SALVONA
Unique&Easy Micro-Encapsulation Solutions

SalSphere® Aqua Skin

A technology for natural skin hydration

SalSphere® Aqua Skin is based on natural ingredients that activate cellular channels, particularly Aquaporin-3 (AQP3), to improve skin conditions.

Aquaporin-3 (AQP3) is a membrane protein predominantly found in the basal layer of epidermal keratinocytes. It functions as a channel facilitating the transport of water, glycerol, and urea across cell membranes, playing a crucial role in maintaining skin hydration and overall health.

SalSphere® Aqua Skin is a unique sun-micron sphere technology designed to deliver a moisturizing sensation to the skin while activating water flow toward dry skin through an AQP3 mechanism.

The sub-micron spheres are made of a lipid core that entraps multiple functional ingredients (Fig 1), such as Urea and Caffeine. The shell of the sphere contains Seaweed and a complex of Hyaluronic Acids.

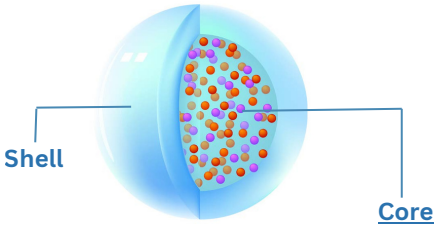


Fig 1: Illustration of SalSphere® Aqua Skin

Encapsulating urea and Caffeine is necessary because both are solubilized in water. Thus, their ability to penetrate the skin is minimal.
Urea is highly soluble in water, with solubility reaching approximately 108 grams per 100 milliliters at 20°C. Caffeine's solubility at room temperature (25°C) is about 2.17 grams per 100 milliliters.
SalSphere® Aqua Skin is designed to enhance the bio-availability of urea and caffeine at the deeper layers of skin as the lipid spheres SalSphere® Aqua Skin can reach.



Fig 2. SalSphere® Aqua Skin PID#: 8414-16 white slurry.

The benefit of activating AQP3 in the Skin:

1. Enhanced. Skin Hydration: Aquaporins facilitate water transport between skin cells, maintaining optimal moisture levels.
2. Strengthened Skin Barrier Function: A well-hydrated epidermis, supported by active aquaporins, enhances the skin's barrier function. This fortified barrier effectively protects against environmental stressors, irritants, and pathogens, reducing the risk of skin conditions like dryness and irritation.
3. Accelerated Wound Healing: AQP3 is associated with improved wound healing processes, aiding in faster recovery from skin injuries.
4. Improved Skin Elasticity: By regulating the flow of water and glycerol. Activation of these channels can lead to firmer, more resilient skin, thereby reducing the appearance of fine lines and wrinkles.
5. Proper hydration facilitated by aquaporins supports overall skin health and may delay signs of aging.

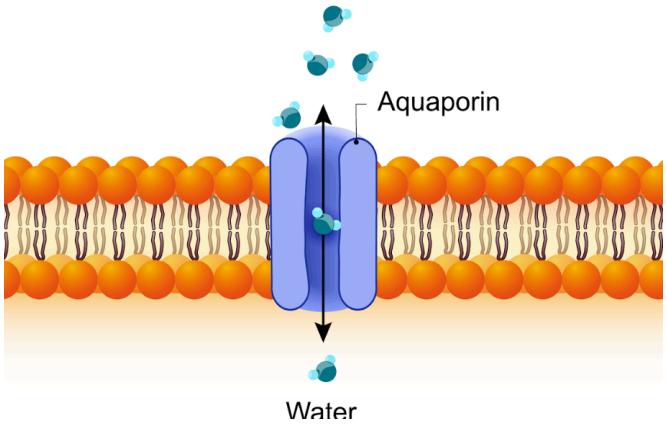


Fig 3. The Aquaporin channel allows the passage of water through a lipid bilayer.

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

SALVONA
Unique&Easy Micro-Encapsulation Solutions

SalSphere® Aqua Skin

A technology for natural skin hydration

QUALIFICATION: Skin study

A panel study was performed to evaluate human skin moisturization over the day, 6 hours. Performance was measured using a Corneometer device CM 825 (Figure 4)



Fig 4. Corneometer device CM 825.

We qualified the technology using the panelist's forearm. We compared the performance of 5% SalSphere® Aqua Skin in a lotion base to the controls, which used the same free ingredients in the same lotion base (Figure 5).



Fig 5. Panelist's forearm with applications of W = water, B free ingredients in a lotion base, E Base with 5% SalSphere®, and Aqua Skin.

Microscopy ,

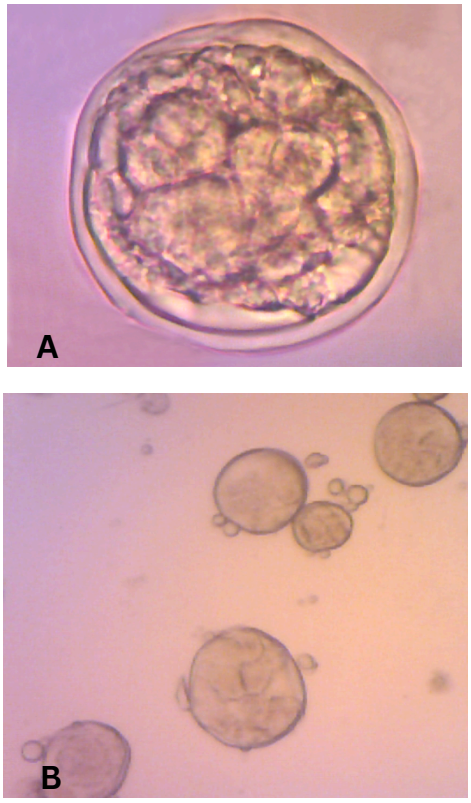


Fig 6. SalSphere® Aqua Skin PID#: 8414-16 under 100x magnification (A) and 400x magnification (B). Spheres range from 0.03 mm to 0.07 mm.

The images show a spherical structure of the core with a thin layer of the shell.

Unique&Easy Micro-Encapsulation Solutions

SalSphere® Aqua Skin

A technology for natural skin hydration

RESULTS

The samples were applied on the skin and then measured over time while they continued with their activities.

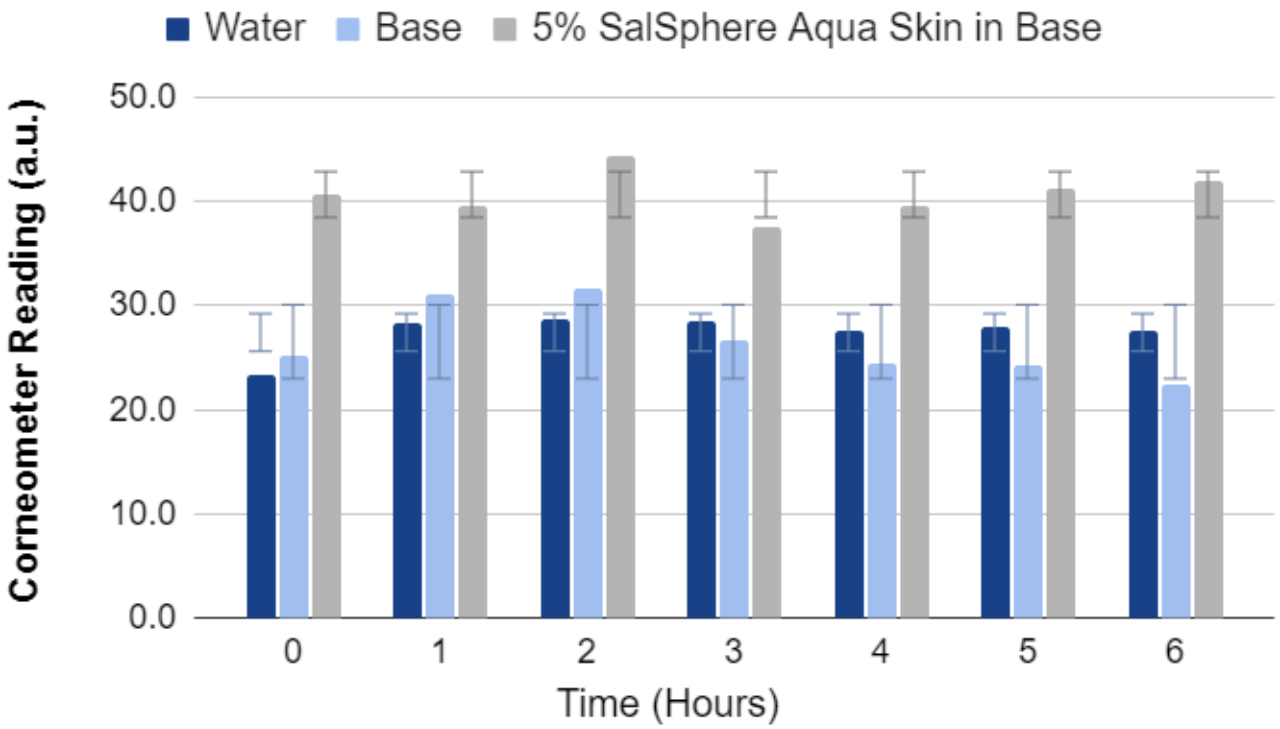


Fig 7. Results of skin moisturization over 6 hours at room temperature using a Corneometer.

We concluded that SalSphere® Aqua Skin provided a significant increase in hydration compared to the control samples in this test.

This highlights the value of encapsulation in SalSphere® Aqua Skin for skin care routine.

Lotion base with 5% SalSphere® Aqua Skin provided statistically significant skin moisturization for 6 hours (Figure 7).

Results below 30 indicate very dry skin, 30-40 indicate dry skin, and above 40 indicate sufficiently moisturized skin.

The control samples, water, and base did not improve skin moisturization.

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

SALVONA
Unique&Easy Micro-Encapsulation Solutions

SalSphere® Aqua Skin

A technology for natural skin hydration

Applications

LIP BALM

Below is a suggested formula for a lip balm using SS Aqua Skin technology

Table 1. INCI List of Lip Balm with 5% SS Aqua Skin

INCI	Wt %
Bis-Diglyceryl Polyacyladipate-2	21.9
Ricinus Communis (Castor) Seed Oil	13.5
Mangifera Indica (Mango) Seed Butter	12.5
Butyrospermum parkii	12.5
Synthetic Beeswax	12
Copernicia Cerifera (Carnauba) Wax	7.5
Cocos Nucifera (Coconut) Oil	7
Simmondsia Chinensis (Jojoba) Seed Oil	5
SalSphere® Aqua Skin	**5**
Hydrogenated Poly(C6-14 Olefin)	3
Tocopherol	0.1
Total	**100**

HAND LOTION

SS Aqua Skin is formulated to improve skin moisturization. The following is a suggested formula for lotion using SS Aqua Skin technology.

Table 2. INCI List of Lotion with 5% SS Aqua Skin

INCI	Wt %
Aqua	69.75
Glycerin	10
C13-C15 Alkane	5
Capric Caprylic Caprylate	5
SalSphere® Aqua Skin	**5**
1,3 Propanediol	2.5
Polyglyceryl-4 Caprate	1
Euxyl PE	1
Ammonium Acryloyldimethyltaurate/ VP Copolymer	0.75
Total	**100**

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

SALVONA
Unique&Easy Micro-Encapsulation Solutions

SalSphere® Aqua Skin

A technology to naturally hydrate for healthy skin.

Technical Data Sheet

Table 4. Specifications of Raw SalSphere® Aqua Skin PID# 8414-16.

Specification	Characteristic
Appearance	Opaque liquid
Odor	Characteristic
Color	White to off-white
pH (neat)	8.93

Table 3. INCI list of SalSphere® Aqua Skin PID#: 8414-16

INCI List
Aqua
Urea
Caffeine
Glycerin
Sorbitan Oleate Decyl Glucoside Crosspolymer
Butyrospermum Parkii (Shea) Butter
Glyceryl Stearate
Fucus Vesiculosus Extract
Sodium Hyaluronate
Phenethyl Alcohol (and) Pentylene Glyol (and Propanediol)

Synergy between Core and Shell

Several ingredients can enhance the expression and activity of Aquaporin-3 (AQP3) in the skin and can improve hydration and overall skin health, such as Ajuga turkestanica Extract and Glyceryl Glucoside. However, they don't need to be encapsulated. We focused on two primary ingredients that significantly enhance skin moisture and benefit from encapsulation:

1) Urea:
An effective humectant that hydrates, smooths, and repairs the skin

2) Caffeine:
Stimulates aquaporins, water channels that transport water to upper skin layers.

The microsphere shell contains polysaccharides that cannot penetrate the skin but can retain water and support the skin's feeling while in use.

3) Seaweed:
Packed with polysaccharides, vitamins, minerals, amino acids, and potent antioxidants

4) Hyaluronic Acid:
A natural polysaccharide which rejuvenates the skin by reducing wrinkles and fine lines. Hyaluronic Acid also improves skin hydration and stimulates collagen and elastin.

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

Unique&Easy Micro-Encapsulation Solutions

SalSphere® Aqua Skin

A technology to naturally hydrate for healthy skin.

Substantiation

Urea	A molecule essential for skin hydration and improving skin barrier function	Piquero-Casals, J., Morgado-Carrasco, D., Granger, C. et al. Urea in Dermatology: A Review of its Emollient, Moisturizing, Keratolytic, Skin Barrier Enhancing and Antimicrobial Properties. Dermatol Ther (Heidelb) 11, 1905–1915 (2021). https://doi.org/10.1007/s13555-021-00611-y
Caffeine	An alkaloid with skin penetration ability and hydrophilic properties	Herman, A., & Herman, A. P. (2012). Caffeine's Mechanisms of Action and Its Cosmetic Use. Skin Pharmacology and Physiology, 26(1), 8-14. https://doi.org/10.1159/000343174
Seaweed	A natural ingredient packed with beneficial polysaccharides, amino acids, and vitamins.	Jesumani V, Du H, Aslam M, Pei P, Huang N. Potential Use of Seaweed Bioactive Compounds in Skincare—A Review. *Marine Drugs*. 2019; 17(12):688. https://doi.org/10.3390/md17120688
Hyaluronic Acid	A natural polysaccharide which enhances skin rejuvenation by reducing wrinkles and improving hydration.	Bukhari, Syed Nasir Abbas, et al. “Hyaluronic Acid, a Promising Skin Rejuvenating Biomedicine: A Review of Recent Updates and Pre-Clinical and Clinical Investigations on Cosmetic and Nutricosmetic Effects.” International Journal of Biological Macromolecules., vol. 120, 2018, pp. 1682–95, https://doi.org/10.1016/j.ijbiomac.2018.09.188.
Aqua Skin	Proprietary Blend of skin hydrating ingredients	https://www.salvona.com/product/salsphere-aqua-skin/
SalSphere	Proprietary Technology for encapsulation of cosmetic ingredients	https://www.salvona.com/?s=salsphere&post_type=product&dgwt_wcas=1

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA