

TECHNICAL DATA SHEET

What is BIOZINY?

BIOZINY is the World's First ZnO Nanofluid based Antimicrobial Coating. BIOZINY is water based transparent, and easy to apply antimicrobial coating

Performance Features and Benefits

1. Superior Antimicrobial properties - Kills 99.99% Microbes within 24 Hours of application¹ Shields the surface from bacteria for six months²
2. Zinc Oxide is generally recognized as safe (GRAS) by the U.S. FDA
3. The coating is water based, hence no VOC and no associated health hazards
4. Can be applied in Plastic, Wood and Metal Surface
5. Superior Transparency
6. Non Carcinogenic; Inorganic Active Ingredient

BIOZINY works against the following Pathogens

1. E.Coli,
2. Staphylococcus Aureus,
3. Bacillus Subtilis,
4. S.Typhi,
5. Klebsiella Pneumoniae
6. A Number of Enveloped Viruses³⁻⁷
7. Fungi
8. Mould

Typical Application Areas

Fact: About 80% of infectious diseases are transmitted by hands touching contaminated surfaces⁸

BIOZINY can be applied in High Touch Surfaces in

- Homes
- Schools/Colleges/Universities Supermarkets
- Malls
- Railway Stations
- Inside Railway coaches
- Airports
- Gyms & Fitness Centers
- IT Parks/Offices/Co-Working Spaces
- Common Areas in Apartment
- Complexes Children's Play Area
- Hospitals And Many More

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Application

The coating can be applied using a wipe or a High Volume Low Pressure (HVLP) spray gun. A wipe can be used when the area to be applied is small, like for domestic application. For larger surfaces, a HVLP spray gun can be used.

The coating becomes touch dry in 15-30 minutes after application. But the coating should be allowed to dry for 24 hours for the coating to deliver its full value.

Surface Preparation before Application

No surface preparation required before the application of the first coat. Only cleaning is enough. These are Direct To Metal (DTM) coatings and do not require any surface preparation for metal surfaces.

Life of Coating and Re-Application

Under Laboratory Conditions the life of the coating is Six Months from the date of application. In a practical scenario, the effectiveness of the coating remains for a minimum of three months². The coating can be re-applied, over the existing coating, after three month.

Number of Coats to be applied for best performance

One coat is enough to render antimicrobial properties to the surface. However a second coat will provide strength to the coating and may increase its life.

Main Ingredients

Surface Modified Nanoparticles of Zinc Oxide⁹⁻¹², Water Based Polyurethane, De-Ionized Water

Test Results¹

| Results as Per JIS Z 2801:2010 | E.Coli | Staphylococcus Aureus |
|--|------------------------|------------------------|
| Bacterial Count of Untreated Sample at T=0 | 9.33 X 10 ⁴ | 9.43 X 10 ⁴ |
| Bacterial Count of Untreated Sample @ T=24 Hrs (U) | 3.93 X 10 ⁷ | 9.16 X 10 ⁵ |
| Log (U) | 7.59 | 5.96 |
| Bacterial Count of Treated Sample at T=24 Hrs (T) | 4.12 | 6.25 |
| Log(T) | 0.61 | 0.79 |
| R=Log (U) – Log (T) | 6.98 | 5.17 |
| Note: For an Antimicrobial Product, as per this standard Test, the Value of R shall not be less than 2 | | |

Precautions

- Only for use on INANIMATE High Touch surfaces
- Keep the product at ambient temperature (<40 °C) in a well ventilated location.
- Keep lid closed when not in use
- The coating is susceptible to mild gelation when it comes in contact with air for an extended period of time. However this does not alter the effectiveness of the coating.
- Keep out of reach of children
- Not for oral consumption
- Not to be used on surgical instruments and devices
- Not to be used on medical devices
- Avoid eye and skin contact in the liquid condition.
- Do not inhale or inject
- The coating in liquid form is very safe. However we recommend using protective equipments like rubber/polyethylene Gloves, Safety Goggles/glasses & Face masks while handling the coating for your own safety.

Safety

- The coating in liquid and solid form is Non-flammable
- Does not contain inflammable Alcohol based Solvents

For Further information on safety of the product, please refer our MSDS Sheet.

Shelf Life of the Coating

1 Year under original conditions in tightly closed containers away from excessive heat & Cold

References

1. The test results are for a particular sample under laboratory conditions. We provide no guarantee on the replication of the same results in other conditions.
2. Only when the surface is not rubbed heavily or treated with strong acid or alkali; when the surface is not scrubbed with hard scrubbers like steel wool or ceramic particle coated scrubber. The coated surface, if at all washed, should be washed with detergent and normal water having room temperature.
3. Hadi Ghaffari et. al. Inhibition of H1N1 influenza virus infection by zinc oxide nanoparticles: another emerging application of nanomedicine, *Journal of Biomedical Science* (2019) 26:70
4. Lin Cai et. al. Preventing viral disease by ZnONPs through directly deactivating TMV and activating plant immunity in *Nicotiana benthamiana*, *Environ. Sci.: Nano*, 2019, 6, 3653
5. Tejabhram Yadavalli et.al. Role of Metal and Metal Oxide Nanoparticles as Diagnostic and Therapeutic Tools for Highly Prevalent Viral Infections, *Nanomedicine*. 2017 January ; 13(1): 219–230.
6. Lavanya Singh et.al. The role of nanotechnology in the treatment of viral infections , *Ther Adv Infectious Dis* 2017, Vol. 4(4) 105–131
7. R. Kumar et.al. Virostatic potential of zinc oxide (ZnO) nanoparticles on capsid protein of cytoplasmic side of chikungunya virus, *International Journal of Infectious Diseases* 73S (2018) 3–398
8. National Center for Preparedness, Detection, and Control of Infectious Diseases (NCPDCID) and National Center for Zoonotic, Vector-Borne, and Enteric Diseases (NCZVED), <http://www.cdc.gov/CDCTV/HandsTogether/>
9. Li, J. H., Hong, R. Y., Li, M. Y., Li, H. Z., Zheng, Y., & Ding, J. (2009). Effects of ZnO nanoparticles on the mechanical and antibacterial properties of polyurethane coatings. *Progress in Organic Coatings*, 64(4), 504–509
10. Padmavathy, N., & Vijayaraghavan, R. (2008). Enhanced bioactivity of ZnO nanoparticles—an Antimicrobial study. *Science and Technology of Advanced Materials*, 9(3), 035004
11. Xie, Y., He, Y., Irwin, P. L., Jin, T., & Shi, X. (2011). Antibacterial activity and mechanism of action of zinc oxide nanoparticles against *Campylobacter jejuni*. *Applied and Environmental Microbiology*, 77(7), 2325–2331.
12. Zhang, L., Ding, Y., Povey, M., & York, D. (2008). ZnO nanofluids—a potential antibacterial agent. *Progress in Natural Science*, 18(8), 939–944.