

Encapsulation of Liquids

Fine Silica Microspheres

Turning Liquids Into Powders

- Microencapsulation traps oils, active ingredients and fragrances to form dry, waterless powders.
- Can be loaded with oil and fragrances greater than 200 wt%.
- A variety of oils can be encapsulated, both polar and nonpolar.

RESIFA™ SOLESPHERE™ H-33 and H-53

- INCI name: Silica
- Appearance: White, powder
- Particle Size: $\sim 3\mu\text{m}$; H-53 $\sim 5\mu\text{m}$
- Oil Absorption: 400 mL/100g
- Surface Area: 600-800 m^2/g
- Pore Volume: ~ 1.8 mL/g

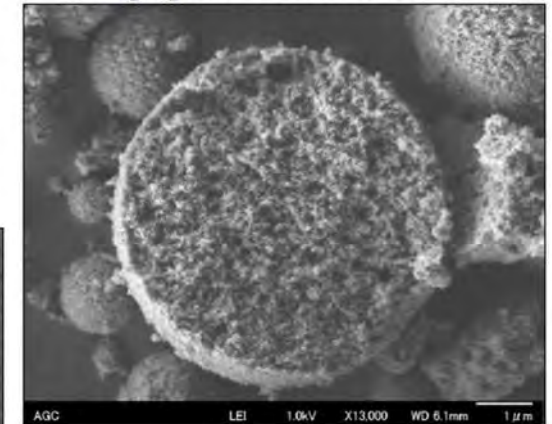
Internal Porous Structure

- Allows absorption of oils



Enlarged photograph of surface

Photograph of Cross Section



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Variety of Oils Can Be Encapsulated: Polar and Nonpolar

	Oil Types					
Appearance	Jojoba Oil	Coconut Oil	Caprylic/Capric Triglyceride	Neossance Squalene	Tea Tree Oil	Clear Imitation Vanilla Extract
Fine Powder	0.50 g	0.50 g	0.50 g	0.60 g	0.50 g	0.50 g
Dry, slightly clumpy, flowing powder	1.32 g	1.25 g	0.80 g	1.30 g	0.875 g	0.90 g
Sticky, clumpy but suitable if adding to a formulation	2.06 g	2.00 g	1.05 g	1.75 g	1.75 g	1.59 g

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A Jojoba Oil Example

- Lab scale: Simple mixing with mortar and pestle at room temperatures is all that is needed.
- Production scale: a ribbon mixer should be sufficient.



50% Jojoba Oil



130% Jojoba Oil



200% Jojoba Oil



SOLESPHERE

Encapsulation Benefits

- **Stability:** Sensitive active ingredients tend to lose their efficacy as soon as they are bottled
- **Protection:** From UV degradation and/or oxidation
- **Sustainability:** Products in powder form tend to have a longer shelf life
- **Eco-friendly:** No water, reduced package weight, reduced plastic usage

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Encapsulation Benefits (continued)

- **Easier incorporation:** Reduces or eliminates preservatives, stabilizers
- **Enhancement:** Enables higher levels of oils to be added to formulations without phase separation
- **Safety:** Protects active ingredients from phase separation in final form which could affect product performance

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SOLESPHERE Encapsulation



Formulations found at resifasolesphere.com

Summary

- SOLESPHERE silica (H-33 and H-53) can encapsulate liquids and fragrances and turn them into powders.
- Advantages: SOLESPHERE silica is a natural and non-nano material that can produce a translucent gel that is easily colorable.
- There are no special processing requirements or elevated temperatures needed.
- Innovative, natural solution for waterless products.

For more information, please visit resifasolesphere.com