



Odour Assessment: PizzaExpress Delivered, 256 Shinfield Road, Reading

December 2015



Experts in air quality
management & assessment

Document Control

Client	PizzaExpress	Principal Contact	Mark Jones
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Report Prepared By:	Penny Wilson
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1 Introduction

- 1.1 This report sets out an odour risk assessment and management plan for the proposed PizzaExpress Delivered outlet at 256 Shinfield Road, Reading.
- 1.2 The report outlines the methodology and summaries the findings of the odour risk assessment, and describes the odour abatement that will be installed in the kitchen extraction system to minimise the risk of odour impacts resulting from the operation of this outlet. This report has been prepared by Air Quality Consultants Ltd on behalf of PizzaExpress.
- 1.3 Pizza deliveries will be carried out using zero-emission electric scooters. Only a very small proportion of takeaways (circa 10%) are likely to be collected, of which only a small proportion would be collected by car. The proposed outlet would therefore not generate a significant amount of additional vehicle movements in the area (particularly in the context of the existing permitted use of the site), and thus this report does not consider air quality impacts as these will be insignificant.

2 Odour Assessment

- 2.1 Defra's Guidance on the 'Control of Odour and Noise from Commercial Kitchen Exhaust Systems' (Defra, 2005) contains an assessment procedure for identifying the potential risk of odour impacts from commercial kitchen operations. The results of this risk assessment can be used to determine a suitable level of odour abatement to be installed into a commercial kitchen.
- 2.2 The risk assessment for odours is split into the following four parts:
- dispersion;
 - proximity to receptors;
 - size of kitchen; and
 - cooking type and grease loading.
- 2.3 Each part is given a risk rating score and the total risk rating denotes the level of odour abatement which is likely to be required to prevent the kitchen from causing odour nuisance impacts. The following sections of this report outline each part of the risk assessment.
- 2.4 It should be noted that where assumptions have been made these are clearly stated in the risk assessment and are based on the professional experience of Air Quality Consultants Ltd.

Dispersion

- 2.5 The risk rating for dispersion relates to the conditions under which kitchen extraction emissions are discharged. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.
- VERY POOR (20) – Low level discharge, discharge into courtyard, or restriction on stack;
 - POOR (15) – Discharge not low level, but below eaves, or discharge rate below 10 m/s;
 - MODERATE (10) – Discharging 1 m above eaves at a rate of 10-15 m/s;
 - GOOD (5) – Discharging 1 m above ridge at a rate of 15 m/s or more.
- 2.6 The risk rating for dispersion is described as MODERATE, as the flue exit will be located just above the roof ridge line and the exit velocity will be slightly less than 10m/s (due to noise considerations).

Proximity to Receptors

- 2.7 The risk rating for proximity to receptors relates to the distance between the point of discharge of kitchen emissions and the nearest sensitive receptor locations. Sensitive receptor locations may

be residential properties, commercial premises or frequently used public open spaces. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- CLOSE (10) – Closest sensitive receptor is less than 20 m from kitchen discharge;
- MEDIUM (5) – Closest sensitive receptor is between 20 and 100 m from kitchen discharge;
- FAR (1) – Closest sensitive receptor is more than 100 m from kitchen discharge.

2.8 The risk rating for the proximity to residential properties is judged to be CLOSE. Flats above the proposed PizzaExpress Delivered outlet and adjacent premises will be situated within 20 m of the flues.

Size of Kitchen

2.9 The risk rating for size of kitchen relates to the volume of food prepared by the kitchen and is described in terms of the capacity of the restaurant or take-away. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- LARGE (5) – More than 100 covers or a large-sized takeaway;
- MEDIUM (3) – Between 30 and 100 covers or a medium-sized takeaway;
- SMALL (1) – Less than 30 covers or a small takeaway.

2.10 The proposed PizzaExpress Delivered outlet will be comparable to a MEDIUM sized takeaway.

Cooking Type and Grease Loading

2.11 The risk rating for cooking type and grease loading relates to the type of cooking methods employed in the kitchen and the type of food prepared. The relevant risk ratings described in the guidance are shown below. The risk score is shown in parentheses.

- VERY HIGH (10) – Pubs (those serving a high level of fried food), fried chicken, burgers or fish and chips;
- HIGH (7) – Kebab, Vietnamese, Thai or Indian;
- MEDIUM (4) – Cantonese, Japanese or Chinese;
- LOW (1) – Most pubs, Italian, French, Pizza or Steakhouse.

2.12 The PizzaExpress Delivered outlet would use ovens for all cooking operations, which would be limited to baking of pizzas and pre-prepared side dishes such as garlic bread. In addition, surveys of existing PizzaExpress restaurant ductwork have found that grease and fat deposits are limited. On this basis, it would be considered to have a LOW grease loading.

Risk Assessment Summary

2.13 The odour risk assessment summary is shown in Table 1 for the proposed delivery outlet.

Table 1: Kitchen Odour Risk Assessment Summary

Criteria	Risk Rating	Risk Score ¹	Description	Comments
Dispersion	Moderate	10	Discharge 1m above eaves at 10-15 m/s.	Flue exit will be located above roof level and exit velocity just below 10m/s. There are no impediments to dispersion.
Proximity to Receptors	Close	10	Closest sensitive receptor less than 20 m from kitchen discharge.	Flat above the shop and adjoining premises are occupied.
Size of Kitchen	Medium	3	Medium sized takeaway.	Medium sized takeaway
Cooking Type and Grease Loading	Low	1	Most pubs, Italian, French, Pizza or Steakhouse.	Pizza and other baked goods only.
TOTAL RATING	High	24	A <u>high</u> level of odour abatement required.	

¹ Total Risk Score of <20 = Low to Medium Risk, 20 to 35 = High Risk; and >35 = Very High Risk.

2.14 The overall odour risk rating of the delivery outlet is 'High', although the score is at the lower end of the 'High Risk' band. This denotes that it would require a high level of odour control to eliminate the risk of odour impacts for nearby residential properties.

Recommended Odour Abatement System

2.15 This section of the report briefly outlines the odour control measures that would need to be installed on the kitchen extract systems at the restaurants to provide optimal odour abatement and minimise the risk of odour impacts at surrounding properties.

2.16 The odour control measures suggested are those recommended within Defra's guidance on odours from commercial kitchens (Defra, 2005) for kitchens with a 'High' odour risk assessment score. The requirements set out below provide a guideline for the development of the proposed abatement system described in Section 3.

2.17 The guidance outlines that abatement systems that offer a high level of odour control may include:

"1. Fine filtration or electrostatic precipitation (ESP) followed by carbon filtration (carbon filters rated with a 0.2-0.4 second residence time).

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

2.18 In addition to this, the guidance states that the flue shall:

- 1. Discharge the extracted air not less than 1 m above the roof ridge of any building within 20 m of the building housing the commercial kitchen.*
- 2. If 1 cannot be complied with for planning reasons, then the extracted air shall be discharged not less than 1 m above the roof eaves or dormer window of the building housing the commercial kitchen. Additional odour control measures may be required.*
- 3. If 1 or 2 cannot be complied with for planning reasons, then an exceptionally high level of odour control will be required.*

2.19 The proposed flue will discharge just above roof ridge height. Whilst this is below the recommended 1m above the ridge (1), it is over 1m above the roof eaves (2) and there are no dormer windows on the building. On the basis of the flue being above the roof ridge and well above the eaves and receptors, in combination with the risk assessment score being at the lower end of the 'High Risk' category, additional odour abatement is not considered necessary in this instance.

3 Odour Abatement System

- 3.1 In accordance with the recommended odour abatement systems identified in paragraphs 2.15 to 2.19 and following discussions with Pizza Express and their kitchen design team, the following odour abatement system has been identified as the most effective and feasible option that will be installed at the delivery outlet. It is judged that the system identified in Table 2 will offer a suitable level of odour abatement and reduce potential odour impacts at nearby sensitive locations as much as practically practicable.

Table 2: Recommended Odour Abatement System

Abatement Stage	System	Comment
Particle Filtration	Filtration system to protect odour removal system	A filtration system will be required to remove any particles or grease, to protect the odour removal system. The system will be installed in an accessible location to facilitate cleaning and changing of filters.
Odour Removal	Carbon Filtration / UV Ozone	Following particulate removal, any residual gaseous odours will be removed using a carbon filtration or UV ozone system. If carbon filtration is used, a minimum residence time of 0.2s will be achieved. The system will be installed in an accessible location to facilitate maintenance and filter changes.
Emissions Discharge	High Velocity Cowl	The flue will be designed with a vertical discharge at a velocity of no less than 10 m/s. The flue will not include anything to inhibit dispersion such as a rain cover.

4 Installed Odour Abatement System

- 4.1 In accordance with the recommendations set out in **Error! Reference source not found.**, an odour abatement system has been designed for the kitchen extraction systems to achieve a high level of odour control. A Kitchavent 2000, 2-stage filtration system will be installed. Details of the proposed odour abatement system are set out in Table 3.

Table 2: Proposed Odour Abatement System (Kitchavent 2000)

Abatement Stage	System	Comment
Particle Filtration	F5 bag filter	Disposable F5 bag filter to protect carbon filter, will meet EN779.
Odour Removal	Activated Carbon Filtration	Extra duty activated carbon filters (Gr50) will be utilised. A minimum residence time of 0.2s will be achieved. The system will be installed in an accessible location to facilitate maintenance and filter changes.
Emissions Discharge	Vertical tapered stack	The flue will be designed with a vertical discharge at a velocity approaching 10 m/s. The flue will be slightly tapered and will not include anything to inhibit dispersion such as a rain cover, cowl or cap.

- 4.2 The odour abatement system adheres to the recommendations of the odour risk assessment (Appendix A1) and meets the requirements of the Defra guidance on the control of odour and noise from commercial kitchen exhaust systems (Defra, 2005) for an odour abatement system achieving a high level of odour control.
- 4.3 A design diagram of the kitchen extraction systems; and specification for the Kitchavent 2000 are appended to this report as Appendices A1 and A2 respectively. The maintenance regime for the proposed systems is set out in the next section of this report.

5 Odour Abatement System Maintenance Procedure

- 5.1 In order to ensure the proposed odour abatement system works efficiently and effectively, it is important to adhere to a stringent service and maintenance regime. The maintenance procedures for different components of the kitchen extraction system are set out below, and a summary of the maintenance schedule is presented in Table .

Kitchen Canopy

- 5.2 The kitchen canopies, will be inspected and cleaned on a daily basis. Thorough internal and external cleaning of the whole kitchen canopy will be carried out on a twice-weekly basis.
- 5.3 Kitchen canopies will be cleaned with a mild detergent or specific stainless steel cleaner.

Bag Filter

- 5.4 The bag filters will be checked on a 3-monthly basis and replaced as necessary.

Activated Carbon Filter

- 5.5 In accordance with the manufacturer's instructions, the activated carbon filter will be checked after 2-months of use. A sample of carbon from the filter will be sent to the laboratory for analysis. This will provide an indication of when the unit will require changing. This will be used as the basis for setting the frequency of filter changes.

Extract Ductwork and Fans

- 5.6 Inspections of established PizzaExpress restaurants have found that only the first few metres of ductwork become coated in fat and grease. Beyond this, any deposits are limited to flour and dirt. As a result, the following ductwork cleaning regime will be followed:
- The first few metres of the extraction ductwork above the kitchen extract hood will need to be cleaned in the traditional method of scraping the ductwork clean to remove the fat and grease. Appropriate hatches will be installed to ensure adequate access.
 - The remaining ductwork will be cleaned using a mechanical rotary brush to spin, dislodge and move the contaminant within the ductwork to allow an air vacuum unit to collect it. This will result in fewer access panels being needed that will restrict access for a visual verification of cleaning being completed. It is therefore proposed to insert a camera to verify and record the ductwork cleanliness where required by landlords
- 5.7 Extract ductwork will be checked and cleaned on an annual basis or as required. Any damaged sections of ductwork will be replaced.

- 5.8 The fans will be checked every 3 months and cleaned to remove any grease deposits that have accumulated on the fans.
- 5.9 Table 4 provides a tabulated summary of the kitchen extraction system cleaning and maintenance schedule for the PizzaExpress Delivered development.

Table 4: Pizza Express Kitchen Extraction System Maintenance Schedule Summary

System Component	Maintenance Required	Frequency
Kitchen Canopy	Check and clean external surfaces	Daily
	Clean internal and external surfaces.	Twice-weekly
Extract Ductwork	First few metres scraped to remove fat and grease, remaining ductwork cleaned using rotary brush and vacuum unit.	Annually
Cowl	Check and clean.	Annually
Fans	Check and clean.	3-monthly
Kitchavent 2000	Check bag filters	3-monthly
	Check carbon filter and change as required.	Check after 1 st 2-months of use, then change as indicated by carbon test results
	Inspect and clean outside of the unit.	3-monthly
	Check seals.	3-monthly

- 5.10 The cleaning frequencies set out in Table will be periodically reviewed once the kitchen is in operation. Cleaning frequencies may be increased or decreased accordingly.
- 5.11 All inspection, cleaning and maintenance carried out on the kitchen extraction system will be recorded in a maintenance record log, as described in the next section of this report.

6 Cleaning and Maintenance Records and Reporting

- 6.1 In order to ensure the cleaning and maintenance schedule is adhered to and is reportable, a series of cleaning and maintenance logs and records will be kept.
- 6.2 Two main records will be kept up to date; the first is a weekly cleaning log to record the routine inspection and cleaning required for the kitchen canopy; the second is a maintenance record log for the less frequent cleaning and maintenance tasks, such as bag and carbon filter replacement.
- 6.3 The routine weekly cleaning will be kept in a log, in a format similar to that presented in Table 3. The log will be kept either electronically, or in hard copy form, or both. When routine cleaning is completed, the log is marked with initials or signed.

Table 3: Example Routine Weekly Cleaning Log

W/C Date:	Cleaning Log (initial in box when cleaning complete)						
Component	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Kitchen Canopy (external)							
	Weekly Clean 1			Weekly Clean 2			
Kitchen Canopy (internal)							

- 6.4 The infrequent maintenance tasks will be recorded on a separate log, in a format similar to the example log shown in Table 4. In order to assist with the long-term system maintenance, a diary/calendar will be kept to remind kitchen staff of key dates for component cleaning and replacement, or a date for next inspection.
- 6.5 The maintenance log will be kept either electronically, in hard copy, or both. Once a task is completed a date for the next completion will be determined and recorded on the log, as well as in the diary/calendar for completion.

Table 4: Example Service and Maintenance Log

Task	Date Conducted	Maintenance Conducted by	Follow-up Maintenance Required	Date task next due
Change bag filters	01/02/16	J. Smith	None	01/05/16
Change carbon filters	01/02/16	J. Smith	None	01/04/16
Check abatement unit and seals	04/03/16	D. Jones	None	04/07/16
Check fans	15/03/16	J. Smith	None	15/06/16
Clean ductwork	04/03/16	D. Jones	None	April 2017

7 List of Appendices

Appendix A1: Kitchen Extraction System Schematic

Appendix A2: Kitchavent 2000 Specification

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Kitchavent 2000 / 3000 / 4000

Applications

- Complete grease, smoke, and odour solution
- 2 / 3 / or 4 Stage Filtration
- Duct Mounted
- Modules and combinations to suit all airflows
- Suitable for all cuisines

The Airclean Kitchavent can be installed into any convenient position in the duct run from the hood to the extract fan, offering a filtration solution for grease, smoke and cooking odours present in a kitchen extract.



Stage 1 : Grease Filter

A washable filter that will filter and remove any grease that has passed through the initial pre filters in the cooker hood.

Stage 2 : F5 Bag Filter

A disposable secondary filter to protect, prolong and ensure the working life of the HEPA and Activated Carbon Filter.

Stage 3 : HEPA Filter

If "Blue Smoke" is a problem from char grilling a HEPA filter will ensure the removal of smoke to an efficiency of up to 99.997%.

Stage 4 : Activated Carbon Filter

The final stage of filtration actually adsorbs the odourous organic compounds remaining in the air. By determining the type of cuisine the kitchen is cooking, a contact time can be determined to ensure the removal of any pertinent odours.

Construction

The casing is manufactured from pre-coated steel, having plain external flanges of 40mm, two access doors on both sides, and a painted finish. The Grease Filter is located in a grease trough to facilitate regular cleaning of the unit.

Maintenance

The cleaning regime is set by the user, and should be in accordance with HVCA document TR/17. Generally the Bag filter will require changing at least every 3 months and the Activated Carbon Filter when odours are being let by.

A sample of the activated carbon can be submitted to ourselves for analysis after 2 months of use, the results will provide a guide prediction as to when the unit will require changing. (See Section 6 of catalogue AC6/4 "Free Carbon Testing Service")

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Technical

The Kitchavent Series

The Kitchavent is available with varying styles and levels of filtration to meet specific kitchen requirements.

KITCHAVENT	Air Filter Combination	Filtration Offered
2000	F5 Bag Filter / Activated Carbon Filter	Light Grease / Odours
3000	G2 Grease Filter / F5 Bag Filter / Activated Carbon Filter	Medium to Heavy Grease / Odours
4000	G2 Grease Filter / F5 Bag Filter / HEPA Filter / Activated Carbon Filter	Medium to Heavy Grease / Smoke / Odours

Contact Times

Typically recommended contact times :-

0.1 Seconds Contact Time : Suitable for most odour removal in English and Chinese Cuisine.
(Light Odours)

0.3 Seconds Contact Time : Suitable for most odour removal in Indian and Thai Cuisine.
(Heavy Odours)

For Specific odour removal please refer to our "Guide to Gaseous Adsorption" (Catalogue AC6/1b, Section 6), or contact our technical team.

Positioning and Mounting

Units having a grease filter must be installed with horizontal airflow direction, and can be multiplied up for larger installations. If the Grease filter is not installed (Kitchavent 2000), then a vertically down airflow can be used.

Filter Changes and maintenance can be carried out from both sides of the units. Consideration must be made for manual handling and mounting as the weights of the Activated Carbon Filters and the actual units are high. (See below, and Catalogue AC6/2a Section 6).

Where installation access is difficult, **flat pack** AHU style Kitchavents are available for engineers to simply put together on site.

Operating Conditions

Max allowable air on conditions to the unit are 40 Degree Centigrade and 80% Relative Humidity, if these conditions are exceeded then the activated carbon filter will be ineffective.

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KITCHAVENT 2000 - 2 Stage Odour Control : 0.1 Second Contact Time

Airflow Rating @ 0.1 Second Contact Time			Overall Casing Size (mm) *			Cell Qty.	Part Numbers
m3/s	P.D. (Pa)		Height	Width	Depth		Casing / F5 Bag / Activated Carbon
	Clean	Dirty					
0.13	160	195	383	383	877	1	(1x) 1815201 / (1x) 1410621 / (1x) 1620601
0.26	160	195	383	681	877	2	(1x) 1815202 / (2x) 1410621 / (2x) 1620601
0.39	160	195	383	979	877	3	(1x) 1815203 / (3x) 1410621 / (3x) 1620601
0.52	160	195	383	1277	877	4	(1x) 1815204 / (4x) 1410621 / (4x) 1620601
0.27	322	400	383	383	1182	1	(1x) 1815211 / (1x) 1410621 / (1x) 1620602
0.54	322	400	383	681	1182	2	(1x) 1815212 / (2x) 1410621 / (2x) 1620602
0.81	322	400	383	979	1182	3	(1x) 1815213 / (3x) 1410621 / (3x) 1620602
1.08	322	400	383	1277	1182	4	(1x) 1815214 / (4x) 1410621 / (4x) 1620602
0.3	132	169	535	535	877	1	(1x) 1815221 / (1x) 1410623 / (1x) 1620603
0.6	132	169	535	985	877	2	(1x) 1815222 / (2x) 1410623 / (2x) 1620603
0.54	253	321	535	535	1182	1	(1x) 1815231 / (1x) 1410623 / (1x) 1620604
1.08	253	321	535	985	1182	2	(1x) 1815232 / (2x) 1410623 / (2x) 1620604
0.53	296	367	688	383	1182	1	(1x) 1815251 / (1x) 1410624 / (1x) 1620606
1.06	296	367	688	681	1182	2	(1x) 1815252 / (2x) 1410624 / (2x) 1620606
1.59	296	367	688	979	1182	3	(1x) 1815253 / (3x) 1410624 / (3x) 1620606
2.12	296	367	688	1277	1182	4	(1x) 1815254 / (4x) 1410624 / (4x) 1620606

KITCHAVENT 2000 - 2 Stage Odour Control : 0.3s Contact Time

Airflow Rating @ 0.3 Second Contact Time			Overall Casing Size (mm) *			Cell Qty.	Part Numbers
m3/s	P.D. (Pa)		Height	Width	Depth		Casing / F5 Bag / Activated Carbon
	Clean	Dirty					
0.04	53	65	383	383	877	1	(1x) 1815201 / (1x) 1410621 / (1x) 1620601
0.09	53	65	383	681	877	2	(1x) 1815202 / (2x) 1410621 / (2x) 1620601
0.13	53	65	383	979	877	3	(1x) 1815203 / (3x) 1410621 / (3x) 1620601
0.17	53	65	383	1277	877	4	(1x) 1815204 / (4x) 1410621 / (4x) 1620601
0.09	107	133	383	383	1182	1	(1x) 1815211 / (1x) 1410621 / (1x) 1620602
0.18	107	133	383	681	1182	2	(1x) 1815212 / (2x) 1410621 / (2x) 1620602
0.27	107	133	383	979	1182	3	(1x) 1815213 / (3x) 1410621 / (3x) 1620602
0.36	107	133	383	1277	1182	4	(1x) 1815214 / (4x) 1410621 / (4x) 1620602
0.10	44	56	535	535	877	1	(1x) 1815221 / (1x) 1410623 / (1x) 1620603
0.20	44	56	535	985	877	2	(1x) 1815222 / (2x) 1410623 / (2x) 1620603
0.18	84	107	535	535	1182	1	(1x) 1815231 / (1x) 1410623 / (1x) 1620604
0.36	84	107	535	985	1182	2	(1x) 1815232 / (2x) 1410623 / (2x) 1620604
0.18	99	122	688	383	1182	1	(1x) 1815251 / (1x) 1410624 / (1x) 1620606
0.35	99	122	688	681	1182	2	(1x) 1815252 / (2x) 1410624 / (2x) 1620606
0.53	99	122	688	979	1182	3	(1x) 1815253 / (3x) 1410624 / (3x) 1620606
0.71	99	122	688	1277	1182	4	(1x) 1815254 / (4x) 1410624 / (4x) 1620606

* Duct Size is overall size Less 80mm.

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KITCHAVENT 3000 - 3 Stage Grease and Odour Control : 0.1 Second Contact Time

Airflow Rating @ 0.1 Second Contact Time			Overall Casing Size (mm) *			Cell Qty.	Part Numbers
m3/s	P.D. (Pa)		Height	Width	Depth		Casing / Grease / F5 Bag / Activated Carbon
	Clean	Dirty					
0.13	178	231	383	383	877	1	(1x) 1815301 / (1x) 1310601 / (1x) 1410621 / (1x) 1620601
0.26	178	231	383	681	877	2	(1x) 1815302 / (2x) 1310601 / (2x) 1410621 / (2x) 1620601
0.39	178	231	383	979	877	3	(1x) 1815303 / (1x) 1310601 / (3x) 1410621 / (3x) 1620601
0.52	178	231	383	1277	877	4	(1x) 1815304 / (1x) 1310601 / (4x) 1410621 / (4x) 1620601
0.27	354	464	383	383	1182	1	(1x) 1815311 / (1x) 1310601 / (1x) 1410621 / (1x) 1620602
0.54	354	464	383	681	1182	2	(1x) 1815312 / (2x) 1310601 / (2x) 1410621 / (2x) 1620602
0.81	354	464	383	979	1182	3	(1x) 1815313 / (2x) 1310601 / (3x) 1410621 / (3x) 1620602
1.08	354	464	383	1277	1182	4	(1x) 1815314 / (2x) 1310601 / (4x) 1410621 / (4x) 1620602
0.3	150	205	535	535	877	1	(1x) 1815321 / (1x) 1310603 / (1x) 1410623 / (1x) 1620603
0.6	150	205	535	985	877	2	(1x) 1815322 / (2x) 1310603 / (2x) 1410623 / (2x) 1620603
0.54	286	387	535	535	1182	1	(1x) 1815331 / (1x) 1310603 / (1x) 1410623 / (1x) 1620604
1.08	286	387	535	985	1182	2	(1x) 1815332 / (2x) 1310603 / (2x) 1410623 / (2x) 1620604
0.53	331	437	688	383	1182	1	(1x) 1815351 / (1x) 1310604 / (1x) 1410624 / (1x) 1620606
1.06	331	437	688	681	1182	2	(1x) 1815352 / (2x) 1310604 / (2x) 1410624 / (2x) 1620606
1.59	331	437	688	979	1182	3	(1x) 1815353 / (3x) 1310604 / (3x) 1410624 / (3x) 1620606
2.12	331	437	688	1277	1182	4	(1x) 1815354 / (4x) 1310604 / (4x) 1410624 / (4x) 1620606

KITCHAVENT 3000 - 3 Stage Grease and Odour Control : 0.3 Second Contact Time

Airflow Rating @ 0.3 Second Contact Time			Overall Casing Size (mm) *			Cell Qty.	Part Numbers
m3/s	P.D. (Pa)		Height	Width	Depth		Casing / Grease / F5 Bag / Activated Carbon
	Clean	Dirty					
0.04	59	77	383	383	877	1	(1x) 1815301 / (1x) 1310601 / (1x) 1410621 / (1x) 1620601
0.09	59	77	383	681	877	2	(1x) 1815302 / (2x) 1310601 / (2x) 1410621 / (2x) 1620601
0.13	59	77	383	979	877	3	(1x) 1815303 / (1x) 1310601 / (3x) 1410621 / (3x) 1620601
0.17	59	77	383	1277	877	4	(1x) 1815304 / (1x) 1310601 / (4x) 1410621 / (4x) 1620601
0.09	118	155	383	383	1182	1	(1x) 1815311 / (1x) 1310601 / (1x) 1410621 / (1x) 1620602
0.18	118	155	383	681	1182	2	(1x) 1815312 / (2x) 1310601 / (2x) 1410621 / (2x) 1620602
0.27	118	155	383	979	1182	3	(1x) 1815313 / (2x) 1310601 / (3x) 1410621 / (3x) 1620602
0.36	118	155	383	1277	1182	4	(1x) 1815314 / (2x) 1310601 / (4x) 1410621 / (4x) 1620602
0.10	50	68	535	535	877	1	(1x) 1815321 / (1x) 1310603 / (1x) 1410623 / (1x) 1620603
0.20	50	68	535	985	877	2	(1x) 1815322 / (2x) 1310603 / (2x) 1410623 / (2x) 1620603
0.18	95	129	535	535	1182	1	(1x) 1815331 / (1x) 1310603 / (1x) 1410623 / (1x) 1620604
0.36	95	129	535	985	1182	2	(1x) 1815332 / (2x) 1310603 / (2x) 1410623 / (2x) 1620604
0.18	110	146	688	383	1182	1	(1x) 1815351 / (1x) 1310604 / (1x) 1410624 / (1x) 1620606
0.35	110	146	688	681	1182	2	(1x) 1815352 / (2x) 1310604 / (2x) 1410624 / (2x) 1620606
0.53	110	146	688	979	1182	3	(1x) 1815353 / (3x) 1310604 / (3x) 1410624 / (3x) 1620606
0.71	110	146	688	1277	1182	4	(1x) 1815354 / (4x) 1310604 / (4x) 1410624 / (4x) 1620606

* Duct Size is overall size Less 80mm.

AIRCLEAN

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KITCHAVENT 4000 - 4 Stage Grease, Smoke, and Odour Control : 0.1 Second Contact Time

Airflow Rating @ 0.1 Second Contact Time		Overall Casing Size (mm) *			Cell Qty.	Part Numbers
m3/s	P.D. (Pa)		Height	Width	Depth	Casing / Grease / F5 Bag / HEPA / Activated Carbon
	Clean	Dirty				
0.13	275	425	383	383	1519	1 (1x) 1815401 / (1x) 1310601 / (1x) 1410621 / (1x) 1510801 / (1x) 1620601
0.26	275	425	383	681	1519	2 (1x) 1815402 / (2x) 1310601 / (2x) 1410621 / (2x) 1510801 / (2x) 1620601
0.39	275	425	383	979	1519	3 (1x) 1815403 / (3x) 1310601 / (3x) 1410621 / (3x) 1510801 / (3x) 1620601
0.52	275	425	383	1277	1519	4 (1x) 1815404 / (4x) 1310601 / (4x) 1410621 / (4x) 1510801 / (4x) 1620601
0.20	418	651	383	383	1824	1 (1x) 1815401 / (1x) 1310601 / (1x) 1410621 / (1x) 1510801 / (1x) 1620602
0.40	418	651	383	681	1824	2 (1x) 1815402 / (2x) 1310601 / (2x) 1410621 / (2x) 1510801 / (2x) 1620602
0.60	418	651	383	979	1824	3 (1x) 1815403 / (3x) 1310601 / (3x) 1410621 / (3x) 1510801 / (3x) 1620602
0.80	418	651	383	1277	1824	4 (1x) 1815404 / (4x) 1310601 / (4x) 1410621 / (4x) 1510801 / (4x) 1620602
0.30	254	413	535	535	1519	1 (1x) 1815421 / (1x) 1310603 / (1x) 1410623 / (1x) 1510803 / (1x) 1620603
0.60	254	413	535	985	1519	2 (1x) 1815422 / (2x) 1310603 / (2x) 1410623 / (2x) 1510803 / (2x) 1620603
0.43	373	599	535	535	1824	1 (1x) 1815421 / (1x) 1310603 / (1x) 1410623 / (1x) 1510803 / (1x) 1620604
0.86	373	599	535	985	1824	2 (1x) 1815422 / (2x) 1310603 / (2x) 1410623 / (2x) 1510803 / (2x) 1620604
0.40	401	632	688	383	1824	1 (1x) 1815451 / (1x) 1310604 / (1x) 1410624 / (1x) 1510804 / (1x) 1620606
0.80	401	632	688	681	1824	2 (1x) 1815452 / (2x) 1310604 / (2x) 1410624 / (2x) 1510804 / (2x) 1620606
1.20	401	632	688	979	1824	3 (1x) 1815453 / (3x) 1310604 / (3x) 1410624 / (3x) 1510804 / (3x) 1620606
1.60	401	632	688	1277	1824	4 (1x) 1815454 / (4x) 1310604 / (4x) 1410624 / (4x) 1510804 / (4x) 1620606

KITCHAVENT 4000 - 4 Stage Grease, Smoke, and Odour Control : 0.3 Second Contact Time

Airflow Rating @ 0.3 Second Contact Time		Overall Casing Size (mm) *			Cell Qty.	Part Numbers
m3/s	Clean P.D. (Pa)		Height	Width	Depth	Casing / Grease / F5 Bag / HEPA / Activated Carbon
	Clean	Dirty				
0.04	92	142	383	383	1519	1 (1x) 1815401 / (1x) 1310601 / (1x) 1410621 / (1x) 1510801 / (1x) 1620601
0.09	92	142	383	681	1519	2 (1x) 1815402 / (2x) 1310601 / (2x) 1410621 / (2x) 1510801 / (2x) 1620601
0.13	92	142	383	979	1519	3 (1x) 1815403 / (3x) 1310601 / (3x) 1410621 / (3x) 1510801 / (3x) 1620601
0.17	92	142	383	1277	1519	4 (1x) 1815404 / (4x) 1310601 / (4x) 1410621 / (4x) 1510801 / (4x) 1620601
0.07	139	217	383	383	1824	1 (1x) 1815401 / (1x) 1310601 / (1x) 1410621 / (1x) 1510801 / (1x) 1620602
0.13	139	217	383	681	1824	2 (1x) 1815402 / (2x) 1310601 / (2x) 1410621 / (2x) 1510801 / (2x) 1620602
0.20	139	217	383	979	1824	3 (1x) 1815403 / (3x) 1310601 / (3x) 1410621 / (3x) 1510801 / (3x) 1620602
0.27	139	217	383	1277	1824	4 (1x) 1815404 / (4x) 1310601 / (4x) 1410621 / (4x) 1510801 / (4x) 1620602
0.10	85	138	535	535	1519	1 (1x) 1815421 / (1x) 1310603 / (1x) 1410623 / (1x) 1510803 / (1x) 1620603
0.20	85	138	535	985	1519	2 (1x) 1815422 / (2x) 1310603 / (2x) 1410623 / (2x) 1510803 / (2x) 1620603
0.14	124	200	535	535	1824	1 (1x) 1815421 / (1x) 1310603 / (1x) 1410623 / (1x) 1510803 / (1x) 1620604
0.29	124	200	535	985	1824	2 (1x) 1815422 / (2x) 1310603 / (2x) 1410623 / (2x) 1510803 / (2x) 1620604
0.13	134	211	688	383	1824	1 (1x) 1815451 / (1x) 1310604 / (1x) 1410624 / (1x) 1510804 / (1x) 1620606
0.27	134	211	688	681	1824	2 (1x) 1815452 / (2x) 1310604 / (2x) 1410624 / (2x) 1510804 / (2x) 1620606
0.40	134	211	688	979	1824	3 (1x) 1815453 / (3x) 1310604 / (3x) 1410624 / (3x) 1510804 / (3x) 1620606
0.53	134	211	688	1277	1824	4 (1x) 1815454 / (4x) 1310604 / (4x) 1410624 / (4x) 1510804 / (4x) 1620606

* Duct Size is overall size Less 80mm.