



**Fog Dispenser (Steam-based)
Sterilization System &
Walk-Through, Disinfectant Tunnel**



Problem Statement

On 30th Jan 2020, the World Health Organization (WHO) declared Covid-19 (Severe Acute Respiratory Syndrome Corona virus 2 or SARS-CoV-2) as a global pandemic and a 'public health emergency'.

As of April 11, 2020, a total of 1,207,198 active COVID19 patients have been diagnosed across the world, out of which 102,136 have been declared fatal. The grim statistics for India are 7447 active cases and 239 fatal. If we have been able to prevent massive spread of the pandemic so far, its because of the foresightedness of our Prime Minister who declared a nation-wide lock-down for 21 days.

However the Covid-19 threat is still not fully averted. There are sensitive, densely populated areas where an unchecked spread of the pandemic will complete overwhelm and collapse our fragile healthcare system and can cause thousands of deaths.

Prevention is Better than Care

As we all know, the most effective way to restrict COVID19's transmission is through social distancing and home quarantine. We are also aware that coronavirus gets transmitted through respiratory droplets that escape an infected person's body through coughing or sneezing.

Even when the lockdown is lifted, we have to be extra vigilant in order to prevent community transmission.

Bearing this in mind, Pune-based Suman Waste Management (OPC) Pvt. Ltd. Has come out with two innovative solutions:

1. A Fog Dispenser (Steam-based) Sterilization System
2. A Walk-through Disinfectant Tunnel

Used in combination, both the systems are very effective for public place screening and sterilization and together they guarantee a complete prevention protocol from COVID19.

1

A Fog Dispenser (Steam-based) Sterilization System



STEP 1:

Any person crossing a checkpoint is asked to sanitise his/her hands with a sanitizer.

STEP 2:

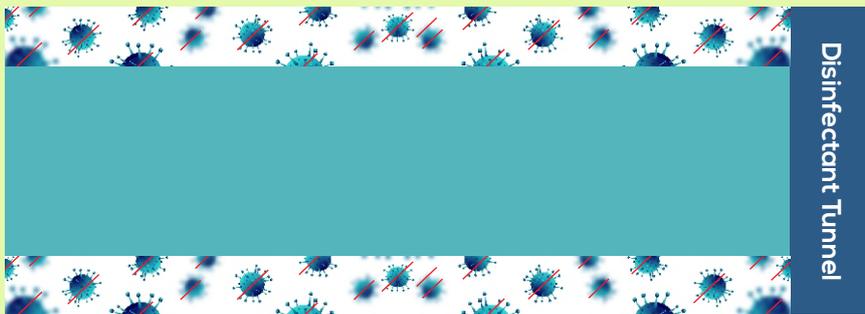
The system sprayed a steam-based fog (Comprising of ClO₂ 5ppm concentration). It's a more powerful disinfectant compared to NaClO₂ (Sodium Hypochlorite) that is currently being used.



2

Walk-through Disinfectant Tunnel

At the next stage of the disinfection process, the person is asked to enter a tunnel that sprays steam for 4-5 seconds, as prescribed under WHO guidelines. The Centre of Disease Control and Prevention also recommends the use of steam as the preferred method for sterilizing critical medical and surgical instruments that are not susceptible to heat.



Technical Specification

Tunnel structure : 9 feet long, 5 feet wide and 7 feet in height

Cover : uPVC Panel

Motor to push water : 3-4 sprinklers on top of the structure connected through a hose pipe / tube (as per requirement)

Disinfectant solution: Chlorine Dioxide ClO₂ otherwise called as chlorine dioxide

Water Tank : 500 / 1,000 litres

Steam generator : one unit long with all control buttons.

Water consumption 200 GPD : To run continuously for 8 to 12 hours without refill.

Maintenance

- Electricity supply for the water pump
- Water tank refilling once a day
- Refilling of the disinfectant solution in the dispenser
- QRC connectors for quick serviceability

Please note: Both the systems require minimum maintenance and upkeep.

Project Cost Estimate

1. A Fog Dispenser (Steam-based) Sterilization System – Rs _____
2. A Walk-through Disinfectant Tunnel Rs _____

Total Cost: Thus the estimated total cost of setting-up both the systems for full protection against COVID19 is Rs _____

Installation Time – One day.

Operating Cost - _____ paise / person, approx..

Suggested Application Areas: Any public hotspots, such as markets, crossroads, busy terminals, entry points to essential service suppliers and other crowded places. schools

Why Chlorine Dioxide?

According to experts, diluted ClO₂ is a safe, inexpensive and effective disinfectant. It can be used on a variety of surfaces. It is already in use as a drinking water disinfectant, swimming pool disinfectant, in waste water treatment and as cooling water disinfectant. The table below explains why Chlorine Dioxide is superior to regular Chlorine.

Chlorine	Chlorine Dioxide
Produce unwanted by-product	Does not form chlorinated by products
Is corrosive and unpleasant to handle	Is much less corrosive then chlorine does not hydrolyze to form an acid
Already Banned in certain part of Europe & USA	Is rapidly replacing chlorine in many of these areas
Is pH Dependent and very ineffective above pH 7	Is not pH dependent (<pH 11)
Is inefficient against complex organisms(e.g. cysts & Protozoa)	A very broad spectrum kill
Limited Oxidative effect against various chemical contaminants. From chlorinated phenol	Destroys phenols (without forming chlorinated phenols) specific destruction of Hydrogen Sulphides. Destruction of a wide range of chemical contaminations
Neutralization required before dumping to the foul drain	Because no unwanted by-product are formed, and will have a lower residual after use, no neutralization normally required
Cannot be used at temperature above 400C due to the release of chlorine gas	Effective at higher temperatures does not disassociate as rapidly as chlorine
Does not remove biofilm	Will remove biofilm and thus clean tanks and pipes
Increased disinfection time and more service work required to combat high bug count	Cost saving in labor and use efficiency outweigh the additional chemical cost

Sources: USA environment protection agency

- Food and drugs administration
- Indian drugs research association & public health*

General Precautions

- It is important to follow recommended guidelines on disinfectant dilution
- Change the disinfectant solution daily and discard the remainder at the end of the day.
- Concentrated chlorine dioxide should only be diluted with cold water
- Wear appropriate personal protective equipment while handling concentrated chlorine dioxide since it is a corrosive substance that can cause irritation to skin, eyes and upper and lower respiratory tract
- Dilution should be carried out in a well-ventilated area
- Advisory should be posted outside the tunnel regarding disinfectant solution being used

About Suman

Suman Waste Management (OPC) Pvt. Ltd. is a Pune-headquartered, leading municipal solid and liquid waste management company. We have special technology and devices to process all kinds of municipal and industrial waste, such as hazardous and non-hazardous; biomedical; e-waste; besides municipal solid and liquid waste.

Contact

Office Address- M/S Suman Waste management (OPC) Pvt Ltd.
Flat No 404, B2 Wing, Dreams Akruiti, Kalepadal Hadapsar Pune
Email Id- kiran.jadhav@sumanservices.com
Contact No- +91 777 589 6046

