

MultiSal® Aloe Vera

Nature's Touch for Calm, Hydrated Skin & Hair.

MultiSal® Aloe Vera is a controlled-release delivery system developed to maximize the skin benefits of aloe vera. While aloe vera is widely recognized for its ability to enhance skin elasticity, reduce inflammation, and promote overall skin health, traditional applications often fall short due to rapid degradation and short-lived effects.

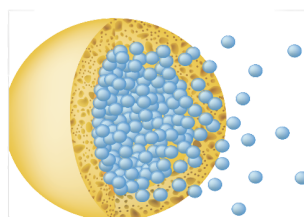


Figure 1: Model of MultiSal® Aloe Vera

MultiSal™ technology overcomes the limitations of conventional aloe vera by encapsulating it in a time-release system. The delivery is moisture-triggered upon contact with the skin, allowing for gradual, sustained release over time. This results in longer-lasting hydration, extended soothing effects, and targeted delivery to areas that need it most—enhancing both product efficacy and consumer satisfaction.

	Benfits	Discriptin
1	Enhanced Stability	Protects sensitive bioactives in aloe (e.g., vitamins, enzymes) from oxidation, UV degradation, and microbial contamination.
2	Moisture-triggered delivery	MS AV releasing aloe vera only upon skin contact or humidity exposure.
3	Targeted action	Better performance consistency, and more elegant consumer experience.
4	Longer Shelf Life	Dry, encapsulated format resists microbial growth and reduces the need for preservatives. Ideal for clean beauty formulations.
5	Controlled Release	Allows gradual release upon exposure to moisture (sweat, humidity, or product activation), enhancing long-term hydration and soothing effects.



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Aloe vera is a widely used natural ingredient in skin and hair care due to its rich composition of vitamins, enzymes, polysaccharides, amino acids, and antioxidants. Here are the key benefits for both applications:

Benefits of Aloe Vera in Skin Care

1. Hydration & Moisturization

- Aloe vera is a powerful humectant—it draws moisture into the skin.
- Polysaccharides in aloe form a moisture-retaining film on the skin surface.

2. Soothing & Anti-inflammatory

- Reduces redness, itching, and inflammation—ideal for:
 - Sunburn
 - Irritated or sensitive skin
 - Post-procedure care (e.g., after shaving, peels)

3. Wound Healing & Skin Repair

- Enhances fibroblast activity and collagen synthesis.
- Speeds up healing of minor cuts, burns, and acne lesions.

4. Antioxidant Protection

- It contains vitamins A, C, and E and enzymes that protect against oxidative damage and aging.

5. Anti-Acne Benefits

- Natural salicylic acid and saponins help cleanse pores and reduce acne-causing bacteria.

Benefits of Aloe Vera in Hair & Scalp Care

1. Soothes the Scalp

- Calms itching, irritation, or inflammation—beneficial for dandruff or seborrheic dermatitis.

2. Balances Oil & pH

- Mildly astringent; helps control excess sebum without over-drying.
- Supports scalp pH balance, which helps maintain healthy follicles.

3. Improves Hair Strength & Shine

- Rich in amino acids and proteolytic enzymes that strengthen hair strands.
- Smooth the cuticle, leading to softer, shinier hair.

4. Promotes Healthy Hair Growth (Indirectly)

- Improves scalp circulation and condition, creating a healthier environment for growth.



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Summary of Benefits

Benefit	Skin Care	Hair/Scalp Care
Hydration	Deeply hydrates	Moisturizes scalp & hair
Soothing	Reduces irritation/redness	Calms itchy scalp
Healing	Supports wound repair	Helps with scalp recovery
Antioxidant	Fights aging & stress	Protects scalp from oxidative damage
Oil control	Mildly astringent	Balances scalp oils
Hair/Skin conditioning	Softens skin	Adds shine & smoothness to hair

7. Saponins

Natural cleansing agents with mild antibacterial and antifungal properties.

Contribute to a light foaming effect in formulations.

8. Sterols

Campesterol, β -Sitosterol, Lupeol, Cholesterol

Function: Anti-inflammatory, moisturizing, support barrier function.

The content of Aloe vera (Aloe barbadensis leaf) is rich and diverse, comprising over 200 biologically active compounds.

Key constituents found in the inner leaf gel.

1. Polysaccharides (Main Functional Group)

- Acemannan: The most bioactive polysaccharide; supports skin healing, hydration, and immune modulation.
- Glucomannans, galactose, arabinose: Contribute to water-binding and film-forming properties.
- Function: Moisturizing, anti-inflammatory, wound-healing.

2. Vitamins

- Vitamin A (beta-carotene)
- Vitamin C
- Vitamin E
- Folic acid (B9), Choline, B1, B2, B3, B6, B12
- Function: Antioxidant protection, anti-aging, skin repair.

3. Enzymes

- Bradykinase: Reduces inflammation.
- Amylase, Lipase, and Cellulase: Break down fats and sugars, sometimes aiding exfoliation.
- Function: Anti-inflammatory, skin calming, potential mild exfoliation.

4. Amino Acids

- Contains 20 of the 22 essential and non-essential amino acids, including 7 of the 8 essential ones.
- Function: Skin repair, moisturization, supports elasticity.

5. Minerals

- Zinc, Magnesium, Calcium, Chromium, Selenium, Copper, Potassium, Sodium
- Function: Support enzyme function, barrier repair, and healing.

6. Phenolic Compounds & Anthraquinones (Mostly in outer leaf; removed in purified gel)

- Aloin, Emodin, Barbaloin (usually removed in cosmetics-grade gel due to potential irritation)
- Function: Natural defense compounds; antimicrobial and laxative effects in whole-leaf extracts.



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THE TECHNOLOGY

MultiSal® technology is a double-layered encapsulation. Aloe vera is first contained within sub-micron spheres and re-encapsulated within larger microspheres. The double layers are essential for the finished product's long shelf life and stability.

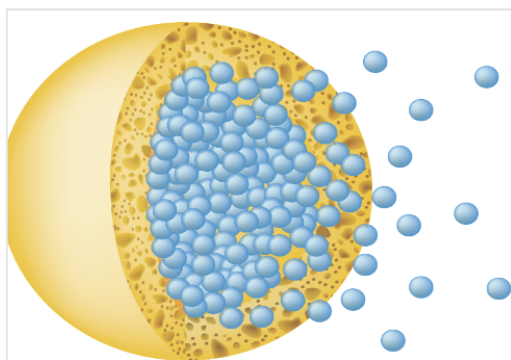


Figure 2: MultiSal® Aloe Vera is a microsphere technology with a core and shell. The shell is water-sensitive and must be dissolved to release the sub-micron spheres infused with aloe vera.



Figure 3: Appearance of MultiSal® Aloe Vera as a fine powder.

MultiSal™ Aloe Vera (MS AV) is ideal for products that aim to deliver long-lasting soothing, hydration, and anti-inflammatory effects, especially where a sustained release or moisture-triggered delivery enhances performance.

Key Advantages in Water-Free Formats

- Preservative-free or minimal preservation is required
- Lightweight & travel-friendly
- Higher concentration of actives without dilution
- Excellent for “clean beauty” or sustainable product lines.

Labeling & Positioning Tips

- Highlight “Encapsulated Aloe Vera for Long-Lasting Soothing”

Marketing Claim Language

Taglines & Features for Labels or Ads”

- “Time-Released Aloe for All-Day Comfort”
- “Moisture-Activated Capsules That Calm on Contact”
- “Soothing Skin Science—Powered by MultiSal™ Technology”
- “Smart Aloe Delivery: Works When and Where You Need It”
- “Encapsulated Aloe Vera for Longer-Lasting Hydration & Relief”.



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Water triggered release

The concept of water/moisture activation in encapsulation refers to a **triggered release** mechanism where active ingredients are released only when the delivery system comes into contact with water or skin moisture.

This is a key feature in technologies like MultiSal® Aloe Vera, enabling controlled, on-demand delivery of sensitive ingredients like aloe.

How Moisture-Activated Release Works

1. Encapsulation Structure

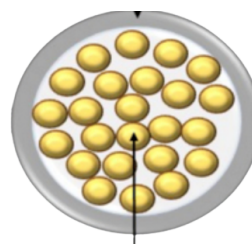
- The active (e.g., aloe vera) is encapsulated in a microcapsule or microsphere.
- The outer shell is hydrophilic (water-sensitive) or swells/dissolves in response to moisture.

2. Moisture Trigger

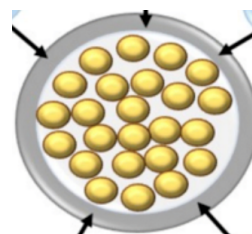
- When applied to damp skin, humid environments, or perspiring scalp, water penetrates the outer shell.
- This causes the capsule to:
 - Swell
 - Dissolve
 - Rupture
- As a result, the active ingredient is released gradually, not all at once.

Moisture-activated delivery is a **smart encapsulation** strategy that turns passive ingredients into **responsive actives**, enabling longer-lasting, targeted, and more effective cosmetic performance.

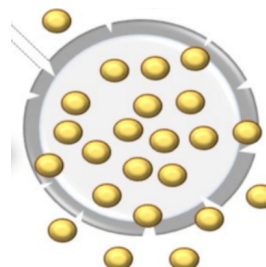
Schematic illustration of moisture-triggered release from a core-shell microcapsule:



A microsphere constructed of a core and shell. The aloe vera is in the submicron spheres of the core. The shell is water sensitive.



Water molecules penetrate the capsule shell. Moisture causes the shell to swell or partially dissolve.



Once the shell integrity is compromised, the core contents—such as an encapsulated aloe vera—are released.



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Technical Specification

Characteristic	Specification/Insight
Particle Size	20–40 µm, spherical microspheres that feel soft on the skin
Physical Form	Supplied as a free-flowing powder, making it easy to dose and disperse uniformly in dry or anhydrous formulas.
Feedstock Concentration	5× inner-leaf aloe gel
Color	Off White
Odor	Characterisitic
pH (0.5% Solution)	Mildly acidic pH (3.5–5.0)—similar to raw inner-leaf gel
Moisture Content & Solids	Moisture: up to 5–8% (organic variants under 10%)

- **Key INCI:** Aloe Barbadensis Leaf:
- Maltodextrin: Drying and stabilizing agent, forming the shell of the microsphere.
- Rice Hull Extract: Offers structural reinforcement and potential antioxidant support.
- Shea Butter: Provides emollience and contributes to shell integrity.
- Glycerin: Acts as a humectant, aiding moisture-triggered release.

Ash content	≤35% in organic aloe powders
Aloin (an impurity)	very low—typically ≤0.1 ppm (often <1 ppm)
Microbial limits	plate count <50–100 cfu/g; yeast & mold <50–100 cfu/g; coliforms absent
Heavy metals	Pb ≤10 ppm, Hg ≤0.5 ppm, Cd ≤5 ppm, As ≤0.5 ppm
Stability & Compatibility	High-concentration MultiSal® Aloe Vera powder is stable, hygroscopic (store dry), and does not degrade easily. Suitable for anhydrous and moisturized release applications.



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Water-Free Hair & Scalp Products

Product Type	The benefits from MultiSal Aloe Vera
Scalp soothing oil-serums	Delivers aloe's calming effect in an oil base—ideal for itchy, flaky scalp conditions.
Leave-in solid hair balms or waxes	Aloe is released gradually as product melts into hair/scalp—great for dry, irritated skin underneath styles.
Dry shampoos (powder form)	Adds a scalp-care dimension to dry shampoos—refreshing and calming irritated or oily scalps.
Powder-to-liquid hair masks	Aloe activates when mixed with water or applied to damp hair—ideal for pre-shampoo treatments or deep conditioning.
Powder-to-cream masks	Powder format keeps aloe stable; transforms into an active cream when mixed with water before application.
Overnight oil-based scalp treatments	Combines aloe with nourishing oils for overnight scalp therapy; water from skin slowly activates aloe release.



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Water-Free Skin Care Products

Product Type	The benefits from MultiSal Aloe Vera
Pressed powder foundations or blush	Adds soothing, anti-inflammatory benefits to makeup—activated by skin moisture or sweat.
Anhydrous balm sticks (e.g., eye, lip, face)	MultiSal® Aloe Vera powder disperses in oil base and releases actives gradually as skin warms and hydrates the area.
Facial or body oils (dry oils)	Non-greasy base + aloe release creates a nourishing yet soothing effect. Ideal for sensitive or sun-exposed skin.
Solid lotion bars	Activated upon rubbing and contact with skin moisture—delivers hydration and skin repair benefits without emulsifiers.
Powder-to-cream masks	Powder format keeps aloe stable; transforms into an active cream when mixed with water before application.
Soothing dry body powders	Useful for post-waxing, shaving, or irritation-prone areas; aloe activates when applied to slightly moist skin.



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Example Formulation Concepts

Moisture-Activated Calming Gel (Anhydrous)

Target Use: After-sun treatment, redness relief, barrier support.

Phase	INCI	% (w/w)
A	Caprylic/Capric Triglyceride	50
A	C12-15 Alkyl Benzoate	20
B	Disteardimonium Hectorite	3
B	Propylene Carbonate	0.5
C	MultiSal® Aloe Vera	5.0
C	Bisabolol	0.5
C	Fragrance (optional)	0.2
	Total	100

Key Features:

Lightweight, non-greasy base

Aloe is released gradually after the application

Gentle enough for daily use on face and body

Powder-to-Gel Mask with MultiSal® Aloe Vera

Target Use: Redness, post-acne recovery, glow treatment.

INCI	% (w/w)
Kaolin	30
Oat Flour	25
MultiSal® Aloe Vera	5.0
Green Tea Extract Powder	2
Allantoin	0.5
MultiSal™ Vitamin C	1.0
Fragrance (optional)	0.2

Instructions: Mix with a few drops of water before applying. You can add 3% of SalSphere® Even Ekin to further address acne.



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Leave-On Scalp Serum (Oil-Based)
Target Use: Sensitive, itchy, or dry scalp.

INCI	% (w/w)
Squalane	40
Jojoba Oil	25
MultiSal® Aloe Vera	5
Tocopherol	0.5
Tea Tree Oil (optional)	0.3
Isoamyl Laurate	29.2

Key Benefits

- Moisture-activated aloe vera calms scalp irritation throughout the day.
- Non-greasy, no-rinse formula—perfect for travel or between washes.
- Natural feel and clean beauty compliant (anhydrous, low preservative).

Waterless Dry Shampoo Powder with MultiSal® Aloe Vera
Target Use: Refreshes oily scalp, absorbs sebum, and releases aloe vera for a soothing, anti-irritant effect.

INCI	% (w/w)	Function
Oryza Sativa (Rice) Starch	45	Oil absorbent, volume boost
Zea Mays (Corn) Starch	30	Sebum control, texture
Kaolin Clay	10	Scalp detox, oil & odor absorption
MultiSal® Aloe Vera	5	Soothing, moisture-triggered aloe
Silica (Micronized)	5	Improves flow, mattifying effect
MultiSal® Menthol	3	moisture-triggered Cooling effect



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Formulation strategies:

Goal	Strategy
Preserve Encapsulation	Use low shear mixing after gel or base is fully prepared. Add MultiSal® Aloe Vera during cool-down phase (<40 °C) .
Targeted Release	MultiSal® Aloe Vera is moisture-triggered, so ideal in anhydrous or water-free bases that activate on skin.
Prolonged Effect	Pair with occlusive or film-forming agents to slow water evaporation and extend aloe release
Sensory Appeal	Use light oils or esters (e.g., C12-15 alkyl benzoate, isododecane) to balance powder texture and deliver smooth feel.

Format-Specific Formulation Approaches

A. Anhydrous Gels

Base: Caprylic/Capric Triglyceride + Dimethicone + Distearidimonium Hectorite
MultiSal® Aloe Vera offers on-demand aloe release when applied to moist skin (e.g., after showering or sweating)
Ideal for: soothing facial gels, post-sun skin balms, or scalp calming mists.

B. Stick or Balm (Hot Pour)

Base: Shea butter, hydrogenated polyisobutene, ozokerite, or beeswax
Add MultiSal® Aloe Vera during the cool phase below 40 °C
Aloe is released by skin warmth and moisture
Great for on-the-go relief sticks, after-wax balms, and scalp relief bars.

C. Oil Serums

Base: Jojoba, squalane, or dry esters (no water phase)
MultiSal® Aloe Vera disperses and remains suspended
Apply to damp skin/scalp to activate
Ideal for overnight scalp serums and face calming oil.

D. Dry Masks or Powders

Combine MultiSal® Aloe Vera with clays, starches, or botanical powders
Rehydrate before use or apply to damp skin
Controlled aloe release enhances soothing & elasticity
Perfect for: powder-to-gel masks, dry scrubs, after-sun sachets

