



# Leucidal® Advanced-Aloe

## Active Micro Technologies

### Technical Data Sheet



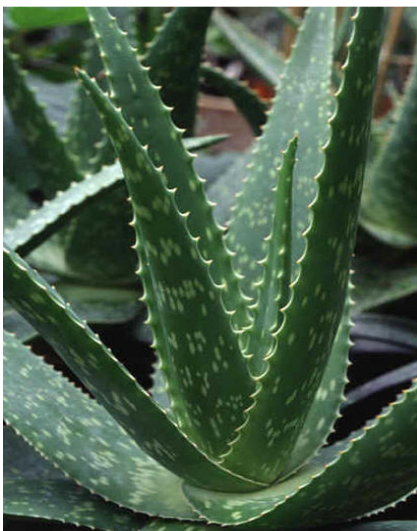
#### BACKGROUND

Aloe is a plant whose medicinal use was first documented by the Egyptians around 1500 B.C. Native to arid climates, the leaves resist desiccation and contain a thick sap known for its healing properties. Over the years, aloe has been used to treat eczema, psoriasis, allergic reactions and insect bites. Today aloe is commonly used to relieve sunburn redness and pain due to its excellent moisturizing and soothing benefits.

The berries of Rowan trees (also known as Mountain Ash) are an excellent natural source of sorbic acid. These berries have long been used to make jelly and alcoholic beverages. The fatty acid provides emollient qualities to soften and soothe skin. Sorbic acid is also well known for its antifungal properties.

#### SCIENCE

**Active Micro Technologies, LLC (AMT)** has developed techniques to combine the performance of botanical extracts and fermentation products with the natural defense mechanisms employed by microorganisms. This exciting synergy results in products offering both traditional skin care benefits and antimicrobial properties.



Fermentation is a natural process that releases the plant's active components while delivering additional nutrients. Manufacturing begins with macerated aloe leaves and rowan berries, a rich growth medium, and the *Leuconostoc* culture to produce a ferment filtrate. Ferment filtrates of this nature provide cosmetic bio-actives valued for their ability to soften, soothe, nourish and moisturize.

**AMT** has an ongoing interest in harnessing the natural mechanisms used by microorganisms to protect themselves. In the case of **Leucidal® Advanced - Aloe**, we are capitalizing on the ability of certain *Leuconostoc* species to restrict competition by producing antimicrobial peptides. With modern biotechnology,

**Code Number:** M15015

**INCI Nomenclature:**

Water & *Leuconostoc/Aloe barbadensis* Leaf/  
*Sorbus aucuparia* Fruit Ferment Filtrate

**INCI Status:** Proposed

**REACH Status:** Fully Compliant

**CAS Number:** 7732-18-5 & N/A

**EINECS Number:** 231-791-2 & N/A

**Origin:** Biotechnology/Botanical:

*Leuconostoc spp.* & *Aloe barbadensis* & *Sorbus aucuparia*

**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:** Water

**Appearance:** Clear to Slightly Hazy Liquid

**Soluble/Miscible:** Aqueous Ferment Filtrate

**Suggested Use Levels:** 2.0 - 4.0%

**Suggested Applications:**

Moisturizer, Skin Conditioner, Antimicrobial



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we are able to create a fermentation extract with an effective concentration of these natural peptides. The broad-spectrum antimicrobial efficacy of these peptides is further enhanced by the fermentation of the sorbic acid containing rowan berries. **Leucidal Advanced - Aloe** not only delivers the cosmetic benefits described above, but also has the ability to protect cosmetic formulations from microbial contamination.

### BENEFITS

Minimum Inhibitory Concentrations (MIC), using a standard growth media dilution method and both bacterial and fungal cultures, were determined to evaluate the ability of **Leucidal Advanced - Aloe** to protect against microbial proliferation. The results shown in Table 1 indicate that **Leucidal Advanced - Aloe** can provide effective protection for cosmetic formulations.

Microorganism Tested	MIC (%)
<i>E. coli</i>	0.75
<i>S. aureus</i>	1.00
<i>P. aeruginosa</i>	0.50
<i>C. albicans</i>	0.50
<i>A. brasiliensis</i>	2.00

Table 1. MIC data for **Leucidal Advanced-Aloe**

Double Challenge Tests were completed using 2% **Leucidal Advanced - Aloe** in a generic shampoo & generic cream formulation to confirm its ability to provide product preservation. Samples of the shampoo and cream were inoculated with bacterial and fungal cultures and then monitored for 28 days for microbial survival. The samples were re-inoculated and monitored for an additional 28 days.

	<i>E. coli</i>	<i>P. aeruginosa</i>	<i>S. aureus</i>	<i>A. brasiliensis</i>	<i>C. albicans</i>
Inoculum (initial)	1.2x10 <sup>6</sup>	2.1x10 <sup>4</sup>	8.0x10 <sup>5</sup>	4.5x10 <sup>5</sup>	2.0x10 <sup>4</sup>
Day 0	>99.999%	>99.999%	96.250%	99.780%	95.000%
Day 7	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Day 14	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Day 21	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Day 28	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Inoculum (re-inoculated)	5.4x10 <sup>5</sup>	4.0x10 <sup>4</sup>	1.0x10 <sup>7</sup>	8.0x10 <sup>4</sup>	1.0x10 <sup>5</sup>
Day 7	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Day 14	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Day 21	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Day 28	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%

Figure 2. Challenge Test results for 2% **Leucidal Advanced - Aloe** in a shampoo formulation inoculated on day 0 and re-inoculated on day 28. Results show % reduction in viable organisms.



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	<i>E. coli</i>	<i>P. aeruginosa</i>	<i>S. aureus</i>	<i>A. brasiliensis</i>	<i>C. albicans</i>
Inoculum (initial)	1.2x10 <sup>6</sup>	1.3x10 <sup>4</sup>	9.1x10 <sup>5</sup>	8.0x10 <sup>4</sup>	2.0x10 <sup>4</sup>
Day 0	>99.999%	>99.999%	99.121%	98.625%	>99.999%
Day 7	>99.999%	>99.999%	99.901%	99.125%	>99.999%
Day 14	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Day 21	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Day 28	>99.999%	>99.999%	>99.999%	>99.999%	>99.999%
Inoculum (re-inoculated)	7.5x10 <sup>6</sup>	5.8x10 <sup>5</sup>	4.2x10 <sup>7</sup>	4.0x10 <sup>5</sup>	1.0x10 <sup>5</sup>
Day 7	>99.999%	>99.999%	>99.999%	99.625%	>99.999%
Day 14	>99.999%	>99.999%	>99.999%	99.688%	>99.999%
Day 21	>99.999%	>99.999%	>99.999%	99.700%	>99.999%
Day 28	>99.999%	>99.999%	>99.999%	99.738%	>99.999%

Table 3. Challenge Test results for 2% **Leucidal Advanced - Aloe** in a cream formulation inoculated on day 0 and re-inoculated on day 28. Results show % reduction in viable organisms.

These Challenge Test results demonstrate the effectiveness of **Leucidal Advanced - Aloe** for both shampoo and cream formulations.

### USE RECOMMENDATIONS

**Leucidal Advanced - Aloe** is temperature stable and its antimicrobial properties are most effective between pH 3 and 8. The suggested use levels are typically between 2 and 4%. This unique ingredient delivers the skin conditioning benefits of soothing and moisturization, while functioning as a natural preservative in many cosmetic formulations.