

# **LifeWave's Nanotechnology Skin Care System™ Topicals: Advanced C Serum and Advanced Skin Renewal**

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This paper describes the ingredients that are in the Advanced (Vitamin) C Serum and Advanced Skin Renewal, which are the topical cosmetic components of LifeWave's Skin Care System. The purpose of this paper is to help LifeWave distributors understand the benefits of including these two cosmetic formulas along with LifeWave's Skin Care Patch to create the **Nanotechnology Skin Care System**.

## **Ingredient Standards and Research**

Every ingredient included in the LifeWave cosmetic skin care program has been selected and approved by a cosmetic chemist to ensure it has a history of safety for use in cosmetics. These skin formulas do not contain parabens, synthetic fragrances or any ingredients derived from animals and no animal testing has been done. \*\*The preservative used in these products are globally accepted as safe.

## **General statements regarding the LifeWave Nanotechnology Skin Care System™ - and the reasons why LifeWave Skin Patches were used together with the two facial formulas (the Advanced C-Serum, and the Advanced Skin Renewal facial moisturizer):**

- The LifeWave Skin Patch supports the effectiveness of the Advanced C-Serum and the Advanced Skin Renewal facial moisturizer. In support of the two topical cosmetics, the Skin Patch up-regulates cellular production, and blood levels, of Glutathione. Glutathione, the body's master antioxidant, not only supports collagen production, but it also recycles many of the body's antioxidants. Glutathione, in a sense, helps maintain skin renewal from the inside out, thus bolstering the effectiveness of the two topicals.
- The LifeWave skin care system **may provide antiageing support**, since it was designed **to provide antioxidant protection** for the skin while at the same time **supporting collagen synthesis**.
- May assist in improving skin tone and may help brighten the complexion.
- The LifeWave Advanced Skin Renewal facial moisturizer contains squalane, Caprylic/Capric Triglycerides and jojoba oil, which are **natural moisturizers** that have similar lipid compositions to the natural oils of the skin. These ingredients help lessen the appearance of fine lines and creases.
- The LifeWave Advanced Skin Renewal moisturizer contains Acetyl hexapeptide-3 a topical cosmetic peptide that may help relax facial expression lines over a period of several weeks of use. The Advanced Skin Renewal moisturizer offers a powerful non-toxic alternative to Botulinum toxin injections. Botulinum toxin injections are used to relax wrinkles, and are now one of the world's most popular cosmetic procedures. However, these expensive injections have to be repeated every few months to be effective and they are associated with significant side-effects in some individuals.

- The combinations of non-irritating and non-staining ingredients in the LifeWave **Advanced C-Serum** and the **Advanced Skin Renewal** facial moisturizer have been specially formulated to leave the skin feeling non-greasy and at the same time help give the skin a firmer, smoother and silky appearance.

**The LifeWave Nanotechnology Skin Care System™ cosmetic topicals are designed to:**

- Revitalize your face and to help reduce the visible signs of aging
- Help diminish the visible appearance of fine lines and wrinkles
- Provide antioxidant protection to the skin of the face
- Help the skin maintain hydration
- Smooth rough skin
- Restore luster and promote firmness in sagging skin

**Disclaimer:**

Statements contained herein have not been evaluated by the Food and Drug Administration (FDA). These products are not intended to diagnose, treat and cure or prevent disease.

**Directions for use:**

**For the Advanced C Serum** – dispense a drop into the palm of your hand and then use the tip of your finger to gently dab and smooth all over your face and neck area. The product is also an ideal after-shave for the skin conscious man.

Vitamin C is essential for healthy glowing skin. Research has shown that Vitamin C can reduce sunburns. Vitamin C Serum should be applied before any planned outdoor activities and then re-applied after exposure to sunlight or environmental pollutants. It is also highly recommended to apply Vitamin C Serum daily as a preventative measure to help protect the skin from environmental exposure, such as wind, cold, water or excess sun.

**For the Advanced Skin Renewal facial moisturizer** – dispense by the drop onto your fingertip and smooth gently all over your face and neck area.

The LifeWave **Advanced Skin Renewal** facial moisturizer contains the **moisturizing agents** tocopherol, glycerin, dimethicone, squalane, Caprylic/Capric Triglycerides and jojoba oil, which slow moisture loss and reduce the tendency of the skin to become dehydrated. These moisturizing agents compliment the moisturizing effect of the hyaluronic acid in the **Advanced C Serum** topical. These uniquely combined moisturizing agents are particularly important for people who live in dry climates or for people who spend time in the sun. Living at altitude magnifies dehydration and sun exposure.

**Warning statement as required by FDA**

**Warning: For external use only.** Use only as directed. Avoid contact with eyes. Keep out of reach of children. The safety of this product has not been determined. Although the ingredients in the LifeWave skin care system have been carefully chosen to be non-

irritating to the skin, however if you develop persistent itching, redness or a rash on the skin of your face you should discontinue the facial system immediately.

**The LifeWave Skin Care System™ contains emollients, antioxidants, emulsifiers and polypeptides and other gentle skin ingredients.**

**Emollients** are supple, lubricating and thickening oils and polymers that prevent water loss and have a softening and soothing effect on the skin.

**Antioxidants** are natural substances that help slow down the action of free-radicals caused by pollution, ultraviolet light, toxins and other environmental factors. Free radicals attack and damage the skin, resulting in visible signs of ageing. The LifeWave skin care system includes Vitamins C and E, green tea extract and hyaluronic acid.

**Emulsifiers** combine water and oil to form a stable emulsion (cream). LifeWave facial moisturizer includes: Sodium Stearate, Cetyl Alcohol, and Glycerol.

**The Polypeptides** in this formula help increase collagen production, while softening wrinkles and replenishing moisture.

#### **Why are polypeptides included in the LifeWave Skin Care system?**

- Proteins are long chains of amino acids. Peptides are smaller chains of amino acids that are in a specific sequence. Peptides could act as “messengers” that travel between cells signaling cells to perform various functions. Because of their molecular size proteins are too large to enter the skin, however very small peptides when packaged in the right type of topical carrier are able to penetrate the skin and initiate biological activities.
- As people age chronic stimulation of facial muscles will pull the skin inward and is part of the reason why people develop facial wrinkles (Fagien, 1999; Song, 1999). For over a decade dermatologists and plastic surgeons have used injections of Botulinum toxin to relax facial muscles and smooth wrinkles. However research scientists are now discovering that topical cosmetic formulas that contain small peptides can have significant benefits in improving facial wrinkles (Bauza et al., 2004).
- LifeWave facial moisturizer contains two important peptides along with the other ingredients that improve the condition of the skin on the face.
- The first peptide in the formula acetyl hexapeptide acts as a muscle relaxant (Lipotec pdf file, 2003), and the second peptide Palmitoyl Tripeptide 3 works to increase collagen production by mimicking the body’s own skin collagen production regulator (Pentapharm pdf file, 2005). Both of these actions are important to diminish the appearance of fine lines and wrinkles and to promote silkier smoother skin.
- **Acetyl Hexapeptide-3** is a non-toxic peptide that is now used in topical cosmetic formulas as an alternative to facial muscle paralyzing injections. This peptide when applied topically to the skin and regularly used can help relax facial muscles that intensify the appearance of wrinkles (Blanes-Mira et al., 2002). It works by

- inhibiting the stimulating effect of neurotransmitters at the neuromuscular junction, which helps relax facial muscle contractions.
- Acetyl Hexapeptide-3 in topical cosmetic formulas can reduce the depth and degree of wrinkles on the face caused by the contraction of muscles of facial expression (Lipotec pdf file, 2003). Clinical studies have confirmed that the depth of facial wrinkles can be reduced, especially in the forehead and around the eyes (Blanes-Mira et al., 2002; Duenwald, 2004).
  - **Palmitoyl Tripeptide-3** is a small peptide produced by the Pentapharm Corporation that is able to stimulate collagen production when it is applied topically. This peptide activates a protein called Tissue Growth Factor a key molecule that activates the synthesis of collagen by skin fibroblast cells (Pentapharm pdf file, 2005).
  - A placebo controlled study has shown that the topical use of Palmitoyl Tripeptide-3 can activate collagen synthesis, which helps reduce wrinkles and add smoothness and freshness to the skin (Pentapharm pdf file, 2005).

### **Why are skin collagen and skin hyaluronic acid losses associated with wrinkles?**

- Some of the characteristic signs of aging are thinning of the skin and the development of fine lines and wrinkles in the face. More advanced effects of aging include furrows at the site of facial expression lines and sagging skin folds over the eyelids. The major cause of fine lines, wrinkles and sagging skin is an increasing imbalance between the regulation of collagen production and collagen breakdown (Debacker et al., 1998). Another significant factor associated with skin aging is **loss of the ability of the skin to retain moisture**, which is associated with loss of hyaluronic acid in the skin (Ghersetich et al., 1994).
- Both intrinsic and extrinsic factors are associated with the loss of collagen and hyaluronic acid in the skin. A decline in estrogen levels occurs during menopause in women. Estrogen decline is associated with loss of collagen and hyaluronic acid in the skin (Shah et al., 2001; Kanda et al., 2005). Excessive and repeated exposure to UV radiation from the sun also disrupts the normal regulation of collagen synthesis and increases the rate degradation of both collagen and hyaluronic acid (Miyachi et al., 1998).

### **Skin and Collagen**

- Collagen is a structural protein that is responsible for the strength and integrity of the skin. Skin collagen is formed by cells located in the dermal layer of the skin called fibroblasts from a precursor molecule called procollagen. The collagen molecule itself is composed of three chains of proteins that are braided like a rope into a triple helix. The formation of healthy collagen from the protein chains of procollagen molecules requires a series of enzyme reactions that require nutritional cofactors *particularly* **vitamin C**.
- There are connective structures composed of collagen known as dermal papillae that lie in the junction where the top epidermal layer of the skin connects to the lower dermal layer. As people age collagen levels decline in the dermis and the dermal papillae become smaller and weaker (Sauermann et al., 2004). Topical use of ascorbic acid can significantly increase both the density and number of dermal

- papillae. Increasing collagen production with topical vitamin C may have a beneficial effect on skin appearance and is associated with a reduction of fine lines and wrinkles (Raschke et al., 2004).
- Vitamin C is an essential cofactor of several enzymes involved in collagen synthesis (Kivirikko et al., 1985). However vitamin C and collagen levels drop in the skin with age, sun exposure and exposure to environmental pollutants (Greenstock, 1993; Miyachi, 1995).
  - Skin collagen is constantly undergoing remodeling and rejuvenation where old damaged collagen is replaced by healthy new collagen. Age associated damage begins to occur when the process of collagen production cannot keep up with collagen degradation (breakdown). Exposure to excessive amounts of ultraviolet light or environmental toxins accelerates the rate of collagen breakdown (Sander et al., 2002; Chiu et al., 2003). Topical antioxidants, however, have been shown to be photoprotective and can help **protect against collagen breakdown** in sun exposed skin (Nachbar et al., 1994).

### **Hyaluronic acid and skin**

- Hyaluronic acid (HA) is another important structural component of the skin. Hyaluronic acid is primarily found in the extracellular matrix of the skin where it is bound to collagen molecules. One of the primary functions of hyaluronic acid is maintenance of skin hydration, since every molecule of HA can bind up to a thousand times its weight in water. Clinical studies have demonstrated that topical water based solutions of hyaluronic acid will absorb through the epidermis of the skin to the deeper dermal layer (Brown et al, 1999).
- Hyaluronic acid also has other important functions in the skin. Hyaluronic acid has both anti-inflammatory and antioxidant properties (Chen et al., 1999; Trommer et al., 2005; Campo et al., 2004). It is also involved in skin growth, wound healing and reduction in scar formation (Trabucchi et al., 2002; Weindl et al., 2004). In wound healing, hyaluronic acid helps the skin retain moisture and it helps promote nutrient movement between the bloodstream and the cells. The antioxidant properties of hyaluronic acid have also been reported to help protect the skin from photoaging due to sun exposure (Trommer et al., 2003).

### **How do topical antioxidants help provide skin protection?**

- In addition to use of topical hyaluronic acid, a significant amount of research now supports the synergistic value of using topical antioxidants such as vitamin C, vitamin E, and botanical extracts such as green tea to protect the skin from oxidative damage (Steenvoorden et al., 1997; Katiyar et al., 2003; Lin et al., 2003; Farris 2005).
- The reason that antioxidants are important as part of an antiageing skin support program is because antioxidants help protect the skin from the toxic effects of free radicals that would otherwise damage and destroy healthy skin cells (Darr et al., 1994). The antioxidant defense system in human skin consists of both enzymatic processes and a number of antioxidants produced in the skin such as hyaluronic acid and glutathione as well as nutritional compounds obtained from the diet. The

various components of the skin's antioxidant systems are regulated in an intricate manner during both intrinsic aging and photoaging processes (Rhie et al., 2001). As free radicals are neutralized by one component of the skin's antioxidant system that component becomes oxidized and inactivated. As one component becomes inactivated other components of the skin's antioxidant system interact in a complex fashion to recycle the inactive components back to an active state to restore the antioxidant capability (Chan, 1993; Beyer, 1994).

- Both water soluble and fat soluble antioxidants are naturally present in human skin. Vitamin C and glutathione are the most important water soluble antioxidants that protect the cytoplasm of the cells and along with hyaluronic acid these antioxidants also protect the extracellular matrix that surrounds the cells. Vitamin E, however, is the skin's most important fat soluble antioxidant that provides the first line of free radical defense of the lipid structures, especially cell membranes (Nachbar et al., 1995; Fuchs et al., 2003). Vitamin E has many forms, but alpha-tocopherol is the major biologically active type of vitamin E found in the skin composing up to 87% of the vitamin E content of the skin (Fuchs et al., 2003; Ekanayake-Mudiyanselage et al., 2005).
- The antioxidant activity of vitamin E protects the polyunsaturated fatty acids in cell membranes from oxidation and so protects cell membranes from destruction by free oxygen radicals. Vitamin E has specific binding sites on cell membranes especially the d-alpha tocopherol form.
- The primary functions of Vitamin E are protective. Vitamin E works in conjunction with other antioxidants. Vitamin E protects biological molecules and cell membranes from oxidative damage. When oxidative damage occurs to the membranes of cells, cells lose their ability to regulate mineral movement into and out of their interior. Since control of mineral concentrations inside of cells is critical for all cellular functions, vitamin E, and other antioxidants must be maintained at physiologic levels in the skin to ensure normal cell functions. Low vitamin E skin levels have been associated with an increased risk of developing premature skin aging.
- It is important to recognize the fact that while vitamin E is a potent antioxidant it does not work in isolation and is most effective when other antioxidants are present. Other antioxidants such as green tea extract, hyaluronic acid, glutathione, and vitamin C have synergistic antioxidant effects. One of the major failings of cosmetic formulations is the failure to recognize antioxidant synergism and the role of antioxidant cascades.
- Alpha-tocopherol along with vitamin C and glutathione protects the skin from oxidative damage that occurs by exposure to UV light from the sun as well as from chemical toxins (Mahamongkol et al., 2005). Unfortunately, skin levels of the protective antioxidants decline when the skin is exposed to oxidizing chemicals or even brief exposure to sunlight (Thiele et al., 1998; Maalouf et al., 2002).
- Exposure to ultraviolet light from the sun results in photoaging of the skin and will reduce the skin content of not only vitamin E, but also vitamin C and glutathione (Rhie et al., 2001; Morley et al., 2003). This evidence supports the need to use topical concentrations of these two important antioxidant vitamins to

replenish skin levels of these vitamins. In addition, supporting glutathione levels in the body and the skin also helps provide synergistic assistance for vitamin E and vitamin C.

- Clinical research has shown that substantial photoprotection can be obtained when both vitamins C and E are included in topical cosmetic preparations (Lin et al., 2003).
- The use of topical cosmetics that contain tocopherol and alpha-tocopherol acetate can substantially increase the vitamin E content of the skin more effectively than even dietary supplementation (Tavakkol et al., 2004). Topical applications of alpha-tocopherol acetate are also beneficial in skin conditions associated with inflammation. This ingredient provides both antioxidant protection to the skin along with a moisturizing effect (Panin et al., 2004).
- Clinical studies show that topical forms of vitamin E and vitamin C, like the type used in the LifeWave skin care system are well absorbed into the skin (Traber et al., 1998; Spiclin et al., 2003), however continuous use of topical agents is required in order to maintain the protective levels of these critical antioxidants, since oxidative stresses will constantly deplete the antioxidant levels in the skin (Krol et al., 2000; Sander et al., 2002).
- Clinical studies have shown that antioxidants work together in an intricate manner to regenerate each other. Ascorbate regenerates the oxidized form of vitamin E (Packer et al., 1979; Mukai et al., 1991) and the oxidized forms of ascorbate and vitamin E in turn are recycled by glutathione (Martensson et al., 1991; Meister, 1994). Vitamin C along with glutathione helps recycle oxidized vitamin E back to its active protective form (Chan, 1993; Winkler et al., 1994; Colven, 1996). In addition, maintaining tocopherol levels in the skin by topical formulas helps maintain the active forms of vitamin C and glutathione in the skin (Lopez-Torres et al., 1998).

### **Green tea as a topical antioxidant and antioxidant recycler**

- The reason green tea extract was included in the LifeWave skin care system is because green tea extract contains polyphenolic compounds that have significant antioxidant and anti-inflammatory activities (Katiyar et al., 1997; Ahmad et al., 2001).
- Clinical studies have shown that the antioxidant properties of green tea extracts may have photoprotective effects when they are added to topical cosmetic formulations (Elmets et al., 2001; Katiyar, 2003; Katiyar et al., 2000, 2001b).
- Topical application of green tea extract will inhibit oxidative stress in the skin caused by ultraviolet light and can significantly reduce depletion of protective antioxidant enzymes in the skin (Vayalil et al., 2003). Topical application of green tea extracts helps maintain the levels of both glutathione and glutathione recycling enzymes in the skin after exposure to ultraviolet light (Katiyar et al., 2001a).
- Other researchers have reported that topical application of alpha-tocopherol also inhibits oxidative stress in the skin caused by ultraviolet light, maintains ascorbic acid levels, maintains glutathione recycling enzymes and increases the skin level of reduced glutathione (Lopez-Torres et al., 1998; Saral et al., 2002).

*In summary, clinical studies support the idea that most promising results can be obtained when multiple antioxidant compounds are used together in topical preparations, which may result in synergism of the protective effects (Steenvoorden et al., 1997). Direct application to the skin of the face of topical cosmetic formulas that contain multiple antioxidant compounds has added advantage of targeting the antioxidants to the area of the skin needing the protection.*

### **Why are multiple antioxidants used in the LifeWave Skin Care System™?**

- It is well accepted that vitamin C (ascorbic acid) is the body's main water-soluble free-radical scavenging antioxidant (Colven et al., 1996). It is less well known that ascorbic acid plays an important role in recycling and regenerating membrane bound lipid-soluble vitamin E after it scavenges free radicals and is converted to oxidized vitamin E. The recycling effect of vitamin C on vitamin E is a non-enzymatic mechanism that is particularly important in the skin (Chan, 1993; Colven, 1996).
- **Glutathione** is another significant water-soluble antioxidant that regenerates oxidized forms of both vitamin C and vitamin E by enzyme dependent mechanisms (Chan, 1993; Winkler et al., 1994). It is apparent that maintaining functional antioxidant levels of vitamin C, vitamin E and glutathione in the skin is critically important in synergistically protecting the skin against oxidative stress and in supporting collagen synthesis. Therefore treating skin with topical antioxidants such as vitamins C and E may be beneficial in the maintenance of a younger-looking complexion.
- A combination of biological antioxidants such as glutathione, vitamin E, green tea extracts, squalane and hyaluronic acid work in concert with ascorbic acid to scavenge reactive oxygen species and thus protect the skin from oxidative damage. The use of combinations of topical antioxidant compounds to protect the skin from the damaging effects of free-radicals has been found to have greater protective effects than use of single antioxidants in high doses (Steenvoorden et al., 1997).
- The LifeWave Skin Care System™ uses a number of antioxidants including, stabilized vitamin C, green tea extract, tocopherol and a stabilized provitamin form of vitamin E called alpha-tocopherol acetate, which converted to its active form alpha-tocopherol after it is absorbed into the skin (Baschong et al., 2001; Mahamongkol et al., 2005). These antioxidants can provide significant skin protection from the damaging effects of sun exposure (Maalouf et al., 2002) and promote skin hydration (Gehring et al., 1998). *In addition, the use of LifeWave's new glutathione skin patch may help maintain the body's level of active glutathione, which not only assists with antioxidant protection, but also helps with recycling deactivated vitamin E and vitamin C back to their active forms.*

### **What are the benefits of topical sodium ascorbyl phosphate?**

- Vitamin C is one of the skin's most important antioxidants, yet vitamin C levels in the skin are rapidly depleted by exposure to ultraviolet light from the sun, external stresses such as pollution and smoking (Colven et al., 1996).

- Topical vitamin C may offer a skin regenerative effect in supporting collagen synthesis in the skin that slows down with aging as well as providing photoprotection against ultraviolet radiation (Farris, 2005). Studies have shown that topical vitamin C preparations can: improve skin appearance by reducing fine lines and wrinkles (Boyera et al., 1998); support collagen production (Boyera et al., 1998) and protect the skin against sun exposure and reduce the severity of sunburns (Hanson et al., 2003). Reducing photodamage to the skin with topical vitamin C helps enhance the appearance of the skin by reducing age spots (Takashima et al., 1971). Topical application of vitamin C also supports skin tone, skin hydration and may help brighten the complexion.
- Unfortunately, skin levels of vitamin C are difficult to maintain with use of oral formulas and most forms of vitamin C are not stable enough to be used topically (Colven et al., 1996). This is why LifeWave uses a stable Vitamin C skin serum developed by Dr. Bernd Friedlander in conjunction with a cosmetic chemist who has decades of experience.
- Sodium ascorbyl phosphate is a stable form of vitamin C invented by Hoffmann-La Roche (Roche, 2005). This form of vitamin C, which is used in LifeWave's C-serum formula is *stable in aqueous solutions* and also provides an available form of vitamin C in this pH-controlled skin formula. This form of vitamin C is not activated until it is absorbed into the skin, which is why this form of vitamin C does not oxidize in the bottle. This is because an enzyme normally found in the skin called phosphatase (Takashima et al., 1971) reacts with sodium ascorbyl phosphate after it is absorbed in the skin to release the biologically active form of ascorbic acid known as L-ascorbic acid within the skin (Spiclin et al., 2003).
- Topical preparations of vitamin C generally tend to be unstable and rapidly break down when added to cosmetic formulations resulting in a brownish discoloration. Sodium ascorbyl phosphate invented by Hoffmann-La Roche, however is a stable provitamin precursor of vitamin C that when properly formulated ensures a constant delivery of vitamin C into the skin. When sodium ascorbyl phosphate is prepared as a topical preparation with thickening agents such **xanthan gum**, it has an effective sustained release profile (Spiclin et al., 2003).
- Sodium ascorbyl phosphate has been shown to alleviate oxidative stress to the skin (Spiclin et al., 2003; Klock et al., 2005), especially when combined with **tocopheryl acetate**. These compounds are bioconvertible provitamin antioxidants that become biologically active converting to vitamins C and E, respectively, within the skin when they are applied as topical preparations (Hanson et al., 2003).
- The sodium ascorbyl phosphate used in this formula is not only an effective antioxidant that helps provide protection against free radicals that accelerate skin aging, but it may also support collagen synthesis (Saika et al., 1992; Nayama et al., 1999; Takamizawa et al., 2004). Scientific studies have shown that sodium ascorbyl phosphate promotes the **synthesis of collagen proteins** in dermal fibroblasts (Boyera et al., 1998; Hata et al., 1998).

## Ingredients in Vitamin C Serum

Deionized Water, Sodium Ascorbyl Phosphate, Hyaluronic Acid, Hydroxypropyl Methylcellulose, Camellia Sinensis Leaf(Green Tea) Extract, Allantoin, Panthenol, Caprylyl Glycol and Phenoxyethanol and Hexylene Glycol, Disodium EDTA.

### **Deionized Water**

Purified water that has had ions removed. The deionization process also removes contaminants such as nitrates and heavy metals.

### **Sodium Ascorbyl Phosphate**

Sodium ascorbyl phosphate is a stable form of vitamin C invented by Hoffmann-La Roche. This form of vitamin C when mixed in the proper ratio in topical formulas is non-irritating to the skin. It is a powerful antioxidant that helps prevent free radical damage to the skin. Topical use of this compound helps replenish vitamin C levels in the skin. Although this is a form of vitamin C cosmetic labeling regulations prohibit the use of the word vitamin on cosmetic product labels.

### **Hyaluronic Acid**

Healthy skin contains a significant amount of hyaluronic acid, which is nature's best moisturizer. Sodium hyaluronate is included in the C-serum formula to assist the skin in staying well hydrated.

### **Hydroxypropyl Methylcellulose**

Cellulose esters derived from plant fibers are used in skin care products for their thickening and lubricating properties to give the skin formulations a silky feel. Hydroxypropyl methylcellulose is a polymer. It is a surfactant-free stabilizing emulsifier that prevents the coalescence of oil drops and separation of ingredients.

### **Camellia Sinensis Leaf (Green Tea) Extract**

Green tea extract has both antioxidant and anti-inflammatory effects, which helps protect the skin from the damaging action of ultraviolet rays.

### **Allantoin**

Allantoin is a non-irritating extract of the comfrey plant and is used in the LifeWave facial system to sooth and soften the skin.

### **Panthenol**

Panthenol also known as Vitamin B5 is a revitalizing moisturizer that works as a humectant to hold water in the skin.

### **Caprylyl Glycol and Phenoxyethanol and Hexylene Glycol**

These clear liquid ingredients are paraben- and formaldehyde- free broad-spectrum preservatives that are globally approved in USA, EU and Japan. They are approved as suitable for leave-on skin care products.

### **Disodium EDTA**

Disodium EDTA is a chelating agent that removes mineral ions from solution. It is used as a preservative and a stabilizer in cosmetic products.

## **Ingredients in LifeWave's Facial Moisturizer**

Deionized Water, Acetyl Hexapeptide-3, Cetearyl Alcohol and Cetearth-20, Glycerin, Cetyl Ester, Caprylic/Capric Triglycerides, Palmitoyl Tripeptide-3, Squalane, Simmondsia Chinensis (Jojoba) Seed Oil, Dimethicone, Steareth-2, Camellia Sinensis Leaf(Green Tea) Extract, Sodium Ascorbyl Phosphate, Allantoin, Tocopherol, Tocopheryl Acetate, Xanthan Gum, Panthenol, Disodium EDTA, Caprylyl Glycol and Phenoxyethanol and Hexylene Glycol.

### **Deionized Water**

Purified water that has had ions removed. The deionization process also removes contaminants such as nitrates and heavy metals.

### **Acetyl Hexapeptide-3**

Acetyl Hexapeptide-3 is a non-toxic peptide that is now used in topical cosmetic formulas as an alternative to facial muscle paralyzing injections. This peptide when applied topically to the skin and regularly used can help relax facial muscles that intensify the appearance of wrinkles.

### **Cetearyl Alcohol**

Cetearyl alcohol is an emulsifying and lubricating wax that is derived from naturally occurring fatty acids in coconut oil and palm kernel oil. It is used in the LifeWave facial moisturizer to form an occlusive film to keep skin moisture from evaporating.

### **Cetearth-20**

Cetearth-20 is derived from vegetable sources. It is an emulsifier, stabilizer and a thickening agent.

### **Glycerin**

Glycerin is a natural emollient, lubricant and humectant derived from vegetable oils. It helps lock moisture in the skin to prevent dryness. Glycerin has been used in cosmetic formulations for thousands of years.

### **Cetyl Ester**

An esterified fatty acid that acts as an emollient, lubricant and a humectant that is produced from palm oil or coconut oil. This compound is used in hundreds of cosmetic formulas. It was originally isolated from whale oil, but is now obtained from vegetable oils.

### **Caprylic/Capric Triglycerides**

These compounds are natural emollients derived from coconut oil. These lipid compounds are well tolerated by a broad range of skin types, from sensitive to extremely dry skin. Because substances are very similar to sebum, they have excellent skin penetration. In humans the lipid content of sebum consists of about 41% triglycerides, 25% wax monoesters, 16% free fatty acids and 12% squalene (Cheng at al., 2004).

**Palmitoyl Tripeptide-3**

Palmitoyl Tripeptide-3 is a small peptide produced by the Pentapharm Corporation that is able to stimulate collagen production when it is applied topically.

**Squalane**

Squalane is an organic product derived from olive oil. It is used in skin care preparations because it is a natural emollient that has bactericidal properties. Squalane chemically resembles the natural skin lipid called sebum, making squalane a highly effective allergy-free gentle skin conditioner and lubricant. Because squalane is well absorbed into the skin it helps support the skin's ability to naturally regenerate and maintain hydration. Its ability to penetrate into the skin also helps carry other ingredients in the LifeWave facial moisturizer into deeper skin levels. Squalane along with ascorbyl phosphate, vitamin E, hyaluronic acid helps protect the skin against photoaging and the formation of brown age spots. Along with the other ingredients it helps soften the skin to reduce fine lines and wrinkles.

**Simmondsia Chinensis (Jojoba) Seed Oil**

Jojoba seed oil is a natural moisturizer and humectant cold pressed from the seeds of a desert shrub known as the jojoba tree. It helps create a protective moisture retaining film over the skin. It is a very stable antibacterial oil that does not oxidize and go rancid. It has been used for hundreds of years by Native Americans as a skin conditioner. It is chemically very similar to sperm whale oil and is a natural substitute in cosmetic preparations. It is used not only because of its stability in LifeWave's facial moisturizer, but because it is very similar to human sebum. Sebum is a natural protective oil secreted by the skin to keep it smooth, soft and supple. Because sebum production in the skin declines with age jojoba oil can act as a protective skin conditioner that softens the skin and promotes skin hydration.

**Dimethicone**

Dimethicone is an oil derived from silica. It is used in the LifeWave facial system as a skin protectant, emollient, and moisture sealant to help provide a silky feeling to the skin. Dimethicone slows down moisture loss and helps smooth and soften fine lines.

**Steareth-2**

Steareth-2 is a stearic acid derivative derived from plant sources that is used as a thickener and an emulsifier.

**Sodium Ascorbyl Phosphate**

Sodium ascorbyl phosphate is a stable form of vitamin C invented by Hoffmann-La Roche. This form of vitamin C when mixed in the proper ratio in topical formulas is non-irritating to the skin. It is a powerful antioxidant that helps prevent free radical damage to the skin. Topical use of this compound helps replenish vitamin C levels in the skin. Although this is a form of vitamin C cosmetic labeling regulations prohibit the use of the word vitamin on cosmetic product labels.

**Allantoin**

Allantoin is an anti-inflammatory plant extract from comfrey roots that is used in face creams as a moisturizer.

### **Tocopherol and Tocopheryl Acetate**

These plant derived vitamin E ingredients in the moisturizing formula possess antioxidant properties, which in combination with Vitamin C help protect the skin from photoaging and promote cell renewal, skin moisture and skin elasticity.

### **Xanthan Gum**

Xanthan Gum is a type of vegetable gum that is as a natural stabilizer, thickener, texturizer, binder and emulsifier. It is a long chain polysaccharide that is composed of the sugars glucose, mannose, and glucuronic acid.

### **Panthenol**

Panthenol also known as Vitamin B5 is a revitalizing moisturizer that works as a humectant to hold water in the skin.

### **Disodium EDTA**

Disodium EDTA is a chelating agent that removes mineral ions from solution. It is used as a preservative, viscosity adjuster and a stabilizer in cosmetic products. It functions to prevent ingredients from binding to trace metals. There are no known adverse effects from using this ingredient in cosmetic products.

### **Caprylyl Glycol and Phenoxyethanol and Hexylene Glycol.**

These clear liquid ingredients are paraben- and formaldehyde- free broad- spectrum preservatives that are globally approved in USA, EU and Japan. They are approved as suitable for leave-on skin care products.

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