



A BETTER WAY TO FORMULATE

VERSAGEL[®] VERSASTIQUE[™]

BLENDING RECOMMENDATIONS

Due to the solubility characteristics of the gellants used in the Versagel and Versastique product lines, the critical factors that impact the stability of the gels or the success of the finished products are:

- The order of the other chemicals being added to the formula
- Mixing time
- Mixing temperature

Order of Addition for other Chemicals Being Added to the Formulation

The rule of thumb for adding chemicals to the gel is to always add the ingredients with the least polarity first. If the formula contains the same base oil as the gel, it should be added first. **Polar materials tend to break down the gel network so they should be added last.** The following is the order generally followed:

- Mineral Oil, Hydrocarbons, Waxes
- Fatty Esters and Fatty Alcohols
- Emulsifiers
- Silicones
- Essential Oils

Mixing Time

Generally, the blend is complete when no lumps are visible, the blend has a smooth texture, a consistent viscosity at the appropriate temperature, and the blend does not immediately separate once the mixing stops.

Let us show you a better way to formulate.

penreco[®]

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To request a sample, visit penreco.com.

Heating & Incorporation of Finished Product Ingredients Recommendations

VERSAGEL[®]

The Versagel product line can incorporate finished product ingredients in the **75° - 95 °C** temperature range. The viscosity range of the Versagel directly affects the ease at which ingredients are incorporated. Higher viscosity products may require more heat while lower viscosity products may require less heat.

Versagel M, ME, MG, ML, MN, MP and SQ products

- In general, the recommended heating/incorporation temperature of almost all the Versagel product lines are **75° - 95 °C**. This recommendation is based on the higher flash points of the substrate or base material being used.

Versagel HSQ, MD, MC and SF products

These products are an exception to the above temperature ranges. This is due to the lower flash points of the substrate or base material used to make the products.

- **Versagel HSQ:** This product is not recommended to be heated above **104 °C** due to the flash point of the substrate or base material. CAUTION: Flash point is approximately **110 °C**.
- **Versagel MD:** The products are not recommended to be heated above **35 °C** due to the flash point of the substrate or base material. CAUTION: Flash point is approximately **49 °C** – flammable liquid.
- **Versagel MC:** The products are not recommended to be heated above **90 °C** due to the flash point of the substrate or base material. CAUTION: Flash point is approximately **100 °C**.
- **Versagel SF:** This product is not recommended to be heated above **90 °C** due to the flash point of the substrate or base material. CAUTION: Flash point is approximately **100 °C**.

Versagel P products

- The recommended heating/incorporation temperature for this series is **95° - 105 °C** due to the use of a slightly different substrate or base material.

VERSASTIQUE[™]

Versastique Low Melt M, ME, ML and SQ 5T products

- **Versastique Low Melt M, ME and SQ 5T:** The recommended heating/incorporation temperature for these products is **80° - 95 °C**.
- **Versastique Low Melt ML 5T:** The recommended heating/incorporation temperature for this product is **75° - 85 °C**.

Cleaning Equipment Recommendations

- Allow the vessel to drain while warm
- Mineral Oil may be heated and added to the vessel to wash out the remaining product.

If there are any further questions, please don't hesitate to contact our Product Support team.

Any technical advice or assistance furnished herein is given and accepted at the customer's sole risk. Calumet Refining, LLC shall have no liability whatsoever for the use of or results obtained from such advice or assistance.



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