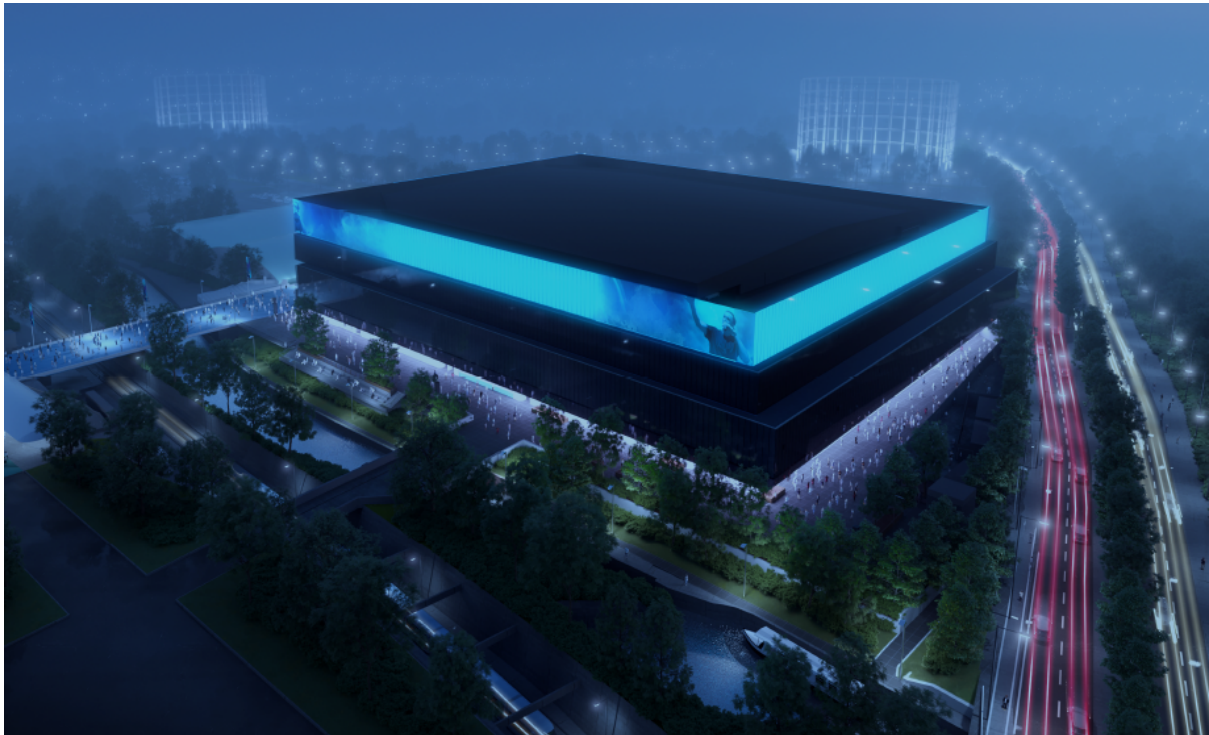




Planning Condition
Section 106, Condition 25
Fumes, Vapours and Odour Extraction

DOCUMENT STATUS

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Introduction

This document has been produced to provide details required under Planning Section 106, Condition 25, which states:

Prior to the first use of the development, details of a scheme to extract fumes, vapours and odours from the premises shall be submitted for approval in writing by the City Council, as Local Planning Authority. The approved scheme shall then be implemented prior to the first use of the development and thereafter retained and maintained in situ.

System Description

The management of fumes, vapours, and odours is a paramount consideration in the facility's operational design. We have implemented a comprehensive system utilizing advanced technology to ensure effective control and mitigation of these elements. Kitchen areas are the only source of fumes, vapours and odours within the premises. The key components of the system include Halton canopies located over cooking areas with UV treatment, a Halton Pollustop unit with carbon filters, and the discharge of clean air through external louvres.

1.	Halton Canopies Incorporating UV Treatment:	
	• Kitchens are equipped with Halton canopies that are specifically designed to capture and contain fumes, vapours, and odours emitted during cooking processes. • These canopies incorporate UV treatment technology, which assists in neutralizing and eliminating airborne pathogens and contaminants, enhancing the overall air quality within the kitchen space.	
2.	Halton Pollustop Unit with Carbon Filters:	
	• The extract system is integrated with a Halton Pollustop unit, a cutting-edge technology aimed at further refining the extracted air. • This unit houses advanced carbon filters, meticulously designed to trap and eliminate odours, volatile organic compounds (VOCs), and other airborne contaminants, ensuring that only purified air is released into the environment.	
3.	Discharge of Clean Air via External Louvres:	
	• The purified air, having undergone rigorous filtration and treatment, is safely and efficiently discharged to the exterior environment through external louvres. • These louvres are strategically positioned to facilitate the dispersal of clean air while minimizing any potential impact on surrounding areas.	

Regular maintenance schedules and stringent quality checks will be integral parts of the operational protocols. This proactive approach ensures the optimal functioning of the ventilation and filtration systems, guaranteeing consistent and efficient management of fumes, vapours, and odours.

RIBA Stage 4a Consultants Design Note

19024	OVG Manchester	DESIGN NOTE	028
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1.0 INTRODUCTION

This design note has been prepared to explain the Stage 4a design strategy for the kitchen extract ventilation systems including the use of UV-C filtration.

2.0 STANDARD KITCHEN EXTRACT

The historic method of designing a kitchen extract system would be to provide a bifurcated extract fan located remote from the space which would be connected by a network of fire rated ductwork. The fire rated ductwork would act as extension of the fire compartment which encapsulates the kitchen. The extract fan and discharge point would have to be located to avoid noise and air contamination issues. Untreated grease and smoke laden air would have required a vertical discharge point above roof level.

During operation, the smoke from the kitchen would discharge at the kitchen extract point to atmosphere. Generally, the extract would be untreated, meaning that the point of exhaust would need to be minimum 10m away from a building entry point or window. This distance increases to 20m to comply with BREEAM as it is classed as a point of pollution

As the air would be untreated, a strict and complex maintenance regime would need to be put in place to ensure that the ductwork could be cleaned regularly. Extract ductwork left uncleaned presents a significant fire hazard due to the build-up of grease. It is also due to the build-up of grease that the fire rated ductwork is used and that fire dampers cannot be installed.



Figure 1 - Grease build-up in extract ductwork

3.0 UV-C FILTRATION METHODOLOGY AND ACTIVE FIRE PROTECTION

As part of the kitchen extract strategy for this project, ME Engineers have utilised a strategy that involves using a high level of filtration that effectively removes grease particles from the air stream, in conjunction with active fire protection (Ansul 1201) within each extract canopy.

UV-light technology breaks small grease particles into smaller molecular units. Ozone generated by the UVC lamps reacts with the solid and vaporized greases. The resulting substance will not stick to the ductwork or fans. This helps to reduce a serious fire risk and expensive cleaning of the ducts. These filters are integrated as an integral part of the kitchen canopies so that the grease is broken down before it gets to the extract ductwork.

As the grease has been broken down and removed from the kitchen extract at the hood, there is no longer a risk of grease build-up in the kitchen extract ductwork. The ductwork can therefore be constructed using conventional galvanised steel (DW144) with fire dampers used where the ductwork passes through fire compartments. This presents a capital and operational cost benefit.

DW172 states that where kitchen extract ductwork leaves the fire compartment of the kitchen, it must be fire rated and fire dampers should not be used. However, this does not take into account the use of UV-C filters and their effect on the grease particles.

In addition to the integrated UV-C canopy filtration with Ansul 1201 protection, is a packaged Ecology air handling unit which is used to extract the air from the kitchen. An Ecology unit comprises of the following components:

- Panel & Bag filter
- HEPA filter
- Active Carbon filter
- Heat recovery coil
- Extract plug fan

After the grease is broken down by the UV-C filters, it will leave a powder like residue. The panel and bag filters are used to remove the larger particles from the air stream prior to the HEPA filter which is used to remove the finer particles. The HEPA filter also acts a level of protection for the carbon filter which is then used to remove the remaining odours and naturally generated Ozone arising from the UV-C filtration system.

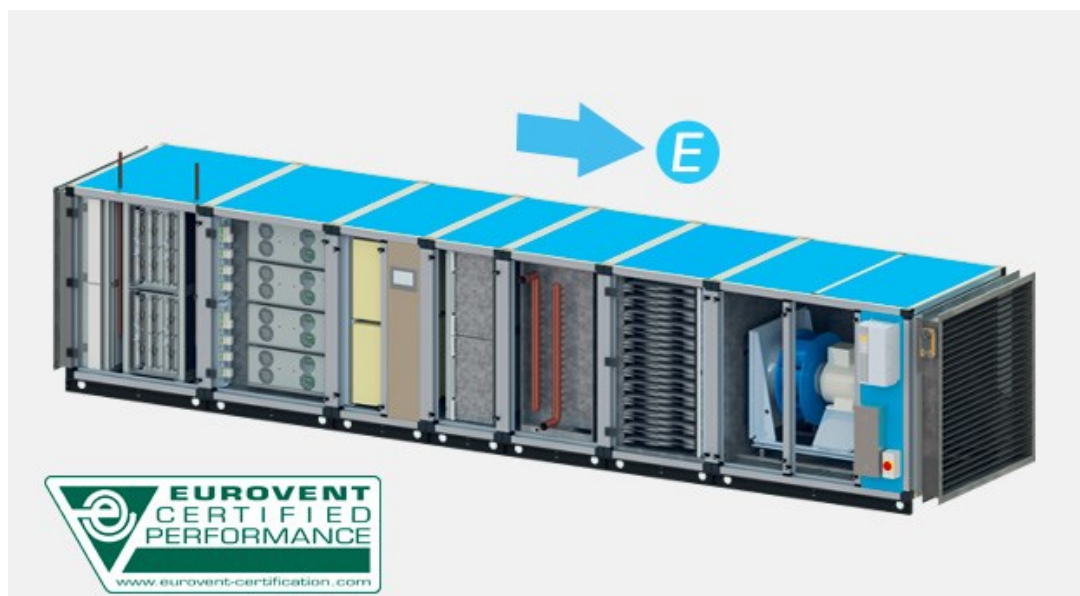


Figure 2 - Ecology unit diagram

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Once the air stream has passed through all levels of filtration, it can then be looked at as a clean exhaust air system, which has benefits for the surrounding environment and compared to a conventional kitchen extract, has less constraints from a design and construction aspect.

In order to extend the life of the filters and the Ecology unit, there are several safety interlocks put in place for the operation of the kitchen extract system. It is critical that the Ecology units are only used in conjunction with UV-C filters to ensure that heavy grease particles do not block the filters within the ecology unit. The kitchen extract system is therefore interlocked with the UV lamp control system to ensure that the ventilation is not in operation unless the UV-C filters are activated.

UV-C filters will also have additional safety interlocks that ensure they are switched off when the ventilation system is not in use to prevent the lamps from burning out. They will also switch off if an access panel is opened during maintenance.

Cleaning and maintenance regimes will still need to be adhered to, to ensure that the UV-C filters and grease baffles in the hoods are being regularly cleaned. The ductwork will also need regular and thorough cleaning.

4.0 CONCLUSION

In conclusion, the UV-C method has a large number of benefits to the client and the surrounding environment:

- Galvanised steel ductwork can be installed as opposed to fire rated ductwork for all kitchen extract systems
- Reduced level of maintenance and cleaning required due to the removal of grease particles at source
- Cleaning the exhaust air stream and removing pollutants before discharging to atmosphere allows flexibility with louvre positions
- Extended life span of all components within the kitchen extract system
- Reduced design restrictions on the ventilation system due to the clean exhaust system

This is a method that ME Engineers have implemented on numerous projects in the past. Examples include:

- O2 Arena, London
- Aviva Stadium, Dublin
- Twickenham Stadium, Twickenham
- Tottenham FC Training Centre, Enfield
- Wimbledon Centre Court
- Wimbledon No.1 Court
- AMEX Stadium, Brighton
- Leicester City FC Training Ground