

MultiSal® Retinol

Age-defying technology treats wrinkles and brightens skin tone.

Why do you need this technology?

Retinol is a highly effective topical vitamin A treatment, a potent antioxidant promoting cellular turnover and epidermal renewal. It's useful for treating and eliminating the wide range of skin aging and pigmentation conditions. It is well known to be one of the best anti-aging ingredients for maintaining youthful skin. Retinol is used to reduce wrinkles, brighten and tone the skin.

Unique natural delivery technology

MultiSal® Retinol is a stable, formulation-friendly product that releases encapsulated Retinol at a slow rate over time in a controlled fashion, making it better suited for consumers with sensitive skin. The encapsulation of retinol within MultiSal® Retinol allows for a modulated release of retinol onto the skin, reducing irritation. This same feature also improves the shelf life stability of retinol, maintaining potency of your formulas for longer.



Retinol is a natural derivative of vitamin A. It can be converted to retinal and retinoic acid, the active form of vitamin A in the skin, through enzymatic activity (Fig 1). Retinol increases skin cell production, helps unclog pores, exfoliates the skin, and increases collagen production to reduce fine lines and wrinkles. Regular use of products containing retinol leaves the skin looking fresher, younger, and more plump. However, stability of retinol in formulas is difficult, as retinol is susceptible to irreversible oxidation which reduces its potency.

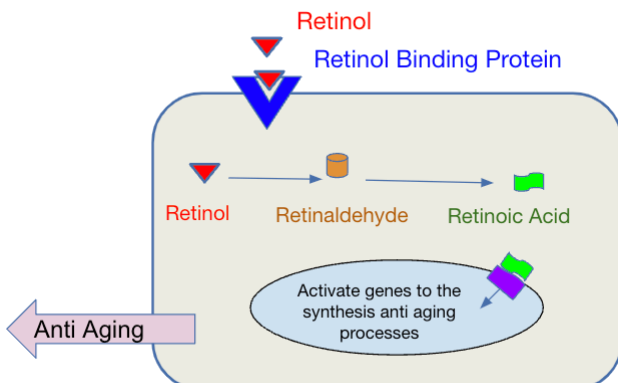


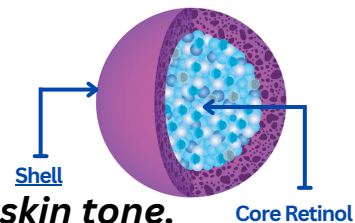
Fig 1: The metabolic path of Retinol in cells

MultiSal encapsulation is an ideal solution to address both of the known challenges of formulating with retinol; irreversible oxidation, and consumer skin irritation.

MultiSal® technology encapsulates retinol first within sub-micron spheres, then a second protective layer surrounds and protects within a microsphere. The double layers are essential for the finished product's long shelf life and stability. The microsphere can swell in water and rupture when the lotion is rubbed into the skin, releasing the sub-micron spheres with encapsulated retinol. The sub-micron spheres slowly release retinol over time, offering a controlled and modulated release of the active.

Fig 2: MultiSal® Retinol is available as a free flowing powder. MultiSal® is soft on the skin and can be formulated in most emulsions.





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Core Retinol

Skin Testing

Controlled Release

Method: The release kinetics of Retinol on the skin was determined by applying multiple samples on volunteers' skin, extracting the skin with ethanol, and analyzing the quantity of retinol within the extraction via HPLC.

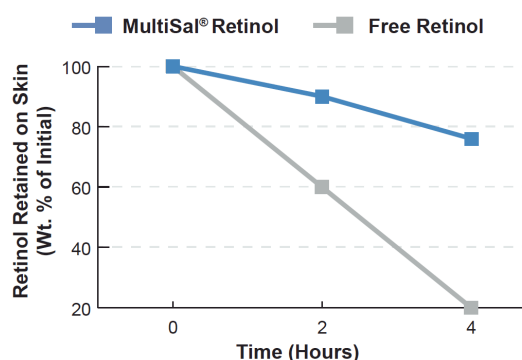


Fig 3: Percent of retinol retained on the skin after application from a product containing 0.5% retinol* from MultiSal® Retinol versus free retinol over four hours. The release rate of MultiSal® Retinol technology was four times slower than that of the free. [*A higher concentration of Retinol was required to consistently meet the detection limit of HPLC assay]

Extended Shelf Life Stability

Method: The stability of MultiSal® Retinol (0.1% retinol) was compared to free retinol in standard moisturizer lotions (Fig 5). After 50 days at 42°C, HPLC analysis revealed that the encapsulation technology facilitated the retention of 80% of the retinol while the free only retained 5% of the initial record.

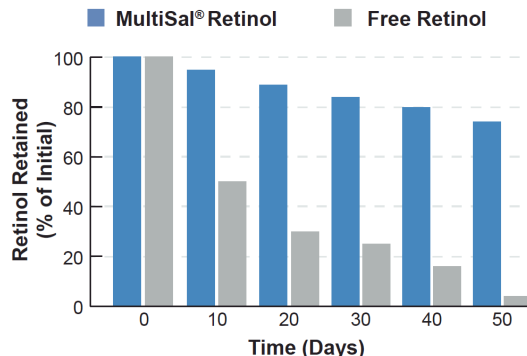


Fig 5: Amount of retinol retained in lotions containing MultiSal® technology versus the free. MultiSal® Retinol provides a longer shelf life than free Retinol, even in high temperatures.

Extended Shelf Life Stability

Method: The stability of the MultiSal® Retinol as raw material (10% Retinol) is confirmed (Fig 4).

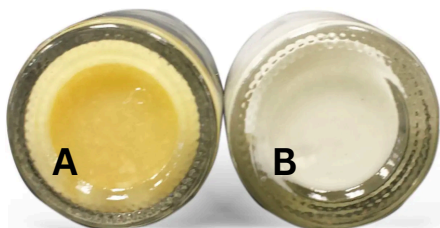
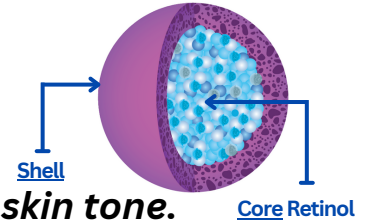


Fig 4: MultiSal® Retinol is stable in a lotion for 18 and 12 months. The original color of Retinol is yellow (A), and the color of MultiSal® Retinol is light yellow (B). The color may intensify in lotion over time.

Core Claims

- Stable and effective encapsulated Retinol
- Results with significant improvement in 2 weeks
- Suitable for sensitive skin



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Core Retinol

Skin Testing

Method: A study evaluated the effect of Free Retinol or MultiSal® Retinol, both at 0.2% of Retinol, on fine lines and wrinkles. Panelists (N=5) applied the lotion daily as a night cream for two weeks. After two weeks, they did a self-assessment. The panel included women aged 25-40 years old with some fine lines. The experimental group used a night cream containing MultiSal® Retinol, the control group used a night cream containing an equivalent amount of free (unencapsulated) retinol.

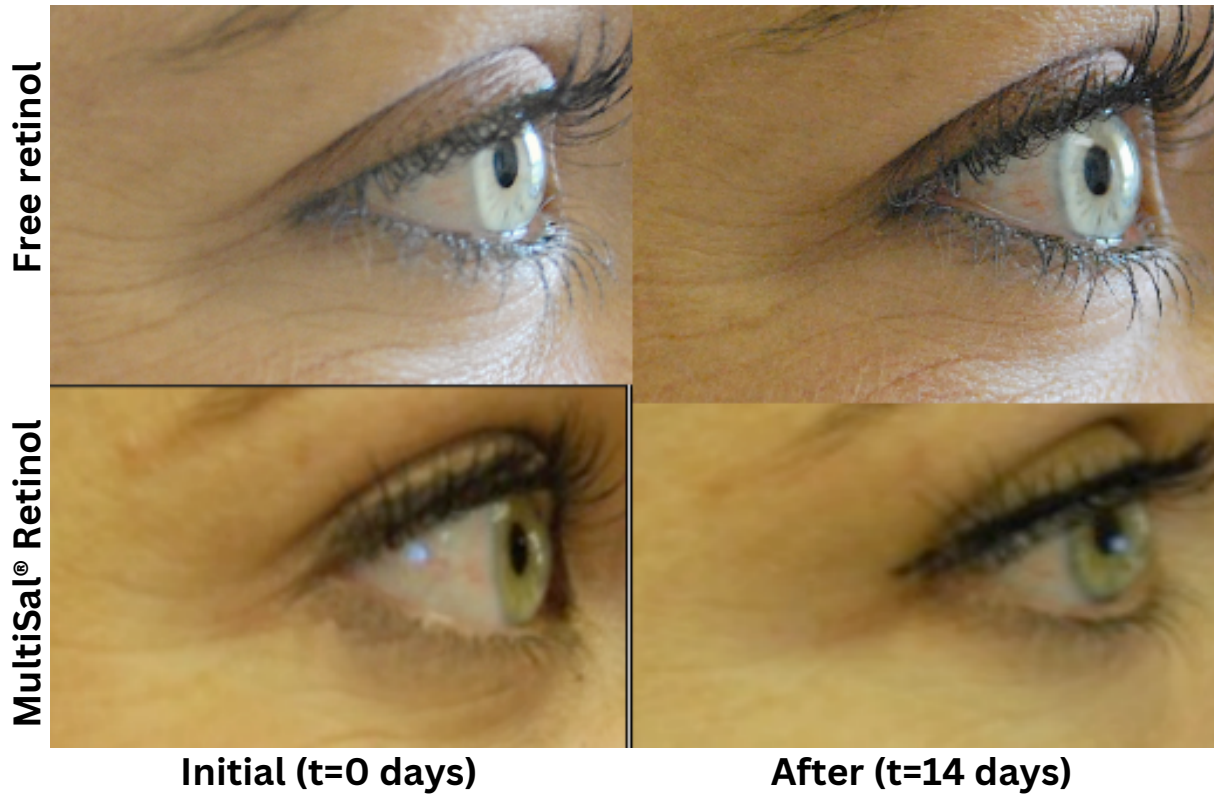
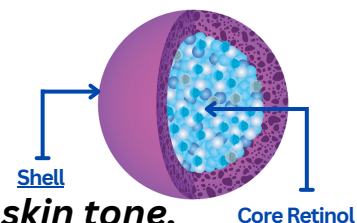


Fig 6: : 80% saw significantly reduced fine lines and deeper wrinkles. No side effects or redness irritation were observed. The control group used free Retinol: After seven days of application, 60% of the panelists reported slight burning and irritation. The panelist saw a reduction of fine lines and a very slight effect on deep wrinkles. Samples were prepared simultaneously and aged for one month at room temperature before use. We relate the reduced effect of the free retinol mostly to the degradation of free Retinol. Overall, when using an encapsulated form of Retinol, MultiSal® Retinol, expect an improvement in skin texture, smoother-looking skin, and reduced fine lines.



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Technical Data Sheet

INCI

Retinol 10%, PPG-3 Benzyl Ether Myristate, Polysorbate 20, PEI-10, BHT, Silica

Fig 8: Specification

Appearance @20°C	Free flowing powder
Applications	Lotions, creams, lip care, body powders, and make up
Color	Off-white to light yellow
Odor	Characteristic
Shelf Life (months)	9.5 ± 1.5
Usage Level (wt%)	1-2
Storage (°C)	Closed container at 12-32° with <45% RH

Fig 9: Formulation of a Cream/Gel (190520)

This hydrating Cream moisturizer is for all kinds of Skin. It's formulated as a lightweight moisturizer for night cream. It absorbs quickly to reveal skin that feels silky, smooth, and nourished with hydration.

Phase	INCI	(W/W%)
A	Water	87.00
A	Diglycerin	3.00
A	Menthylpropanediol	3.00
B	Macadamia Seed Oil Polyglyceryl-6 Ester	0.40
B	Isopropyl Myristate	0.90
B	Polysorbate 60	0.50
C	Triethanolamine	0.30
C	1,2-Hexandiol	1.00
D	Caprylic/Capric Triglyceride	3.60
D	MS RT INCI listed above	0.30
	Total	100.00

Fig 10: Formulation of an anti-aging night cream

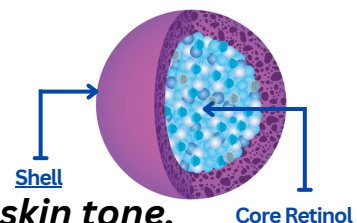
For best results, incorporate MultiSal® Retinol into the oil phase before mixing it into the water phase.

Ingredients	(WW%)
DI Water	88.70
Niacinamide	0.50
Sodium Acrylate, Sodium Acryloyldimethyl Taurate Copolymer, Isohexadecane	1.50
Glycerin, Water, Glycyrrhiza Glabra Root Extract	0.10
Squalene	3.00
Phenoxyethanol, Ethylhexylglycerin	1.00
Cyclopentasioxane	3.00
Lemon Oil	0.20
MS RT	0.50
Sodium Acrylate, Sodium Acryloyldimethyl Taurate Copolymer, Isohexadecane	1.50
Total	100

Fig 11: Formulation of an accelerated recovery cream (6415-01)

Phase	INCI	(W/W%)
A1	Aqua	83.70
A2	Niacinamide	1.00
A3	Xanthan gum	0.30
A3	Glycerin	2.00
A4	Sodium Carbomer	1.50
B1	Argania Spinsosa (Argan) Oil	1.00
B2	Squalane	2.00
B3	Phenoxyethanol, Ethylhexylglycerin	1.00
B3	Isododecane	2.00
B5	MS RT	1.50
C1	Sodium Acrylate/Sodium Acryloyldimethyl Taurate Copolymer & Isohexadecane & Polysorbate 80	1.50
D1	SS NAA	2.50
	Total	100





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Claim Substantiation

Claim	Source
Reduce skin hyperpigmentation, unevenness, and wrinkles. Enhance skin tone, skin elasticity, and moisture	A Clinical Anti-Ageing Comparative Study of 0.3 and 0.5% Retinol Serums: A Clinically Controlled Trial, Zasada M.a · Budzisz E.a · Erkiert-Polguj A.b", Skin Pharmacol Physiol 2020;33:102–116
Moderate skin irritation symptoms observed with 0.5% Retinol.	A Clinical Anti-Ageing Comparative Study of 0.3 and 0.5% Retinol Serums: A Clinically Controlled Trial, Zasada M.a · Budzisz E.a · Erkiert-Polguj A.b", Skin Pharmacol Physiol 2020;33:102–116
Topical retinol improves fine wrinkles associated with natural aging. Significant induction of glycosaminoglycan, which is known to retain substantial water, and increased collagen production are most likely responsible for wrinkle effacement. With greater skin matrix synthesis, retinol-treated aged skin is more likely to withstand skin injury and ulcer formation along with improved appearance.	Improvement of Naturally Aged Skin With Vitamin A (Retinol), Reza Kafi, MD; Heh Shin R. Kwak, MD; Wendy E. Schumacher, Arch Dermatol. 2007;143(5):606-612. doi:10.1001/archderm.143.5.606
Long-Lasting Anti-Aging Benefits of a Cream Containing Retinol	A Placebo-Controlled Study Demonstrates the Long-Lasting Anti-Aging Benefits of a Cream Containing Retinol, DihydroxyMethylChromone (DMC) and Hyaluronic Acid, Oddos Thierry and Romain Roure, Journal of Cosmetics, Dermatological Sciences and Applications 02(02),DOI:10.4236/jcdsa.2012.22012