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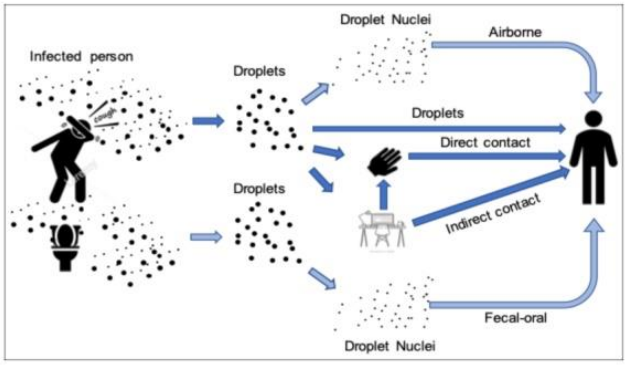
Information on air sanitization in the environment



With this information we would like to clarify the ideas for those who have to venture into the purchase of a sanitizer for environments that is really useful and not harmful as well as useless.

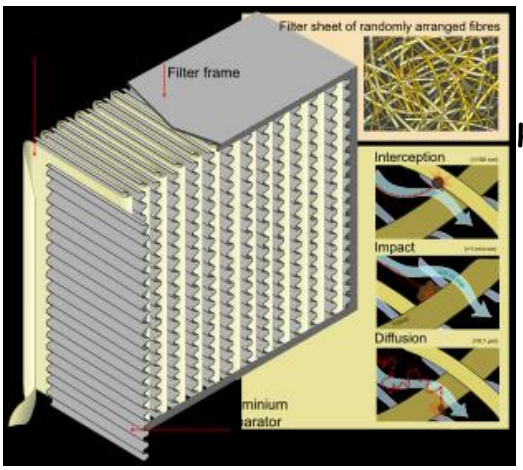
The most known and used types of devices are three:

- Air purifiers
- Ozone generators
- Sterilizers or air sanitizers

All these devices, although they could seem similar to the layman, differ profoundly in their different operating principles.

The air purifiers

They are devices that work mainly with HEPA filters (from English High Efficiency Particulate Air filter) it indicates a particular filtration system, with high efficiency, of liquid or gaseous fluids.
Normally this filtration is excellent for eliminating dust and pollen, but also bacteria and microorganisms, that may be present in volatile aerosols, provided that filters with a high efficiency class are used, which often have higher pressure drops and which can reduce the exchange of air hour (ACH) and also impact on humidity.
These devices are basically filters which, depending on the filter fitted, filter the air up to a limit of 0.3 microns.
A special consideration must be made on the expensive filter which must be replaced often enough to ensure a good degree of filtration.

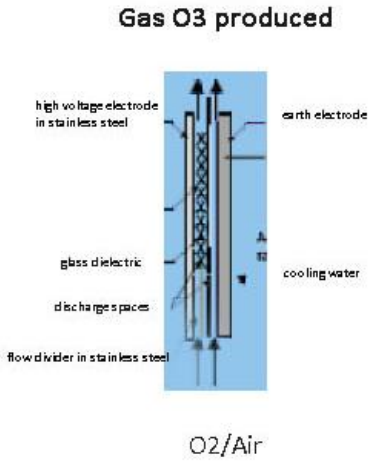


Hepa filter scheme

Ozone generators

The high effectiveness of ozone for the removal of many elements of organic and inorganic nature is now well known.
These devices are capable of transforming the oxygen present in the air into ozone by means of an electrical/ electrochemical process.
The gas obtained (ozone) has a destructive action that it can exert on many indoor pollutants such as: sulphur oxides, airborne particulates, benzene, volatile organic compounds (VOC), formaldehyde, polycyclic aromatic hydrocarbons (PAH) endotoxins and mycotoxins generated by bacteria and mold, etc.
Science has amply demonstrated that the periodic treatment of environments, both in civil and industrial settings, significantly improves people's quality of life, thanks to the profound decontamination that ozone is able to carry.

Ozoniser scheme



Most of the applications are carried out for the prevention of microbiological contamination compared to the resolution of contamination in progress. The treatments generally use a concentration of ozone in the air of 1-3 ppm and a contact time that varies from 30 to 180 minutes.

To produce clean ozone, however, it is necessary that the starting gas, i.e. the one from which this compound is obtained, is pure oxygen, therefore gas produced by an appliance or cylinder that supplies pure oxygen must be used.

The generation of ozone that takes place using ambient air produces reactions, with nitrogen present, which lead to the production of toxic substances such as nitrogen dioxide (NO2), nitrate (NO3), nitrogen trioxide (N2O3) and Nitrogen (N2O5). Without suitable filtering systems, numerous toxic and carcinogenic substances are generated due to the reaction of the particulates PM10, PM2.5, VOC, Hydrocarbons, etc. Furthermore, in the absence of sophisticated dryers, the water contained in the air (humidity), in reaction with nitrogen oxides, produces significant quantities of Nitric Acid which, through the passage of the air flow and evaporation due to the heat of the cell, is dispersed in the environment.

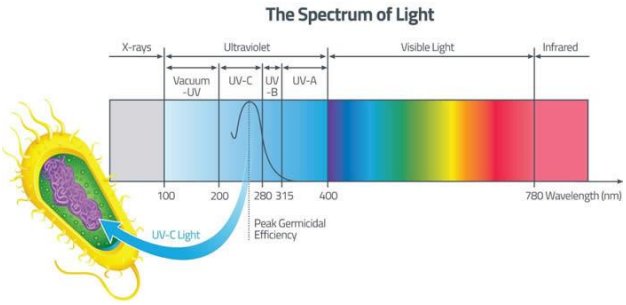
(Extract from several accredited sources including the University of Padua - Faculty of Engineering - Department of Chemical Engineering Processes)

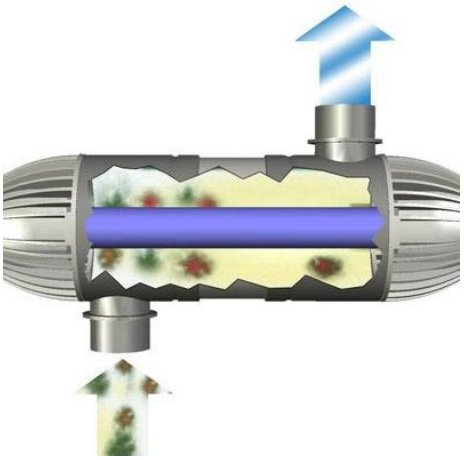
Ozone generators which directly ozonize ambient air by tubes or plates, where corona discharge occurs, produce toxic and carcinogenic substances extremely harmful to the health of people and animals.

This treatment, when correctly done, has truly excellent efficacy, but must be set up to be carried out in the absolute absence of operators and customers on the premises as extremely harmful to health, usually alternating cycles of 1 or 2 hours of sanitization during the night or during work breaks. Also effective on all surfaces that come into contact with gas.

Air sterilizers or sanitisers

The UV-C band (253 Nm.) eliminates bacteria, viruses, fungi, spores, molds and mites, destroying their DNA, and inhibiting their reproduction and proliferation.





The great advantage of this type of treatment is that it can be used 24 hours a day in the rooms to be sanitized, allowing the presence of staff and customers in the premises.
The operating principle is very simple: the air is passed through a conveyor that has UVC lamps inside that reduce the bacterial and microbial load, making the outlet air sanitized.
Germicidal efficiency is certified by analyses of accredited microbiology laboratories.

During this process of air decontamination, even if only a small part, ozone is produced, which can be considered favourable for lowering the bacterial load as long as it does not exceed 0.05 ppm for a maximum of 8 hours of exposure.
Alternatively, some lamp manufacturers can supply lamps made with modified quartz glass which cancels the formation of ozone.

In our opinion, this UVC sanitization system, if well calibrated, is the one that guarantees a good reduction of the bacterial load achieved without excessive costs and in complete safety as the device can work regardless of the presence or absence of people.