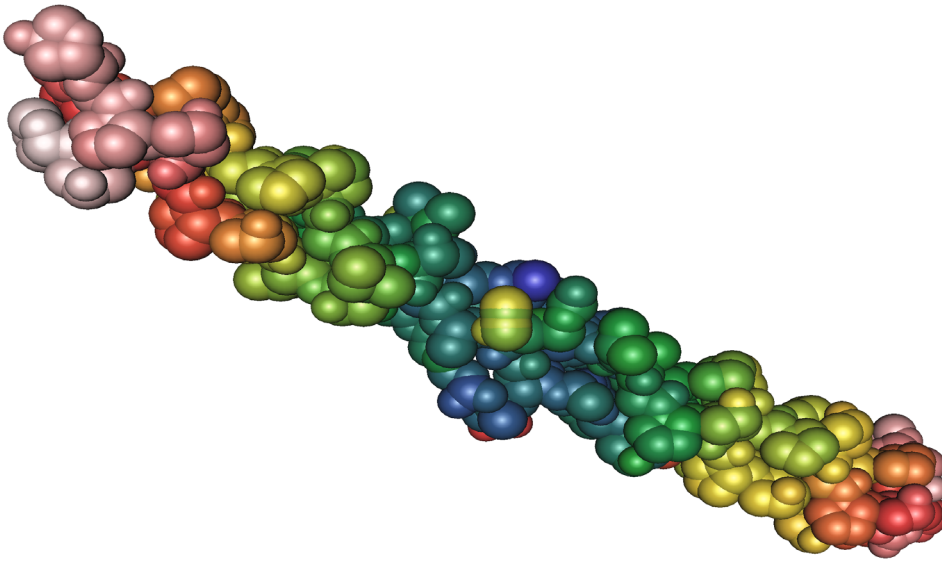


# AC Marine Collagen PF



Tightening  
**Water Soluble Extract**  
Natural Structural  
**Youthful appearance**  
Stabilizing Protein

## BACKGROUND

Between public figures, doctors, friends and family, collagen has become the topic of daily conversation. The idea of improving the skin and lips natural collagen structure or even introducing new collagen through invasive injections is fast become the normal in the anti-aging community. No more, **AC Marine Collagen PF** consists of fish derived soluble collagen that offers both excellent hydrating properties and film forming benefits in a safe, reliable manner. Collagen used in this raw is sourced entirely through sustainable green methods and is a byproduct of the fishing industry that would otherwise be considered a waste product.

While collagen is largely used aesthetically in cosmetic surgery, it has many other functional applications. This essential protein comprises one of the strongest components of the cells structural system. As the most abundant protein in the body, constituting an astounding ~25% of total protein content, it would be foolish to ignore when talking about tissue health. Collagen is integral to the composition of cartilage, ligaments, tendons, bone and teeth, while it additionally provides tensile strength to various body tissues such as the skin, where it determines strength and elasticity.

## SCIENCE

Collagen is created by fibroblasts, specialized cells found in the dermal layer of the skin. Fibroblasts are responsible for the production of collagen, elastin, and fibronectin that act as the structural support beams within the skin. Fibroblasts synthesize collagen within the cell and release it through exocytosis, a process by which molecules diffuse through the cell membrane.

**Code Number:** 20739  
**INCI Name:** Soluble Collagen  
**INCI Status:** Conforms  
**REACH Status:** Complies  
**CAS Number:** 9015-54-7  
**EINCS Number:** 310-296-6

**Origin:** Animal  
**Processing:**  
 GMO Free  
 No Ethoxylation  
 No Irradiation  
 No Sulphonation

**Additives:**  
 Preservatives: None  
 Antioxidants: None  
 Other additives: None

**Solvents Used:** Water  
**Appearance:** Hazy Viscous Liquid  
**Soluble/ Miscible:** Water Soluble  
 100% Biodegradability  
**Microbial Count:** <100 opg,  
 No Pathogens

**Suggested Use Levels:** 1.0 - 10.0%  
**Suggested Applications:** Hydration,  
 Conditioning

## Benefits of AC Marine Collagen PF

- Structural Benefits
- Versatile in Formulations
- Tightening Capabilities

# AC Marine Collagen PF

Once outside the cell, the collagen molecules will self-assemble, creating the same structures found in skin. This extracellular matrix is run on a negative feedback loop, or multiple processes controlling one another. As collagen degradation occurs, byproducts/building blocks of collagen begin to accumulate. These byproducts bind to fibroblasts and essentially indicate that collagen is decreasing, and we need new collagen, thus stimulating production. This new collagen production, decrease in byproducts leads to lower collagen production and the process comes full circle.

## BENEFITS

Collagen synthesis is a process that slows down as we age. When collagen production fades and its support abilities decline, the skin becomes loose and saggy, causing wrinkles. By restoring some of the collagen content in the skin, the appearance of wrinkles is decreased and skin has a smoother, tighter look and feel. **AC Marine Collagen PF** may be used to restore one's youthful appearance by hydrating the skin and helping to increase its natural collagen production. Since it is easily incorporated into the water phase, this product may be used in a wide variety of personal care formulas. In addition to its benefits with restoring moisture in the skin and scalp, marine collagen is capitalizing on what is arguably the most profound trend in cosmetics in the last decade. Collagen, particularly sourced from fish has been a heavily researched and documented material for increasing collagen synthesis in addition to having the other benefits of traditional topical collagen treatments.

## EFFICACY DATA

As shown in figure 1, improvements in skin hydration were observed following a 2 week study where subjects applied 5% **AC Marine Collagen PF** in an o/w emulsion to randomized 2cm<sup>2</sup> sites on their volar forearms twice daily. The 10 (m/f) volunteers also applied the blank o/w emulsion to an additional test site for added perspective. Changes in hydration were measured using a DPM 9003 Novameter NOVA Technologies. On average after 2 weeks, 3% **AC Marine Collagen PF** improved skin hydration by 12% when compared to baseline hydration values and by 8% when compared to the test vehicle (o/w emulsion). These findings support the use of **AC Marine Collagen PF** in personal care applications designed to enhance hydration levels for both skin and scalp care.

### Improvements in Hydration

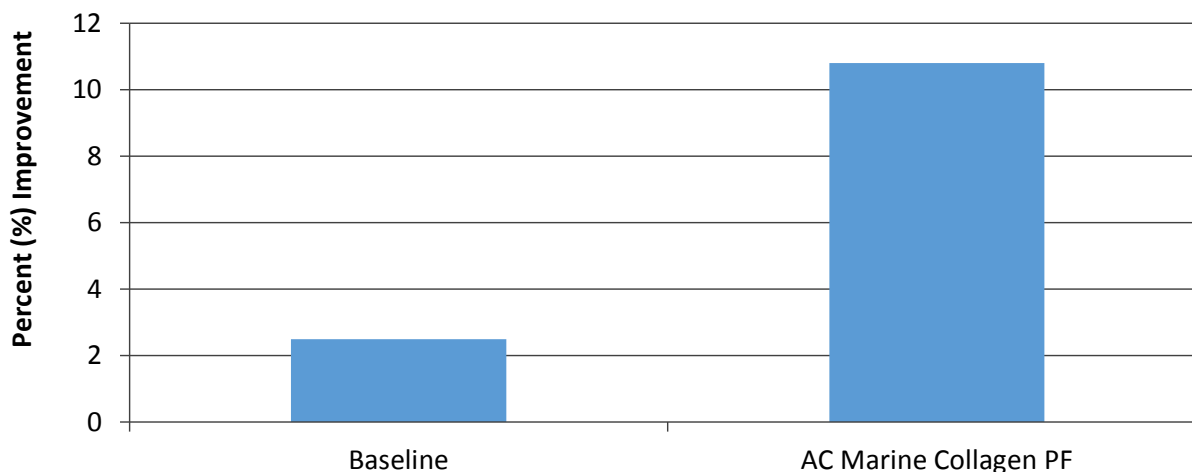


Figure 1. Percent improvement in hydration following application of AC Marine Collagen.

# AC Marine Collagen PF

## ORAC Assay

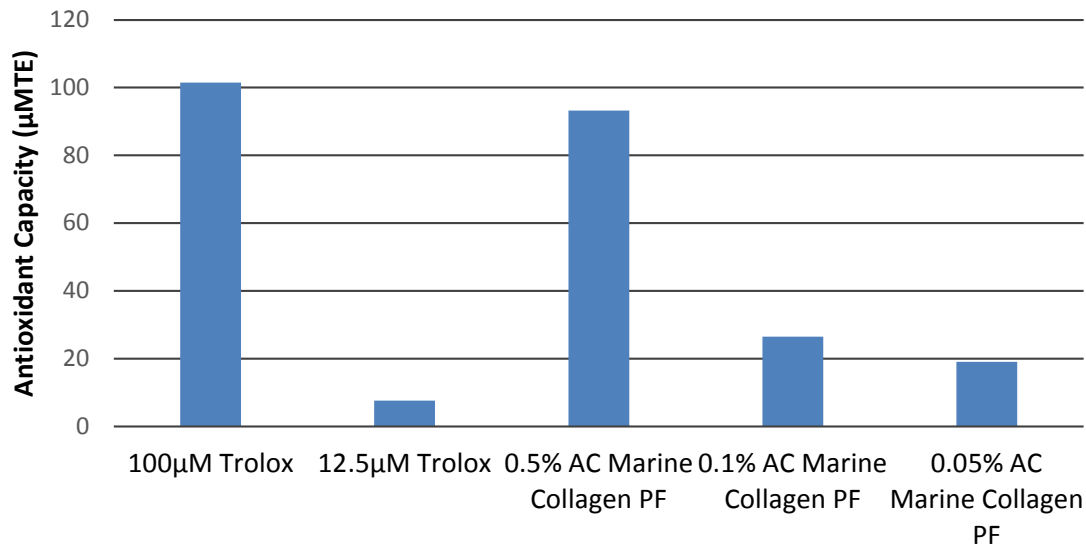


Figure 2. Antioxidant capacities

As shown in figure 2, **AC Marine Collagen PF** exhibited antioxidant activity comparable to 100µM Trolox®. The antioxidant capacity of **AC Marine Collagen PF** increased as the concentration increased, as a result we can assure that its ability to minimize oxidative stress is dose dependent. **AC Marine Collagen PF** was designed to provide hydrating and conditioning properties. With the present study we can confirm that this unique ingredient is not only capable of providing functional benefits but it is also capable of providing potent antioxidant benefits when added to cosmetic applications.

## Moisturization Assay

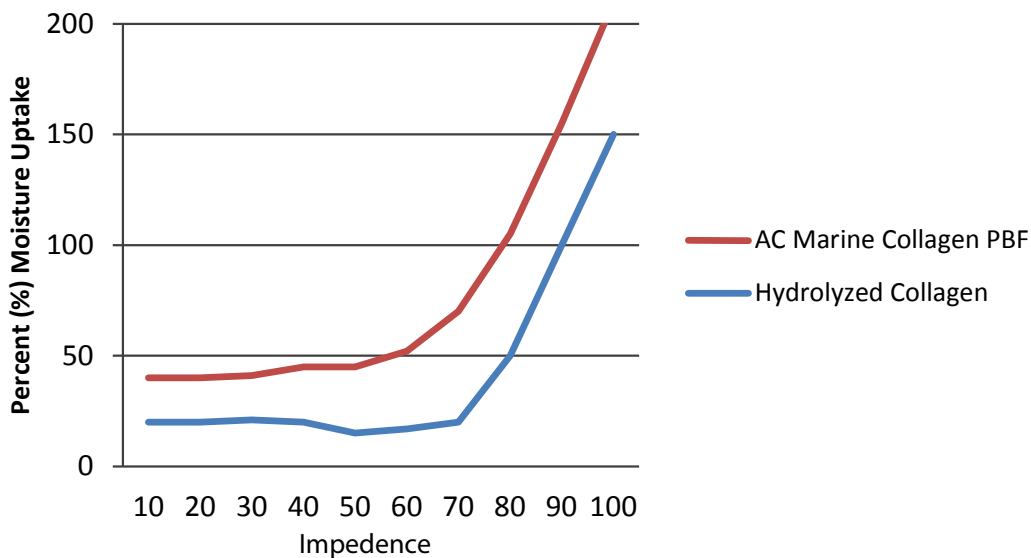


Figure 3. Percent increase in moisturization following application of AC Marine Collagen PF

The results indicate that **AC Marine Collagen PF** is capable of increasing stratum corneum moisturization values after 1 hour. AC Marine Collagen PF may be added to anhydrous systems to effectively increase epidermal moisture.

# AC Marine Collagen PF

As shown in figure 4, **AC Marine Collagen PF** exhibited positive collagen synthesis activity. The increase in collagen production may lead to improvement in the dermal-epidermal junction integrity as well as an improved scaffolding matrix. For these reasons, we can assume **AC Marine Collagen PF** is suitable for cosmetic applications designed to boost collagen synthesis to aid in providing a younger and healthier complexion.

## Sirius Red Fast Green Assay

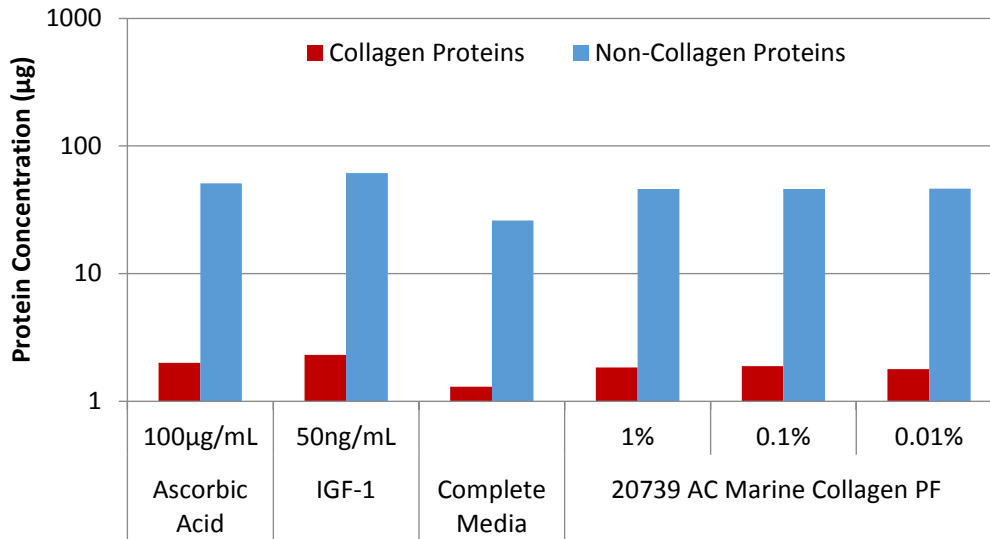


Figure 4. Collagen and non-collagen protein concentrations

## Sirius Red Fast Green Assay

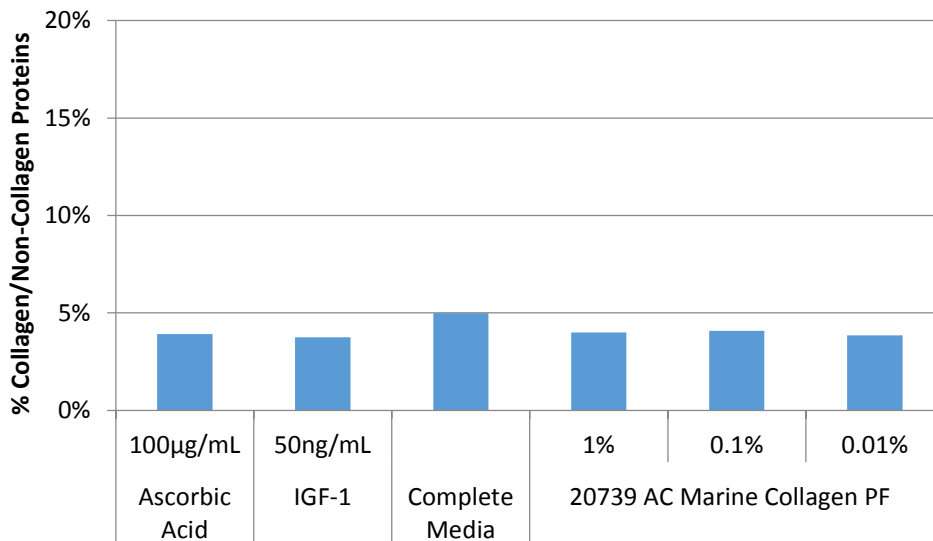


Figure 5. Percent collagen compared to non-collagen proteins

# AC Marine Collagen PF

While **AC Marine Collagen** is typically thought of as a skin care ingredient, it has utility as a hair product as well. As seen in Figure 6, in comparison to the control, the shampoo that contained 5.0% **AC Marine Collagen PF** increased the sensorial perception of wet combing ease by 90.0%, whereas the control was rated as only improving combability by 20.0% for wet hair. When assessing dry hair combability, participants rated the control as increasing combability by 40.0% and the test material as increasing dry combability by 50.0%. Results indicate that this unique ingredient improves wet and dry combability. Therefore it is useful for preventing damage and breakage which typically results from excessive combing forces during styling.

## Improvements in Combability

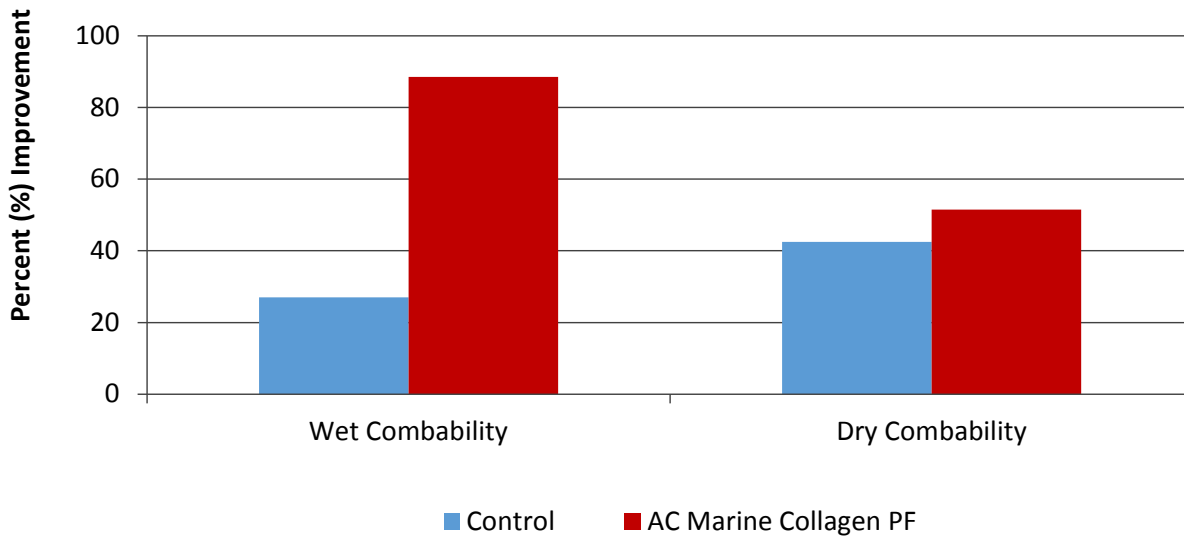


Figure 6. Percent change in Combability

References:

- 1) Alberts et. al. Essential Cell Biology: An Introduction to the Molecular Biology of the Skin. 1998: Garland Publishing, New York.
- 2) Orgel, J. P. et al.(2006). "Microfibrillar structure of type I collagen in situ". PNAS 103 (24): 9001–9005
- 3) Traub, W.; Yonath, A.; Segal, D. M. (1969). "On the molecular structure of collagen". Nature Magazine 221 (5184): 914–917.