



# Leucidal® Advanced-Bamboo

## Active Micro Technologies

### Technical Data Sheet

#### BACKGROUND

Bamboo is perhaps the perfect embodiment of the growing “green” movement. This highly sustainable plant has served as a source of food and shelter as well as artistic inspiration for centuries. Today bamboo is a popular active ingredient used in a variety of personal care and cosmetic applications. On its own, bamboo is recognized for its antioxidant properties. However, when fermented with *Leuconostoc* it can be used to create a unique bio-active ingredient that functions as a potent antioxidant, as well as providing antimicrobial 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.



**Leucidal® Advanced - Bamboo** is derived from bamboo native to the United States. The leaves of the species *Arundinaria gigantea*, or Giant Bamboo, are rich in iso-flavones, which have been shown to provide antioxidant properties as potent as Vitamin C. These phytochemicals are useful in cosmetic applications as they help prevent damage from oxidative stress, which would typically contribute to aging. The isoflavones also stimulate cellular proliferation to aid in the repair of existing damage for additional anti-aging benefits.

**Code Number:** M15016

**INCI Nomenclature:**

*Water & Leuconostoc/Arundinaria gigantea 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. & Arundinaria gigantea & 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:** Antioxidant, Skin Conditioner, Antimicrobial



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Fermentation is a natural process that enhances the plant’s active components while delivering additional nutrients. Manufacturing begins with macerated bamboo 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 and moisturize. Combined with the antioxidant isoflavones, this botanical ferment functions as a potent skin conditioner and anti-aging ingredient.

**AMT** has an ongoing interest in harnessing the natural mechanisms used by microorganisms to protect themselves. In the case of **Leucidal Advanced - Bamboo**, we are capturing the ability of the *Leuconostoc* species to restrict competition by producing antimicrobial peptides. With modern biotechnology, 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 – Bamboo** not only provides the cosmetic benefits discussed above, but also has the ability to protect cosmetic formulations from microbial contamination.

### BENEFITS

The Oxygen Radical Absorbance Capacity (ORAC) test is commonly used to measure antioxidant activity. Figure 1 illustrates the capability of **Leucidal Advanced – Bamboo** to provide antioxidant protection comparable to Vitamin C. Based on these results we can confirm that **Leucidal Advanced – Bamboo** is an ideal ingredient for cosmetic and personal care product applications when potent antioxidant and skin protection benefits are desired.

Figure 1. ORAC Assay

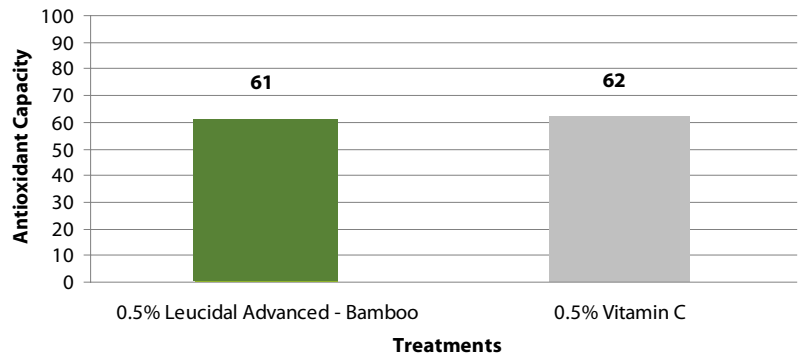


Table 1. ORAC data for **Leucidal Advanced-Bamboo**

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

Table 2. MIC data for **Leucidal Advanced-Bamboo**

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 - Bamboo** to protect against microbial proliferation. The results shown in Table 2 indicate **Leucidal Advanced - Bamboo** can provide effective protection for cosmetic formulations.



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Double Challenge Tests were completed using 2% **Leucidal Advanced – Bamboo** in a generic cream formulation to confirm its ability to provide product preservation. Samples of the 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)	1.0x10 <sup>6</sup>	1.0x10 <sup>5</sup>	3.0x10 <sup>6</sup>	9.0x10 <sup>4</sup>	1.0x10 <sup>4</sup>
Day 0	99.991%	>99.999%	99.917%	99.889%	99.400%
Day 7	>99.999%	>99.999%	99.983%	99.956%	99.900%
Day 21	>99.999%	>99.999%	>99.999%	99.989%	99.900%
Day 21	>99.999%	>99.999%	>99.999%	99.989%	99.900%
Day 28	>99.999%	>99.999%	>99.999%	99.989%	99.900%
Inoculum (re-inoculated)	2.0x10 <sup>6</sup>	1.3x10 <sup>5</sup>	4.0x10 <sup>5</sup>	3.0x10 <sup>6</sup>	1.2x10 <sup>6</sup>
Day 7	>99.999%	>99.999%	99.973%	99.994%	>99.999%
Day 14	>99.999%	>99.999%	>99.999%	99.995%	>99.999%
Day 21	>99.999%	>99.999%	>99.999%	99.997%	>99.999%
Day 28	>99.999%	>99.999%	>99.999%	99.997%	>99.999%

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

### USE RECOMMENDATIONS

**Leucidal Advanced - Bamboo** 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 anti-aging and skin conditioning benefits, while functioning as a natural preservative in many cosmetic formulations.