Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8736-11

HydroSal® Sebum Control

Mattifies, Clarifies, and Controls Oil All Day

HydroSal® Sebum Control is a sub-micron delivery system designed to reduce excess oil on the face and scalp.

Each sphere contains a ceramide-based core infused with zinc sulfate and niacinamide, two actives that help regulate sebum production and calm inflammation.

The outer shell, made of hydroxypropyl cellulose, starch, aloe vera, and hyaluronic acid, immediately absorbs surface oil, soothes the skin, and reduces shine.
The system provides instant matte results through rapid oil absorption and delivers ingredients deep into the follicle—directly to the sebaceous gland where oil is produced.

Through encapsulation, HydroSal® enhances the performance of zinc and niacinamide, preserving their potency, reducing irritation, and enabling faster, more noticeable improvements in skin clarity and oil balance.



Figure 1: The sub-micron structure of HydroSal® Sebum Control with its Hyaluronic shell.

CLAIMS

HydroSal® is a liquid encapsulation system that delivers dual-action sebum control.
1. Instant Oil Absorption
Sub-micron spheres instantly bind excess sebum, creating a fast matte finish with reduced shine and smoother skin.
2. Targeted Delivery
Zinc and niacinamide reach the sebaceous glands to help regulate sebum production and maintain long-lasting oil control.

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Active Functional Ingredients in HydroSal® Sebum Control

Zinc can help reduce sebum production both in the short-term and over time through multiple mechanisms:

Short-Term Effects

- **Inhibits Bacterial Lipase Activity**

Zinc directly inhibits the lipase enzyme from Propionibacterium acnes (now Cutibacterium acnes), which converts triglycerides into free fatty acids in sebum. In vitro studies showed up to 80% lipase inhibition at specific zinc concentrations, reducing oily buildup on the skin.

- **Mattifying and Oil Absorption**

When used topically, zinc compounds such as zinc sulfate can provide a mattifying effect and help absorb surface oil, offering immediate shine control.

Long-Term Effects

- **Modulates Sebum Regulation via Hormonal Pathways**

Zinc appears to reduce sebum by inhibiting androgen-related pathways—particularly androgenic hormones that stimulate sebaceous gland activity.

- **Clinical Support in Acne and Oiliness**

A study using 5% topical zinc sulfate for two months showed reduced acne severity (GAGS score reduction) in a significant portion of participants—suggesting indirect sebum regulation through clarity and reduced inflammation.

Using HydroSal®-encapsulated zinc offers several enhanced benefits for sebum control, combining the well-known efficacy of zinc with smarter delivery mechanisms:

Why Encapsulated Zinc Works Better for Sebum Control

Mechanism	Benefits of encapsualtion
Prolonged Release	The HydroSal® microcapsules gradually release zinc over time, ensuring extended sebum regulation and longer-lasting matte effects.
Targeted Delivery	Sub-micron zinc particles penetrate micro-fissures in hair or skin without immediate diffusion, improving adherence to oily areas.
Enhanced Stability	Encapsulation protects the zinc from degradation (e.g., due to oxidation or environmental stress), preserving its sebum-regulating activity.
Reduced Irritation	Encapsulated delivery softens initial exposure, making formulations with active zinc gentler on the skin while maintaining efficacy.

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Vitamin B3— (Niacinamide) is a proven partner in regulating sebum production, thanks to both clinical evidence and multiple biological mechanisms:

Clinical Evidence

- 2% topical Niacinamide significantly reduced sebum excretion rate (SER) in a study conducted in Japan and decreased casual sebum levels (CSL) in a Caucasian study over 4–6 weeks.
- Another randomized, placebo-controlled trial confirmed that 2% Niacinamide moisturizer significantly lowered sebum production compared to control.

Aloe Vera:
Aloe Vera Helps Control Sebum
1. Oil Absorption & Astringent Effects
Aloe vera naturally absorbs excess oil and helps clean skin or scalp without stripping hydration. It also offers gentle astringent qualities that help unclog pores.
2. Anti-Inflammatory & Antimicrobial Properties
The plant contains compounds like acemannan and anthraquinones, which help calm inflammation and inhibit acne-causing bacteria such as Propionibacterium acnes. This creates a healthier skin environment that supports regulated oil production.
3. Supports Sebum Regulation
Emerging research suggests aloe vera plays a role in regulating sebum production, especially beneficial for oily and acne-prone skin.

Encapsulation with HydroSal®

HydroSal® Sebum Control is a sub-micron sphere delivery system that controls or reduces excess oil production on the skin, particularly on the face and scalp.

Encapsulating active ingredients like Aloe Vera, Niacinamide (vitamin B3), and Zinc within the HydroSal® delivery system offers distinct advantages that boost efficacy and speed up visible results. Here's how this approach enhances their performance:

Benefits of Encapsulation in HydroSal®

1. Enhanced Stability
Encapsulation protects sensitive actives from degradation caused by light, oxygen, or formulation interactions. This preservation ensures the ingredients remain potent throughout the product's shelf life.
2. Controlled & Sustained Release
HydroSal® technology enables a gradual release of encapsulated ingredients, providing sustained activity over time. This prolongs the effect, reducing the need for frequent reapplication.
3. Improved Skin Penetration
Micro- or nanoencapsulation enhances the delivery of actives through the stratum corneum into target layers of the skin, increasing bioavailability and efficacy.
4. Reduced Irritation
By mitigating the initial burst of active ingredient exposure, encapsulation reduces irritation potential—especially valuable for sensitizing actives like niacinamide or zinc.

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Follicular Delivery as a Mechanism of Release

The ceramide-based core in HydroSal® capsules can penetrate the hair follicle and modulate sebum reduction by:

1. Targeted Delivery through Hair Follicles
Encapsulating actives in ceramide-rich particles facilitates transport along the follicular route—one of the primary pathways through the skin barrier. Particles of appropriate size and composition can travel down the hair shaft and lodge near the sebaceous glands, enabling localized delivery.

2. Enhanced Penetration by sub-micron-scale Ceramides
Research on ceramide nanoemulsions shows that particles around 100 nm can permeate deeper into the epidermis—and particularly into hair follicles—enhancing delivery efficiency.

3. Improved Formulation Efficacy via Penetration Enhancement
Lipid-based carriers, such as ceramides submicron spheres, enhance through-follicle transport by disrupting or fluidizing lipid structures in the skin barrier. This increases active ingredient bioavailability precisely within or near the pilosebaceous unit.

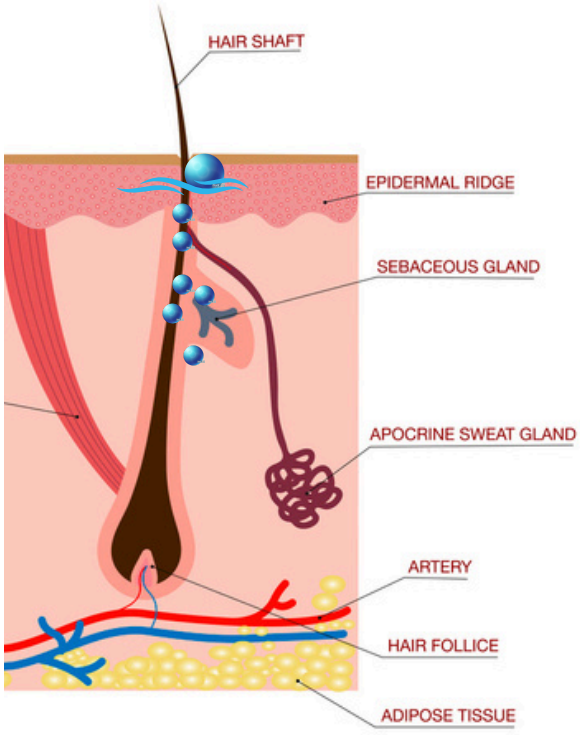


Figure 2: The sub-micron of HydroSal® Sebum Control can penetrate the hair follicle and migrate to the sebaceous gland to modulate sebum production. The hyaluronic acid remains on the surface of the skin.

Benefits of Targeted Delivery

- Reaches Deeper Layers
- Protects ingredients
- Releases gradually
- Reduces irritation
- Improves performance.

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Performance

Skin test with Sebum meter and visual evaluation

Use a Sebumeter (e.g., SM815) to quantify casual sebum level (CSL) and sebum excretion rate (SER).
A group of panelists applied approximately 0.1 mL of soybean oil to a 5 × 10 cm area on their forearms to simulate sebum accumulation. The area was divided into two equal halves—one treated with a lotion containing HydroSal® Sebum Control and the other left untreated as a control. Panelists then visually assessed and rated the percentage reduction in shine between the treated and control halves.

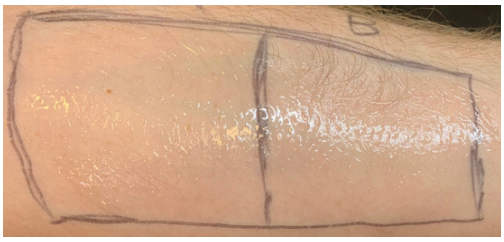
HydroSal® Sebum Control Demonstration Kit
HydroSal® Sebum Control Demonstration Kit:
Includes two essentials:

- Technology Concentrate: High-potency encapsulated core—perfect for custom formulation or testing.
- 5% Lotion: Ready-to-use and skin-friendly, ideal for demos, sampling, or consumer use.

Application of Soybean Oil was used to simulate oily skin , followed by application of lotion containing 5% HydroSal® Sebum Control



Before application of the technology



After application of the technology on A

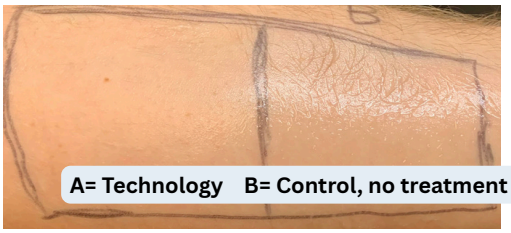


Figure 3: Photos of oily skin before and immediately after application of a lotion containing 5% HydroSal® Sebum Control.

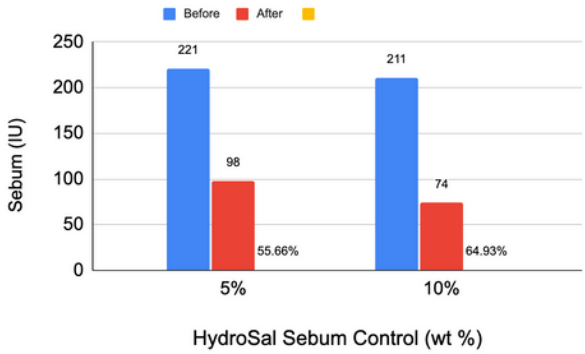


Figure 4: Effect of HydroSal® Sebum Control on shine reduction within 15 min.

It shows a **55%** reduction in shine as measured and **100 %** reduction by visual

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Performance

Long-lasting effect: While shine reduction may vary from person to person, a small study of individuals using HydroSal® Sebum Control for one full day showed a significant initial decrease in sebum—and levels remained low throughout the day.

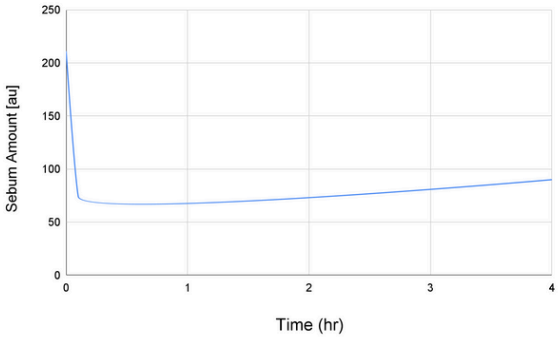


Figure 5: Reduction of sebum over 6 hours from a signle application of a serum containing 5% HydroSal® Sebum Control

Lotion containing 5% HydroSal® Sebum Control reduced visible shine by 16%, while the 10% formulation achieved a 34% reduction in shine.

Cosmetic Products Ideal for HydroSal® Sebum Control

- Mattifying Lotions & Moisturizers

Lightweight creams for oily or combo skin—deliver lasting hydration and oil absorption for a shine-free complexion.

- Oil-Control Primers & Serums

Layer under makeup to absorb oil throughout the day and ensure smooth application.

- Setting Sprays & Face Mists

Refreshing, non-clogging sprays tailored for shine control—especially useful during long wear.

- Cleansers & Toners for Oily Skin

Products that cleanse but leave a matte, oil-regulated finish without stripping skin balance.

- Clay Masks & Powder Masks

Excel at deep oil absorption and pore detox, enhanced by HydroSal® for lasting effects.

- Scalp Lotions for Oily Scalp

Formulated to reduce greasiness and improve comfort between washes.

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Technical Data Sheet

Table 1: INCI of HydroSal® Sebum Control

Core	
Ceramide AP	Strengthens and supports the natural skin barrier, which *indirectly* improves penetration
Zinc PCA	Zinc helps calm overactive sebaceous glands, bind and absorb extra sebum to give the skin a cleaner, matte finish. Specifically inhibits 5α-R1
Niacinamide	Niacinamide helps regulate the activity of sebaceous glands

Shell	Oil Absorption
Hydroxypropyl Cellulose, Gum	Control the appearance of oil, creates a thin, invisible polymer film on the skin. This film absorbs a small amount of surface oil, Spreads sebum uniformly, Prevents heavy, greasy “pools” of oil, Reduces shine
Aloe Vera	Natural astringents, temporarily tighten pores, reduce excess oil on the surface, give a more matte appearance, anti-inflammatory
Starch Modified, Tapioca Starch	Starch is used in skincare to absorb excess oil and reduce surface shine, providing a matte, smooth finish.
Hyaluronic Acid	Helps lower oiliness and shine

Table 2: Specifications and Characteristics of HydroSal® Sebum control

Specification	Characteristics
Appearance	Viscous Liquid
Color	Light Yellow
Odor	Characteristic
pH (neat)	5 +/- 1



Figure 6. HydroSal® Sebum Control

The recommended usage level for HydroSal® Sebum Control is between 2-10%.

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Formualtion

Table 3: Example Formulation of facial anti acne wash

Ingredient	Weight (%)
Water (Aqua)	54.83
Sodium Lauroyl Sarcosinate	18
Cocamidopropyl Betaine	20
Sodium Benzoate	0.5
SalSphere® Even Skin PID: 8894-21	6.67
HydroSal® Sebum Control PID: 8736-10	**5**
TOTAL	100

A serum with HydroSal® Sebum Control

Ingredient	Weight (%)
Water (Aqua)	71.6
Sodium Gluconate	0.1
Propanediol	10
Glycerin	5.5
Hydroxypropyl Guar, Water (Aqua)	0.9
Xanthan Gum	0.3
HydroSal® Sebum Control PID: 8736-10	10
Preservative	1.6
TOTAL	100

HydroSal® Sebum Control Works Well in Anti-Acne Skincare with SalSphere® Even Skin, SalSphere® Severe Acne Relief.

- Dual efficacy: Combines oil absorption with regulation of sebum production.
- Improved wear: Offers lasting shine control even in leave-on applications.
- Enhanced delivery: Encapsulation enhances user comfort.

Product Type	Benefit with HydroSal® Sebum Control
Cleansers & Washes	Removes impurities + retains oil control post-rinse
Serums & Spot Treatments	Targets individual blemishes while balancing oil and reducing inflammation
Toners	Balances skin between cleansing and treatment steps
Lightweight Moisturizers	Hydrates without adding shine or clogging pores
Masks	Deep cleaning oil elimination followed by extended shine control

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Additional Claim Substantiation

Ingredient	Claim	Source
Zinc	"Zinc is targeted towards individuals with oily skin, skin with imperfections such as comedones and enlarged pores, and skin that is prone to acne. It is also suitable for those with lack of brilliance with oily skin."	https://universkin.com/en-us/pages/zinc#:~:text=Zinc%20has%20astringent%20properties%20that,reduce%20the%20appearance%20of%20blemishes.
	Inhibits Bacterial Lipase Activity	The Effect of Oral Zinc Administration on Sebum Free Fatty Acids in Acne vu lgaris. TESSIO REBELL0,1 DAVID J. ATHERTON2 and COLIN HOLDEN2 , Acta Derm Venereol (Stockh) 1986; 66: 305-310. https://pdfs.semanticscholar.org/cff0/6fef682b06f64660fdcd7982b6bd194dcaf7.pdf?utm_source=chatgpt.com
	Mattifying and Oil Absorption	-https://www.realsimple.com/best-tinted-sunscreen-7113563?utm_source=chatgpt.com -https://www.byrdie.com/zinc-for-acne?utm_source=chatgpt.com
	The effect of zinc on the sebum secretion rate	The effect of zinc on the sebum secretion rate, J W Demetree, L F Safer, W M Artis, Acta Derm Venereol 1980;60(2):166-69.
	Clinical Support in Acne and Oiliness	Effectiveness of 5% topical zinc sulfate solution in reduction of acne vulgaris - a study from a tertiary care hospital of Lahore Ayesha Aqeel1 , Muneeza Qamar2 , Aneela Gillani3 *, Sehrish Khalid4 , Mahwish Javed5, Biomedica - Official Journal of University of Health Sciences, Lahore, Pakistan Volume 39(3):118-122 https://doi.org/10.51441/BioMedica/5-1019

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Aloe Vera	"Research highlights aloe vera's role in regulating sebum production—a critical factor in preventing excess oil that can lead to acne lesions."	https://www.rupahealth.com/post/aloe-for-acne-unlocking-the-natural-healing-power-of-aloe-vera-in-skincare
Hyaluronic Acid	Studies have shown that HA can interact with specific receptors on sebocytes (the cells responsible for producing sebum) to modulate intracellular signaling pathways involved in sebum production. Specifically, HA activates a protein called RhoA, which helps regulate sebum production.	https://www.vivantskincare.com/blogs/got-60-seconds/hyaluronic-acid-a-summer-essential-for-all-skin-types#:~:text=Studies%20have%20shown%20that%20HA,which%20helps%20regulate%20sebum%20production.
Vitamin B3	"Niacinamide can help regulate sebum production by reducing the activity of sebaceous glands. In fact, a study found that applying a moisturizer containing 2% niacinamide resulted in lower sebum production and excretion rates. "	https://wishtrend.com/blogs/glam/niacinamide-4-benefits-for-skin-and-usage-tips-for-topical-use#:~:text=3.,the%20activity%20of%20sebaceous%20glands.
Niacinamide	The effect of 2% niacinamide on facial sebum production	The effect of 2% niacinamide on facial sebum production Zoe Diana Draelos 1, Akira Matsubara, Kenneth Smiles, J Cosmet Laser Ther., 2006 Jun;8(2):96-101. doi: 10.1080/14764170600717704.
Zinc	Several factors have been postulated for the excessive sebum secretions and a few strategies to overcome the excessive sebum production are (a) treatment with polyunsaturated fatty acids, (b) use of zinc, which specifically inhibits 5α-R1 and (c) use of inhibitors like epicatechin-3-gallate and epigallocatechin-3-gallate (EGCG), which are major constituents of green tea15,16. It has been postulated that polyunsaturated fatty acids, the incorporation of zinc compounds, and inhibitors of 5α-R1 may all contribute to the reduction of sebum secretion associated with pathophysiological conditions like acne.	1. Mahmood, T., Akhtar, N., & Moldovan, C. (2013). A comparison of the effects of topical green tea and lotus on facial sebum control in healthy humans. *Hippokratia*, *17*(1), 64. 2. Demetree, J. W., Safer, L. F., & Artis, W. M. (1980). The effect of zinc on the sebum secretion rate. *Acta dermato-venereologica*, *60*(2), 166-169. 3. 3. Frydrych, A., Arcf, J. and Kasiura, K. Zinc: a critical importance element in cosmetology. *J. Appl. Cosmetol.* 22, 1–13 (2004)