

## **Design and Access Statement**

95 to 99 Field End Road, Eastcote

### **Location**

The main frontage is on Field End Road is surrounded by predominantly retail properties with residential above. There are a few large residential developments located around 100 metres. The proposed site is accessed directly from Field End Road, and a service road to the rear backing on to residential garden spaces. The properties have been emptied for a number of years.

### **Proposal**

The ground floor units are restaurant and take-away use and the proposal is to retain this use. The three units were already interconnected to each other. No alterations are proposed to the street frontage. Alterations are all internal, along with minor changes to the fenestrations at the rear and replacement of a timber clad wall with facing brick, new roof over the proposed toilet area and a replacement combined extract system for the restaurants.

### **Access**

No changes are proposed to access. The existing restaurants are to be accessed directly from Field End Road. The entrances are to Part M standards to enable wheelchair access. All service access is from the rear of the buildings.

### **Extract ventilation**

The replacement extract system has been designed by Fan Services Ltd, a specialist in this field. Fan Services Ltd has sought advice from acoustic specialists DAA Group to carry out a noise assessment to determine the specification of fan and acoustic baffles needed to noise mitigation measures under current Planning Guidance.

### ***Acoustic measures***

The flues have also been configured and directed away from windows to avoid any adverse effect that can be enjoyed from their outlook. The noise assessment has set out parameters to the mitigation measures for the replacement extract ventilation system. This covers discharge duct opening, fan casing & flexible connection noise break-out and duct break-out noise on the fan inlet ducting. Based on the specification provided by Fan Services Ltd, the acoustic report concludes the noise omissions would not have an adverse impact on the nearest residential receivers.

The Noise Impact Assessment by DAA Group Ltd ( See Appendix A) has been provided as part of this application along with the fan details and specifications proposed by Fan Services Ltd.

### ***Odour control***

The risk assessment under DEGRA Guidance had taken place and be found in the Fan Services Ltd report. This determines the total score for both extract systems to be 30 and a high level of filtration will therefore required. The Extraction report details the specification of the odour mitigation proposal in Appendix B

### **Conclusion**

The internal works do not affect the external appearance of the main frontage, and not alterations are proposed in this area. The internal alterations enhance the proposed experience of diners and take away customers. The alterations to the rear are minimal and generally in keeping with the surroundings. The new replacement extract ventilation has been designed taking care to avoid impeding outlook from the flats above, mitigating noise and odours. The buildings had been empty of a number years and the proposal will bring back the operation of restaurants / take-away that will enhance the activities on Field End Road.

## Appendix A

### Noise Impact Assessment

# NOISE IMPACT ASSESSMENT



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**95-99 Field End Road, Pinner, HA5 1QG**

**20<sup>th</sup> April 2023**

**ISSUE 01**





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This report has been compiled by Deane Austin Ltd (DAA) with all reasonable skill, care and diligence in accordance with generally accepted acoustic consultancy principles. Information contained in this document contains confidential and commercially sensitive information and shall not be disclosed to third parties.				



## 1.0 INTRODUCTION

DAA Group has been appointed to carry out a Noise Impact Assessment at 95-99 Field End Road, Pinner, HA5 1QG to support a Planning Application for the installation of two kitchen extraction systems.

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The purpose of the survey is to ensure that the development does not prejudice the amenities of occupiers of nearby premises in accordance with the provisions of:

- The National Planning Policy Framework, the Noise Policy Statement for England (NPSE)
- The World Health Organisation Guidelines for Community Noise 1999 (WHO)
- The Environmental Health legislation 'the Control of Odour and Noise from Commercial Kitchen Exhaust Systems (2018).'
- Hillingdon Council Local Plan

The technical content of this assessment has been provided by a Tech member of the Institute of Acoustics.

The Institute of Acoustics is the UK's professional body for those working in Acoustics, Noise and Vibration.

## 2.0 NOISE CRITERIA

### 2.1 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

The Department for Communities and Local Government introduced the National Planning Policy Framework (NPPF) in March 2012. The latest revision of the NPPF is dated March 2021.

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The NPPF sets out the Government's planning policies for England and how these are expected to be applied. It provides a framework where local Councils can produce their own local and neighbourhood plans which reflect the needs of their communities.

In conserving and enhancing the natural environment, the planning system should prevent both new and existing development from contributing to, or being put at, unacceptable risk from environmental factors including noise.

Planning policies and decisions should aim to avoid noise giving rise to significant adverse impacts on health and quality of life as a result of new development. Conditions may be used to mitigate and reduce noise to a minimum so that adverse impacts on health and quality of life are minimised. It must be recognised that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them. Reference is made within NPPF to the Noise Policy Statement for England (NPSE) as published by DEFRA in March 2010.

### 2.2 NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The long-term vision of the NPSE is stated within the documents scope, to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development'. The policy aims are stated to:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

The application of NPSE should mean that noise is properly taken into account at the appropriate time (for example in planning applications or appeals) where it must be considered alongside other relevant issues. The guiding principles of Government policy on sustainable development should be used to assist in the implementation of the NPSE.

The NPSE should apply to all types of noise apart from occupational noise in the workplace. The types of noises defined in the NPSE includes:

- Environmental noise from transportation sources;
- Neighbourhood noise which includes noise arising from within the community; industrial premises, trade and business premises, construction sites and noise in the street

The Noise Policy Statement England (NPSE) outlines observed effect levels relating to the above, as follows:

- **NOEL – No Observed Effect Level**

- o This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

- **LOAEL – Lowest Observed Adverse Effect Level**

- o This is the level above which adverse effects on health and quality of life can be detected.

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- **SOAEL – Significant Observed Adverse Effect Level**

- o This is the level above which significant adverse effects on health and quality of life occur.

As stated in The Noise Policy Statement England (NPSE), it is not currently possible to have a single objective based measure that defines SOAEL that is applicable to all sources of noise in all situations. Specific noise levels are not stated within the guidance for this reason, and allow flexibility in the policy until further guidance is available.

## 2.3 ProPG: PLANNING AND NOISE

As outlined above, the National Planning Policy Framework encourages improved standards of design, although it provides no specific noise levels which should be achieved on site for varying standards of acoustic acceptability, or a prescriptive method for the assessment of noise.

ProPG: Planning and Noise was published in May 2017 in order to encourage better acoustic design for new residential schemes in order to protect future residents from the harmful effects of noise. This guidance can be seen as the missing link between the current NPPF and its predecessor, PPG24 (Planning Policy Guidance 24: Planning and Noise), which provided a prescriptive method for assessing sites for residential development, but without the nuance of 'good acoustic design' as outlined in ProPG.

ProPG allows the assessor to take a holistic approach to consider the site's suitability, taking into consideration numerous design factors which previously may not have been considered alongside the noise level measured on site, for example the orientation of the building in relation to the main source of noise incident upon it.

It should be noted this document is not an official government code of practice, and neither replaces nor provides an authoritative interpretation of the law or government policy, and therefore should be seen as a good practice document only.

## 2.4 BRITISH STANDARD 4142: 2014+A1:2019

British Standard (BS) 4142:2014 "Methods for rating and assessing industrial and commercial sound" describes methods for assessing the likely effects of sound on premises used for residential purposes.

It includes the assessment of sound from industrial and manufacturing processes, M&E plant and equipment, loading and unloading of goods and materials, and mobile plant/vehicles on the site. It can be used to assess sound from proposed, new, modified or additional industrial/commercial sources, at existing or new premises used for residential purposes.

The method described in BS4142: 2014 use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

The standard describes methods to measure and determine ambient, background and residual sound levels, and the rating levels of industrial/commercial sound. BS 4142: 2014 requires consideration of the level of uncertainty in the data and associated calculations.

BS 4142 is not intended to be used for the derivation or assessment of internal sound levels, or for the assessment of non-industrial / commercial sources such as recreational activities, motorsport, music and entertainment, shooting grounds, construction and demolition, domestic animals, people, and public address systems for speech.

The Reference Time Interval, T, is defined in the standard as the "specified interval over which the specific sound level is determined", which is 1 hour during the daytime (07:00 to 23:00 hours) and 15 minutes during the night (23:00 to 07:00 hours).

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Ambient sound is defined in BS 4142: 2014 as "totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far". It comprises the residual sound and the specific sound when present.

Residual sound is defined in BS 4142: 2014 as "ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound".

The background sound level is the LA90, T of the residual sound level, and is the underlying level of sound. Measurements of background sound level should be undertaken at the assessment location where possible or at a comparable location.

The measurement time interval should be sufficient to obtain a representative value (normally not less than 15 minutes) and the monitoring duration should reflect the range of background sound levels across the assessment period. The background sound level used for the assessment should be representative of the period being assessed.

The specific sound level is the LAeq,T of the sound source being assessed over the reference time interval, Tr. BS 4142: 2014 advises that Tr should be 1 hour during the day and 15 minutes at night.

The rating level is the specific sound level plus any adjustment for the characteristics of the sound (tone, impulse, intermittent or other acoustic feature). The standard describes subjective and objective methods to establish the appropriate adjustment. The adjustments for the different features and assessment methods are summarised in the table below.

#### Acoustic Feature Corrections in BS4142: 2014

Acoustic Feature	Adjustment for Acoustic Feature		
	Subjective Methods	Objective Methods	
Tonality	+2 dB if just perceptible +4 dB if clearly perceptible +6 dB if highly perceptible	Third Octave Analysis +6 dB if tones identified	Narrow Band Analysis Sliding scale of 0 to +6 dB depending on audibility of tone
Impulsivity	+3 dB if just perceptible +6 dB if clearly perceptible +9 dB if highly perceptible	Sliding scale of 0 to +9 dB depending on prominence of impulsive sound	
Intermittency	+ 3 dB if intermittency is readily distinctive	n/a	
Other	+ 3 dB if neither tonal nor impulsive, but otherwise readily distinctive	n/a	

Where tonal and impulsive characters are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant, it might be appropriate to apply a single correction. The rating level is equal to the specific sound level if there are no features present.



The level of impact is assessed by comparing the rating level of the specific sound source with the background sound level. Typically the greater the difference the greater the magnitude of the impact, depending on the context.

Other factors that may require consideration include the absolute level of sound, the character and level of the residual sound compared to the specific sound, and the sensitivity of the receptor and scope for mitigation.

When the rating level is above the background sound level, a difference of around +5 dB is likely to indicate an adverse impact and a difference of around +10 dB or more is likely to indicate a significant adverse impact, depending on the context.

The lower the rating level with respect to the background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

### 3.0 SITE SURVEYS

#### 3.1 SITE DESCRIPTION

The application site is situated on Field End Road. It comprises of a commercial unit on the ground floor and residential on the first and second floor. The area is typical of an urban cityscape environment. The dominant noise source is traffic noise from the surrounding roads. (See Figure 3.1)

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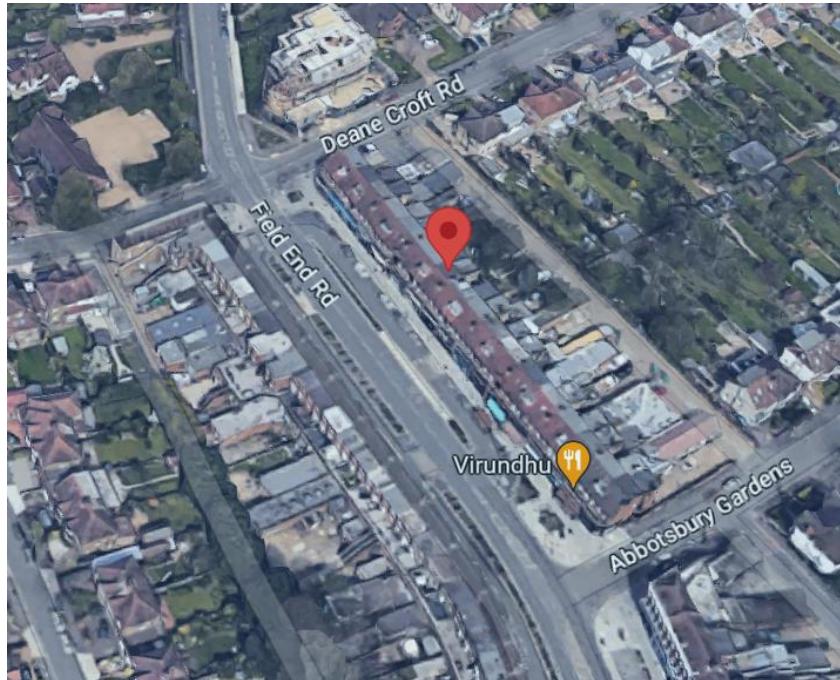


Figure 3.1 – Site Location

#### 3.2 ENVIRONMENTAL SITE SURVEY PROCEDURE

In order to characterise the sound profile of the area at the closest sensitive receptor (NSR), an environmental sound survey has been carried out from 12/04/2023 to 13/04/2023. The monitoring position was chosen in order to collect representative sound levels at the NSR and the proposed location of the plant.

Noise Measurements were carried out Free Field. The monitoring location is shown in Figure 5.2.



### 3.3 EQUIPMENT

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Instrument manufacturer	Cirrus Research Plc
Model	IEC 61672-3:2013
Serial Number	G302987
Microphone Type	MK:224
Serial Number	214457A
Calibrator	CR:515
Serial Number	96653
Cirrus CK: 675 Outdoor Kit	

The calibration of the sound level meters was verified in-situ before any measurements were taken, using the handheld calibrator and reference tone of 114dB at 1kHz. Validation checks at the end of the survey indicated that all instruments had operated within permitted tolerances for drift and measured level.

Calibration certificates are available on request.

### 3.4 METEOROLOGICAL CONDITIONS

As the environmental noise survey was carried out over a long un-manned period no localized records of weather conditions were taken. However, during the set up and collection of the monitoring equipment, the weather conditions have been documented in the following table. All measurements have been compared with met office weather data of the area, specifically the closest weather station, the data from the weather station is outlined in the table below. When reviewing the time history of the noise measurements, any scenarios that were considered potentially to be affected by the local weather conditions have been omitted. The analysis of the noise data includes statistical and percentile analysis and review of minimum and maximum values, which aids in the preclusion of any periods of undesirable weather conditions. The weather conditions were deemed suitable for the measurement of environmental noise in accordance with BS7445 Description and Measurement of Environmental Noise. The table below presents the average temperature, wind speed and rainfall range for each 24-hour period during the entire measurement.

Weather Conditions – Northolt Weather station				
Time Period	Air Temp ( °C)	Rainfall mm/h	Prevailing Wind Direction	Wind Speed (m/s)
12/04/2023 – 00:00 – 23:59	-1 - 15	0.0	E	2 – 6
13/04/2023 – 00:00 – 23:59	3 - 14	0.0	SSW	2 - 9

Table 3.4 – Weather Summary

#### 4.0 NOISE SURVEY

Period	Lowest Recorded LA90, 15	Typical LAeq,15
07:00 – 23:00	40dB	54dB

Table 4.1 Noise Measurements

## 5.0 NOISE IMPACT ASSESSMENT

### 5.1 PROPOSED PLANT

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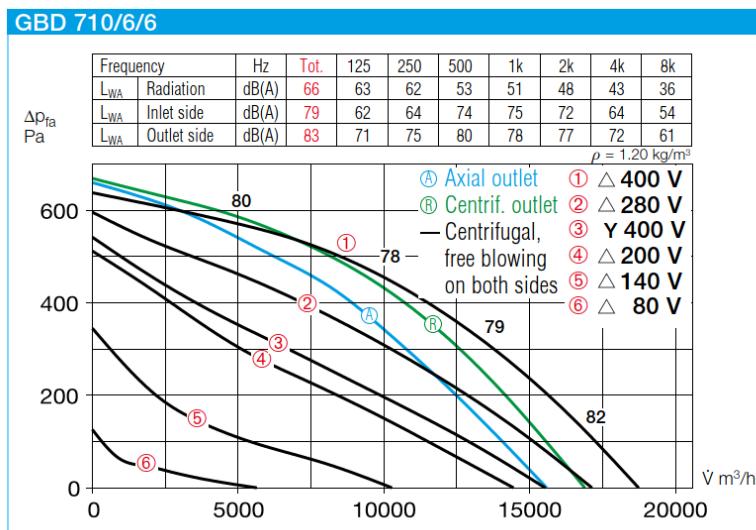
It is understood that the proposed outdoor plant is comprised of the following units:  
 • 2 x Helios Gigabox - GBD 710/6/6

The flue locations are shown below in figure 5.2

Proposed Plant	LWA (dB(A))
GBD 710/6/6	83



Table 5.1 – Manufacturer supplied Sound power level



Manufacturer's noise level data gives the following sound power levels of the fan unit. Corrections from sound attenuation due to bends, duct losses and end reflection, etc, have been taken where considered appropriate.

## 5.2 CLOSEST NOISE SENSITIVE RECEIVER

The closest noise sensitive receiver to the installation location of the plant has been identified as being residential windows located approximately 2 metres from the proposed location of the extraction outlets and approximately 1 metre from the proposed locations of the extract fans as shown in Figure 5.2

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Figure 5.2 – Closest Noise Sensitive Receiver

<span style="background-color: red; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	Proposed Location Kitchen Extraction Outlet
<span style="background-color: green; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	Nearest Residential Noise Sensitive Window
<span style="background-color: yellow; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	Measurement Location
<span style="background-color: blue; border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span>	Proposed Location Kitchen Extraction Fan

### 5.3 NOISE EMISSION CRITERION

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It is understood the operating hours are between 07:00 – 23:00.

It is determined that the proposed kitchen extraction system is not considered to contain tones. In addition, the proposed operation of the equipment is also unlikely to be sufficiently intermittent to attract attention at the nearest noise sensitive property.

The criteria for plant sound, to be achieved at a point 1m from the closest noise sensitive window, has been set as shown in Table 5.3 in order to comply with the Local Authority requirements.

Time Period	Noise Criteria
Operating Hours (07:00 – 23:00)	30dB(A)

Table 5.3 - Proposed noise emissions criterion 1m at the nearest noise sensitive window.

### 5.4 NOISE ASSESSMENT – 1m at Nearest residential Window

BS4142 Noise Assessment - Outlet	
Source	Kitchen Extract Fan
Operating Period	07.00 – 23:00
Reference Time Interval (Tr)	15 minutes
Element	Level (dB)
Specific Sound Level	24
Representative Background Noise Level (LA90)	40
Acoustic feature correction	3
Rating Level	27
Excess of Rating over Background Sound Level	-13

BS4142 Noise Assessment – Breakout Noise	
Source	Kitchen Extract Fan
Operating Period	07.00 – 23:00
Reference Time Interval (Tr)	15 minutes
Element	Level (dB)
Specific Sound Level	22
Representative Background Noise Level (LA90)	40
Acoustic feature correction	3
Rating Level	25
Excess of Rating over Background Sound Level	-15

Combined Rating of 29dB

Detailed calculations are shown in Appendix B.

## 5.5 MITIGATION MEASURES

### 5.5.1 – Noise Emissions

In order to achieve the specific sound level and subsequent rating level shown in the assessment above, the following mitigation measures are required.

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There are three main noise transmission paths to be considered from the fan to the receptor.

- I. Discharge duct opening.
- II. Fan casing & flexible connection noise break-out.
- III. Duct break-out noise on the fan inlet ducting.

To reduce duct breakout noise on the extract fan an attenuator is required to be fitted on the discharge side of the fan (each System), similar to an Acoustica R02-5-1800 with the below insertion losses:

INSERTION LOSS (dB) – CENTRE BAND FREQUENCY								
Hz	63	125	250	500	1K	2K	4K	8K
R02-5-1800	8	13	25	44	50	50	37	24

The attenuator's acoustic media shall have to be lined with 'Melinex' to enable the kitchen extract system to be regularly steam cleaned.

### 5.5.2 – Breakout Noise

As the fans are to be located outside, approximately 1m from the nearest noise sensitive window, the breakout noise from the fans needs to be mitigated. DAA Group recommend fitting 100mm acoustic panels around the Helios Gigaboxes with the below insertion losses.

INSERTION LOSS (dB) – CENTRE BAND FREQUENCY								
Hz	63	125	250	500	1K	2K	4K	8K
100mm Acoustic Panel	15	17	26	34	40	43	45	47

Suitable suppliers include:  
[Enclosures-uk.com](http://Enclosures-uk.com)  
[Environ.co.uk](http://Environ.co.uk)

### 5.5.3 – Vibration

In addition to the control of airborne noise transfer, it is important to consider the transfer of noise as vibration to adjacent properties as well as any sensitive areas of the same building. The duct should be isolated from the structure of the building using anti-vibration. The isolators shall incorporate rubber or neoprene high-frequency isolation pads. The fan should be installed with flexible connections to adjacent structures. Antivibration mounts are widely available from suppliers/installers often in pedestal rubber mountings.

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Examples of these are MPO and MP1, and ISL Maxi pedestal vibration mounts. These types of anti-vibration and shock isolators are industry standard and commonplace for mechanical plant installations. They are designed to provide medium to high frequency isolation from vibration and noise via high resilience rubber.

## 5.6 BS8233 ASSESSMENT

The highest value of 30dB(A) is to be considered externally at 1m from the receiving residential window. Windows may be closed or partially closed leading to further attenuation, as follows. Further calculations have been undertaken to assess whether the noise emissions from the plant unit installation would be expected to meet the recognized British Planning Compliance Review recommendations, in order to further ensure the amenity of nearby noise sensitive receivers. British Standard 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:2014 recommends 35dB(A) for internal resting/sleeping conditions during daytime hours. With a calculated external level of 29dB(A), the residential window itself would not need to provide any additional attenuation in order for the recommended internal noise conditions to be achieved. According to BS8233:2014, even a partially open window offers 10dB attenuation, thus leading to a further reduced interior noise level.

Receiver	Design Range – for resting/ sleeping conditions in a bedroom during daytime in BS8233:2014	Internal Noise Level at Receiver With Open Window (Due to Plant Installation)
Residential Window as in figure 5.2	35dB(A)	19dB(A)



## 6.0 SUMMARY AND CONCLUSIONS

DAA Group has been appointed to carry out a Noise Impact Assessment at 95-99 Field End Road, Pinner, HA5 1QG. The purpose of the survey was to assess the level of noise emanating from the proposed kitchen extraction systems to the nearest noise sensitive residential window and to advise on the level and type of mitigation that will be required.

Manufacturer's noise data of proposed kitchen extract systems has been used to obtain Specific and Rated Noise Level at the nearest noise sensitive receiver in accordance with Local Authority requirements.

The proposed kitchen extraction systems are not considered to contain tones. In addition, the proposed operation of the equipment is also unlikely to be sufficiently intermittent to attract attention at the nearest noise sensitive property.

The plant-specific noise level is 29dB(A) at 1 metre outside the nearest noise sensitive windows. This is -11dB(A) below the background noise level (L90).

It has been concluded that noise emissions from the proposed plant would not have an adverse impact on the nearest residential receivers provided that the mitigation measures presented in 5.5 is followed.

## APPENDIX A ACOUSTIC TERMINOLOGY

### B.1 WEIGHTED DECIBEL, dB(A)

The unit generally used for measuring environmental, traffic or industrial noise is the A-weighted sound pressure level in decibels, denoted dB(A). The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds. An increase or decrease of approximately 10 dB corresponds to a subjective doubling or halving of the loudness of a noise, and a change of 2 to 3 dB is subjectively barely perceptible.

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### B.2 EQUIVALENT CONTINUOUS SOUND LEVEL, L<sub>Aeq</sub>

Another index for assessment for overall noise exposure is the equivalent continuous sound level, L<sub>Aeq</sub>. This is a notional steady level which would, over a given period, deliver the same sound energy as the actual time-varying sound over the same period.

### B.3 MAXIMUM NOISE LEVEL, L<sub>Amax</sub>

The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125 ms in duration.

### B.4 NOISE RATING, NR

Noise ratings are used as a single figure criterion for specifying services noise in buildings. Each noise rating value has an associated spectrum of defined values in each third or octave frequency band. To determine the noise rating of a room the measured spectrum is compared to a set of noise rating curves. The highest NR curve that crosses any single frequency band of the measurement determines the noise rating for the room.

The single figure noise rating is read at the 1 kHz band.

### B.5 SOUND LEVEL DIFFERENCE (D)

The sound insulation required between two spaces may be determined by the sound level difference needed between them. A single figure descriptor which characterises a range of frequencies, the weighted sound level difference, D, is sometimes used (BS EN ISO 717-1). This parameter is not adjusted to reference conditions.

The standardized level difference, D<sub>n</sub>, T is a measure of the difference in sound level between two rooms, in each frequency band, where the reverberation time in the receiving room has been normalised to 0.5 s. This parameter measures all transmission paths, including flanking paths.

The weighted standardized level difference, D<sub>nTw</sub>, is a measure of the difference in sound level between two rooms, which characterises a range of frequencies and is normalised to a reference reverberation time

### B.6 SOUND REDUCTION INDEX (R)

The sound reduction index (or transmission loss) of a building element is a measure of the loss of sound through the material, i.e. its attenuation properties. It is a property of the component, unlike the sound level difference which is affected by the common area between the rooms and the acoustic of the receiving room. The weighted sound reduction index, R<sub>w</sub>, is a single figure description of sound reduction index characterising a range of frequencies, which is defined in BS EN ISO 717-1: 1997. The R<sub>w</sub> is calculated from measurements in an acoustic laboratory



#### **B.7 STATISTICAL NOISE LEVELS (LA<sub>90</sub>, (T) LA<sub>1</sub>, (T) LA<sub>10</sub>, (T) etc.)**

For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The LA<sub>10</sub> is the level exceeded for ten per cent of the time under consideration, has historically been adopted in the UK for the assessment of road traffic noise. The LA<sub>90</sub> is the level exceeded for ninety per cent of the time, has been adopted to represent the background noise level. The LA<sub>1</sub> the level exceeded for one per cent of the time, is representative of the maximum levels recorded during the sample period. A weighted statistical noise levels are denoted LA10, dB LA90, dB. etc. The reference time (T) is normally included, e.g. LA10, (5min), & LA90, (8hr).

#### **B.8 TYPICAL NOISE LEVELS**

Typical noise levels are given in the following table.

<b>Noise Level dB(A)</b>	<b>Example</b>
130	Threshold of pain
120	Jet aircraft take-offs at 100 m
110	Chain saw at 1 m
100	Inside disco
90	Heavy lorries at 5 m
80	Kerbside of busy street
70	Loud radio (in typical domestic room)
60	Office or restaurant
50	Domestic fan heaters at 1m
40	Living room
30	Ventilation Noise in Theatre
20	Remote countryside on still night
10	Sound insulated test chamber
0	Threshold of hearing.

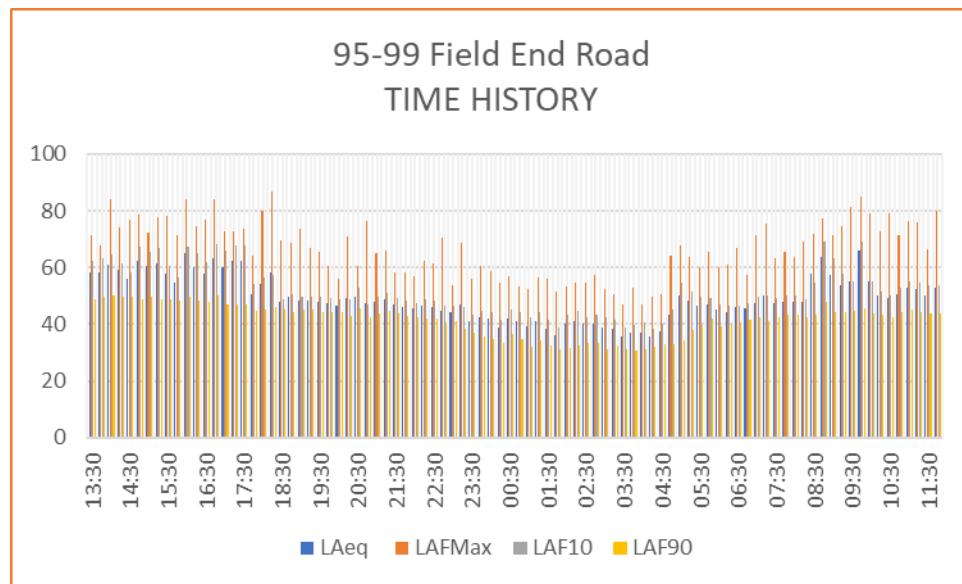
**APPENDIX B    CALCULATIONS**

95-99 Field End Rd														
Kitchen Extract Fan														
NOISE EMISSION CALCULATION														
ITEM	PARAMETER				HZ	63	125	250	500	1K	2K	4K	8K	dBA
1	Schedule of Plant		Qty											
2	Helios													
3	GBD 710/6/6		2	Sw1	dB	+	74	74	78	83	81	80	75	64
4	Ductwork Losses		1	IL	dB	-	15	10	3	2	6	8	8	8
5	Directivity		1	IL	dB	-	5	5	5	5	5	5	5	5
6	Attenuator - R02-5-1800	Primary	1	IL	dB	-	8	13	25	44	50	50	37	24
7		Secondary	1	IL	dB	-	0	0	0	0	0	0	0	0
8														
9														
10														
11	Revised Sound Power Level:		1	Sw1	dB	+	46	46	45	32	20	17	25	27
12														
13														
14														
15	Distance to nearest receptor Metres:	r	2		dB	-	14	14	14	14	14	14	14	14
16	SPL=SWL -20log( r ) + 10log(Q) -11 dB.	Q	2											
17														
18														
19														
20	Spl at receptor				dB	+	32	32	31	18	6	3	11	13
21														
22														
23	Noise correction		3		dB	+	3	3	3	3	3	3	3	3
24						dB	+							
25														
26														
27	Specific noise level at receptor				dB	+	35	35	34	21	9	6	14	16
28	(1m outside noise sensitive window)													27
29	Lowest Background Noise Levels: (L <sub>A90</sub> )													
30	Daytime (07:00-23:00)				dB	+								40
31	Difference: (Daytime Assessment level)				dB	-								-13
32														
33	E&OE													

Kitchen Extract System. BREAK OUT NOISE														
NOISE EMISSION CALCULATION														
ITEM	PARAMETER				HZ	63	125	250	500	1K	2K	4K	8K	dBA
1	Schedule of Plant		Qty											
2	Helios													
3	Model: GBD 710/6/6		1	Swl	dB	+	63	63	62	53	51	48	43	36
4	100mm Acoustic Panel surround		Lot	IL	dB	-	15	17	26	34	40	43	45	38
5														
6														
7														
8														
9														
10														
11	Revised Sound Pressure Level:		1	spl	dB	+	48	46	36	19	11	5	-2	-11
12														
13														
14														
15	Distance to nearest receptor Metres:	r	0	dB	-	-	-	-	-	-	-	-	-	-
16	SPL=SWL -20log(r) + 10log(Q) -11 dB.	Q	2											
17														
18														
19														
20	Spl at receptor			dB	+	48	46	38	19	11	5	-2	-11	22
21														
22														
23	correction		3	dB	+	3	3	3	3	3	3	3	3	3
24				dB	+									
25														
26														
27	Specific noise level at receptor			dB	+	51	49	41	22	14	8	1	-8	25
28	(1m outside noise sensitive window)													
29	Lowest Background Noise Levels: (L <sub>A90</sub> )													
30	Daytime (07:00-23:00)			dB	+									40
31	Difference: (Daytime Assessment level)			dB	-									-15
32														
33														
34														
35														
36														
	E&OE													

## APPENDIX C MEASUREMENTS

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## Appendix B

### Full Extraction report



# Fan Services

*Commercial Kitchen Extraction  
and Ventilation Experts*

**Email:** [info@fanservices.co.uk](mailto:info@fanservices.co.uk) |

**Website:** [www.fanservices.co.uk](http://www.fanservices.co.uk) |

**Office:** 0203 539 1475 | **After Hours:** 0759 500 3000 |

95-99 Field End Road,

HA5 1QG

24/04/2023

## **KITCHEN EXTRACTION & ODOUR CONTROL SYSTEM PROPOSAL**

Fan Services was asked to carry out a site survey and put together a proposal for the extraction system at the above address:

The above address will be set across 2 shops with each shop having 5 small kitchens on each side. The kitchen will be serving worlds food to eat in and take away.

There will be 2 X identical extraction systems serving both areas, below you can find the proposal for each system:

After concluding the odour risk assessment under the DEFRA guidance, the total score for each system is 30 which leads to high level of odour filtration (please see attached Odour risk assessment).

Above the cooking equipment on each unit, a stainless-steel extractor hood canopy 2,000mm long x 1,200mm deep.

The canopies are manufactured in 304 grade with external dull polish grain and internal filter housing to removable/washable baffle type grease filters.

Coil canopy grease control filters (first stage filters) of a re-usable stainless-steel type design. There will be sufficient primary grease filters fitted to cover the complete length of the canopy face above the cooking ranges which are highly efficient at grease removal (please find the attached data sheets of the filters).

The main ductwork on top of the extractor hood canopies will incorporate the second stage of filtration which is 2X Plasma-Clean-Xtract-4200 which will inject ozone into the extract ductwork.

These will treat the odour emissions, via an oxidation reaction. This location closest to the source of the odours, will allow the maximum dwell time for the ozone to react with the emissions in the extract ventilation ductwork and ensure that adequate dilution takes place before the plume interacts with a receptor.

The ozone unit will be interlocked so that it only operates when the extract fan is operating. (Please see attached tech spec for Plasma-Clean-Xtract-4200).

The ductwork after the canopies will exist the building get connected to third stage of filtration which is a fine filter box such as G4 Pleated Panel Filters and Carbon bag filters (please see attached tech spec for fine filter).

The filter housing unit will be designed to ensure ease of access for maintenance and to provide a good seal around the filters to prevent gases bypassing the filters.

The filtration unit will then be connected to Helios GBD 710-4-4 extractor fan with an inverter speed controller and overheat protection. (Please see attached fan technical specification).

The fan will be mounted on using anti vibration rubber mountings and connected to ducting using flexible connectors to eliminate vibration levels.

The 600mm ductwork will run vertically to terminate one meter above the roof level with high velocity jet accelerator as per the drawings.

A sound attenuator would be installed after the fan (atmosphere outlet side) type Acustica R02-05-1800 to achieve the insertion loss as per the acoustic report.

The system will be designed and installed in accordance with EMAQ & DW172.

### **CLEANING AND MAINTAINCE SCHEDULE**

- 1- Extractor hood canopy and baffle filters to be cleaned weekly.
- 2- G4 Filter to be replaced every week.
- 3- Carbon bag to be replaced every 2 weeks.
- 4- Plasma-Clean-Xtract-4200 ozone generator to be serviced once a year as per manufacturer recommendation.
- 5- TR19 extractor system, ductwork cleaning to be scheduled every 3 months.

We hope this is of assistance and await your further instruction.

Kind regards

Jay Zen

## Appendix 3: Risk Assessment for Odour

Odour control must be designed to prevent odour nuisance in a given situation. The following score methodology is suggested as a means of determining odour control requirements using a simple risk assessment approach. The odour control requirements considered here are consistent with the performance requirements listed in this report.

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:

Criteria	Score	Score	Details
Dispersion	Very poor	20	Low level discharge, discharge into courtyard or restriction on stack.
	Poor	15	Not low level but below eaves, or discharge at below 10 m/s.
	Moderate	10	Discharging 1m above eaves at 10 -15 m/s.
	Good	5	Discharging 1m above ridge at 15 m/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 <sup>1</sup> .
Size of kitchen	Large	5	More than 100 covers or large sized take away.
	Medium	3	Between 30 and 100 covers or medium sized take away.
	Small	1	Less than 30 covers or small take away <sup>1</sup> .
Cooking type (odour and grease loading)	Very high	10	Pub (high level of fried food), fried chicken, burgers or fish & chips. <i>Turkish, Middle Eastern or any premises cooking with solid fuel</i>
	High	7	Vietnamese, Thai, Indian, <i>Japanese, Chinese, steakhouse</i>
	Medium	4	Cantonese, <i>Italian, French, Pizza (gas fired),</i>
	Low	1	Most pubs ( <i>no fried food, mainly reheating and sandwiches etc</i> ), <i>Tea rooms<sup>1</sup></i>

**Note 1:** A planner may take a pragmatic view when assessing whether certain low risk kitchens require any odour abatement to be fitted. In reaching this decision the Planner may consider the nature of the food being cooked and/or the size of kitchen and/or its location.

Three times the performance of traditional filters



Commercial kitchens using traditional baffle-type filters will remove just 20-40% of grease, but our filters capture 95% of grease particles from commercial kitchens in the extraction canopies.

This drives up productivity by making kitchens healthier and cleaner places to be.

## Benefits

- Reduce fire risk
- Are easy to clean
- Significantly cut duct-cleaning
- Reduced requirement for downstream maintenance
- Offer an ROI within 12 months



Ask us about  
**Coil Filter adapters**

Our Coil Filter adapters allow retrofitting for any commercial kitchen project

**plasma-clean.com** · [ask@plasma-clean.com](mailto:ask@plasma-clean.com) | +44 (0)161 870 2325  
Earl Business Centre, Dowry Street, Oldham, OL8 2PF

[@PlasmaClean](#) [/Plasma-Clean-LTD](#)



## Introduction to Kitchen Ventilation from Plasma Clean

Grease, odour and smoke emissions produced by commercial kitchens are an increasing concern both for existing establishments and for new build projects. Therefore, it is essential to implement a suitable grease and odour control strategy - as a matter of urgency - to ensure that the kitchen emissions comply with DW/172 and DEFRA guidance. This is not just about protecting the environment from nuisance emissions, but also reducing grease build up in the ductwork, which could present a fire risk if left untreated.

Plasma Clean's Kitchen Ventilation range consists of a range of modular solutions for grease, smoke and odour control which can be used alone or can be combined to provide a site-specific solution. For example, a pizza restaurant will not require the same level of grease, odour and smoke control equipment as a char-grill steak house.

Starting at the canopy, our [Coil Filters](#) are designed to capture 95% of grease particles; between 55-70% more than traditional baffle-type filters. Our [Xtract](#) range releases natural ozone - a superb disinfectant and odour neutraliser - directly into kitchen ventilation systems. Our [Techniclean](#) range includes the canopy mounted [Techniclean CM](#), combining high intensity UV-C light with ozone technology to break down odour and grease in the air, as well as the [Techniclean Mini](#), [5000](#) and [7500](#) models; perfect for new projects or retrofitting into existing ductwork. High levels of grease and smoke particulate are treated by the [Electrostatix](#) and combining Electrostatic Precipitation with UV-C, are our [ESP UV](#) units, provide highly efficient removal of grease, smoke and odour from a compact unit.

For a final polish - removing residual ozone - [Activated Carbon](#) filters are the ideal choice for low level extraction. Our Carbon Housing allows Activated Carbon filters to sit in 3, 6 or 9 easily mountable Sitesafe Discarb units.

When it comes to Control Panels, our [Air Flow Interlock](#) range is used to synchronise the operation of all of our Kitchen Ventilation products with detected air flow. The equipment is automatically turned off when the system is shut down, preventing accidental exposure to UV-C light and ozone, whilst ensuring energy efficiency for the system. Options are available for Lamp Life Indicators, Lamp Fault and BMS interface.

## Filtration with Coil Filters from Plasma Clean

There are four stages to the operation:

1. Oil vapours condense on the large surface area of the filter coils as heat is transferred from the air
2. Air is spun into a vortex and the droplets of oil and grease continue in a straight line
3. Oil and grease particles then collide with the filter coils, and the oil-coated filter surface traps more oil and grease due to its enhanced viscosity
4. Oil and grease droplets simply settle due to gravity and are collected for recycling

## Installation

Installation is simple, if you are producing a new canopy, let us know and we can advise on the design and dimensions of the Coil Filter mounting plate. If you have an existing canopy, then an adaptor plate is available to enable the Coil Filters to be installed into existing kitchen canopies, replacing existing low efficiency baffle type filters. Multiple units can be joined together for increased volume or efficiency.

## Accessories

Depending on the level of cooking, the system can be washed daily or as part of a weekly cleaning routine.

## Maintenance

Adaptor plate for retrofit

## Warranty

1 year Manufacturer's Warranty (subject to terms and conditions)  
Extended 3 year Warranty (care plan available)

## Terms

In accordance with our standard terms of business.

## Technical Specifications & Data

	CF 375	CF 475
Dimensions (HWD)	159 x 395 x 170mm	159 x 495 x 170mm
Air Volume	0.24 m <sup>3</sup> /s	0.34 m <sup>3</sup> /s
Face velocity		4-6 m/s
Pressure drop		200Pa
Noise		3.8<50dB
Finish		Grade 304 stainless steel

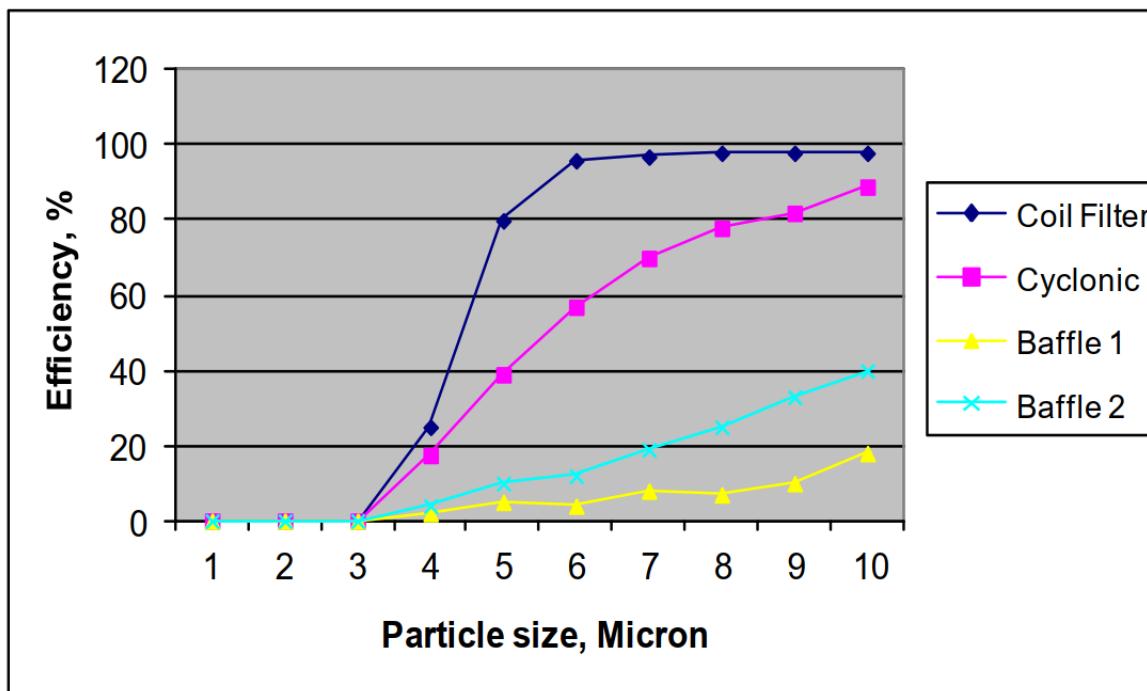


## INDEPENDENT TESTS

Tested by Deutsche Montan Technologie (DMT) organisation according to the VDI 2052 test.

An analysis of the results shows that the efficiency is 95% for all particle sizes above 5 microns. An analysis of these results according to the inverse law shows that overall grease recovery efficiency for the filter for all of the non-gaseous grease entering the filter is over 95% at 100% rated airflow. This compares with just 54% for reference filter used in the test.

The difference shows that the reference filter passed 4.5 times as much grease into the duct as the Coil Filter.

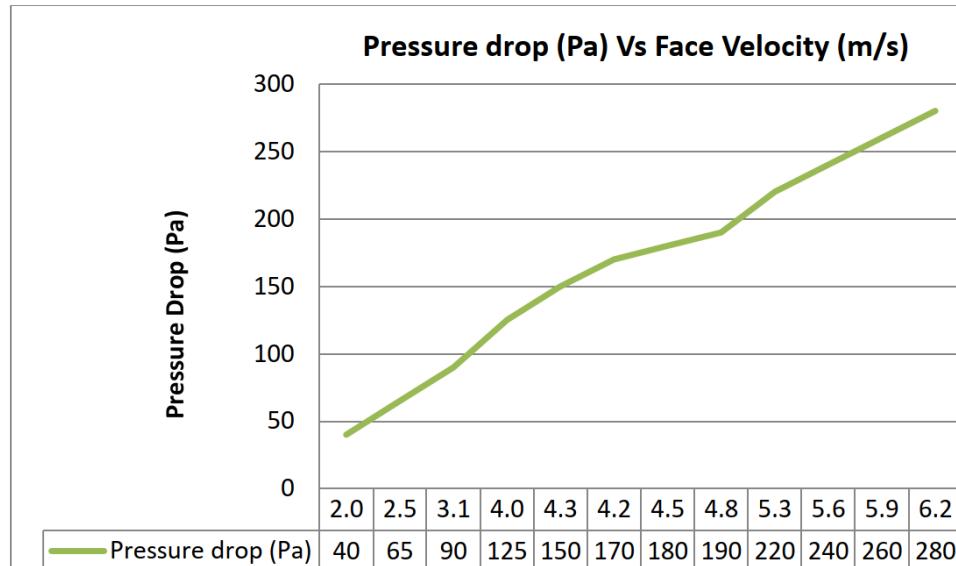


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  @PlasmaClean  /Plasma-Clean-LTD



## STATIC PRESSURE:



PROCESS CATEGORY	CLASS 1	CLASS 2	CLASS 3
Application	Boiling operations without sudden bursts of vapour (cooking pots, bay marie's, steam ovens, etc.)	Conventional frying and similar processes emitting a steady flow of vapours (flat top grills, chip fryers, salamanders, etc.)	Open flame grilling, flame processes and processes emitting sudden surcharges of hot vapours (charcoal, gas fired open grills etc.)
Min capture vel. (m/s)	0.25 m/s	0.31 m/s	0.35 m/s
Min face vel. (m/s)	0.40 m/s	0.50 m/s	0.55 m/s

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## Remove smells with a single unit

Chlorine bleach is powerful at removing odour and infection. But ozone is more powerful still.



\*Plasma Clean is continuously improving its products and services and reserves the right to alter designs without prior notice



Some competitor units simply mask smells with a chemical perfume. But our Xtract system releases natural ozone directly into the kitchen ventilation system.

Ozone is a superb disinfectant and odour neutraliser that eliminates cooking smells at source, using ozonolysis. And it works around the clock – just change the filters every few months.

### Benefits

- Affordable, space-efficient and robust
- Easy to install – no disruption to business
- Chemical-free
- Quiet
- Environmentally friendly and tested to EN13725:2003

#### Related products



#### Xtract 2100

The ideal product for achieving oxidation in smaller commercial kitchen spaces

[Find out more](#)



#### Xtract 2100 Mini

The perfect solution for removing cooking smells in small, start-up kitchens

[Find out more](#)

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When it comes to Control Panels, our [Air Flow Interlock](#) range is used to synchronise the operation of all of our Kitchen Ventilation products with detected air flow. The equipment is automatically turned off when the system is shut down, preventing accidental exposure to UVC light and ozone, whilst ensuring energy efficiency for the system. Options are available for Lamp Life Indicators, Lamp Fault and BMS interface.

## Treatment with Ozone from Plasma Clean

Oxidation using ozone and activated oxygen ions is used to treat odour emissions from commercial and industrial kitchen processes (DW/172: Specification for Kitchen Ventilation Systems and DEFRA, 2005: Guidance on the Control of Odour and Noise from Commercial Kitchen Exhaust Systems). The unit has been specifically designed for use in commercial kitchens. The system injects ozone into the kitchen extraction canopy or ductwork where it reacts with odours.

It is recommended to locate the units with an injection point located closest to the source of odours in order to maximize dwell time. In any case the dwell time must be no less than 2 seconds. The system is powered via a fused spur which is to be interconnected to air flow or the main extraction fan control to ensure that the unit(s) only operate when the main fan is operating.

## Installation

It is recommended to locate the units with an injection point located closest to the source of odours in order to maximize dwell time. In any case the dwell time must be no less than 2 seconds. The system is powered via a fused spur which is to be interconnected to air flow or the main extraction fan control to ensure that the unit(s) only operate when the main fan is operating. Multiple units can be joined together for increased volume or efficiency.

## Accessories

Installation kit  
Remote monitor

## Maintenance

A Plasma Clean service contract is available (please enquire) and in any case Plasma Clean would recommend:

- Routine cleaning of the housing and exchange of the prefilter when spent
- A yearly service is recommended

## Warranty

1 year Manufacturer's Warranty ([subject to terms and conditions](#))

Extended 3 year Warranty (care plan available)

## Terms

In accordance with our standard terms of business.

## Technical Specifications & Data

<b>Dimensions (HWD)</b>	400 x 600 x 300mm
<b>Control lights</b>	Air Flow LED indicators
<b>Capacity max.</b>	Up to 3.0 m <sup>3</sup> /s (subject to grease and odour loading)
<b>Volume flow rate (through unit)</b>	0.066 m <sup>3</sup> /s
<b>Pre-filtration grade</b>	G4
<b>Supply</b>	230Vac/ 1 phase / 50Hz
<b>Power</b>	570W
<b>Weight</b>	25kg
<b>Pressure drop</b>	N/A (ozone injection)
<b>Safety</b>	Internal flow switch Recommended interlock to fan control
<b>Finish</b>	Powder coated mild steel
<b>Approvals</b>	Plasma Clean air cleaners comply with current CE requirements and EMC standards. Certificates are available on request.



# AIRCLEAN

YOUR AIR FILTER MANUFACTURER

P.O. BOX 147,  
MAIDSTONE, ME14 2LA.

TEL:01622 832777  
FAX:01622 832507

[sales@airclean.co.uk](mailto:sales@airclean.co.uk) [www.airclean.co.uk](http://www.airclean.co.uk)

## Pleated Panel Filters

### Applications

The Pleated Panel is a medium efficiency disposable filter, suitable for ventilation and air conditioning systems which require a higher efficiency and greater dust holding capacity than can be achieved with glass or synthetic panels.

The Pleated Panel can be used where glass panels are undesirable, such as in the food industry and hospitals.

### Construction

Pleated filters consist of a dry non-woven fabric media, pleated to give an extended surface area, producing a low initial resistance for the same air volume.

The pleated assembly is contained within either a rigid all cardboard casing, or a cardboard frame with perforated cap-punch retaining grids.



### Technical

**Filter Classification:**

Grade G4 to EN779.

**Pleated Material Flammability :**

Fire Resistant to :-

Underwriters Laboratories

Standard 900 class 2

100°C (212°F)

**Maximum operating temperature:**

840 g/m<sup>2</sup> (2") and 1260 g/m<sup>2</sup> (4") to

**Dust Holding Capacity:**

EN779

### Resistance to Airflow

m/s fpm	Face Velocity									
	1.25 250		1.50 300		2.0 400		2.5 500		3.0 600	
Pressure Drop	Pa	“wg	Pa	“wg	Pa	“wg	Pa	“wg	Pa	“wg
2" Panel	22	0.09	27	0.11	50	0.20	70	0.28	-	-
1" Panel	25	0.10	30	0.12	55	0.22	75	0.30	87	0.35

Recommended discard resistance is 125 Pa (0.5"wg) in excess of clean resistances shown above for a 2" panel and 150 Pa (0.6"wg) for 4" panel.

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## Capacity Chart (2" Pleated Panels)

Data based on Face Velocity of 2.5 m/s (500 fpm)

SIZE	SIZE	Flow Rate
OT Inches	Actual mm	m <sup>3</sup> /s
10 x 10	242 x 242	0.14
12 x 12	289 x 289	0.20
15 x 15	369 x 369	0.33
18 x 18	445 x 445	0.48
20 x 10	495 x 242	0.29
20 x 16	495 x 394	0.48
20 x 20	495 x 495	0.60
25 x 16	620 x 394	0.60
25 x 20	620 x 495	0.76
24 x 12	594 x 289	0.43
24 x 20	594 x 495	0.73
24 x 24	594 x 594	0.88

Actual Face Size = Nominal Size less 6mm (0.25")

## Capacity Chart (4" Pleated Panels)

Data based on Face Velocity of 3.0 m/s (600 fpm)

SIZE	SIZE	Flow Rate
OT Inches	Actual mm	m <sup>3</sup> /s
10 x 10	242 x 242	0.18
12 x 12	289 x 289	0.25
15 x 15	369 x 369	0.41
18 x 18	445 x 445	0.60
20 x 10	495 x 242	0.36
20 x 16	495 x 394	0.58
20 x 20	495 x 495	0.73
25 x 16	620 x 394	0.72
25 x 20	620 x 495	0.91
24 x 12	594 x 289	0.51
24 x 20	594 x 495	0.87
24 x 24	594 x 594	1.05

## Holding Frames and Casings

Holding frames and casings for Disposable Pleated Panels are available singularly or in multiples, and can be manufactured to suit non-standard sizes and special applications.

See leaflets (code AC8) for full technical information.

Code AC1/3b Ref 06/11



## Description:

592x592x380 6 pocket 25mm header Carbon filter bag giving a combination of particle and low level gas and odour removal

## Construction:

Galvanised steel header frame holding pockets made from an impregnated carbon synthetic media

## Efficiency:

G3/G4 to BS EN 779

## Rating:

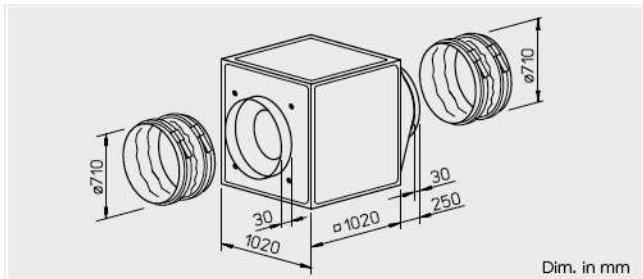
3400 m<sup>3</sup>/hr @ 60 Pa

## Carbon Loading:

78 grams / m<sup>2</sup>

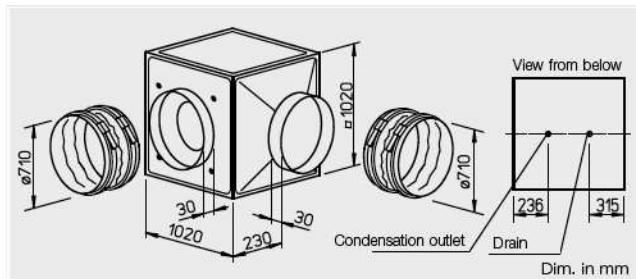
In our constant endeavour to seek product improvement The Filter Business reserve the right to modify designs or materials without prior notice. E&OE

GB



GB T120

Designed for moving dirty, humid and hot air up to max. 120° C.  
Motor located outside the air flow.



#### ■ Special features of types

##### GB T120

- Designed for moving dirty, humid and hot air volumes up to max. 120° C.
- Motor located outside of air flow.
- Temperature insulated partition panel between motor and impeller, lined with 20 mm thick, flame-retardant mineral wool.
- Easily accessible motor and impeller unit, removable without disassembling the system components.
- Inspection cover with handle, simply remove for cleaning and maintenance.
- Condensate collector with condensate spigot included in delivery. Drill hole for rain drainage (accessories) for outdoor installation is prepared.

#### □ Assembly GB T120

Installation must be carried out with condensation discharge showing downward. Flexible assembly by three possible centrifugal discharge directions via the discharge adapter. Outdoor installation is possible using outdoor cover hood and external weather louvers (accessories).

#### ■ Feature

**Assembly of types GB**  
Arbitrary installation position and flexible assembly by five possible discharge directions via the discharge adapter. For wall mounting the wall bracket (accessories) have to be used. Outdoor installation is possible using outdoor cover

hood and external weather louvers (accessories).

#### ■ Specification of both types

##### Casing

Self-supporting frame construction from aluminium hollow profiles. Double-walled side panels from galvanised sheet steel, lined with 20 mm thick temperature insulating and flame-retardant mineral wool. Intake cone for ideal inflow as well as spigot and flexible sleeve (for the respective max. permissible air flow temperature) for duct connection. With discharge adapter (from square to circular) on the pressure side for low-loss discharge and flexible sleeve to reduce vibration transmission. Simple positioning by standard crane hooks.

##### Impeller

Smooth running backward curved aluminium centrifugal impeller highly efficient and direct driven. Energy efficient with a low noise development. Dynamically balanced together with the motor to DIN ISO 1940 Pt.1 – class 6.3.

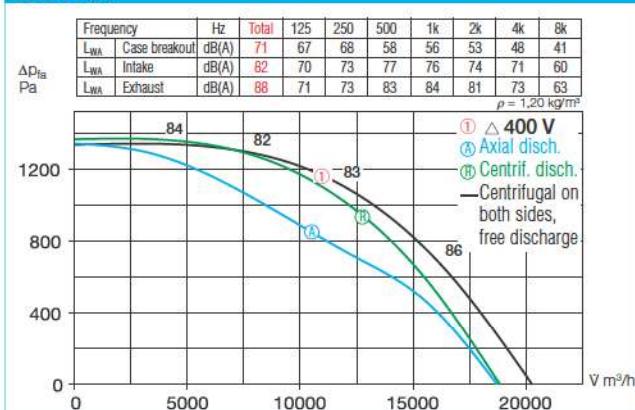
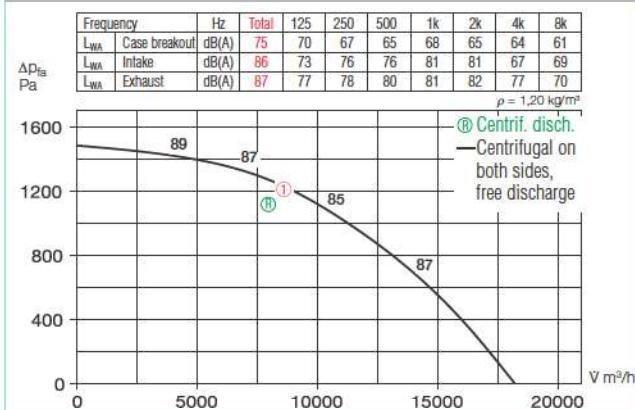
##### Motor

Maintenance-free external rotor motor or IEC-standard motor protected to IP 54/55. With ball bearings and interference-free as standard.

##### Electrical connection

Standard terminal box (IP 54/55) fitted on the motor; with GB T120 fitted on the motor support plate.

Type	Ref. no.	Air flow volume (FID)	R.P.M.	Sound press. case breakout	Motor power (nominal)	Current full load	Current speed controlled	Wiring diagram	Maximum air flow Full load controlled	Weight (net) kg	5 step transformer controller with mot. protect. unit	5 step transformer controller without mot. protect. unit	Full motor protection unit using the thermal contacts				
		l/s	min <sup>-1</sup>	dB(A) in 4 m	kW	A	A	No.	+°C	+°C	kg	Type	Ref. no.	Type	Ref. no.	Type	Ref. no.
<b>3 Phase motor, 3~, 400 V, 50 Hz, Y/△ wiring, protection to IP 55</b>																	
GBD 710/4	5529	20285	1465	51	5.97	10.20	—	499	70	—	170	—	—	—	MD	5849	
<b>2 speed motor, 3 Phase motor, 400 V / 3 ph. / 50 Hz, Y/△ wiring, protection to IP 54</b>																	
GBD 710/6/6	5525	16500/19000	690/890	46	1.55/2.45	2.90/4.70	4.70	867	50	50	157	RDS 7	1578	TSD 7,0	1504	MD	5849
<b>3 Phase motor, 3~, 400 V, 50 Hz, protection to IP 54</b>																	
GBD 710/4 T120	5756	18200	1465	55	5.89	10.4	—	499	120	—	188	—	—	—	MD	5849	

**GBD 710/4**

**GBD 710/4 T120**


### Motor protection

Types GBD with thermal contacts embedded on the terminal strip, which must be wired with the full motor protection device. Type GBD T120 with PTC thermistor for direct wiring with the full motor protection device or frequency inverter FU-BS (see table below, accessories).

### Speed control

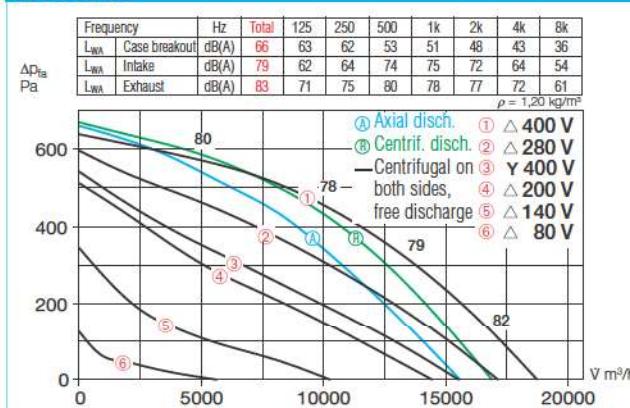
All types (except GB T120) are speed controllable by voltage reduction using a transformer controller. The 3-phase models can also be 2 speed controlled by Y/△ switch or full motor protection unit M4; Type GBD T120 is exclusively controllable via frequency inverter with Sine filter. The duties at different speeds are given in the performance curve.

### Sound levels

Total sound power levels and the spectrum figures in dB(A) are given for:

- Sound level case breakout
- Sound level intake
- Sound level exhaust

In the table below as well as underneath the performance curve you can find additionally the sound pressure levels at 4 m (free field conditions).

**GBD 710/6/6**


### Accessories of both types

Anti vibration mounts for installation indoors. Set of 4.

**SDD-U** Ref. no. 5627

External weather louvers to cover exhaust opening.

**GB-WSG 710** Ref. no. 5641

Outdoor cover hood for outdoor installation.

**GB-WSD 710** Ref. no. 5750

### Specific accessories

#### for types GB

Condensate collector with condensate spigot for pipe connection.

**GB-KW 710** Ref. no. 5646

(Condensate collector with condensate spigot included in delivery with GB T120).

On/Off and 2-speed switch for 3-phase Y/△ motors.

**Type DS 2<sup>1)</sup>** Ref. no. 1351

<sup>1)</sup> full motor protection unit recommended:  
MD Ref. No. 5849

#### for types GB T120

Rain drainage for outdoor installation (drill holes for rain drainage is already prepared).

**GB-RA** Ref. no. 9418

### Information

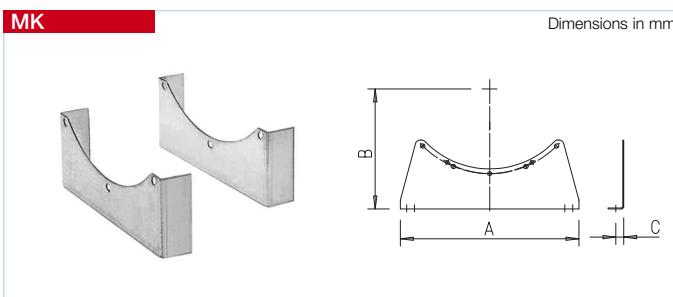
Information for planning  
General techn. information,  
speed control

10 on  
15 on

### Accessory-Details

Speed controller and full  
motor protection unit

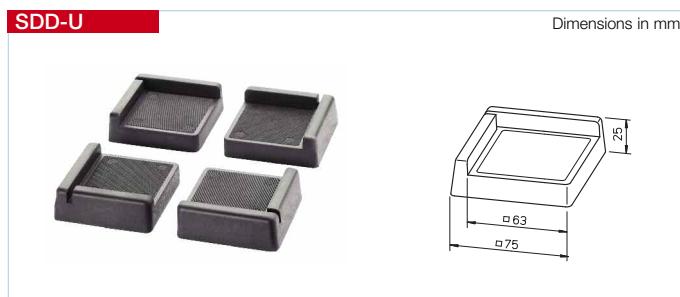
525 on


**Mounting feet**

To fix Axial/VAR cased fans on ceiling, wall or floor. Made from galvanised sheet steel or hot dipped galvanised steel. Fixing holes fit casing flanges. Set includes a pair of feet, nuts and bolts.

**Note:**

If motors of high weight are installed, an extension duct (VR...) is recommended to move the centre of gravity within the mounting feet. Mount feet on the outer flange.

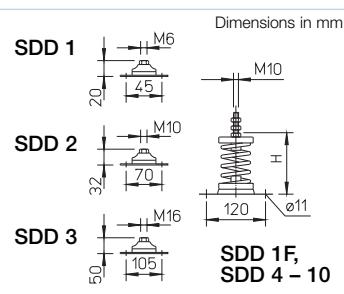

**Anti vibration pads**

The rubber mounting pads SDD-U are suitable as a base for installation of fans on flat, horizontal surfaces. They reduce the direct noise and vibration transmission to the building structure.

One set consists of 4 elements, which are positioned individually under the corners of the fan unit. Maximum compression: 40 kg/pad = total 160 kg.

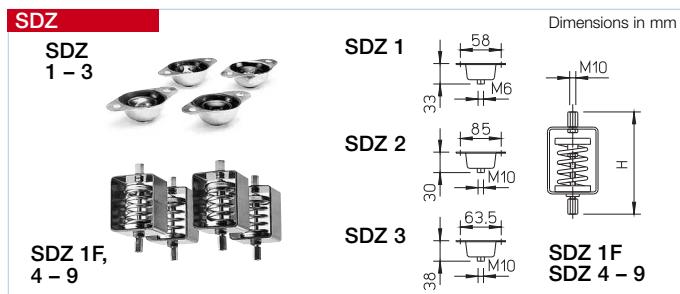
**SDD-U** Ref. No. 5627

Type	Ref. No.	A	B	C	Weight in kg
<b>MK 200-225</b>	1446	310	208/220	20	1.5
<b>MK 250-280</b>	1447	340	227/245	20	1.7
<b>MK 315-355</b>	1448	380	281/300	25	2.2
<b>MK 400-450</b>	1449	360	311/335	25	2.6
<b>MK 500-560</b>	1450	570	383/415	25	5.3
<b>MK 630</b>	1333	600	465	30	8.5
<b>MK 710</b>	1372	670	515	35	10.5
<b>MK 800</b>	1373	680	565	35	15.5
<b>MK 900</b>	1374	760	625	35	18.0
<b>MK 1000</b>	1375	840	690	35	19.5


**Anti vibration mounts for compression**

To reduce noise and vibration transmission of fans installed on horizontal surfaces. Simple installation in combination with feet MK (accessory). Select size according to fan weight (see table).

Rubber elements are suitable for small to middle weights and ambients up to +60 °C. Spring elements are suitable for higher temperatures above +60 °C (e.g. smoke extraction).


**Anti vibration mounts for suspension**

To reduce noise and vibration transmission of fans installed hanging from ceilings. Specification as model SDD.

**Important note for installation!**

Make sure that fan system is well balanced (centre of gravity of heavy motor may cause uneven loading of mounts).

Type	Ref. No.	Maximum fan weight in kg	H Height in mm	Spring element	Contents 1 set = 4 pieces
<b>SDD 1</b>	1452	80	*		
<b>SDD 1F</b>	1942	70	112 – 82	•	
<b>SDD 2</b>	1453	180	*		
<b>SDD 3</b>	1367	750	*		
<b>SDD 4</b>	1944	130	112 – 86	•	
<b>SDD 5</b>	1924	210	112 – 86	•	
<b>SDD 6</b>	1926	400	112 – 80	•	
<b>SDD 7</b>	1928	580	112 – 82	•	
<b>SDD 8</b>	1930	900	112 – 82	•	
<b>SDD 9</b>	1934	1300	112 – 85	•	
<b>SDD 10</b>	1951	1800	112 – 88	•	

Type	Ref. No.	Maximum fan weight in kg	H Height in mm	Spring element	Contents 1 set = 4 pieces
<b>SDZ 1</b>	1454	60	*		
<b>SDZ 1F</b>	1943	70	190 – 220	•	
<b>SDZ 2</b>	1455	160	*		
<b>SDZ 3</b>	1366	300	*		
<b>SDZ 4</b>	1945	130	190 – 216	•	
<b>SDZ 5</b>	1925	210	190 – 216	•	
<b>SDZ 6</b>	1927	400	190 – 221	•	
<b>SDZ 7</b>	1929	580	190 – 220	•	
<b>SDZ 8</b>	1931	900	190 – 220	•	
<b>SDZ 9</b>	1935	1300	190 – 217	•	

\* shown in dimensional drawing

\* shown in dimensional drawing

## General Purpose Bag Filters

**Grades G3, G4, and M5 to EN779:2012**

### Applications

General Purpose Bag Filters offer a low to medium filtration efficiency suitable for fresh air conditioning and ventilation systems where a greater dust holding capacity is required than a panel air filter can offer.

Typical applications for General Purpose Bag Filters would be as a pre filter to high efficiency filters, prior to a fan or heating / cooling coil, or as a pre filter to an Activated Carbon Filter.



### Description

The General Purpose Multi Pocket Bag Filter comprises a corrosion resistant heavy gauge galvanised header frame housing the filter media, which is supported by a copper coated rod assembly and tags which keep the media pockets from blinding each other. The pockets are of a lofted non-woven synthetic material ensuring a high dust holding capacity.

### Technical

**Filter Classification :** Grade G3, G4 or M5 to EN779:2012 (Previously G3, G4, and F5 to EN779:2002)

**Maximum Operating Temperature :** 100°C (212°F)

**Flammability :** Flame Retardant to DIN 53438, Classes F1 & K1

Suitable for use in the food industry.

### STANDARD GENERAL PURPOSE BAG FILTER SIZES

Size			Flow Rate m³/s	Part Numbers		
Nominal (actual)	Bag Length			GP3 Grade G3 to EN779	GP4 Grade G4 to EN779	MP5 Grade M5 to EN779
	inch	mm				
24H x 12W (594H x 292Wmm) 2 Pockets	6	150	0.24	1410301	1410401	1410501
	9	225	0.35	1410302	1410402	1410502
	12	300	0.47	1410303	1410403	1410503
	15	375	0.59	1410304	1410404	1410504
	18	450	0.71	1410305	1410405	1410505
	24	600	0.80	1410306	1410406	1410506
24H x 20W (594H x 492Wmm) 3 Pockets	6	150	0.40	1410311	1410411	1410511
	9	225	0.53	1410312	1410412	1410512
	12	300	0.80	1410313	1410413	1410513
	15	375	0.88	1410314	1410414	1410514
	18	450	1.20	1410315	1410415	1410515
	24	600	1.39	1410316	1410416	1410516
24H x 24W (594H x 594Wmm) 4 Pockets	6	150	0.47	1410321	1410421	1410521
	9	225	0.71	1410322	1410422	1410522
	12	300	0.94	1410323	1410423	1410523
	15	375	1.18	1410324	1410424	1410524
	18	450	1.41	1410325	1410425	1410525
	24	600	1.65	1410326	1410426	1410526

#### Notes

Standard Bag Filter Header Depth = 22mm (16mm deep header available upon request)

Clean pressure differentials at Rated Flow: G3 = 40Pa, G4 = 50Pa, M5 = 63Pa

Recommended discard resistance is 200 Pa above clean resistance.

Non standard sizes are available upon request

Stainless Steel Header, Grade 304 available upon request (1410901)

Bag Loops for vertical or low airflows (1410902)

#### **Holding Frames and Cases**

Holding frames and casings for General Purpose Bag Filters are available singularly or in multiples, and can be manufactured to suit non-standard sizes and special applications.

See Catalogue Section 8 (code AC8) for full information.



Front Withdrawal Frame (1810)



MEZ Flanged Side Access Housing (1820)



Duct Mounted Filter Housing (1825)



Fully Welded Side Withdrawal Filter Housing (1840)

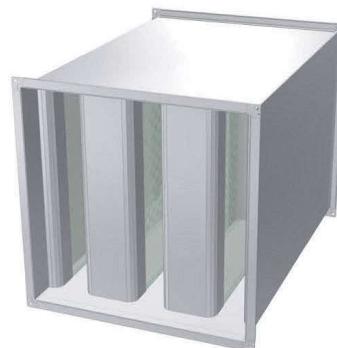
# R02 Rectangular Silencers



## R02 - 5 - Attenuator

Available in seven standard lengths R02 5 Rectangular Duct Mounted Silencers have excellent attenuation properties, achieved with sound absorbing infill splitters, retained in the attenuator casing by a perforated liner. The resistance to airflow is a function of the face velocity and length. It is not recommended to select the R02 5 Silencers with a face velocity above 3.5 metres per second without asking advice regarding re-generated self noise. We can advise on the selections and can perform system analysis to ensure the correct unit is specified.

- High performance rectangular duct silencer
- Seven standard lengths
- Many connection options
- Cross section dimensions in 1mm increments
- System pressure within ducted systems to 1500 Pa
- Special lengths on request



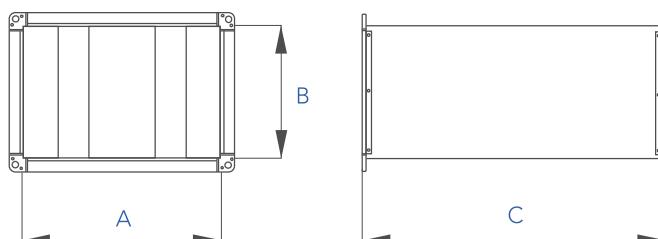
## Insertion Loss (dB) - Centre Band Frequency

Product Code	Length (mm)	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
R02 - 5 - 600	600	4	6	11	19	24	23	18	12
R02 - 5 - 900	900	4	6	12	26	30	31	22	16
R02 - 5 - 1200	1200	5	9	18	32	40	39	28	19
R02 - 5 - 1500	1500	7	11	23	37	45	45	32	22
R02 - 5 - 1800	1800	8	13	25	44	50	50	37	24
R02 - 5 - 2100	2100	9	16	28	50	50	50	45	29
R02 - 5 - 2400	2400	11	19	33	50	50	50	50	32

Insertion loss data is derived from continual testing to BS4718 and other standards in independent UKAS certified laboratories, which includes where appropriate, re-generated or self noise testing in both forward and reverse flow conditions. If you request system analysis from our technicians all predictions will be assessed using the relevant certified insertion loss data together with relevant dynamic corrections.

## Dimensional Data

Code	A Min	A Max	B Min	B Max	C Min	C Max
R02 - 5	100	1200	100	1200	400	2400



## Resistance to Airflow (Pa)

Product Code	1.0m/s	1.5m/s	2.0m/s	2.5m/s	3.0m/s
R02 - 5 - 600	10	16	22	39	60
R02 - 5 - 900	10	16	23	40	62
R02 - 5 - 1200	11	16	24	40	64
R02 - 5 - 1500	11	17	25	40	66
R02 - 5 - 1800	11	18	26	42	67
R02 - 5 - 2100	12	19	26	43	69
R02 - 5 - 2400	13	19	28	48	71

# R02 Rectangular Silencers



## Material & Finish

All components are manufactured from mill finish hot dip galvanised mild steel conforming to EN10327 (BS2989). To prevent erosion of absorbing materials, the R Series Silencers are fitted with perforated splitters manufactured from galvanised mild steel conforming to EN10327 (BS2989) R Series Silencers utilise acoustic grade mineral fibre absorbing infill and are manufactured to the HVCA specification DW144 class B and M&E 100 for sheet steel thickness and stiffening.

**Pressure** Up to 1500 Pascals positive and negative.

**Temperature** -12° to +100°C.

**Location** Internally & externally mountable.

## Melinex Lining (Optional)

Where moist conditions exist (e.g. process systems) or for critically clean applications (e.g. hospitals) the sound absorbing material may be required to be fully sealed by Melinex lining to prevent fibre migration. This will however, effect the acoustic performance of the silencer. Please contact us to discuss your requirements.

## Alternative Specification

The above specification refers to our standard, stock range. We can also supply custom materials such as 304 and 316 grade stainless steels, cold reduced (CR4) mild steel and aluminium.

## Dimensional Data

Units smaller than the minimum and larger than the maximum with the same aero-acoustic performances are available, but may have different manufacturing methods and are therefore coded accordingly.

Connection Options	
MEX Flanges	20, 30 & 40mm
Ductmate Flanges	25 & 35mm
Circular Spigot	"SPIRAL FIT" circular spigots, can be offset.
Rectangular Spigot	Rectangular spigots, can be offset
Raw	Plan end for slip jointing etc.

## Installation

For recommendations for the support of the fan the principles of Part Six (pages 43-46) of the HVCA DW144 standard should be followed. Always use the correct size bolts as specified in the dimensional data table above. The arcuate holes are sized to allow the metric thread sizes to be utilised, for example, for an M10 fixing, the slot is made 19mm long by 13mm wide. Please contact us to confirm the suitability of any fan manufacturers product.

Equipment	Location
Centrifugal Fans	Position at least one duct width from inlet or outlet.
Axial Fans	Position at least one duct width from inlet or outlet.
Mixed Flow Fans	Position at least one duct width from inlet or outlet.
Ductwork Bends	Position at least three duct widths from inlet or outlet. One duct width will increase resistance by 90%, two by 20%. Ensure splitters are in parallel plane to bend.
Ductwork Reducers	Direct couple only with reducers of maximum 15° cheek slope.
Finned Coils & Filters	Leave 500mm plenum between silencer and coil or filter, and suitable reducer as specified in HVCA DW/144 1998.

## Cleaning & Maintenance

Should the product require routine cleaning we recommend low-pressure air blasting, vacuuming or wiping the exposed surfaces with a damp cloth. It is not unusual for "White Zinc Oxide" to develop on galvanised silencers when the zinc in the galvanising reacts electrolytically with moisture. Silencers are of a passive nature and as such require no routine maintenance or lubrication.