



A BETTER WAY TO FORMULATE

VERSAGEL[®]

INTELLIGENT GEL TECHNOLOGY

The Penreco[®] Versagel technology is used in thousands of cosmetic, pharmaceutical and personal care products around the world. Our innovative patented system for thickening and gelling hydrocarbon materials offers an infinite number of customized rheological properties.

- Clear, colorless (does not discolor with age), hydrophobic, thermally reversible and without syneresis.
- Creates a film barrier for added moisturization, delivers superior stabilization and suspension properties.
- Available in multiple viscosity ranges and compatible with many common ingredients.
- Easier and safer than gels made using metal stearates or fumed silica.
- Provides enhanced fragrance retention and waterproofing properties.

For more than 100 years, Penreco has specialized in niche product blending to meet customer specific requirements. If you are interested in finding out more about the many attributes of our gelled technology, we can provide supporting clinical studies. Please contact your Penreco sales representative and our technical experts will be happy to find a solution that's right for you.

Let us show you a better way to formulate.

penreco[®]

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To request a sample, visit penreco.com.

VERSAGEL® M & MX

MOISTURIZING GELS

The Versagel M & MX products are based on gelling USP grade white mineral oil in such a way as it promotes superior moisture retention by creating a continuous film enabling oil to be easily spread with no pooling of the product. It also provides a low-moisture system for protection of water-sensitive additive packages/ingredients. In liquid systems fine particles don't easily remain in suspension; they tend to settle at the bottom and agglomerate. As shown below in the suspension stability testing, Versagel provides excellent suspension properties because the polymers provide sufficient yield stress to prevent aggregation and settling.

APPLICATIONS

- Color Cosmetics ■ Fragrances ■ Hair Products ■ Soap and Bath Products ■ Skin Care ■ Sun Care
- Pharmaceuticals/Nutraceuticals ■ Healthcare

TYPICAL PROPERTIES

	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °F	SAYBOLT COLOR ASTM D-156	FLASH POINT C ASTM D-92
VERSAGEL M (70 VIS White Mineral Oil)				
M 200	20,000	0.85	+30	>175 °C
M 500	50,000	0.85	+30	>175 °C
M 750	75,000	0.85	+30	>175 °C
M 1600	160,000	0.85	+30	>175 °C

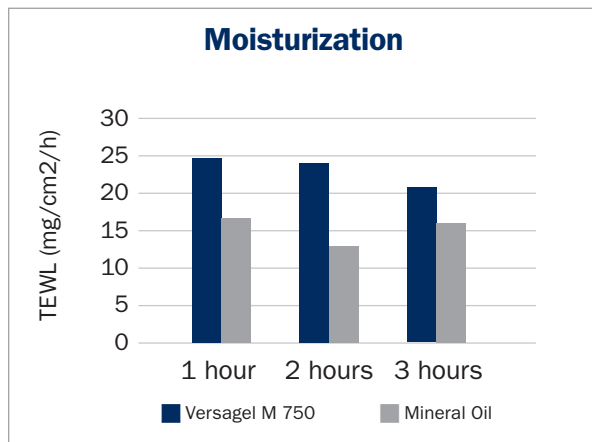
VERSAGEL MX (600 VIS White Mineral Oil)				
MX 500 T	58,000	0.87	+30	>250 °C
MX 750 T	75,000	0.87	+30	>250 °C
MX 1600 T	160,000	0.87	+30	>250 °C

Versagel MX meets the EU Colipa Lip Care Requirements.

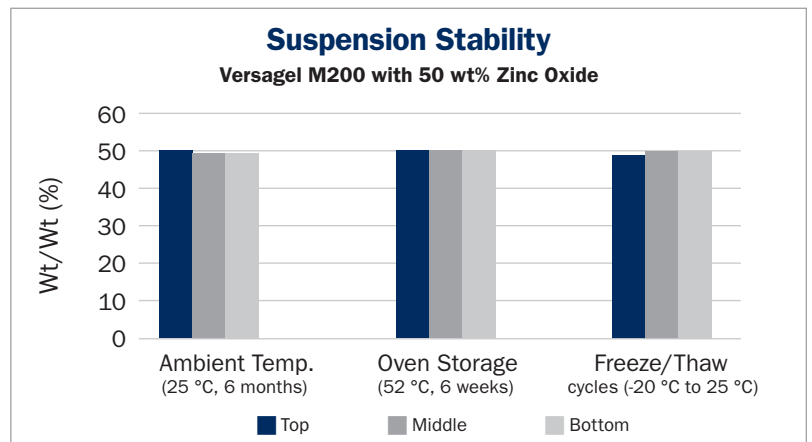
International Nomenclature of Cosmetic Ingredients (INCI):

Mineral Oil (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer.

All products are also available with Tinogard®, Pentaerythrityl Tetra-di-t-butyl Hydroxyhydrocinnamate and will be indicated by a T in the name.



The TEWL test shows gelled mineral oil improves moisturization by 53% more than mineral oil alone. Using a gelled product in your formulation can significantly improve its moisturization benefits.



No change in suspension capabilities under test conditions. Gelled mineral oil maintains suspension of active ingredients at a very high load.

VERSAGEL® MC

LIGHT NON-STICKY GEL

The Versagel MC products are isohexadecane (C16 isoparaffin) as the base. The gelled isohexadecane is known to have great silicone compatibility, slip and shine. As an emollient it can help create a creamy, thick formula, with rich texture and a light non-sticky feel on the skin. In formulations it provides good cleansing properties which is ideal in buffing oils, face primers and gel cleansers.

APPLICATIONS

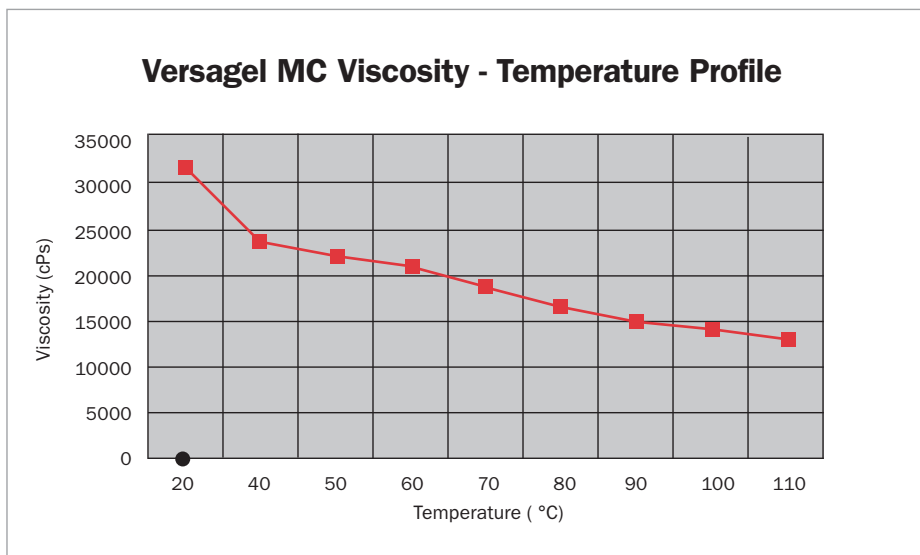
- Color Cosmetics: mascara, primer
- Skin Care: lotions, moisturizers, massage oils, cleansers
- Sun care: suntan oils, sunblock/sunscreen

TYPICAL PROPERTIES

	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASH POINT °C ASTM D-92 (D-93*)
VERSAGEL MC (Isohexadecane)				
MC 750	35,000 - 53,000	0.79	+30	>95
MC 1600	50,000 - 70,000	0.79	+30	>95

International Nomenclature of Cosmetic Ingredients (INCI):

Isohexadecane (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer



Like the other Versagel products, Versagel MC is shear thinning. However, the Versagel MC products are unique in that they exhibit minimal “stringiness” due to the short hydrocarbon chain structure of the base oil. This characteristic is desirable in certain applications where elasticity needs to be minimized. The graph shows how viscosity decreases as the temperature decreases for Versagel MC 750.

VERSAGEL® MD

FAST-DRYING AND TRANSFER-RESISTANT GEL

Gelled Isododecane (C12 isoparaffin) provides a highly volatile emollient with light, non-greasy and low residue skin feel. It is an ideal vehicle for delivering pigments and other solid materials in quick-set/fast-dry anhydrous applications. With a low viscosity and density, Versagel MD products have high spreadability and are used as a film former for applications that require transfer-resistance. The gels have excellent clarity which allows unique items such as glitter, wax beads and other materials to be suspended. It is thermally stable and UV stable as well as compatible with most chemical ingredients including, cyclomethicone and phenyl trimethicone; however, the viscosity of the gel may be decreased significantly.

APPLICATIONS

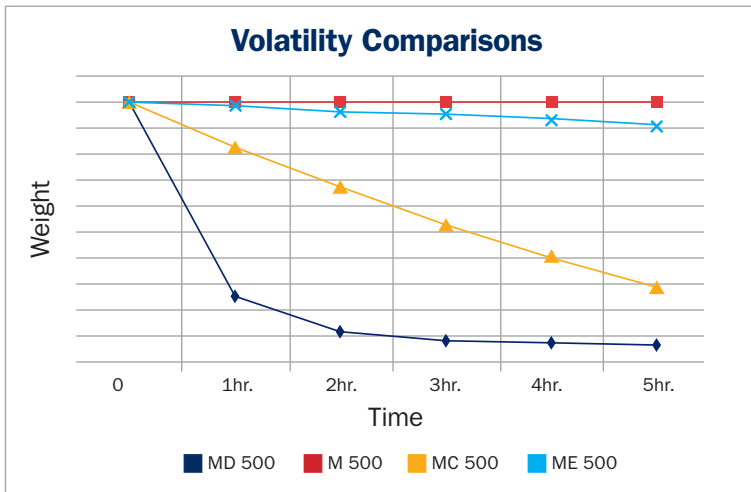
- Color Cosmetics: mascara, eyeliner, lipstick, eyeshadow, face/body paint, blush, bronzer, foundation, setting lotions and primers, body glitter
- Skin Care: serums, gels, oils, lotions, creams, scrubs, balms, makeup remover, hand cleaners
- Hair Care: serums, oils, styling products, conditioners, creams

TYPICAL PROPERTIES

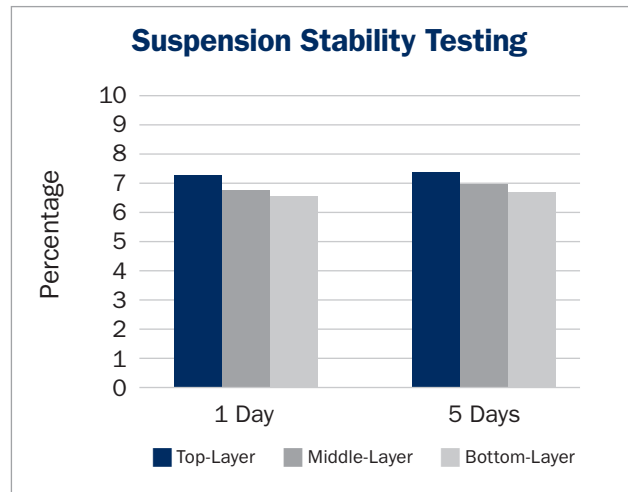
	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASH POINT °C ASTM D-93
VERSAGEL MD (Isododecane)				
MD 500	20,000 - 35,000	0.75	+27	>45
MD 1600	40,000 - 55,000	0.75	+27	>45

International Nomenclature of Cosmetic Ingredients (INCI):

Isododecane (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer



Among the Versagel line of products, Versagel MD has the greatest volatility. The graph illustrates the volatility differences among Versagel MD, MC, ME and M product series. Versagel MD 500 loses 75% of its weight in the first hour, versus 18% for MC 500 and 1.6% for ME 500 at elevated temperatures (90 °C).



The stability results shows Versagel MD 1600 and iron oxide suspension stored at elevated temperature (60 °C). The distribution of iron oxide remains homogeneous throughout the aging process.

VERSAGEL® ME

MINERAL OIL-FREE GEL

The Versagel ME products are patented gelled emollients which exhibit extraordinarily good clarity, excellent thermal and UV stability, and versatile chemical compatibility. It is highly non-polar and thus, has a better affinity for low polarity materials such as fatty esters, low HLB nonionic surfactants, cyclomethicone, and other synthetic and natural emollients. Moisturization properties will be affected only minimally even though the viscosity of the gel may decrease significantly when other ingredients are added.

TYPICAL PROPERTIES

	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR ASTM D-156	FLASH POINT °C ASTM D-92
VERSAGEL ME (Hydrogenated Polyisobutene)				
ME 500	64,000	0.82	+30	>165 °C
ME 750	100,000	0.82	+30	>165 °C
ME 1600	177,000	0.82	+30	>165 °C
ME 2000	260,000	0.82	+30	>165 °C

International Nomenclature of Cosmetic Ingredients (INCI):

Hydrogenated Polyisobutene (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer

APPLICATIONS

- Color Cosmetics: lip gloss, lipstick, mascara, eyeliner, eyebrow gel, eyeshadow, face/body paint, blush, bronzer, foundation, concealer, illuminators, primer
- Skin Care: moisturizers, gels, oils, lotions, butters, creams, scrubs, balms, exfoliators, masks/peels, massage oils, serums
- Sun care: suntan oils, sunblock/sunscreen
- Hair Care: treatments, serums, oils, conditioners, styling products
- Health Care: topicals, ointments, wound healing products

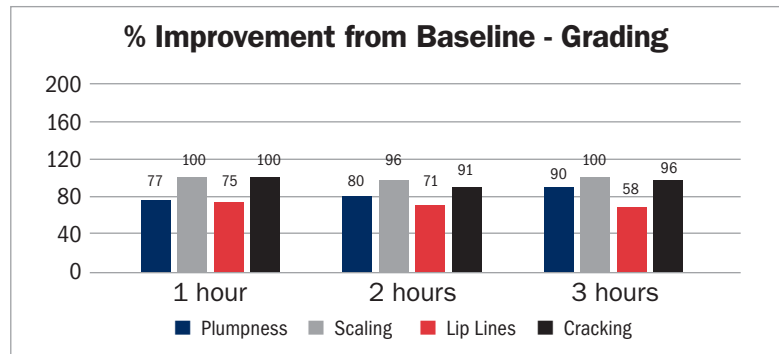
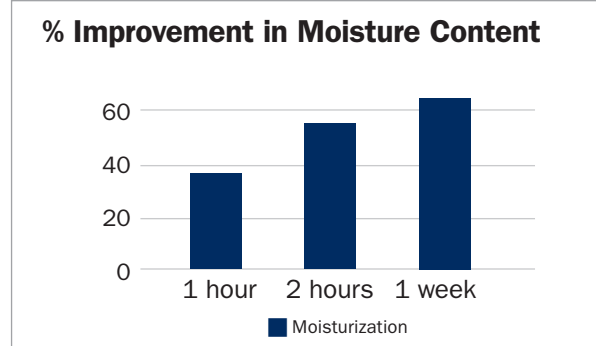
VERSAGEL ME 750 MOISTURIZATION AND LIP CONDITIONING BENEFITS STUDY

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:

- Plumpness: Increased 45%
- Scaling: Decreased 27%
- Lip Lines: Decreased 62%
- 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.



VERSAGEL® MG

CONDITIONING AND CLEANSING GEL

The Versagel MG products are based on hydrogenated C6 – C14 alkenes combined with the Penreco patented gelling technology. The Versagel MG offers an alternative to silicones for formulating products when a silky, elegant after-feel is desired. Versagel MG gels are compatible with most ingredients, with most non-ionic surfactants, and other synthetic and natural emollients. A unique property of the Versagel products is their suspension capability for fine particles. Versagel MG can be utilized as suspension vehicles for fine particles or encapsulated liquids such as Zinc Oxide, Titanium Dioxide, Iron Oxide, Talc, Decorative Glitters and Vitamins E and C.

APPLICATIONS

- Color Cosmetics: lipstick, lip gloss, lip balm, lip oil, mascara, eyeshadow, powder/blush/bronzer, foundation, concealer
- Skin Care: gels, oils, creams/lotions, cleansers, masks/peels

TYPICAL PROPERTIES

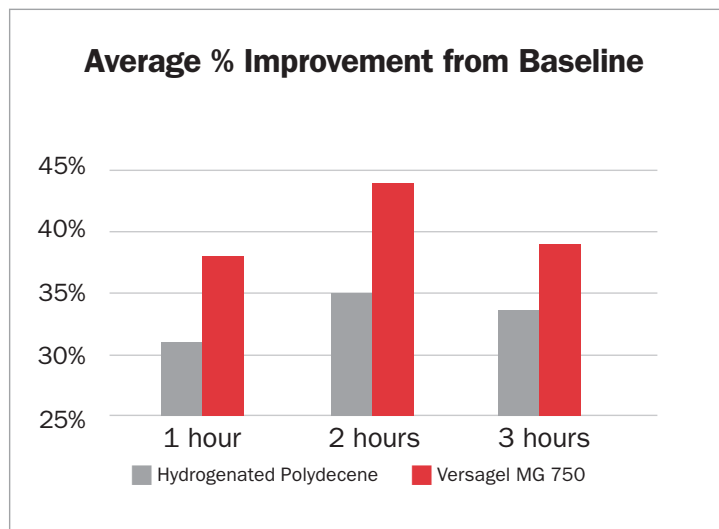
	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASH POINT °C ASTM D-92 (D-93*)
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VERSAGEL MG (Hydrogenated Poly (C6-14 Olefin))

MG 500 T	50,000 - 75,000	0.82	+30	>175
MG 750 T	85,000 - 110,000	0.82	+30	>175
MG 1600 T	140,000 - 180,000	0.82	+30	>175

International Nomenclature of Cosmetic Ingredients (INCI):

Hydrogenated Poly (C6-14 Olefin) (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer and Pentaerythrityl Tetra-di-t-butyl Hydroxyhydrocinnamate.



A moisturization clinical study measuring transepidermal water loss (TEWL) showed that the gelled hydrogenated poly (C6-14 olefin) (Versagel MG 750) outperformed the neat hydrogenated poly (C6-14 olefin) throughout the test period. The test demonstrates that Versagel MG 750 exhibits better occlusivity and barrier function improvement on skin than the same substrate ungelled.

VERSAGEL® ML

FAST ABSORBING DRY-FEEL GEL

The Versagel ML products are based on C12-15 Alkyl Benzoate, which provides a light, dry and non-greasy skin feel. It provides superior solubility, broad ingredient compatibility, and water proofing properties. It also brings additional benefits such as suspension and stability of APIs such as organic sunscreen agents and topical pain relievers. It's known as an emulsifier and solubilizer for sunscreen agents and antiperspirant actives. The suggested use level of these gels ranges from 5% to 70%, depending on the specific application. Versagel ML products can be easily combined with other oil-phase ingredients in the formula when they are mixed at elevated temperature. To ensure uniformity during mixing, it is highly recommended that nonpolar or less polar ingredients be added to the gel first. Cyclomethicone and nonpolar esters can also be added to formulations containing Versagel ML materials to modify the aesthetics of finished products.

APPLICATIONS

- Color Cosmetics: mascara, lipstick, lip liner, lip gloss, rouge, multi-use illuminator, eyeshadow, foundation
- Skin Care: serums, gels, oils, lotions, creams, balms, butters
- Sun Care: self-tanning, sunblock/sunscreen, bronzing gel, after sun, suntan oil
- Hair Care: treatments, conditioners, serums, oils, pomade, colorants

TYPICAL PROPERTIES

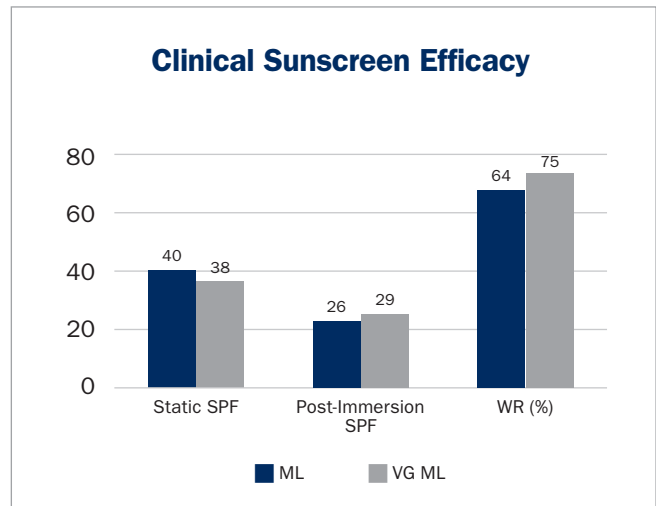
	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASHPOINT °C ASTM D-92
VERSAGEL ML (C12-15 Alkyl Benzoate)				
ML 750	105,000	0.92	+25	>205
ML 1600	280,000	0.92	+25	>200

International Nomenclature of Cosmetic Ingredients (INCI):

C12-15 Alkyl Benzoate (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer

CLINICAL EFFECT OF VERSAGEL ON SUN PROTECTION FACTOR (SPF)

This study showed that both sunscreen lotion containing ML and VG ML performed similarly for static sunscreen protection with average SPF of 40 and 38 respectively. Similar comparative performance was seen after 40 minutes of immersion with SPF of 26 vs. 29 for ML and VG ML respectively. Both products can be classified as good water resistance with WR of 64% vs. 75% for ML and VG ML respectively. The 15% improvement in water resistance achieved by VG ML placed its performance on the threshold of very good water resistance. This result shows that VG ML can be used to improve the water resistance of sunscreen products.



VERSAGEL® MN

SILKY CONDITIONING GEL

The Versagel MN products are anhydrous clear gels that provide versatility and a distinctive, elegant feel. The polymer system provides lubricity and conditioning, while the ester base, isononyl isononanoate, offers non-greasy emolliency. Due to the polymer matrix in the gel, these materials enable fine particles, such as color pigments, to be readily suspended or dispersed with minimal settling and agglomeration. The Versagel MN products also exhibit good thermal and UV stability and silicone solubilization.

Depending on the application, the suggested use level may range from 5% to 60%. Versagel MN gels should be blended with the rest of the ingredients in the oil phase of the formulation, while the nonpolar or less polar ingredients are added to the gel first. The gels are compatible with most nonionic surfactants, cyclomethicone, phenyl trimethicone, and other synthetic and natural emollients.

APPLICATIONS

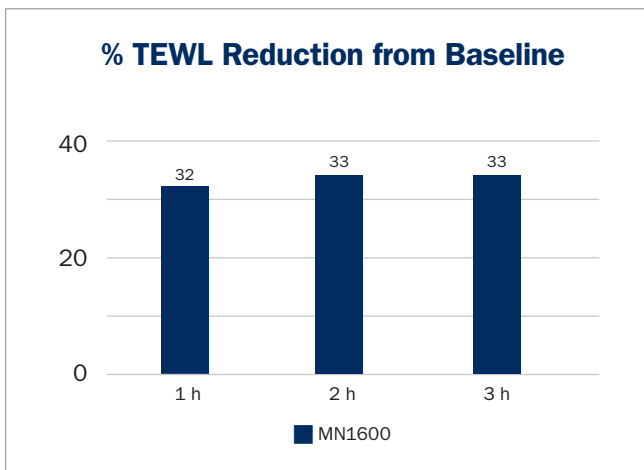
- Color Cosmetics: lipstick, lip polish, lip stain, lip gloss, lip balm, eye shadow, brow shadow, bronzer, foundation
- Skin Care: depilatory cream, scrubs/exfoliators, serums, moisturizers, creams, lotions
- Sun Care: sunblock/sunscreen

TYPICAL PROPERTIES

	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASHPOINT °C ASTM D-92
VERSAGEL MN (Isononyl Isononanoate)				
MN 750	105,000	0.92	+25	>205
MN 1600	280,000	0.92	+25	>200

International Nomenclature of Cosmetic Ingredients (INCI):

Isononyl Isononanoate (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer



The rapid and sustained moisturization improvement of Versagel MN results showed a >30% reduction in Transepidermal Water Loss (TEWL), an improvement from baseline statistically significant at $p \leq 0.05$

VERSAGEL® MP

ENHANCING GEL

Versagel MP products are a gelled fatty ester made from isopropyl palmitate. Isopropyl palmitate is an emollient ester derived from isopropyl alcohol and palmitic acid, generally conforming to the following structure: $\text{CH}_3(\text{CH}_2)_{14}\text{CO}_2\text{CH}(\text{CH}_3)_2$. Similar to hydrocarbon gels with similar chain length, the Versagel MP materials are equipped with a long hydrophobic hydrocarbon chain to provide skin occlusivity. Additionally, they have a carboxylic functionality near the end of the molecule to give a drier and lighter skin feel.

Versagel MP acts as a fast spreading emollient providing moisturization and efficient absorption. It provides a soft and supple texture as well as good spreading characteristics. Isopropyl palmitate is an established penetration enhancer for transdermal systems and the innovative gelled option can provide better functionality and aesthetics.

APPLICATIONS

- Color Cosmetics: lipstick, lip gloss, lip gel
- Skin Care: creams, lotions, face mask/peels, oils
- Hair Care: treatments, serums, oils

TYPICAL PROPERTIES

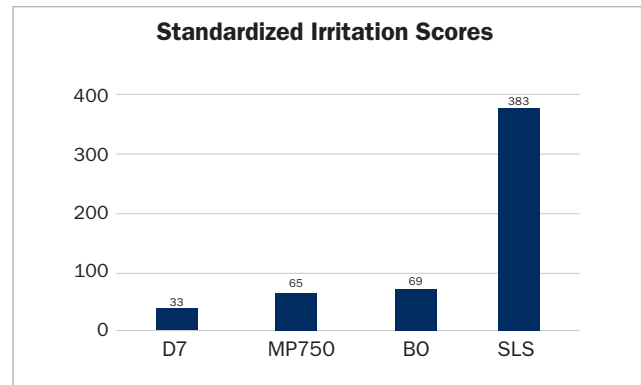
	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASH POINT °C ASTM D-92
VERSAGEL MP (Isopropyl Palmitate)				
MP 750	82,000 - 108,000	0.86	+27	>160
MP 1600	160,000 - 200,000	0.86	+27	>160

International Nomenclature of Cosmetic Ingredients (INCI):

Isopropyl Palmitate (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer

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.



VERSAGEL® P

HYDRATING AND PROTECTING GEL

The Versagel P products combine highly purified, USP-grade, white petrolatum with block copolymers to enhance the occlusivity that naturally accompanies all petrolatum products. Even though petrolatum is considered the best occlusive agent available, our studies indicate that gelled petrolatum outperforms ungelled petrolatum in reducing transepidermal water loss (TEWL). These Versagel P products also exhibit excellent thermal and UV stability, as well as a versatile chemical compatibility.

APPLICATIONS

- Color Cosmetics: lipstick, lip balm, lip gloss, illuminator, foundation, blush
- Skin Care: lotions, creams, balms, butters, moisturizers, scrubs/exfoliators, rash guard, body wash
- Hair Care: moisturizers, pomade, styling products, treatments
- Health Care: scar treatment, topicals, ointments, wound-healing products, pain relief
- Other: diapers and paper products

TYPICAL PROPERTIES

	VISCOSITY @ 110 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASH POINT °C ASTM D-92
VERSAGEL P (Petrolatum)				
P 100	380 (typ)	0.87	Opaque (Lovi Bond <3.0y)	>260
P 200	2,800 - 6,800	0.87	Opaque (Lovi Bond <2.0y)	>260

International Nomenclature of Cosmetic Ingredients (INCI):

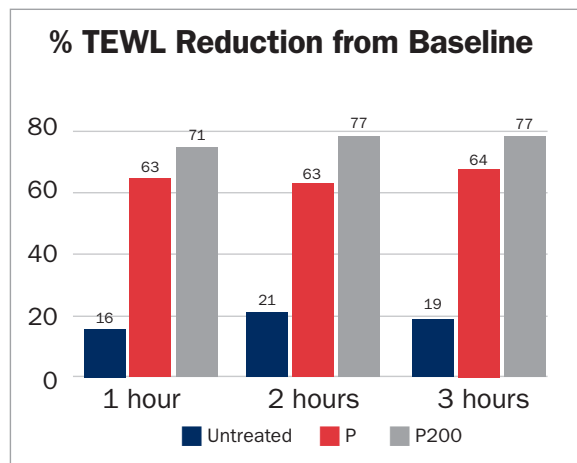
Petrolatum (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer

Also available, Versagel P "EU" version which is Colipa compliant. Colipa compliance parameters:

Viscosity ≥ 11 cSt at 100 °C, Average molecular weight ≥ 500 and, Carbon number at the 5% boiling point ≥ 25

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.



Unlike conventional petrolatums that become very fluid in the temperature range of 50 – 60 °C, Versagel P products maintain some degree of consistency above 60 °C. These gelled petrolatum materials have a much broader melting temperature "slope." Versagel P gels are stiffer and have more adhesive properties than conventional petrolatums. These gels also provide film-forming benefits which can enhance the characteristics of several types of finished products.

Even though Versagel P products are made from white petrolatum, USP, the gels are not classified as USP products. All components are listed on US TSCA, Canadian DSL. One or more components are listed on EU EINECS, Japanese ENCS.

VERSAGEL® SF

VERSATILE SILICONE-FREE GEL

The Versagel SF products offer a silicone-free alternative for haircare with flexibility to suit a formulator's unique needs. The Versagel SF product is based on Isoparaffin combined with the Penreco patented gel technology. The gellant system for the SF product is comprised of proprietary synthetic polymers which allow the gels to be clear, stable, thermally reversible and is BHT free. The Versagel SF gels are compatible with most non-ionic surfactants and other synthetic and natural emollients.

TYPICAL PROPERTIES

	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASH POINT °C ASTM D-92
VERSAGEL SF (C13-14 Isoparaffin)				
SF	12,000	0.84	+30	>206

APPLICATIONS

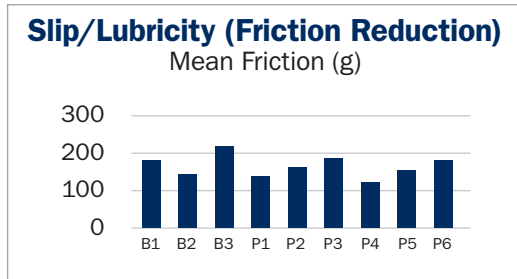
- Hair Care: colorants, treatments, styling products, serums, oils, creams, moisturizers

International Nomenclature of Cosmetic Ingredients (INCI):

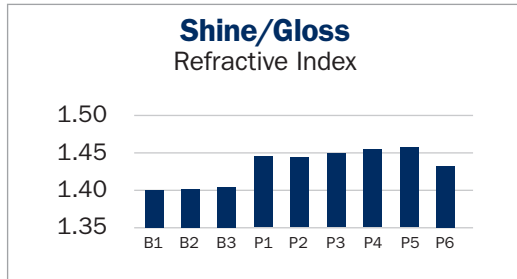
C13-14 Isoparaffin, Butylene/Ethylene/Styrene Copolymer, Ethylene/Propylene/Styrene Copolymer, Pentaerythrityl Tetra-Di-t-Butyl Hydroxyhydrocinnamate

UNIQUE PROPERTIES

Studies on the Versagel SF technology have shown that the Penreco gelled products improve key properties such as slip, shine and smoothness compared to commercial benchmarks.



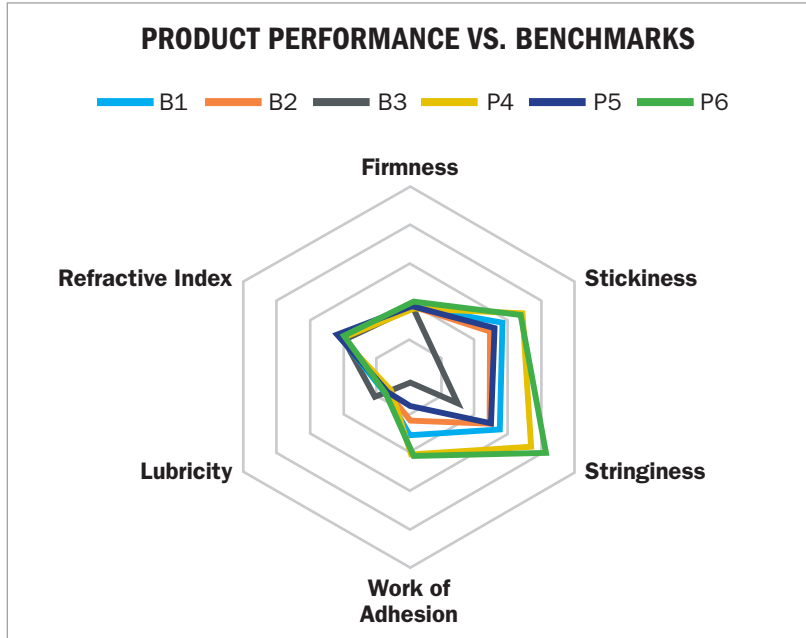
Versagel SF formulation outperformed even the most lubricious benchmark (B2).



All Versagel SF blends have higher RI than all commercial hair oil product benchmarks.

VERSATILITY

Test results indicate that the prototype formulation using Versagel SF allows for formulation versatility in various attributes such as shine, rheology and lubricity. Based on formulator's performance goals for a haircare product, formulation can be adjusted to optimize key attributes.



KEY

- Benchmark Oil 1 (B1)
- Benchmark Oil 2 (B2)
- Benchmark Oil 3 (B3)
- Versagel SF/Sunflower Oil (90/10) (P1)
- Versagel SF/Sunflower Oil (80/20) (P2)
- Versagel SF/Sunflower Oil (70/30) (P3)
- Versagel SF/Sunflower Oil (60/40) (P4)
- Versagel SF/Sunflower Oil (50/50) (P5)
- Versagel SF/Dodecanol (50/50) (P6)

VERSAGEL® SQ

ANTI-AGING “NATURAL” GEL

Versagel SQ products are a great additive or substitute in both oil-based formulas and emulsions. Versagel SQ is a gelled form of squalane. Squalane is naturally present in the skin lipid barrier and is an ingredient known for its exceptional skin membrane fluidizing and moisturizing properties, and its ability to penetrate the skin to deliver benefits. Like jojoba, it closely mimics the body’s natural moisturizers and is absorbed quickly and effectively, without leaving greasy residue on the skin. Squalane is a non-GMO, plant-derived ingredient and Versagel SQ is a high-quality replacement for shark and olive squalene. It is derived from plant sugar, is ECOCERT approved, and is readily biodegradable as well.

Versagel SQ is a versatile ingredient which works well in skin care, sun care and baby care. In skin care, it helps to facilitate an even distribution of sunscreen active ingredients. In baby care, it softens the skin and is easily absorbed. In makeup, it facilitates the even application of products such as lipsticks, foundations and hot-poured products such as lip balms, glosses and gels. It also is a useful ingredient in hair care products, as it lends a soft after-feel.

FORMULATION BENEFITS

- Non-polar, colorless and odorless
- Stable to oxidation, heat, cold and UV
- Easily incorporated into emulsions
- Compatible with most cosmetic ingredients
- Spreads easily and is rapidly absorbed into the epidermis
- Highly moisturizing, softens and soothes
- Creates very elegant textures

**Data provided pertains to pure Neossance® Squalane, not in gelled form*

APPLICATIONS

- Color Cosmetics: foundation, lipstick, lip balm, lip gloss, primer, rouge/cheek balm, highlighter/contour
- Skin Care: serums, gels, oils, lotions, creams, moisturizers, masks, butters, complexion correction
- Sun Care: self-tanning, sunblock/sunscreen
- Hair Care: shampoos, conditioners and styling products

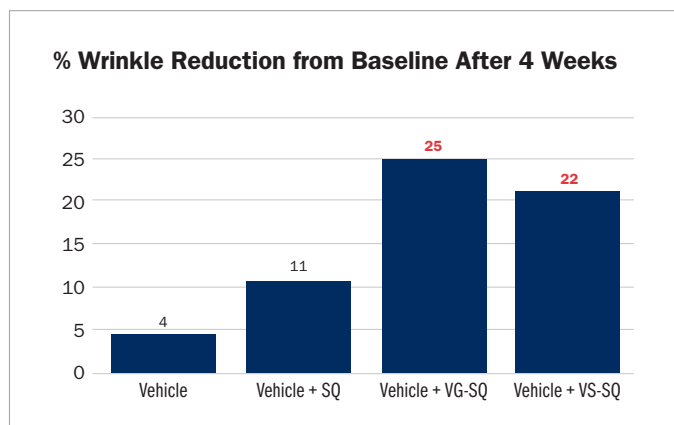
TYPICAL PROPERTIES

	VISCOSITY @ 25 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASH POINT °C ASTM D-92 (D-93*)
VERSAGEL SQ (Squalane)				
SQ 500 T	52,000	0.81	+28	>218
SQ 1600 T	138,000	0.81	+30	>218

International Nomenclature of Cosmetic Ingredients (INCI):

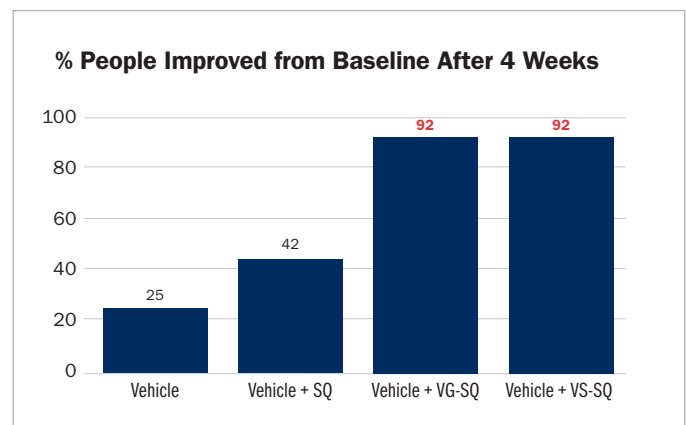
Squalane (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer and Pentaerythrityl Tetra-di-t-butyl Hydroxyhydrocinnamate.

ANTI-AGING CLINICAL STUDY TO COMPARE THE EFFECT OF VERSAGEL SQUALANE TO SQUALANE AND A PLACEBO



Reduction of Periorcular Wrinkles

Subjects showed an average of 25% reduction in total area of periorcular wrinkles after 4 weeks. Test results showed VG-SQ is 127% more effective than SQ.



Improvement of Overall Appearance

92% of subjects showed an improvement of visual smoothness and texture after 4 weeks. Test results showed VG-SQ is 119% more effective than SQ.

APPLICATIONS

- Color Cosmetics ■ Fragrances ■ Hair Products ■ Soap and Bath Products ■ Skin Care ■ Sun Care
- Pharmaceuticals/Nutraceuticals ■ Healthcare

VERSAGEL[®] TYPICAL PROPERTIES

	VISCOSITY @ 25 °C (cPs)	VISCOSITY @ 110 °C (cPs)	SPECIFIC GRAVITY @ 25 °C	SAYBOLT COLOR D-156	FLASH POINT °C ASTM D-92 (D-93*)
VERSAGEL M (70 VIS White Mineral Oil)					
M 200	13,330 - 27,700	-	0.85	+30	>175
M 500	47,000 - 57,000	-	0.85	+30	>175
M 750	67,000 - 83,000	-	0.85	+30	>175
M 1600	132,000 - 198,000	-	0.85	+30	>175
VERSAGEL MC (Isohexadecane)					
MC 750	35,000 - 53,000	-	0.79	+30	>95
MC 1600	50,000 - 70,000	-	0.79	+30	>95
VERSAGEL MD (Isododecane)					
MD 500	20,000 - 35,000	-	0.75	+27	>45*
MD 1600	40,000 - 55,000	-	0.75	+27	>45*
VERSAGEL ME (Hydrogenated Polyisobutene)					
ME 500	50,000 - 75,000	-	0.82	+30	>165
ME 750	85,000 - 110,000	-	0.82	+30	>165
ME 1600	140,000 - 180,000	-	0.82	+30	>165
ME 2000	245,000 - 325,000	-	0.82	+30	>165
VERSAGEL MG (Hydrogenated Poly (C6-14 Olefin))					
MG 500 T	50,000 - 75,000	-	0.82	+30	>175
MG 750 T	85,000 - 110,000	-	0.82	+30	>175
MG 1600 T	140,000 - 180,000	-	0.82	+30	>175
VERSAGEL ML (C12-15 Alkyl Benzoate)					
ML 750	105,000	-	0.92	+25	>205
ML 1600	280,000	-	0.92	+25	>200
VERSAGEL MN (Isononyl Isononanoate)					
MN 750	105,000	-	0.92	+25	>205
MN 1600	280,000	-	0.92	+25	>200
VERSAGEL MP (Isopropyl Palmitate)					
MP 750	82,000 - 108,000	-	0.86	+27	>160
MP 1600	160,000 - 200,000	-	0.86	+27	>160
VERSAGEL MX (600 VIS White Mineral Oil)					
MX 500 T	58,000	-	0.87	+30	>250
MX 750 T	75,000	-	0.87	+30	>250
MX 1600 T	160,000	-	0.87	+30	>250
VERSAGEL P (Petrolatum)					
P 100	-	380 (typ)	0.87	Opaque (Lovi Bond <3.0y)	>260
P 200	-	2,800 - 6,800	0.87	Opaque (Lovi Bond <2.0y)	>260
VERSAGEL SF (C13-14 Isoparaffin)					
SF	12,000	-	0.84	+30	>206
VERSAGEL SQ (Squalane)					
SQ 500 T	52,000	-	0.81	+28	>218
SQ 1600 T	138,000	-	0.81	+30	>218

International Nomenclature of Cosmetic Ingredients (INCI)

Each product line includes the gelled (substrate) and Ethylene/Propylene/Styrene Copolymer, Butylene/Ethylene/Styrene Copolymer. All products are also available with Tinogard[®], Pentaerythrityl Tetra-di-t-butyl Hydroxyhydrocinnamate and will be indicated by a T in the name.

penreco[®]

Penreco[®] is a registered trademark of Calumet Refining, LLC ("Calumet"), which is a wholly owned subsidiary of Calumet Specialty Products Partners, L.P.



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