



ENDURATEX™ EP & ENDURATEX XL SYNTHETIC BLEND GEAR OILS

Introduction

Petro-Canada's ENDURATEX™ EP Gear Oils are premium quality, extreme-pressure lubricants designed for use in enclosed industrial gear drives operating under normal, heavy or shock-loaded conditions. They are also recommended for lubricating plain or anti-friction bearings running under heavy or shock-loaded conditions.

ENDURATEX EP Gear Oils are specially formulated to deliver sustained long-life, anti-wear and extreme pressure protection to industrial gear drives and bearings. These oils are available in nine ISO viscosity grades and two multigrades.

Features and Benefits

- **Exceptional long life**
 - Reduces operating and maintenance costs
 - Longer oil life helps extend time between oil changes
 - Withstands high operating temperatures for longer periods
 - Reduces build-up of harmful sludge and varnish deposits for reduced wear and longer oil life



ENDURATEX minimizes sludge and varnish deposits for outstanding protection of gears and components

- **Excellent film strength and extreme pressure properties for ENDURATEX EP equipment protection**
 - Prevents seizure, scuffing or spalling of gear teeth and bearing surfaces under shock-loaded conditions
 - Reduces gear and bearing wear

- Reduces maintenance costs and extends equipment life
- **Protects against rust and corrosion**
 - Prevents iron parts from rusting
 - Protects copper-containing bearings, bushings, etc., from corrosive attack
 - Extends equipment life
- **Excellent water separability**
 - Prevents emulsion formation
 - Allows water to be drained off before oil is re-circulated
 - Eliminates corrosive damage to metal parts when water present
- **Low foaming tendency**
 - Ensures a continuous lubricant film present at all times
 - Prevents overflow from gear-boxes and oil reservoirs
 - Reduces the possibility of cavitation damage to oil circulating pumps where installed

Applications

Petro-Canada's ENDURATEX EP Gear Oils are versatile, high quality lubricants recommended for use in all types of enclosed industrial gear drives where an extreme pressure gear oil is specified. They are also recommended for lubricating all types of heavy or shock-loaded bearings.

In addition, the low viscosity grades of ENDURATEX EP are effective wire-rope lubricants.

ENDURATEX EP Oils offer excellent gear and bearing protection and long service life in a wide range of gear designs. These include:

- Spur, Internal, Planetary, Rack & Pinion, Bevel, Spiral-Bevel, Helical, Herringbone and Worm gears

What is the HT difference?

Petro-Canada starts with the patented 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.



ENDURATEX EP Gear Oils are approved by many manufacturers of industrial gear drives including:

- Greer-Lightnin, Hansen Transmissions, Kraus-Maffei and David Brown
- Enduratex EP 68 has Metso Paper approval and is recommended for pulp and paper companies using thermo-mechanical pulping processes (TMP)
- ENDURATEX EP 150 is GMLS2 approved
- ENDURATEX EP Gear Oils are typically suitable for use in situations requiring DIN 51517 Part 3, ISO 12925 – Type 1 CKC or AGMA 9005-D95 specifications

ENDURATEX XL SYNTHETIC BLENDS

ENDURATEX XL Synthetic Blend are multigrade EP gear oils designed with all the same benefits but with the additional advantage of eliminating seasonal change-outs- **available in 68/150 and 68/220 grades.** 68/150 delivers excellent low temperature properties versus leading all season competitive products for easier cold start-ups and better equipment protection. 68/220 supports winter requirements (68 grade) and summer requirements (220 grade). 68/220 is especially recommended for gearboxes exposed to temperature extremes and has sufficient low temperature fluidity to perform well in exposed locations- giving you extended drain intervals and minimized downtime.

Enclosed Gear Lubrication

With enclosed gear drives, best results are obtained by maintaining the correct oil level, i.e. the lowest teeth should be half submerged when at rest.

The American Gear Manufacturers' Association (AGMA) has published several gear lubricant standards for industrial machinery. ENDURATEX EP Oils are recommended for use, where the AGMA specifies the following **EP type oils**:

AGMA LUBRICANT NO'S	VISC. RANGE cSt @ 40°C/104°F	ENDURATEX EP
2EP	61 - 75	68
3EP	90 - 110	100
4EP	135 - 165	150
5EP	198 - 242	220
6EP	288 - 352	320
7EP	414-506	460
8EP	612-748	680
8A EP	900-1100	1000

For applications where no specific AGMA recommendation exists, the appropriate ENDURATEX EP viscosity grade can be determined from the following tables:

SPUR, BEVEL & HELICAL GEAR LUBRICATION

TYPE OF UNIT/SIZE	ENDURATEX EP	
	-10°C to +15°C 14°F to 62°F	+10°C to +50°C 50°F to 122°F
Single/Double Reduction Units Parallel shaft separation: - up to 20 cm (8") - 20 to 50 cm (8" - 20") - over 50 cm (20")	68 100 150	100 150 220
Triple Reduction Units Shaft separation: - over 50 cm (20")	220	320
Planetary Gears Outside housing diameter - up to 40 cm (16") - over 40 cm (16")	68 150	150 220
Bevel, Spiral Bevel Cone distance - up to 30 cm (12") - over 30 cm (12") - High speed, above 3600 rpm	68 150 68	150 220 68
Gearmotors - all sizes	68	150

WORM GEAR LUBRICATION

TYPE OF UNIT/SIZE	ENDURATEX EP	
	-10°C to +15°C 14°F to 62°F	+10°C to +50°C 50°F to 122°F
Low speed(below 600 rpm) - single enveloping - double enveloping	460 680	680 680
High speed(above 600 rpm) - single enveloping - double enveloping	320 460	460 680

Where all-season protection is required for wide temperature ranges, ENDURATEX XL Synthetic Blend EP multigrades are recommended.

Typical Performance Data

PROPERTY	TEST METHOD	ENDURATEX EP Oils										XL SYNTHETIC BLEND	
		32	68	100	150	220	320	460	680	1000	68/150	68/220	
AGMA Number		-	2EP	3EP	4EP	5EP	6EP	7EP	8EP	8AEP	3EP	4EP	
Density, kg/L @ 15°C/59°F	ASTM D1298	0.847	0.863	0.872	0.879	0.884	0.895	0.902	0.909	0.902	0.868	0.869	
Colour	ASTM D1500	1.0	1.0	1.0	3.5	5.5	5.5	6.0	8.0	Black	<1.0	1.0	
Viscosity cSt @ 40°C	ASTM D445	32.0	68.0	101	150	220	320	452	666	990	98	152	
cSt @ 100°C	ASTM D445	6.0	9.1	11.3	14.7	19.0	23.8	29.7	34.5	55	14.3	22.2	
SUS @ 100°F	ASTM D2161	166	351	527	784	1163	1750	2425	3695	5340	503	776	
SUS @ 210°F	ASTM D2161	46	56	64	77	96	118	145	174	265	76	110	
Viscosity Index	ASTM D2270	136	109	97	97	97	94	94	82	100	149	174	
Flash Point, °C/°F	ASTM D92	224/435	240/464	240/464	260/500	262/500	252/486	261/502	249/480	249/480	250/482	251/484	
Pour Point, °C/°F	ASTM D97	-51/-60	-39/-38	-33/-27	-33/-27	-27/-17	-21/-6	-15/5	-15/5	5/41	-39/-38	-36/-33	
Channel Point, °C/°F	CGSB 3-GP-029.1B	-58/-72	-46/-51	-40/-40	-37/-35	-37/-35	-29/-20	-24/-11	-23/-9	—	-55/-67	-54/-65	
Brookfield viscosity 150,000 cP Temperature, °C / °F	ASTM D2983	-47/-53	-33/-27	-29/-20	-21/-6	-18/0	-15/5	-13/9	-5/23	—	-32/-26	-31/-24	
Timken EP Test, kg / lb	ASTM D2782	27/60	29/65	32/70	32/70	32/70	32/70	32/70	30/65	34/75	32/70	32/70	
Four-Ball Weld Load, kg	US Steel DM53	250	250	250	250	250	315	250	315	315	250	250	
Four-Ball Scar Diameter mm, 1 hour, 20 kg / 44 lb, 54.4°C / 129°F	US Steel DM57	0.31	0.30	0.29	0.30	0.30	0.30	0.33	0.29	0.38	0.28	0.28	
Load Wear Index	ASTM D2783	45	49	49	50	55	55	54	54	55	46	46	
FZG (stages)	DIN 51354	12+	12+	12+	12+	12+	12+	12+	12+	13	12+	12+	
Demulsibility Test													
Water separated, mL	ASTM D2711	85.0	86.3	86.0	84.4	83.8	83.0	82.0	81.0	—	76.0	74.5	
Emulsion formed, mL	Para 3-2	1.0	0.1	0.1	0.2	0.1	0.5	0.0	0.3	—	1.4	1.6	
Foaming Characteristics													
Vol. after blow/settling, 24°C / 75°F	ASTM D892	5/0	20/0	0/0	0/0	0/0	0/0	0/0	0/0	—	5/0	5/0	
93°C / 200°F		0/0	40/0	0/0	0/0	0/0	0/0	0/0	5/0	—	0/0	0/0	
Oxidation Stability													
% Viscosity Increase													
312 hours, 121°C / 250°F	ASTM D2893	3.7	2.7	3.7	3.6	4.1	5.2	5.8	16	—	3.5	3.5	
Rust Test Procedure A, 48 hrs	ASTM D665	Pass	Pass	Pass	Pass	Pass	Pass	Pass	Pass	—	Pass	Pass	
Copper Strip Corrosion Test, 3 hours @ 100°C / 212°F	ASTM D130	1a	1a	1a	1b	1b	1a	1b	1b	1a	1a	1a	

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

Health and Safety

To obtain Material Safety Data Sheet (MSDS), contact one of Petro-Canada's TechData Info Lines.

TechData Info Lines

If you would like to know more about Petro-Canada's ENDURATEX EP or XL Synthetic Blend Gear Oils, or any other product in our complete line of quality lubricants, please contact us at:

Lubricants Head Office
Petro-Canada
2310 Lakeshore Road West
Mississauga, Ontario
Canada L5J 1K2



Canada - West Phone 1-800-661-1199
- East (English) Phone 1-800-268-5850
(French) Phone 1-800-576-1686
Other Areas Phone (416) 730-2408
E-mail lubecsr@petro-canada.ca
Internet lubricants.petro-canada.ca

Petro-Canada Europe Lubricants
The Manor, Haseley Business Centre
Warwick, Warwickshire
CV35 7LS

United Kingdom
Phone +44 (0) 2476-247294
Fax +44 (0) 2476-247295

Petro-Canada America Lubricants
980 North Michigan Avenue
Suite 1400, #1431
Chicago, Illinois
USA 60611

Phone 1-888-284-4572
Fax (708) 246-8994
E-mail email@petro-canadaamerica.com