

Chlorine
Dioxide Gas
Decontamination

MINIDOX-B



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Portable Chlorine Dioxide Gas Generator

The ClorDiSys Minidox-B Portable Chlorine Dioxide Gas Generator is an easy-to-use decontamination system which is easily adaptable to many different applications of varying size and type, delivering repeatable 6-log sterilization level results.

Dimensions

30" W x 56"H x 24" D
76cm W x 142cm H x 61cm D

Weight

230 lbs
104 kg

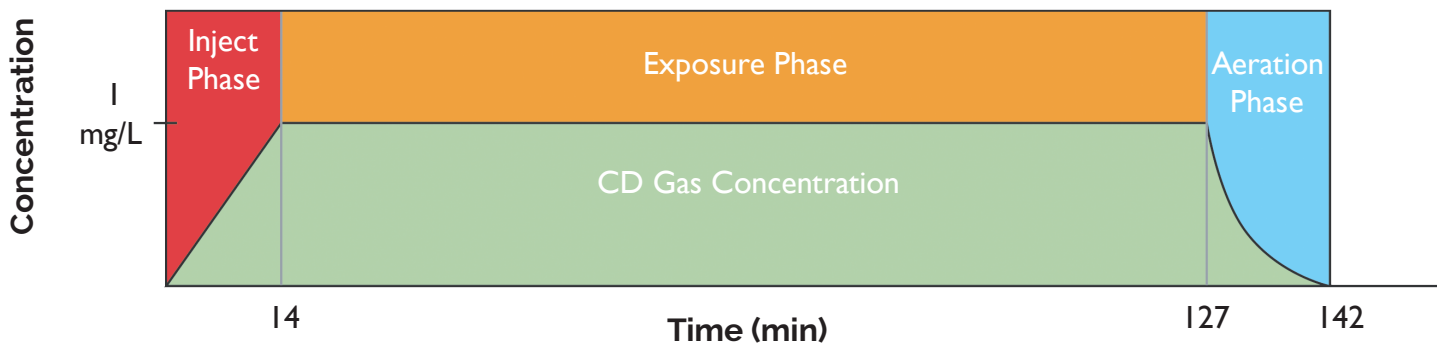
Utility Requirements

100-240 VAC
5 amp, single phase

Key Features of the Minidox-B

- Able to decontaminate spaces up to 70,000 ft³
- Flexible multi-use generator
- Fully automated process
- Easily portable
- Simple control system and interface
- No cycle development necessary
- Effective against viruses, bacteria, fungi, spores, beta lactams and pinworm eggs
- Multiple alarms and checkpoints for increased safety
- Dual data storage on paper printout and USB drive
 - No required maintenance contracts
 - Injection tubing can fit under most doors

Decontamination Cycle Data for 1000 ft³ Area



Benefits of Chlorine Dioxide Gas

- Safe on materials including sensitive electronics
- Process not affected by temperature or dew point
- ClO₂ molecule smaller than viruses, bacteria and spores
- Naturally fills the space its contained within, contacting all surfaces evenly, including crevices deeper than microorganisms can reach
- No measurable residue
- Non-carcinogenic
- US EPA registered as a sterilant, able to kill all viruses, bacteria, fungi and spores
- Effective against beta lactams and pinworm eggs

Minidox-B Optional Equipment

Interface Plates

For quick connections from Minidox-B to various rooms / chambers

Low Level Chlorine / Chlorine Dioxide Gas Sensor

For leak detection and location

HVAC Isolation Systems

To isolate the room being decontaminated from a shared air handling system

Carbon Scrubbers

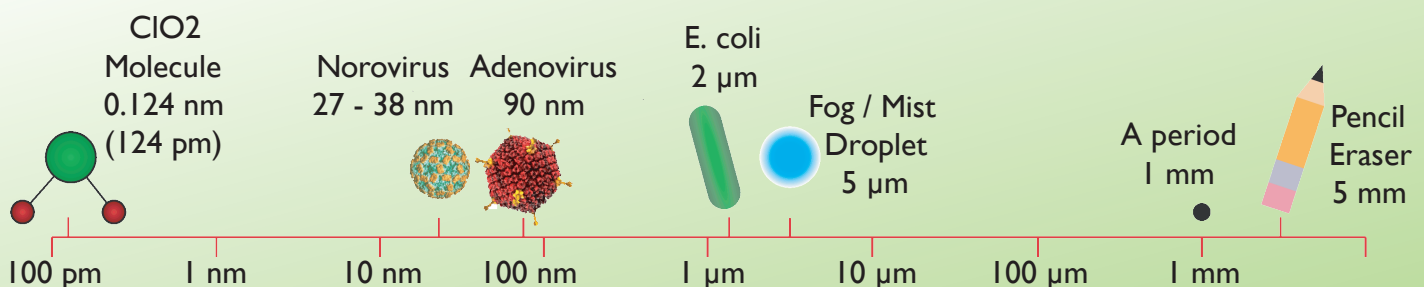
Used to break down chlorine dioxide gas when normal aeration using HVAC is not possible

HEPA Housing Decon Kit

Kit containing connection hosing and recirculation blower to enable the Minidox-B to decontaminate HEPA housings.

Applications

- Rooms
- Suites
- HVAC Ductwork
- HEPA Housings
- Processing Tanks
- Pass-throughs
- Tented Equipment
- Transport Vans
- Lyophilizers
- Isolators
- Piping
- Decontamination Chambers
- Biological Safety Cabinets



Chlorine Dioxide Gas

Safety and Material Compatibility

The chlorine dioxide gas produced by the Minidox-B is safer on materials than hydrogen peroxide, ozone, peracetic acid, bleach, and liquid chlorine dioxide solutions. While some liquid chlorine dioxide products are corrosive, its due to byproducts in the solution rather than the chlorine dioxide itself. The Minidox-B produces pure chlorine dioxide which is safe on electronics, epoxies, stainless steels, and other sensitive materials.

| Decontaminating Agent | Oxidation / Corrosion Potential (V) |
|-----------------------|-------------------------------------|
| Ozone | 2.07 |
| Peracetic Acid | 1.81 |
| Hydrogen Peroxide | 1.78 |
| Bleach | 1.49 |
| Chlorine Dioxide | 0.95 |

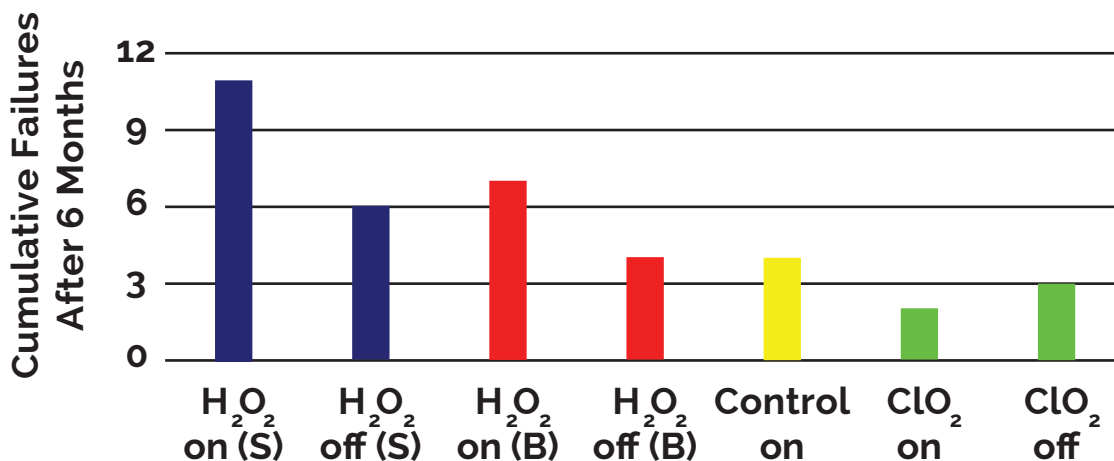
↑
More
Corrosive

The below graph comes from the US EPA, who performed material compatibility studies in 2011 using two hydrogen peroxide vapor technologies as well as our chlorine dioxide gas. Our chlorine dioxide gas resulted in fewer computer failures than both hydrogen peroxide methods and was in line with the non-exposed control computers.

Key Safety Features

- Odor Threshold at the 8-hr OSHA safety level, meaning CD gas can be sensed before dangerous levels are reached.
- Chlorine dioxide is a non-carcinogen (formaldehyde and ethylene oxide are known carcinogens and hydrogen peroxide is a Class A3 Animal Carcinogen according to the ACGIH)
- CD gas is able to penetrate and maintain efficacy in water, unlike hydrogen peroxide.
- Chlorine dioxide is used for both drinking water treatment and the sanitization of many foods.

The US EPA shows that hydrogen peroxide is more corrosive than chlorine dioxide gas



Ref: Emily Snyder, "Indoor and Outdoor Decontamination" Presentation at the EPA Region 9 / ORD Homeland Security Research Workshop, July 14, 2011 San Francisco,

Chlorine Dioxide Gas

Connections and Cycle Development

Cycle Development

- Gasses get everywhere, no shadow areas, no airflow studies necessary
- Equipment and components in the area do not affect cycle parameters
- Same cycle parameters for all volumes
- Room shape and layout do not affect cycle parameters
- Temperature, temperature gradients and dew points do not affect the cycle, no condensation issues to worry about
- Starting humidity levels not a factor
- Wet surfaces do not affect efficacy, no need to make sure surfaces are completely dry
- Surfaces do not need to be perfectly clean prior to sterilization

Wall Plate

Wall plates can be sized to replace a cement block for block walls or made shallower to fit stud walls.



Under Door Plate

Used by most customers, this plate offers an easier interface to seal against when tubing is run underneath a doorway.



Door Plate

Door plates can be made custom for any door type to provide a leak-tight interface between a room and the Minidox-B.



Distribution Plate

This plate connects one location to many as tubing connects the distribution plate to various rooms or chambers within a facility. Best for barrier suites and restricted access facilities as the Minidox-B can stay outside the barrier and be used both within and outside of the barrier.



Other solutions available from ClorDiSys



Decontamination Chamber

Fully sealed chambers for the decontamination of equipment and other items. Chambers can be installed passthrough chambers, portable chambers, or dual-use rack washer / decontamination chambers.

- Items can be heat and moisture sensitive (non-autoclavable)
- Lower energy consumption compared to bulk autoclaves
- Quickest cycle times among common decontamination methods
- Items can be tyvek wrapped to keep sterile post-decontamination
- Items do not need precise placement to ensure successful decontamination.

Decontamination Services

Complete turnkey decontamination services on a routine or emergency basis for rooms, zones, and buildings

- No areas too large
- Routine service, emergency contamination response, pre- and post-renovation, commissioning and decommissioning.
- Fast turnaround times
- No residues
- Full report issued upon completion
- 6-log sporicidal kill
- Achieves kill in wet areas as well as dry areas

Minidox-M Portable CD Gas Generator

A CD gas generator similar to the Minidox-B but with an integrated concentration monitor for more accurate process control.

- Able to connect up to many different types of chambers / rooms.
- Faster cycle times than other methods
- Easily portable
- Simple control system and interface
- Effective against viruses, bacteria, fungi, spores, beta lactams, and pinworm eggs
- No required maintenance contracts

