

HydroSal® Natural Antiseptic

Time Released Natural Protection Against Microbes

The Science Behind Natural Protection

Microbial contamination on the skin and surfaces can lead to infections, irritation, and hygiene concerns. Traditional antiseptic solutions often rely on alcohol, which evaporates quickly and can be harsh on the skin.

The Technology

HydroSal® Natural Antiseptic is a next-generation encapsulation system that delivers plant-based antimicrobial protection with prolonged efficacy. Designed to provide a controlled release of antiseptic actives, it offers a safe and alcohol-free solution for skin and surface hygiene. By utilizing optimized levels of encapsulated botanical extracts, HydroSal® ensures potency, reduced volatility, and enhanced retention for continuous protection against microbes. HydroSal® Natural Antiseptic offers a non-drying, water-soluble alternative that provides extended antimicrobial action by reducing volatility and increasing adherence.

Key Benefits:

Encapsulated Plant-Based Actives: Delivers potent antimicrobial protection with controlled release.

Water-Triggered Activation: Enhances protection upon contact with moisture.

Extended Retention: Improves adhesion on skin and surfaces for long-lasting efficacy.
Alcohol-Free & Gentle: Ideal for frequent use without causing dryness or irritation.

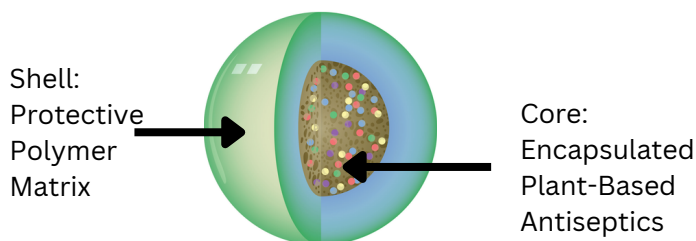


Figure 1: Sub-Micron Structure of HydroSal® Natural Antiseptic



How It Works

HydroSal® Natural Antiseptic functions by encapsulating plant-based antimicrobials within a polymer shell that locks in the actives until needed. Upon application, the system adheres to the skin or surface, gradually releasing antimicrobial agents. When exposed to moisture, the encapsulated actives activate, delivering a burst of protection against bacteria, fungi, and other harmful microorganisms.

Unique Smart Delivery System

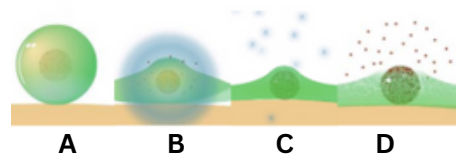


Figure 2: Depiction of HydroSal® Mechanism

- (A) The structure in water formula.
- (B) After application on a surface, the system dries out and turns flat like a film
- (C) The dry product is invisible, 1μ or less in thickness. The natural antiseptics are trapped within the polymers
- (D) When exposed to water, the polymer exposes the natural antiseptics to the environment

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Technical Data

INCI of HydroSal® Natural Antiseptic

Key INCI: Water (Aqua), Polyvinyl Alcohol, Acrylates/C12-22 Alkyl Methacrylate Copolymer, Thymus Vulgaris (Thyme) Extract, Mentha Piperita (Peppermint) Leaf Extract, Origanum Vulgare Leaf Extract, Rosmarinus Officinalis (Rosemary) Leaf Extract, Lavandula Angustifolia (Lavender) Flower Extract, Hydrastis Canadensis (Goldenseal) Root Extract, Cinnamomum Zeylanicum Bark Extract, Olea Europaea (Olive) Leaf Extract, Citrus Limon (Lemon) Peel Extract

Other INCI: Phenoxyethanol, Propylene Glycol, Sodium Acetate, Ethylhexylglycerin, Methylparaben, Acetic Acid, Methyl Alcohol.



Figure 3: Appearance of Natural HydroSal® Antiseptic

Specifications of HydroSal® Natural Antiseptic

Table 1: Specifications of HydroSal® Natural Antiseptic

Specification	Characteristic
Appearance at 20C	Opaque Paste
Color	White to Off-White
Odor	Characteristic
pH (1% Solution)	5.5-7.5
Shelf Life (Months)	18
Usage Level (Wt%)	2.5-10.0%
Storage (Celsius)	Closed Container at 12-32C

Potential Application

Table 2: Serum with HydroSal® Natural Antiseptic

Serum with 10% Natural HydroSal® Antiseptic	
Component	Weight (%)
Water	71.6
Sodium Gluconate	0.1
Propanediol	10
Glycerin	5.5
Hydroxypropyl Guar	0.9
Xanthan Gum	0.3
HydroSal® Natural Antiseptic PID: 8419-02	10
Preservative	1.6
TOTAL	100

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Clinical Data

Controlled Release

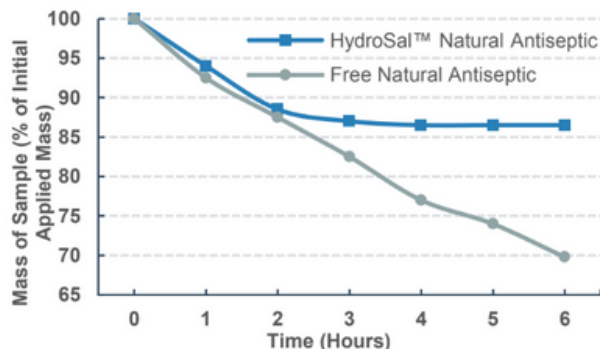


Figure 3: Illustration of the mass lost due to volatility of free NAS compared to HydroSal® NAS during thermal gravim analysis (TGA) at 35°C (approx. skin surface temperature).

Reduced volatility is one of the key benefits of HydroSal® Natural Antiseptic (NAS). A study done clearly demonstrates the capacity of HydroSal® to reduce the volatility of this potent blend, providing retention on both skin and surfaces.

Targeted Delivery

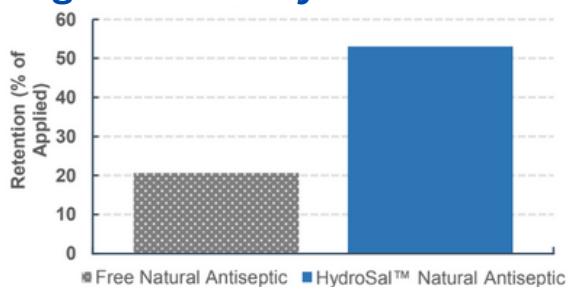


Figure 4: Comparison of NAS retained on skin of volunteers treated with spray at equivalent concentration of HydroSal® NAS or free NAS.

HydroSal® Natural Antiseptic (NAS) was applied to the arms of volunteers for 6 hours. Their arms were then extracted with ethanol and these fractions analyzed via HPLC to determine how much of the NAS was retained.

Enhanced Efficacy

A test was done in a high-traffic public restroom, with HydroSal® NAS and free NAS each put on a floor tile. After 48 hours of normal use, the free NAS and HydroSal® NAS areas were swabbed (Figure 4A and 4B). After swabbing, the free NAS and HydroSal® NAS areas were wiped for 10 seconds with a paper towel dampened with water, then swabbed again after 5 minutes (Figure 4C and 4D).

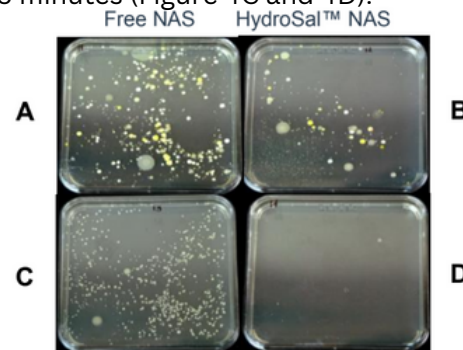


Figure 4: Cultures collected from bathroom surfaces tested at t=48 hours of normal use, one area with free NAS and another with HydroSal® NAS. The top row is before wetting, and the bottom row is after.

Organism	HydroSal® Natural Antiseptic (µl/ml)
<i>S. aureus</i>	40.0
<i>E. coli</i>	40.0
<i>S. typhimurium</i>	40.0
<i>K. pneumoniae</i>	20.0
<i>P. aeruginosa</i>	90.0
<i>M. smegmatis</i>	10.0
<i>C. albicans</i>	10.0
<i>A. niger</i>	10.0
MIC for all organisms	9.1

HydroSal® Natural Antiseptic has been tested for effectiveness against a range of bacteria and fungi, demonstrating broad-spectrum protection.

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Substantiation

Ingredient	Claim	Substantiation
Thymus Vulgaris (Thyme) Extract	Oregano and thyme oils showed much stronger antibacterial potential than streptomycin.	1
Mentha Piperita (Peppermint) Leaf Extract	Oils from Mentha species showed almost the same antibacterial potential as the antibiotic.	1
Origanum Vulgare Leaf Extract	Oregano and thyme oils showed much stronger antibacterial potential than streptomycin.	1
Rosmarinus Officinalis (Rosemary) Leaf Extract	The results showed a higher antibacterial activity in rosemary extracts, compared to other extracts studied. Only rosemary extracts were able to inhibit the 11 bacteria tested.	2
Lavandula Angustifolia (Lavender) Flower Extract	Lavender (<i>Lavandula angustifolia</i>) essential oil exhibited high antimicrobial activity against the growth of the fungal strains <i>Penicillium chrysogenum</i> ATCC 28089, <i>Aspergillus niger</i> ATCC 1015, and <i>Aspergillus flavus</i> ATCC 9643.	3
Hydrastis Canadensis (Goldenseal) Root Extract	Goldenseal (<i>Hydrastis canadensis</i>) root extract has demonstrated notable antimicrobial properties, primarily attributed to its alkaloid content, particularly berberine. Studies have shown that goldenseal extracts exhibit antibacterial activity against various pathogens, including <i>Staphylococcus aureus</i> and <i>Escherichia coli</i> . For instance, research indicates that ethanolic extracts from goldenseal roots possess significant antibacterial effects, which are enhanced when combined with other compounds present in the plant.	4
Cinnamomum Zeylanicum Bark Extract	Cinnamon (<i>Cinnamomum zeylanicum</i>) bark extract has demonstrated significant antimicrobial properties, particularly against various bacterial strains. Research indicates that methanolic extracts of cinnamon bark exhibit antibacterial activity with minimum inhibitory concentrations (MICs) ranging from 64 to 1024 µg/mL, depending on the bacterial strain.	5



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Substantiation

Ingredient	Claim	Substantiation
Olea Europaea (Olive) Leaf Extract	Olive leaf extract (<i>Olea europaea</i>) has demonstrated significant antimicrobial properties, attributed primarily to its high content of phenolic compounds, notably oleuropein. Research indicates that olive leaf extract exhibits antibacterial activity against both Gram-positive and Gram-negative bacteria, including <i>Listeria monocytogenes</i> , <i>Escherichia coli</i> O157:H7, and <i>Salmonella Enteritidis</i> .	6
Citrus Limon (Lemon) Peel Extract	Lemon (<i>Citrus limon</i>) peel extract has demonstrated notable antimicrobial properties, primarily due to its rich content of flavonoids and essential oils. Studies have shown that ethanolic extracts of lemon peel exhibit significant antibacterial activity against <i>Escherichia coli</i> , with inhibition zones measuring 15.03 mm at 25% concentration and 18.77 mm at 100% concentration.	7





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Sources

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