



How Do Hair Bond Repair Treatments Work?

Recently a category of hair care products has emerged in the market claiming for hair bond repair. It also claims for bond-building, hair repair, restructuring and reconstruction. How do hair bond repair treatments work?

First, we should know hair structure. Hair is composed of proteins mainly. It is divided into three layers: the cuticle, the cortex and the medulla. The cuticle is the outermost layer. It prevents water evaporation, protects the inner layers from damage and gives your hair shine. The medulla is the innermost layer. It is made up of a spongy, soft tissue which gives the hair strength and elasticity. The cortex provides the bulk of the hair mass and gives hair tensile strength. In between layers, there is a lipid rich cell membrane complex (CMC) that acts as glue for hair layers. There are two important types of protein structures in the hair cortex called intermediate filaments and matrix proteins. Intermediate filaments are made from keratins built from pairs of proteins. They are tightly wrapped around each other which is called alpha-helical structure. Matrix proteins are packed between intermediate filaments, also known as keratin associated proteins. These proteins are highly cross-linked with others and with the intermediate filaments.

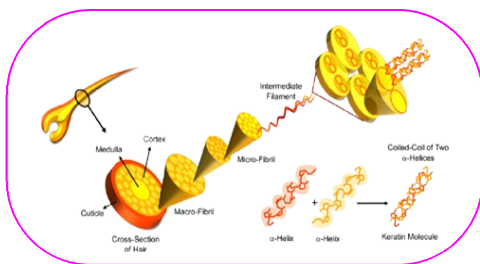


Figure 1: Structure of hair²

The cross-linked bonds formed by keratin proteins, also known as hair bonds. There are three different types of hair bonds: hydrogen bonds, ionic bonds and disulfide bonds, depending on the side chains of amino acids in keratin protein as shown in figure 2.

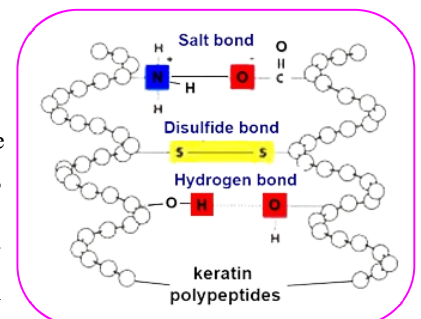
Figure 2: Types of hair bonds³

Hydrogen bonds help to provide strength and smoothness to the hair. They can break easily by exposure to heat or water including daily wash and heat styling. This damage shows up as visible hair breakage, split ends and frizz.

Ionic bonds or Salt bonds help make hair manageable. They can break easily by the changes of pH levels which can be attributed to the external factors such as using hair products. An internal factor is, for example, the alteration of your diet.

Disulfide bonds are the cross link between pairs of cysteine residues on adjacent peptide chains. They also help matrix proteins attach to intermediate filament proteins. Disulfide bonds are the strongest hair bonds and the most resistant to breakage. Typically, disulfide bonds only break when exposed to strong chemicals such as hair straighteners, perm and bleach.

So, the bond repair treatments must contain active which can penetrate to the hair and improve or restore the internal structure of hair and hair bonds. They can improve hair mechanical properties such as increase strength or have repair benefits.



Standard for Pathogenic Microorganisms in Foods (Finale)



Food Product	Type of Pathogenic	Requirement
29. Processed Gelatin and Jelly Desserts		
(29.1) Processed Gelatin and Jelly Desserts, not in dried form	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 100 CFU/g
(29.2) Processed Gelatin and Jelly Desserts, not in dried form other than listed in (29.1)	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i>	not detected in 25 g not more than 100 CFU/g
30. Bread		
	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 100 CFU/g not more than 100 CFU/g
31. Husked Rice Flour		
	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i>	not detected in 25 g not more than 100 CFU/g not more than 1,000 CFU/g
32. Some Meat Products such as meat balls, sausages, fermented pork, moo-yor (Vietnamese pork sausages), Chinese sausages, and products which are made by the same process and packed in containers ready for sale.		
(32.1) Some Meat Products, ready to eat such as fried meat balls and fried moo-yor (Vietnamese pork sausages), etc.	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 100 CFU/g not more than 100 CFU/g
(32.2) Some Chilled Meat Products		
(32.3) Some Frozen Meat Products	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 50 CFU/g not more than 50 CFU/g not more than 50 CFU/g
33. Chewing Gum and Candy		
	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i>	not detected in 25 g not more than 100 CFU/g
34. Ready-to-Eat foods⁽⁶⁾		
(34.1) Desserts and Thai desserts such as Thai custard cake (Maw kaeng), Golden drop, Steamed layer cake, Steamed Rice Flour (Kanom kee nu), Boiled Banana in coconut milk, etc.	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 100 CFU/g not more than 100 CFU/g
(34.2) Pickled or preserved vegetable and fruit		
(34.3) Bakery product with filling or without filling which $a_w \leq 0.85^{(6)}$	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 10 CFU/g not more than 100 CFU/g not more than 100 CFU/g
(34.4) Curry and rice, Noodle, Surimi, Imitation crab stick, Seasoned squid, Sushi, Sandwich, Salad, Papaya salad (Som tam), Yum salad, Slice grilled pork salad, Ground pork salad and products which are made by the same process ⁽⁶⁾ :		
1) Ready to eat or chilled	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 500 CFU/g not more than 100 CFU/g
2) Frozen	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 50 CFU/g not more than 50 CFU/g not more than 50 CFU/g

Standard for Pathogenic Microorganisms in Foods (Finale)



Food Product	Type of Pathogenic	Requirement
(34.5) Chilled and frozen ready to cook food that preheat before consume such as pizza, dumpling, stem bun, etc. ⁽⁶⁾		
1) Chilled	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 500 CFU/g not more than 100 CFU/g
2) Frozen	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 50 CFU/g not more than 50 CFU/g not more than 50 CFU/g
(34.6) Food with water activity (aW) < 0.85 such as crispy food, fried food, chili pasted, dried shredded pork, crispy pork, bakery product, cookie, cracker, biscuit, etc.	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 10 CFU/g not more than 100 CFU/g; except food contain spice or cereal or nut shall not be more than 1,000 CFU/g not more than 100 CFU/g; except food contain spice or cereal or nut shall not be more than 1,000 CFU/g
(34.7) Prepackaged cutting and trimming fresh fruits and vegetables	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 500 CFU/g not more than 100 CFU/g
(34.8) fresh and raw seafood in prepackaged food such as fish, shrimp, squid, clams, sasimi, etc. ⁽⁶⁾	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 100 CFU/g not more than 100 CFU/g
35. Prepackaged fermented food made from animal products (Ferment Food produced by yeast, mold, lactic acid bacteria, etc.) such as shrimped paste, fermented fish, pickled fish, fish sauce southern style (Budu), pickled pork (Naem) including animal products pickled with vinegar salt, etc.⁽⁷⁾	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 1,000 CFU/g not more than 1,000 CFU/g
36. Fresh noodle		
(36.1) Rice noodles	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 100 CFU/g not more than 100 CFU/g
(36.2) Noodles, Egg noodles, Giam-il, Japanese noodles (Udon), Wonton wrapper and products which are made by the same process	1. <i>Salmonella</i> spp. 2. <i>Staphylococcus aureus</i> 3. <i>Bacillus cereus</i> 4. <i>Clostridium perfringens</i>	not detected in 25 g not more than 100 CFU/g not more than 1,000 CFU/g not more than 1,000 CFU/g

Remark:

- (1) Food products under 9 (9.1) 1) as Aloe vera beverages shall determine only *Salmonella* spp., *Staphylococcus aureus* and *Bacillus cereus*.
- (2) Food products under 9 shall also determine *Listeria monocytogenes* only in Ready-to-drink products which have pH \geq 4.3 and are passed through the heat treatment process by Pasteurization which contained milk and food products under 9 (9.2) particular concentrated beverages which contained milk
- (3) Food products under 9 (9.2) as Cereal beverages shall also determine *Clostridium perfringens*
- (4) For food products other than food products which are passed through any process that cannot destroy or inhibit microbial growth by thermal treatment before or after a packing step in sealed containers which are made of metal or other rigid forms materials that can prevent transmission of air into the container and can be kept at room temperature.
- (5) Food products under 17 shall also determine *Clostridium botulinum* as food products which are passed through any process that can destroy or inhibit microbial growth by thermal treatment before or after a packing step in sealed containers which are made of metal or other rigid forms materials that can prevent transmission of air into the container and can be kept at room temperature, low acidified food (pH higher than 4.6 and water activity higher than 0.85)
- (6) Food products under 32 and 34 shall also determine *Vibrio cholera* which shall not be detected in 25 g and *Vibrio parahaemolyticus* which shall not be more than 100 CFU/g
- (7) Food products under 35 as Brine fermented and pickled fishery product shall also determine *Vibrio cholera* which shall not be detected in 25 g and *Vibrio parahaemolyticus* which shall be detected not more than 100 CFU/g

Carotenoids :

Nature's Powerful Antioxidants



Carotenoids are a diverse group of phytonutrients found in plants, algae, and bacteria, which cannot be synthesized by humans. They are responsible for the vibrant red, yellow, and orange colors seen in many fruits and vegetables. Over 600 types of carotenoids have been identified, and each possesses unique health-promoting properties. These compounds play essential roles in plant photosynthesis and offer a range of benefits when incorporated into the human diet, contributing to overall health and well-being.

Main Carotenoids	Health Benefits	Source
Colored Carotenoids		
Lycopene	<p>Prostate Health: Lycopene-rich foods are linked to a reduced risk of prostate cancer by protecting prostate cells from oxidative damage.</p> <p>Skin Protection: Acts as a natural sunscreen, helping to shield the skin from UV radiation and reduce the risk of sunburn</p> <p>Heart Health: Helps lower LDL cholesterol levels, promotes cardiovascular health by reducing plaque buildup in arteries</p>	Tomato, Watermelon, Grapefruit, Red pepper, Papaya
Beta-Carotene	<p>Vision Health: Converted into vitamin A, beta-carotene supports good vision and helps prevent night blindness.</p> <p>Immune Support: Enhances immune function contributing to overall health and well-being</p> <p>Skin Health: Protects skin cells from sun damage, maintains skin hydration and reduces signs of aging.</p>	Carrot, Sweet potato, Pumpkin, Kale, Spinach
Alpha-Carotene	<p>Cancer Prevention: Exhibits antioxidant properties that may lower the risk of certain cancers</p> <p>Eye Health: Converted into vitamin A, supports vision health and protects against eye diseases</p> <p>Anti-Aging: Reduces oxidative stress contributing to aging and age-related diseases</p>	Carrot, Sweet potato, Pumpkin, Kale, Spinach
Lutein	<p>Eye Health: Protects against age-related macular degeneration (AMD) by filtering harmful blue light and supporting retinal health</p> <p>Skin Health: Improves skin hydration and elasticity, reduces the appearance of wrinkles</p>	Spinach, Kale, Corn, Marigold
Zeaxanthin	<p>Eye Health: Essential for protecting against AMD and maintaining overall eye health by filtering harmful light</p> <p>Cognitive Function: Supports brain health and cognitive function, particularly in older adults</p>	Corn, Orange, Papaya, Mango, Red pepper
Colorless carotenoids		
Phytoene & Phytofluene	<p>Skin Protection: Protects against UV damage, improves skin texture and reduces the risk of skin disorders</p> <p>Antioxidant Support: Combats free radicals, thus reducing oxidative stress and inflammation in the body</p>	Tomato, Carrot, Citrus fruit, Watermelon

Incorporating a variety of these colorful and colorless carotenoids into your diet offers numerous health benefits. Whether you are aiming to support vision, enhance skin health, or to boost overall antioxidant protection. These nutrient-packed compounds are essential additions to a balanced diet.

References

- Clinton, Steven K. "Lycopene: Chemistry, biology, and implications for human health and disease." *Crit Rev Food Sci Nutr.* 1998. 38(1): 1-42.
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- Landrum, John T., and Richard A. Bone. "Lutein, zeaxanthin, and the macular pigment." *Arch Biochem Biophys.* 2001. 385(1): 28-40.
- Mathews-Roth, Marian M. "Carotenoids in the prevention of UV-induced skin damage." *Photochem Photobiol.* 1991. 54(6): 833-836.

EVENT

JUL-AUG 2024

1-2 Jul

Professional Beauty Delhi 2024, Pragati Maidan, New Delhi, India

2 Jul

Rahn Seminar,
Chemico Inter Corporation Co., Ltd.,
Thailand

3-5 Jul

The Wuhan International Beauty, Hairdressing,
and Cosmetics Expo in Central China 2024,
Wuhan International Convention and
Exhibition Center, Wuhan, China

16 Jul

CAHB and Mini-CAHB Makeup Seminar,
PT. Kemiko Indonesia, Jakarta, Indonesia
Momentive seminar, Chemico Vietnam Co.,
Ltd., Hanoi, Vietnam

18 Jul

CAHB and Mini-CAHB Makeup Seminar,
PT. Kemiko Indonesia, Bandung, Indonesia

23-25 Jul

Cosmoprof North America Las Vegas
<https://cosmoprofnorthamerica.com/las-vegas/>

24 Jul

Abyss Seminar, Chemico Philippines Inc.,
Philippines

24-26 Jul

in-cosmetics Korea 2024, Coex, Seoul, South
Korea
<https://www.in-cosmetics.com/korea>

31 Jul

CAHB and Mini CAHB Hair Care Seminar,
Chemico Myanmar Co., Ltd., Myanmar

31 Jul-2 Aug

INDO Beauty Expo 2024, Jakarta, Indonesia
<https://indobeautyexpo.com>



1-3 Aug

InterCare Asia 2024, Bangkok, Thailand
<https://intercare-asia.com>

2 Aug

Daito Seminar, Chemico Vietnam Co., Ltd.,
Hanoi, Vietnam

3-5 Aug

BIOFACH India 2024, Greater Noida, India
<https://biofach-india.com>

7 Aug

Food Focus Thailand 2024 Roadmap:
Bev Trend & Tech Edition, Nonthaburi, Thailand

7-9 Aug

Shanghai International Personal Care Expo 2024,
Shanghai, China
<http://www.spcexpo.com/eng/index.asp>

8-10 Aug

VietFood & Beverage + ProPack Vietnam 2024,
Ho Chi Minh City, Vietnam
<https://hcm.foodexvietnam.com/en>

15-17 Aug

Food Expo PRO 2024, Hong Kong, China
<https://www.hktdc.com/event/foodexpopro/en>

22-24 Aug

DairyTech India (Indian Dairy Expo) 2024,
Bangalore, India
<https://www.dairytechindia.in>

24-25 Aug

Beauty Expo Australia 2024, Sydney, Australia
<https://www.beautyexpoaustralia.com.au>

27 Aug

Derypol seminar, Kuala Lumpur, Chemico Asia
Pacific (M) Sdn. Bhd., Malaysia

28 Aug

Abyss & Davos Seminar,
Chemico Inter Corporation Co., Ltd., Thailand

30-31 Aug

India International Beauty Fair 2024, Mumbai,
India
<https://www.indiabeautyfair.in>



INNOSPEC Seminar, Vietnam

Innospec Inc., and Chemico Vietnam Co., Ltd., handed up for a full day seminar at Chemico Vietnam Application center, Hanoi branch with the topic “Explore Unique” on June 04th, 2024. All were about the cleansing breakthrough from Innospec related to the Sulfate-free trend. We took this chance to introduce all advanced ingredients as well as the prototypes that could provide the amazing results, developed by Chemico Vietnam Application team. After the theory part, each participant also experienced making Sulfate-free cleansing products based on Chemico Application team guidelines.



Momentive Seminar, Malaysia (Penang)

Momentive Performance Materials Inc., in collaboration with Chemico Asia Pacific (M) Sdn. Bhd., Malaysia (Penang), held a seminar entitled “Momentive Innovative Ingredients: Enhancing Skin Care, Color Cosmetics, and Sun Care Formulations” on June 12th, 2024. The seminar focused on the newly launched products from Momentive and reviewed some of the existing products based on the latest concepts and formulations which covered Color Cosmetics, Skin Care and Sun Care products.



CARGILL Seminar, Vietnam

Cargill Beauty in collaboration with Chemico Vietnam Co., Ltd., Hanoi held a big seminar at Sheraton Hanoi Hotel on June 12th, 2024 to introduce the most effective beauty solutions from nature. The topic was “Beauty made with Promises”. Each product presented in the seminar has a unique property that hopefully would help create the signature breakthrough for your products. Actigum series, “Emollient mapping”, Starch series, Floraesters K-20W Jojoba, as well as new technologies like FiberDesign Citrus, CocoaDesign were included in the content. Moreover, we also welcomed all customers to visit the showcase area where all latest trendy beauty products developed by Chemico application team were displayed.



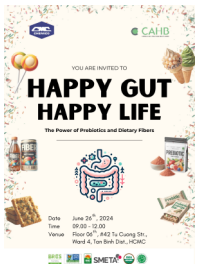
Lucas Meyer Seminar, Thailand

Lucas Meyer Cosmetics Inc., by Clariant, Denmark in collaboration with Chemico Inter Corporation Co., Ltd., Thailand organized a seminar entitled “PHYTOFLORAL[®]: Super Fruit Power for Brighter and Healthy Glowing Skin” on June 19th, 2024 at Chemico Asia Health and Beauty (CAHB) center, Thailand. The seminar provided information on Phytochemical and PHYTOFLORAL[®], clinical studies, market trends, regulations and formulations as well as tasters. The information is very useful in the development of new products in the field of dietary supplements (powder shot, jelly strip, jelly drink, shot drink) and beverage products.



Food (Mini CAHB) Seminar, Vietnam

Chemico Vietnam Co., Ltd., teamed up with Chemico Asia Health and Beauty (CAHB) Center to hold a half day seminar at Chemico Vietnam Application Center on June 26th, 2024. Inspired by the topic “HAPPY GUT, HAPPY LIFE”, the seminar provided the advanced solutions for adding fiber and prebiotics to the products. Throughout the seminar, the participant could explore the outstanding potential of prebiotics and fiber in food and health industry, the benefits of prebiotics and fiber in formulations, how to improve product quality and enhance the consumer health as well as the current market.



CAHB Seminar, Myanmar

Chemico Myanmar Co., Ltd., in collaboration with Chemico Asia Health and Beauty (CAHB) center, Bangkok, Thailand organized an interesting seminar on June 26th, 2024 at Chemico Myanmar Application center. The topic was “Exploring 2024 Global Makeup Trends and Key Ingredients.” The seminar presented about Global makeup trends 2024 and the related makeup formulations. Key ingredients of the presented formulas were also included. The theory part was followed by workshop section where the customers could do the trial of those formulations.



NuCera Seminar, Vietnam

NuCera Solutions LLC., in collaboration with Chemico Vietnam Co., Ltd., held a seminar under the topic “An Introduction to Innovative Synthetic Wax & Sustainable Plant-Based Polymers” on June 27th, 2024. The seminar was about synthetic waxes with different melting temperatures and natural waxes followed the sustainable trends for skin care and make up products. During the theory part, the participants had tried the prototypes containing different amounts of these waxes developed by Chemico Vietnam Application team. And, in the workshop part, the customers had done the trial of lipstick and cleansing balm formulations.

