



ENCAPSULATION TECHNOLOGIES

**SalSphere® CBD Broad Spectrum (SS CBD B) • #8421**

**SalSphere® CBD Isolate (SS CBD I) • #8426**

*A delivery system of hemp cannabidiol that makes it easy to handle with wide possibilities in cosmetics and wellness.*

### PRODUCT OVERVIEW

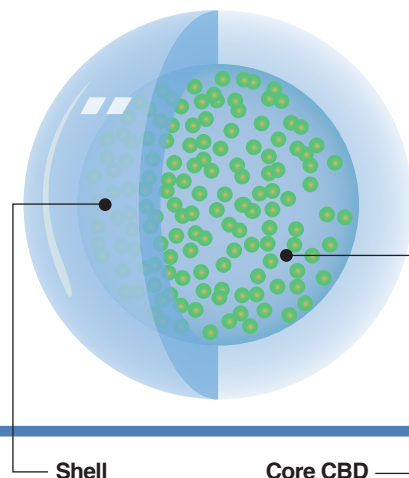


Figure 1: The sub-micron structure of SalSphere® CBD with its core encapsulating the CBD.

### Encapsulated forms of CBD – Broad Spectrum (B) and Isolate (I)

SalSphere® CBD (SS CBD) is an encapsulated form of CBD, the cannabinoid found in hemp plants (Cannabis Sativa). Both SS CBD B&I are available as a soft paste (Figure 2B) that is easy to use in topical formulations.

CBD is derived from the hemp plant, which is related to the marijuana plant. Broad spectrum CBD (B) and CBD Isolate (I) are encapsulated. Broad spectrum CBD may contain undetectable trace amounts of THC and terpenes. Isolate CBD is a purified form of CBD (99% CBD). Both the broad and isolate extracts are not water soluble and challenging for use in the formulation of topical lotions. The encapsulation enables easy formulation and incorporation in final formulations of products. SS CBD enhances the performance of CBD in many ways such as stability, deposition, and time-release of CBD.



### Unique Features of SS CBD

- A stable form of natural hemp CBD**  
Encapsulation protects CBD from oxidation and extends shelf life. (Figure 5)
- Eases handling**  
Low viscosity, semi-solid (Figure 2, B) which makes it compatible with water-based formulations.
- Skin friendly**  
Products containing SS CBD can be readily absorbed into the skin and also prolong time release. Cruelty-free, polysorbate-free, PEG-free & biodegradable.

Topical use of SS CBD offers targeted and localized delivery of CBD to specific areas. The external use of CBD enhances and regulates a variety of physiological processes through already existing CB1 and CB2 cannabinoid receptors in the skin. This means that if the skin is low in endocannabinoids, an external application of cannabinoid-like CBD can help supply the skin and enhance the skin with a vital boost.

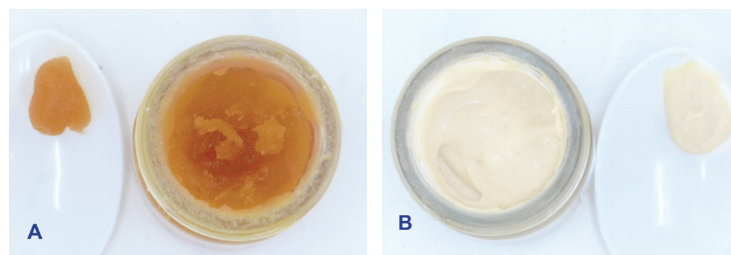


Figure 2: Free CBD B (A) is solid while SS CBD (B) has a low viscosity enabling incorporation of CBD in a more friendly manner.

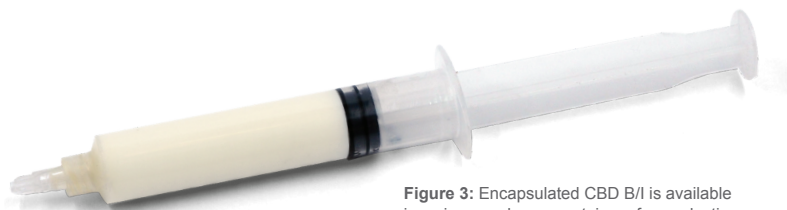


Figure 3: Encapsulated CBD B/I is available in syringes or larger containers for production.

## Formulation Ready for a Wide Variety of Skin Applications

CBD has been revered for a wide variety of health and beauty benefits. Studies of topically-administrated CBD are on the rise. However, cosmetic and dermocosmetic CBD products are not formulated clearly and systemically based on large-scale clinical reports. There is no recommended minimal dosage of CBD per outcome. Therefore, one has to estimate a dosage based on experiencing its effects, then increase gradually while continuing to monitor the body's reactions until finding the perfect dosage that works. The following is a brief literature review to identify the multiple benefits of CBD for topical applications.

### COSMETIC APPLICATIONS



**Antioxidant** - CBD is a potent antioxidant and can help lessen the visible signs of aging skin by counteracting free-radical damage. It may be able to help visibly diminish issues like wrinkles, skin dullness, and redness. Can work well with other encapsulated polyphenols such as SalSphere® Natural Anti-Aging.



**Anti-Aging and Wrinkle therapy** - CBD has anti-aging and moisturizing properties that can help reduce and prevent fine lines and wrinkles. Works well with MultiSal® Retinol and SalSphere® Natural Anti-Aging.



**Soothing sensitive and itching skin** - Studies indicate that CBD may reduce redness and itching, by inhibiting certain triggers of disorders like psoriasis and improve eczema-prone skin. Works well with SalSphere® Skin Repair.



**Anti Blemish** - Studies show that CBD can reduce the appearance of blemishes like acne or red spots. It can also reduce excess sebum secretion and thus reduce the spread of acne-causing bacteria that utilize the fatty acid in sebum as a nutritional source. Works well with SalSphere® Even Skin and SalSphere® Severe Acne Relief.



**Skin toning** - CBD can help erase dark spots on the face. Hemp seed oil has vitamin D, which boosts elasticity, stimulates collagen production, enhances radiance, and lessens lines and the appearance of dark spots on the face. Works well with SalSphere® Light and MultiSal® Multilayers.

The recommendations are based on public literature.

### DERMOCOSMETICS APPLICATIONS



**Anti Acne** - CBD may help reduce various types of acne thanks to its ability to adjust how the body creates sebum. CBD also has anti-inflammatory properties. Works well with SalSphere® EvenSkin and SalSphere® Severe Acne Relief.



**Reduce moles** - Most moles are benign and may reduce when CBD oil is applied topically. Works well with SalSphere® Even Skin.



**Pain Relief** - Creams containing SS CBD in combination with other topical pain relief, such as Menthol and Wintergreen, can provide rapid and long-lasting pain relief in a specific area associated with chronic conditions like arthritis. Works well with MultiSal® Menthol and HydroSal™ SalCool.



**Anti-inflammatory** - CBD has been found to help relieve common skin conditions such as inflammation, itching and burning, bug bites, infections, and scrapes. Works well with SalSphere® Natural Anti-Aging.



**Dermatitis** - It has been suggested that treating the endocannabinoid system with cannabinoids such as CBD could help skin conditions like eczema by reducing inflammation and relieving dry skin. Because cannabinoid receptors are also present in the nervous system, CBD can help to soothe eczema symptoms such as itching and pain. Works well with SalSphere® Skin Repair.



**Wart removal** - SS CBD combined with herbal extracts and SalSphere® Even Skin can enhance the body's natural ability to restore cell health and help to slough away dead wart tissue.



Let us formulate your products

A variety of finished products are available to review at [advancedbeautylabs.com](http://advancedbeautylabs.com).

## SS CBD B, 8421-10

CBD contains about 10-13% CBD and the level of THC is below permissible.

### Ingredients\*

Cannabis Sativa Stem Extract, DL-Alpha Tocopherol, Cholesterol, Isononyl Isononoate, Glyceryl Stearate, Hydroxyl Alcohol and Hydroxystearyl Glucoside, Lactic Acid, Brassicyl Isoleucinate Esylate, Brassica Alcohol, Rice Sugar, Xanthan Gum, Aqua, Propanediol, Sodium Citrate Dihydrate, Phenoxxyethanol\*, Ethylhexylglycerin\*

\*Some of the ingredients can be replaced

## Model Calculation

Salvona is using HEMP CBD from approved growers in the USA that supply a COA. The assay of each batch is confirmed in our QC lab. Based on the analysis results, we formulate SS CBD I and SS CBD B. In SS CBD B, the level of THC is below permissible (0.3%). SS CBD B/I contains 130 mg CBD/gram of SalSphere® CBD.

If you desire to make a product unit of 100 grams that contains 8 mg CBD/gram of finished product, you will need 800 mg CBD. Therefore, you have to use  $800/130 = 6.15$  grams of SS CBD B/I.

### The general formula:

A = Required concentration of CBD in the unit, mg per gram

B = Total volume of a unit, gram

C = Concentration of CBD in SS CBD, mg/gram

Total amount of SS CBD required (grams) =  $A \cdot B / C$ .

## Characteristics of Encapsulated SS CBD B/I

The SalSphere® technology is a liquid suspension (Figure 4C). The suspension is milky and homogeneous. The microspheres (Figure 5A & 5B) encapsulate the oil droplets to form a homogeneous liquid phase. The particle size (Figure 4) has a mean of 1.6 micron.

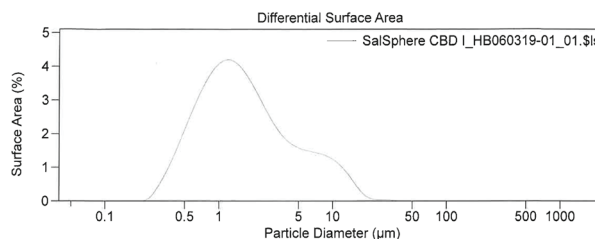


Figure 4: Particle size analysis of SS CBD B. 95% of particles have a diameter below 1.6 micron as measured with laser diffraction particle size analysis.

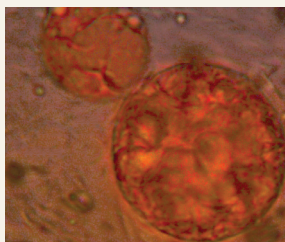


Figure 5A: Microscopy image of SalSphere® CBD B (x100)

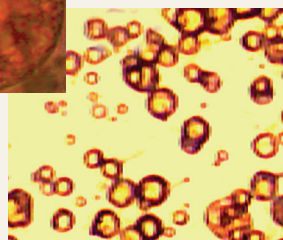


Figure 5B: Microscopy image of SalSphere® CBD B (x40)



Figure 5C: ▲ SalSphere® CBD I & SalSphere® CBD B ▲

## Stability of CBD vs. SS CBD

SS CBD offers a more stable form of CBD making it suitable for topical applications (Figure 6). Research reports show that free CBD deteriorates significantly over time. The stability of cannabinoids can be slightly improved when stored in darkness and at reduced temperature.

Preliminary studies show that SS CBD can offer a more stable form of CBD when compared to free CBD.

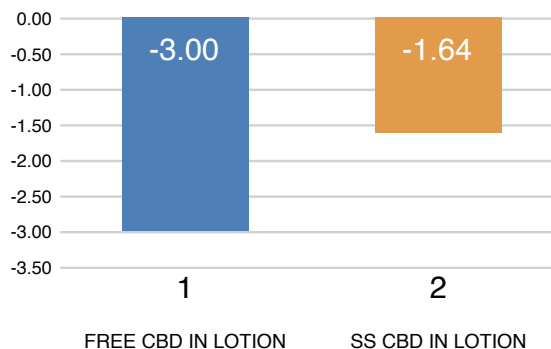


Figure 6: Free CBD lost 3% of its original content. Encapsulated CBD lost only 1.64% which is about 50% of the free CBD over the first 1 month of incubation at room temperature. SS CBD I shows promising results for longer lasting stability.



Figure 6: A lotion containing SS CBD and ready for topical application.

## SS CBD Cream Formulation

This is a model lotion that is based on natural ingredients that are China compliant and PEG free.

Ingredients	(W/W %)
SalSphere® CBD	5.00
Zea Mays (Corn) Starch	4.00
Propanediol	4.00
Xanthan Gum	0.50
Isostearyl Isostearate	8.00
Glyceryl Stearate	3.00
C14-22 Alcohols (and) C12-20 Alkyl Glucoside	2.00
Cetearyl Alcohol	1.00
Helianthus annuus (Sunflower) Seed Oil	1.00
Coconut Oil	1.00
Butyrospermum Parkii (Shea) Butter	0.50
Squalane	4.00
C13-15 Alkane	4.00
Preservative	2.00
Water	60.00

SalSphere® CBD B/I can be added to the emulsion at any stage, but recommended to add at room temperature (25°C). It can be homogenized.

## Terpenes

\*SalSphere® CBD I is recommended to follow CA Prop 65 where terpenes are not allowed.

\*Research found that CBD broad and full spectrum, containing all versions of cannabidiol, are more effective.

## Water Compatibility

Cannabis extracts can be emulsified with a carrier oil such as triglycerides to form nano/microemulsions. However, the emulsions are typically unstable when mixed with water because of the relatively large droplet sizes which reduce stability and bioavailability.

The SalSphere® technology, microemulsion, has small droplet sizes (Figure 4) (< 1.6 microns) which makes the emulsion stable. (Figure 7 & 8)

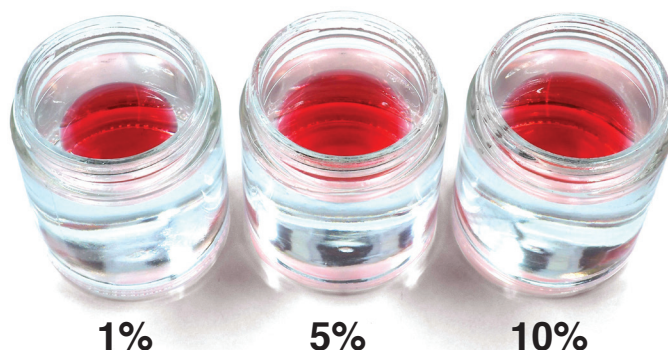


Figure 7: Complex of Triglycerides with CBD I, at 1, 5 & 10% CBD solution in Triglyceride is floating in water indicating incompatibility. CBD was dyed for better visibility with natural dye (Eclipta Prostrata extract).

## SalSphere® CBD allows the formulation of stable emulsions

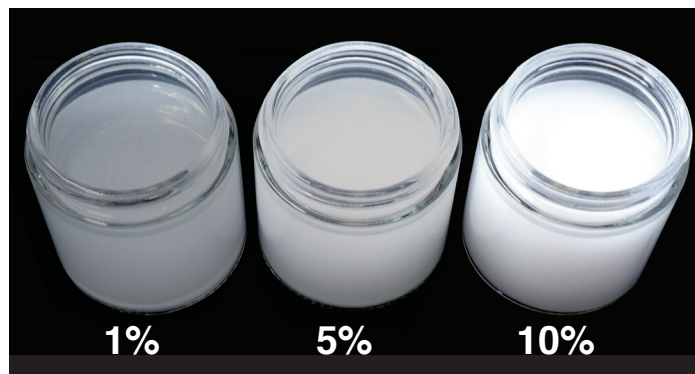


Figure 8: Water compatibility of SalSphere® CBD I at 1, 5, 10%. SalSphere® CBD exhibits homogeneous dispersion.

## Regulatory aspects of CBD

Consult with the authorities in your area.

## Side effects not likely

CBD skin products are generally safe to apply liberally to the skin and are not likely to cause side effects. SS CBD does not contain alcohol or any known allergens. If an allergic reaction occurs, it may be in response to an additive in the product.

Always speak with your doctor before using CBD, especially if you already take other medications. Drug interactions when using CBD topically are unlikely.

According to a report from the World Health Organization, in humans, CBD exhibits no effects indicative of any abuse or dependence potential. There is no evidence of public health-related problems associated with the use of pure CBD.