



A BETTER WAY TO FORMULATE

**VERSAGEL®**

## **VERSAGEL® SF HAIRCARE STUDY**

### SHINE AND ANTI-FRIZZ PERFORMANCE

Versagel SF products offer a silicone-free alternative for haircare with flexibility to suit a formulator's unique needs. The Versagel SF products are based on Isoparaffin combined with patented block copolymer 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.

**penreco®**

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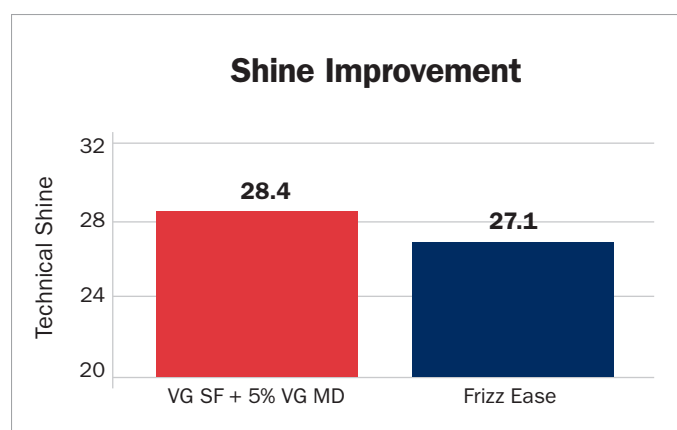
# VERSAGEL<sup>®</sup> SF HAIRCARE STUDY

## SHINE AND ANTI-FRIZZ PERFORMANCE

Calumet Specialty Product Partners L.P. has created Versagel SF and is a gelled emollient that provides a personalized and multifunctional ingredient for hair care. Due to the customizable benefits, it allows for incorporation of various natural and essentials oils. Versagel SF provides shine boosting, smoothing and frizz fighting benefits.

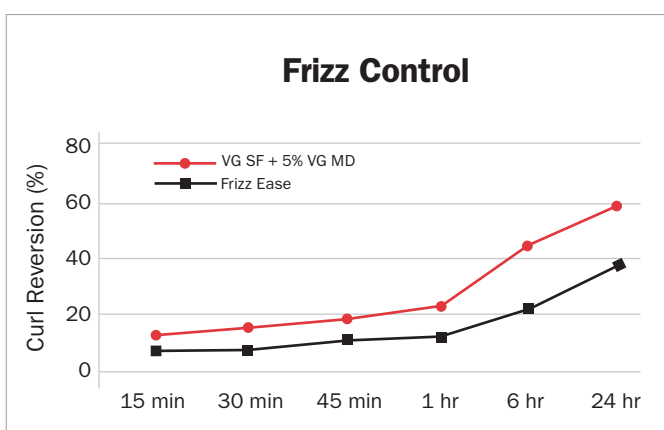
A recent study performed on a Versagel SF hair serum formulation (VG SF) demonstrated VG SF improves key properties such as shine and frizz compared to a commercial benchmark (Frizz Ease) which had a high silicone content. Shine Improvement was measured using a Samba instrument while Frizz Reduction was measured via curl reversion after humidity chamber exposure.

### OBJECTIVE MEASUREMENTS



For the Shine Improvement test, clinically prepared hair swatches of virgin frizzy colorant scale level 1 for dark black hair were cut into small sections approximately 5 grams each and 1/2" wide. Swatches were treated with equal amounts of assigned hair serum.

The results demonstrate VG SF hair serum formulation give similar amount of shine compared to 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 they placed in a high T and % RH Chamber.

Curl reversion was measured at various time intervals. The prototype serum significantly outperformed Frizz Ease at 30 min and beyond (95% confidence).

Overall, this shows Versagel Technology improves anti-frizz performance.

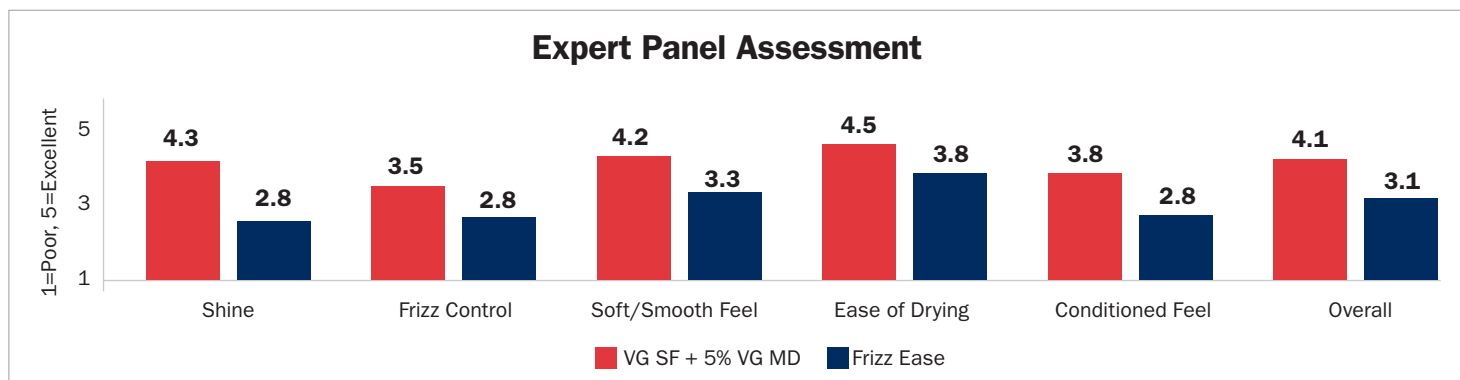
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There is a good correlation between objective Frizz Control measurements (% Curl Reversion in humidity chamber) and objective Frizz Control (Expert Panel Assessment) with both confirming superior performance of VG SF over Frizz Ease.

### Expert Panel Assessments

Prepared swatches of Virgin frizzy colorant scale level 1 for dark 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 dry. Expert panel of eight 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 SF is superior to Frizz Ease across a wide range of consumer relevant attributes.

## PRODUCT FORMULARY

### VERSASHINE

This formulation combines Versagel SF & Versagel MD for a multifunctional hair treatment for moisturization, shine and frizz taming. Apricot, grapeseed and Argan Oils enable a relaxing scalp treatment with the added benefit of Versagel MD which aids in providing fast-dry properties.

Phase	Trade/Common Name	INCI	WT%
A	<b>Versagel SF</b>	C13-14 Isoparaffin (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer (and) Pentaerythrityl tetra-di-t-butyl Hydroxycinnamate	54.5
A	<b>Versagel MD 500T</b>	Isododecane (and) Ethylene/Propylene/Styrene Copolymer (and) Butylene/Ethylene/Styrene Copolymer (and) Pentaerythrityl Tetra-di-t-butyl Hydroxyhydrocinnamate	5.0
B	Grapeseed Oil	Vitis Vinifera (Grape) Seed Oil	5.0
B	Apricot Oil	Prunus Armeniaca (Apricot) Kernel Oil	10.0
B	Argan Oil	Argania Spinosa Kernel Oil	25.0
B	Fragrance, Citrus Sea Salt AN-91-1033-59	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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