

## Micro sponge:

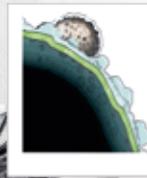
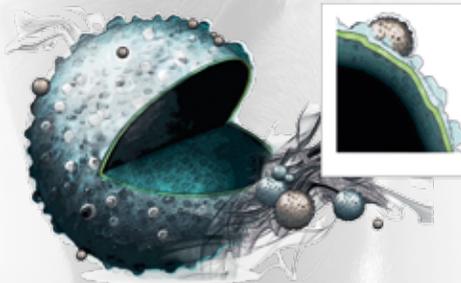


*Micro sponge open. The red dots illustrates the active ingredients stored inside the sponge.*

A micro sponge consists of a matrix which is structurally open to diffusion by a lot of small holes through the matrix and up to the surface. The active ingredient is inside the matrix, and will slowly be dissolved by water passing through the holes.

The smallest of the micro sponges may penetrate into the most superficial layers of the skin, and deliver their load there. The major part will be caught by the chitosane, and kept close to the surface of the skin, where the active ingredients are released over some days. The micro sponges are especially well suited to carry active ingredients which has got a low solubility in water.

## Micro sphere:



*Micro sphere, with particles of active ingredients diffusing away.*

The microsphere consists of an inert solid core with particles of active ingredient attached to its surface, and it is all wrapped up in a thin layer of cellulose polymer.

Due to its very small size and lack of electrical charge, the micro sphere will diffuse into the superficial layers of the epidermis. When placed at its target point the cellulose polymer will slowly disintegrate, and the active substance particles will be released into the surrounding epidermis. This means that the microspheres is a vehicle which produces a targeted and prolonged delivery of active ingredients.



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## A short introduction



## to the EPCP-system of encapsulation vehicles and their benefits



Pet Care



## EPCP-system\* general purpose:

- ✓ Protection of vulnerable active ingredients
- ✓ Separation of incompatible ingredients
- ✓ Predestined placing of active ingredients by the choice of encapsulation type.
- ✓ Sustained release of active ingredients

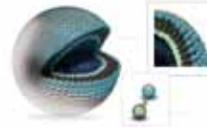
## 5 different vehicles:

- ✓ Liposomes, mono or multi layered
- ✓ Firm micro capsules
- ✓ Micro sponges
- ✓ Micro spheres.

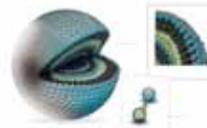
\* Encapsulation-carrier-prolongation-positioning system

## Liposomes:

Two types are available in the system, mono or multi layered.



*Mono layer liposome*



*Multi layer liposome*

Liposomes are spherical shells made of molecules, which have a lipophilic end and a hydrophilic end. When the hydrophilic ends are arranged on the outside of the liposome, it will be fully miscible with water, and it will carry a load of lipophilic ingredient. If multilamellar liposomes are used they will be able to carry both lipophilic and hydrophilic ingredients within the different compartments of the liposome.

The liposomes will normally not penetrate the skin, but depending on their electrical charge on the surface, they may (with a charged surface) attach themselves to the skin and hairs. In all cases the chitosane will help keeping the liposomes in contact with the skin, even after rinsing. The liposomes will then gradually degrade and release small quantities of active ingredient. Thus giving a prolonged effect on the skin.

## Capsule:



*Firm capsule*

The capsule consists of an inert spherical shell, which contains the active ingredient. The purpose of using the capsule is to separate an active ingredient from the rest of the shampoo. The reason for this may be to protect the ingredient against degradation, or to be able to have a shampoo with otherwise incompatible ingredients.

The capsule is the vehicle in this system which carries the largest load of ingredient, compared to the weight.

The major part of the capsules will rupture during the washing process, and release the active ingredient.

Those capsules which stay intact will be caught by the chitosane, and kept close to the skin, where they gradually degrade, and thereby releases the active ingredient, for a prolongation of the effect.