

**StarWest**  
PETROLEUM LTD.

KEEPING THE  
WORLD  
RUNNING  
SMOOTHLY.



## Products Designed with the Environment in Mind.

Mining  
Construction  
Pipeline  
Forestry  
Marine  
Manufacturing  
Industrial Plant  
Agriculture  
Landscaping



# SUPPORTING THE ENERGY EVOLUTION



We know you work in environmentally sensitive areas, and protecting the earth is all our responsibility.

Star West Petroleum partners with Phillips 66, Summit Lubricants and Aspen Fuels to bring you the best products designed to lower your carbon footprint.

Whether you are looking for fuel economy, zinc-free, non-toxic, biodegradable, re-refined base stocks, oil used in natural gas engines, and oils used for landfill gas applications, we have products that fit your needs.





# LUBRICANTS

# HYDRAULIC OILS

## Choose Zinc Free Hydraulics

- ✓ Superior Performance Characteristics
- ✓ Improved TOST/RPVOT results
- ✓ Superior oxidation resistance
- ✓ Resists localized thermal cracking/coking
- ✓ Improved compatibility with zinc containing hydraulic fluids
- ✓ Non-toxic to aquatic life
- ✓ Inherently Biodegradable
- ✓ Reduced downtime for customers electing to leave in service no matter where the job site is located.



### POWERFLOW™ NZ HYDRAULIC OIL

NONTOXIC, ZINC-FREE ANTI-WEAR HYDRAULIC OIL; INHERENTLY BIODEGRADABLE

Phillips 66® Powerflow NZ Hydraulic Oil is a high-quality, zinc-free anti-wear hydraulic oil specifically developed for use in industrial and mobile equipment operating in environmentally sensitive areas. It is specially formulated for reduced environmental impact in case of leaks or spills. It is non-toxic to fish and aquatic species as determined by OECD Test Method 203 1-12, and is classified as inherently biodegradable by the OECD Test Method 301B. It passes the visual “no sheen” requirements of the U.S. EPA Static Sheen Test.

### POWERFLOW™ NZ HE HYDRAULIC OIL

HIGH-EFFICIENCY, HIGH VI, ZINC-FREE ANTI-WEAR HYDRAULIC OIL FOR OFF-ROAD EQUIPMENT; SEPARATES FROM WATER; INHERENTLY BIODEGRADABLE

Phillips 66® Powerflow NZ HE Hydraulic Oil is a high-quality, high viscosity index, zinc-free anti-wear hydraulic oil developed for use in mobile equipment operating over a wide temperature range. It passes the visual “no sheen” requirements of the U.S. EPA Static Sheen Test, and is classified as inherently biodegradable by the OECD Test Method 301B.

### POWERFLOW™ NZ HE-E HYDRAULIC OIL

HIGH-EFFICIENCY, HIGH VI, ZINC-FREE ANTIWEAR HYDRAULIC OIL FOR OFF-ROAD EQUIPMENT; EMULSIFIES WITH WATER

Phillips 66® Powerflow NZ HE-E Hydraulic Oil is a high-quality, high viscosity index, zinc-free anti-wear hydraulic oil developed for use in mobile equipment operating over a wide temperature range and in wet environments. It is specially formulated to emulsify readily with water to maintain effective lubrication in the presence of water. It is particularly recommended for use in off-road equipment manufactured by Hitachi, John Deere and others, operating under conditions where an emulsifiable hydraulic oil is specified or preferred.



# LUBRICANTS

# SPECIALTY LUBRICANTS

## **FIREBIRD® TRACTOR HYDRAULIC FLUID**

TRACTOR HYDRAULIC/TRANSMISSION FLUID FORMULATED WITH  $\geq 70\%$  RE-REFINED BASE STOCKS

Phillips 66® Firebird Tractor Hydraulic Fluid is an environmentally responsible tractor transmission fluid formulated with a blend of high-quality conventional and re-refined base stocks. It is designed for use in farm tractors and other off-highway equipment requiring one lubricant for the transmission, final drive, wet brakes and hydraulic systems. It meets the performance requirements of all major brands of farm tractors and other farm equipment that utilize a common fluid reservoir. The use of re-refined base stocks helps lessen the environmental impact of disposal of used oil.

## **FIREBIRD AW HYDRAULIC OIL**

ANTIWEAR HYDRAULIC OIL FORMULATED WITH RE-REFINED BASE STOCKS

Phillips 66® Firebird AW Hydraulic Oil is an environmentally responsible anti-wear hydraulic oil formulated with a blend of high-quality conventional and re-refined base stocks. It is recommended for use in a wide variety of industrial, mobile and marine hydraulic system applications. The use of re-refined base stocks helps lessen the environmental impact of disposal of used oil.

## **ECOTERRA® ROCK DRILL FLUID**

ASHLESS, NON-CHLORINATED, EXTREME- PRESSURE AIR TOOL LUBRICANT

Phillips 66® Ecoterra® Rock Drill Fluid is a high-quality, adhesive, extreme-pressure (EP) lubricant specially developed for the lubrication of percussion rock drills used surface and underground mining operations. It also is recommended for other air-powered tools such as jackhammers, pavement breakers and drifters. It is formulated with an ashless, chlorine-free additive package for reduced environmental impact.

## **ECOTERRA® PAPER MACHINE OIL**

ASHLESS PAPER MACHINE CIRCULATING OIL

Phillips 66® Ecoterra® Paper Machine Oil is a high-quality, ashless circulating oil developed for use in modern papermaking machines. It is recommended for use in paper machines manufactured by all leading OEMs. It is specially formulated to provide excellent detergency while still maintaining excellent water-separating properties. It does not contain zinc or other heavy metals, and is non-toxic to aquatic species.

## **EL MAR® LF-D GEO**

PREMIUM, NEXT-GENERATION GEO FOR LANDFILL AND DIGESTER FUEL

Phillips 66® El Mar LF-D (landfill-digester) GEO is a premium quality, next-generation, low-ash, gas engine oil designed for landfill gas applications. It is especially effective in controlling silica deposits formed during the combustion of siloxane gases found in many landfills

## **SHIELD® FIREBIRD PASSENGER CAR ENGINE OIL**

FORMULATED WITH 70% OR GREATER RE-REFINED BASE STOCKS

Phillips 66® Shield Firebird Motor Oil is an environmentally responsible, part-synthetic automotive engine oil designed to provide excellent engine protection for both turbocharged gasoline direct injection, conventional gasoline-fueled and flex-fueled passenger cars and light trucks under all operating conditions. It is formulated with a blend of synthetic and 70% or greater high-quality re-refined base stocks. The use of re-refined base stocks helps lessen the environmental impact of disposal of used oil.



# LUBRICANTS GUARDOL SERIES

## GUARDOL ECO™ DIESEL ENGINE OIL

### API CK-4 DIESEL ENGINE OIL FORMULATED WITH RE-REFINED BASE STOCKS

Phillips 66® Guardol Eco Diesel Engine Oil is an environmentally responsible API CK-4 engine oil developed for use in four-stroke cycle diesel engines designed to meet 2007 and later EPA on-highway exhaust emissions standards. It is specially formulated for compatibility with exhaust after treatment systems using diesel particulate filters (DPFs), diesel oxidation catalysts (DOCs) and/or selective catalytic reduction (SCR). It is backward serviceable for use in pre-2007 diesel engines.

## GUARDOL® NG NATURAL GAS ENGINE OIL

Phillips 66® Guardol NG is a high-quality, dispersant-detergent gas engine oil specially designed for use in vehicular natural gas engines. It is formulated with a higher level of anti-wear additives to meet the enhanced wear protection requirements of diesel engines converted to natural gas service. It is particularly recommended for use in transit buses, school buses, delivery trucks and other vehicles equipped with Cummins, Detroit Diesel or John Deere CNG or LNG engines.

## GUARDOL FE® SYNTHETIC BLEND DIESEL ENGINE OIL

### PREMIUM SYNTHETIC BLEND API FA-4 DIESEL ENGINE OIL; FORMULATED FOR FUEL ECONOMY

Phillips 66® Guardol FE (Fuel Economy) Synthetic Blend Diesel Engine Oil is a premium quality, part-synthetic API FA-4 engine oil developed for fuel economy benefits in 2014 and newer engines. Guardol FE with Liquid Titanium is formulated with a blend of synthetic and high-quality Group II base stocks and a proprietary low-SAPS additive package to provide outstanding engine protection in late model diesel engines. It is fortified with our exclusive Liquid Titanium protection additive for enhanced oxidation resistance and protection against wear. This additive enhancement provides increased engine protection from a strongly bonded titanium shield formed on the surface of critical engine parts, despite lower HTHS requirements of FA-4.

## GUARDOL ECT® SYNTHETIC BLEND DIESEL ENGINE OIL

### PREMIUM SYNTHETIC BLEND API CK-4 DIESEL ENGINE OIL; FORTIFIED WITH LIQUID TITANIUM PROTECTION ADDITIVE

Phillips 66® Guardol ECT (Emission Compatible Technology) Synthetic Blend Diesel Engine Oil is a premium quality, part-synthetic API CK-4 engine oil developed for use in four-stroke cycle diesel engines designed to meet 2007 and later EPA on-highway exhaust emissions standards. It is specially formulated for compatibility with exhaust after treatment systems using diesel particulate filters (DPF), diesel oxidation catalysts (DOC) and/or selective catalytic reduction (SCR). It is backward serviceable for use in pre-2007 diesel engines.



## GUARDOL XT™ FULL SYNTHETIC DIESEL ENGINE OIL

Phillips 66® Guardol XT Full Synthetic Diesel Engine Oil is a premium quality, full-synthetic engine oil developed for use in 4-stroke cycle diesel engines operating under extreme temperature conditions. It meets API CK-4 performance requirements for use in modern low-emission engines designed to meet 2007 and later EPA on-highway exhaust emissions standards, and is backward serviceable for use in older diesel engines. It is specially formulated for compatibility with exhaust aftertreatment systems using diesel particulate filters (DPF), diesel oxidation catalysts (DOC) and/or selective catalytic reduction (SCR). The full synthetic formulation provides excellent low-temperature properties for better performance in harsh winter climates.



## GUARDOL FE FULL SYNTHETIC DIESEL ENGINE OIL

Phillips 66® Guardol FE (Fuel Economy) Full Synthetic Diesel Engine Oil, is a premium quality, API FA-4 engine oil developed for fuel economy benefits in 2017 and newer engines where FA-4 is specified. Guardol FE is formulated with the highest quality synthetic base stocks and a proprietary low-SAPS additive package to provide outstanding engine protection in diesel engines specifying FA-4. This additive enhancement provides increased engine protection of critical engine parts, despite lower HTHS requirements of FA-4.

## GUARDOL EURO FULL SYNTHETIC DIESEL ENGINE OIL

Phillips 66® Guardol Euro Full Synthetic Diesel Engine Oil is a premium quality, full-synthetic engine oil developed for use in 4-stroke cycle diesel engines operating under extreme temperature conditions. It meets API CK-4 performance requirements for use in modern low-emission engines designed to meet 2007 and later EPA on-highway exhaust emissions standards, and is backward serviceable for use in older diesel engines. It is specially formulated for compatibility with exhaust aftertreatment systems using diesel particulate filters (DPF), diesel oxidation catalysts (DOC) and/or selective catalytic reduction (SCR). The full synthetic formulation provides excellent low-temperature properties for better performance in harsh winter climates.

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## EnviroTech EAL H Series - HYDRAULIC OILS

EnviroTech® hydraulic oils are zinc-free ashless premium environmentally responsible hydraulic fluids designed to provide exceptional performance in hydraulic and circulation systems. These vegetable based formulations have been engineered to meet or exceed the performance requirements of most hydraulic pump and system manufacturers, while satisfying the rigorous criteria for biodegradability and toxicity. They offer the anti-wear and film strength characteristics necessary for hydraulic systems operating under high load and high pressure. EnviroTec® hydraulic oils are inhibited for excellent protection against rust and corrosion. EnviroTech® EAL H Series complies with the “biodegradable”, “minimally-toxic” and “not bio-accumulative” standards as defined in Appendix A of the 2013 Vessel General Permit issued by the United States Environmental Protection Agency.

### EAL H Extreme

EnviroTech® EAL H-46 Extreme has a zinc-free additive system and is inhibited for excellent protection against rust and corrosion. In addition to its excellent performance capability, EnviroTech® EAL H-46 Extreme hydraulic oil satisfies the requirements for ultimate biodegradability and non-toxicity making it an excellent choice for hydraulic and circulation systems operating in environmentally sensitive areas.

- EnviroTech® EAL H Series hydraulic oils satisfy the requirements for ultimate biodegradability and non-toxicity making them an excellent choice for hydraulic and circulation systems operating in environmentally sensitive areas.
- Any system where biodegradable and virtually non-toxic fluids may be required.
- Marine and mobile equipment operating in environmentally sensitive areas
- Industrial hydraulic systems where leaked or spilled fluids could get into plant effluent
- Air line oils and some limited oil-mist generating systems
- Air-over-hydraulic systems operating in environmentally sensitive areas

### ENVIROTECH BENEFITS:

- ✓ Ultimately Biodegradable
- ✓ Low Pour Point
- ✓ High Viscosity Index
- ✓ Excellent Oxidation Stability
- ✓ Improved Shear Stability
- ✓ Increased Load Capacity
- ✓ Excellent anti-wear performance
- ✓ Excellent anti-rust and anti-corrosion characteristics
- ✓ Increased flashpoint for built in safety features
- ✓ Seal conditioning for longer seal life and reduced oil leakage
- ✓ Easier clean up and lower remediation
- ✓ Exceeds LC-50 acute toxicity criteria adopted by the US EPA and US Fish and Wildlife Service
- ✓ Exceeds the requirements of US Federal Specification AA50354
- ✓ Highest possible Biodegradable rating of PW1
- ✓ EnviroTech® meets the definition of a biobased lubricant as outlined in section 9001 of The Farm Security and Rural Investment Act (FSRIA) of 2002 (Public Law 107-171/ HR 2642) and qualifies for preferred procurement by U.S. Federal Agencies as set forth in FSRIA section 9002.

## EnviroTech EAL EP GEAR OIL SERIES

EnviroTech® EAL EP Gear Oils are environmentally responsible lubricants designed for the protection of gears and bearings in systems where high temperature and/or extreme pressure conditions exist. This biosynthetic formulation is recommended for lubricating heavy duty spur, helical, bevel, and worm gear configurations, subject to heavy loading or shock loading.

EnviroTech® EAL EP Gear Oils meet or exceed the following performance requirements:

- U.S. Steel 224 • AGMA 9005/250.04 • DIN 51517, Part 3
- David Brown DB S1.53.101 • Cincinnati Machine E.P.

Classified as ultimately biodegradable (Pw1) and non-toxic, EnviroTech® EAL EP Gear Oils are ideal for equipment operating in environmentally sensitive areas.

EnviroTech® EAL EP Series complies with the “biodegradable”, “minimally toxic” and “not bioaccumulative” standards as defined in Appendix A of the 2013 Vessel General Permit issued by the United States Environmental Protection Agency.

### Physical Properties

PRODUCTS	EP-100	EP-150	EP-220	EP-320	EP-460
ISO Grade, Approximate	100	150	220	320	460
AGMA #, Approximate	3 EP	4 EP	5 EP	6 EP	7 EP
Viscosity					
@40°C, cSt	89	135	190	275	385
@100°C, cSt	16.3	22	30.2	40.1	53.2
Viscosity Index	197	191	202	200	205
Specific Gravity	0.900	0.900	0.903	0.900	0.908
Flash Point °F(°C)	498 (259)	536(280)	536(280)	536(280)	536(280)
Pour Point °F(°C)	-29(-34)	-40(-40)	-36(-38)	-18(-36)	-11(-24)
Copper Corrosion	1A	1A	1A	1A	1A
Rust Test	Pass	Pass	Pass	Pass	Pass
Timken OK, lbs	70	70	70	70	70
Four-Ball Wear	0.3	0.3	0.3	0.3	0.3
Four-Ball EP					
Weld Point (kg)	315	375	395	395	395
Four-Ball EP Load					
Wear Index	51	55	55	56	56
FZG Gear Test	>12	>12	>12	>12	>12
Biodegradation	Ultimate	Ultimate	Ultimate	Ultimate	Ultimate
Classification,	Pw1	Pw1	Pw1	Pw1	Pw1
VGP/EAL Compliant	Yes	Yes	Yes	Yes	Yes



# EnviroTech® Green Cleaner

EPA Recognized Degreaser and Cleaner

## ► Innovative Green Cleaning Solution



### Product Benefits

Advances in chemistry and technology means a “green” cleaner is no longer a weak cleaner. EnviroTech® Green Cleaner is a powerful degreaser and is proven safe and effective.

- Superior penetration and removal of oily, greasy particulate soils
- Ability to clean where mechanical or agitation is restricted
- Self-splitting: oils rapidly break from used solution
- Readily biodegradable
- No VOCs or phosphates
- Non-sensitizer to skin
- Excellent rinsing properties
- Very low streak/smear profile

## U.S. EPA Safer Choice Product\* & NSF Food Grade Registered

EPA's Safer Choice program helps consumers, businesses, and institutional buyers identify cleaning and other products that perform well and are safer for human health and the environment.

- No hazardous ingredients in packaging
- No dangerous interactions
- No carcinogens or reproductive toxins
- No sensitizers



EnviroTech® Green Cleaner is a Propylene based Glycol Ether solvent with an environmentally safe chelating agent and surfactant.

## SUPPORTING THE ENERGY EVOLUTION



**100%**

Of Phillips 66 Lubricants plants are ISO 14001 and ISO 9001 certified.



Over 10 specialty lubricants are formulated without zinc and other heavy metals, to limit the impact on the environment. Many Phillips 66 products are non-toxic, non-irritating and contain no hazardous ingredients making them environmentally friendly.



Phillips 66 Lubricants is committed to improving formulations to advance fuel economy in the passenger car and heavy-duty segments. Guardol FE® synthetic blend diesel engine oil is proven to deliver up to 2% fuels savings while providing superior wear protection.



Phillips 66 Firebird® products feature re-refined base stocks. The use of re-refined base stocks helps lessen the environmental impact of the disposal of used oils.



The Shield® lineup of passenger car engine oils meet or exceed the ILSAC GF-6 specifications that maintain the stricter fuel economy standards in newer vehicles and help reduce emissions.



Phillips 66 has a state-of-the-art Energy Research and Innovation Center with a dedicated team focusing on efforts to address climate changes including carbon capture, hydrogen, renewable transportation fuels, batteries organic photovoltaic cells and solid oxide fuel cell technologies.



# e-Shield



The new Phillips 66® e-Shield line is a high-performing lubricant solution to optimize electric vehicles' performance and protection. The line of industry-leading products includes a system fluid, grease and coolant designed to meet the unique requirements of electric vehicles.



The e-Shield line offers:

- ✓ Excellent thermal and conductivity properties that keep electric vehicles protected while running cooler and longer per charge.
- ✓ Unique formulations designed specifically to enhance performance in electric vehicles.
- ✓ Modern proprietary formulations that enable optimized protection and extended driving range.

The e-Shield line is another example of the company's ongoing commitment to develop the latest technology and engineering advances that reduce emissions and improve energy conservation while ensuring that the equipment people depend on worldwide operates efficiently and reliably.

# ASPEN 2 & 4

Fuel for air cooled two stroke engines  
and other types of four stroke engines.

 **ASPEN®**  
FUEL FOR PROFESSIONALS



# ASPEN 2 & 4

## Fuel for air cooled two stroke engines and other types of four stroke engines

Aspen 2 and Aspen 4 are virtually free from harmful substances such as benzene and aromatic; substances that can cause serious health problems. Aspen alkylate petrol also keeps the spark plugs and combustion chamber cleaner. Aspen can be stored for a long time without any deterioration in quality, which makes your engine easy to start even after standstill periods. There are numerous environmental benefits, such as reducing the formation of ground-level ozone (smog) up to 40%.



## ASPEN 2

**Aspen 2** alkylate petrol premixed with 2% biodegradable 2-stroke oil, suitable for chainsaws, clearing saws, hedge trimmers, mopeds, lawn trimmers, power cutters and other land-based 2-stroke engines. The oil in Aspen 2 has been selected and developed for the future. It is completely synthetic with as much as 60% renewable content, it is biodegradable (more than 80% after 28 days) and free from both ash and solvents. The oil gives an extremely clean engine and has optimum lubrication characteristics at all engine temperatures.

### Areas of use



### Units

Are in packaging of 5L, 25L and 200L

## ASPEN 4

**Aspen 4** alkylate petrol without oil, suitable for lawnmowers, rotary cultivators, snow blowers, boats and other 4-stroke engines. Ordinary petrol contains ethanol, which attracts moisture, and can cause engine failures. Aspen alkylate petrol contains no ethanol, making it ideal for use in for example marine environments. To use Aspen alkylate petrol in your 2-stroke outboard engine, simply mix Aspen 4 with outboard oil. To minimise the environmental impact, choose a biodegradable oil.

### Areas of use



### Units

Are in packaging of 5L, 25L and 200L

Ordinary petrol is produced during the crude oil refinement process, in which various fractions are processed in different ways and then combined. Petrol is therefore not homogeneous, but a mixture of several substances. Ordinary petrol purchased at petrol stations contains around one hundred different substances, all with different impacts on performance, health and the environment. Many components are extremely hazardous and toxic to humans and our environment. Alkylate is produced synthetically from the pure gases that are released when crude oil is refined. The result is a very clean petrol, which consists of around ten of the least harmful substances, and is therefore virtually free from hazardous constituent components such as benzene, aromatics, sulphur and olefins.



#### Environment + plastic container = true

All plastic packaging is manufactured from HDPE (high density polyethylene). Polyethylene plastic can be recycled both in terms of materials and for energy. Plastic packaging for Aspen's petrol products is UN approved – i.e. type approved for the storage and transport of hazardous goods.

#### Accessibility

Aspen alkylate petrol is available in containers from outlets such as gardening shops, DIY stores, supermarkets, specialist shops, marinas and water sports shops. Find your nearest dealer on our website, [aspenfuels.com](http://aspenfuels.com).

#### Product Information

	Aspen*	Alkylate**	EN228***	Comment
Octane rating RON	94	>93	95	Knocking resistance at low engine speed.
Octane rating MON	92	>90	85	Knocking resistance at high engine speed.
Vapour pressure (kPa)	55-65	55-65	45-95	High vapour pressure produces more petrol fumes and operating problems in heat. Local deviations may occur.
Sulphur (ppm)	<3	<10	<10	Very harmful for the environment and health. Contributes to the acidification of lakes, for example.
Aromatic hydrocarbon content (vol %)	<0,5	<1	<35	Very harmful for the environment and health. May cause nerve damage, headaches, fatigue and nausea.
Benzene content (vol%)	<0,03	<0,1	<1	Benzene is the most dangerous aromatic hydrocarbon in petrol. May cause blood cancer (leukaemia).
Olefin content (vol %)	<0,3	<1	<18	It is harmful for the environment and health, causes operational problems and impairs shelf-life.
Ethanol (vol %)	0	0	<10	Attracts moisture which may lead to engine failures.
Oxidation stability (min)	>11340	-	>360	A measure of the way petrol tends to react with oxygen at high temperatures. A low value means the petrol will age faster.

\* Typical values for Aspen alkylate petrol.  
 \*\* Alkylate Standard SS 15 54 61:2017.  
 \*\*\* EN228 Standard SS-EN 228:2012