

Burger King Kitchen Extraction Maintenance

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Burger King Europe Safety Department

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Background

To date the worldwide standard for Burger King has been based upon a cleaning frequency of a full end to end clean every \$250,000 sales. In the US due to local codes there has been the requirement to clean every 3 months if this comes sooner than the \$250,000, in International the standard has been clean every six months if this comes sooner than the \$250,000.

Two areas of development have lead to this review of our current system:

- The development and publication in the UK by the Heating and Ventilating Contractors' Association (HVCA) of the **GUIDE TO GOOD PRACTICE – CLEANLINESS OF VENTILATION SYSTEMS TR/17** which bases frequency of extract clean upon depth of grease deposit within the duct. Many bodies are adopting this standard namely landlords, fire officers and insurers.
- The recent dramatic improvements in usable grease extraction technology available

It was realized that it was time to challenge our previous standard and to produce one better reflecting the risks and opportunities open to us.

New BK duct cleaning standard

The Burger King Duct Maintenance Standards and hence cleaning frequency will now be based upon the level of grease build up on the duct walls.

The levels of grease build up will be determined using the Wet Film Thickness Measurement system as described in on page 6. This system allows reasonably accurate and cost effective way of determining the level of build up on any flat surface.

Wet film thickness measurements must be taken on the four sides of the duct at the following points to give an average thickness for each location:

- 100mm into the broiler duct after it leaves the hood.
- 100mm into the fryer duct after it leaves the hood.
- In the Broiler duct half way between hood and common duct.
- In the fryer duct half way between hood and common duct.
- 1 meter into the common duct after the broiler and fryer duct junction.
- Halfway between the start of the common duct and the fan.
- 300mm before duct enters the fan housing.
- At the fan discharge / exhaust.

If the average thickness taken across eight points is greater than 200 microns (0.2mm) then the duct must be cleaned.

If any single area of the duct exceeds 500 microns (0.5mm) then that area must be cleaned.

Following a clean there must not be any deposits of more than 50 microns (0.05 mm)

The fan and the 2 meters beyond the fan will be fully cleaned twice per annum.

Testing has shown that filter choice plays a significant part in determining the rate of grease build up. When a new site is opened the rate of grease deposition should be monitored on a minimum of a monthly basis until the rate of deposition for that site is confirmed to adhere to the predicted deposition rate for the filter type used. In existing sites this standard must be discussed with the duct cleaning company and a frequency agreed upon.

All cleans must be fully documented on the Duct Cleaning Record Sheet and any defects or requests for additional work followed up on by the restaurant manager with the specified contractor.

Each restaurant will have a true scale isometric diagram of the extract system (see example) held in the maintenance records on site. This will be readily available to the cleaning contractors or other interested parties to allow easy identification of issues and to help ensure all parts of the duct are included in all cleaning and inspection exercises.

All cleaning companies should have their work inspected or audited by an independent third party employed directly by the restaurant operator on a basis of at least one inspection in ten cleans.

This Standard may be adopted by any restaurant immediately but will be mandated from 1st July 2005.

KITCHEN EXTRACT DUCT JOB RECORD SHEET



RESTAURANT: _____ MANAGER: _____

DATE: _____ CLEANING COMPANY: _____

CLEANING COMPANY TEAM LEADER: _____

NUMBER IN TEAM: _____

TIME AT START OF CLEAN: _____ TIME AT FINISH: _____

Pre Clean Wet Film Thickness Readings (Microns):

	100mm into the broiler duct after it leaves the hood.		1 meter into the common duct after the broiler and fryer duct junction.
	100mm into the fryer duct after it leaves the hood.		Halfway between the start of the common duct and the fan.
	In the Broiler duct half way between hood and common duct.		300mm before duct enters the fan housing.
	In the fryer duct half way between hood and common duct.		At the fan discharge / exhaust.

Number of access panels removed for cleaning: _____

Are there access panels to allow total access to all areas?

Tick box if action required

Number of filters removed for cleaning - are any damaged / allowing unfiltered air to bypass?

Tick box if action required

Any visible problems with extract fan?

Tick box if action required

Has the entire duct been cleaned back less than 50 micron thickness grease deposits on this visit
- if not why and when will it be completed?

Tick box if action required

Further actions: _____

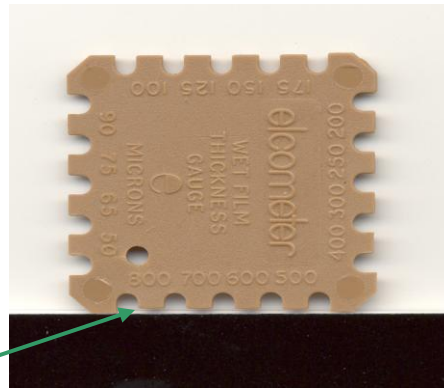
Managers signature on completion & inspection: _____

Team Leaders signature on completion & inspection: _____

Measuring Grease Thickness

The most appropriate and cost effective means of measuring grease thickness within our ducts is by the use of a wet film thickness gauge.

The main supplier of these in the UK is Elcometer who may be contacted on 0161 371 6010 or via their web site.



The gaps between the surface on which the comb is placed and the teeth of the comb are indicated in microns (thousandths of a millimeter).



When the comb is placed on the duct wall and pulled across the surface for 100mm (for circular ductwork, slide around the circumference of the duct) the comb teeth leave marks on the surface of the grease also grease is collected on all teeth that touch the grease. Examine the marks left in the grease and note the value of the last tooth to scrape the surface and collect grease. The last / highest tooth to collect grease will identify the grease film thickness at that point.

Measurements should be taken on all four faces of the duct at each test location. The four point measurements should be added together and the total divided by 4 to give the mean or average grease depth at that test location.

It is this mean figure that should be written in the “Pre clean wet film thickness reading” chart on the Kitchen Extract Duct Job Record Sheet.

Filter testing

The following filters were tested to determine the relative efficiency and the rate at which they allowed grease to build up on the duct walls:

Gamble baffle filter:



Gaylord GX filter



Ventmaster Cartridge filter

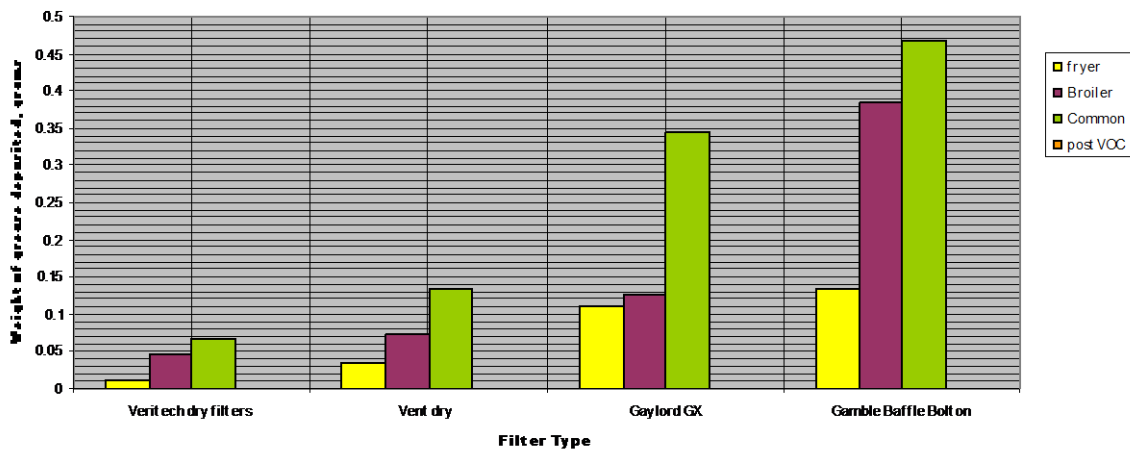


Veritech Filters



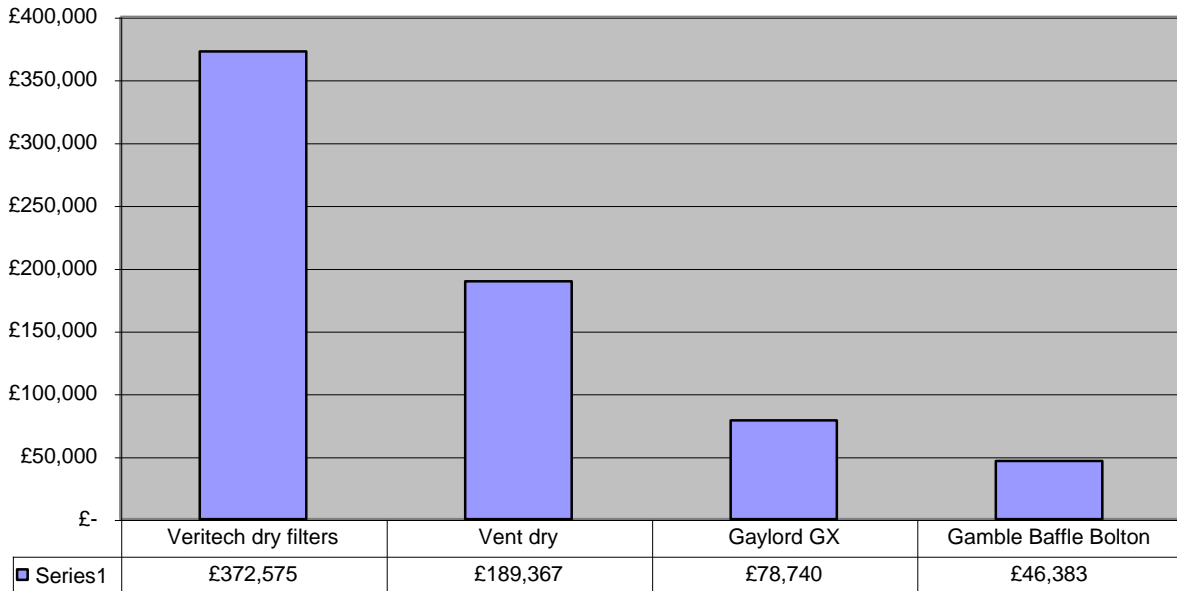
The comparative results for these filters are shown below:

Grease deposited per £1000 sales



It can be seen from the graph that the least efficient filter – that which allows most to pass through and deposit on the wire mesh is the Gamble baffle, the most efficient filter is the Veritech. This data allows us to see what typical restaurant sales volumes that we should be able to achieve before the duct requires cleaning based upon the 200 micron average across the eight measuring points.

Restaurant Sales Before Duct Clean



Based upon this if following the TR17 guidelines we will need to clean a Gamble Baffle filter restaurant every £46,383 whereas a Veritech dry filter would not be expecting to be cleaned until £372,575.

Payback on filter upgrades

The operating costs of all these filters are directly equivalent as they all require cleaning by staff every night, the new build installation costs are not going to vary by more than few hundred pounds and are a one off cost.

The exact installation costs will vary by site if being done as a retrofit as the size and design of the hoods will vary.

Having reviewed the company estate typical costs for conversion of a DT restaurant using a two filter broiler hood and a four vat fry suite are:

Material cost	£1260
Installation cost	£1695
Total retrofit cost	£2955

If we take this DT restaurant fitted with baffle filters and a sales volume of £750,000 per annum, once the BK/TR17 duct cleaning standard is introduced the duct cleaning frequency will increase from three times per annum to fifteen times per annum.

If each clean costs £400 this will cost an additional £4800 per annum.

The Burger King grease filter evaluation exercise has proven that grease contamination rates are up to eight times less when the existing filters are replaced with Veritech filters, therefore by installing Veritech grease filters the TR17 cleaning requirement of fifteen times per annum at the £750,000 DT site formally fitted with baffle filters, could reduce to just twice per annum with the site still complying with TR17.

This situation would give an annual saving of £400 over the current (pre TR17) position or, £5200 pa over the cost of complying with the new TR17 standard whilst retaining the old filters.

Although the actual saving may vary from site to site subject to individual ventilation system designs, replacement of the existing grease filters with Veritech filters will allow similar / substantial reductions in the duct cleaning requirement in all cases.