General information, description of the product, efficacy, safety and use.

The Product

Efficient and extremely safe tap water based disinfectant for disinfection of spaces and surfaces. The disinfectant eliminates pathogens such as germs, resistant germs, spores and viruses within less than 2 minutes by contact.

WHAT IS HOCL and why its the best solution for our tunnles:

HOCl is a natural part of our internal defense system, produced by white blood cells. When produced outside the body, HOCl is an electrolyzed, antimicrobial, biocide solution that inactivates pathogens such as bacteria, viruses, spores, and fungi.

Works to fight infection, control responses to injury, and enhance healing

Part of the healthy response to injury and recovery

HOCl consistently shows no adverse effects

Will not irritate or aggravate tissue damage at wound sites

Safe for use on humans and animals

HOCL: REAL SCIENCE IN THE HUMAN BODY

Harmful pathogens, such as bacteria, spores and viruses, can be found all around us — in the air, on food, plants, animals, on inanimate surfaces. And our body. The human body uses innate, non-specific mechanisms as the first line of defense against pathogens, infection and injury. The skin itself, and mucous secretions at epithelial membranes, are both important elements of the innate resistance response. But when these are breached, HOCl is immediately generated by the body in response as the key chemical component of innate immunity.

2.Description and mechanism

The product is tap water based disinfectant. Basically, tap water undergoes electrolysis in special electrochemical cells in which the pH of the water is manipulated to be in a well defined range. The active material is hypochlorous acid (HOCl) in a concentration range of 50-200 ppm and a pH range between 4.5 and 6.5.

- The disinfectant solution can be stored in standard plastic containers or sprays where the shelf life is expected to be about two months.
- Alternatively, the disinfectant solution can be produced on site. We have the capability to extend the shelf life of the product up to two years in a way that when the consumer opens a container the material is being "activated".
- The disinfectant solution eliminates pathogens by contact within two minutes.
- In comparison to other materials existing in the market, this product is extremely safe and has no environmental impact (like corrosion). Moreover, the disinfectant solution eventually turns into water.

3. The goal of use

Prevention of spreading infectious disease by using, available and simple to use disinfectant solution which contains very low amount of active material, and therefore, is not harmful to the environment.

4.Destination

- Spaces and equipment in disease prone environments such as hospitals, emergency departments, nursing homes, etc.
- Public spaces like supermarkets, restaurants, factories, offices..
- We see in the assimilation of this product as an important strategy for fighting of spreading of viruses and covid-19 virus in particular.

- The active material concentration is extremely low (0.0005-0.02% w/w) which is significantly lower compared to other available disinfectants products (bleach, alcohol, chlorohexidine) which makes this product extremely safe and therefore, this material can be applied frequently in the presence of people, thing that strategy can lower the chances of virus spreading.

- The material, thanks to its safety characteristics can be applied in the presence of people and being eco-friendly, can be applied on disease spreading prone places, like sinks, curtains, wheel chairs and so on.

- Since the product is FDA approved for skin contact, this product can be ultimate solution for kindergartens for disinfection of objects like toys.

- Production of this material is significantly more cost effective compared to other disinfectants.

All the abovementioned is a game changer in all we percept the way of disinfection.

5. safety of use

- In application on object – no limitations
- In application on skin – since the product contains very low amount of active material, the disinfectant solution does not irritate and does not cause burns.
- The material is FDA approved for skin contact and food contact.

7.Disinfection efficacy

The material was tested and its efficacy was proven against gram positive and negative germs. Moreover, the material was tested against antibiotic resistant germs in hospital and was found very efficient. In addition, the material was tested and validated on fruits. Regarding viruses, we checked the capability of the material to inhibit viruses infection's capabilities; Herpes virus and human corona virus (OC43). Experiments were held in Prof. Ronit Sarid lab from Bar-Ilan university.

Below are brief summary of disinfection tests we conducted on some pathogens.

אמינולאב בע"מ שרותי מעבדה אנליטיים
5.1.2e
קרית ויצמן, פנחס ספיר 1, ת.ד. 4674, נס ציונה 70400
AMINOLAB
Every Particle Counts

14.05.2018
Report No.: 16811.18

Disinfection Test for Spray - Microbiological Examination Report

Customer:	**Bar-Ilan University**
Telephone:	5.1.2e
E-Mail	eranchem@gmail.com
Date samples received:	23.04.2018
Aminolab No.:	**033773.18M**
Test Item	Plates with liquid

Method:

1. Aminolab SOP NO.50.WI.106, Version 6: Bioburden test – pre-sterilization estimation of population of microorganisms on/in medical devices.
2. Aminolab SOP NO.50.WI.034: Counting microorganisms using membrane filtration method.
3. Sponsor's instructions.

Test microorganism	***Staphylococcus aureus*** **ATCC 6538**	***Escherichia coli*** **ATCC 8739**
Incubation temperature	30-35°C	30-35°C
Incubation period	2 days	1 day
Test medium	Baird-Parker Agar	m-Endo LES Agar

Product Description:

Item #	***Staphylococcus aureus*** **ATCC 6538**		***Escherichia coli*** **ATCC 8739**	
1	200 ppm HOCL	pH = 3	200 ppm HOCL	pH = 3
2	200 ppm HOCL	pH = 5.5-6	200 ppm HOCL	pH = 5.5
3	200 ppm HOCL	pH = 6.3	200 ppm HOCL	pH = 7.2
4	50 ppm HOCL	pH = 3	50 ppm HOCL	pH = 3.2
5	50 ppm HOCL	pH = 6.5	50 ppm HOCL	pH = 6.9

אמינולאב בע"מ שרותי מעבדה אנליטיים
ד 5.1.2e
קרית ויצמן, פנחס ספיר 1, ת.ד. 4074, נס ציונה 70400

AMINOLAB
Every Particle Counts

14.05.2018
Report No.: 16811.18

Customer:	**Bar-Ilan University**
Telephone:	5.1.2e
E-Mail	eranchem@gmail.com
Date samples received:	23.04.2018
Aminolab No.:	**033773.18M**
Test Item	Plates with liquid

Test procedure:

1. 1 ml of suspension of the test microorganisms was added to 14 ml of the liquid product (see table product description) and further incubated for 3 or 10 minutes subsequently.
2. After the incubation, 14 ml of neutralizing solution (Sodium Thiosulfate, Na2S2O3, 0.1N) was added.
3. The treated samples were tested to determine the bacterial load by the membrane filtration technique.
4. 20 ml sterile buffer was filtered and incubated as above and served as a negative control.

Results:

Staphylococcus aureus ATCC 6538:

Sample Name	Tested incubation time	CFU/sample	Log	Log Reduction
200 ppm HOCL; pH = 3	3 minutes	<10	1	6.6
	10 minutes	<1	0	7.6
200 ppm HOCL; pH = 5.5-6	3 minutes	<10	1	6.6
	10 minutes	<1	0	7.6
200 ppm HOCL; pH = 6.3	3 minutes	<10	1	6.6
	10 minutes	<1	0	7.6
50 ppm HOCL; pH = 3	3 minutes	<10	1	6.6
	10 minutes	<1	0	7.6
50 ppm HOCL; pH = 6.3	3 minutes	<10	1	6.6
	10 minutes	<1	0	7.6
Negative control	N/A	No growth	NA	NA
Size of inoculum – Positive Control	N/A	$4.4x10^7$	7.6	NA

אמינולאב בע"מ שרותי מעבדה אנליטיים
ד 5.1.2e
קרית יצחק, כנחס ספיר 1, ת.ד. 4074, נס ציונה 70460

AMINOLAB
Every Particle Counts

14.05.2018
Report No.: 16811.18

Customer:	**Bar-Ilan University**
Telephone:	5.1.2e
E-Mail	eranchem@gmail.com
Date samples received:	23.04.2018
Aminolab No.:	**033773.18M**
Test Item	Plates with liquid

Escherichia coli ATCC 8739

Sample Name	Tested incubation time	CFU/sample	Log	Log Reduction
200 ppm HOCL; pH = 3	3 minutes	<1	0	8
	10 minutes	<1	0	8
200 ppm HOCL; pH = 5.5	3 minutes	<1	0	8
	10 minutes	<1	0	8
200 ppm HOCL; pH = 7.2	3 minutes	<1	0	8
	10 minutes	<1	0	8
50 ppm HOCL; pH = 3.2	3 minutes	<1	0	8
	10 minutes	<1	0	8
50 ppm HOCL; pH = 6.9	3 minutes	<1	0	8
	10 minutes	<1	0	8
Negative control	N/A	No growth	NA	NA
Size of inoculum – Positive Control	N/A	$1.0x10^8$	8.0	NA

Examined by 5.1.2e

Checked and confirmed 5.1.2e

*** End of certificate of analysis ***

מרכז רפואי ע"ש ברוך פדה, פוריה
מוסף לפקולטה לרפואה של אוניברסיטת בר אילן בצפת
The BARUCH PADEH Medical Center, Poriya
Affiliated to The Faculty of Medicine in the Galilee – Bar-Ilan University

המעבדה למיקרוביולוגיה קלינית
מנהל המעבדה: ד"ר אבי פרץ

30 לספטמבר 2018

לכבוד:
מר ברק דרור
חברת ביראד-ישראל

הנדון: **תוצאות בדיקת פעילות אנטיבקטריאלית של תמיסות ששופקו ע"י חברת ביראד**

שלום רב,

בתאריך 13/8/2018 בוצעה בדיקת פעילות אנטיבקטריאלית של תמיסות ששופקו ע"י חברתכם. שיטת הבדיקה כללה ביצוע תרבית semi-quantitative באמצעות ערכת NOVASTREAK (תוצרת חברת נובמד, ישראל) לאחר חשיפת תרחיף בריכוז התחלתי של 10^8 חיידקים למ"ל לתמיסות בפרקי זמן שונים של הדגרה.
להלן תוצאות הבדיקה:

תמיסה 1: pH=6

זמן הדגרה (דקות)/פתוגן	0	3	10
Ps. aeruginosa-1	10^3	אין צמיחה	אין צמיחה
Ps. aeruginosa-2	10^3	אין צמיחה	אין צמיחה
Acinetobacter baumanii-1	10^4	אין צמיחה	אין צמיחה
Acinetobacter baumanii-2	10^6	אין צמיחה	אין צמיחה
MRSA-1	אין צמיחה	אין צמיחה	אין צמיחה
MRSA -2	אין צמיחה	אין צמיחה	אין צמיחה
Candida albicans	אין צמיחה	אין צמיחה	אין צמיחה

5.1.2e
מרכז רפואי ע"ש ברוך פדה, פוריה – ד.נ. הגליל התחתון 15208, טל.
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מרכז רפואי ע"ש ברוך פדה, פוריה
מסונף לפקולטה לרפואה של אוניברסיטת בר אילן בגליל
The BARUCH PADEH Medical Center, Poriya
Affiliated to The Faculty of Medicine in the Galilee – Bar-Ilan University

המעבדה למיקרוביולוגיה קלינית
מנהל המעבדה: ד"ר אבי פרץ

תמיסה 2: pH=3
זמנים: 0, 3, 10 דקות

זמן הדגרה (דקות) /פתוגן	0	3	10
Ps. aeruginosa-1	10^3	אין צמיחה	אין צמיחה
Ps. aeruginosa-2	10^3	אין צמיחה	אין צמיחה
Acinetobacter baumanii-1	10^6	אין צמיחה	אין צמיחה
Acinetobacter baumanii-2	10^6	אין צמיחה	אין צמיחה
MRSA-1	אין צמיחה	אין צמיחה	אין צמיחה
MRSA -2	אין צמיחה	אין צמיחה	אין צמיחה
Candida albicans	אין צמיחה	אין צמיחה	אין צמיחה

הערות:
יש לציין כי הרכב התמיסות הנבדק אינו ידוע למעבדה ואינו באחריות המעבדה.

בברכה,
ד"ר אבי פרץ
מנהל המעבדה למיקרוביולוגיה
ומכון המחקר
נשיא האיגוד הישראלי למדעי המעבדה הרפואית

מרכז רפואי ע"ש ברוך פדה, פוריה – ד.נ. הגליל התחתון 15208, טל. 5.1.2e
The BARUCH PADEH Medical Center, PORIYA – M.P. Lower Galilee 15208, 5.1.2e
5.1.2e poria.health.gov.il

8.Data regarding disinfection efficacy of the material against covid-19.

The efficacy of the disinfection solution was tested in various active material concentrations (50-200ppm) against two types of viruses; Herpes and Hcov-OC43.

Below is a detailed report. As it can be seen, the product is highly efficient against viruses.

Electrolyzed Water - Summary of Anti-viral Experiments

Assay #1:

Anti-viral efficacy of the electrolyzed water was tested using Herpes simplex virus type 1 (HSV-1).

- 6.5 µl of 150 mM NaCl were added into 1 µl of HSV-1 suspension containing 2,000 plaque forming units (PFU) followed by the addition of 2.5 µl of electrolyzed water (50 or 200 mg/l). This was followed by 2 or 10-min incubation at room temperature.
- 4 µl of 150 mM NaCl were added into 1 µl of HSV-1 suspension containing 2,000 plaque forming units (PFU) followed by the addition of 5 µl of electrolyzed water (50 or 200 mg/l). This was followed by 2 or 10-min incubation at room temperature.
- Infectious viruses were then quantified by assay plaque assay.
- Controls included uninfected cells (mock), viruses that were incubated with Saline and viruses that were incubated with Sodium thiosulfate which is known to neutralize the electrolyzed water.
- Complete inhibition of plaque formation which indicates complete neutralization of HSV-1 was evident in all assay conditions (addition of 2.5 or 5 µl of electrolyzed water at 50 and 200 mg/l and incubation for 2 or 10-min).
- Similar results were obtained in two independent biologic repeats, each including two repeats for each assay condition.
- This provides a Neutralization Index (NI) of >6.3 at 12.5 mg/l upon 2-min incubation.

Assay #2:

Anti-viral efficacy of the electrolyzed water was tested using the human coronavirus OC43 (HCoV-OC43).

- A similar assay as described in Assay#1 was carried but instead we tested the neutralizing efficacy of 8,000 PFU of HCoV-OC43.
- Complete inhibition of plaque formation which indicates complete neutralization of HCoV-OC43 was evident in all assay conditions (addition of 2.5 or 5 µl of electrolyzed water at 50 and 200 mg/l and incubation for 2 or 10-min).
- Similar results were obtained in two independent biologic repeats, each including two repeats for each assay condition.
- This provides a Neutralization Index (NI) of >6.9 at 12.5 mg/l upon 2-min incubation.
-

Assay #3:

Anti-viral efficacy of the electrolyzed water was tested using the human coronavirus OC43 (HCoV-OC43) (variations in virus challenge, concentrations of the electrolyzed water and incubation time)

- 1, 2 or 3 µl of HCoV-OC43 suspension, corresponding to 30,000, 60,000 and 90,000 PFU, respectively, were added to 150 mM NaCl.
- 2.5 or 5 µl of 50 mg/l or 2.5 µl of 25 mg/l electrolyzed water were added, followed by 1 or 2-min incubation at room temperature (each assay was in total volume of 10 µl).
- Complete inhibition of plaque formation was obtained when 10,000 PFU were incubated for 2-min with 2.5 or 5 µl of 50 mg/l electrolyzed water (Neutralization index >7 at 12.5 mg/l).
- Complete inhibition of plaque formation was obtained when 30,000 PFU were incubated for 2-min with 5 µl of 50 mg/l electrolyzed water (Neutralization index >7.4 at 25 mg/l).
- Partial inhibition of plaque formation was obtained when 10,000 PFU were incubated for 1-min with 2.5 or 5 µl of 50 mg/ml or with 2.5 µl of 25 mg/l electrolyzed water.
- Partial inhibition of plaque formation was obtained when 30,000 PFU were incubated for 1-min with 2.5 µl of 50 mg/ml.
- The results with 90,000 PFU could not be evaluated.
- This experiment provides NI of >7 at 12.5.mg/ml upon 2-min incubation.

Assay #4:

Anti-viral efficacy of the electrolyzed water was tested using the human coronavirus OC43 (HCoV-OC43).

- This experiment employed a different preparation of HCoV-OC43.
- The experiment was carried as described in Assay #1 yet employed 18,000, 45,000 and 90,000 PFU.
- Use of 2.5 or 5 µl of 50 mg/l electrolyzed water for 2-min.
- Complete inhibition of plaque formation was obtained when 18,000 PFU were incubated with 2.5 or 5 µl of 50 mg/ml electrolyzed water for 2-min (Neutralization index >7.25 at 12.5 mg/l upon 2-min incubation).
- An estimated 70-80% inhibition was evident with 45,000 and 90,000 PFU (Neutralization index > 7.49-7.8 at 12.5 mg/l upon 2-min incubation).

Assay # 5:

Anti-viral efficacy of the electrolyzed water was tested using the human coronavirus OC43 (HCoV-OC43).

- The experiment was carried as described in Assay #1 yet employed 18,000, 45,000 and 90,000 PFU.
- Use of 2.5 or 5 µl of 200 mg/l electrolyzed water for 30 seconds.
- Complete inhibition of plaque formation was obtained when 18,000 PFU when incubated with 5 µl of 200 mg/ml electrolyzed water for 30 seconds (Neutralization index >7.25 at 100 mg/l upon 30 sec incubation).
- An estimated 95% inhibition of plaque formation was evident when 45,000 and 90,000 PFU were incubated with 5 µl of 200 mg/ml electrolyzed water for 30 seconds (Neutralization index > 7.63-7.93 at 100 mg/l upon 30 incubation).
- An estimated 50% inhibition of plaque formation was evident when 18,000, 45,000 and 90,000 PFU were incubated with 2.5 µl of 200 mg/ml electrolyzed water for 30 seconds.
-

In terms of mechanism, we assume that the active material is involved with oxidation processes of the phospholipid envelope of the virus which is the cause for its inhibition.

9.The efficacy of the product in the form of aerosol or vapors

- The efficacy of the material was tested in the form of vapors. The material was vaporized (200ppm) where a very contaminated surface (10^7) with viruses was placed about 10 cm from the exit of the vapors at different time of exposure. After 10 minutes, the material washed away.
- It was observed that after 15 seconds of exposure, total elimination of viruses was obtained (after 5 seconds of exposure, partial elimination was observed).
- It is important to mention, that after 15 seconds of exposure, where the material was washed away after one minute, we did not observe total elimination of the viruses, which leads to the conclusion, that the material remains active on the surface at least for several minutes.
- Logically assumed, that application of the material in the form of aerosol (larger droplets than vapors) will give more material coverage, given the same exposure duration, and hence, shorter exposure time will be required (and spraying frequencies).