

Anthium™ Dioxide for SARS-CoV-2 Virus Hard Surface Disinfection (Cause of COVID-19 Illness)



Anthium™ Dioxide – Trusted Chemistry for Over 70 Years

- Anthium™ Dioxide, is a 5% EPA approved Stabilized ClO₂ solution.
- Approved by EPA for Emerging Viral Pathogens (EPA's N list for SARS-CoV-2).
- Has virucide claims on the label at 800 PPM Total (with 100 PPM of Free ClO₂).
- Requires activation with an acid prior to use.
- Instructions allow for bucket activation or equipment activation for larger applications.
- Produced out of Grand Rapids, MI and packaged in Pail, Drum and Tote.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, DC 20460

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION

April 6, 2020

Christina M. Swick
Agent
International Dioxide, Inc.
40 Whitecap Drive
North Kingstown, RI 02852

Subject: Label Amendment: Emerging Viral Pathogens Claim
Product Name: Anthium Dioxide
EPA Registration Number: 9150-2
Application Date: 03/26/2020
Decision Number: 561169

Dear Ms. Swick:

The amended label referred to above, submitted in connection with registration under the Federal Insecticide, Fungicide and Rodenticide Act, as amended, is acceptable. This approval does not affect any conditions that were previously imposed on this registration. You continue to be subject to existing conditions on your registration and any deadlines connected with them.

EPA Approval for Emerging Pathogens Claim

- Anthium™ Dioxide approved for surface disinfection against SARS-CoV-2, the virus that causes COVID-19
 - Decision number 561169
 - Anthium™ Dioxide is activated to release chlorine dioxide (ClO_2) as described on label
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A brief history of ClO_2 for Disinfection

ClO_2 is a powerful biocide:

- 200-year old chemistry → **Well Established!**
- Lower dosage and contact time in comparison to alternatives → **Highly Selective!**
- Used as a gas to sterilize Anthrax spores in the Hart Senate Building → **Commercially Proven!**
- Common disinfectant in food and drinking water applications → **Low Toxicity!!**
- Used globally to disinfect public spaces, medical equipment, and farms → **Broad Spectrum!**
- Used to disinfect the Wuhan Train Station in the recent COVID-19 outbreak → **Global Adoption!**



Wuhan Train Station Treatment Prior to Opening

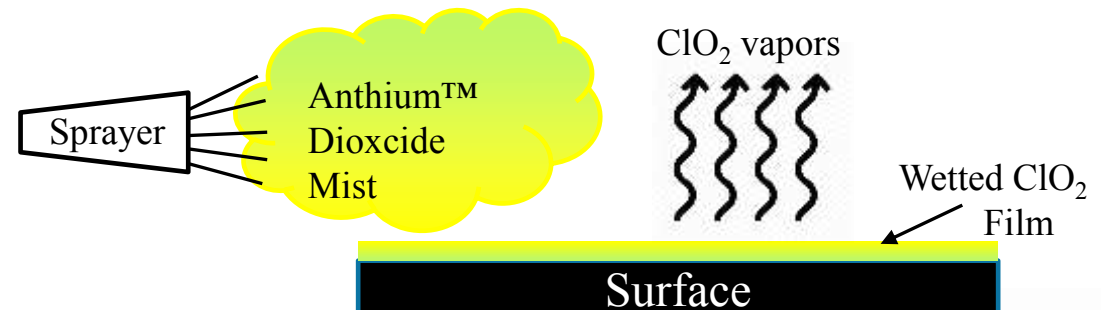
Sprayed ClO_2 is Present Both on Surfaces and in Air

As a soluble gas in solution:

- Does not ionize
- Not affected by pH
- Reacts via exchange of electrons
- Remains neutral molecule
- Not impacted by static charge
- 2.5X more oxidation capacity than bleach or peroxide
- Unreacted ClO_2 partitions to air readily for added benefits

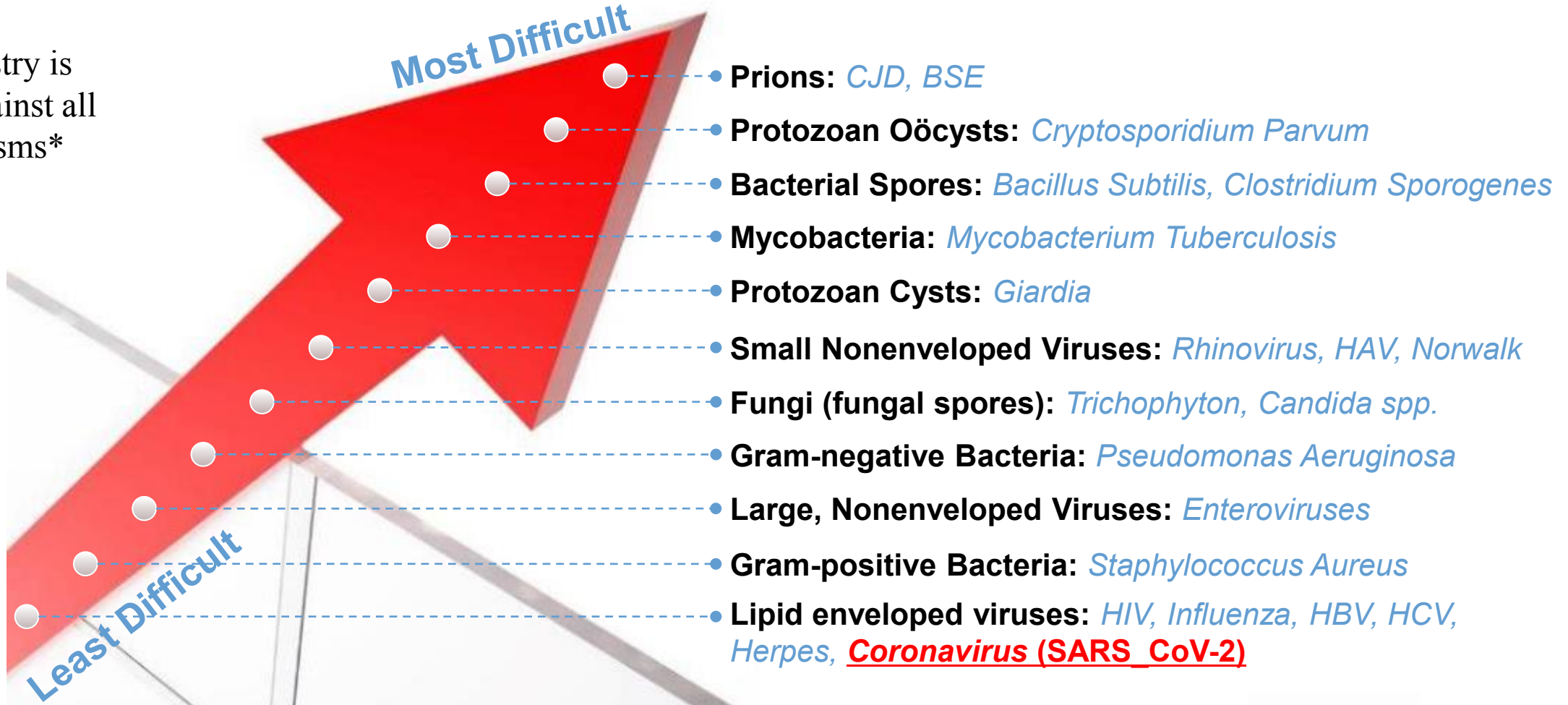
As a gas molecule:

- Heavier than air, hangs around
- ~800X smaller than virus
- ~160,000X smaller than spore
- ~800,000X smaller than mist
- Penetrates cracks and crevices where virus may float and hide



Order of Difficulty to Kill or Destroy

ClO₂ chemistry is effective against all these organisms*



* Different contact times and dosages are required for each organism.

Anthium™ Dioxide Viricidal Solution Makeup Chart

Desired Volume	Anthium™ Dioxide	Acid *	Water
32 ounces (1/4 gallon)	0.5 ounce	2.5 ounces	29 ounces
64 ounces (1/2 gallon)	1 ounce	5 ounces	58 ounces
128 ounces (1 gal)	2 ounces	10 ounces	116 ounces
640 ounces (5 gallon)	10 ounces	50 ounces	580 ounces

- Wait 15 minutes after adding the acid to the Anthium™ Dioxide prior to dilution with water.
- Maintain 15 minute wetted surface.
- 1 ounce of Anthium™ Dioxide will treat 1,000 square feet.

Anthium™ Dioxide Viricidal Economics

Key Assumptions:

- Anthium™ Dioxide 50,000 ppm
- Total ClO₂ dose 800 ppm
- Contact time 15 min
- Sprayer film 20 um
- Treatment area basis 1,000 sq. ft.
- Anthium™ Dioxide Cost: \$ X/lb.

Treatment Economics: per 1,000 sq. ft.

- Volume Anthium™ Dioxide 30 ml
- Chemical Cost: \$ 1/3 X

Anthium™ Dioxide for SARS-CoV-2 Virus Hard Surface Disinfection Summary

- EPA Emerging Pathogen Approval
 - Readily Available
 - FDA APPROVED 21 CFR 173.300 AND 173.325
 - Easily Activated Solution
 - Hard Surface Disinfectant
 - Spray, Mop or Wipe
 - 15 Minutes Wet Surface
 - Unreacted ClO_2 Follows the Virus
 - Established Product & Chemistry
 - Published References
 - Selective Oxidation
 - High Oxidative Capacity
 - Food & Drinking Water Applications
 - Expert Application Support
 - Competitive Economics
-

References & Credits

- Wuhan Train Station

<https://www.dailymail.co.uk/news/article-8147393/Hazmat-clad-officers-disinfect-Wuhan-train-stations-city-prepares-lift-lockdown.html>

- EPA List N: Disinfectants for use against SARS-CoV-2

<https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>

- Report for Hart Building / Anthrax

<https://www.cnn.com/2001/HEALTH/conditions/12/01/anthrax.hart/index.html>

Emerging Viral Pathogens Claims

Allowable and subject to the terms described in Agency guidance dated August 19, 2016, “Guidance to Registrants: Process for Making Claims Against Emerging Viral Pathogens not on EPA-Registered Disinfectant Labels.”

This product qualifies for emerging pathogens claims against:

- Enveloped Viruses
- Large Non-Enveloped Viruses

For an emerging viral pathogen that is a/an...	... following the directions for use for the following supporting organism(s) on the label:
Enveloped virus	Canine parvovirus ATCC VR-2017
Large, non-enveloped virus	Canine parvovirus ATCC VR-2017

OR

Anthium™ Dioxide has demonstrated effectiveness against viruses similar to SARS-CoV-2 on hard, non-porous surfaces. Therefore, Anthium™ Dioxide can be used against SARS-CoV-2 when used in accordance with the directions for use against Canine parvovirus ATCC VR-2017 on hard, non-porous surfaces. Refer to the CDC website at <http://www.cdc.gov> for additional information.

OR

COVID-19 is caused by SARS-CoV-2. Anthium™ Dioxide kills similar viruses and therefore can be used against SARS-CoV-2 when used in accordance with the directions for use against Canine parvovirus ATCC VR-2017 on hard, non-porous surfaces. Refer to the CDC website at <http://www.cdc.gov> for additional information.

Anthium™ Dioxide – Emerging Viral Pathogens Claim

Emerging Viral Pathogens Claims

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Enveloped virus	Canine parvovirus ATCC VR-2017
Large, non-enveloped virus	Canine parvovirus ATCC VR-2017

Anthium™ Dioxide has demonstrated effectiveness against viruses similar to **SARS-CoV-2** on hard, non-porous surfaces. Therefore, **Anthium™ Dioxide** can be used against **SARS-CoV-2** when used in accordance with the directions for use against **Canine parvovirus ATCC VR-2017** on hard, nonporous surfaces. Refer to the CDC website at <http://www.cdc.gov> for additional information.

Covid-19 is caused by **SARS-CoV-2**. **Anthium™ Dioxide** kills similar viruses and therefore can be used against **SARS-CoV-2** when used in accordance with the directions for use against **Canine parvovirus ATCC VR-2017** on hard, non-porous surfaces. Refer to the CDC website at <http://www.cdc.gov> for additional information.

EPA Cover Letter - Emerging Viral Pathogens Claim



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Chlorine Dioxide Chemistry

Although it has chlorine in the name, ClO_2 behaves very differently than Cl_2

Chemistry

- 200 year old, well proven chemistry which has been used commercially for more than 70 years
- ClO_2 chemistry is 1 of 4 EPA approved disinfectants for potable drinking water
- ClO_2 chemistry used to sterilize Anthrax contamination
- ClO_2 is a gas dissolved in a solution

Key market drivers

- Replacing Cl_2 gas/bleach in most instances
 - Regulatory compliance (no chlorinated organics / less by-products)
 - Superior biocidal performance (e-coli, cryptosporidium, legionella, etc.)
 - Highly selective oxidant minimizes undesired reactions (lower dose)
- Knowledge intensive / solution sale

