

NANO KANAK BIOTECH PVT LTD

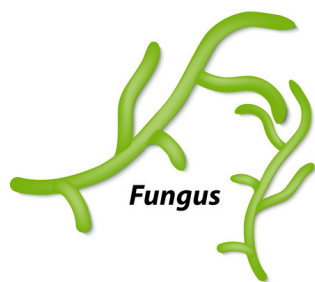
BIO NANO SILVER™

SURFACE PROTECTOR

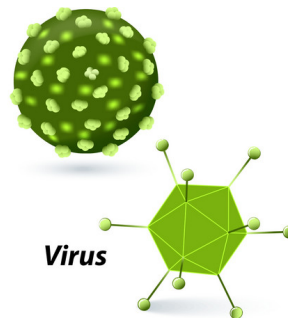
Multi-purpose



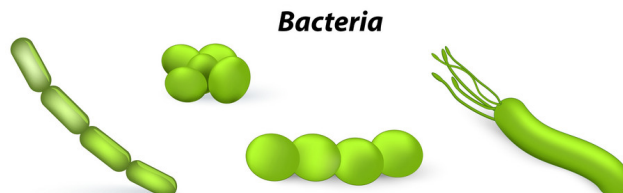
PRODUCT TESTED FROM WORLD RENOWNED TESTING LABORATORY



Fungus



Virus



Bacteria





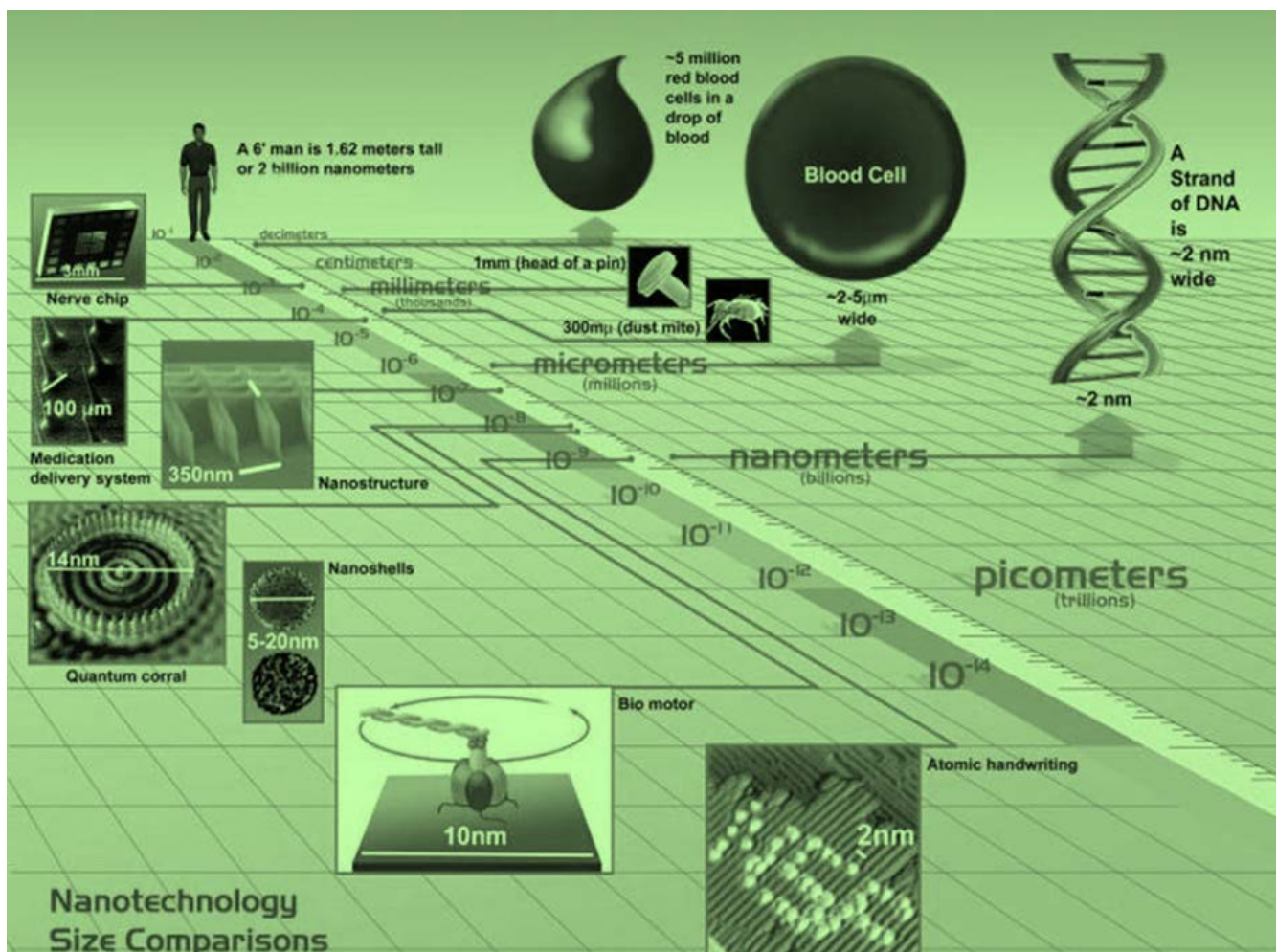
The concept

The product **Bio Nano Silver, Surface Protector** is based on the Nano Silver ion that manufacture from the technique of Biologically Synthesis **Nanotechnology**. The Particles size of the Silver ions are in **Nanometer**, which is around 40,000 times smaller than the Human Hair

What is Nanotechnology ?

"Nanotechnology is the art and science of manipulating matter / elements or product at **NANO SCALE**"

- 1 nm = one billionth (10^{-9}) of metre
- Size range between 0.1 and 100 nm



Product Concept

Why Nano Silver Ion used in the Surface Protector ?

- Since ancient times & 1000 odecades, the silver known as an effective against a broad range of microorganisms.
- The Greeks used silver vessels to keep water fresh.
- The Roman Empire stored wine in silver to prevent spoilage.
- Australian people suspend silverware in their water tanks to retard spoilage.
- Japanese work place, silver is a popular agent in the fight against airborne toxins.
- In Switzerland silver water filters purifier were used in homes and offices to prevent the growth of micro organisms.
- Some U.S. municipalities use silver in treatment of sewage.
- The former Soviet Union used silver to sterilize recycled water on their space vehicles.
- In Ayurvedic medicine, silver used as a tonic, elixir or rejuvenative agent for patients debilitated by age or disease.
- Silver Foil used in Indian sweets as Varakh.

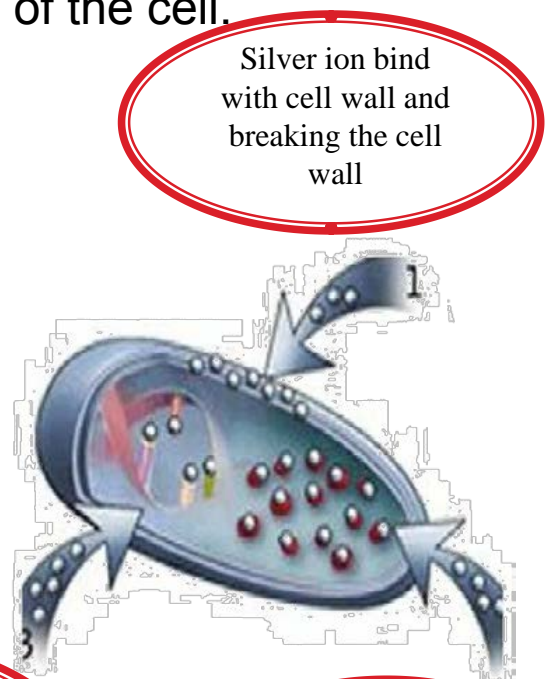


TOXIC FREE

Nano Silver Concept

Working Principal of Nano Silver

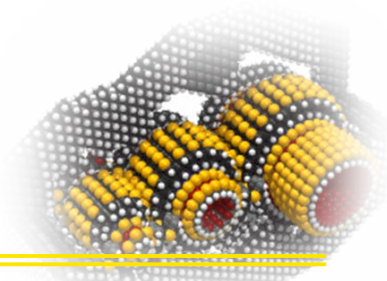
- Microorganism exposed to Silver Ion, it bind to surface of cell wall of the MO.
- Silver Ion creating a rupture leading to cell lysis, breakdown of the cell wall of the MO.
- Due to Nano in size, silver ion enter inside the cell of the micro-organism that attached to metabolic enzymes.
- This enzyme nts and energy to the cell, leading to stopping the transfer of nutrients and suffocation the microorganism.
- It further stopping reproduction of the cell.



Silver Ion bind with DNA of the microorganism leading to the death of the micro-organisms.

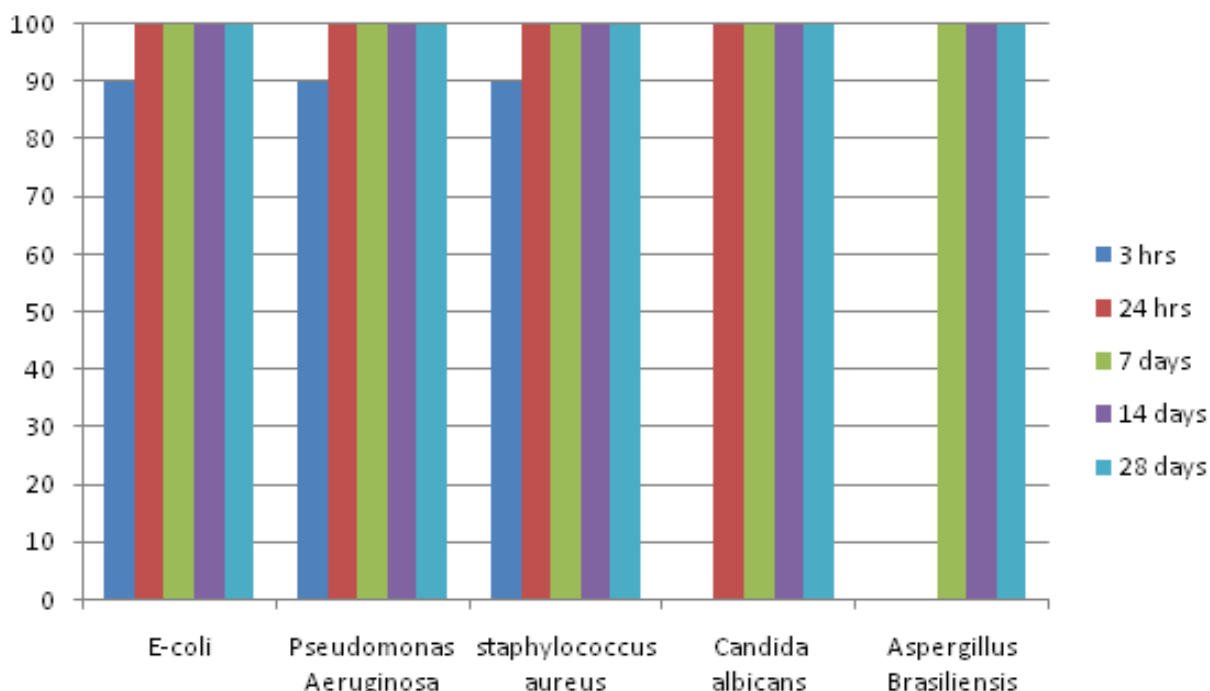
Silver ions attached to enzymes, which provide nutrients and energy, leading to suffocating the cell.

Product Efficacy



ANTI-MICROBIAL EFFICACY

- Due to the **Nano size** of the Silver Ion the contact surface area increases.
- Bio Nano Silver™ Surface protector interaction with the Micro-organism increases **80-100 times** as compared to other surface protector.
- Bio Nano Silver™ Surface protector inhibits the growth of the Micro-organisms upto **99.99%**.
- Nano Silver is an effective Antimicrobial in more than **650 Micro-organisms**, including Bacteria, fungus, Protozoa, Algae, Virus and may also include all strains of Corona Viruses.
- Bio Nano Silver™ Surface protector has been tested from the World renowned laboratory known as **SGS**, India and **Eurofins**, India.
- The product shows excellent and remarkable result in Anti-microbial efficacy and controlling the micro-organism growth on the surface upto **30 Days**.



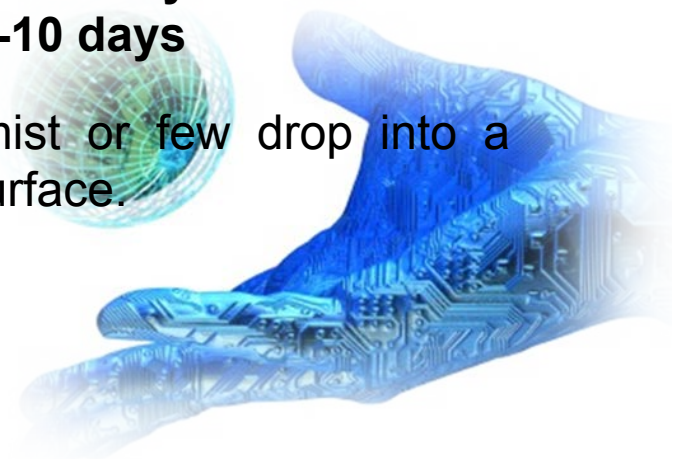
 eurofins

 SGS

Product Specification

Product Information

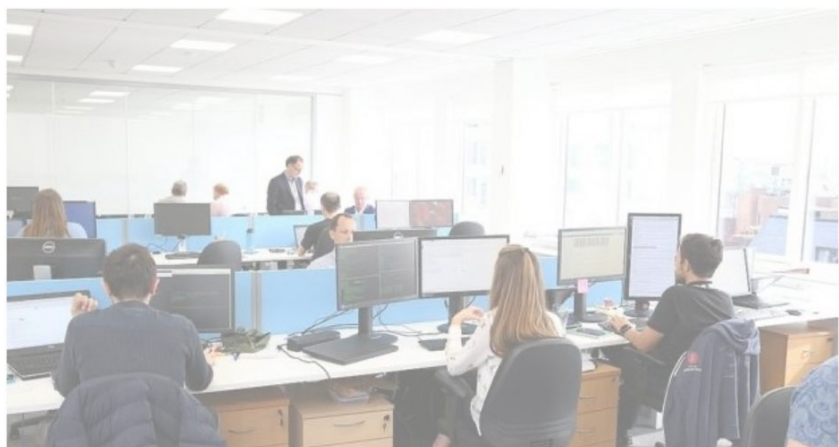
- The product is based on Food grade Silver Ion incorporated with acrylic binder, hence **100% safe** for the Human contact.
- Product is environment friendly, alcohol free and non-toxic protective coating that provides **non-stop 24 hr** protection.
- Ordinary alcohol based surface protector provide only instant protection leaving you vulnerable even after 5mins of application.
- Product is aqueous liquid, **water** soluble & thermal stable.
- **Physical Appearance** : White opaque liquid, Viscosity 0.0091 poise at 25 Degree Celsius.
- After coating/application a **thin transparent** layer is formed on the surface with the impression of minute silver particles.
- Coating **Durability** depends that how frequently the applied surface been used / contact / touched with the external sources.
- **Dilution rate** : 1% to 5 % of Bio Nano Silver™ Surface protector in water.
1% dilution rate coating long last for 1-2 days
5 % dilution rate coating long last 7-10 days
- **Usage** : Foliar spray, sprinkle, mist or few drop into a sponge to uniformly apply on the surface.



Product Application

Application

- Coating application can be done almost on all the surfaces i.e **Cement, glass, plastic, metal, clothing, fiber, paper, etc.**
- Applicable for **Hard & Soft surfaces**. Surface
- **Recommended** : Hospital, Public & Private Transports, Elevator, Vehicles, Hotels, Restaurants, Railway, Metro, Buses, Door knobs, furnitures, ATM machine, Kitchen counters, Stairs railings, Malls, Government offices, Corporate offices, Defense, etc.



**The Standard Bactericidal & Virus effect (germ kill efficacy)
of Evaluation**

Customer Detail –Kanak Biotech

C-34, Sigaddi Growth Centre, Kotdwar, Uttarakhand, 246149

Sample Name: Bio Nano Silver “Surface protector

Validation Report

Sample Code- 260-2021-09000383

Sample Receipt : Sep 10,2021

Analysis Start date : Sep 10,2021

Analysis End Date : Sep 21,2021

Test Method: JIS2801 :2010

Eurofins Analytical Services India Private Limited

Plot no. 157, First Floor, Udyog Vihar, Phase 1, Gurugram - 122016, Haryana, India

Phone: 124 625 0300, Email: delhifood@eurofins.com, website: www.eurofins.in, CIN: U73100KA2009PTC049992

Regd. Office: #540/1, Doddanakundi Industrial Area 2, Hoodi, Whitefield, Bengaluru-560048, Karnataka, India, Phone: +91 80 30982500

The Standard Bactericidal & Virus effect (germ kill efficacy) of Evaluation

Test Organisms Used:

1. *Escherichia coli* (ATCC -8739) 1.8×10^7 CFU/ml
2. *Staphylococcus aureus* (ATCC-6538) 3.2×10^6 CFU/ml
3. MS2 phase virus (ATCC-15597-B1, ATCC-15597) 2.7×10^7 PFU/ml

Sample Particulars:

Untreated Plastic sample and treated plastic sample marked and spray with Kanak biotech BIO NANO SILVER (Surface protector)

1. **Dilution Medium Used:** Phosphate *Buffered* Saline Buffer Solution, Tryptic Soy Broth (D/E Neutralizing Broth)

Method of Sterilization: N/A

Contact Time: 24 hrs

Test Microorganism information:

MS2 Bacteriophage (MS2) is an RNA virus of the family Leviviridae. *Escherichia coli* 15597 are the host for MS2 bacteriophages. Due to its environmental resistance, MS2 bacteriophages are used as a surrogate virus (particularly in place of Picomaviruses such as Poliovirus and human Norovirus) in water quality and Antimicrobial studies.

Virus: MS2 Phase virus

Permissive Host Cell: *Escherichia coli* ATCC 15597

ANTIBACTERIAL ACTIVITY

1. **Test Bacteria:** *Staphylococcus aureus*

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The Standard Bactericidal & Virus effect (germ kill efficacy) of Evaluation

| Quantitative Assessment of Activity- JIS 2801-2010 | | | | |
|--|-------------------------------|-----------------------------|---|---------------------------------|
| Untreated Sample: Concentration of Inoculum in untreated (Uo): 4.12×10^6 CFU/ml | | | | Log = 6.61 |
| Untreated Sample: Concentration after 24 hour of incubation (Ut): 2.84×10^6 CFU/ml | | | | Log =6.45 |
| No. of bacteria recovered in untreated sample (Ut) | | | | 2840000 |
| Antibacterial Activity: $R = (Ut - Uo) - (At - Uo)$ | | | | |
| Sample Identification | No. of Bacteria Recovered(At) | Log Bacteria recovered (At) | Antibacterial Activity(R) (value criteria : not less than 2) | Microbial Kill (% Reduction) |
| Treated plastic sample marked and spray with Kanak biotech BIO NANO SILVER (Surface protector) | 4400 | 3.64 | 2.81 | 99.84 |

2. Test Bacteria: Escherichia Coli

| Quantitative Assessment of Activity- JIS Z 2801: 2010 | | | | |
|--|-------------------------------|-----------------------------|---|---------------------------------|
| Untreated Sample: Concentration of Inoculum in untreated (Uo): 5.75×10^6 CFU/ml | | | | Log = 6.76 |
| Untreated Sample: Concentration after 24 hour of incubation (Ut): 3.15×10^6 CFU/ml | | | | Log =6.49 |
| No. of bacteria recovered in untreated Sample (Ut) | | | | 3150000 |
| Antibacterial Activity: $R = (Ut - Uo) - (At - Uo)$ | | | | |
| Sample Identification | No. of Bacteria Recovered(At) | Log Bacteria recovered (At) | Antibacterial Activity(R) (value criteria : not less than 2) | Microbial Kill (% Reduction) |
| Treated plastic sample marked and spray with Kanak biotech BIO NANO SILVER (Surface protector) | 3600 | 3.6 | 2.89 | 99.9 |

3. Test Bacteria: Virus (MS2 PHASE)

| Quantitative Assessment of Activity- EASI –MB-SOP -32 (In House Method) | | | | |
|--|----------------------------|--------------------------|--|-----------------------------|
| Untreated Sample: Concentration of Inoculum in untreated (Uo): 4.59×10^5 PFU/ml | | | | Log = 5.66 |
| Untreated Sample: Concentration after 24 hour of incubation (Ut): 2.28×10^5 PFU/ml | | | | Log = 5.36 |
| No. of Virus recovered in untreated sample (Ut) | | | | 228000 |
| Antibacterial Activity: $R = (Ut - Uo) - (At - Uo)$ | | | | |
| Sample Identification | No. of Virus Recovered(At) | Log Virus recovered (At) | Antiviral Activity (value criteria : not less than 2) | Viral Kill (% Reduction) |
| Treated plastic sample marked and spray with Kanak biotech BIO NANO SILVER (Surface protector) | 200 | 2.3 | 3.06 | 99.9 |

The Standard Bactericidal & Virus effect (germ kill efficacy) of Evaluation

Test Report:

The standard Antimicrobial value of Evaluation: $R > 2$

Conclusion:

When tested as specified Antibacterial & Antiviral Test sample with Kanak biotech BIO NANO SILVER (Surface protector) PASSES the quantitative assessment of activity tested as per JIS Z 2801: 2010 & MS2 phage Virus In House test method.

Remark: The product Kanak biotech, Bio Nano Silver (Surface protector) has been tested on MS2 Bacteriophage Virus (MS2) is an RNA virus of the family Leviviridae. As Escherichia coli 15597 are the host for MS2 bacteriophages. MS2 bacteriophages are used as a surrogate virus (particularly in place of Picomaviruses such as Poliovirus and human Norovirus).

As (MS2) bacteriophage is a family of Virus, so it is further expected that it may kill/ control the applied surface, from the effect of all the strains of the Corona / Covid viruses.

Note: The above results pertain only to the sample tested and applicable parameter.

*****END OF TEST REPORT*****



Analyzed by:



Verified and Authorized by:

The Standard: ASTM G-21 Fungal resistance TEST

Customer Detail – Kanak Biotech

C-34, Sigaddi Growth Centre, Kotdwar Uttarakhand 246149

Validation Report

Sample Code- 260-2021-09000383

Sample Receipt : Sep 10,2021

Analysis Start date : Sep 10,2021

Analysis End Date : 7 Oct,2021

Test Method: ASTM G-21

The Standard: ASTM G-21 Fungal resistance TEST

Objective:

To evaluate the Mold / Fungal resistance properties on the surface of the Plastic, which has been treated with the product Kanak Biotech, Bio nano silver (Surface Protector) as seen in the ASTM G-21 fungal resistance test.

Test Sample Description:

Plastic Surface treated with Kanak Biotech, Bio Nano Silver (Surface Protector)

Experimental Summary:

ASTM G-21 utilizes a nutrient salts agar that provides all the trace nutritional elements needed by fungi to support growth. Samples were received for testing. Testing was performed according to ASTM G21, which determines the resistance of synthetic polymeric materials to fungi. Samples were tested using petri dishes containing sterile nutrient salts agar (pH 6.5) and one 2"x2" piece of each coupon. Each sample type was tested in triplicates. Each replicate was inoculated with a fungal suspension that consisted of equal volumes (30.0 mL) of 1 mold suspensions that were at a concentration of 1,000,000 spore \pm 200,000 per ml. The fungal species tested included *Aspergillus niger* ATCC 6275, *Candida albicans* ATCC 10231. One non inoculated coupon per sample type was included as negative control as well as a set of media blanks as controls. Samples and controls were incubated at 27.0⁰C \pm 2.0⁰C for 14 days at relative humidity of 85.0% for 2 weeks with reading taken after 7, 14, 28 days according to the rating scale below.

The Standard: ASTM G-21 Fungal resistance TEST

Results:

After 4 weeks of incubation, the results for the test pieces can be found in the data table below. The control test pieces had copious no fungal growth at Day 14 & 28 confirming the validity of the test. Temperature and humidity were maintained for the duration of the test. These results pertain only to the sample tested.

The rating scale for this test is as follows:

| Observed Growth on Specimens Rating | Rating |
|---|--------|
| None | 0 |
| Traces of Growth (less than 10%) | 1 |
| Light Growth (10-30%) | 2 |
| Medium Growth (30-60%) | 3 |
| Heavy Growth (60-100% to complete coverage) | 4 |

At week 2, sample rating a "0" or "3" were examined microscopically to confirm the ratings.

| Sample Identification | Rep | Week1 | Week 2 | Week 3 | Week 4 |
|---|-----|------------------|--------|--------|--------|
| | | ASTM G-21 Rating | | | |
| Untreated Plastic sample and treated plastic sample marked and sprayed with Kanak biotech BIO NANO SILVER (Surface protector) | 1 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 |
| Media control | 1 | 0 | 0 | 0 | 0 |
| | 2 | 0 | 0 | 0 | 0 |
| | 3 | 0 | 0 | 0 | 0 |
| Positive control | 1 | 2 | 3 | 4 | 4 |
| | 2 | 2 | 3 | 4 | 4 |
| | 3 | 2 | 3 | 4 | 4 |

Conclusion: The sample has been sprayed on the plastic surface and allowed the surface for 15 – 20 min to dry. Thin layer containing minute particle visible after the dry. Then the sample tested as specified Antifungal activity sample which **PASS** the quantitative assessment of activity tested as per ASTM G-21.

Analyzed by: 

Verified and Authorized by: 



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Test Report

SAMPLE NOT DRAWN BY SGS INDIA PVT. LTD.

Report No : GG16-002825.001-R1

JOE No : GG16-002825

Report Control No : GGR0000381658

Sample Described by Customer as

: BIO NANO SILVER

Client Name : KANAK BIOTECH
Client Address : C-34, SIGADDI GROWTH CENTRE,
City : KOTDWAR
State : UTTARAKHAND
Country : INDIA
Sample Type : BIO NANO SILVER
Received : 13/07/2016
Marks on Sample : 279PPM
Composition : 1 : 10 WITH DISTILLED WATER
Sample Qty. Recd. : 100ml
Batch No. : O-NAG-06-16
Mfg. Date : JUNE-2016
Manufactured By : KANAK BIOTECH
Best Before : 1 YEAR
Test Start/End Date : 13/07/2016 - 15/09/2016

This Report/Certificate cancels and supersedes the Report/Certificate No GG16-002825.001 dated 8/31/2016 (MM/DD/YYYY) issued by SGS India

| Analysis | Method | Result | Unit |
|---|-----------------|-----------------|------|
| Antimicrobial Efficacy Testing | USP : 39 | | |
| 3 hours (E.coli) | | 1 log reduction | |
| 24 hours | | 5 log reduction | |
| 7th day | | 5 log reduction | |
| 14th day | | 5 log reduction | |
| 28th day | | 5 log reduction | |
| 3 hours (Pseudomonas Aeruginosa) | | 1 log reduction | |
| 24 hours | | 5 log reduction | |
| 7th day | | 5 log reduction | |
| 14th day | | 5 log reduction | |
| 28th day | | 5 log reduction | |

Page 1 of 3

WARNING: The sample(s) to which the findings recorded herein (the "Findings") relate was(were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.

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| Analysis | Method | Result | Unit |
|---|--------|-----------------|------|
| 3 hours (Staphylococcus aureus) | | 1 log reduction | |
| 24 hours | | 5 log reduction | |
| 7th day | | 5 log reduction | |
| 14th day | | 5 log reduction | |
| 28th day | | 5 log reduction | |
| 3 hours (Candida albicans) | | No reduction | |
| 24 hours | | 5 log reduction | |
| 7th day | | 5 log reduction | |
| 14th day | | 5 log reduction | |
| 28th day | | 5 log reduction | |
| 3 hours (Aspergillus Brasiliensis) | | No reduction | |
| 24 hours | | No reduction | |
| 7th day | | 5 log reduction | |
| 14th day | | 5 log reduction | |
| 28th day | | 5 log reduction | |

Remark : The sample complies with respect to the above test as per the USP 39 specification , bio nano silver (1 :10) with water is an effective antimicrobial on the above microorganism within 3 hours - 28 days.

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Per pro SGS India Private Ltd



HariShanker Jha

Section Incharge - AFL

Authorized Signatory

****End of Report****

Page 3 of 3

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