A BETTER WAY TO FORMULATE

VERSAGEL® C

CLEAR GEL CANDLE FORMULATIONS

Experience the Penreco® difference. Penreco offers a series of candle gels under the Versagel® brand name. These gels are specially formulated for candle making and offer flash points of 450 °F and a (typical) sustained burn (fire point) of 500 °F. The clear Versagel is thermally reversible, offers no syneresis (oil bleed) and has excellent suspension and dispersion properties.

In addition, each Versagel C grade is designed for different fragrance capacities:

- Versagel C LP is designed for fragrance loads of 0-4%.
- Versagel C MP designed for fragrance loads of 3-6%.
- Versagel C HP grade designed for suspension of ingredients such as glitter and specialty pigments.
- Versagel CC is an easier handing candle gel with lower melt temperature. The enhancement makes the gel applicable for use in candles in which the gel is poured over insoluble embeds, such as pieces of wax.

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To request a sample, visit penreco.com.

VERSAGEL® C

PRODUCT SPECIFICATIONS

Versagel candle gel series products may be custom formulated to incorporate fragrances, finely dispersed decorations, and other active and/or inert components.

		Versagel C LP	Versagel C MP	Versagel C HP	Versagel CC
	Method	Typical	Typical	Typical	Typical
VISCOSITY @ 110 °C cPs	D2983	89	230	504	
VISCOSITY @ 250 °F cPs	D2983				42
API GRAVITY @ 60 °F	D4052	33.3	33.3	33.2	32.9
POUNDS PER GALLON @ 60 °F lb/gal	D1250	7.148	7.150	7.152	7.168
FLASH POINT, COC °F	D92	441	443	450	429
COLOR, SAYBOLT	D156	30	30	30	29
APPEARANCE, CLEAR SOFT GEL	VISUAL	PASS	PASS	PASS	PASS
ODOR	Organoleptic				PASS

BLENDING FORMULATIONS

Guidelines to assist the handling of Versagel C:

Physical Process	Temperature °C
Mixing and blending other ingredients into the gel	95-105
Pouring the candle gel from one container into another	85-95
Loss of air bubbles	75-85
Stiffening of the liquid product into a gel structure	60-75
Oven temperature for the removal of air bubbles from the gel base	55-70

- Please note that these temperatures are only estimates and may need to be adjusted by as much as +/- 10 °C.
- The inclusion of fragrance or other materials will affect the properties listed above.
- These temperatures may need to be modified depending on the flash points of the added ingredients.
- When adding fragrances or other soluble ingredients to the gels, the blend should be thoroughly mixed to ensure that the resulting gel is completely uniform and homogeneous.

These temperature ranges have been developed from our experience in the lab while working with the candle gels and should not be considered recommendations for manufacturing conditions. In a manufacturing environment, other factors may be important which cannot be predicted or simulated in a laboratory.

For more information or to request a sample please visit www.penreco.com.

VERSAGEL® C

SAFETY FACTORS

Please consider the following safety factors before formulating a clear gel candle.

We have compiled the below list from candle industry data and resources, and internal evaluations of clear gel candle formulations. This list is not intended to be a comprehensive list of factors to be taken into consideration when formulating a clear gel candle. It also does not eliminate the need for the candle manufacturer to perform strict safety tests concerning the burning and flaming characteristics of any candle.

1. FORMULATION INGREDIENT – GEL

Versagel candle gel series are formulated with a narrow cut hydrocarbon oil of exceptional safety relative to the flash point. Via the COC method, flash points of 450 °F and sustained burn (fire point) of 500 °F are typical. We have also optimized polymer type and concentration to produce a gel of exceptional clarity and maximized viscosity to resist cold flow of the gel in the container of choice.

2. FORMULATION INGREDIENT – FRAGRANCE

Fragrance selection becomes critical as it relates to compatibility or solubility in the gel. Each fragrance is a complex mixture of many aroma chemicals, perhaps 30-50 different chemical ingredients, combined to produce a fragrance in which the polarity of the mixture needs careful consideration. A fragrance with a non-polar (hydrocarbon compatible) character is most preferred. A most preferred fragrance flash point would be 170 °F or higher.

3. FORMULATION INGREDIENT – DYES

No information has been found which shows that the dye influences candle safety.

4. FORMULATION PROCESSING OR MIXING

When processing the Versagel candle gel series, Penreco has insured that the polymer concentration is uniform throughout the gel. Care must be taken in not only selecting the correct fragrance but also in completely and uniformly mixing the fragrance into the gel before packaging the gel into the container. Incomplete mixing of the fragrance can cause an irregularly burning flame.

5. GEL CANDLE WICKS

We believe the slower burn rate of gelled candle technology (perhaps 40-50% slower than wax) may, unfortunately, encourage manufacturers to use “oversized” wicks. Wick sizes are diverse and must be test burned by the manufacturer to make sure they work with the gel and additive combination. Cotton and paper cored wicks are generally not used in gel candles, whereas zinc cored wicks stand straight in hot gel during manufacture and burning. Do not trim wicks to less than 1/4 inch as it creates a potential for a very large flame with non-uniform combustion. Proper placement is also important as when not centered properly, can create localized overheating of the container and “pool.”

6. GEL CANDLE CONTAINERS

We have studied and burned countless experimental candles in containers, jars, glasses and mugs of different sizes and shapes. The characteristics of the “pool viscosity” and pool temperature are influenced by the wick size and container selection. Container diameter will influence “pool temperature” and can hinder the safe dissipation of generated heat. Therefore, container composition (glass, tempered glass, clay, etc.), container center of gravity and base stability, and container diameter are all factors to be considered.

In summary, we have attempted to identify key safety factors. However, this report should not be construed by the manufacturer as license to bypass clear and decisive safety testing of all variables before launch.

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