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RE: Shelf Life Information

In response to the many questions concerning expiration dates and shelf life of our base stock, solvent, wax, petrolatum, white mineral oil, and synthetic base stock products, we offer the following information and parameters that affect shelf life/stability:

### **Shelf Life of Calumet Products**

Hydrocarbon and synthetic base stock products do not have a shelf life or expiration date as they are expected to maintain their quality indefinitely if properly stored. The storage environment of the products greatly affects their integrity. In order to help our customers assess the long-term integrity of the products, we have established recommended test intervals to detect contamination and early signs of degradation.

### **Storage Conditions Affecting All Hydrocarbon and Synthetic Base Stocks**

The storage conditions that could compromise the integrity of the products include:

#### **Temperature**

Both high heat and extreme cold can affect the stability of hydrocarbon and synthetic base stocks. Heat will increase the rate of oil oxidation and cold can result in wax and possible sediment formation. In addition, alternating exposure to heat and cold may result in breathing of storage vessels and possible moisture contamination. Ideally, the storage temperature range is 32°F to 75°F.

#### **Light**

Light may impact color and appearance in hydrocarbon and synthetic base stocks. Hydrocarbon and synthetic base stocks should be kept in their original metal or opaque plastic containers. It is also recommended that Calumet bulk hydrocarbon and synthetic base stocks are stored under cover, in the dark, and free of any impurities.

#### **Water**

Hydrocarbon and synthetic base stock products will absorb water from the atmosphere. Water will react with some lubricant additives in certain products. Water can also promote microbial growth at the oil/water interface in highly regulated products. Hydrocarbon and synthetic base stocks should be stored in a dry location, preferably inside.

#### **Particulate Contamination**

Hydrocarbon and synthetic base stocks should not be stored in areas where there is a high level of airborne particles. This is especially important when a partially used container is stored for later use.

#### **Atmospheric Contamination**

Oxygen and carbon dioxide can react with hydrocarbon and synthetic base stocks and affect their shelf life. Keeping containers sealed until the product is needed is the best protection.

### **Recommended Retest Interval for Regulated Products**

The recommended retest interval for United States Pharmacopeia (USP), Food and Drug Administration (FDA), Active Pharmaceutical Ingredient (API), Environmental Protection Agency (EPA), and European Pharmacopeia (EP) regulated products (white mineral oil, petrolatum, horticultural spray oils, wax, and aliphatic solvents) is three (3) years from the date of manufacture. The properties of these products should be compared to their original certificates of analysis provided by Calumet at the time of delivery. For customers who have a need to establish an expiration date, we recommend following cGMP guidance.

### **Recommended Retest Interval for Standard Stocks**

Calumet's standard hydrocarbon and synthetic base stocks (base oil, process oil, aliphatic solvents, wax, blended specialty lubricants, synthetic esters) are not subject to regulated retest intervals.

### **Recertification of Products**

Calumet will recertify any new, unused product in our customers' inventory by individual request. The properties of these products will be compared to their original certificates of analysis provided by Calumet at the time of delivery.

Please contact Calumet's Product Support Team at [technical@clmt.com](mailto:technical@clmt.com) should you have further questions.

Sincerely,

Lynn Massad  
Technical Market Development Manager