Leucidal® SF Max Powder

US Patent Number 10,232,197

Technical Data Sheet

BACKGROUND

Consumer preference has continued to drive the personal care industry away from using synthetic preservatives and to focus on using more natural products in their formulations. For these reasons, formulators have been actively searching for alternatives to synthetic materials that can provide broad-spectrum antimicrobial activity and can be added into a wide range of cosmetic applications.

Active Micro Technologies (AMT) has developed a full line of products derived from naturally occurring compounds that provide broad-spectrum antimicrobial protection, in addition to its primary skin and hair care benefits. These novel, natural antimicrobials are considered self-preserving cosmetic actives that are friendly alternatives to synthetic preservatives.

Leucidal® SF Max Powder has proven less is more. This powdered version of the **Leucidal® SF Max** is a more effective, more concentrated version. With five times higher and stronger potency than the original, it allows formulators to save time and money, while simultaneously delivering efficacy with an increased sense of confidence.

Code Number: M15031
INCI Nomenclature:
Lactobacillus Ferment
INCI Status: Conforms
REACH Status: Fully Compliant
CAS Number: 1686112-36-6 (or)
68333-16-4
EINECS Number: N/A (or) N/A
Origin: Biotechnology
Lactobacillus
Processing:
GMO Free
No Ethoxylation
No Irradiation
No Sulphonation
No Ethylene Oxide treatment
No Hydrogenation
Additives: None
-Preservatives: None
-Antioxidants: None
Other additives: None
Solvents used: None
Appearance: Free Flowing Powder
Soluble/Miscible: Water Soluble
Suggested Use Levels: 0.50 - 1.00%
Suggested Applications:
Skin Conditioning, Antimicrobial

SCIENCE

Leucidal® SF Max Powder is a probiotic-based ingredient created by the fermentation of *Lactobacillus* in a defined growth medium. *Lactobacillus* is one of the species of microorganisms used to produce fermented products, such as kimchi, a Korean dietary staple, and sauerkraut, from cabbage. Like many members of the lactic acid bacteria family, *Lactobacillus* is capable of restricting the growth of other microorganisms by acidifying its environment. However, *Lactobacillus* also produces novel antimicrobial peptides, known as bacteriocins, that are capable of providing broad spectrum antimicrobial protection. During the manufacturing process, lysozyme is added to the ferment filtrate to facilitate a controlled cell lysis to ensure the release of the antimicrobial peptides for maximized activity.



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BENEFITS

A 24-hour skin moisturization study was performed involving 20 M/F participants between the ages of 23-45. Using an untreated control, generic cream base, and an experimental with the same cream base containing 0.5% and 1.0% **Leucidal® SF Max Powder**, moisturization readings were taken and compared. Results from this study are shown below in Figure 1. A Dermalab Corneometer was used to measure moisture levels, in µSiemens (µS), as the presence of moisture in the skin improves conductance. Therefore, the higher the conductance measurements, the higher the moisture levels.

As demonstrated by the results of this study, **Leucidal® SF Max Powder** showed high moisturizing capabilities at both concentrations of 0.5% and 1.0%. Please note, each value is an average of three consecutive readings per test site. Based on these results, adding this innovative product provides the formulator the opportunity to capitalize on both the natural antimicrobial properties of **Leucidal® SF Max Powder**, as well as its ability to provide potent moisturizing benefits to the cosmetic formulation.

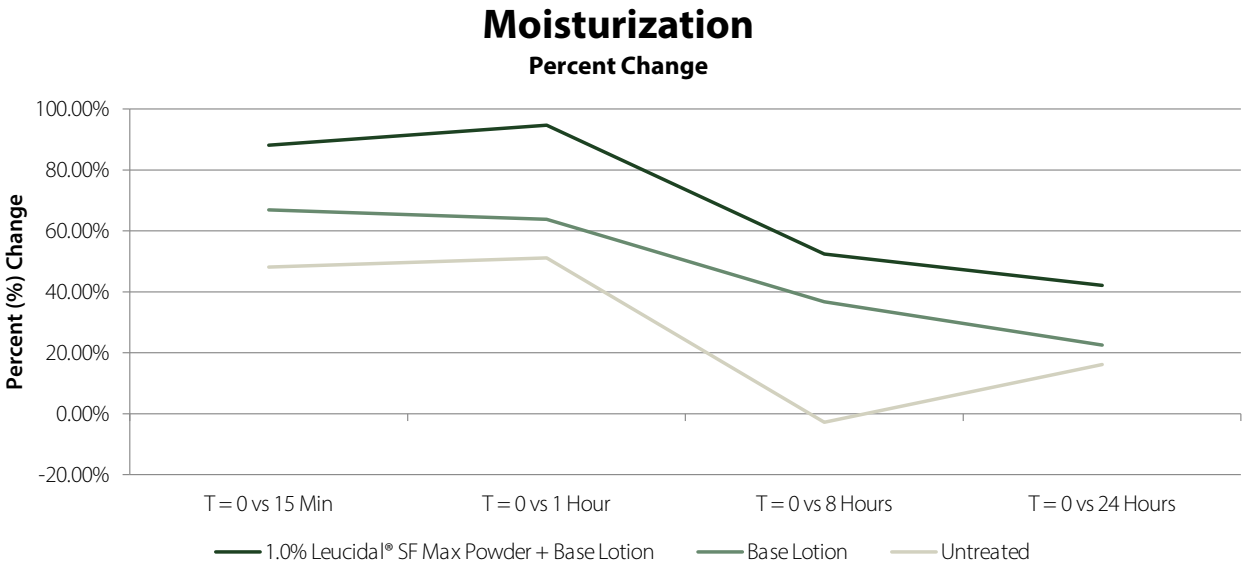

Figure 1. Percent Change in Moisturization.

Leucidal® SF Max Powder has the ability to more effectively inhibit the growth of a variety of bacteria and fungi than its liquid version, **Leucidal® SF Max**. The powder version is about five times more concentrated. Therefore, better results are acheived while also using less product.

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In Table 2, the Minimum Inhibitory Concentration (MIC) test shows comparative results between the two ingredients and shows that both materials provide broad-spectrum antimicrobial protection. The positive MIC screening results warranted further testing to confirm its ability to provide product preservation.

Minimum Inhibitory Concentration (%)		
Organisms	Leucidal® SF Max (M15019MAX)	Leucidal® SF Max Powder (M15031)
E. coli #8739	0.50	0.12
S. aureus #6538	0.50	0.12
P. aeruginosa #9027	0.50	0.12
C. albicans #10231	0.50	0.12
A. brasiliensis #16404	0.50	0.12

Figure 2. MIC Results

Double Challenge Tests were completed using 1.0% **Leucidal® SF Max Powder** in the water phase of a generic base lotion formula. Samples were inoculated with *E. coli, P. aeruginosa*, *S. aureus*, *C. albicans*, and *A. brasiliensis*.

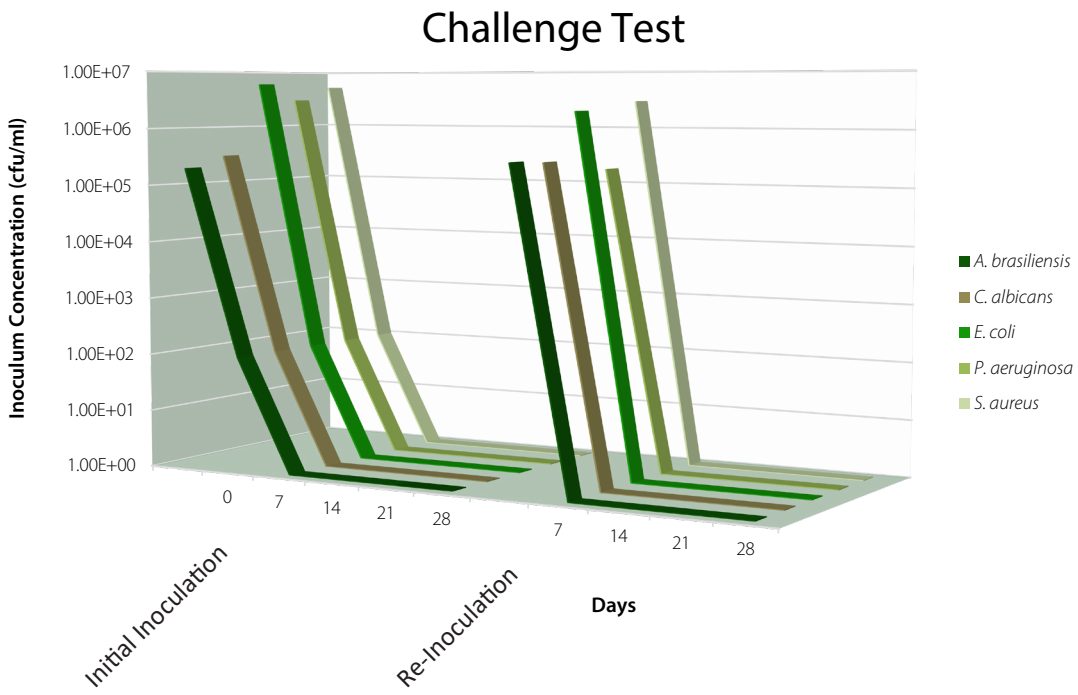

Figure 3. Challenge Test results for Generic Base Lotion Formula with 1.0% Leucidal® SF Max Powder inoculated on Day 0 and re-inoculated on Day 28. Results show log reduction in viable organisms.

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A Time Kill Test was performed to determine the change in population of aerobic microorganisms within a specified sampling time when tested against 1.0% **Leucidal® SF Max Powder** solution. The activity of the test material inoculated was evaluated at determined time intervals of 30 seconds, 1, 5, 10 and 30 minutes after the inoculation to determine quantitatively the number of viable microorganisms remaining after the incubation time. As shown in Figure 4, the gram-positive and gram-negative bacteria as well as the yeast and mold were reduced by 99.9% within 30 seconds after the inoculation.



Figure 4. Time Kill Test results for 1.0% **Leucidal® SF Max Powder**

USE RECOMMENDATIONS

Leucidal® SF Max Powder can be used in a wide range of cosmetic products; however, to ensure optimum results we recommend using the following guidelines. Incorporate the product into formulations at a pH between 3 and 7 during the aqueous phase of the process at temperatures lower than 70°C.

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