



## CALFLO\* LT SYNTHETIC HEAT TRANSFER FLUID

### Introduction

Petro-Canada CALFLO\* LT is a synthetic heat transfer fluid, suitable for use over a wide range of operating temperatures, and formulated to lower operating costs by reducing the frequency of fluid change outs.

CALFLO LT's unique chemistry starts with a blend of synthetic poly-alpha-olefins, and Petro-Canada's 99.9% pure, synthetic VHVI base fluids produced from a patented HT purity process. These crystal-clear fluids are free of impurities and aromatic compounds that can be hazardous to workplace health and safety. Utilizing more than 25 years of formulating experience, Petro-Canada fortifies these thermally stable base fluids with specially selected additives to provide stronger resistance to oxidative breakdown than competitive synthetic fluids.

The result is CALFLO LT, a heat transfer fluid that provides high thermal efficiency in systems operating up to 260°C (500°F) and excellent cold temperature pumpability in start-up operating conditions as low as -40°C (-40°F). CALFLO LT's breakthrough chemistry can extend fluid life longer than leading competitive fluids, lowering operating costs by reducing the frequency of fluid change-outs. Yet the fluid's purity ensures no compromise to environmental and workplace health and safety.

### Applications

Petro-Canada CALFLO LT is recommended for use in liquid phase heat transfer systems operating continuously at bulk temperatures up to 260°C (500°F). Yet, CALFLO LT's low viscosity ensures outstanding heat transfer efficiency even at moderate operating temperatures. Its low temperature fluidity ensures good pumpability under extreme conditions, eliminating the need for expensive heat tracing and insulation in outdoor applications with ambient temperatures down to -40°C (-40°F).

### Features and Benefits

- **Higher thermal and oxidative stability than leading competitors can extend fluid life and lower operating costs.**

- More thermally stable than leading synthetic paraffin based fluids.

Thermal stressing of a heat transfer fluid can cause the formation of light molecular compounds. These compounds can:

- raise a fluid's vapour pressure, which can cause fluid leakage from control valves and pipe flanges, circulating pump cavitation and vapour locking
- dramatically reduce a fluid's auto-ignition temperature, the lowest temperature that a fluid will combust, without flame or spark, in the presence of oxygen
- lower the operating temperature at which the heat transfer system can safely operate
- necessitate a costly, premature fluid change-out

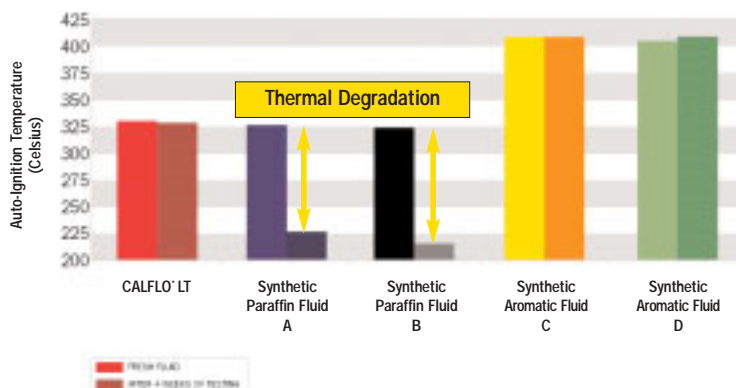
**In ampoule studies conducted at 316°C (600°F), CALFLO LT and two synthetic aromatic competitive fluids remained thermally stable and maintained their auto-ignition temperature throughout a four week test, while two synthetic paraffin based fluids underwent significant thermal degradation resulting in dramatic drops in their auto-ignition temperatures:**

#### What is the HT Purity Process?

Petro-Canada starts with the patented HT purity process to produce water-white, 99.9% pure VHVI base fluids. The result is a range of lubricants, specialty fluids and greases that deliver maximum performance for our customers.



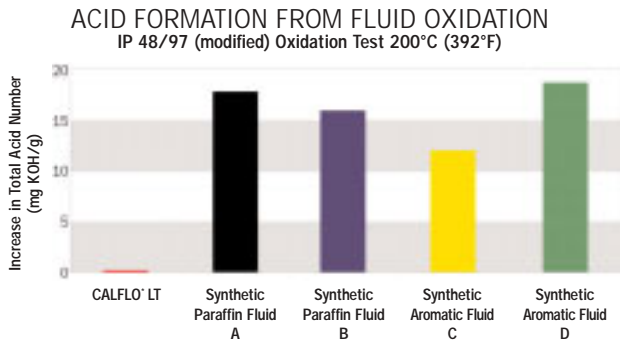
RESISTANCE TO THERMAL DEGRADATION  
316°C (600°F) Ampoule Study based on the DIN 51528 method



- More resistant to oxidative breakdown than leading competitive fluids.

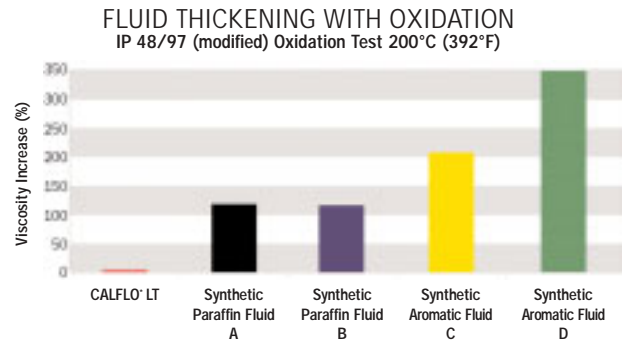
A fluid's resistance to oxidative breakdown is critical in heat transfer systems where exposure to air is likely or can not be avoided. Strong oxidative resistance can significantly extend fluid life, providing operational savings by reducing fluid change-out frequency and down time.

**The formation of acids within a fluid is indicative of oxidation. In a severe oxidation test, CALFLO LT demonstrates almost no signs of fluid oxidation while synthetic paraffin and synthetic aromatic fluids experience significant oxidation:**



- Higher resistance to oxidative thickening versus leading competitive fluids.
- As a fluid oxidizes, it becomes more viscous. This increase in viscosity can:
- significantly reduce a fluid's thermal efficiency
  - make the fluid more difficult to circulate through the heat transfer system
  - result in overheating of the fluid
  - necessitate a costly, premature fluid change-out

**In a severe oxidation stability test, CALFLO LT demonstrates virtually no increase in fluid viscosity, while synthetic paraffin and synthetic aromatic fluids experienced significant oxidative viscosity increases:**



- **Low vapour pressure can save on top-up costs while improving workplace safety.**
  - CALFLO LT's low vapour pressure can reduce or eliminate fluid leakage from control valves and pipe flanges.
  - Reduction or elimination of leaks provides a cleaner and safer operating environment, and results in operational savings by reducing the need for cleaning, maintenance and fluid top-up.
- **Natural lubricity extends operational savings.**
  - CALFLO LT's natural lubricating properties can also reduce maintenance costs by extending the service life of circulating pumps and other rotating parts.
- **No compromise to environmental and workplace health and safety.**
  - Unlike synthetic aromatic fluids, CALFLO LT is non-hazardous, virtually odourless and is not considered a toxic substance according to OSHA (United States) and WHMIS (Canadian) criteria.
  - Because CALFLO LT produces no objectionable odours and is not a respiratory or skin irritant, workplace conditions remain pleasant and safe for continuous operations.
  - CALFLO LT does NOT require special handling and is NOT considered a "hazardous substance" under OSHA (United States) or a "controlled product" under WHMIS (Canadian) regulations.
  - Shipments and storage of CALFLO LT do not normally require special safety permits.
  - Further, drums used to transport CALFLO LT are readily accepted by drum re-conditioners.

ENVIRONMENT, HEALTH & SAFETY CLASSIFICATION	CALFLO LT	SYNTHETIC AROMATIC FLUID C	SYNTHETIC AROMATIC FLUID D
OSHA	✓ Non-Hazardous	✗ Hazardous	✗ Hazardous
WHMIS	✓ Non-Controlled	✗ D2B – eye/skin irritant	✗ D2B – eye/skin irritant
SARA TITLE III Hazard Categories	✓ Non-Hazardous	✗ Immediate health hazard	✗ Immediate health hazard ✗ Delayed health hazard ✗ Fire hazard