The MaXfan Compac includes a preprogrammed inverter drive to operate via 1 phase supply, offering full speed control and optimised performance.

Acoustic data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with BS 848 Pt 2, 1985 / BS EN ISO 5136 under Ducted conditions. The single figure provided is the overall Inlet sound pressure level at the specified distance, under spherical, free field conditions.

Acoustic figures for adjusted running speeds have been interpolated and are for reference only.

Terms and Conditions: This offer is made subject to the terms and conditions detailed on the accompanying letter.

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	92	102	101	102	100	97	93	90	108	84
Outlet*	93	105	103	102	100	97	95	92	109	84
Breakout*	93	105	103	102	100	97	95	92	109	84

* Lw dB re 10⁻¹² W ** dBA re 2x10⁻⁵ Pa
 Sound data at requested duty.

3.05 SUPPLY FAN EQUIPMENT PARTICULARS

The main supply air system within the kitchen serves the single wall mounted canopy arrangements as described in earlier sections of this document. The supply fan shall also serve both the Main Canopy and general areas via ceiling mounted diffusers. The fan is mounted internally within the kitchen-ceiling void. Details are included in this document for reference even though the equipment is not located externally

The supply fan equipment shall be
as



Fan Code	56 MaxFan Compac
Fan Diameter / Size	560 Size / mm
Fan Speed	2910 rpm
Velocity	5.2 m/s
Blade Angle	16°
Installation Type / Form of Running	D / AB
Fan Casing	Long
Requested Duty	1.29m³/s @ 701 Pa (static)
Outlet Dynamic Pressure	17 Pa
Duty Shaft Power	1.92 kW
Max Shaft Power	2.22 kW
Total Efficiency	48.8 %
Motor Frame	90L [Class F]
Motor Rating	2.64 kW [IE2]
Full Load Current	9.36 A
Starting Current	52.8 A
Motor Mounting	Pad
Electrical Supply	220-240 Volts 50 Hz 1 Phase
Start Type	DOL
Motor Winding	Standard
Enclosure	Standard All
ErP [FMEG] Rating	N 70 (ErP Compliant 2015)
ErP [FMEG] Target	N 58
FMEG Blade Angle [Range]	0° [0° - 0°]
Measurement Category	D (Total)
VSD	N
Fan + Motor Efficiency	66.7% (3.44 m³/s @ 467 Pa)
Motor Input Power (ErP)	2.41 kW
SFP value	1.79 W/(l/s) @ Requested Duty
Power from mains	2.31 kW
Energy Consumption	6925 kWh (3000 h/year)
Running Cost / Year	£831
Air Density	1.2 kg/m³ / 20 °C / 0 m / 50% RH
Smoke Venting	Non Smoke Venting
Product Number	EJ563236

Performance data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with ISO 5801 and is specifically applicable for Ducted installations. When an electronic controller is incorporated, enhanced motor noise can occur - particularly when the operating speed is well below maximum. FWL therefore recommend using an auto transformer speed controller for noise sensitive applications. Bifurcateds are Erp exempt when used continuously at >100C. They are not for use in the EEA at lower temperatures.

The MaxFan Compac includes a preprogrammed inverter drive to operate via 1 phase supply, offering full speed control and optimised performance.

Acoustic data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with BS 848 Pt 2, 1985 / BS EN ISO 5136 under Ducted conditions. The single figure provided is the overall inlet sound pressure level at the specified distance, under spherical, free field conditions.

Acoustic figures for adjusted running speeds have been interpolated and are for reference only.

Terms and Conditions: This offer is made subject to the terms and conditions detailed on the accompanying letter.

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	87	94	91	93	90	87	81	79	99	74
Outlet*	88	96	92	93	91	88	82	80	100	75
Breakout*	78	75	66	68	66	61	63	56	80	51

* Lw dB re 10⁻¹² W
Sound data at requested duty.

** dBA re 2x10⁻⁵ Pa

3.06 GENERAL EXTRACT FAN EQUIPMENT PARTICULARS

The general extract fan serves the toilet and staff area toilets and general areas. The fan is mounted internally within the staff area-ceiling void. Details are included in this document for reference even though the equipment is not located externally

The extract fan equipment shall be

as follows: - EF2

Elta Fans Limited
Model SJ250A in line
centrifugal tube fan. Motor:
180 watts 2 pole 2450rpm
Duty:0.24 cu.m/sec @ 100
pascals Sound Level:
53dBA@3 metres
Controller: WC lighting
circuit Electrical:230 volt/
1 phase / 50 Hz Weight:
5.5kg
Dimensions: 335mm overall diameter x 230mm long



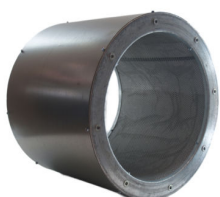
Silencers

630mm dia x 630mm long straight through silencer (generally reduces a fan noise level by 7 – 10dB (A)*
Can be supplied to either bolt directly to any manufacturer of cased axial or with spigots to mount inline with ducting.

The addition of this silencer to a system will act in the same way a silencer does on a car, so if you've ever heard a car with no silencer fitted, this gives you an idea of the impact a silencer can have on a system.

Please Note — for a straight through silencer to work to have the maximum impact on a system, a silencer should be fixed either side of the fan, this will give 3 benefits to the overall noise level of the system.

1. System side (usually the noise level inside a building) noise level is reduced
2. Atmospheric side (usually the noise level outside a building) noise level is reduced
3. The breakout from the fan is reduced, this could be a big factor depending where the fan is fitted, such as a false ceiling in a class room or office area





END OF DOCUMENT