Vital ET®

A unique, bio-available, complex that helps reduce the appearance of skin redness.

A Description
B Properties
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Positioning

- **Origin**
  - Bioavailable complex of tocopheryl phosphate and disodium lauriminodipropionate.

- **Positioning**
  - Innovative approach to limit skin redness induced by various external skin aggressions: bacterial (acne), mechanical (razor burn) and UV induced.

- **Acne induced skin redness**
  - Helps smooth the appearance and redness of acne spots in 6 days.
  - Helps facilitate the transition of acne prone skin to clear skin in 6 days.

- **Razor Burn** (male beard and female leg shaving)
  - Effective in reducing clinical and self-assessed skin redness and discomfort on face, neck and legs caused by razor burn, in two and four weeks.

- **UV induced skin redness**
  - Helps prevent and relieve skin from UV induced redness and discomfort.
  - Activity of Vital ET at 3% is comparable to a positive benchmark.
  - Helps protect *ex-vivo* skin from UV damage and Sunburn Cell (SBC) formation.
  - Helps protect *ex-vivo* skin from Langerhans cells UV depletion.
Tocopherol Phosphate
Vital ET: natural bioavailable form of vitamin E

The beneficial use of vitamins in general and specifically vitamin E, continues to be an active area in dermatology and cosmetic science.

A major skincare challenge for using vitamin E (α-tocopherol) has been to keep it stable in formulations. The most common approach has been to use the ester α-tocopherol acetate. Although it is more stable, it has a different efficacy profile than vitamin E.

An entirely different approach has been taken in designing Vital ET which focuses on a phosphorylated form, tocopheryl phosphate, which scientific evidence shows is a naturally occurring form of vitamin E. [1]

To improve its bioavailability, tocopheryl phosphate has been associated with a complexing agent, disodium laurylaminodipropionate.

α-Tocopherol (α-T) is a typical antioxidant when studied in a test tube. However, like other antioxidants, *in vivo* this molecule has different properties, which are used to trigger signal transduction and modulate gene transcription [1].

At cellular level, α-tocopheryl phosphate (α-TP) is acting in a way similar to α-T but more potently. It appears possible that the conversion of α-T to α-TP produces a more active compound.

*In-vitro* studies have suggested that α-TP may be transported into cells, and once in the cytosol is not significantly hydrolyzed but instead acts as such.

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Vital ET®

Bioavailability
Tocopheryl phosphates: bioavailability (ex-vivo)

Confocal Raman spectroscopy is a non-invasive method that provides depth-resolved information. The recent development of this technique in skin research has enabled the characterization of in vivo variation in skin constituents such as natural moisturizing factors, water and lipids.

In this study, confocal Raman spectroscopy has been utilized to determine the chemical stability and concentration profile of Vital ET 3 hours after topical application to ex-vivo skin (room temperature).

Topically applied the penetration of tocopheryl phosphates into ex-vivo skin is monitored with confocal Raman. The molecule is delivered around 10 µm into the stratum corneum in these experimental conditions.
Efficacy studies

- Acne prone skin
- Razor Burn
- UV redness
Vital ET®

- Clinically demonstrated to help reduce skin redness and help prevent skin damage from shaving, for male (beard) and for female (legs).

- Helps smooth the appearance and redness of acne spots.
- Helps facilitate the transition of acne prone skin to clear skin in 6 days.
- Improves the appearance of spots.

- Clinically reduces the appearance of UV-induced redness
- Helps protect, ex-vivo, skin from UV induced SBC formation and Langerhans cell depletion

Mechanically induced redness and skin damage by shaving

Environmental redness induced by UVA & UVB

Bacterial induced redness related to acne
Acne induced skin redness
Acne induced skin redness: protocol

The clinical study was conducted in order to assess the efficacy of a preparation containing Vital ET to quickly improve the appearance of acneic skin lesions over a six-day treatment period.

Ten subjects whose acne was graded 3-5 on the Modified Cook Acne grading scale and with at least four equivalent red spots on the face (2 on each side). Subjects are 13 to 24 years old.

Subjects received two test materials (Carbomer gel containing 7.5% Vital ET and placebo gel), one to use on the right side of the face and one to use on the left side according to a predetermined randomization. Subjects were instructed to dispense products onto clean fingertips and apply to designated blemishes nightly.

At baseline, and after one, two and five days, volunteers participated in the following procedure:

- Clinical grading of spot shape and redness.
- Assessment of transition from acne prone skin to clear skin in 6 days.
- Subjects completed a self-assessment questionnaire.
Acne induced skin redness: shape & redness

At baseline, and after one, two and five days of test material use, spots were evaluated for shape (0 = flat and 10 = very elevated) and redness (0 = none and 10 = severe). Mean scores are presented for each parameter at each grading time-point.

Results show that the formula containing Vital ET is significantly better than the placebo in smoothing the appearance of acne spots, and reducing redness (observed after 1 and 5 days).

The formula containing Vital ET also significantly outperformed the placebo in reducing redness by day 6 of the treatment period.
Acne induced skin redness: skin clarifying effect

Skin clarifying effect is measured by the disappearance of the red spots.

By day 6, 9 out of the 20 red spots (45%) treated with the formula containing Vital ET had returned to a healthy looking skin. This score was only 1 out of 20 for the placebo treated side.

Additionally, results of a self-assessment questionnaire show that by day 6, 90% of the subjects felt that the formula containing Vital ET gave better results than the placebo in clarifying the skin.
Vital ET®

Acne induced skin redness: conclusion

- Vital ET helps smooth the appearance (shape and redness) of acne spots in 6 days.

- Vital ET helps facilitate the transition of acne prone skin to clear skin.

Results of this study suggest that repetitive skin applications of Vital ET may help acne prone skin reach a healthy looking appearance.
Razor burn
Razor burn: protocol

The clinical study was conducted to assess the efficacy of a cosmetic product containing 5% Vital ET in reducing skin and follicle redness, tactile roughness and skin discomfort associated with razor burn.

Twenty-eight subjects (15 female and 13 male) having mild to moderate razor burn, determined by the clinical grader after shaving at the baseline clinic visit.

Volunteers received a formula containing 5% Vital ET (After Shave Balm 11089-64-1). Volunteers were instructed to use their regular brand of disposable razor to shave their face/neck or legs at their regular frequency, and to apply the test material to the shaved areas after patting dry.

At baseline, then week 2 and week 4, subjects shaved their face/neck or legs within 1 hour prior to each clinic visit and subjects participated in the following procedure:

- Clinical grading on face/neck (male subjects) or legs (female subjects) for the following parameters: dryness, tactile roughness, clarity and razor burn (nicks/cuts, skin redness, follicle redness).
- Subjective Discomfort Assessment at the shaved area.
- Volunteers completed a self-assessment questionnaire at Week 2 and Week 4.
Razor burn: clinical grading

Volunteers were clinically graded on the face/neck (male subjects) or legs (female subjects) for the following parameters using 0 to 10 scale (scale anchors are listed in parentheses):

- Dryness (0 = no dryness, 10 = severe dryness)
- Tactile Roughness (0 = smooth, 10 = rough)
- Razor Burn: Nicks and Cuts (0 = none, 10 = severe)
- Razor Burn: Skin redness (0 = none, 10 = severe)
- Razor Burn: Follicle redness (0 = none, 10 = severe)

Follicle redness may start when hair follicles are damaged, for example by shaving, but also from friction from clothing, insect bites, blockage of the follicle, or braids that are too tight.
Razor burn: clinical grading for male beard shaving

Results showed a statistically significant improvement in all parameters, both for the face and the neck at Week 2 and Week 4 compared to the mean baseline values with the exception of Razor Burn: Nicks and Cuts on the neck at Week 2.
Razor burn: clinical grading for female legs shaving

Results showed a statistically significant improvement in all parameters for the legs at Week 2 and Week 4 compared to the mean baseline values.
Razor burn: self-assessment

 Volunteers self-assessed skin discomfort at Baseline, Week 2 and Week 4. They assessed skin discomfort (burning, stinging, itching and tightness) at the shaved areas using the following grading scale:

- 0 = none
- 1 = mild
- 2 = moderate
- 3 = severe

Results show a statistically significant decrease (improvement) in all 4 assessed parameters at Week 2 and Week 4 compared to mean baseline values.
Razor burn: self-assessment questionnaires

Volunteers also completed a self-assessment questionnaire regarding the tested formula’s attributes and benefits at Week 2 and Week 4:

The after-shave product makes my skin feel:

The after-shave product was effective in:

(\% of subjects that agree strongly or somewhat after 4 weeks)

Results of the questionnaire were very favorable, with a significantly greater proportion of subjects responding positively for all of the asked attributes at Week 2 and Week 4.

Click here for full results
Razor burn: conclusion

The After Shave Balm with 5% Vital ET (11089-64-1) is effective in reducing clinical and self-assessed skin redness and discomfort (burning, stinging and itching) on the face, neck and legs caused by razor burn.

Significant improvements were observed after two weeks of use and maximum results were seen after four weeks.
UV induced skin redness
UV Induced Redness: protocol

The clinical study was conducted to determine the efficacy of Vital ET in improving skin redness as compared to a reference control. Five female subjects, aged 24 to 43, with type II skin (Fitzpatrick Classification) completed this study.

The subjects were occlusively patched with a set of the following test materials on opposite sides of the lower back during treatment before or after receiving 1 MED (UVA/UVB light):

- Undosed
- Placebo
- Medium Potency Prescription Steroid Cream 0.1% (reference control)
- 1.25% Vital ET
- 2.5% Vital ET
- 7.5% Vital ET
- 3% Vitamin E Acetate

Each test site was clinically graded for skin redness and Chromameter (a*) measurements were taken to assess skin color.

Results of redness grading were recorded using a scale where 0 = no redness and 10 = bright redness.

Chromameter (a*) measurements were taken to measure the red/green color component of the skin. Increases in the a* value are indicative of increasing red tone.
UV Induced Redness: application before UV

Occlusive patches were applied for 3 consecutive days (Day 2, Day 3 and Day 4) on opposite sides of the lower back. All patches were worn for approximately 24 hours. On Day 6, each test site received 1.0 MED of UVA/UVB light.
Application of Vital ET for three consecutive days prior to exposure to 1.0 MED of UV light resulted in lower scores compared to the sites where vitamin E acetate, placebo and an undosed patch site were applied.

Difference in degrees of redness were noticeable as early as 1 day after exposure. Vital ET at 2.5% and 7.5% performed better than the positive benchmark (steroid cream 0.1%).
UV Induced Redness: application after UV

On Day 3, subject received 2.0 MED of UVA/UVB light on the back. Immediately after, subjects were occlusively patched. The patches were applied for three consecutive days (Day 3, Day 4 and Day 5). Patches were worn for approximately 24 hours. Clinical grading of skin redness and Chromameter (a*) measurements were performed on Day 4, Day 5, Day 6 and Day 7.
Application of Vital ET or the positive benchmark (steroid cream) for 3 consecutive days following exposure to UV light resulted in lower scores compared to undosed, placebo (not shown) and Vitamin E Acetate sites.
UV Induced Redness: conclusion

Vital ET helps protect and relieve skin from UV induced redness and discomfort.

Vital ET effects are visible between 1.25 and 7.5%.

Unlike Vitamin E acetate, Vital ET helps significantly reduce UV induced skin redness.

The activity of Vital ET at 7.5% is comparable to a positive benchmark (steroid cream 0.1%).
Recent studies have demonstrated that tocopheryl phosphate is a naturally occurring form of tocopherol with both soothing and anti-oxidant properties.

The current study investigates the role of mono and ditocopheryl phosphate in the *in vitro* inhibition of prostaglandin E₂ (PGE₂) release from keratinocytes following UV exposure.

Tocopheryl phosphate concentrations of 1.56 µg.mL⁻¹ or greater resulted in a significant decrease in the released amount of PGE₂ by cells after UVB irradiation.

**Cell culture:** Human epidermal cells  
**Product application:** Tocopheryl Phosphates at 0, 1.56, 3.13 and 6.25 µg.mL⁻¹  
**Application time:** 24 hours  
**Evaluation:** PGE₂ released in culture medium 24 hours after UVB irradiation using commercial kit.
Ex-vivo studies were conducted to determine the efficacy of Vital ET in preventing signs of skin damage following a UV irradiation. Skin morphology (including Sunburn Cells - SBC - formation) and Langerhans cell depletion were evaluated.

Vital ET at 1% or at 3% is applied on ex-vivo human skin 24 hours before irradiation with 100 mJ.cm^{-2} UVB and then after for 24 hours.

Vital ET helps limit skin UV damage and SBC formation.

Vital ET helps protect the skin from Langerhans cell depletion.
**Vital ET®**

**UV skin damage: *ex-vivo* skin morphology study**

<table>
<thead>
<tr>
<th>Control</th>
<th>Vital ET 1%</th>
<th>Vital ET 3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>UVB (100 mJ.cm⁻²)</td>
<td>UVB (100 mJ.cm⁻²)</td>
<td>UVB (100 mJ.cm⁻²)</td>
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Histology observation of UVB irradiated skin shows a better preserved morphology and structure, with less SBC formation when *ex-vivo* skin is treated with Vital ET. These results suggest that Vital ET may help the skin’s natural protection from UV damage and SBC formation.
UV skin damage: *ex-vivo* CD1a immunostaining study

CD1a immunostaining observation of UVB irradiated skin shows less Langerhans cells depletion when *ex-vivo* skin is treated with Vital ET. These results suggest that Vital ET helps preserve the skin from Langerhans cell depletion.
Conclusion

The skin is the interface between the body and the surrounding environment. It is daily on the frontline of various aggressions such as bacteria (like acne), abrasion (razor, clothing, etc), pollution and sun (UV radiations).

In response to all these attacks, the skin triggers a mechanism of protection which results in unaesthetic visible redness and sensory discomfort.

Vital ET provides a skin-care solution for a clear and comfortable skin for a healthy looking tone.

Therefore, Vital ET is an excellent biofunctional ingredient to use either in lower concentration in the base of the formula for sensitive skins, or as the key ingredient to smooth the visible signs of skin redness and sensory discomfort.
Cosmetic applications

**Acne prone skin** (reduces the appearance of redness and shape of spots)

**Shaving and After-Shave** (prevents and reduces redness and discomfort related to shaving)

**After-sun** (reduces the appearance of redness caused by sun exposure)

**Deodorants** (reduces the appearance of redness caused by shaving)

**Sensitive Skin Treatment**

**Baby Care**

**Foundations**

**Scalp Care** (helps reduce discomfort and redness resulting from some hair treatments)

Recommended use level: 0.75 to 7.5%
Prototype formulations

**Intensive facial serum**

This multifunctional velvety serum was created to help fight the signs of aging and to reduce the appearance of wrinkles. It contains a unique biofunctional peptide, Collaxyl IS, designed to decrease the appearance of skin wrinkles and help enhance epidermal renewal. Enriched with Vital ET, this product will also help reduce the appearance of redness and discomfort on the face. Other applications for this face serum can be to help sensitive, fragile, delicate skin, mature skin and acneic prone skin.

The serum also contains Si-Tec RE-100, a semisolid translucent resin gel that imparts an elegant, velvety feel to skin and Lubrajel CG and Lubrajel Oil which are highly efficient clathrate hydrogels that deliver superior moisturization for smooth and silky skin.

The formula can be used for intensive anti-wrinkle care (around the eyes), as well as an excellent treatment such as after-shave or after-sun serums.

**Moisturizing after shave balm**

This light, comforting lotion has been formulated especially for the shaven area of a man’s face. A special blend of esters provides exceptional spreadability and a non-greasy afterfeel. This formula also contains Prolipid 151 which provides a lamellar gel system to help generate a “second skin effect” as well as provide long-term moisturization.

The formulation of Vital ET, a particularly interesting ingredient for sensitive skin, helps to prevent and reduce redness and discomfort after shaving. This formula has been clinically proven to help reduce skin redness related to razor burn, improve skin feel and limit nicks and cuts.
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