Treatment cycle for environmental sanitation

The typical phases of a treatment cycle are (SSICA, 2010):

This phase coincides exactly with the one in which ozone starts to be delivered in the room to be treated. Such

supply must allow the programmed ozone concentration to be reached in a short time

as necessary in relation to the target to be reached.

This phase has the purpose of guaranteeing the effectiveness of the cycle by continuing for the necessary time of the disinfection

keeping doors and windows closed.

This phase must guarantee the elimination of ozone from the air in the treated room and lasts until

achievement of the ozone concentrations required for occupant safety.

In order to develop the treatment cycle it is crucial to know:

the environment to be treated.

The process must also be able to reach all surfaces and critical points, distributing the gas ozone in

homogeneous and constant form to carry out its activity.

Technical data of the ozone generator to consider:

These parameters determine the concentration and distribution of ozone in the environment and the time of action

necessary to achieve the goal set in relation to the size of the room. Most of the machinery

they only come with a timer, while some equipments have approximate programs that define the

cycle duration in relation to the m2 / m3 of the room involved in the treatment and, at times, also of the

control / alarm for safe use.

For example, if we have a generator with a production capacity of 2 g / h of ozone, for the treatment of

a room of 100 m3 will be needed approx. 20 minutes of dispensing to reach a concentration of 2.5 ppm

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(bearing in mind that in air 1 ppm = 2.14 mg / m3). As the volume of the environment increases, with the same capacity

production of ozone, it will be necessary to use a longer delivery time or for smaller environments they can

use shorter times or, for the same time of action, higher concentrations.

During the ozonation process, the ozone concentration increases very slowly over the period initial.

The delay in the accumulation of ozone concentration is due to the consumption of ozone due to the presence of pollutants in the

initial period. Subsequently, after oxidizing the main pollutants, the ozone concentration inside of

of the room rapidly increases to the desired level. To guarantee the "biocidal" action the concentration of ozone

it must therefore be maintained for the foreseen time (action time). Relative humidity, temperature, substances chemical,

microorganisms present determine the real amount of ozone needed to reach the concentration

desired and keep it for as long as necessary. In this regard, the importance of proceeding with the cleansing

preliminary surface for dirt removal.

When the generator is switched off, the ozone concentration gradually decreases by reconversion

spontaneous ozone into oxygen.

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The environmental conditions of temperature / relative humidity have an important influence on susceptibility of

ozone microorganisms. Literature data show, in particular, that susceptibility increases in presence of highs

relative humidity levels (> 70%): the combined effect of ozone and OH radicals strengthens the effectiveness of treatment.

For large rooms (eg warehouses) it is necessary to use generators equipped with long-lasting fans range

to ensure a homogeneous distribution of the gas.

During the treatment it is necessary to close doors and windows and it is forbidden to stay in the room.

C. Elimination of residual environmental ozone

Ozone is an unstable gas and spontaneously decays to oxygen. The time it takes to bring back the

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concentration of ozone to that adequate for the safety of the occupants is always a function of concentration

of ozone used in the treatment. The decomposition time of ozone also depends on the temperature, humidity

relative and the levels of chemical and biological contamination of the environment.

In real conditions, the natural decay time necessary to make the premises accessible is at least 2 hours

(residual concentration below the olfactory perceptibility threshold for humans, between 0.02 ppm (40 µg / m3) e

0.05 ppm (100 µg / m3), and equal to about 1/10 of the 0.2 ppm threshold defined as safe in the workplace for once

exposure time of 2 hours).

If possible, it is preferable to perform the treatments at night so that when work is resumed amount of

ambient ozone is within health safety limits.
To speed up the conversion times, however, it is possible to resort to the use of ultraviolet rays UV-C 254 nm o

of chemical catalysts that some manufacturers already install inside their equipment and that are activated

in the final phase of the cycle, with the ozone cell off.

Avoid eliminating residual ozone by using forced ventilation to convey it into the room external: the

In fact, Legislative Decree 155/2010 sets limit values and quality objectives also for concentrations in the ambient air