

COVID-19



CRITICAL SOLUTIONS FOR MARITIME



Activator for



How to establish a healthy environment in the COVID-19 era and beyond

Rudi Roegiers, Owner

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VMP Distribution

VMP is a wholesaler of ecological cleaning and protective products for the maritime industry. We strive to reconcile high quality and efficiency with respect for the environment and, in particular, the marine flora.

Port of Antwerp, Belgium

Global distributor




BioOrg

BioOrg is a Belgian biotech company that harvests bacteria from forests to enable fine and visible dust to be cleaned naturally. This technology is protected by various international patents and is already being used successfully by numerous Belgian and European customers.



Virusses (a.o. COVID-19)

- Need a (human) host to reproduce
 - Transferred via cough, sneez, spit...
 - Survive up to 72 hours on hard surfaces with humidity or biofilm (from detergents)
 - Therefore:
 - Keep distance (1.5m)
 - **Disinfect** (hands, doorknobs, tables, chairs etc....)
-  Will kill every microorganism!

Bacteria (the good, the bad and the ugly)

- Reproduce every 20'... in 6 hours from 1 to over 1 Million
- Need a habitat to reproduce... humidity, dust, etc...
- Bad and good bacteria communicate via quorum sensing: outnumbered bad bacteria will make room for good bacteria.
- Therefore:
 - Disinfection will create space for possible bad bacteria
 - After disinfection always reproduce your ecosystem of good bacteria on board



Some facts

1. Air Pollution exacerbates Covid-19

There's a murky relationship between air pollution and coronavirus, which may mean that tackling air pollution will be a crucial part of easing lockdown.

Source: BBC Future

- “People who have been living in places that are more polluted over time...are more likely to die from coronavirus,”

Aaron Bernstein, the director of the Center for Climate, Health, and Global Environment at Harvard University

- One recent study found that even small increases in fine particulate matter, known as **PM2.5**, have had an outsized effect in the US. An increase of just 1 microgram per cubic meter corresponded to a 15% increase in Covid-19 deaths,

according to the researchers, led by Xiao Wu and Rachel Nethery at the Harvard University T.H. Chan School of Public Health.

- A study of air quality in Italy's northern provinces of Lombardy and Emilia Romagna also found a correlation between Covid-19 mortality rates and high levels of pollution





Some facts

2. Particulate matter could spread Covid-19

A research hypothesis associates higher mortality rates due to COVID-19 observed in Northern Italy and the peaks of particulate matter concentrations.

Source: COVID-19 SARS-CoV-2 preprints from medRxiv and bioRxiv

A study detected Sars-CoV-2 (the virus that causes Covid-19) could even be hitching a ride on **PM10, 10 μ m, particles** (Coronavirus is 65-125nm). The researchers, based at several universities across Italy, suggest the virus could be dispersed more widely on air pollution particles.

Method:

To assess environmental factors related to the spread of the COVID-19 in Italy from February 24th to March 13th (the date when the lockdown has been imposed over Italy), official daily data relevant to ambient PM10 levels were collected from all Italian Provinces between February 9th and February 29th, taking into account the average time (estimated in 17 days) elapsing between the initial infection and the recorded COVID-19 positivity.

Results:

PM10 daily limit value exceedances appear to be a significant predictor ($p < 0.001$) of infection in univariate analyses.

Less polluted Provinces had a median of 0.03 infection cases over 1000 residents, while most polluted Provinces had a median of 0.26 cases over 1000 residents.



Disinfection

Hypochlorous Acid aka Bright Water aka ECA Water

- Completely safe for humans
- Better disinfection:
 - 2 - 5 times greater effect than free chlorine
 - Better security in the galley
- No chemicals:
 - No use, no storage and no handling of dangerous chemicals
 - No possibility of over dosing
 - Better working environment for the crew
 - Less impact on the environment
- Versatile in use: Nebulizing, spraying
- Complies with all biocide regulations
- Available in
 - 0,5L, 1L spray bottles
 - 5 & 10L cans
 - 600L IBC



After disinfection: install the ecosystem





LET NATURE COME ON BOARD

Invite a natural ecosystem of good bacteria
to heal your life!







First activate and maintain the ecosystem

(using patented technology)



- Periodic Spray&Go by nebulising
- Selection of 11 forest, good bacteria
- Scientificly proven



PROBLEM	EFFECTIVITY	METHOD	PRODUCT
Off-odors (organic base)	-100%	SPRAY & GO	
VOCs	-80%	SPRAY & GO	
PM 2,5	-50%	SPRAY & GO	
PM 10	-35%	SPRAY & GO	
PAHC	-100%	SPRAY & GO	
High dust particles	-65%	SPRAY & GO	

RESULTS

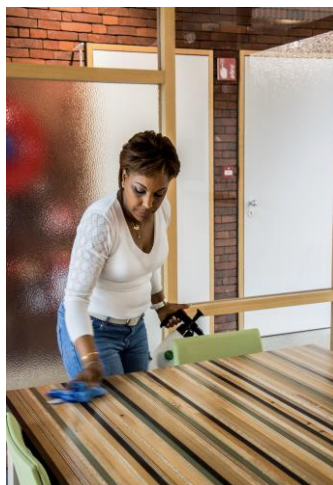
- metabolises air pollution
- reduction of dust
- elimination of odor
- no residual waste
- dehydrate surfaces
- introduction to less cleaning
- positive footprint

Then easier cleaning without water!

(using patented technology)



- Compatible cleaning
- Spray & rinse with dry(!) Microfibre cloth or mop
- “Daily Cleaning”
- Remove excessive dust or stains



OBJECTS	PRODUCTIVITY*	METHOD	EFFECTS
Sanitary	+20%	No water, no soap. Only spray & mop + descaling	Less dust, less odors, less labour
Offices, meeting rooms	+20%	No water, no soap. Only spray + micro fibre if needed	Less dust, less odors, less finger prints, less labour
Manual floor cleaning	+15%	No water, no soap. Only spray & mop + descaling	
High dust cleaning	+50%	No water, no soap. Only spray & go	Less dust, less odors, less labour
Vacuum cleaning	+75%	No water, no soap. Only spray & go	Less dust, less odors, less labour
Carpet cleaning	+100%	No water, no soap. Only spray & go	Less dust, less odors, less labour
Inside Window cleaning	+50%	No water, no soap. Only spray + micro fibre if needed	Less dust, less odors, less labour

*Average productivity gain per object
*Compared to standard classical cleaning method

Verified by SGS

RESULTS

- no water, no detergents or chemicals
- less dust
- no smell
- safe and ergonomic for both crew and pax
- higher productivity
- reduced labor time
- zero waste
- simplified product range

Product range



Aero Clean

Against air pollution



Surface Clean

Daily surface cleaning



HVAC Clean

HVAC cleaning

Others:

- Odor Clean
 - Removes excessive odors
- Dust Clean
 - Heavy duty carpet cleaning

Positive Footprint Certification



50m² = 1 tree



Vlaamse Overheid Virginie Lovelinggebouw Gent

Koningin Maria Hendrikaplein 70, 9000 Gent

Geldig: 20/06/2019 – 20/06/2020

Gecertificeerd Ecosysteem Nr. 2019-59

In de gebouwen van **VAC Gent** werd het microbiom verrijkt en een ecosysteem gecreëerd van **goede bacteriën**, dat, net zoals in het bos, de binnenomgeving schoonmaakt. De biomassa van het verrijkte BioOrg microbiom staat gelijk aan het planten van een boom per 50 m².

De natuur werd binnengebracht in de gebouwen door de medewerkers van **Het Facilitair Bedrijf** en zorgt jaarlijks voor:



New technology?

The healing power of bacteria has been perfected
by nature for millions of years!



Scientific proof

Indoor air quality

- Up to 90% of time spend indoors ^I
- Conservation energy → increasing sealing of buildings
- Badly maintained or located ventilation system
- Increasing number of non-natural products
 - Volatile chemical products: ½ fossil fuel emissions ^{II}
- Indoor air pollution > outdoor air pollution
 - VOCs: Indoor sources (61%) & Ventilation (39%) ^{III}
- Good IAQ is beneficial for:
 - general health, comfort & productivity
- High economic costs due to indoor air pollution
 - California's economy: > €40 billion/year ^{IV}



Novel technology: microorganisms

- Bacillus subtilis*
- Bacillus amyloliquefaciens*
- Bacillus pumilus*
- Bacillus megaterium*
- Bacillus licheniformis*

Nebulization



self-cleaning ecosystem due to **bioremediation & competitive exclusion**

Bioremediation : Indoor air pollutants → less hazardous metabolites

Aim

Effect of microorganisms on indoor air quality in offices

Material & methods

Treatment group



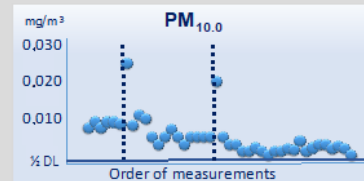
Control



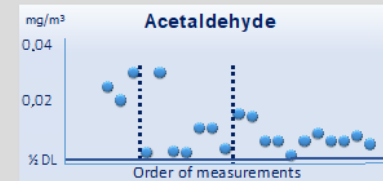
- 3 Weeks
- 3 Offices: same occupancy rate
- Parameters:
 - CO₂
 - Aldehydes
 - Particulate matter
 - Polycyclic aromatic hydrocarbons
 - Volatile organic compounds
- Temperature, relative humidity and ventilation rate
- Total aerobic colony-forming units, yeasts and moulds

Results & Discussion

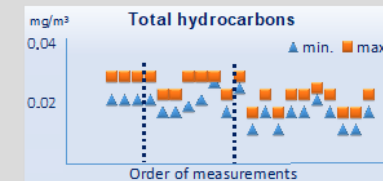
I.) Chemical



Workplace 1	Control
52 %	5 %



Workplace 1	Control
33 %	23 %



Workplace 1	Control
28 %	11 %

Workplace 2	Control
33 %	13 %

Workplace 2	Control
25 %	7 %

Workplace 2	Control
29 %	9 %

II.) Biotic

- Ensured a coverage of at least 10,000 CFU/cm²
- Yeasts & moulds below DL after nebulization

Significance testing: unpaired Student's t-test (P<0.05)

Note on COVID-19



The BioOrg ecosystem ensures maximum hygienic surfaces

Viruses are known to "survive" in wet conditions such as biofilms.

Recent studies showed that the persistence of coronaviruses on hard surfaces such as metal, glass or plastic at room temperature can range from 3 hours to 9 days. (Kampf et al. Journal of Hospital Infection 104 (2020): 246-251).

Selected for their purification performance, our Bacillus strains are aerobic spore-forming bacteria that do not form a classic biofilm and thus create dry conditions on surfaces.

In addition, the selected Bacillus strains produce biosurfactants: lipoproteins such as surfactin, fengycin and iturine, with a known purifying action of organic fraction and contamination.

Please consult the following scientific publications:

<https://www.ncbi.nlm.nih.gov/pubmed/9324997>

<https://link.springer.com/article/10.1007/s10989-006-9041-4>

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0198107>

We recommend that after treatment with biocides, repaint the treated contact surfaces with BioOrg liquids in order to reinstall the benign BioOrg ecosystem.

Sincerely,

Dr. ir. Filip Willocx, Managing Partner BioOrg.



Summary:

- Desinfect with ECA water
- Spray&Go to install the ecosystem
- Compatible cleaning for :
 - Dehydrate surfaces
 - Higher efficiency
 - Less labor
 - Zero waste
- Give virusses and bad bacteria no chance and make the indoor air healthier.

You're not the first!





Bio
org

Let nature in



Thank you!



VMP Distribution

**Exclusive BioOrg Activator for
Maritime**

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