



HAND CARE

FORMULATING LASTING PARTNERSHIPS

PRODUCTS DESIGNED WITH CARE

Penreco's® lines of Versagel®, petrolatums and mineral oils are used in numerous, dermatologically-supported creams and lotions that help fortify the skin barrier. Each product line is available in multiple viscosity ranges and are suitable for a wide variety of personal care formulations.

For more than 100 years, Penreco has specialized in niche product blending to meet customer-specific requirements. We're proud to offer safe stable products that provide a moisturizing agent as well as a gel structure for ease of formulation.

penreco®

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To request a sample, visit penreco.com.

VERSAGEL® M & ME

MOISTURIZING GELS

Penreco's® patented gel technology offers superior moisturization, stabilization, and suspension properties. Versagel products are also nontoxic and compatible with most chemical ingredients providing fragrance and moisture retention characteristics.

TYPICAL PROPERTIES

	Versagel M (Mineral Oil)				Versagel ME (Hydrogenated Polyisobutene)			
	Versagel M 200	Versagel M 500	Versagel M 750	Versagel M 1600	Versagel ME 500	Versagel ME 750	Versagel ME 1600	Versagel ME 2000
Viscosity @ 25° C (cPs)	20,000	50,000	75,000	160,000	64,000	100,000	177,000	260,000
Specific Gravity @ 25° C	0.85	0.85	0.85	0.85	0.82	0.82	0.82	0.82
Saybolt Color ASTM D-156	+30	+30	+30	+30	+30	+30	+30	+30
Flashpoint C ASTM D-92	> 175 °C	> 175 °C	> 175 °C	> 175 °C	> 165 °C	> 165 °C	> 165 °C	> 165 °C

VERSAGEL ME 750 MOISTURIZATION AND LIP CONDITIONING BENEFITS STUDY

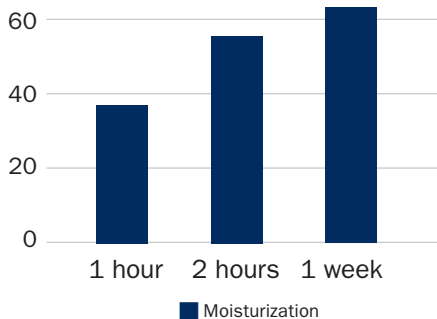
In the clinical study, moisture content of the lips was measured with a NOVA Dermal Phase Meter (NOVA DPM) which measures the moisture in the skin by measuring an electrical parameter (impedance). Measurements were taken on the right and left side of the lower lip to quantify the moisture content of the stratum corneum. Overall, there was a 61% improvement in lip moisture content in 1 week.

Additionally, lip condition was graded by skilled clinician comparing all improvements to baseline. The clinical grading of lip condition correlated with the instrumentally measured improvement in skin moisturization at 1h, 2h, and 1 week:

- Lip Lines: Decreased 62%
- Scaling: Decreased 27%
- Cracking: Decreased 22%

The high sensitivity of lip skin is well known and partly due to its much lower number of skin layers compared to regular skin. This makes lips highly susceptible to dryness. The excellent performance of Versagel ME in lip care applications is due to its exceptional mildness, moisturization, and lip conditioning benefits – which also makes it an excellent ingredient for leave-on skincare products such as creams and lotions.

% Improvement in Moisture Content



SILKY SMOOTH HAND & BODY CREAM

A rich, protective hand and body cream designed to relieve dryness and leave the skin soft and silky smooth. Versagel M 750 provides long-lasting moisturization, a perceptible conditioning effect, and an elegant after-feel.

	Ingredient	Weight (%)
A	Deionized Water	70.6
	Carbomer	0.2
	Propylene Glycol	7.0
	Methylparaben	0.2
	Panthenol	0.1
B	Versagel M 750	8.0
	Propylene Glycol Discarylate/ Dicaprata	5.0
	Isostearyl Alcohol	2.0
	Propylparaben	0.1
	Cetyl Alcohol	2.0
	Glyceryl Stearate (and) PEG-100 Stearate	2.5
	Potassium Cetyl Phosphate	1.75
	Tocopheryl Acetate	0.1
C	Triethanolamine, 99%	0.15
D	Diazolidinyl Urea	q.s.
E	Fragrance	0.1
	Total	100%

*Products in **bold** are supplied by Calumet Specialty Products Partners, L.P.

Procedure: Disperse Carbomer into rapidly agitated deionized water. Add remaining part A ingredients. Heat to 75-80 °C and mix until uniform and lump-free. Combine part B ingredients. Heat to 80 °C and mix until all the solids are dissolved. Add part B to part A. Mix for 30 minutes with good agitation. Add part C. Mix until completely smooth and homogeneous. Cool to 50 °C. Add part D. Cool to 40 °C. Add part E. Continue mixing and cooling to 30 °C.

PETROLATUMS

CUSTOMIZED FROM START TO FINISH

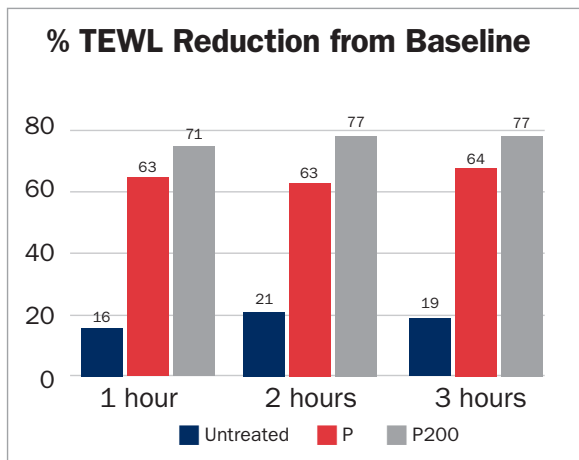
We are devoted to understanding the unique chemistry required to deliver customized petrolatum products to meet the specific needs of today's consumer products. Our manufacturing process delivers high purity, extremely stable and custom natural colors.

TYPICAL PROPERTIES

	Melting Point, °F (°C) USP/ASTM D-127	Viscosity SUS @ 210 °F ASTM D-2161	Maximum Lovibond Color 2" Cell	Consistency @ 77 °F USP/ASTM D-937
WHITE PETROLATUM USP				
Ultima	130/140 (54/60)	60/75	.5Y	155/180
Super	125/135 (52/57)	60/75	.5Y	170/205
Snow	125/135 (52/57)	64/75	2Y	170/205
Regent	118/130 (48/54)	57/70	2Y	210/240
Lily	125/135 (52/57)	64/75	8Y .5R	170/205
Cream	125/135 (52/57)	64/75	18Y 1.5R	175/205
PETROLATUM USP				
Royal	118/130 (48/54)	57/70	35Y 3R	210/240
Blond	125/135 (52/57)	68/82	35Y 2R	175/205
Amber	125/135 (52/57)	68/82	35Y 7R	175/205

PETROLATUM AND VERSAGEL P200 SKIN BARRIER REPAIR STUDY

A clinical study was conducted using petrolatum and Versagel P on the volar forearms of test subjects with self-perceived dry skin. TEWL measurements (DermaLab) were taken at baseline 1 hour, 2 hours, and 3 hours with re-application after each test. The study showed that petrolatum had over 60% decrease in Transepidermal Water Loss (TEWL) and Versagel P200 (gelled Petrolatum) had even higher TEWL at over 70% and both were much more efficacious than the untreated site. Thus, proving that petrolatum and Versagel P200 are highly effective moisturizing ingredients for use in hand creams and lotions.



HEALTHY HANDS LOTION

This thick, rich lotion spreads easily on the skin. It contains a high level of petrolatum for extra moisturization.

	Ingredient	Weight (%)
A	Snow Petrolatum	70.0
	Glycol Stearate SE	5.0
	Isopropyl Palmitate	3.1
	Cetyl Alcohol	2.0
	Polysorbate 20	1.0
	Tocopheryl Acetate	0.1
	Propylparaben	0.1
B	Deionized Water	17.5
	Methylparaben	0.2
C	Aloe Barbadensis Leaf Juice	0.7
	Diazolidinyl Urea	0.3
	Fragrance	q.s.
Total		100%

*Products in **bold** are supplied by Calumet Specialty Products Partners, L.P.

Procedure: Heat part A to 75-80 °C with stirring until uniform. Heat part B to 75-80 °C with stirring. Add part B to part A with stirring. Allow the mixture to cool with stirring. Below 50 °C, add the part C ingredients sequentially. Continue stirring to 30 °C and package.

WHITE OILS

TRUSTED SECURE SOLUTIONS

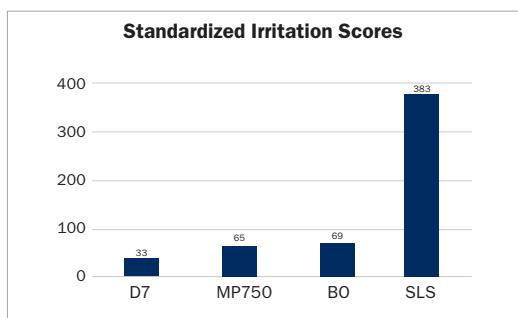
Penreco® white oils of specific viscosities are refined to meet the purity specifications of the USP/NF and FDA. As trusted key ingredient for over 100 years, our manufacturing process delivers not only a high purity and safe product but is also very stable over time.

TYPICAL PROPERTIES

	VISCOSITY		SPECIFIC GRAVITY ASTM D-4052 @ 77 °F	FLASH POINT ASTM D-92 (Typical)		POUR POINT ASTM D-97 (Typical)	
	ASTM D-2161 SUS @ 100 °F	ASTM-D7042 CST @ 40 °C		°F	°C	°F	°C
MINERAL OIL USP							
Drakeol® 600	515/625	99.0/120.0	.860/.878	505	263	max 20	max -7
Drakeol® 350	350/370	66.7/71.2	.857/.873	min 400	min 206	5	-15
Drakeol® 35	340/365	65.8/71.0	.864/.881	465	240	10	-12
Drakeol® 34	370/410	72.0/79.5	.858/.872	475	246	10	-12
Drakeol® 32	312/330	60.0/63.3	.856/.876	440	226	5	-15
Drakeol® 21	200/215	38.4/41.5	.853/.876	420	215	5	-15
Drakeol® 19	180/190	34.9/37.3	.852/.876	410	210	5	-15
LIGHT MINERAL OIL NF							
Drakeol® 15	145/155	28.1/30.3	.850/.873	405	207	5	-15
Drakeol® 13	125/135	24.2/26.3	.848/.867	400	204	5	-15
Drakeol® 10	102/115	19.0/21.9	.838/.864	415	212	10	-12
Drakeol® 10B	95/105	17.7/20.2	.867/.884	340	173	-35	-37
Drakeol® 9	80/90	14.2/17.0	.833/.861	385	196	0	-18
Drakeol® 7	65/75	10.8/13.6	.833/.861	360	182	-15	-26
Drakeol® 6 VR	60.0(typ)	9.4/10.0	.834/.838	350	177	-15	-26
Drakeol® 5	50/60	6.9/9.6	.818/.861	335	168	-20	-29

MINERAL OIL AND VERSAGEL MP STUDY TO DETERMINE COMPARATIVE MILDNESS OF INGREDIENTS

A clinical study was conducted using 100 micro liters occlusive patches of product applied to backs of subjects for 14 days. Using the Berger & Bowman Grading Score the skin patches were evaluated and given standardized cumulative irritation scores. The study showed that Drakeol 7 (D7) was more than 50% less irritating than a commercial baby oil (BO) while Versagel MP 750 had a similarly low irritation score to BO. The study also showed the anionic surfactant sodium lauryl sulfate (SLS) which is a known skin irritant as a positive control. The BO and SLS provided benchmarks that further showed how both Drakeol 7 White Mineral Oil and Versagel MP are very mild ingredients in applications such as moisturizers and offer hydration without irritating sensitive skin.



24/7 SKIN LOTION

This rich, smooth lotion leaves the skin feeling soft and moist. The product spreads easily and does not leave a greasy afterfeel.

	Ingredients	Weight (%)
A	Drakeol 7	7.0
	Myreth-3 Myristate	5.0
	Sorbitan Stearate	3.6
	Cetyl PPG-2 Isodeceth-7 Carboxylate	3.0
	Steareth-100	2.4
B	Dimethicone	0.5
	Deionized Water	72.5
	Glycerin	2.5
C	Carbomer	0.5
	Sodium Hydroxide (10% aq. Solution)	2.0
D	Propylene Glycol (and) Diazolidinyl Urea (and) Methylparaben (and) Propylparaben	1.0
	Fragrance	q.s.
Total		100%

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Procedure: Disperse the Carbomer into rapidly agitated deionized water. Add the glycerin, and heat to 70-75 °C with vigorous stirring. Heat part A to 75-80 °C with stirring. Add part A to part B with stirring and allow to cool. After 5 minutes, add part C. At 40 °C, add part D. Continue stirring to 30 °C.

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