

## PRODURO™ TO-4+ SYNTHETIC ALL SEASON TRANSMISSION/DRIVE TRAIN OIL (TDTO)

### Introduction

PRODURO TO-4+ Synthetic All Season is a high quality, premium performance fluid designed to maximize durability and equipment protection in both the very cold winter months and the hot summer months. Seasonal change-outs for hydraulics<sup>5</sup>, wet brakes, drive trains and transmissions can be eliminated without compromising the lubricant performance. Moreover, component wear, attributable to both cold start-up conditions and high operating temperatures, can be reduced.

PRODURO TO-4+ Synthetic All Season offers true year round performance with excellent shear stability, standing up to the toughest operating conditions for mobile equipment. The 99.9% pure synthetic base oils combined with high performance additives deliver outstanding equipment protection and longer oil life. Drain intervals can be extended to reduce total maintenance costs.

### Features and Benefits

The following demonstrates how PRODURO TO-4+ Synthetic All Season can help increase productivity and decrease operating costs:

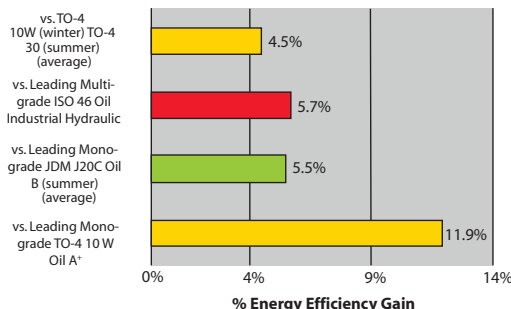
- **High viscosity index ensures consistent performance over a wide temperature range**
  - Extended component life through better lubricant protection
  - Fewer cold start-up problems and reduced wear
  - Better protection of wet brakes and hydraulic components at elevated operating temperatures versus TO-4 10W's
- **Year-round use provides increased efficiencies**
  - May eliminate seasonal oil changes
  - Extends oil drains
  - May allow for product consolidation which results in reduced handling costs
- **Premium additive package ensures peak performance**
  - Carefully balanced lubricity and frictional properties optimize the operation of powershift clutches and wet brakes, eliminating brake chatter and clutch wear
  - Minimal deposit build-up on clutch and transmission components
  - Outstanding anti-wear protection for hydraulic pumps and transmission systems<sup>1</sup> versus TO-4 10W or TO-4 30 oils
- **Extremely high after shear VI for increased pump efficiency in outdoor applications**
  - Lower energy consumption for same amount of work or increased equipment productivity

### What is the HT difference?

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



**Produro TO-4+ Synthetic All Season % Energy Efficiency Gain vs. Competitive Hydraulic Oils**



**Produro TO-4+ provides better energy efficiency vs. competitive hydraulic oils, given the same amount of work.**

Comparison based on Denison T6CM pump - B10 cartridge, 2000 rpm, 200 bar, 70°C (158°F) and 90°C (194°F)

## Applications

Petro-Canada PRODURO TO-4+ Synthetic All Season is intended for use in Caterpillar off-highway vehicles and any mobile equipment where conventional motor oils are accepted in hydraulics, transmissions, gears and wet brake applications. It is formulated to meet the Caterpillar TO-4 specification, Allison C-4 fluid requirements, API Gear Lubricant Service GL-3 for manual transmissions and spiral bevel gears, API Category CD (obsolete) for diesel engine oils, ZF transmission oil specification TE-ML03 and KOMATSU micro-clutch.

PRODURO TO-4+ Synthetic All Season transmission/drive train oils are recommended for the following Caterpillar vehicle systems:

- Powershift and Hydrostatic Transmissions<sup>1</sup>
- Wet Brake Mechanisms
- Differentials and Final Drives
- Hydraulics

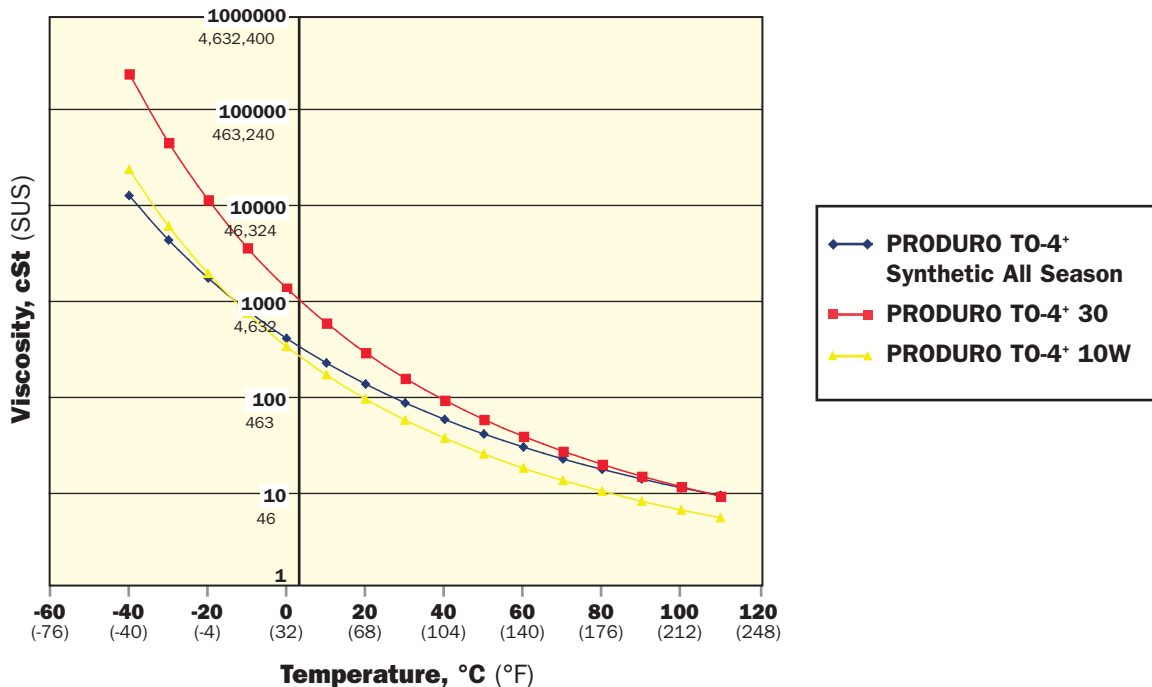
PRODURO TO-4+ Synthetic All Season is viscometrically equivalent to SAE 5W-30. It may be recommended for product consolidation of 10W and 30 single grades, reduced energy usage, and extend drain intervals versus conventional TO-4 products. Consult SEBU 6250-17 for applicable applications.

For components requiring a Caterpillar FD-1 oil, Petro-Canada recommends the PRODURO FD-1 product line.

## Viscosity-Temperature Relationship

Over a wide temperature change, the viscosity-temperature relationship demonstrates the advanced capability of the PRODURO TO-4+ Synthetic All Season at both very low and high temperatures versus SAE 10W and SAE 30 grades.

### Viscosity-Temperature Relationship



## Grade Selection

APPLICATION	PRODURO TO-4+ SYNTHETIC ALL SEASON
<sup>1</sup> Powershift Transmissions	-34°C to +30°C (-30°F to +95°F)
<sup>1</sup> Hydrostatic Transmissions	-34°C to +45°C (-30°F to +104°F)
<sup>2</sup> Final Drive On-Highway	-37°C to +25°C (-35°F to +77°F)
<sup>3</sup> Final Drive Off-Highway	-37°C to +15°C (-35°F to +59°F)
<sup>5</sup> Hydraulics	-34°C to +50°C (-29°F to +122°F)
<sup>4</sup> Output Transfer Gears	-37°C to +35°C (-35°F to +95°F)
Powershift Transmissions (797)	-34°C to +30°C (-29°F to +86°F)
Hydraulic Systems (M Series Motor Graders)	-18°C to +25°C (0°F to +77°F)
Track Roller Fram Recoil Spring/Pivot Shaft Bearing	-37°C to +25°C (-35°F to +77°F)
<sup>4</sup> Drive Axles (Small/Med)	-37°C to +30°C (-35°F to +86°F)
Drive Axles (Large)	-37°C to +15°C (-35°F to +59°F)
Starting Engine Transmissions	-37°C to +20°C (-35°F to +68°F)
Variable Pitch Fans	-34°C to +20°C (-29°F to +68°F)
<sup>4</sup> Backhoe Loaders (Rear Axles)	-37°C to +30°C (-35°F to +86°F)

Note:

<sup>1</sup>Powershift and Hydrostatic transmissions applications may need higher viscosity fluids for added film thickness protection if used in continuous operation or under extreme heavy loading. Refer to SEBU 6250-17 (Most Recent) for further details.

<sup>2</sup>Wheeled vehicles (e.g. tractors, loaders, skidders).

<sup>3</sup>Tracked vehicles (e.g. tractors, pipelayers, skidders and loaders).

<sup>4</sup>Refer to "Caterpillar Machine Fluids Recommendations" - SEBU 6250-17 (Most Recent) for more specific information.

<sup>5</sup>Refer to "Caterpillar Machine Fluids Recommendations" service publication SEBU 6250-17 (Most Recent) for more specific information.

## Typical Performance Data

PROPERTY	TEST METHOD	PRODURO TO-4+ SYNTHETIC ALL SEASON
Density @ 15°C, kg/l (lb/gal @ 60°F)	D4052	0.860 (7.16)
Flash Point, °C (°F)	D92	222 (432)
Viscosity		
cSt @ 40°C (SUS @ 100°F)	D445	55.8 (132.4)
cSt @ 100°C (SUS @ 210°F)		10.7 (51.3)
Viscosity Index	D2270	187
Brookfield Viscosity, cP @ °C (°F)	D2983	14,720 @ -35 (-31)
Cold Cranking Viscosity, cP @ °C (°F)	D5293	6,530 @ -30 (-22)
Borderline Pumping Viscosity, cP @ °C (°F)	D4684	16,135 @ -35 (-31)
Pour Point, °C (°F)	ASTM D5950	-48 (-54)
Channel Point, °C (°F)	FDSTD 971D3456.2	-54 (-65)
Sulphur, % wt	D4294	0.4
Zinc, % wt	D4951	0.1
Calcium, % wt	D4951	0.3
Phosphorus, % wt	D4951	0.1

The values quoted above are typical of normal production. They do not constitute a specification.

---

To order product or to learn more about how Petro-Canada Lubricants  
can help your business visit: [lubricants.petro-canada.com](http://lubricants.petro-canada.com)  
or contact us at: [lubecsr@petrocanadalsp.com](mailto:lubecsr@petrocanadalsp.com)



IM-7960E (2013.08)

™ Owned or used under license



Beyond today's standards.™

**LUBRICANTS**