



- Bacteria
- Fungus
- Virus



WARRIORTM ANTI-MICROBIAL COATINGS



Anti-Microbial Performance Coatings

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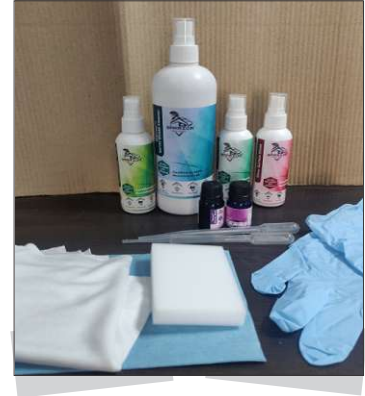
A COVID19 Research Consortium Funded Product
Biotechnology Industry Research Assistance Council
A Government of India Enterprise

WARRIOR™ ANTI-MICROBIAL COATINGS

Next Generation Technology

AgSterilized Nanotechnology Based Coatings

It is well known to all of us that paints can provide our wall surfaces nice look as well as provide a layer of protection to the walls. But do you know? The antimicrobial coatings can help to keep you healthy too. The wall surfaces are potentially good sources of diseases due to the growth of bacteria, fungus and virus on the walls. Coatings are powered by the AgSterilized Nano Silver antimicrobial technology, which provides germ-free surfaces. Many diseases, such as common flu and other infectious diseases, can be prevented by using this nanotechnology modified AgSterilized antibacterial coatings.



Approved by Research and International Standards



Many research indicates that bacteria develop resistance against various types of antibacterial products, but with the use of nanosilver technology, this can be avoided, as microbes cannot develop resistance against nanosilver. This product developed with the help of nanosilver technology can provide us long-lasting protection against microbes.

The efficacy of antimicrobial ingredient used to develop coatings can be verified by means of microbiological Nanosilver is certified according to international standards.

- ISO 22196:2007, JIS L1902:2002,
- DIN EN ISO 20743:2007-10
- SN 195921, ASTM G21 96, JIS Z 2911:1992
- Silver Leaching: 10993: 2002-17

★ For testing efficacy of antimicrobial coatings, JIS Z 2801: 2000 and ASTM E 2180-01 are followed.

First Class Specification Support

In addition to the comprehensive range of premium nanoproducts, Reinste offers a wide range of support and services to customers and suppliers. Our dedicated team is on hand to provide a complete package of support including technical advice, consultancy and on-site inspection service.

Applicable Surfaces

- Ceramic
- Stone
- Metals
- Leather
- Polymer
- Wood
- Painted Surface
- Plastic
- Glass
- Bricks
- Textile
- Concrete etc.



Active nanosilver as per customer demand.

Safe for Humans and Animals

Reinste Nano Ventures has been providing excellence in antimicrobial technology since 2010 and provide a wide range of antimicrobial products such as performance coatings, antimicrobial textiles, germ free floorings. etc.

It has been proven in various research and tests that nanosilver does not possess any cytotoxic effects in various cell lines (ISO 10993-5).

- Test is on the extracts based on ISO 10993-5:2009

Test Report No: **TRNVS 001** Signature: *[Signature]* Date: **22/10/20** Page no: **3 of 9**

After incubation of cells with extracts of test sample and controls at 37 °C for 24 to 26h, cell culture was examined microscopically for cellular response. Cells were examined microscopically and cellular responses were scored as 0, 1, 2, 3 and 4 based on the following table:

Grade	Reactivity	Conditions of all cultures
0	None	There is intracellular growth, no cell death or reduction of cell growth.
1	Slight	Not more than 20% of the cells are round, heavily clustered and without intracellular granules or silver clusters in morphology; occasional, spred cells are present and silver growth inhibition observable.
2	Mild	Not more than 50% of the cells are round, devoid of intracellular granules, no extensive cell death; not more than 50% growth inhibition observable.
3	Moderate	Not more than 70% of the cell layers contain rounded cells or any lysed cell areas not regularly distributed, but more than 50% growth inhibition observable.
4	Severe	Nearly complete to complete laceration of the cell layers.


4. Observations

The cytotoxic reactivity of test and control samples were evaluated using an inverted phase contrast microscope based on the above table:

Sl No	Sample	Grade	Reactivity
1.	Negative Control	0	None
2.	Positive Control	4	Severe
3.	Warrior™ Silver Surface Shield RN-VW3	0	None

5. Result

As per ISO 10993-5 the achievement of microbial grade score less than 2 is considered as cytotoxic effect. Since the test material, Warrior™ Silver Surface Shield RN-VW3, rendered a numerical grade not greater than 2, the material is considered as not cytotoxic. Negative control gave normal growth reactivity and positive control gave severe cytotoxicity as expected.



How Does It Work?



- Due to the different modes of action (reduction of germ adherence, disturbance of the germs, K⁺ metabolism and irreversible reaction with S-containing amino acids) and the marginal Ag⁺ release, nanosilver does not induce or propagate bacterial resistance.
- WARRIOR™ are non-toxic to humans and animals.
- 99.9% of bacteria are eradicated within 18 hours
- The antimicrobial effect does not decrease over a period of time even when exposed to UV light or subjected to harsh cleaning procedures.

Benefits Include

- Supported by various international standards
- Inhibits growth of MRSA, E. coli, etc. and deactivates viruses.
- Contains silver ion technology.
- Proven to actively inhibit bacteria and fungi.
- Washable and durable.
- Suitable for almost any clean and dry building, finishing material or surface.
- One coat, easy application, quick drying, permanent durable finish.
- Safe during and after application, no residual smell or toxic fumes.
- User friendly and compliant with environmental legislation.

Application Area in a Hospital Environment

- Reception
- Waiting area
- Ambulance
- Nursing station
- Lab testing area
- Patient wards
- Doctor OPD
- ICU/Emergency
- Room and lobbies
- Staircase and lift area



Broad antimicrobial/antiviral action



Hydrophobicity



Easy to clean



Dirt proof



Durable



High temperature resistant



Chemical abrasion resistant



Mechanical abrasion resistant

Where Do I Use It?

Anti-Microbial Coatings have been developed for use in areas wherever infection control is required. Common usage includes wall and ceiling areas in the establishments such as:

- Hospitals
- Clinics
- Surgeries
- Dental practices
- Health care buildings
- Zoos
- Laboratories
- Veterinary practices
- Food industry
- Pharmaceutical areas



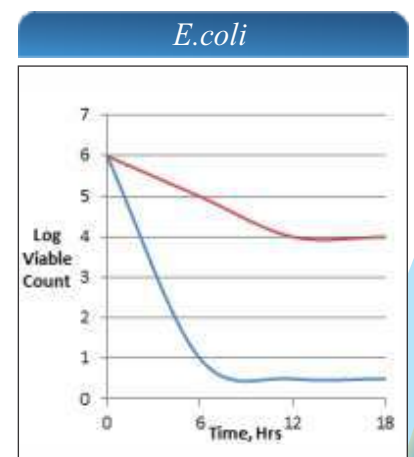
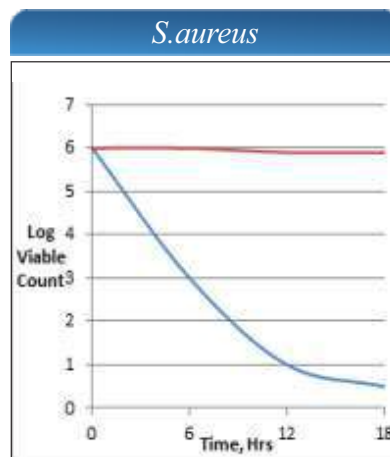
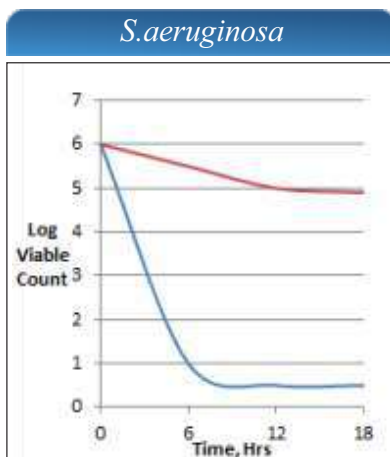
Anti-Microbial Coatings have been developed to give excellent adhesion over various substrates such as wood, metal, wall and ceilings.

Coatings has been developed to be both tough and durable that creates a seamless finish along with anti-microbial protection.

These coatings contain an active ingredient that act as fungicide and algicide to inhibit the fungal and algal growth.

These coatings are environment friendly and nonhazardous in nature.

Antibacterial Action of Warrior™ Anti-Microbial Coating



Standard Coating █

Warrior™ Anti-Microbial Coating █

Testing

Nanocoatings provide antimicrobial activity to all applied surfaces. Coatings exhibits strong activity against all gram-positive and gram-negative bacteria, antibiotic-resistant strains, yeast and fungi. (Viruses can be inactivated by unbonded nanosilver particles). Coatings are the long-term shield against antimicrobial growth. It is not a sterilizing agent and does not have long range effects.

Antiviral activity of the surface SARS (CoV-2)	CFU control	CFU sample	Log Reduction / Difference	Percentage of Reduction of virus activities	Viral Activities (Qualitative)
(Standard uncoated)	7.18x10 ⁵				
0 Min (coated)	6.86x10 ⁵	4.12x10 ⁵	0.22	39.95%	Viral activity found
2 Mins (coated)		1.69x10 ⁵	0.60	75.36%	Viral activity found
4 mins (coated)		1.04x10 ⁵	0.82	84.83%	Viral activity found
6 mins & 30 sec (coated)	7.57x10 ⁵	7.50x10 ¹	4.00	99.99%	No Viral activity found
8 mins (coated)		7.50x10 ¹	4.00	99.99%	No Viral activity found
10 mins (coated)		-	5.87	100%	No Viral activity found

Warrior™ Smart Coatings is the finished product manufactured and marketed by Reinste Nano Ventures Pvt. Ltd. The surfaces which are in regular contact with people must be made microbial free. The antimicrobial coating developed by Reinste Nano Ventures is the permanent solution for making all surfaces microbes free.

This coating provides a shield and protects you from virus, bacterial and fungal exposures. The product is backed by superior silver ions technology that inhibits and deactivates the viruses. The lifetime of the product is excellent even on high temperatures and when subjected to UV radiations and harsh cleaning procedures.



Warrior™ ADTL Ag⁺ Shield

All Fabrics and Leather Surfaces

- Suitable for bags, leather belts, PPE kits, masks, surgical gloves, fabrics for clothing and curtains, sofa, bedsheet and table covers.
- 99.9% strong antiviral efficacy.
- ISO 21702:2019 and ISO 18184:2019 certified.
- Backed by nanosilver technology.
- Provides self-sanitization and germ-resistant surface.
- Used as antimicrobial and odor control for textiles and leather.
- Up to 12 months of protection on single application against invisible threats.



Warrior™ Germi Shield Cleaner

All Metals, Glass, Ceramic, Wooden & Polished Stone

- Suitable for metal railings, door handles, kitchen slabs, tiles, laminated doors and almirah.
- Broad-spectrum antiviral action, 99.9% efficacy.
- IISO 21702:2019 and SO 18184:2019 certified.
- Hydrophobicity.
- Longer durability time up to 7 days on single application.
- Dirt repellent.
- Variety of surfaces covered and cleaned with one product.
- Smooth finish.



Warrior™ Clear Coat Ag⁺ shield

All Non-absorbent Solids Surfaces

- Nanopolymer-based coatings for wood, ceramics and metals, plastics, etc.
- 99.9% strong antiviral efficacy.
- ISO 21702:2019 and ISO 18184:2019 certified.
- Hydrophobic and slight oleophobic.
- Dirt repellent and easy to clean.
- Good UV protection.
- Very cost effective.
- Good color and gloss retention.
- Up to 4 months surface protection on one single application.



Warrior™ Aquaperl Surface Shield

All Glass, Ceramic and Polished Natural Stone

- Suitable for all glass, toilet seat, wash basins, bathroom tiles, glass partitions, laminates etc.
- Backed by nanosilver technology (proven 99.9% effective against SARS CoV-2).
- ISO 21702:2019 and ISO 18184:2019 certified.
- Outstanding mechanical and chemical abrasion resistance.
- Extreme temperature resistance.
- Hydrophobic and slight oleophobic.
- Antiviral, anti-stain, anti-fingerprint, dirt repellent properties.
- Complete protection for up to 12 months, after one single use.



Unique Properties and Key Features

- Backed by nanosilver technology (proven effective against SARS CoV-2).
- DBT-BIRAC (Government of India) funded project.
- Very cost effective.
- Provides self-sanitization and germ-resistant surface.
- Long lasting effect.
- Dirt repellent and easy to clean.
- Robust and reliable.



Precautions

- Apply at room temperature.
- Stir well before use.
- Use coating on small surface before using on large surface for test results.
- Test the efficacy of coating on leather surface.
- Ensure the leather surface is fully covered and wet by the coating.
- This is not a medical product and should not be used on body.



Government Certified Test Reports

Coatings: Non-cytotoxic

SREE CHITRA TIRUNAL INSTITUTE FOR MEDICAL SCIENCES AND TECHNOLOGY
(An Institute of National Importance under Govt. of India)
BIOMEDICAL TECHNOLOGY WING
Poojappura, Thiruvananthapuram 695 012, Kerala INDIA
Phone: (0471) 2520307, Fax: (0471) 2341814, E-mail: cse@scimst.ac.in

TEST REPORT

Date: 27/10/2021 Report No: TRTIC041.Y21 Total Number of pages: 4

Name of the laboratory: Division of Tissue Culture

1. Name of the test: In vitro Cytotoxicity test
2. Work order number: WETIC N46.Y21
3. Customer sample code: Warrior™ Universal Surface Shield RN-PW3
4. Date of receipt of sample: 13/10/2021
5. Date/Period of conduct of test: 20/10/2021 to 22/10/2021
6. Test method used: Test on Extracts based on ISO 10993-5, 2009
7. Description of the sample: PU(Poly Urethane) based coating for all non absorbent surface with added nano silver
8. Details of specimen preparation (if applicable): Extract was prepared by incubating 25cm³ test sample Warrior™ Universal Surface Shield RN-PW3 in 20ml of culture medium containing serum at 37 ± 1°C for 24 ± 2h at an extraction ratio of 1:25cm³/ml.
9. Result (with units of measurement): The test material Warrior™ Universal Surface Shield RN-PW3 achieved a numerical grade not greater than 2 and is considered as non cytotoxic.

Declaration
I hereby certify that, this test certificate is for the sample received as per the above work order number.

10. Authorized Signatory, Name & Designation: Dr. Anil Kumar P.R. Scientist F.

Issued to: - Reinste Nano Ventures Pvt. Ltd.
A-118, Second Floor, Sector 63
Noida, UP

Issued by: - S. Balram
(Scientist-in-Charge, Customer Service Cell)

Signature
Date of issue

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NFSU National Forensic Sciences University
Knowledge | Wisdom | Fulfilment
An Institution of National Importance
(Ministry of Home Affairs, Government of India)

COVID -19 Testing Facility (ICMR APPROVED)

ANALYSIS REPORT

Long Term Durability Testing of Antiviral Coating on metal plates for SARS-CoV-2 Virus as per IS 17051:2018 (equivalent to NIJ Standard-0101.06 and MIL-STD-810G) and ISO 21702:2019 (Modified) Test Methods

Name of Company
Reinste Nano Ventures Pvt. Ltd.

Report No.
NFSU/IFS/AntiViral-Testing/19/2022

Date: 12 January 2022

Signature
Date of issue

COVID Testing Lab
National Forensic Sciences University
Gandhinagar

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Coatings: Non-cytotoxic

Analysis Report			National Forensic Sciences University											
Test Results (These results pertain only to the samples tested)														
No.	Sample Code	Time Interval (min)	Antiviral Coating on Metal Plate									Uncoated Metal Plate (Control)		
			**N Gene C _t (Average)	Delta C _t (3-13)	% Reduction in viral Load	**ORF Gene C _t (Mean of Triplicate)	Delta C _t (7-14)	% Reduction in viral Load	**RNAseP C _t (Mean of Triplicate)	Delta C _t (10-15)	% Reduction in viral Load	**N Gene C _t (Average)	**ORF Gene C _t (Average)	**RNAseP C _t (Average)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Pre-Aging	10	34	04	99.99	35	05	99.999	34	04	99.99	30	30	30
2	Post-Aging	10	34	04	99.99	36	06	99.999	33	05	99.999	30	30	30
3	Positive Control	-	27	-	-	27	-	-	27	-	-	-	-	-
4	Negative Control	-	ND	-	-	ND	-	-	-	-	-	ND	ND	ND

** = Mean of Triplicates, ND=Not Detected

Conclusion (These results pertain only to the samples tested)

Based on the test results, it is concluded that the tested coating on metal plate (tested samples) is effective to reduce viral load of SARS CoV-2 up to **99.99%** within **10 min** of contact time **pre and post aging of Five Years Equivalent** (Aging protocol as per the IS 17051:2018 which is equivalent to NIJ Standard-0101.06 and MIL-STD-810G)



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About the Company

Since its inception in 2011-12, Reinste Nano Ventures is among the few companies in India who solely works in the domain of Nanotechnology. The company has introduced new innovative products and technologies for various industrial sectors including automobile, construction, renewable energy, Water purification, textiles, Paint & coating industry and many more. It is “first of its kind” company in India providing products like world’s most portable water purifier, Lab on a chip set-up, Electronic Circuit on paper etc. Having various global collaborations with industrial giants help us to provide state of art solutions to industrial and general customers. We provide scratch resistant, hydrophobic, anti-corrosion, anti-microbial, Heat insulation, fire retardant coatings and other amazing properties for all surfaces.

- Reinste Nano Ventures Pvt. Ltd. is one of India's premier nanotechnology solutions and material supplier.
- The company is working with different industry segments such as textiles, paints, oil and gas, energy, filtration, electronics etc.
- The company is also a part of major events and forums across India in the areas of specialty and innovative materials.
- Top management and key staff are very well qualified and experienced in nanotechnology materials and specially in marketing of highly technical and latest innovative products to industry.
- The company is catering its clients across India, and providing handholding to all industries in developing innovative products.
- Top management is associated with major Industry associations like CII, FICCI, ASSOCHAM and Nano Vision Group.

S. No.	FEATURES	WARRIOR™ SMART COATINGS	OTHER COATINGS	COMMENTS
1	Active Content: Nano Silver	Yes	No	NanoSilver used is very safe and is proven of Antiviral / Antimicrobial Action
2	Tested Under Global Test Protocols by Govt. body	Yes	No	Tested by ICMR Approved COVID-19 testing lab Ministry of Home Affairs (MHA) Govt. of India as per ISO 21702 : 2019 and other global test standards
3	Tested on SARS CoV-2 Virus	Yes	No	WARRIOR™ Coatings have been tested on SARS CoV-2 Virus, in India (Always check Test Certificate is available with WARRIOR™ Coatings for testing on SARS CoV-2 Virus in almost all the cases)
4	Good UV Stability	Yes	No	As per WARRIOR™ Coatings Specifications
5	Dirt & Scratch Resistance	Yes	No	As per WARRIOR™ Coatings Specifications
6	Hydrophobicity/ Oil Repellence	Yes	No	As per WARRIOR™ Coatings Specifications (Depending upon the coating)
7	Lifespan	Up to 365 days	Up to few minutes	Most of the other products available in market are cleaners/ sanitizers they fail to self neutralize the virus / microbes after few minutes , where as Warrior™ Antiviral Coatings due to Nanomaterials continue to neutralize / Kill the virus/microbes for upto 365 days 24*7
8	Self Sanitization	Yes	No	WARRIOR™ Coatings can self-sanitize the surfaces due to Nano materials action
9	All Surface Coverage	Yes	No	Being Superior Coatings they don't alter the natural feel and aesthetics of coated surfaces
10	Natural Feel of the Surface	Retained	No	
11	Colour and Gloss Retention	Yes	No	
12	Different Coatings for Customized Requirement	Yes	Not-Applicable	WARRIOR™ Coatings are available for all kind of Surfaces
13	DIY Coatings	Yes	No	Most of WARRIOR™ Coatings are very easy to use and can be done by layman without any assistance
14	Safe for Humans and Environment	Yes	No	Non-leaching film forming Coatings which uses human and environment safe materials
15	Alcohol Toxicity	No	Yes	
16	Deep Cleaning	No		According to CDC norms deep cleaning of outdoor surfaces is not recommended
17	Pricing/ Cost	Very Cost effective	Other Sanitizing Solutions are Cleaners only actually due to short Life Span of Antiviral action and thus in reality very costly	Due to the extremely long life of WARRIOR™ coatings the net effective cost is about 2000% cheaper when compared on yearly basis from other normal coatings available in the market
18	Packaging	All products are packaged in both retail and bulk packing. 100 ml, 1lt, 5 Lt, 20 L	No	
19	Post Application Maintenance	WARRIOR™ Coatings are easy to maintain and can withstand normal cleanings and day to day operations and still can remain Antiviral for their lifetime	Most of the coatings life is very short e.g., few minutes as they do not form a bonding with the surface that can withstand daily operation	
20	Government Funded COVID Consortium Project	Yes	No	The funding is received from DEPARTMENT OF BIOTECHNOLOGY-BIRAC)
21	Proven in Global Journals	Yes	No	The technology has been tested & proven to be effective and safe as published in globally renowned Journals
22	Made in India	Yes, WARRIOR™ Coatings are proudly developed in India under MSMSE, Govt. of India Certification	In most of the cases these products are sold by vendors who have imported the products for sales purpose	
23	Trusted Brand and Company	Under WARRIOR™ (Registered Trademark in India) the Nanotechnology Focused Reinste Nano Ventures is 11 Yrs. Old Company catering to DRDO/ CSIR/ IIT's/ Universities/ TATA/ Reliance/ Birla and major Groups in India and overseas.	The seller Companies are just opportunistic Companies with no prior experience and track record and absolutely no background in Antiviral Coating Development	

Why WARRIOR™ Smart Coatings?

WARRIOR™ Coatings are developed after rigorous R&D by a 11-year-old nanotechnology company which has a history of service in nanotechnology for health care sector. Research of this product was reviewed looked by DBT (BIRAC), Govt. of India and all certifications are from government accredited labs. The product is proven 99.9% effective against SARS CoV-2 and other disease-causing viruses, fungi & bacteria.

WARRIOR™ Coatings is a Trademark of Reinste Nano Ventures Pvt Ltd