

Defend tag

What is it all about?



It is a personal protective equipment, containing 5g of sodium chlorite in a sachet. Our sodium chlorite is innovatively formulated to be able to release standardized concentrations of Chlorine Dioxide (ClO₂) gas.

ClO₂ gas has anti-microbial effect, protecting the bearer from airborne infection via aerosol (airborne) transmitted bacteria and viruses.



It is highly recommended for use when one is in a confined space or crowded areas such as meeting rooms, public transport (cars, airplanes, buses, trains), classrooms, offices, hospitals etc.

Defend tag offers 1 cubic meter protection around the bearer. Thanks to Japanese innovative technology, each tag is able to provide protection around the user for 45 days.



Chlorine Dioxide: common use...

As disinfectant – in Food industry, Water treatment industry and more recently as a fumigation agent to decontaminate spaces.



Food additives¹

Used as an antimicrobial agent in water or poultry processing and washing of fruits & vegetables in amounts not exceeding 3ppm

¹FDA – Subchapter: Food for Human Consumption



Drinking Water Treatment²

According to U.S. Center for Disease Control and Prevention, chlorine dioxide is added to drinking water to protect people from harmful bacteria and other microorganisms. EPA recognizes chlorine dioxide use as a drinking water disinfectant. Chlorine dioxide dose applied in drinking water is typically limited to approximately 1.4 mg/L

²EPA – Drinking Water Treatability Database
(note: 1.4mg/L = 1.4ppm)



Preventing Spread of Coronavirus Disease 2019 (COVID-19)

Guideline for Airports³

Use of Chlorine dioxide by aerosol spray method to disinfect air and surfaces of airports.

³Civil Aviation Administration of China (CAAC)

Is Defend Tag safe?



What people are saying: "Chlorine Dioxide is highly flammable and reactive gas?"



TRUE, chlorine dioxide gas is explosive when its concentration in air exceeds 10% v/v⁴. However, Defend tags are designed to release 0.03-0.05ppm.

⁴Chlorine Dioxide, CAS No: 10049-04-4, International Programme on Chemical Safety (IPCS) and the European Commission (EC), Oct 1999.

FACT: Yes, Defend Tag is safe to be used. Why?

Concentration of 10% v/v (100,000 ppm) is equivalent to two million Defend tags!!



What people are saying: "Chlorine Dioxide gas causes respiratory irritation?"



According to international ClO₂ gas Permissible Exposure Limits^{5,6}:

0.1 ppm 8-h Time Weighted Average (TWA)

0.3 ppm 15-min Short-Term Exposure Limit (STEL)

⁵United State Occupational Safety and Health Administration (OSHA)

⁶United State National Institute for Occupational Safety and Health (NIOSH)

FACT: Yes, Defend Tag is safe to be used. Why?

Defend Tag = Standardized release of 0.03-0.05ppm is way below the OSHA and NIOSH safe exposure limits.



The Controversial Research Study

Investigation on Practical Usefulness of Body-worn Devices that Claim to Release Chlorine Dioxide

July 2017 · Japanese Journal of Environmental Infections 32(4):222-226

DOI: [10.4058/jsei.32.222](https://doi.org/10.4058/jsei.32.222)

Hidekazu NISHIMURA

1st Research report:

- Date of report: April 2017
- Publication date: Jul 2017
- By Nishimura alone.

What does the study say?



That the device is not effective in killing bacteria and viruses.

Peer review of the study:

This 1st study is **FLAWED** in many ways.

- × **There was no control and standardization of Chlorine dioxide gas.**
- × **Relative Humidity at 30% only.**

2 months later

Inactivation of Airborne Influenza Virus Using Low Concentration of Chlorine Dioxide: About the Relative Humidity-dependency

September 2017 · Japanese Journal of Environmental Infections 32(5):243-249

DOI: [10.4058/jsei.32.243](https://doi.org/10.4058/jsei.32.243)

Hidekazu NISHIMURA · Hiroyuki HAYASHI · Shigeru URA · Soichiro SAKATA

2nd Research report:

- Date of report: Jun 2017
- Publication date: Sept 2017
- by Nishimura and 3 other fellow scientist.

What does the study say?



“Thus, it was shown that chlorine dioxide at low concentration of less than 0.02-0.03 ppm has an ability to inactivate airborne influenza virus under 50% and 70% RH conditions.”

What has been corrected in this 2nd study?

- √ **Improved research conditions.**
- √ **Controlled concentration range of ClO₂ @ 0.02-0.03ppm.**
- √ **Relative Humidity at 30%, 50% and 70%**

Both studies are done in a 25m³ enclosed space environment and at temperature of 22-23°C.



So, is low concentration Chlorine Dioxide gas effective?

What do other studies say? they all show that ClO₂ gas concentration as low as 0.03ppm is effective as an antimicrobial agent.

“From these results, it was suggested that as low as 0.03 ppm of ClO₂ gas prevented the influenza infection.”

[Antiviral Effect of Chlorine Dioxide against Influenza Virus and Its Application for Infection Control]

Takanori Miura* and Takashi Shibata, Taiko Pharmaceutical Co., Ltd, 3-34-14 Uchihonmachi, Suita, Osaka, 564-0032 Japan, The Open Antimicrobial Agents Journal, 2010, 2, 71-78.

“The level of ClO₂ gas (0.03 p.p.m.) used in this study is well below this level, and our results indicate that ClO₂ at this level could be used in the presence of humans to prevent their infection by influenza A virus and possibly other related virus infections of the respiratory tract. Specifically, ClO₂ gas could be used in places such as offices, theatres, hotels, schools and airport buildings without evacuating people, thus not interrupting their normal activities.”

[Protective effect of low-concentration chlorine dioxide gas against influenza A virus infection]

Norio Ogata and Takashi Shibata, Taiko Pharmaceutical Co. Ltd, 3-34-14 Uchihonmachi, Suita, Osaka 564-0032, Japan, Journal of General Virology (2008), 89, 60–67.

“We conclude that ClO₂ gas at extremely low concentrations (≤ 0.03 ppm) can reduce the number of viable microbes floating in the air in a room. These results strongly support the potential use of ClO₂ gas at a non-toxic level to reduce infections caused by the inhalation of pathogenic microbes in nursing homes and medical facilities.”

[Inactivation of Airborne Bacteria and Viruses Using Extremely Low Concentrations of Chlorine Dioxide Gas.]

Ogata N1, Sakasegawa M, Miura T, Shibata T, Takigawa Y, Taura K, Taguchi K, Matsubara K, Nakahara K, Kato D, Sogawa K, Oka H, Pharmacology. 2016;97(5-6):301-6. doi: 10.1159/000444503. Epub 2016 Mar 1.

We say:

Innovation is the way forward.

Low concentration Chlorine Dioxide (ClO₂) gas is proven to be safe and effective antimicrobial agent. Defend tag is able to control the release of ClO₂ concentration within 0.03-0.05 ppm, a concentration range which is proven to be a safe and effective. This standardized release of ClO₂ is able to protect the bearer from airborne pathogens.



Prevention is better than cure.

As of now, COVID19 is known to be transmissible via droplets and close contact. We strongly encourage the new normal practice of good personal hygiene and social distancing. By no means should Defend tags be used in place of face masks and good hand hygiene. As responsible citizens, we should continue to play our part in breaking the chain and adopt preventative measures recommended by our MOH and WHO.