



NATURAL EMOLLIENTS

Experience the Penreco® difference. Our expertise and reputation were built by over 100 years of dedicated partnerships with our customers. We are devoted to understanding the unique chemistry required to deliver customized solutions to meet the specific needs of today's consumer products. As the personal care and cosmetics industries have experienced the emergence of "clean beauty," our customers increasingly want to incorporate the best natural ingredients into their products.

As an industry leader in specialty products such as gels, petrolatums and white mineral oils, we rely on our experience, high standards, research and development, and innovation to create PenNatural™, a new premium line of natural emollients. PenNatural delivers optimal moisturization and emollient benefits similar to petrolatum, along with a wide range of sensory attributes, perfect for your personal care and cosmetic formulations. PenNatural Plus contains castor oil and candelilla wax which optimizes cost while still delivering strong emollient benefits. PenNatural Ultra and Supreme contain the same ingredients with the addition of squalane which delivers a luxurious skin feel and anti-aging benefits.

APPLICATIONS

■ Cosmetics ■ Personal Care ■ Balms & Ointments ■ Salves & Rubs

PRODUCT SPECIFICATIONS

Test Method	Petrolatum Min - Max (Typical)	PenNatural Plus	PenNatural Ultra	PenNatural Supreme
Lovibond Color	2.0Y max (0.37Y)	12.0Y	21.0Y	32.0Y
Melting Point, °F	125 - 135 (133)	127.0	139.0	148.5
Viscosity @ 210 °F, SUS	64 - 75 (67)	97.5	83.6	80.4
Specific Gravity 60 °C/25 °C	0.815 - 0.855 (0.843)	0.9310	0.9132	0.9075
Consistency, dmm	170 - 205 (185)	201	172	149
*Stability @ 45 °C	Stable	Stable	Stable	Stable

*Accelerated aging study is ongoing (1-month data shown)

**Preliminary Data: these products are not yet commercially available. Please inquire if you have questions and/or would like to sample our products

International Nomenclature of Cosmetic Ingredients (INCI)

PenNatural Plus: Ricinus Communis (Castor) Seed Oil and Euphorbia Cerifera (Candelilla) Wax

PenNatural Ultra: Ricinus Communis (Castor) Seed Oil, Euphorbia Cerifera (Candelilla) Wax and Squalane

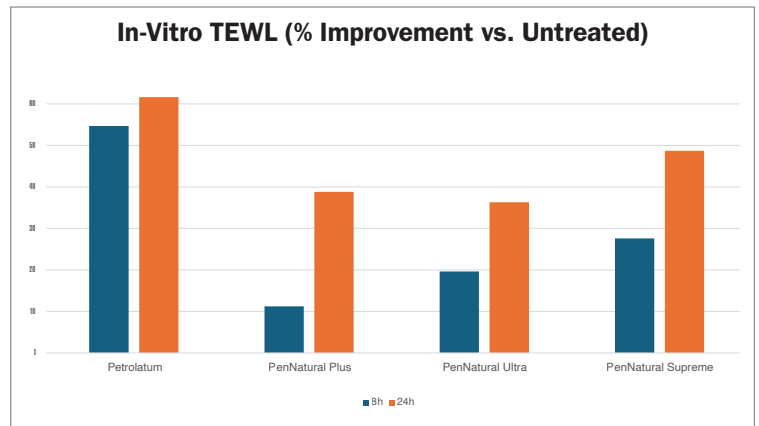
PenNatural Supreme: Ricinus Communis (Castor) Seed Oil, Euphorbia Cerifera (Candelilla) Wax and Squalane



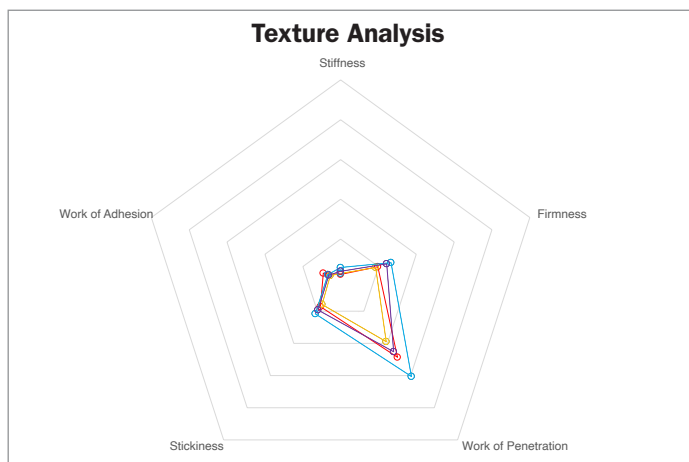
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Transepidermal Water Loss (TEWL) In-Vitro Study

The graph to the right shows significant improvement in TEWL reduction over the duration of the study for PenNatural and Petrolatum control vs. untreated control. Petrolatum shows high level of occlusive moisturization as expected. All PenNatural products show good improvement in TEWL reduction. Thus, the PenNatural products are expected to deliver high and long-lasting moisturizing benefits.



Study #25-017-25-020



Texture Profiling of PenNatural and Petrolatum

PenNatural was evaluated using instrumental texture profiling methods against Petrolatum positive control. The textural properties measured included stiffness, firmness, penetration, stickiness and adhesion. The natural emollients have texture profiles that resemble Petrolatum. PenNatural Supreme most closely mirrored Petrolatum results across all measured parameters. This was followed by PenNatural Plus. PenNatural Ultra exhibited slightly more structure than Petrolatum by this sensitive test method.

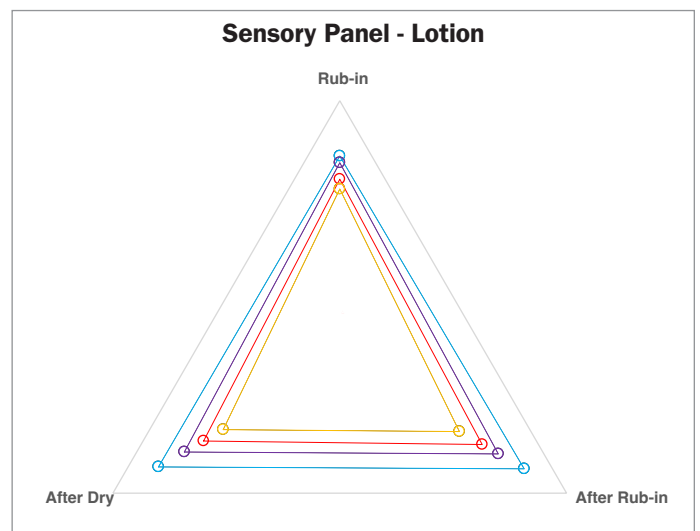
*Texture Profiling measurements were done on TA.XT Plus texture analyzer using the TA-23 round end probe

Sensory Evaluation of Lotion Formulations

Petrolatum and PenNatural were separately added at 3% into a lotion formulation base. These lotions were tested at three use stages: rub-in, immediately after rub-in, and after 7 minutes of drying. The graph shows average preference on a 5-point scale. Panelists (N = 8) also wrote comments at each use stage.

Key Learnings

- PenNatural Ultra and PenNatural Supreme performed the best at all stages. The samples applied smoothly and absorbed well on the skin. They had a thicker, more luxurious feel.
- PenNatural Plus and Petrolatum performed similarly, went on smooth and took slightly longer to be absorbed onto the skin.



PRODUCT KEY: ○ Petrolatum ○ PenNatural Plus ○ PenNatural Ultra ○ PenNatural Supreme

LOTION FORMULATION

This formulation creates a creamy nourishing lotion that delivers the moisturizing and skin feel benefits of Petrolatum and PenNatural. It has a light, soothing, breezy and indulgent tropical fragrance.

PROCEDURE

1. Heat Phase 1 and Phase 2 components separately to 50 – 70 °C.
2. Pour Phase 1 into Phase 2 and blend well.
3. Cool to 40 °C then add Phase 3 components sequentially.
4. Blend to homogenize.

PHASE	INGREDIENT	INCI NOMENCLATURE	W/W%
1	Distilled Water	Aqua	68.10
1	Glycerin, USP	Glycerin	5.00
2	Sunflower Oil	Helianthus Annuus (Sunflower) Seed Oil	8.00
2	CreamMaker WAX (HLB 12-13)	Cetearyl Alcohol (and) Polysorbate 60	2.50
2	CreamMaker Behenyl (HLB 8-10)	Behenyl Alcohol (and) Polyglyceryl-3 Stearate	2.50
2	Lipobutter Refined Shea	Butyrospermum Parkii (Shea) Butter	8.00
2	Petrolatum, or PenNatural Plus, Ultra, Supreme*	Refer to the INCI listing on page 1	3.00
3	Hexanediol CG	1,2-Hexanediol (and) Caprylyl Glycol	0.80
3	Phenoxyethanol	Phenoxyethanol	0.90
3	Vitamin E Acetate	Tocopheryl Acetate	1.00
3	Fragrance: Coral Reef	Fragrance	0.20

*Products in **bold** are supplied by Calumet, Inc.

*Each lotion formulation was created using either Petrolatum, PenNatural Plus, PenNatural Ultra or PenNatural Supreme.

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For product or technical questions, contact your Sales Representative or Calumet Product Support at (800) 437-3188 or email technical@calumet.com.

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