

Cosmetic/Pharma Actives Incorporated

- Vitamins - vitamin A series, vitamin C palmitate, vitamin E, vitamin K, vitamin D and co-enzyme Q10
- Hydrophobic peptides
- Skin lipids - ceramides, cholesterol, cholesterol sulphate
- Anti-fungals - clotrimazole, ketoconazole, nystatin, piroctone olamine
- Anti-bacterials - erythromycin, neomycin sulphate
- Steroidals - cortisone acetate, hydrocortisone, hydrocortisone acetate/butyrate, clobetasol propionate, clobetasone butyrate, dexamethasone, dexamethasone acetate
- Minoxidil, hexyl nicotinate

Botanical Actives Incorporated

- *Aesculus hippocastanum* (Horse Chestnut)
- *Capsicum annuum* (Chilli Pepper)
- *Centella asiatica* (Gotu Kola)
- *Cimicifuga racemosa* (Black Cohosh)
- *Ginkgo biloba* (Maidenhair Tree)
- *Glycine max* (Soy)
- *Glycyrrhiza glabra* (Licorice)
- *Hippophae rhamnoides* (Sea-Buckthorn)
- *Melissa officinalis* (Lemon Balm)
- *Ruscus aculeatus* (Butcher's Broom)
- *Trifolium pratense* (Red Clover)

Example Formulation Centella asiatica Extract (CAE)

Solubility in water	1g / 1340ml ~ 0.08%
Solubility in glycerin	1g / 1000ml ~ 0.10%
Solubility in ethanol	1g / 33ml ~ 3.33%
Solubility in Lipodisq®	1g / 8ml ~ 12.5%

(CAE ~ 30% dry weight of Lipodisq®)



CAE



CAE aq.
emulsion
(1%)



CAE aq.
Lipodisq®
(1%)



Dried CAE in
Lipodisq®

Contact Details

For further information please contact

Malvern Cosmeceutics Ltd

Malvern Hills Science Park, Geraldine Road, Malvern,
Worcestershire WR14 3SZ.

Tel: **+44 (0)1684 585356**

Fax: **+44 (0)1684 585201**

E-mail: **enquiries@malverncosmeceutics.com**



Malvern Cosmeceutics Ltd. 2009

Lipodisq®

A Biodegradable Delivery
System for Cosmetics

The biomimetic solution to
enhance skin penetration

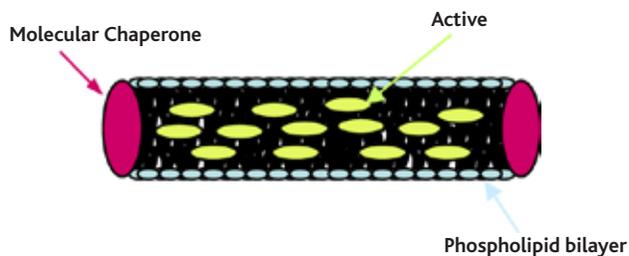
About Us

Malvern Cosmeceutics is a natural products driven development company based in the Malvern Hills, England. The company offers cosmetic manufacturers delivery solutions using its advanced skin penetration system Lipodisq®.



Lipodisq® Technology

- Lipodisq® - proprietary technology for use in dermal delivery of oily or hydrophobic actives
- Mimics structure and carrying ability of natural lipoproteins (HDL)



Lipodisq® cross-sectional structure shown in a discoidal form ca. 20nm

Advantages of Lipodisq® Technology

- Enables easy formulation of oil-soluble or hydrophobic actives into aqueous solutions or aqueous-based gels
- Long-term stability in aqueous environment

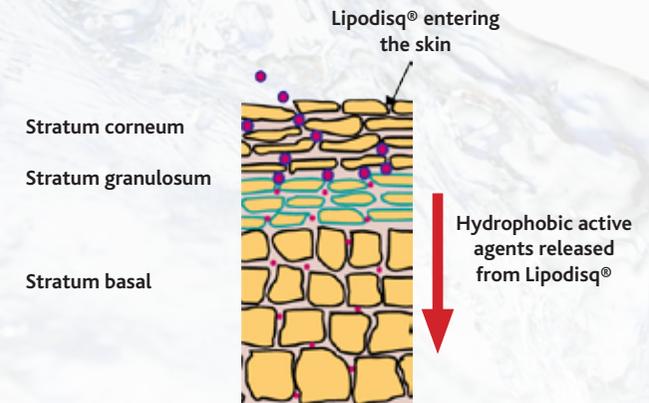


Active in aqueous emulsion

Active in Lipodisq® solution

- Small biodegradable particles (20-40nm) facilitates optimal skin (stratum corneum) penetration
- Significantly smaller particle size than conventional cosmetic delivery systems e.g. liposomes
- Composition consists of cosmetically approved ingredients (INCI)
- Non-irritating
- Tolerant of conventional formulation excipients, e.g. preservatives, viscosifiers etc.
- High active loading - up to 30% of dry weight
- Low material cost
- Lipodisq® particles accumulate in the stratum corneum then degrade harmlessly to give a sustained release of actives into lower skin layers

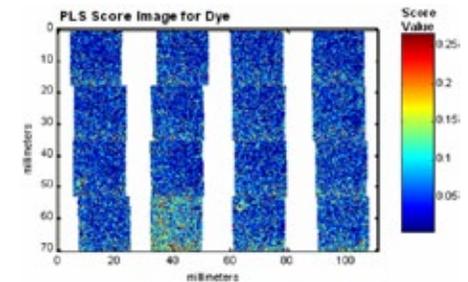
Lipodisq® Technology Facilitates Skin Penetration



Lipodisq® accumulate in the stratum corneum forming a reservoir for release of active agents

Lipodisq® Technology Skin Penetration Study

Skin stripping from 1 cm² area exposed to Lipodisq® formulation containing oil-soluble cosmetic red dye.



N-IR spectroscopic image of marker dye contained on tape strips removed from skin. 1st (top left) to 16th (bottom right) strip, showing accumulation of dye in 14th strip.