Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8731-01

MultiSal® White

Encapsulated Brightening for Visible Skin Uniformity

Advanced Microsphere Delivery for Controlled Skin Toning with phenylethyl resorcinol.

The Challenge

Phenylethyl resorcinol is a highly effective skin-toning ingredient known for helping achieve a more even-looking complexion. However, in its free form, phenylethyl resorcinol presents formulation and consumer challenges—including instability, potential for irritation, rapid surface activity, and limited control over skin interaction. These limitations often limit its use, application format, and consumer acceptability.

The Salvona Solution

MultiSal® White is a proprietary microsphere encapsulation technology that entraps phenylethel resorcinol within a protective polymeric matrix, enabling controlled, targeted delivery to the skin.

By encapsulating phenylethyl resorcinol, MultiSal® White helps stabilize the active, modulate its release, and reduce excessive surface exposure—while maintaining efficacy and improving overall skin comfort.



Key Advantages

- Controlled release of phenylethel resorcinol to support consistent skin-toning performance
- Improved stability versus free phenylethel resorcinol
- Reduced irritation potential through moderated skin exposure
- Enhanced formulation flexibility, suitable for serums, lotions, creams, and targeted treatments
- Improved sensory profile, enabling daily-use products

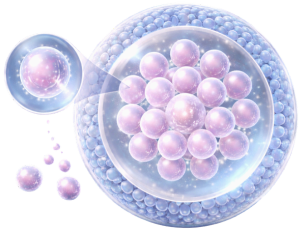


Figure 1: Illustrates the structure of MultiSal® white

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8731-01

MultiSal® White

Encapsulated Brightening for Visible Skin Uniformity

Why It Matters

MultiSal® White transforms Phenylethyl resorcinol from a challenging single active into a formulation-ready, performance-optimized skin-toning technology. Controlled release allows Phenylethyl resorcinol to interact with the skin more gradually and evenly, supporting visible tone refinement without the harsh sensory or tolerance issues often associated with traditional systems.

MultiSal® utilizes a two-phase release mechanism in which gentle rubbing triggers microsphere rupture, releasing lipid submicron carriers that spread evenly across the skin and gradually interact with the skin's lipid pathways—supporting controlled, uniform delivery and improved skin comfort.



Figure 2: A jar with microspheres of MultiSal® White

Phenylethyl Resorcinol — What It Is, What It Does, and How It's Used in Cosmetics

Phenylethyl resorcinol is a skin-active ingredient developed for use in skincare and cosmetic products. It's a brightening and antioxidant compound inspired by natural molecules found in pine tree bark (though the commercial form is typically synthesized for consistency and stability).

How It Works on the Skin

Phenylethyl resorcinol acts on the skin primarily through two mechanisms:

1. Inhibits melanin production:

- It's known as a potent tyrosinase inhibitor — tyrosinase is the key enzyme involved in the biochemical pathway that produces melanin, the pigment responsible for skin tone and dark spots. By reducing this enzyme's activity, phenylethyl resorcinol slows melanin synthesis, which can lead to a lighter, more even skin tone and reduced dark spots and hyperpigmentation.

2. Provides antioxidant protection:

- Phenylethyl resorcinol also has antioxidant properties that help neutralize free radicals generated from UV exposure and environmental stress. This can help protect skin cells from oxidative damage and support overall skin health and radiance.

Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8731-01

MultiSal® White

Hydrate. Lift. Brighten—one layer at a time

MultiSal® microsphere is a double-layer encapsulation

Why It Delivers Stable, Gentle Skin Toning with Phenylethyl Resorcinol.

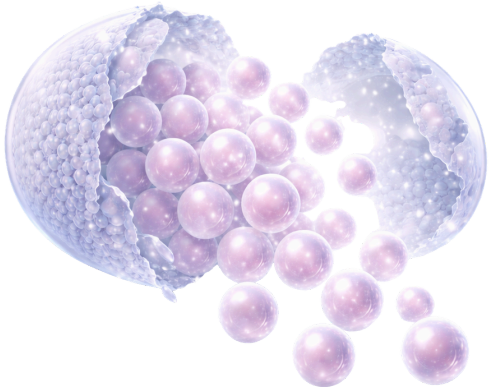
1. First Encapsulation: Phenylethyl resorcinol in submicron lipid spheres
In the first step, Phenylethyl resorcinol is encapsulated inside very small lipid-based submicron spheres.

What this does:

- Physically isolates Phenylethyl resorcinol from air, light, and water
- Protects it from oxidation, degradation, and premature reaction
- Keeps Phenylethyl resorcinol in a non-reactive, stabilized microenvironment

Because Phenylethyl resorcinol is sensitive and highly reactive in free form, this lipid encapsulation:

- Reduces its tendency to cause irritation
- Prevents burst release on the skin
- Improves chemical stability during storage and formulation



2. Second Encapsulation: Lipid Spheres Locked Inside ~30 µm Dry Microspheres
The lipid spheres are then re-encapsulated into larger, dry microspheres (~30 microns) using MultiSal® technology.
This second layer acts as a physical and kinetic control barrier.

What this outer shell does:

- Further protects the lipid spheres during processing and storage
- Prevents aggregation, crystallization, or leakage of Phenylethyl resorcinol
- Enables a dry, free-flowing powder that is easy to formulate
- Shields Phenylethyl resorcinol from direct skin contact until application

How This Structure Improves Product Stability

Multi-Level Protection

- The double encapsulation creates two independent protection zones:
- Chemical protection (lipid core)
- Physical protection (outer microsphere)

This dramatically improves:

- Shelf stability
- Formulation robustness
- Compatibility with water-based systems

Compared to free Phenylethyl resorcinol, this system:

- Is far less sensitive to pH and formulation stress
- Shows reduced discoloration and degradation over time

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8731-01

MultiSal® White

Encapsulated Brightening for Visible Skin Uniformity

Mechanism of Release – MultiSal® White

Two-Phase Release Mechanism of MultiSal® Double-Layer Encapsulation.

MultiSal® is engineered to deliver actives via a mechanically triggered, biologically guided two-phase release mechanism, ensuring stability and controlled skin interaction.

Phase 1: Mechanical Release During Application

During application, rubbing and massage on the skin surface provide gentle mechanical energy.

- The outer MultiSal® microsphere shell is soft and designed to rupture easily under gentle shear
- Upon rupture, the encapsulated submicron lipid spheres are released
- These submicron spheres diffuse and spread evenly across the skin surface

Outcome of Phase 1

- Uniform distribution of the active-loaded lipid spheres
- Avoidance of localized “hot spots” of phenylethyl resorcinol
- Immediate yet controlled availability of the active system

This step ensures even coverage and improved sensory experience without aggressive release.

Phase 2: Biological Penetration and Targeted Delivery

Once released, the lipid-based submicron spheres interact naturally with the skin’s lipid architecture.

They penetrate the skin through two complementary pathways:

1. Intercellular Lipid Pathway

- The lipid submicron spheres are compatible with the intercellular lipid matrix of the stratum corneum
- They migrate between corneocytes via lipid–lipid affinity
- This supports gradual diffusion into the upper skin layers

2. Follicular Delivery Pathway

- Due to their small size, submicron lipid spheres can also enter hair follicles and associated sebaceous units
- Follicles act as reservoirs, allowing prolonged residence time and sustained release

Outcome of Phase 2

- Gradual, sustained release of resorcinol
- Reduced surface irritation
- More uniform interaction with melanogenic pathways

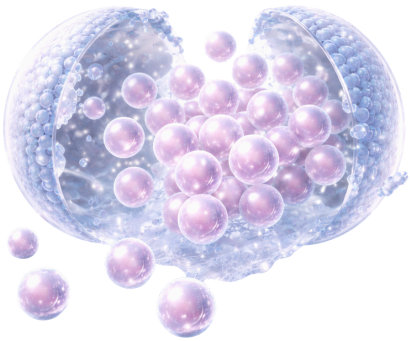


Figure 3: Illustration of rupture of MultiSal® white to release the lipid-based submicron spheres.

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

SALVONA
Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8731-01

MultiSal® MultiLayer

Hydrate. Lift. Brighten—one layer at a time

Technical information

INCI Composition

INCI	%
Modified Food Starch	
Caprylic/Capric Triglyceride	
Phenylethyl Resorcinol	10
Silica or other anti caking	

Specifications

Parameter	Specification
Appearance at 20 °C (Visual)	Free flowing powder
Odor	Odorless
Color (Visual)	White to off-white
pH (1 % solution)	4.0 -6.5

Recommended Use Levels – MultiSal® White

General Guidance

- MultiSal® White is designed to reduce irritation risk and improve uniform delivery, allowing effective performance at lower apparent active levels than free Phenylethyl Resorcinol.
- Final use levels should always be confirmed during formulation and safety assessment.

By Application Type

1. Soap Bars (Rinse-Off, Solid Cleansers)

- MultiSal® White: 0.5 – 2.0 wt%
- Equivalent Phenylethyl Resorcinol in formula: 0.05 – 0.20%

Rationale

- Short contact time
- Mechanical action helps rupture microspheres
- Suitable for daily cleansing products

2. Anhydrous Oils (Leave-On)

- MultiSal® White: 0.3 – 1.0 wt%
- Equivalent Phenylethyl Resorcinol: 0.03 – 0.10%

Rationale

- Oil phase supports lipid submicron spreading
- Controlled release reduces irritation risk
- Ideal for targeted tone-evening oils

3. Serums (Leave-On, Water or Emulsion Based)

- MultiSal® White: 0.2 – 0.8 wt%
- Equivalent Phenylethyl Resorcinol: 0.02 – 0.08%

Rationale

- Leave-on exposure requires lower dosing
- Double-layer encapsulation supports gradual release
- Suitable for daily or night serums

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

SALVONA
Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8731-01

MultiSal® White

Encapsulated Brightening for Visible Skin Uniformity

Cosmetic Applications of MultiSal® White

MultiSal® White is designed for controlled, gentle skin-toning and brightening, making it suitable for a wide range of leave-on cosmetic applications where uniform tone, comfort, and stability are critical.

Facial Skincare

Serums & Ampoules

- Skin-tone refining serums
- Brightening / radiance boosters
- Anti-spot and tone-correcting serums
- Ideal for daily-use formulations requiring controlled delivery

Why MultiSal® White fits:
Controlled release minimizes irritation and allows elegant, lightweight textures.

Creams & Lotions

- Brightening day creams
- Night creams targeting uneven tone
- Anti-aging creams with tone-evening benefits

Why MultiSal® White fits:
Stable in emulsions and supports gradual, uniform tone improvement over time.

Spot & Targeted Treatments

- Dark spot correctors
- Post-blemish appearance care
- Localized tone-evening treatments

Why MultiSal® White fits:
Prevents “hot spots” of resorcinol, reducing redness and uneven effects.

Most Suitable Applications

- **Soap Bars (Solid Cleansers)**

Supports even distribution of the brightening active in solid matrices and enables controlled release during use.



- **Anhydrous Oils**

Stable in oil-based systems, providing uniform dispersion and controlled skin contact without solubility challenges.





Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

MultiSal® White

Encapsulated Brightening for Visible Skin Uniformity

Comparison of Salvona's systems for skin toning

Platform	Primary Active (INCI)	Delivery Focus	Typical Use
MultiSal® White	Phenylethyl Resorcinol	Controlled, deeper pathways	Corrective / spot
SalSphere® Light	Ascorbic Acid, Alpha-Arbutin	Surface radiance	Instant glow
HydroSal® Skin Toning	Kojic Acid, Niacinamide	Submicron penetration	Daily maintenance

EU Claim-Safe Takeaway

MultiSal® White
Helps improve the appearance of uneven skin tone through controlled delivery of a high-performance brightening ingredient.

SalSphere® Light
Helps enhance skin radiance and brightness at the skin surface for an immediate, luminous appearance.

HydroSal® Skin Toning
Helps support gradual improvement in skin tone appearance with Kojic Acid delivered via a submicron system, providing high skin comfort.

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

SALVONA
Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8731-01

MultiSal® White

Encapsulated Brightening for Visible Skin Uniformity

Claim	Benefit	Observation	Details of the study	Full reference
Tyrosinase inhibition	Reduces melanin formation; supports skin brightening	PER inhibited mushroom tyrosinase **22× more effectively than kojic acid**; B16 melanoma melanin IC50 ≈ **2 µM**	In-vitro screening of hydroxy-stilbene derivatives; 3D pigmented epidermis model showed near-complete melanin suppression with **0.1% PER after 14 days**	Vielhaber G, Schmaus G, Jacobs K, et al. "4-(1-Phenylethyl)1,3-Benzenediol: A New, Highly Efficient Lightening Agent." *International Journal of Cosmetic Science*. 2007. DOI: 10.1111/j.1467-2494.2007.00355_6.x. (ResearchGate)
Human skin lightening	Visible whitening / brightening	**0.5% PER** lightened human skin in Asian subjects; reported more effective than **1% kojic acid**	Human in-vivo study; limited public detail available from abstract, but cited as clinical evidence for 0.5% PER	Vielhaber G, Schmaus G, Jacobs K, et al. *International Journal of Cosmetic Science*. 2007. (ResearchGate)
Melasma support	Improves melasma appearance as part of HQ-free brightener	Cosmetic topical brightener containing **tranexamic acid, phenylethyl resorcinol, niacinamide, tetrapeptide-30** significantly improved half-face MASI, hyperpigmentation, MSRS, and MelasQoL vs baseline	Randomized, double-blind, split-face study; **18 adults**, Fitzpatrick III–VI, 12 weeks; compared HQ-free brightener vs 4% hydroquinone	Desai S, et al. "Randomized, Double-Blinded, Split-Face Study Comparing the Efficacy and Tolerability of Two Topical Products for Melasma." *Journal of Drugs in Dermatology*. 2020;19(9):822–827. DOI: 10.36849/JDD.2020.5353. (JDD Online)
Post-IPL brightening	Helps maintain pigment improvement and reduce re-darkening after IPL	PER side showed greater MASI improvement than control: **25.09% vs 5.12% at week 2** and **31.88% vs 8.92% at week 4**	Single-center, randomized, placebo-controlled, split-face, evaluator-blinded trial; **50 Chinese females**, solar lentigo or stable epidermal melasma; PER serum twice daily after IPL	Fu Y, Liu X, Lu L, Liu Y, Li X, Mao K, Xi W, Li L. "Clinical Safety and Efficacy of a Novel Topical Phenylethyl Resorcinol Formulation for Intense Pulsed Light Adjunctive Usage for Solar Lentigo and Melasma Skin." IMCAS Asia 2025 poster.

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA

SALVONA
Unique&Easy Micro-Encapsulation Solutions

Product Overview - 8731-01

MultiSal® White

Encapsulated Brightening for Visible Skin Uniformity

Claim	Benefit	Observation	Details of the study	Full reference
Hyperpigmentation reduction after IPL	Anti-spot / pigment correction	Hyperpigmentation improved more on PER-treated side: **18.30% vs 7.62% at week 2** and **22.13% vs 8.52% at week 4**	Same post-IPL split-face study; measured MASI, skin tone, spot severity, ITA°	Fu Y, et al. IMCAS Asia 2025 poster.
Skin tone / brightness	Improves brightness and helps prevent rebound darkening	ITA° data suggested brightening trend on PER side, while control showed re-darkening after IPL	Same clinical study; PER use started 1–3 days post-IPL based on dermatologic assessment	Fu Y, et al. IMCAS Asia 2025 poster.
Tolerability	Supports use in sensitive post-procedure skin	No significant treatment-emergent adverse events; no hypersensitivity reported	PER serum used post-IPL under dermatologic guideline	Fu Y, et al. IMCAS Asia 2025 poster.
Anti-melanogenic pathway	Mechanistic support beyond tyrosinase inhibition	PER reported to act through **p44/42 MAPK signaling**, supporting anti-melanogenic activity	Mechanistic reference cited in clinical pigment-correcting literature; not a consumer clinical endpoint	Kang M, Park SH, Park SJ, et al. "p44/42 MAPK signaling is a prime target activated by phenylethyl resorcinol in its anti-melanogenic action." *Phytomedicine*. 2019;58:152877. (Dove Medical Press)
Dark spots / PIH / solar lentigines	Relevant comparator category for brightening products	Significant improvement in hyperpigmentation, tone evenness, dark spot intensity, contrast, and size by weeks 2–12	This study was **not PER-based**; useful benchmark for multi-active pigment products and clinical endpoints	Makino ET, Huang P, Cheng T, Acevedo SF, de Oliveira C, Mehta RC. "12-Week, Single-Center Study of a Targeted Pigment-Correcting Dark Spot Treatment for Post-Inflammatory Hyperpigmentation and Solar Lentigines." *Clinical, Cosmetic and Investigational Dermatology*. 2023;16:2677–2686. (Dove Medical Press)

Tel 1-(844) SALVONA | sales@salvona.com
www.salvona.com
2521 Kuser Road, Hamilton NJ 08691, USA