



ANIMAL HEALTH – WHITE OILS

**DRAKEOL®**

## DRAKEOL®

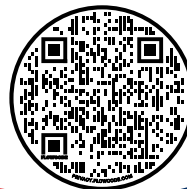
### TRUSTED SECURE SOLUTIONS FOR ADJUVANTS AND INJECTABLES

White oils are among the most versatile products in the world, making them a preferred gold standard across diverse industries. Due to their extremely high purity, white oils are effectively used as a base, emollient, lubricant, release agent, binder, or excipient in multiple product applications. Experience the Penreco difference. Penreco white oils of specific viscosities are refined to meet the purity specifications of the USP/NF and FDA standards.

- A trusted key ingredient for more than 100 years.
- Heavily credentialed to meet global standards.
- We use the highest quality ingredients from reliable sources to ensure traceability.
- Multiple manufacturing sites ensures dependable supply.
- Manufacturing process delivers a high quality product with exceptional purity, safety and stability.

**Let us show you a better way to formulate.**

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of this brochure.



**penreco®**

138 Petrolia St., Karns City, PA 16041 ■ 800.437.3188 ■ 724.756.0110 ■ penreco@calumet.com  
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# DRAKEOL®

TRUSTED SECURE SOLUTIONS FOR ADJUVANTS AND INJECTABLES

## ADJUVANTS & INJECTABLES

Adjuvants increase the efficacy of vaccines by enhancing the patient’s immune response. Historically, vaccination is the process of exposing the patient to a weakened or killed form of a germ (antigen) so that their immune system develops a protective immune response (e.g. antibodies). Today, antigens are often small components of germs (e.g. germ protein or peptide) and not the entire microbe. These purified antigens are often less immunogenic and rely more heavily on adjuvants to magnify their immune response. White oils are used to make highly effective adjuvants in animal vaccine e.g. Freund’s Complete Adjuvant (FCA) and Montanide ISA™. These adjuvants are water-in-oil (W/O) emulsions created from white oil and mannide monooleate surfactants. These W/O emulsions prolong the immune response by the slow release of antigen over time (i.e. depot effect). The emulsion also protects the antigen from rapid enzymatic degradation and modifies the surface charge of the antigen making it more immunogenic. High-quality white oils are essential to produce adjuvants that are safe, effective, stable, easy to use (emulsification and injectability), and economical (reduce antigen dose or concentration). Penreco white oils enable creation of adjuvants with all these desirable properties.

Drakeol 5 LT Mineral Oil NF and our Drakeol 6 VR LT Mineral Oil NF have desired hydrocarbon composition and their physical uniformity are rigidly controlled by sustaining unusually narrow tolerances for each significant property. This strict control also guarantees the highest degree of purity consistent with requirements for a pharmaceutical product.

## TYPICAL PROPERTIES

|                             | VISCOSITY                  |                           | SPECIFIC GRAVITY<br>ASTM D4052<br>@ 25/25 °C | FLASH POINT<br>ASTM D92<br>(Typical) |     | POUR POINT<br>ASTM D97<br>(Typical) |     |
|-----------------------------|----------------------------|---------------------------|----------------------------------------------|--------------------------------------|-----|-------------------------------------|-----|
|                             | ASTM D2161<br>SUS @ 100 °F | ASTM D7042<br>cSt @ 40 °C |                                              | °F                                   | °C  | °F                                  | °C  |
| <b>LIGHT MINERAL OIL NF</b> |                            |                           |                                              |                                      |     |                                     |     |
| Drakeol 5                   | 50/60                      | 7.0/9.6                   | 0.8180/0.8610                                | 336                                  | 168 | -20                                 | -29 |
| Drakeol 6 VR                | 60 (typical)               | 9.4/10.0                  | 0.8340/0.8380                                | 348                                  | 176 | -22                                 | -30 |

- Complies with all USP/NF specifications and yields emulsified injections of suitable fluidity
- Extraordinary purity due to the high temperature manufacturing process, along with no water being introduced into the process to allow for microbial growth
- Manufactured to meet and surpass the purity requirements of the Pharmacopoeias
- Kosher and Halal certified
- Penreco is ISO 9001:2015 certified along with following cGMP guidelines per FDA 21 CFR 211
- Used for emulsions and inverse emulsions

