Chemtronics Technologies (India) Pvt. Ltd.
28, Satyam Industrial Estate, Subhash Road, Jogeshwari (East), Mumbai - 400 060. INDIA.
Tel : +91-22-3291 4823 ; +91-22-65269554 ; Fax : +91-22-2825 9933
Email : response@chemtronicsindia.com ; URL : www.chemtronicsindia.com

# "Integrated Ozone technology based solution"
# For
# Hospital

Ozone is one of the most advance technologies and can be integrated with great advantage in treatment of Water, Waste Water and air treatment in hospital. Chemtronics has successfully designed and installed solution to integrate and retrofit with the present and conventional system with proven and time tested ozone based technology. Its technology integration gives buy back of CapEx in reasonably short period depending upon the application and customised solution.

## Application Areas:-

***IN LAUNDRY: -***

- *Textile suppliers to hospitals and hospital laundries face great pressures to meet high standards of hygiene, quality, logistics, cost optimization and transparency.*
- *Textiles must be handled correctly to limit the transfer of dangerous bacteria amongst patients and healthcare staff and the right wash processes are vital for the desired result.*
- *As pressure grows on hospitals to cut costs, healthcare administrators are weighing the cost of outsourcing their linen services to textile rental companies against the cost-effectiveness of operating an on-premise laundry (OPL).*
- *A bad linen service is one of the most frequently heard complaints in a hospital. Attention to patients' personal needs and comforts are as important as the physician's medication and therefore adequate supply of clean linen becomes imperative. Besides helping in maintaining a clean environment, clean linen is a vital element in providing high-quality medical care. Also, pleasant employees in a fresh and neat uniform go a long way in creating a positive image of the hospital.*
- *The prevention of microbiological contamination is the most significant requirement for the hygienic processing of textiles.*
- *Hospital bed sheets, gowns, uniforms, towels and cleaning mops are potential tools for spreading infections.*
- *Properly controlled laundry processes can limit the spread of bacteria. Good practices start with appropriate washing techniques that will ensure decontamination of linen.*
- *The use of ozone in the laundry water reduces the requirement of detergents and also the wash can be achieved with lower temperatures.*
- *Ozone acts as a chemical enhancer. When applied properly ozone; Reduces water use, reduces fuel use in making hot water. Reduces chemical use, reduces waste water contamination. Ozone is also effective in Reducing fabric degradation .Extending linen life reducing formula run time (productive hours).extending equipment life*
- *Reduces energy cost of heating.*
- *Ozone destroys the residual alkali, eliminating the salt crystals left by the residual alkali and so eliminating the need for fabric softener. Once the fabric softener is removed, the drying time is substantially reduced which in turn results in additional energy savings.*

***IN DRINKING WATER: -***

- *The Hospital Water Supply as a Source of Nosocomial Infections.*
- *Some of the most frequently isolated gram-negative bacteria, including Pseudomonas and Enterobacter, have been found to persist in hospital water for extended periods and have been responsible for nosocominal outbreaks.*
- *Contamination of the hospital water supply with potentially pathogenic organisms is very common,*
- *Impurities in potable water cases health disorders. In the hospitals patients generally take the drinking water directly from the supplies provided by the public health engineering. If this water becomes contaminated, the patient may suffer from some water borne disease.*
- *The drinking water distribution system of a hospital mainly obtained Legionella and Pseudomonas aeruginosa Moreover, several other opportunistic pathogenic bacteria, such as Escherichia albertii, Acinetobacter lwoffi and Corynebacterium tuberculostrearicum emphasizing that drinking water systems, especially those with stagnant water sections, could be the source of nosocomial infections.*
- *Ozone is both a strong oxidizing agent as well as a strong disinfectant*
- *Ozone interferes with the metabolism of bacterium cells most likely through inhibiting and blocking the operation of the enzymatic control system.*
- *A sufficient amount of ozone breaks through the cell membrane, and this leads to the destruction of the bacteria.*
- *Ozone destroys viruses by diffusing through the protein coat into nucleic acid core, resulting in damage of the viral RNA.*

***IN HVAC: -***

- *Ozone has been successfully reduced smell, bacteria, mould, mildew and other mi.cro organisms from the HVAC system. Ozone is increasingly being used in HVAC system to improve the indoor air quality and also to improve the energy efficiency of the HVAC cooling coils.*
- *Controlled quantity of ozone introduces in the AC Ducts Eliminates Toxic gasses, odors smoke by oxidation and microbes & virus.*

***IN OPERATION ROOM:-***

- *It is very important to maintain good indoor air quality (IAQ) in OR to ensure health and safety for the patient and surgical team. A significant consideration in ORs is the control of aerosols, anesthesia gases and smoke. Aerosols are solid and liquid particles,*
- *It is very important to maintain good indoor air quality (IAQ) in OR to ensure health and safety for the patient and surgical team.*
- *A significant consideration in ORs is the control of aerosols, anesthesia gases and smoke. In OR, however the main sources have an indoor origin are the patient, the surgical team and equipment. The anesthesia gases dispersed in ORs are also considered as pollutants. The anesthesia gases are dispersed in the environment through problems in the equipment and from the exhalations of the patient. Some gases used in the surgery, for example, NO2 will continue to be exhaled by the patient for up to one hour after the surgery is finished. During surgery the highest concentration of gases is on the floor. However, with the movements of people these gases can be mixed with room air and inhaled by the surgical team.*
- *The concentration of gases in the OR is critical and needs to be controlled; otherwise the productivity and quality of the work of the surgical team can decrease, and in the medium and long term health problems may occur.*
- *Halothane gas, for example, has a high toxicity and can affect the central nervous system. The gas concentration is controlled by the air change rate in the OR by dilution to acceptable levels.*
- *The smoke can be generated by laser or electro surgery unit. "Research studies have confirmed that this smoke plume can contain toxic gases and vapours such as benzene, hydrogen cyanide, and Formaldehyde, bioaerosols, dead and live cellular material (including blood fragments), and viruses. At high concentrations the smoke causes ocular and upper respiratory tract irritation in health care personnel, and creates visual problems for the surgeon.*
- *In some critical situations the indoor air in OR will be ultra-cleaned, for example, for orthopedic surgery, traumas, implants, burn patients, and other situations where the patient isimmunocompromised. Otherwise, when the surgery is septic, there should be also a higher control in the indoor environment, to protect the adjacent areas.*
- *In OR Air Conditioner duct system instilled.*
- *Duct mounted Ozone generators the released ozone combines with the mainstream air in the supply air duct and reaches the space. It is present in the indoor space at the times at low concentration. When it encounters chemical pollutants, it almost instantly oxidize them and keeps the indoor air free of chemical pollutants VOC as interferes with metabolism of cell multiplication of fungi resulting in the reduction of fungi along which is responsible for vide range of indoor related allergies.*

***IN KITCHEN: -***

- *In many hospitals meals are prepared and cooked in the hospital kitchen and distributed directly to the wards. Food from these outlets must also be safe for patients and staff.*
- *In hospital catering, food handlers are very frequently nurses or domestic staffs, who are involved in food operations and supervision functions.*
- *Food hygiene in hospital poses peculiar problems, particularly given the presence of patients who could be more vulnerable than healthy subjects to microbiological and nutritional risks.*
- *Ozone oxidizes any bacteria, viruses, fungus, moulds and fungi thus; using it in the kitchen creates a totally sanitary environment in which to prepare food, free of germs and diseases.*
- *By neutralizing bacteria, ozone also kills odors, leaving the kitchen totally free of any unpleasant odors from stale cooking smells, dustbins or drains, or clears the air of chemical pollution like glue or paint.*
- *Insides of a fridges and freezers absorb unpleasant smells of fish or garlic etc, which cannot be cleaned away with detergents. Ozone permeates all of the surfaces inside the area being treated, destroying the smells inside the fridge or freezer, even in the cracks and corners which conventional cleaning methods cannot reach.*
- *Ozone makes your perishables last longer, in the pantry or in the refrigerator. Ozone will keep the air free from bacteria, which slows down the ripening of fruits and vegetables and extends the life of food material substantially.*
- *By making your kitchen cleaner and significantly reduces bacterial load which also deters insects like cockroaches and flies.*
- *In the staff washrooms and changing rooms, disinfecting clothing and shoes and preventing spread of bacteria into the kitchen from contaminated clothing.*

***IN AIR CONDITINING: -***

- *By treating the air conditioning system with ozone, you can prevent the buildup of bacteria and fungi this will eliminate bad smell and the spread of health problems such as, allergies, rashes, colds, viruses & legionnaires.*

***IN COOLING TOWER: -***

- *Cooling tower water requires extensive treatment. During Cooling Tower water treatment, three main factors must be controlled.*
- *Corrosion of pipes and heat exchanger units.*
- *Scaling in pipes and (mainly) in heat exchangers.*
- *Microbial growth (bacteria algae).*
- *These three aspects cannot be viewed separately. Conventional treatment techniques are mainly applications of chemical biocides, corrosion inhibitors and scale inhibitors. Ozone is a reliable alternative that controls the above-mentioned factors sufficiently.*
- *Makes the water crystal clear, eliminating all turbidity.*
- *Dissolves the scale and inhibits further scaling, hence improving heat transfer and further saving on chemicals and pollution.*
- *Reduced Chemical Usage – Chlorine can substitute for several chemicals in a cooling tower treatment package, reducing and possibly eliminating the use of such chemicals.*
- *Increases dramatically Heat Transfer Efficiency*.