

BotanicalsPlus BP–VitaDerm[™] Complex

cellular level moisture control

INCI Name: Water (and) Urea (and) Yeast Amino Acids (and) Trehalose (and) Inositol (and) Taurine (and) Betaine

Key Benefits:

- Regulates water channeling at the cellular level
- Three key osmolyte regulators
- Cellular membrane homeostasis
- Non-tacky aesthetics
- Ideal for clear formulations

Background

Skin hydration is essential for proper functioning of the barrier that separates our bodies from the outside environment. When the skin's hydration mechanisms function improperly, for example, during times of intense cold or dryness, the skin can begin to crack and the barrier function of the skin is compromised. This results in an accelerated rate of water loss through the skin to the surface. To replace the vanishing water, the skin cells lying just below the stratum corneum must lose moisture to the stratum corneum more rapidly. This accelerating loss of water can be measured as transepidermal water loss (TEWL) and is indicative of improper barrier function. Improperly hydrated skin is also an imperfect surface and this can make daily hygiene and makeup applications more difficult. In addition, as the skin loses moisture, fine lines and wrinkles will appear more predominantly which gives the face and hands the appearance of dryness and aging.

What it Does

BP-VitaDerm[™] Complex is an active blend that controls moisture flux at the cellular level. Moisture flux is essentially the rate at which the water

moves from inside of the cells to the outside of the cells. It is well-known that in dry skin, the flux of water loss accelerates significantly. The blend was designed to regulate the ability to channel moisture to areas where it is needed most. This effect is achieved through a multipronged approached that addresses several key targets of moisture movement. Principal in these pathways is control of Aquaporin-3 (AQP3) functioning. By using select Yeast Amino Acids that mimic and influence AQP3 function, skin cell moisture flux can be improved⁽¹⁻³⁾. By upregulating AQP3 in the skin cells (proteins that are located in the cell membranes of keratinocytes in the skin), BP-VitaDerm[™] Complex helps draw moisture from within the body into the skin cells. Cells are plumped up as they retain water better which leaves the skin hydrated and more supple.

| Typical Properties | |
|--------------------------|---|
| Appearance @ 25°C | Clear to Slightly Hazy, Light Yellow to Amber Liquid |
| Odor | Characteristic |
| Color (Gardner) | 6 Max. |
| pH (as is @ 25°C) | 5.0 - 7.0 |
| Solubility in Water | Soluble |
| NVM (1g-1hr-105°C) | 35% Min. |
| Recommended Use Level | 1.0 - 5.0% |

References

¹ Boury-Jamot M, Daraspe J, Bonté F, Perrier E, Schnebert S, Dumas M, Verbavatz JM. Skin aquaporins: function in hydration, wound healing, and skin epidermis homeostasis. *Handb Exp Pharmacol.* **2009**;190:205-17.

² Wintour EM. Water channels and urea transporters. *Clin Exp Pharmacol Physiol.* **1997**;24:1-9.

³ Bjørkskov FB, Krabbe SL, Nurup CN, Missel JW, Spulber M, Bomholt J, Molbaek K, Helix-Nielsen C, Gotfryd K, Gourdon P, Pedersen PA. Purification and functional comparison of nine human Aquaporins produced in Saccharomyces cerevisiae for the purpose of biophysical characterization. *Sci Rep.* **2017**;7:16899. **BP-VitaDerm[™] Complex** also helps control moisture flux within the cellular membranes through the function of three key cellular osmolyte channels by supply the essential osmolytes required for proper functioning of these channels. The three key osmolytes include betaine, taurine and inositol and they function by influencing the betaine/ GABA transporter (BGT-1), the taurine transporter (TAUT) and the sodium myoinositol transporter (SMIT) [4,5].

Trehalose is not expressed in human skin cells, but rather is also a product of yeast cellular metabolism. Yeast cellular membranes and human skin cell membranes share many proteins and functions in common. During times of stress, yeast express high levels of trehalose to improve water retention. However, it is established that trehalose can influence water binding and water flux conditions in the skin, particularly in skin that has been stressed by UV radiation [6,7].

Finally, urea is one of the principal water control

agents produced in the skin and it functions to essentially soften and plasticize the skin [1, 8-9]. Topically, urea is often added to formulations as a humectant and emollient to improve the skin's texture and elasticity.

How It Works

BP-VitaDerm[™] Complex works with the intrinsic hydrating capacity of our bodies to keep the skin optimally hydrated at a cellular level. Using a product containing **BP-VitaDerm[™] Complex** will help the skin regain its proper moisture balance and will also increase the power of your moisturizer. Hydrating ingredients make the skin more receptive to absorbing all the beneficial ingredients offered by a moisturizer.

Using **BP-VitaDerm[™]** Complex is a versatile way to hydrate the skin by incorporating it into formulations that contain water, including skin care, sun care, hair care, eye care, and even lip plumpers. Its beautiful non-tacky aesthetics help elevate any of these formulations.

Product Applications:

- Hydrous formulations for: hair care skin care sun care
- Clear products
- Ideal for enhanced/advanced eye gels
- Lip plumper applications

References

- ⁴ Warskulat U, Reinen A, Grether-Beck S, Krutmann J, Häussinger D. The osmolyte strategy of normal human keratinocytes in maintaining cell homeostasis. J Invest Dermatol. **2004**;123:516-21.
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- ⁷ Emanuele E, Bertona M, Sanchis-Gomar F, Pareja-Galeano H, Lucia A. Protective effect of trehalose-loaded liposomes against UVB-induced photodamage in human keratinocytes. *Biomed Rep.* **2014**;2:755-759.
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 ⁹ Lorencini M, Brohem CA, Dieamant GC, Zanchin NI, Maibach HI. Active ingredients against human epidermal aging. Ageing Res Rev. 2014;15:100-15.

JEEN International is the exclusive distributor for BotanicalsPlus in the Personal Care Industry.

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