



A BETTER WAY TO FORMULATE

VERSAGEL®

VERSAGEL® HSQ

INNOVATIVE NATURAL GEL

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.
- 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®

138 Petrolia St., Karns City, PA 16041
800.437.3188 ■ 724.756.1050 ■ penreco@clmt.com

To request a sample, visit penreco.com.

VERSAGEL[®] HSQ

INNOVATIVE NATURAL GEL

The Versagel HSQ product offers a silicone-free alternative to oil-based and emulsion formulas. The gelled structure is based on Hemisqualane (C13-15 Alkane) combined with patented block copolymer technology. Hemisqualane is a non-volatile emollient derived from plant sugar and is inherently biodegradable, ECOCERT-approved, NPA Natural Seal Certified, and a USDA Certified bio-based product. It provides a light, non-greasy and silky feel, and serves as an effective alternative to petroleum and silicone-based ingredients. The gelled version provides additional benefits of a rheology modifier and a suspension agent for a wide range of cosmetic and personal care applications.

APPLICATIONS

- Hair Care: colorants, treatments, styling products, serums, oils, creams, moisturizers
- Color Cosmetics: lip gloss, foundations/fluid illuminators
- Skin Care: creams, cleansers, make-up removers, lotions, balms, moisturizers, butters
- Sun Care: sunblock/sunscreen

TYPICAL PROPERTIES

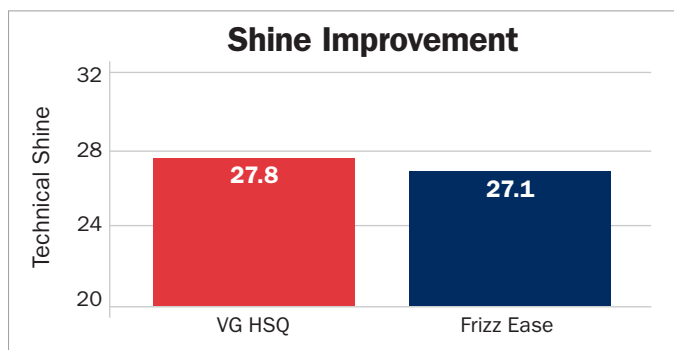
	VISCOSITY @ 25 °C D2983 (cPs)	SPECIFIC GRAVITY @ 25/25 °C D4052	SAYBOLT COLOR D156	FLASH POINT °C ASTM D92	POLARITY Log P
VERSAGEL HSQ (C13-15 Alkane)					
HSQ 200T	13,500	0.8080	+25	>200	6.2

Finished formulations using each Versagel product can vary depending on the other ingredients incorporated. To help formulators understand how each Versagel may perform we have provided the calculated polarity. The polarity calculation was performed on Mol inspiration yielding a value of Log P. A higher Log P means more non-polar.

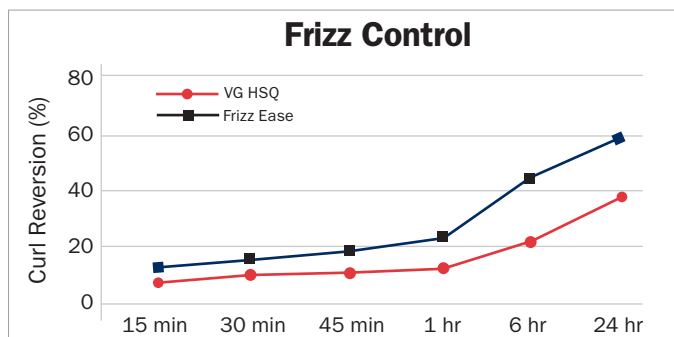
International Nomenclature of Cosmetic Ingredients (INCI): C13-15 Alkane (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer and Pentaerythrityl Tetra-di-t-butyl Hydroxyhydrocinnamate

UNIQUE PROPERTIES

Efficacy testing of a Versagel Hemisqualane hair serum formulation (VG HSQ) demonstrated that VG HSQ improves key properties such as shine and frizz compared to a commercial benchmark (Frizz Ease) which had a high silicone content. Shine Improvement was measured using a Samba instrument while Frizz Reduction was measured via curl reversion after humidity chamber exposure.



For the Shine Improvement test, clinically prepared hair swatches of virgin frizzy black hair were cut into small sections approximately five grams each and 1/2" wide. Swatches were treated with equal amounts of assigned hair serum. The results demonstrate that VG HSQ hair serum formulation gives similar amount of shine as the Frizz Ease benchmark.



For the Frizz Control test, six curly hair swatches were treated with the assigned test serum and swatches were then treated with a flat iron and brush. Initial straight hair length measures were taken and the swatches were placed in a high T and % RH Chamber. Curl reversion was measured at various time intervals. The prototype hair serum significantly outperformed Frizz Ease at 30 min and beyond (95% confidence). This shows that Versagel HSQ significantly improves anti-frizz performance

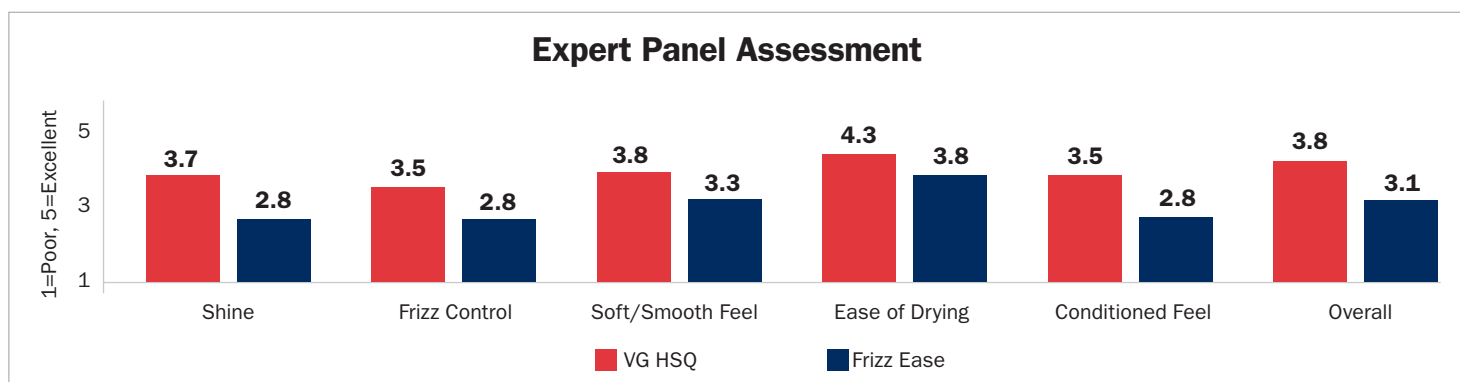
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There is a good correlation between objective Frizz Control measurements (% Curl Reversion in humidity chamber) and subjective Frizz Control (Expert Panel Assessment) with both confirming superior performance of VG HSQ over Frizz Ease.

Expert Panel Assessments

Prepared swatches of virgin frizzy black hair cut into small sections (approx. 5 g each; 0.5" wide). Treated each swatch with equal amount of assigned hair serum and allowed to dry. Expert panel of 8 judges rated the hair swatches on the five attributes (shown in the ballot) on a scale of 1 –5; (1 = Poor, 5 = Excellent).



Expert Panel Assessment shows that VG HSQ is equal or superior to Frizz Ease across a wide range of consumer relevant attributes.

PRODUCT FORMULARY

VERSAGROOM

This formulation combines Versagel HSQ with natural oils and Cedar Leather scent for a multifunctional 2-in-1 hair and skin treatment. This grooming treatment is designed to soften and tame the beard and hair with a healthy shine while moisturizing the skin and scalp underneath.

Phase	Trade/Common Name	INCI	WT%
A	Versagel HSQ	C13-15 Alkane (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer and Pentaerythrityl Tetra-di-t-butyl Hydroxyhydrocinamate	54.5
B	Grapeseed Oil	Vitis Vinifera (Grape) Seed Oil	30.0
B	Apricot Oil	Prunus Armeniaca (Apricot) Kernel Oil	10.0
B	Argan Oil	Argania Spinosa Kernel Oil	5.0
B	Cedar Leather	Fragrance	0.5

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

Procedure: Melt Phase A (85 °C). Add Phase B. Mix Phase A/B at 85 °C until homogeneous. Pour into suitable containers and allow to cool.

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