



# Ozone Monitor Pharmaceutical Applications

## Application Note

### Pharmaceutical Water Treatment

Ozone treatment of wastewater reduces the usage of energy, water, utilities and chemicals, and provides an effective alternative to traditional chemical treatments and older technologies. Pharmaceutical wastewater containing from 0.5% up to 10% formaldehyde or glutaraldehyde can be treated using ozone or ozone/peroxide/UV combinations. Up to 55% reductions in chemical oxygen demand (COD) levels are observed for solutions containing either formaldehyde, glutaraldehyde or a mixture of the two aldehydes when these solutions are treated using ozone or ozone/peroxide/UV combinations.

### For Plant Washdown & Cleaning

Many ozone equipment suppliers offer specially designed "ozone-wash carts" that are portable and produce a pressurized water stream that contains a few parts per million of ozone dissolved in water. The solution is under pressure, thus the aqueous stream can perform the normal water washdown functions. However, because of the presence of dissolved ozone, wherever the aqueous spray contacts a surface, microorganisms on that surface will be attacked by ozone.

A special modification of this application for ozone is the washing of workers' boots and waterproof aprons, when leaving the processing room for the day. Boots are hung on special racks outside the processing room, and these are rinsed with ozone-containing water from the portable ozone-water-washer.

Ozone washes can replace Best Management Practice washing procedures that utilize strong sanitizers. They are usually used when a quick washdown is needed during break periods and shift changes.



### Recommended Ozone Monitor for Pharmaceutical Applications



Gas Monitor Model S500

## Ozone for Treating Process Room Air

If workers are not present in the processing room (rare circumstances - such as a storage room), ozone can be applied throughout the room air to levels that are effective for their intended purposes, but which may exceed federal government regulations for ozone in air. When workers are present, room air should be treated with levels of ozone that are below federal regulations, and these may be too low to accomplish their air-treatment objective. In these cases, contaminated air can be removed from the room, treated with appropriate quantities of ozone, excess ozone destroyed, and the cleaned air then returned to the processing room.

Another approach is to mount ozone-generating UV lamps in the processing room ceiling. When turned on, these lamps produce lower concentrations of ozone than by the corona discharge technique used for treating large quantities of water. Since ozone gas is slightly heavier than air, it will fall from the ceiling UV bulbs to the floor of the processing room. At two meters above floor level, there may be no ozone at all (as measured by a wall-mounted ozone monitor pre-set at just below the appropriate OSHA level).

Still another approach is to install an ozone generator in ceiling corners and have each generator fitted with a timer. During times of human occupancy, the ozone generators are turned off. When the plant closes for the night, the timers automatically turn on the ozone generators, and then turn them off an hour or so prior to human occupancy.

Gaseous ozone usually dissipates within an hour. To be sure there is no ozone above federal levels when workers return; a fan can be turned on a few minutes before workers return to exhaust the last traces of ozone from the processing room. This procedure is a simple solution for greatly reducing the level of airborne biological contaminants in process room air.

### Recommended Ozone Monitor for Pharmaceutical Applications



Transmitter / Controller Model S900