

# AC Rice Curl Complex PF



**Curl Retention Complex**  
 rice amino acids, Anti-Aging Hair  
 tomato Bioferment  
 SCD-1 Enzyme, lactobacillus  
 intense Hydration, sustainable

## BACKGROUND

Curly hair is unique. In terms of structure, it contains a higher degree of disulfide bridges than straight or wavy hair. Research indicates that hair is more susceptible to breakage as the individual fibers overlap or wrap around the teeth of either a comb or a brush when styling. Given the nature of curly hair, it is more prone to damage and breakage. When hair fibers are damaged, the cuticle lifts and the hair becomes dry, brittle, dull, and difficult to manage. It also tangles easily.

## SCIENCE

**AC Rice Curl Complex PF** is designed to deliver protection and optimize the integrity of the hair while enhancing curl retention. It contains a unique blend of rice amino acids, stearoyl CoA-desaturase (SCD-1), tomato bioferment and keratin amino acids. All of which work synergistically to improve and protect the hair. The rice amino acids help condition and hydrate the hair to enhance its integrity and reduce moisture loss. Rice is a staple grain in many cultures and is considered to be highly nutritious. Including rice ingredients in cosmetic applications garners exceptional marketing appeal amongst consumers. Flexibility is an important characteristic for curly hair. SCD-1 is an enzyme that converts saturated fatty acids on the hair to unsaturated fatty acids. This conversion changes the melting point of the fatty acids on the hair to improve the hair's flexibility and enhance curl retention. SCD-1 will also help improve texture.

Our hair consists of 3 different layers, the cuticle, cortex and medulla. The cuticle is the outermost layer. It is similar to shingles on a roof that overlap each other to both protect and water proof the hair. The next layer, the cortex contains keratin filaments wrapped in helical structures similar to telephone cords that are then intertwined into bundles. The cortex is the layer that gives hair its strength and elasticity. The individual keratin amino acids that make up the cortex are held together by 3 different types of bonds, hydrogen bonds, salt bonds and disulfide bonds. Hydrogen bonds are weak physical bonds that can easily be broken with water or heat. These bonds typically re-form once the hair dries or cools. Salt bonds are also weak and easily break when hair is treated with slightly alkaline or acidic solutions that alter the pH of the hair.

**Code Number: 20650PF**

**INCI Name:** Water & Lactobacillus/ Tomato Fruit Ferment Extract & Oryza Sativa (Rice) Extract & Keratin Amino Acids & Acyl Coenzyme A Desaturase  
**INCI Status:** Conforms  
**REACH Status:** Compliant  
**CAS Number:** 7732-18-5 & 90131-63-8 & 68553-81-1 & 65072-01-7 & 85-61-0  
**EINCS Number:** 231-791-2 & 290-375-9 & N/A & N/A & 201-619-0

**Origin:** Botanical

**Processing:**

- GMO Free
- No Ethoxylation
- No Irradiation
- No Sulphonation

**Additives:**

- Preservatives: None
- Antioxidants: None
- Other additives: None

**Solvents Used:** N/A

**Appearance:** Slightly Hazy to Hazy Liquid

**Soluble/ Miscible:** Water

**Ecological Information:**  
 100% Biodegradability

**Microbial Count:**

< 100 opg, No Pathogens

**Suggested Use Levels:** 1.0 – 10.0%

**Suggested Applications:** Curl Retention, Conditioning, Anti-Aging

**Benefits of AC Rice Curl Complex PF:**

- Curl Retention Properties
- Anti-Aging Hair Care
- Enhance the appearance of curly hair
- Hydration

# AC Rice Curl Complex PF

These bonds also typically re-form once the pH of the hair is normalized. In addition to hydrating hair, the rice amino acids in **AC Rice Curl Complex PF** help stabilize both the hydrogen and salt bonds to help strengthen the hair and maintain curl.

The last type of bond is much stronger than both hydrogen and salt bonds. Cysteine is a key amino acid in keratin filaments. Each cysteine amino acid contains a sulfhydryl group that links together with a sulfhydryl group in an adjacent cysteine to form disulfide bonds and create a molecule referred to as cystine. Disulfide bonds give hair its shape. In order to permanently straighten or curl the hair, these bonds need to be chemically broken. The hair is then manipulated (either straightened or curled) and is then chemically treated again to re-form the disulfide bonds. The oxidation of sulfhydryl groups in cysteine damages the hair and weakens the individual fibers. As naturally curly hair becomes damaged, it loses its curl as the disulfide bonds break and the helical structure of keratin unfurls. Protecting the integrity of the disulfide bonds is perhaps the best way to strengthen the hair.

The tomato bioferment that is added to our **AC Rice Curl Complex PF** contains a unique bi-enzyme complex that converts serine in the tomato to cysteine in situ. This can help repair oxidized sulfhydryl groups. Restoring the disulfide bonds in damaged curly hair strengthens it and improve its structure to ultimately improve curl. The bi-enzyme complex is also useful in styling aids for individuals that either curl their hair with a curling iron or get a perm. Increasing the strength of the hair and repairing the disulfide bonds cannot only help repair damage caused by curling irons, but also enhances retention of the newly formed curls. After all the stronger the disulfide bonds, the more capable the hair is of maintaining its shape. The tomato bioferment can also help strengthen the newly re-aligned disulfide bonds that are created when perming. Another benefit of using tomato derived ingredients is that tomatoes contain lycopene, an antioxidant that can further protect the hair from oxidative stress. The last ingredient in our **AC Rice Curl Complex PF** is a blend of keratin amino acids, which acts as a humectant to further hydrate the hair and help it appear smooth and polished.

## EFFICACY

A curl retention study was performed using **AC Rice Curl Complex PF**. Clean, virgin brown tresses were treated with 5% **AC Rice Curl Complex PF** in an aqueous solution. Other hair swatches were treated with water as the control. All hair swatches were then dried under ambient conditions. After combing 10 times, each swatch was then curled using a curling iron. The length of each hair swatch was then measured over a period of 18 hours. The results indicate that after 18 hours, the hair swatches treated with **AC Rice Curl Complex PF** had a 12% improvement in curl retention compared to the control. Clearly this indicates that **AC Rice Curl Complex PF** can be added to hair care applications to enhance curl retention, it can also be used to help condition, hydrate and protect curly hair.

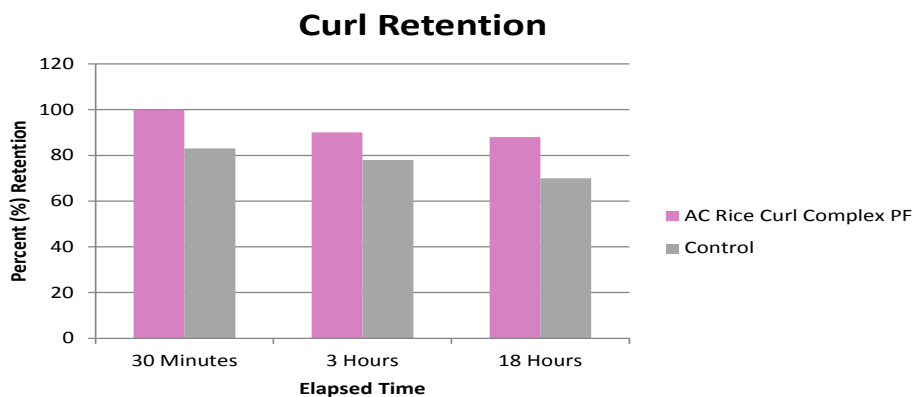


Figure 1. Comparison of curl retention properties.