LUCASMEYER COSMETICS

DELIVERY SYSTEMS

PRO-LIPO™ NEO

SMART LIPOSOME TECHNOLOGY

Easy preparation for customized liposomes

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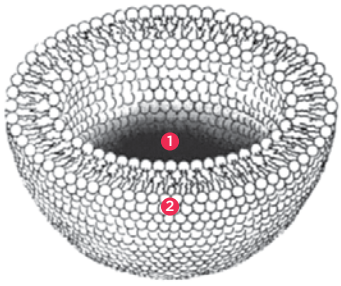
Lipo- and hydrosoluble active ingredient entrapment

-

Enhances efficacy for faster and better results

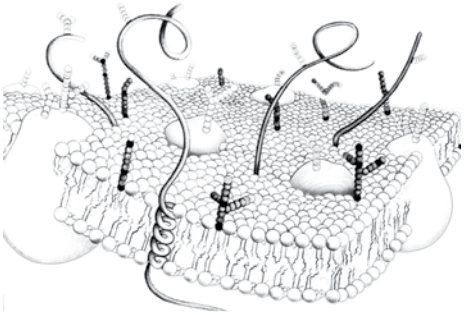
PRO-LIPO™ NEO IS A UNIQUE TECHNOLOGY DEVELOPPED TO EASILY CREATE CUSTOMIZABLE HOMEMADE NATURAL LIPOSOMES, ALLOWING A COMPLETE CONTROL OVER THE TYPE AND CONCENTRATION OF THE INGREDIENTS TO ENTRAP FOR AN OPTIMAL EFFICACY.

Cross section of a unilamellar liposome



1. Aqueous core (hydrophilic ingredient entrapment)
2. Phospholipid bilayer (lipophilic ingredient entrapment)

Cell membrane structure



WHY USE LIPOSOMES?

The bio-efficacy of a cosmetic product depends largely on the properties and concentration of the active ingredients it contains. But it depends also on their ability and the time they need to penetrate the skin barrier and reach the biological targets they have to act on.

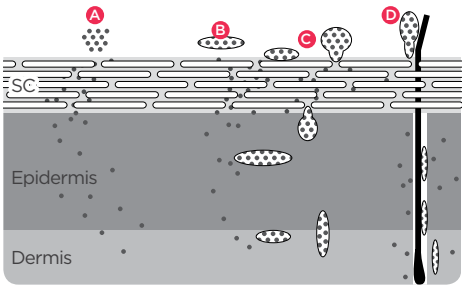
Originally developed for the pharmaceutical industry for drug delivery, delivery systems are nowadays a major challenge in the cosmetic industry for product efficacy improvement by enhancing the skin penetration of active compounds. These complex technologies are more and more used worldwide for the development of sophisticated and ultra-efficient ingredients emphasizing a high-tech image.

Liposome are microscopic hollow soft vesicles composed of one or more phospholipid bilayers (= unilamellar or multilamellar liposomes) surrounding an aqueous core. They are able to entrap hydrosoluble active ingredients in the internal cavity and liposoluble active ingredients in the lipid bilayer(s) of the membrane.

Because of their cell-like composition, liposomes are efficient biomimetic vectors highly adapted for cosmetic products to improve ingredient percutaneous absorption and efficacy, acting as a non-skin-irritating penetration enhancer.

The entrapped ingredients present a higher ability to cross the cutaneous barrier and diffuse through skin layers, leading to the improvement of their bioavailability.

Different pathway of liposomes cutaneous absorption



A. Non-encapsulated ingredient penetration
B. Transcellular penetration (fusion of liposome with skin and diffusion of ingredients through skin layers)
C. Intercellular penetration (diffusion of liposome through skin layers)
D. Transfollicular penetration (penetration of liposome through hair follicule)

PRO-LIPO™ NEO: AN EASY TECHNOLOGY TO CREATE CUSTOMIZED LIPOSOMES

Since liposome membranes are usually composed of an optimized combination of various phospholipids, the type and ratio of the different phospholipids have to be carefully chosen in order to prepare the most stable and efficient structure. This development requires a strong technical knowledge that makes it sometimes too complicated for a non-expert formulator.

In order to make the liposome preparation easier, Lucas Meyer Cosmetics offers the Pro-Lipo™ Neo technology.

Pro-Lipo™ Neo is a ready-to-use mixture of selected phospholipids already organized in lamellar bilayers by their solubilization in an appropriate medium.

This pro-liposome structure requires only the addition of a water phase to spontaneously form, at room temperature, an alcohol free suspension of multilamellar liposomes (mainly bilamellar) of a mean size of 250 nm.

This type of liposomes is small enough to present high cutaneous absorption and release the entrapped ingredients while membranes merge with skin one by one.

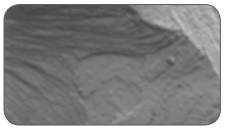
Able to entrap hydrosoluble and/or liposoluble active ingredients, Pro-Lipo™ Neo technology allows the selection of the type and concentration of the ingredients to entrap, offering the possibility to customize liposomes.

The unique customized liposomes obtained can be named with a personalized trade name to promote a strong marketing and technical talk. They can also be useful to relaunch a range with a second generation of a more efficient active ingredient.

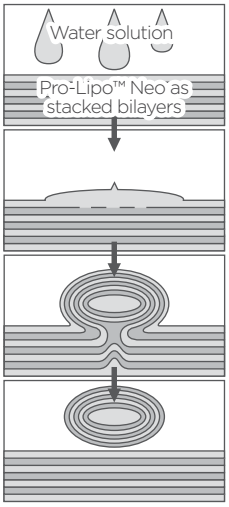
The Pro-Lipo™ Neo technology offers many other advantages:

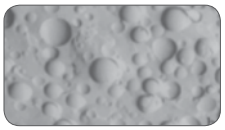
- **It needs low energy steps during the manufacturing process (compared to a classical preparation of liposomes requiring high speed stirring, high pressure, sonication or heat process);**
- **It doesn't contain alcohol or preservatives (compared to some ready-to-use liposome suspensions on the market);**
- **It is suitable for bulk manufacturing and requires no complex equipment;**
- **It forms natural liposome suspensions (usually found with chemical ingredients).**

EASY PREPARATION OF LIPOSOMES WITH PRO-LIPO™ NEO



Electron microscopy image of Pro-Lipo™ Neo bilayers





Electron microscopy image of liposomes formed with Pro-Lipo™ Neo

AN EFFICACY BOOSTER

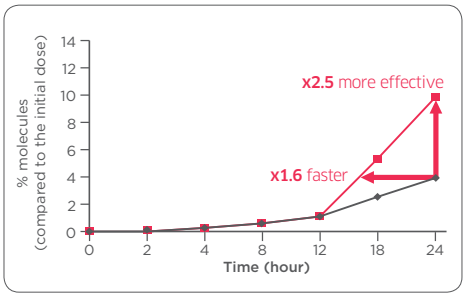
Test protocol

- A water suspension of liposomes was prepared with 1.5% model hydrophilic molecule and 27% Pro-Lipo™ Neo;
- A water solution with 1.5% model hydrophilic molecule was used as a control (non-entrapped molecule);
- Application at a dose of 10 mg/cm² on skin explants (Franz cell method);
- The kinetic of the molecules passed through skin explants was measured during 24h;
- After 24h, the molecule content was measured in each skin layer.

Liposomes formed from Pro-Lipo™ Neo increases the penetration of the active ingredient through the different skin layers. After 24h, the total quantity of bioavailable molecules is higher compared to the control.

The Pro-Lipo™ Neo technology permits a shorter-time activity (x1.6) and higher efficacy (x2.5) compared to the non-entrapped molecule.

DIFFUSION THROUGH HUMAN SKIN



PRO-LIPO™ NEO IS AN EASY SOLUTION TO IMPROVE PRODUCT EFFICACY FOR FASTER AND BETTER RESULTS.

PRODUCT DESCRIPTION

INCI NAME
Propanediol (1) (and) Lecithin (2)

CAS
504-63-2 (1), 8002-43-5 (2)

EINECS
207-997-3 (1), 232-307-2 (2)

ECOCERT STATUS
Registered

APPEARANCE
Amber gel

FORMULATION
A premix (liposome suspension) should be prepared in water and should be added to the formula at a temperature below 40°C.

DOSAGE
0.1 - 3%

OPTIMUM pH
5-8

APPLICATIONS
- All types of O/W emulsions**
- All types of oil free formulas**
***Following formulation advices*

CHINA-COMPLIANT

FEATURES AND BENEFITS

FEATURES	BENEFITS
Ready-to-use alcohol free optimized pro-liposome preparation	- Easy cold process manufacturing of customized liposomes - Requires only water to form spontaneously liposome - Do not require complex equipments
Lipo- and hydrosoluble active ingredient loading	Large choice of molecules to entrap
Increases ingredient percutaneous absorption and bioavailabilty	Boosts product efficacy with faster and better results

REMODELING GEL-CREAM 13.255.06 C140

	INGREDIENTS	INCI NAME	%
A	Deionized Water	Water	77.50
	Dermofeel™ PA-3*	Sodium Phytate (and) Water	0.10
	Ecogel™	Lysolecithin (and) Sclerotium Gum (and) Xanthan Gum (and) Pullulan	2.00
B	Sweet Almond Oil	Prunus Amygdalus Dulcis (Sweet Almond) Oil	3.00
	Shea Butter	Butyrospermum Parkii (Shea) Butter	4.00
	Dermofeel™ Sensolv*	Isoamyl Laurate	2.00
	Dermofeel™ Toco 70*	Tocopherol (and) Helianthus Annuus (Sunflower) Seed Oil	0.20
C	Dermosoft™ 1388 ECO*	Fragrance	4.00
D	Sculptessence™	Water (and) Glycerin (and) Linum Usitatissimum (Linseed) Seed Extract	3.65
	Pro-Lipo™ Neo	Propanediol (and) Lecithin	1.35
E	Suprem'™ WP Cotton	Water (and) Gossypium Herbaceum (Cotton) Seed Oil (and) Lecithin (and) Polyglyceryl-3 Diisostearate (and) Glycerin (and) Glyceryl Stearate	2.00
F	Douceur C3246	Fragrance	0.20

* Distributed in France by Lucas Meyer Cosmetics and Unipex Solutions

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LUCAS MEYER COSMETICS S.A.S.

ZA les Belles Fontaines
99 route de Versailles
91160 Champlan - France
T: +33 (0) 1 69 10 69 69 - F: +33 (0) 1 69 10 69 70

LUCAS MEYER COSMETICS CANADA INC.

Place de la Cité, Tour de la Cité
2600 boul. Laurier, #900
Québec (Québec) G1V 4W2 Canada
T: +1 418 653-6888 - F: +1 418 653-6005

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www.lucasmeyercosmetics.com
info@lucasmeyercosmetics.com