



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

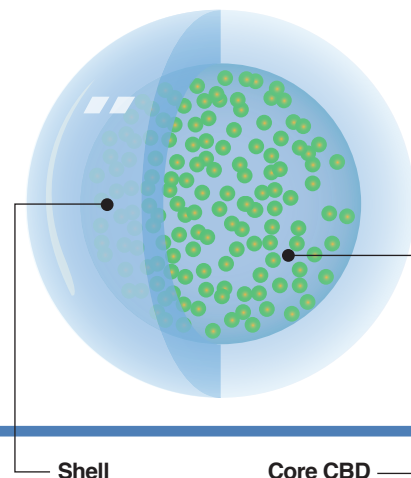


Figure 1: The sub-micron structure of SalSphere® CBD with its core encapsulating the CBD.



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*). SS CBD is available as a soft paste (Figure 2B) that is easy to use.

CBD is derived from the hemp plant, which is related to the marijuana plant. Broad spectrum (B) and CBD Isolate (I) are encapsulated. Broad spectrum CBD doesn't contain THC. Isolate CBD is a purified form of CBD (99% CBD) without terpenes. Both the broad and isolate extracts are not water soluble and challenging for the formulation of topical lotions. The encapsulation is designed to enable easy formulation and incorporation in production of final formulations. 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 for 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 CBD enhances already existing Cannabinoids receptors of the skin. This means that if the skin is low in endocannabinoids, an external cannabinoid-like CBD can help supply the skin and enhance the skin with a vital boost.

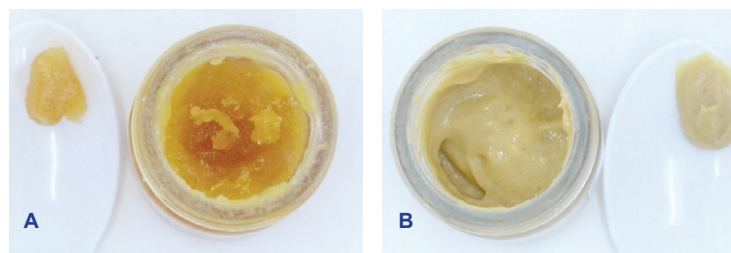


Figure 2: Free CBD B (A) is solid while SS CBD (B) has a low viscosity enabling incorporation of CBD in a more friendly manner.

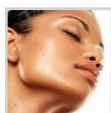


Figure 3: Encapsulated CBD B/I is available in syringes or larger containers for production.

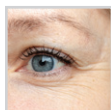
Formulation Ready for a Wide Variety of Skin Applications

CBD has been revered for a wide variety of health and beauty issues. Unfortunately, studies with CBD administered topically to repair skin issues are still scarce. More studies in humans are needed in this area to substantiate the claims of CBD promoting skin repair. However, there is anecdotal evidence to associate CBD with cosmetic and dermocosmetic benefits. There is no recommended daily intake (RDI) or application dosage for CBD. 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 for the situation. 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 ruddy skin tone.



Anti-Aging, 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 it may be able to 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 - It can reduce the appearance of blemishes like acne or red spots. Studies show that it can reduce excess sebum secretion and thus reduce the spread of acne-causing bacteria that utilize the fatty acid in sebum as a nutritional source.



Skin toning - Can help even 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.

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.



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.



Anti-inflammatory - CBD has been found to help relieve common skin conditions such as inflammation, itching and burning, bug bites, infections, and scrapes.



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 also help to soothe eczema symptoms such as itching and pain.



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.

The recommendations are based on public literature.

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, Brassicyleucinate Esylate, Brassica Alcohol, Rice Sugar, Xanthan Gum, Aqua, Propanediol, Sodium Citrate Dihydrate, Phenoxxyethanol*, Ethylhexylglycerin*

*can be replaced

Model Calculation

Salvona is using HEMP CBD from approved growers that supply a COA. The assay of each batch is confirmed in our QC lab. Based on the results of the analysis we use about 13% of the raw CBD to produce SalSphere®. At this dosage 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. The particle size (Figure 4) has a mean of 0.71 micron and a median of 0.55 micron.

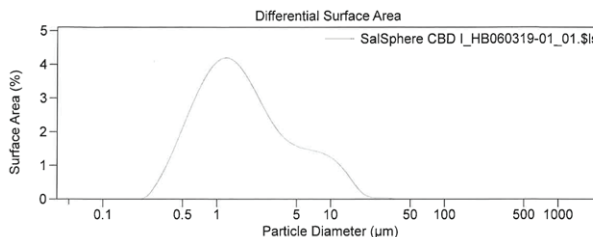


Figure 4: Particle size analysis of SS CBD B. 95% of particles have a diameter below 1.6 micron.

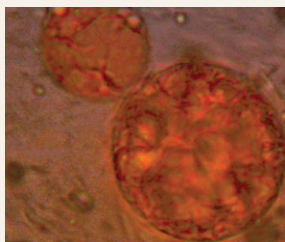


Figure 5A: Microscopy image of SalSphere® CBD B (x100)

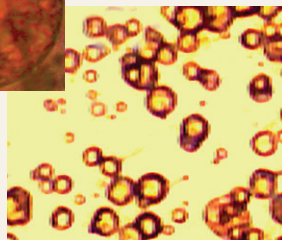


Figure 5B: Microscopy image of SalSphere® CBD B (x40)



Figure 5C: CBD B & CBD I

Stability of CBD vs. SS CBD

SS CBD offers a more stable form of CBD for topical applications (Figure 6). Research reports show that free CBD is deteriorating significantly over time, neutral cannabinoids are more stable when stored in darkness and reduced temperature.

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

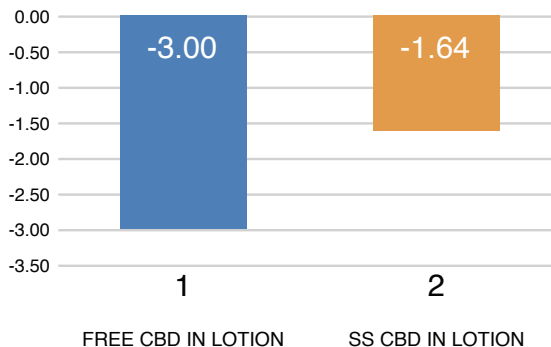


Figure 6: Free CBD lost 3% of its original content. CBD from SS lost only 1.64% which is about 50% of the free CBD over the first 1 month of incubation at room temperature. SS CBD I shows promising results for longer lasting stability.



Figure 6: A lotion containing SS CBD.

SS CBD Anti-Aging Lotion Formulation

Ingredients	(W/W %)
SalSphere CBD®*	5.00
Glycerin	1.00
Water	81.00
Polquaternium-37, Cetearyl Alcohol, PEG-40 Stearate	2.00
Caprylic, Capric Triglyceride	5.00
Squalene	5.00
Preservative	1.00

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

It is well known that cannabis extract or isolate can be emulsified with a carrier oil such as triglycerides to form nano/microemulsions. However, the emulsions are unstable, 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)

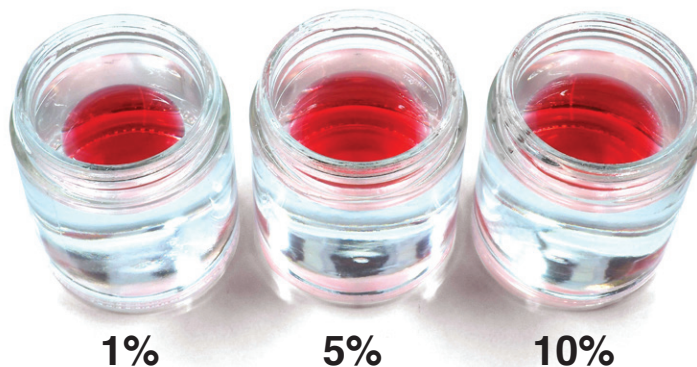


Figure 7: Complex of Triglycerides with CBD I, at 1, 5 & 10% CBD solution in Triglyceride is floating in water indicating incompatibility. CBD was dyed for better visibility with natural dye (Eclipta Prostrata extract).

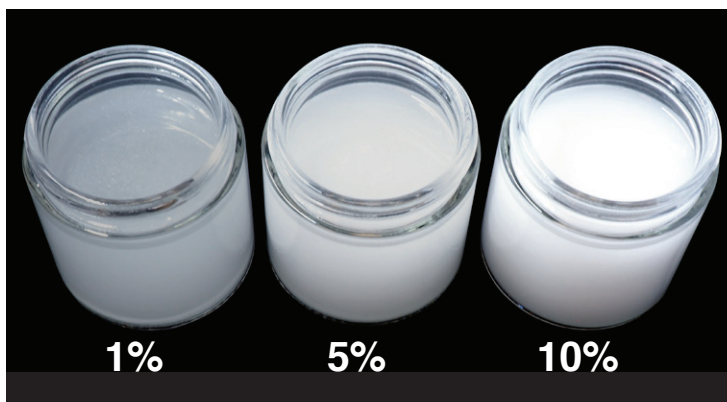


Figure 8: Water compatibility of SalSphere® CBD I at 1, 5, 10%. SalSphere® CBD exhibits homogeneous dispersion.

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 a 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.