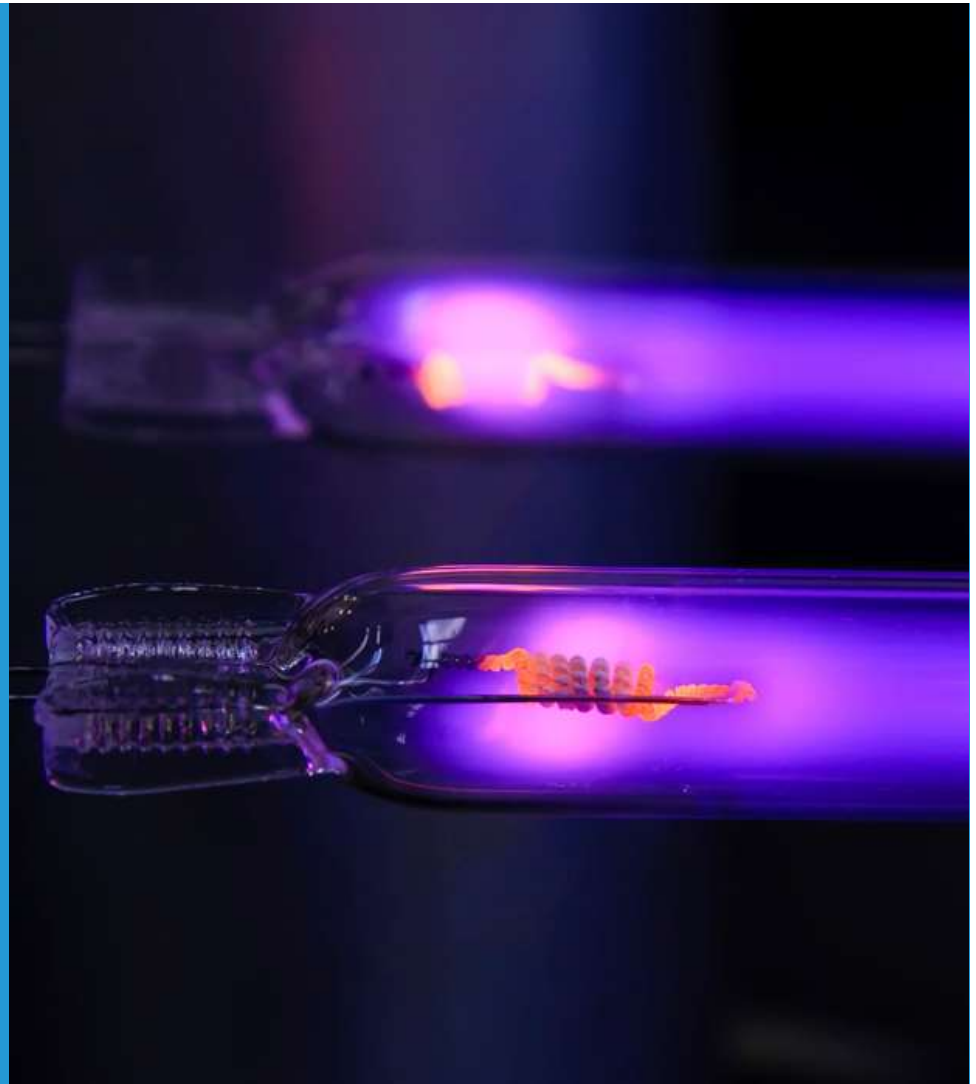


The Capture Ray™ technology in brief

Enabling Wellbeing



What kind of UV lamps do we use?

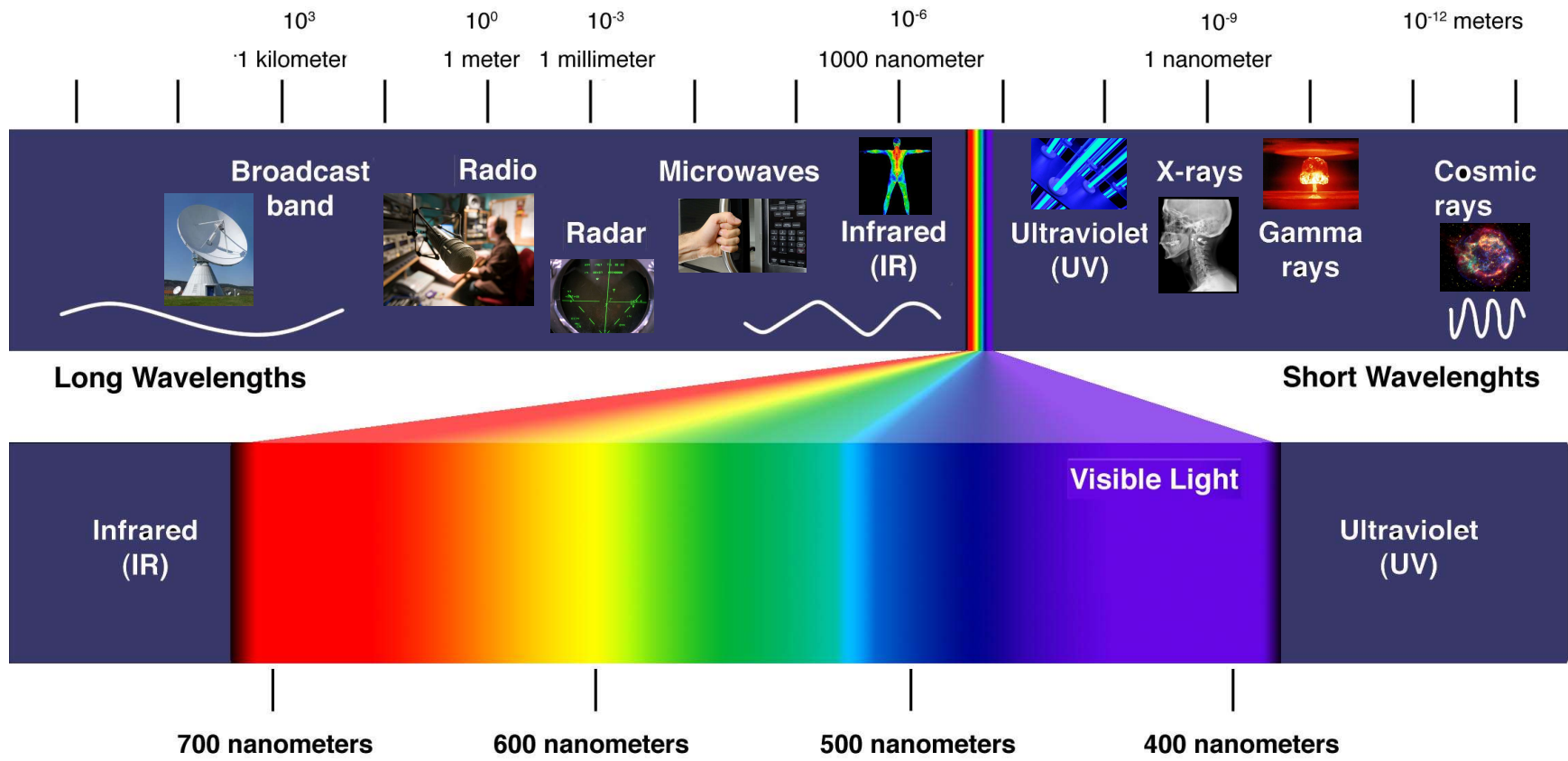


The Capture Ray™ technology is based on the use of UV-C lamps that are integrated into the exhaust plenum of our hoods or ventilated ceilings.

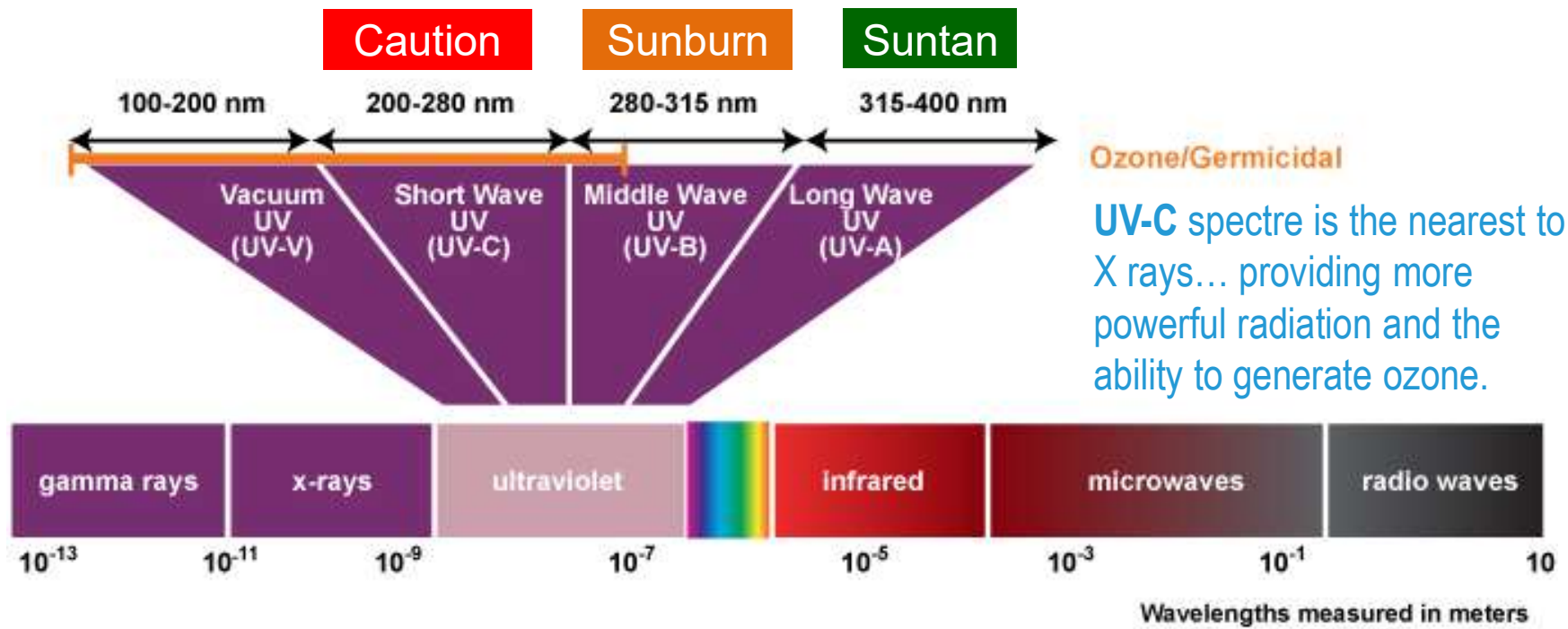
The Capture Ray™ technology is also used in PolluStop Air Handling Units.

Let's have a look on the UV spectrum!

Halton



UV spectrum



Beware: Access safety is a must!



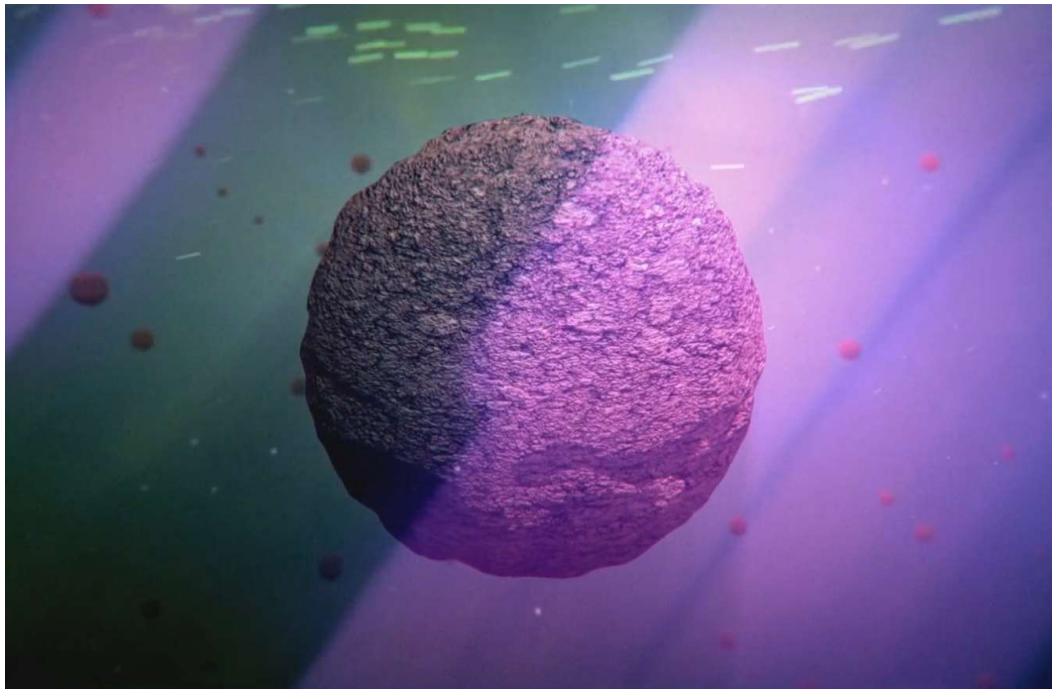
UV-C lamps are widely used in different industries but they require specific provisions.

Halton Capture Ray™ hoods are equipped with 3 securities that prevent any accidental exposure to UV-C light.

- Safety switch on the access door
- magnetic control on each filter
- Pressure control

Halton

How does the UV-C act on grease ?

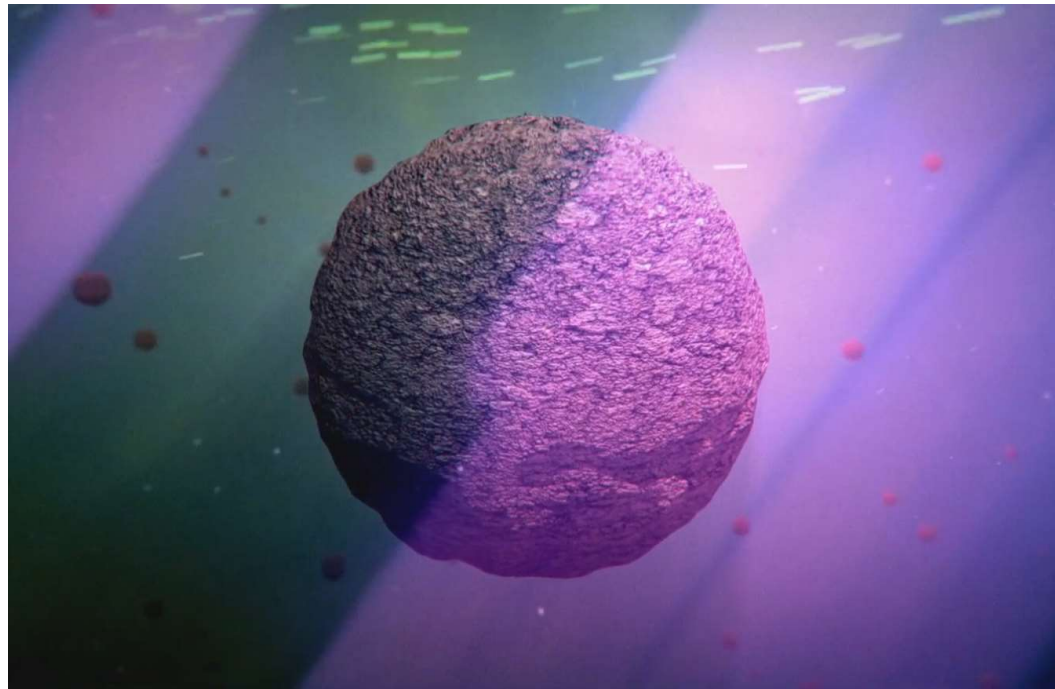


Halton's Capture Ray™ technology neutralises the grease particles but above all, it also acts on grease vapours and VOCs.

These are the 3 main factors for odour transfer.

Halton

How does the UV-C act on grease ?



Neutralisation reaction is based on **two simultaneous phenomena**

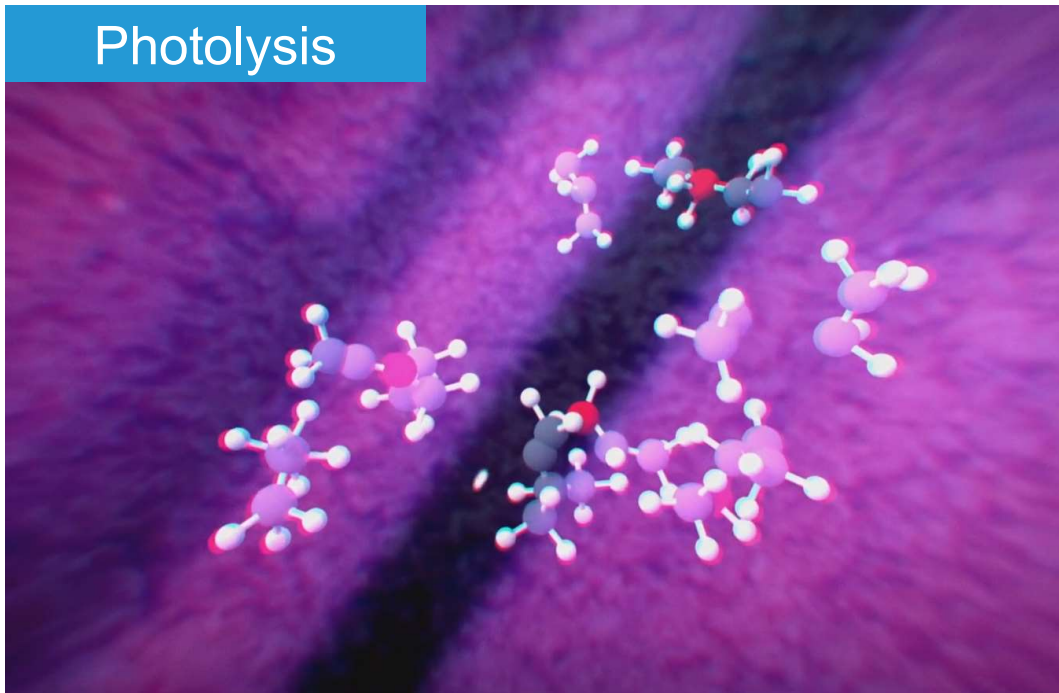
Photolysis

Ozonolysis

Halton

How does the UV-C act on grease ?

Photolysis

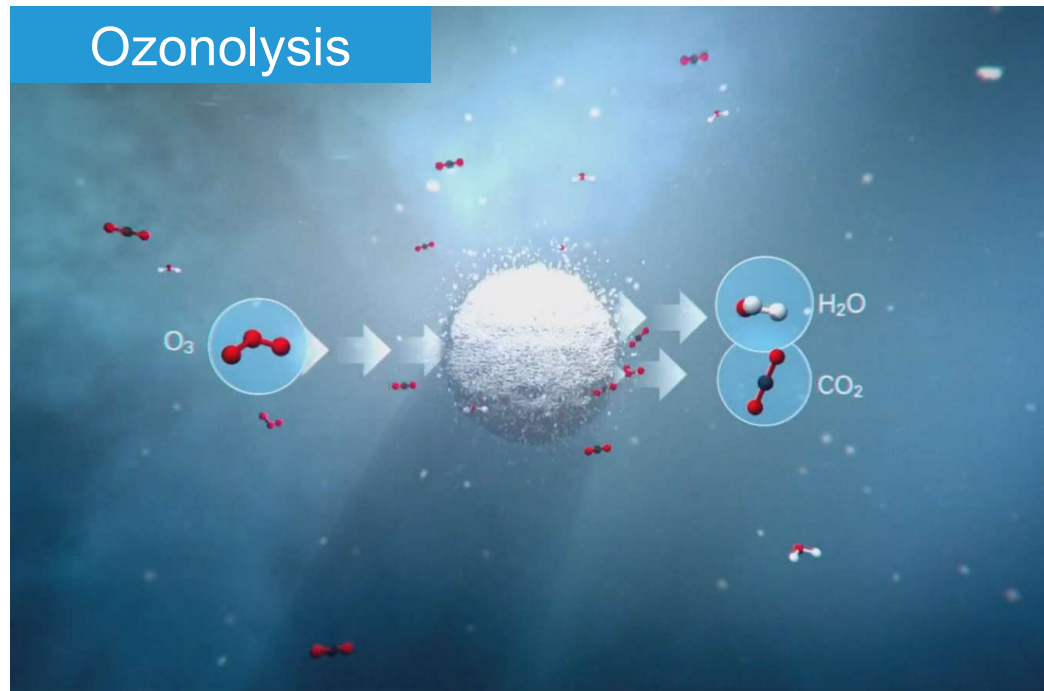


Photolysis is the direct effect of the UV-C light photons that breaks down the grease molecules.

The direct exposure to the UV-C light is a **must** to get an efficient neutralisation of the grease particles and vapours!

Halton

How does the UV-C act on grease ?

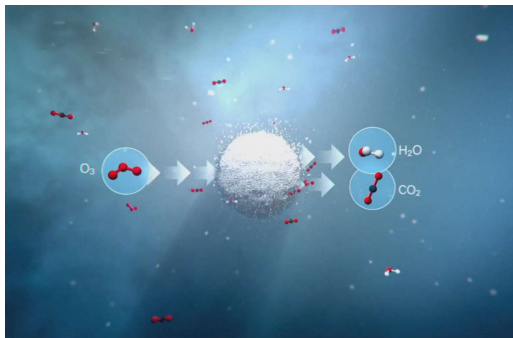
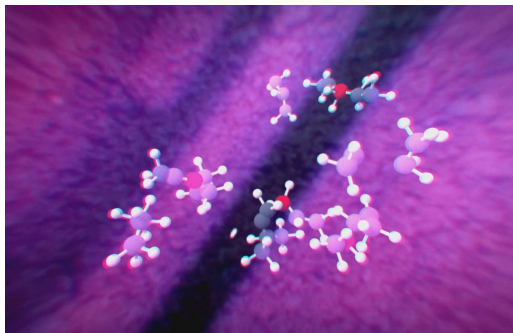


Ozonolysis oxidises the shortened grease molecules and airborne cooking odours due to the ozone generated by the lamps.

Ozone is a gas, and is carried with the light rays. Oxidation therefore takes place in the exhaust plenum but also in the ductwork (when ozone is generated in excess).

Halton

How does the UV-C act on grease ?



The Capture Ray™ technology drastically removes the grease and smoke particles released by the cooking appliances while greatly reducing the odour emissions !

By increasing the number of UV-C lamps to a carefully determined level, the odours conveyed through the air become so weak that it may no longer be necessary to discharge exhaust air at roof level

(special attention must be paid to the ozone concentration... it requires complementary NFX carbon filters... i.e. a PolluStop unit)

Halton

BENEFITS



Halton

BENEFITS

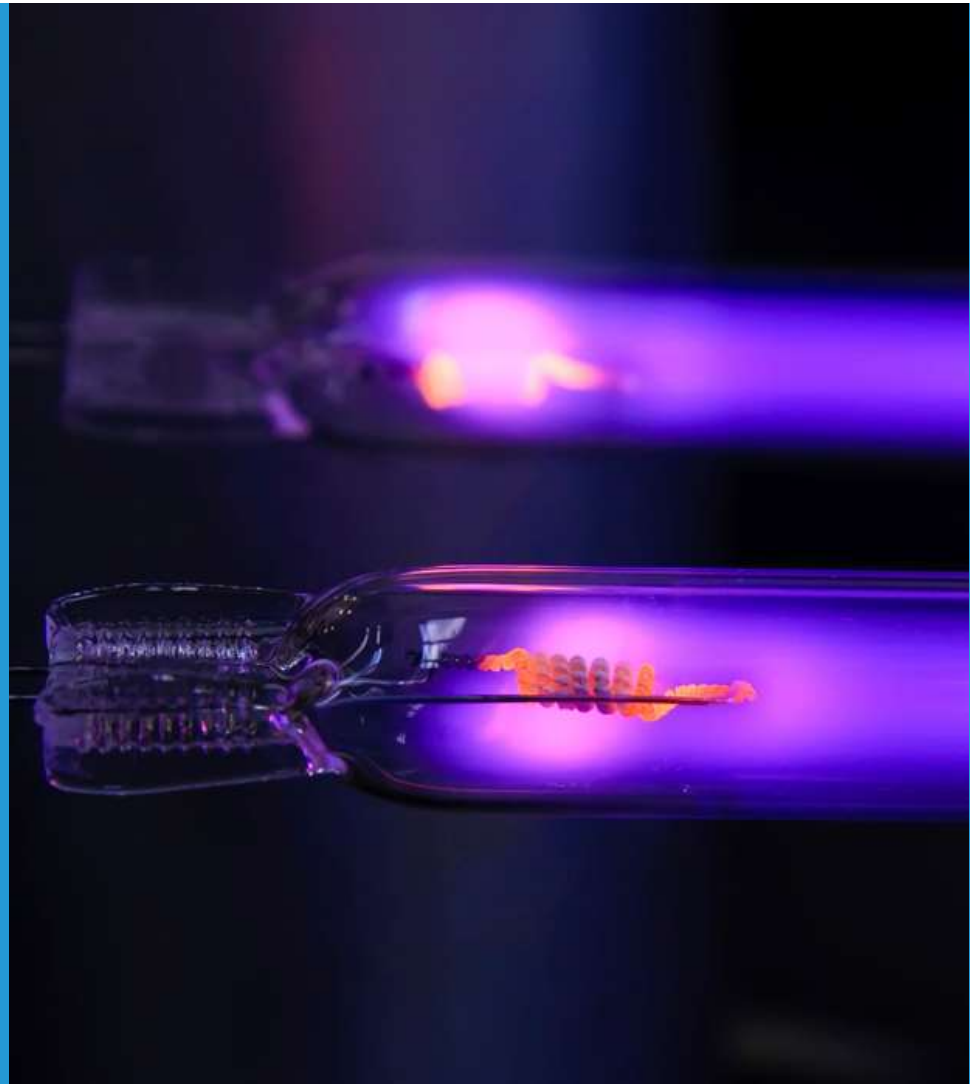
- √ The ductwork is kept clean;
- √ Cleaning operations are less frequent;
(depending on local regulations)
- √ Fire safety and hygiene of the ductwork reach high standards;
(minimal grease deposits inside the ductwork)
- √ Heat recovery becomes constant and efficient over time;
- √ Increased energy savings and reduced maintenance costs;

BENEFITS

- √ The emissions at the point of discharge are controlled;
(depending on local regulations)
- √ Mitigates the risk of neighbourhood complaints;
- √ Facilitates the establishment of restaurants in dense urban areas;
- √ Can be combined with PolluStop units to establish a restaurant wherever you choose

UV-C use in
professional kitchens:
What is true?
What is fiction?

Enabling Wellbeing



Reality or fiction?

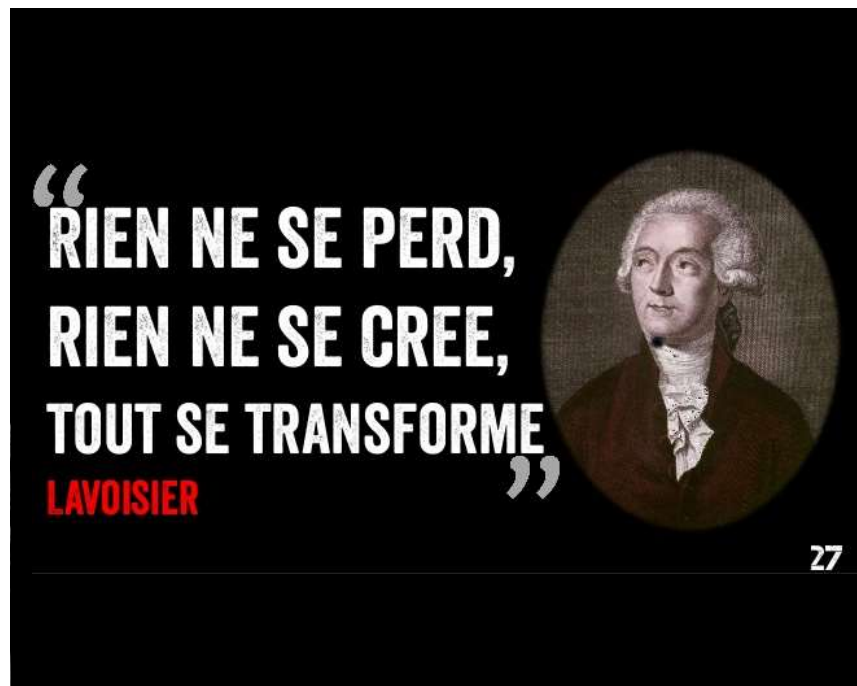


A lot of information, sometimes contradictory, has been delivered in the past... leading to real confusion.

In the end, how does the grease and odours neutralization by UV-C work and what can be considered as true or fiction?

Halton

What really happens to the grease?



* “Nothing is lost, nothing is created everything changes”

The residues of the grease neutralisation by UV-C are :

- Carbon dioxide CO₂
- Water
- and a fine white powder comparable to... SOAP ! (polymerization of grease)

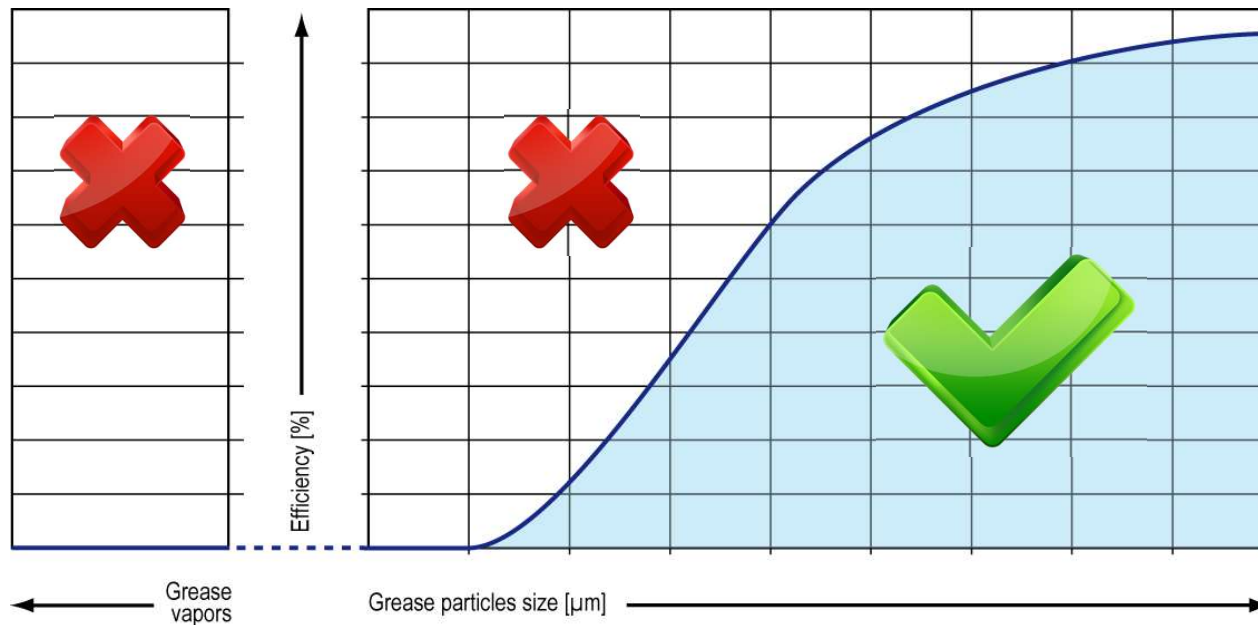
Here's the techy bit...



Ozone reacts directly with organic compounds by attacking unsaturated carbon to carbon double bonds. Some reaction products of ozonation include organic peroxides, hydrogen peroxide, and superoxide anion. These organic peroxides can react non-selectively with other saturated or unsaturated compounds in the duct work through a free radical reaction mechanism, thus forming new compounds through a coupling process that is similar to polymerization. This results in the creation of a wide variety of surface active compounds in the recycled cleaner/ozone process.

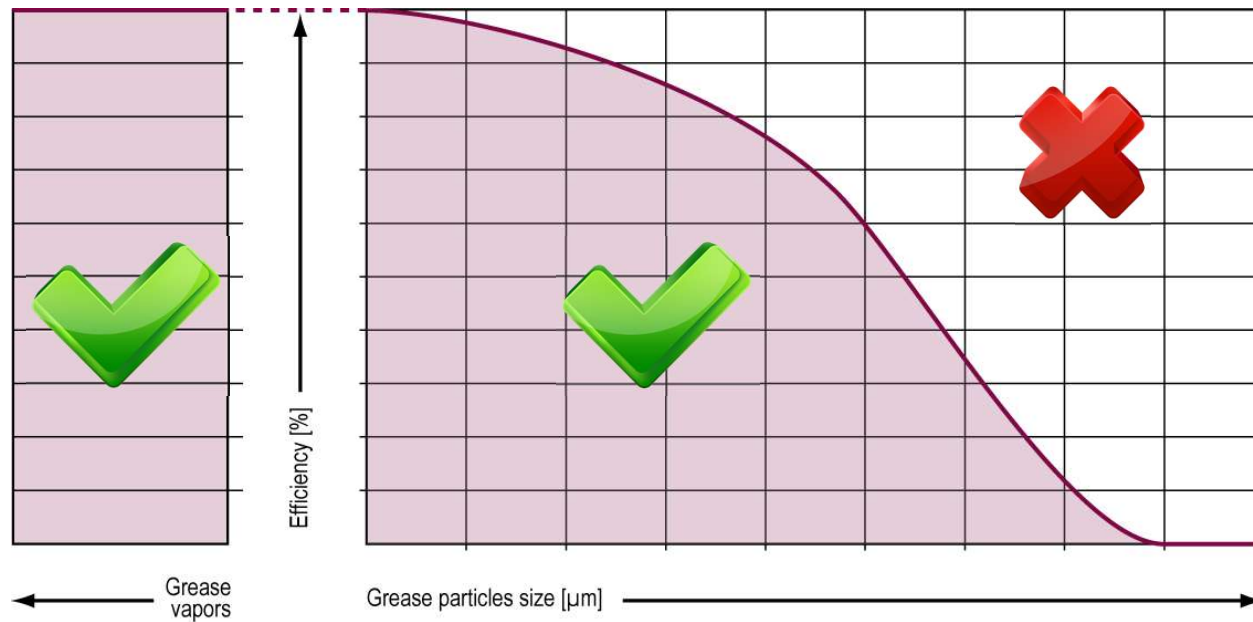
Halton

Is the KSA role really as vital as we say?



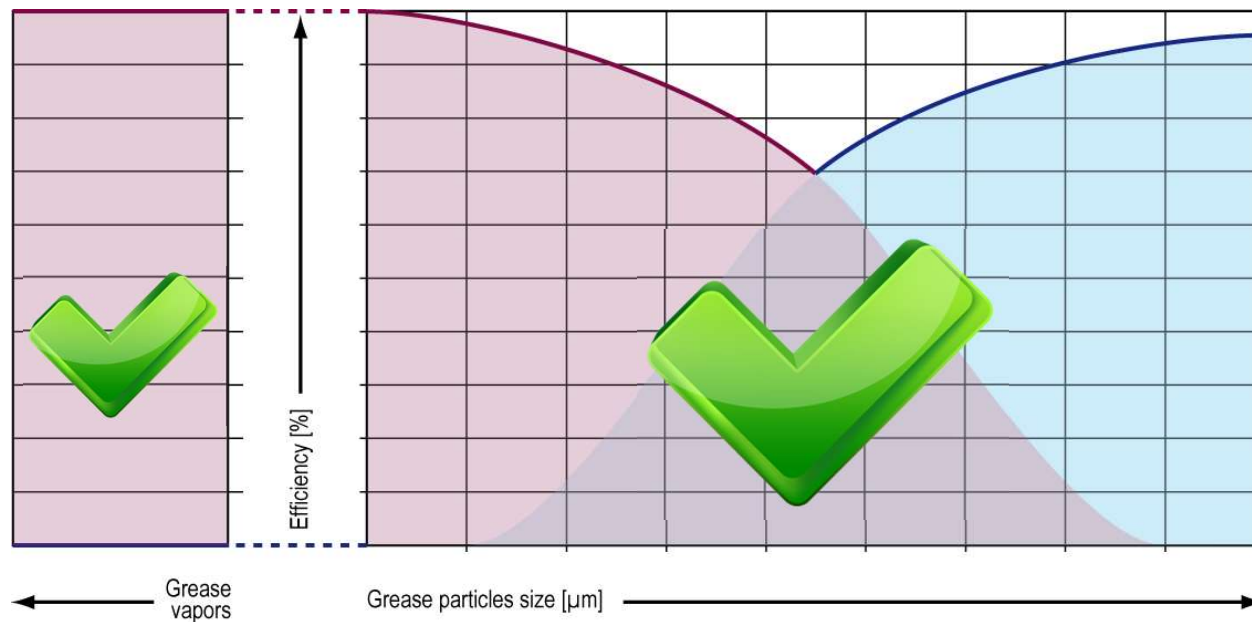
KSA cyclonic filter is amongst the most efficient mechanical filters... however its efficiency rapidly drops for small particles and they are totally inefficient on grease vapours

Is the KSA role really as vital as we say?



On the other hand, UV-C is extremely efficient on grease vapours and small particles. Much less on medium sized grease particles and really inefficient on large particles.

Is the KSA role really as vital as we say?



KSA filters are not an option, they are a must when using the Capture Ray™ technology!

Any inefficient primary mechanical filtration would lead to a strange mixture of partially neutralized grease particles and pure grease! All this inside the ductwork!

Halton

Truth or fiction?



Do we need an exposure time of 2 sec for the ozone to complete the grease neutralization ?



The rule of time for a reaction is an old myth... the 2 seconds are not required to complete the neutralization. They are vital to decrease O_3 concentration at the discharge point (when cooking appliances are not all in cooking mode).

Note:

When UV lamps are integrated into the PolluStop, they are installed just before the activated carbon filters so that such kind of exposure time cant' be reached. And they are still efficient!

Halton

Truth or fiction?



Does it mean that the reaction is quite instantaneous????



The neutralisation happens immediately when the ozone and the molecules collide. The efficiency is particularly linked to turbulence intensity. The higher it is, the better the efficiency. Turbulence inside the exhaust plenums of hoods/ventilated ceilings or inside PolluStop units are high enough to complete the reaction.

Truth or fiction?



After 13,000 hours of work, are the lamps out of order?



They still work but their efficiency, on the wavelength which generates O_3 , is reduced by 40%.

When the lamps are dirty, the efficiency of the lamps also decreases. The lamps have to be regularly cleaned to get a constant efficiency over the recommended lifetime of the lamps.

Halton

Truth or fiction?



Is the Capture Ray™ technology efficient for all types of cooking?

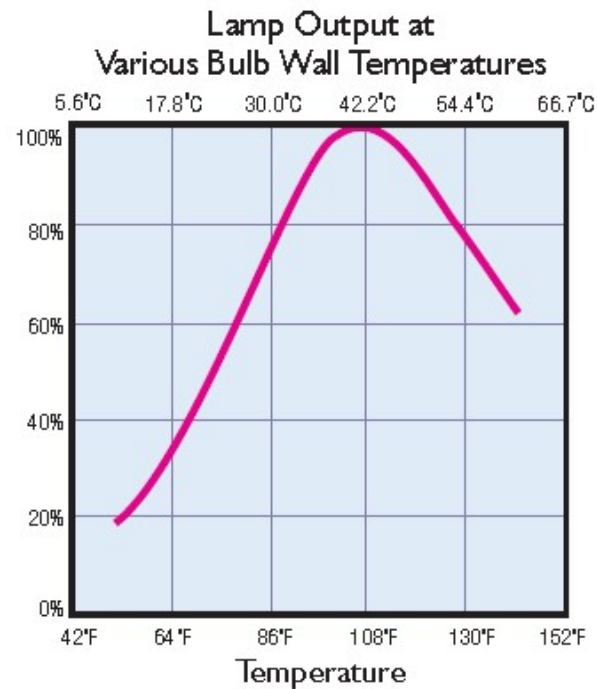


The UV lamps efficiency varies depending on the temperature. Therefore, it is not recommended to use the Capture Ray™ technology with heavy duty cooking appliances that generate high heat loads. Use preferably the Cold Mist technology.

Note: Specific types of cooking are also sometimes more challenging than others. Always contact Halton's customer service department.

Halton

Truth or fiction?



UV lamps efficiency depending on the temperature...

Max efficiency is reached at 42,2°C !

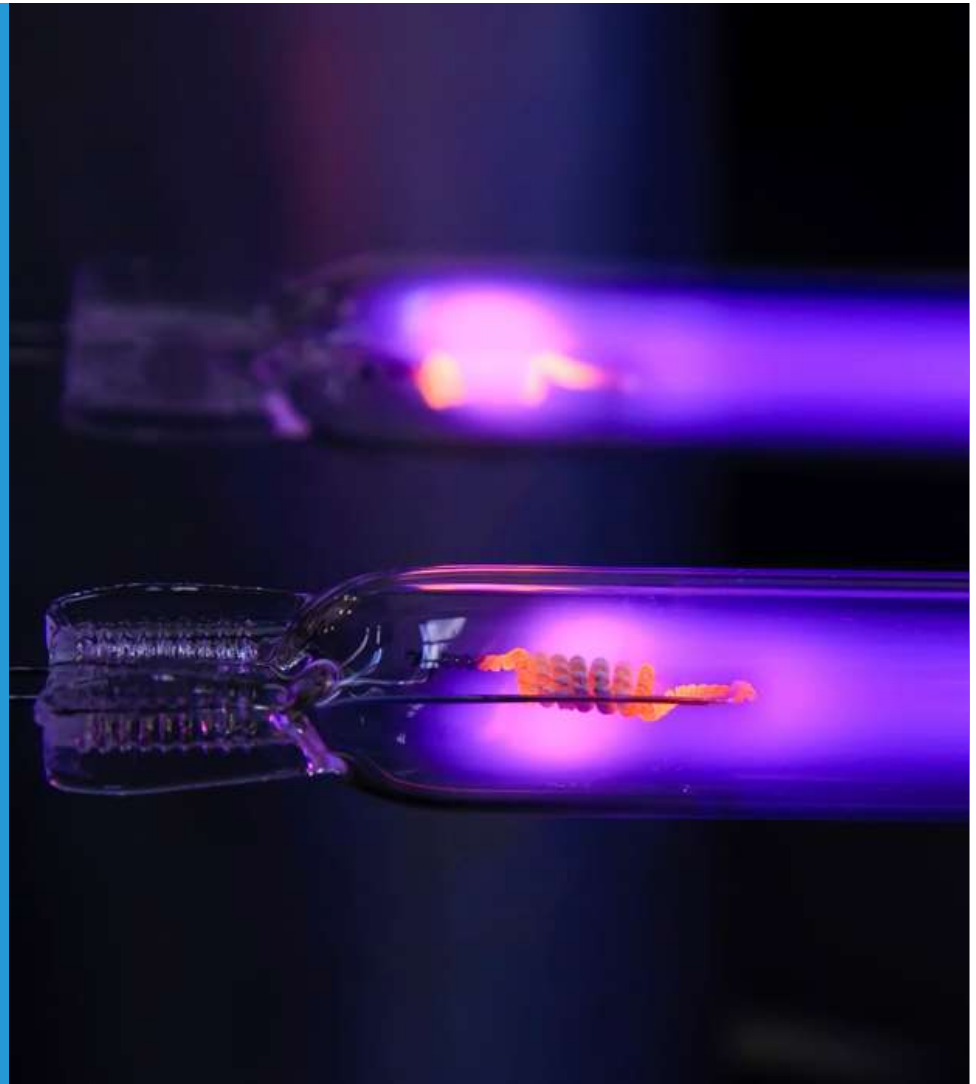
Temperature inside the ductwork can be much lower therefore the number of lamps should be increased.

Note: with standard cooking appliances, temperature inside the ductwork varies between 30 to 40°C.

Halton

What are the results on site?

Enabling Wellbeing



Results on site

Inside plenums after several weeks operation (two separate sites)





High Performance Kitchen