

FOR YOUR SKIN

SOOTHE



VECTICELL

OMEGA

# VECTICELL

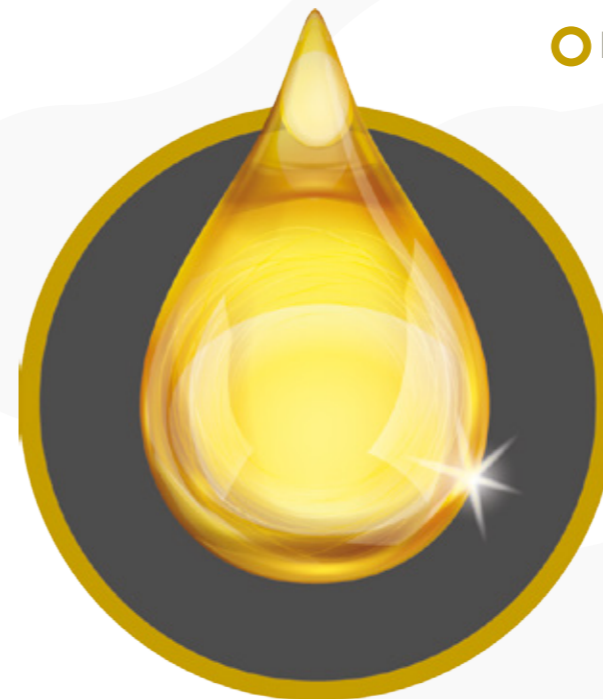
# OMEGA

## 3-6-9

# SOOTHE FOR YOUR SKIN

**Omega 3-6-9** essential unsaturated fatty acids (EFAs) are important both to our health and the proper functioning of the skin. They are present in intercellular cement lipids, mostly ceramides, and phospholipids forming cell membranes. The most important are  $\alpha$ -linolenic (omega-3) acid and linoleic (omega-6) acid, which cannot be synthesized by the human body, and therefore they should be supplemented with food on a regular basis. EUFAs help to reduce inflammation caused by UV radiation, to soothe irritated skin, and to maintain appropriate skin hydration level. They also stimulate the skin repair processes. Omega 3-6-9 acid deficits are known to disrupt the functions of Ceramide 1, which leads to the weakening of the barrier functions of the stratum corneum and the disturbance of the keratinization process. The functions of phospholipids forming cell membranes, which are responsible for maintaining the correct pH of the skin, are also impaired. As a consequence, the skin becomes dry, rough, prone to atopy and psoriasis, and bacterial superinfections<sup>1</sup>. EUFA deficiency can also lead to the exacerbation of acne lesions through thickening of sebum, blocking of sebaceous gland ostia, and thus to the formation of comedones.

**Vecticell Omega** has been designed for dry, sensitive, atopic and acne-prone skin, which shows signs of an impaired epidermal lipid barrier. Various external agents, e.g. detergents, low temperatures, UV radiation, inflammatory processes, disruptions in ceramide metabolism, and higher fatty acid levels in the epidermis, can affect the proper composition of intercellular cement lipids. This is also accompanied by an abnormal keratinization process, which is usually associated with acne vulgaris, psoriasis, fish scales and atopic dermatitis.

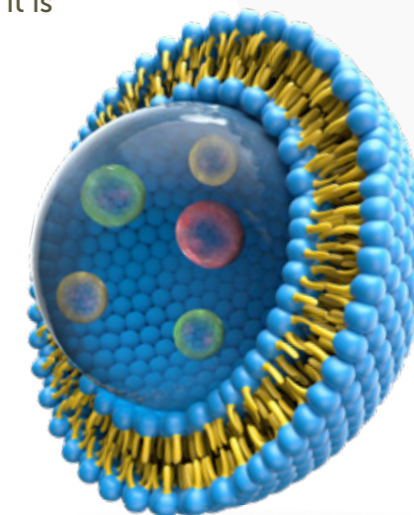


- Regulation of sebaceous glands and secretion of sebum
- Narrowing and limiting the number of pores
- Reduction of acne lesions
- Alleviation of irritation and erythema reduction
- Reconstruction of intercellular cement lipids
- Strengthening the epidermal barrier
- Silencing the UV<sup>2</sup> induced inflammatory process
- Resistance to oxidation processes

## VECTICELL OMEGA

**VECTICELL Omega** is a combination of selected ethyl esters of Omega 3-6-9 acids: linolenic, linoleic and oleic (EE Omega 3-6-9) acids, encapsulated in VECTICELL carriers. Compared to triglycerides, Omega ethyl esters contain higher, standardized levels of Omega 3-6-9 acids. Additionally, they are characterized by much higher oxidation stability as a result of the lower oxygen solubility as compared to triglycerides, which results in reduced potential toxicity, and thus improved skin tolerance. Another benefit of using EE Omega is that it is cleaner than natural triglycerides.

Triglycerides obtained from fish fat increase the risk of presence of environmental toxins such as heavy metals, dioxins, polychlorinated biphenyls, while triglycerides derived from plants may contain pesticides and polycyclic aromatic hydrocarbons. Processes used for purification of EE Omega help to significantly reduce this risk. Furthermore, EE Omega is free of substances which might cause allergic reactions and modulate the hormonal balance.



# IN VITRO

- Stability
- Very good permeability through the epidermis

## Formulation stability

To confirm the stability of VECTICELL Omega carriers, a number of thermal stability tests were performed. The measurements of the size of the carrier particles using dynamic light scattering and pH tests were

**Figure 1. Change of the VECTICELL Omega particles' size**

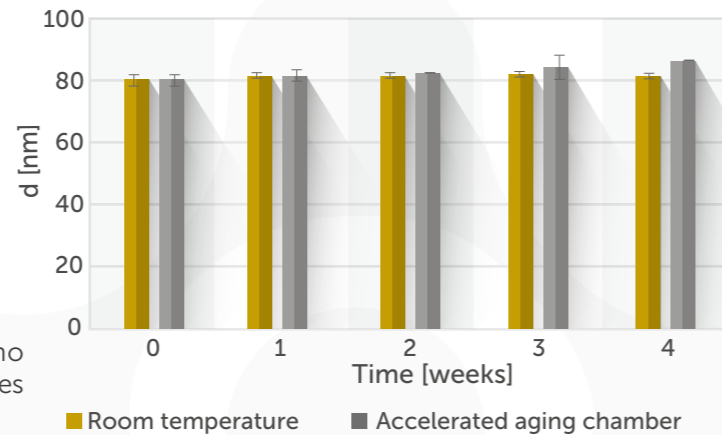
**RESULTS** High stability of the carrier

The study clearly showed that temperature had no effect on the particle size. The stable pH level indicates that there was no hydrolysis to free fatty acids.

## In vitro tests of VECTICELL Omega demonstrated:

- Bioavailability
- Strong antioxidant properties

performed at weekly intervals. The formulation was stored for one month at room temperature in an accelerated aging chamber (+40°C).



## Oxidative stability

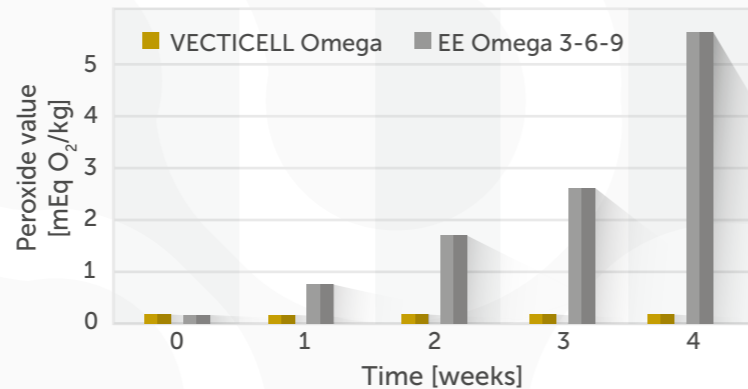
Oxidative stability of Omega 3-6-9 ethyl esters encapsulated in the VECTICELL carrier was confirmed by measuring the peroxide value of the VECTICELL

Omega formulation and free Omega 3-6-9 ethyl esters [EE Omega 3-6-9] based on the PN-ISO 3960 standard.

**Figure 2. Increase in peroxide value**

**RESULTS** The increase in oxidative stability of the system

The encapsulation of ethyl esters of Omega 3-6-9 acids helped to mitigate adverse effects of external agents, mostly oxygen, on the stability of the active substance, thus improving the oxidative stability of the system. The double lipid membrane of VECTICELL vesicles effectively protects Omega 3-6-9 acid



esters against oxidation of unsaturated bonds. The increased stability guarantees greater effectiveness and eliminates the risk of skin irritation which might be caused by products of oxidation of the active substance.

## Antioxidant properties

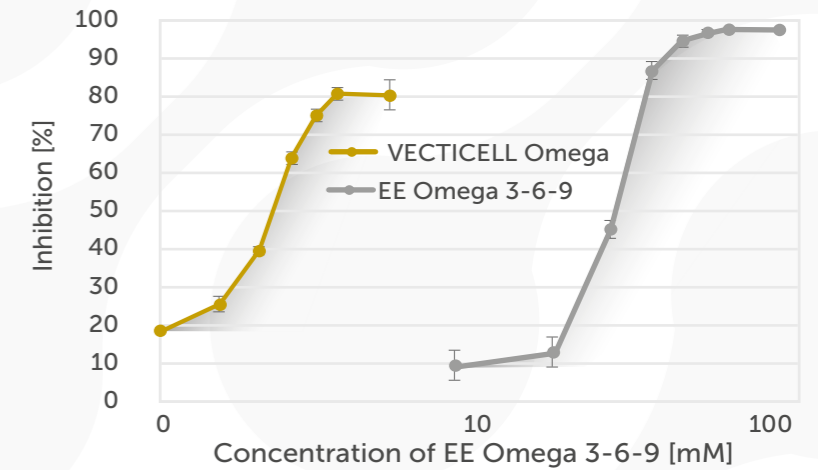
The oxidative stability of Omega 3-6-9 ethyl esters encapsulated in VECTICELL carriers was compared with the properties of non-encapsulated Omega 3-6-9 ethyl esters based on the IC<sub>50</sub> parameter which corresponds to the amount of the active substance needed to reduce the initial DPPH level by 50%. The

lower the value of IC<sub>50</sub>, the better the antioxidant properties. The tests were performed for the active substance concentrations in the range of 0 to 100 mM, under no-light conditions, after 30 minutes of reaction time. The result was given as a radical uptake rate (% of inhibition).

**Figure 3. Free radicals scavenging**

**RESULTS** Stronger antioxidant properties

It was demonstrated that Omega 3-6-9 ethyl esters encapsulated in VECTICELL carriers, have definitely stronger antioxidant properties as compared to non-encapsulated Omega 3-6-9 ethyl esters. This is evidenced by the lower IC<sub>50</sub> values obtained for



ethyl esters encapsulated in VECTICELL carriers. An additional benefit of using VECTICELL carriers is the increased solubility in aqueous solutions, which improves the free radical scavenging capacity of the active substance.

## Skin permeability

To demonstrate the increased skin permeability of Omega 3-6-9 ethyl esters encapsulated in VECTICELL carriers relative to non-encapsulated Omega 3-6-9 ethyl esters using a skin model, an experiment was carried out using the Franz cell chamber. Solutions of VECTICELL Omega and non-encapsulated Omega 3-6-9 ethyl esters were applied to the membrane at

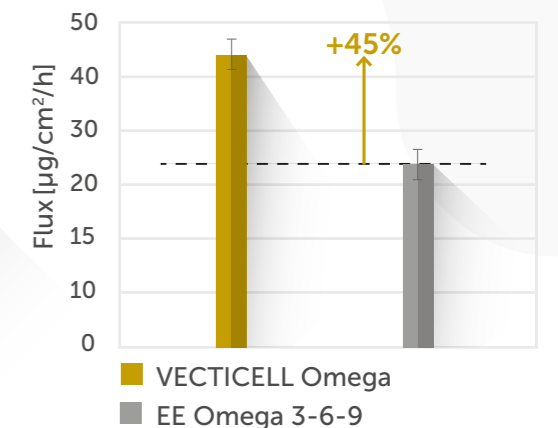
the same concentrations. The level of permeability was monitored for 6 hours. Oxidative stability of Omega 3-6-9 ethyl esters encapsulated in the VECTICELL carrier was confirmed by measuring the peroxide value of the VECTICELL Omega formulation and free Omega 3-6-9 ethyl esters [EE Omega 3-6-9] based on the PN-ISO 3960 standard.

**Figure 4. Permeability of Omega 3-6-9 ethyl esters through the skin**

**RESULTS** Permeability increase

After only 6 hours, the permeability of Omega 3-6-9 ethyl esters encapsulated in VECTICELL Omega was found to have increased by nearly 45% as compared to a solution of non-encapsulated Omega 3-6-9 ethyl

45%



esters. As a result of the flexible lipid bilayer, Vecticell vesicles can penetrate through the epidermis into the deeper skin layers.

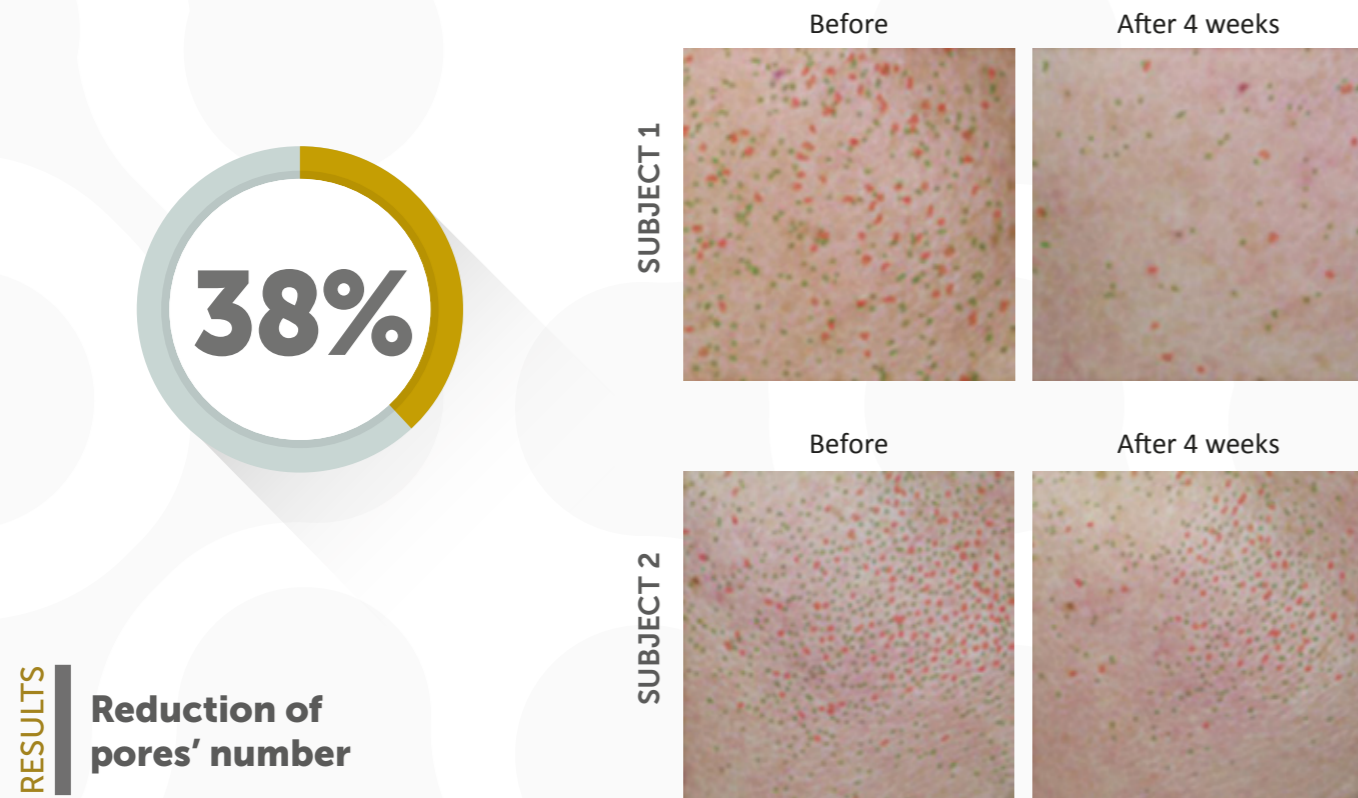
# IN VIVO

In vivo tests are a comprehensive assessment of the effects of active substances on the skin, and as a result they offer the possibility to rule out the potential for causing irritation or allergic reactions. They also help to demonstrate the actual effects of the carriers on the skin. The tests were performed using the cream based on 5% VECTICELL Omega. The study included both instrumental tests and a subjective evaluation

by 30 volunteers with oily and combination skin. The tests were performed by an independent research laboratory. The cream was applied twice daily, in the morning and in the evening, on the clean skin of the face and the neck, for a period of 4 weeks. During that time the subjects did not use any other products intended for identical or similar use.

## Reduction of pores' number

Figure 5

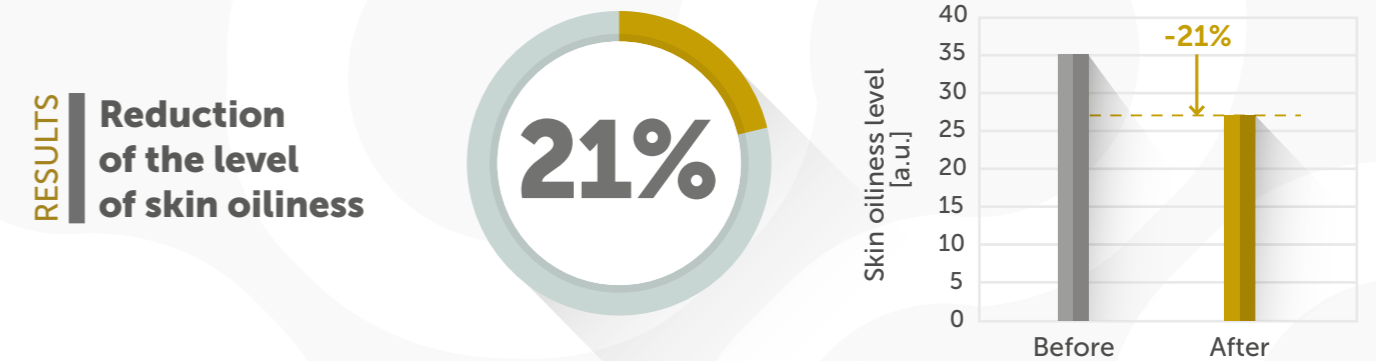


Particularly good effects were achieved in the reduction of the number and size of pores. After 4 weeks of using the cream, the number of pores was reduced on average by 38% as a result of normalized activity of sebaceous glands and elimination of excessive sebum secretion<sup>3</sup>. According to the

literature<sup>3</sup>, derivatives of linolenic acid can modulate the cascade of inflammatory reactions associated with acne by influencing TLR-2 and TLR-4 receptors. This helps to reduce the number of comedones, papules and pustules secondary to mild acne.

## Reduction of skin oiliness

Figure 6



After 4 weeks of using the cream, the skin oiliness level was observed to have decreased significantly, on average by 21%. This shows that VECTICELL Omega helps to normalize sebum secretion and liquefaction, thus reducing the number of comedones and skin shininess,

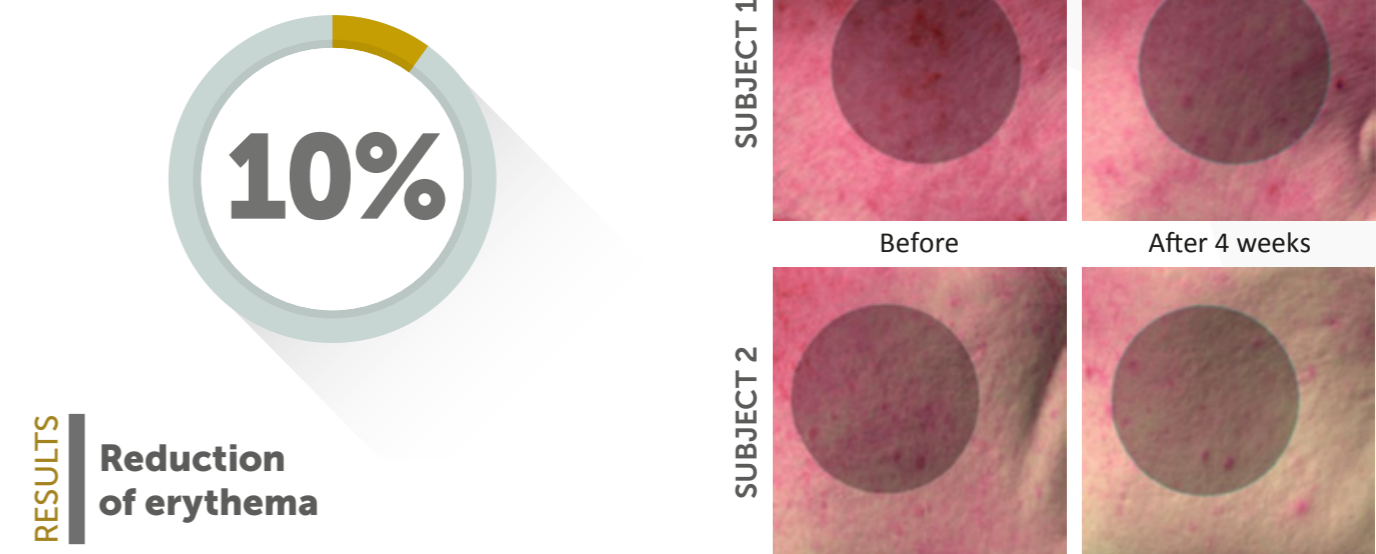
and narrowing sebaceous gland ostia (pores). The linoleic and linolenic acid esters used in the formulation have no comedogenic effects and are particularly effective in reducing comedones and pustules.

## Skin color improvement

In vivo tests of the cream containing 5% VECTICELL Omega were performed in a group of 30 volunteers with oily and combination skin to determine the colour

(erythema) of the skin. The skin redness was measured before and after 4 weeks of using of the cream.

Figure 7



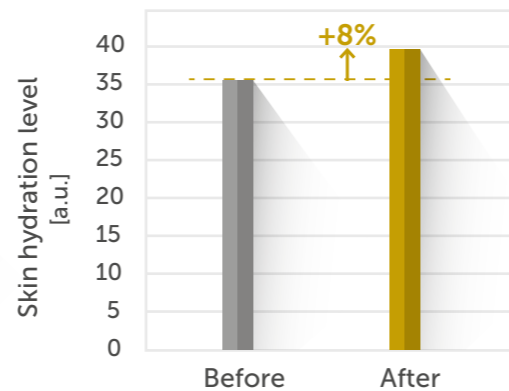
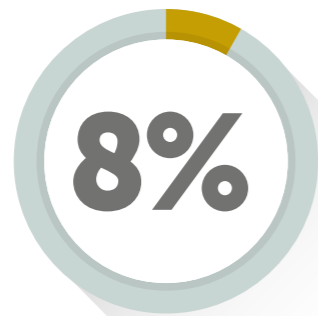
The above photographs of the skin of two test subjects clearly confirm a significant reduction of erythema, on average by 10%, and the reduced visibility of dilated blood vessels in the skin. The results support the effectiveness of VECTICELL

Omega in reducing inflammations within skin capillaries. It has been reported in the literature<sup>2</sup> that it also helps to reduce erythema induced by UV radiation.

## Increased skin hydration

Figure 8

RESULTS  
Reduction of pores' number



After 4 weeks of using the cream containing 5% VECTICELL Omega, the skin hydration level was found to have improved significantly, on average by 8%. This shows that TEWL was significantly reduced and the epidermal barrier was regenerated based on ethyl esters of Omega 3-6-9 acids contained in Vecticell,

which have the ability to become integrated into cell membranes and intercellular cement. The cream is therefore suitable for excessively dry, atopic skin for follow-up care after aesthetic medicine treatments and exposure to sunlight.

## Assessment of the cream based on 5% VECTICELL Omega by test subjects

After one month of using the cream containing 5% VECTICELL Omega, all the study participants confirmed visible and significant soothing effects on the irritated skin areas as well as a noticeable effect of well-balanced skin. As many as 90% of test subjects observed that **the activity of the sebaceous glands was normalized**, which resulted in reduced sebum production, a lower number of pores and an excellent skin-matting effect. The susceptibility to **skin imperfections was also observed to have decreased** (77% of test subjects). A total of 83% of test subjects also confirmed that the cream is **highly effective in reducing erythema**. The product caused no skin irritation in any of the subjects.



# VECTICELL

# OMEGA

## EFFECTIVENESS

In vitro and in vivo studies confirm the effectiveness of VECTICELL Omega in:

- significant reduction in the number of pores,
- smoothing the skin surface,
- regulating the secretion of sebum,
- reducing the ability of imperfections, such as papules, pustules and comedones,
- soothing irritation,
- reducing erythema,
- intensive moisturizing,
- providing the skin with a feeling of relief and comfort.

Products containing VECTICELL Omega are recommendable to users with acne-prone, oily or combination skin, to reduce the "shiny skin" effect, as well as for sensitive skin, prone to irritation and erythema induced e.g. by UV radiation.

1. Bojarowicz H., Woźniak B., Wielonienasycone kwasy tłuszczowe oraz ich wpływ na skórę, Probl Hig Epidemiol 2008, 89(4): 471-475  
2. Angelo G., Essential Fatty Acids and Skin Health, Linus Pauling Institute, Copyright 2012-2017  
3. Araviiskaia E., Dreno B., The role of topical dermocosmetics in acne vulgaris, JEADV 2016, 30, 926-935

# SUMMARY FILE

## Product description

A viscous, opalescent, milky solution.

## Appearance

An opalescent milky to milky-yellow coloured solution.

## INCI

Aqua/Water, Phosphatidylcholine, Propylene Glycol, Polysorbate 80, Ethyl Linolenate, Ethyl Linoleate, Ethyl Oleate, Sodium Deoxycholate, Citric Acid, Disodium Edta, Dehydroacetic Acid, Benzyl Alcohol.

## Storage conditions

The product should be stored in its original packaging. It is necessary to store the product indoors, protected from direct sunlight, at a temperature not exceeding  $5 \pm 3^{\circ}\text{C}$ .

## Shelf life

12 months from the production date.

## Recommended formulation conditions

Shake the product every time before applying.

It is recommended to add the raw material to the final product at the final stage of production, at a temperature not exceeding  $35^{\circ}\text{C}$ . Optimal pH of the formulation during the addition of the raw material: 5.0 – 7.0.

An alkaline pH is inadvisable.

## Soluble in water.

Recommended concentration **3% – 5%**.



# VECTICELL

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