12053.

# AC Pina Colloida

FUNCTIONAL ACTIVES

Active Concepts

VEGAN

COSMOS

IN VITRO

IN VIVO

ISO 16128

PRODUCT PASSPORT

## THE FEATURES.

Introducing a breakthrough in beauty protection against global warming: a film-forming pineapple biopolymer that safeguards both skin and hair while promoting environmental sustainability. Our innovative solution repurposes pineapple crown leaf waste, using a natural polymer to create a shield against environmental factors. By adopting crosslinking technology based on yeast, we transform waste into a valuable foundation for a new eco-friendly ingredient, addressing environmental pollution and contributing to a greener future. Unveil beauty's shield against the impact of global warming with a film-forming pineapple biopolymer, a fusion of protection for your skin and our planet.

*Water & Ananas Sativus (Pineapple) Fiber Crosspolymer & Lactobacillus Ferment*

## Actions

**Anti-Pollution**
**Anti-Aging**
**Skin & Hair Protection**
**Moisturization**
**Dispersant**

TECHNICAL DATA SHEET.

# AC Pina Colloida

## THE REGULATION.

**INCI.** Water & Ananas Sativus (Pineapple) Fiber Crosspolymer & Lactobacillus Ferment
**CAS.** 7732-18-5 & 68917-26-0 & 68333-16-4 (or) 1686112-36-6 (or) 9015-54-7
**EINECS.** 231-791-2 & 272-839-2 & N/A (or) N/A (or) 295-635-5
**EUROPE.** Contact us
**USA.** Compliant
**CHINA.** Contact us

## THE SPECIFICATION.

**Origin.** Botanical/Bacteria
**Natural Antimicrobial.** Lactobacillus Ferment
**Preservatives.** None
**Solvents Used.** Water
**Soluble/Miscible.** Water Soluble
**Appearance.** Clear to Slightly Hazy Viscous Liquid, Colorless to Yellow
**Viscosity*.** 1,000 cPs Minimum Brookfield, T-D(94), 10 rpm
**Use Level.** 1- 10 %

## THE STORY.

Rising global temperatures and increasing pollution levels are influencing shifts in clothing and grooming habits, impacting the fashion and beauty industries. The market for anti-pollution skincare products is projected to reach $1.4 billion by 2031, as consumers seek technologically advanced sun protection.[1] Global warming directly affects skin aging and quality, heightening the risk of UV-induced damage. The skin, as the body's largest organ, faces increased threats from elevated temperatures, air pollution, and heightened UV radiation. Cosmetic products play a crucial role in maintaining skin health by addressing issues like hydration, elasticity, and integrity. Similarly, hair undergoes structural changes due to aging and external factors, with air pollution and sunlight potentially harming hair proteins. Cosmetic chemistry provides solutions to repair damaged hair. The use of various raw materials, including biopolymers, in cosmetic preparations helps counteract the impacts of climate change on skin and hair. Natural polymers, such as cellulose, play a significant role in cosmetic formulations.[2]

The objective of the project was to develop an innovative solution for protecting hair and skin using a novel, natural polymer derived from pineapple crowns. The resulting product, AC Pina Colloida, combines yeast polysaccharides with pineapple leaf fibers (PALF), creating a cross-linked biopolymer with enhanced film-forming abilities, texture, moisture, dispersion, and holding benefits. This eco-friendly solution addresses the need to mitigate harm from petrochemical pollutants, aligning with the beauty industry's focus on biobased and biodegradable materials for sustainability. The industry is increasingly conscious of environmental, social, and economic consequences, promoting the use of fair-trade ingredients, green chemistry, and waterless products. Consumers are actively seeking high-performance products with minimal environmental impact. While biodegradable polymers offer eco-friendly options, researchers emphasize the importance of minimally modified or unmodified ingredients for sustainable solutions, as extensive modifications may contribute to a higher carbon footprint.

## THE SCIENCE.

Our main focus in developing our new ingredient was based on sustainability in biomaterial science and engineering, aiming to address environmental challenges associated with synthetic fiber-based polymer composites. We explored diverse applications, from food to fashion, seeking alternatives in technology and fiber sources.[3] Active Concepts emphasizes the importance of addressing environmental concerns by exploring biopolymer-based options, particularly cellulose films and derivatives from pineapple field waste.

The transformation of pineapple leaves into sustainable vegan textiles inspired us to explore the potential of pineapple waste for creating novel materials and evaluating fiber applicability.[4] We all need to understand the significant issue of global agricultural post-harvest waste, particularly with pineapple leaves, and finding ways to repurpose a fraction of this waste to minimize pollution and introducing a beneficial sourcing strategy for new biopolymers would be a great alternative. Were you aware that agricultural waste contributes significantly to pollution? Annually, millions of tons of crops are either abandoned in fields or burned, emitting harmful greenhouse gases. However, there exists a more sustainable alternative – PALF.

This innovative solution transforms agricultural waste into valuable products, not only curbing pollution but also contributing to the circular economy's closed-loop system. For our sourcing, we strategically identified three local methods to acquire pineapple crowns, meeting the requirements of our production site.

# AC Pina Colloida

## THE BENEFITS.

### Skin

- **Anti-Aging** — *Cellular Protein vs UVB Irradiation Assay*
- **Anti-Pollution** — *Carbon Pollution Protection Study*
- **Barrier Function** — *24-Hour TEWL Study*
- **Moisturizing** — *24-Hour Moisturization Study*

### Hair

- **UV Shield** — *UV Hair Protection Assay*
- **Hair Enhancement** — *Salon Half-Head Study*

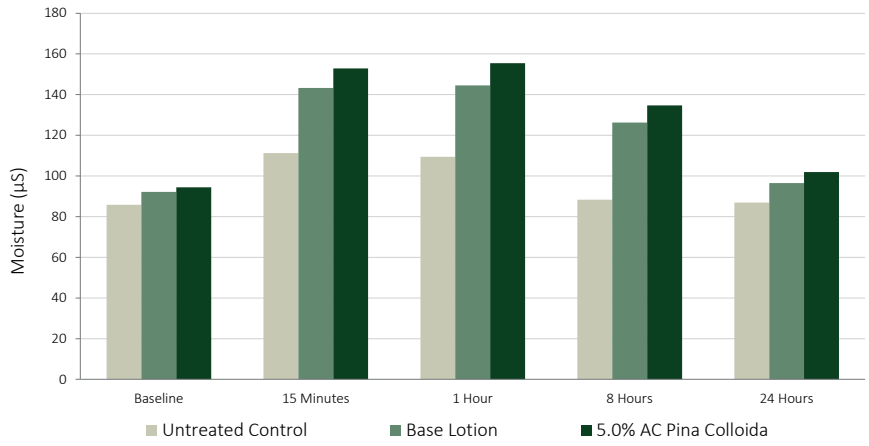
### Formulation

- **Dispersing** — *Color & SPF Pigment Dispersion Assays*

## THE EFFICACY.

### 24-Hour Moisturization Study.

An *in vivo* moisturization study was conducted to evaluate the immediate and short-term skin hydrating properties of AC Pina Colloida tested at 5% over a 24-hour period. Proper hydration maintains the skin's structural and functional integrity and contributes to the appearance of healthier-looking skin.



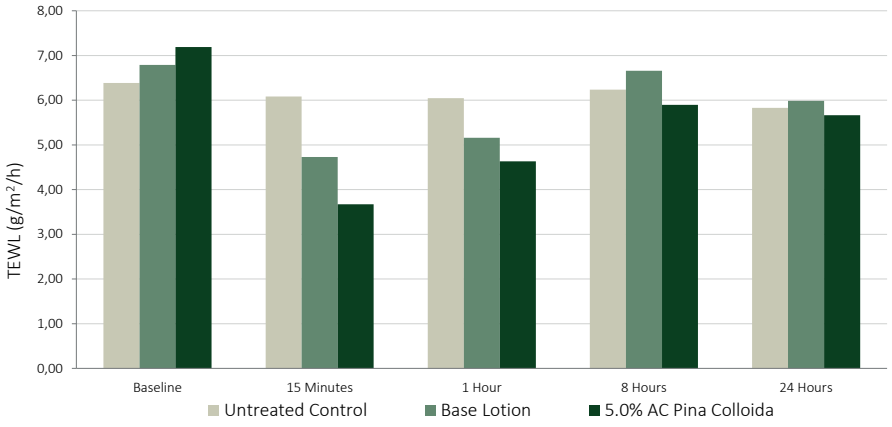

Demonstrated immediate 65% (after 1H) and short-term skin hydrating properties **(tested at 5%)**

**Moisturizing.**

Skin hydrating
&
Skin structure maintenance

### 24-Hour TEWL Study.

A Transepidermal Water Loss (TEWL) study was conducted to evaluate the immediate and short-term moisture retention properties of AC Pina Colloida. Moderating excessive TEWL improves the skin's protective barrier function and contributes to the appearance of healthier-looking skin.



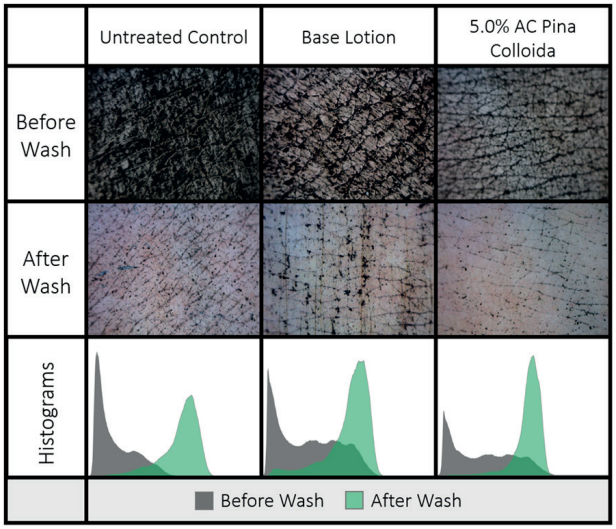

Reduced TEWL by 36% immediately when added to personal care applications **(tested at 5%)**

**Barrier Function**

Hydration retention
&
Healthier-looking skin

## Carbon Pollution Protection Study.

A Carbon Pollution Protection Study was conducted to assess the ability of AC Pina Colloida to provide immediate barrier protection from carbon air pollution and enhance the removal of carbon air pollution.



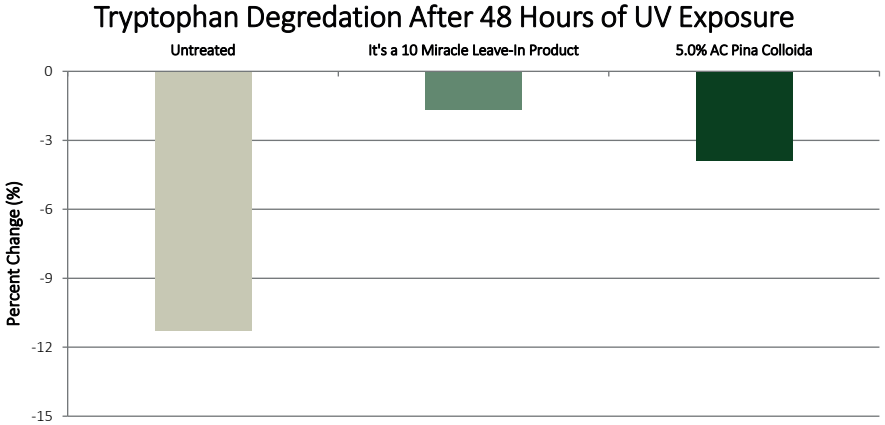

Reduced carbon accumulation on the skin by 64% versus untreated and enhanced carbon removal **(tested at 5%)**

**Anti-Pollution.**

Skin barrier protection
&
Reduces skin agressions

## UV Hair Protection Assay.

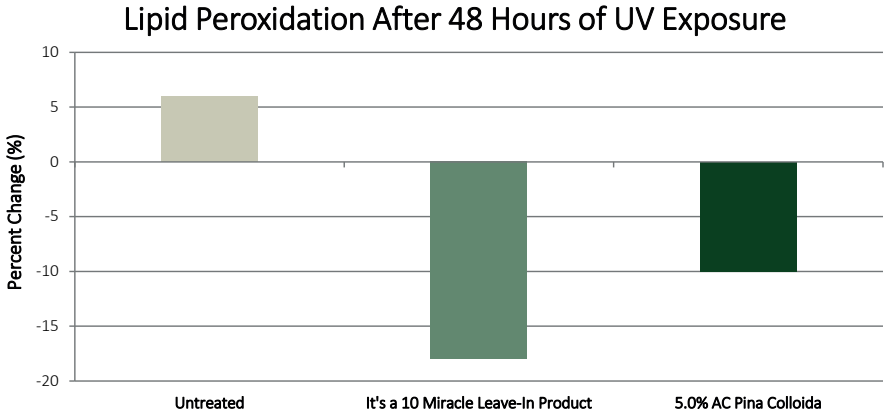
A multiparameter approach was used to determine the UV protection capabilities of cosmetic hair applications. Human hair tresses were treated with test materials and exposed to UVB irradiation. Extractions of amino acids and lipids were performed on each hair tress. The ability of AC Pina Colloida to protect hair from UV irradiation was assessed via determination of amino acid and lipid degradation.




Helped maintain hair shaft structural integrity by protecting amino acids **(tested at 5%)**

**UV Shield.**

Reduces hair damage
&
Healthier hair




Reduced lipid peroxidation in hair by 10% compared to control **(tested at 5%)**

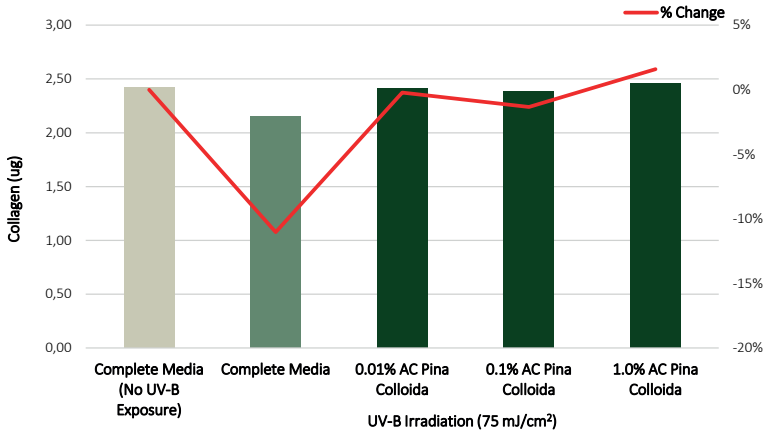
**UV Shield.**

Protects structural integrity
&
Reduces UV harmful effects

# AC Pina Colloida

## Cellular Protein vs UVB Irradiation Assay.

An *in vitro* study using a Sirius Red/Fast Green Collagen Assay evaluated AC Pina Colloida's protective effect against UVB-induced reductions in collagen synthesis and non-collagenous protein levels. UVB exposure can lead to inflammation, DNA mutations, and disruptions in dermal-epidermal junction integrity, exacerbating skin wrinkling and aging.



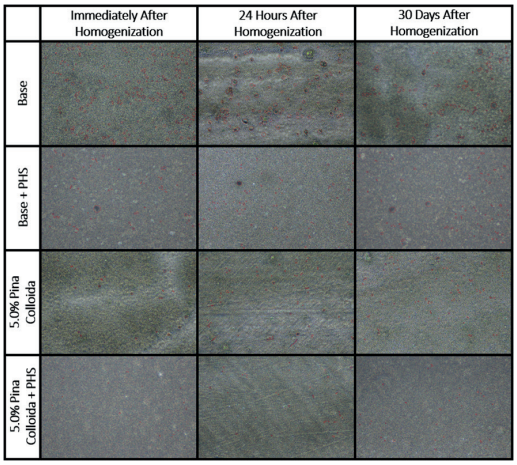

Blunted the negative effects of UVB irradiation with only 0.2% reductions in collagen compared to untreated fibroblasts
**(tested at 0.01%)**

**Anti-Aging.**

Improves scaffolding matrix
&
Helps prevent visible signs of aging

## SPF Pigment Dispersion Assay.

An SPF Pigment Dispersion Assay was conducted to assess the ability of AC Pina Colloida to increase the dispersion properties of zinc oxide in sunscreen formulations with and without the presence of a standard dispersing agent polyhydroxystearic acid (PHS).



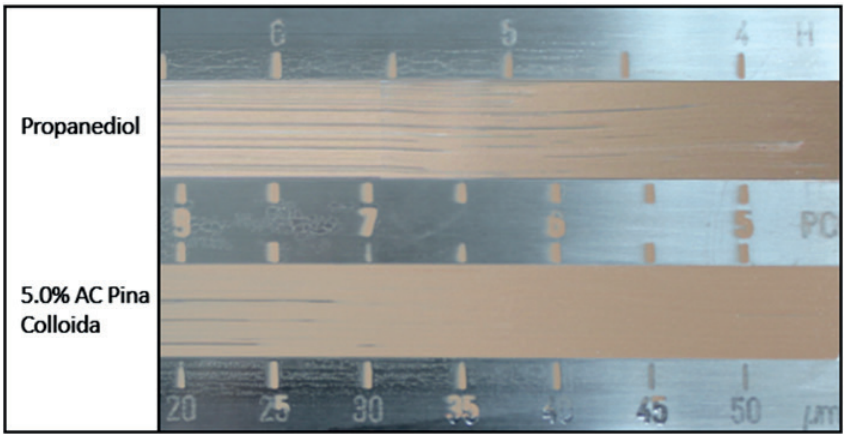

Improved zinc oxide pigment dispersion by reducing individual pigment size
**(tested at 5%)**

**Dispersing.**

Improves overall skin coverage
&
Product appearance

## Color Pigment Dispersion Assay.

A Color Pigment Dispersion Assay was conducted to assess AC Pina Colloida's capability to enhance color pigment dispersion in cosmetic products. It utilized a multiparameter approach, showing decreased pigment sizes and improved realism in formulation conditions.




Reduced particle agglomeration and particle size by 39%
**(tested at 5%)**

**Dispersing.**

Improves homegenity
&
Optimal color rendering


1. https://www.businessoffashion.com/articles/sustainability/how-global-warming-is-changing-fashion-and-beauty/
2. https://www.personalcareinsights.com/news/bountiful-biopolymers-biodegradable-solutions-and-trends-in-personal-care-formulations.html
3. https://www.mdpi.com/2073-4360/15/10/2388
4. https://iopscience.iop.org/article/10.1088/1757-899X/796/1/012007/pdf#:~:text=Generally%2C%20pineapple%20crowns%20leaf%20(PCL,reinforcement%20in%20polymers%20%5B5%5D



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