

EPO

Ethylene-Propylene Oligomer

Ethylene-Propylene Oligomer (EPO) is a liquid polymer product that selectively polymerizes ethylene and propylene with metallocene catalyst. It is a synthetic oil with an ethylene-propylene polymer structure.

Using EPO delivers fuel efficiency and durability through superior oxidation stability, low-temperature resistance, and shear stability, therefore increase cost competitiveness.

Characteristics

EPO has various characteristics and advantages:

- High Viscosity Index** Viscosity index varying from 150 to 300. Its high VI improves and conserves the viscosity index in a variety of lubricants.
- Excellent Shear Stability** It has outstanding shear strength even after long exposures to mechanical movements, which contributes to extending the lifetime of end products.
- Chemical Stability** Chemically stable and hardly oxidizes in the air due to its exceptional oxidation stability to light, UV, and air.
- Non-toxic** It is a high-purity, non-toxic product with little sulphur and metal content.
- Excellent Thickening Power** It shows excellent viscosity-enhancing properties when mixed with mineral oils.

Features of EPO

- **High quality synthetic oil**
Improves energy efficiency and durability through high viscosity index, low temperature resistance and heat/oxidation stability.
- **Enhanced lubricant performance**
Lubricant additive that can improve shear stability.
- **Environmental-friendly and Non-toxic**
REACH and NSF certified (H-1, HX-1)
LuSC listed, our additives can be used in lubricants with Ecolabel certification

Physical Properties

- **Specific Gravity and Density**

The specific gravity and density of EPO is between 0.84 and 0.85 and 40~2000 (@100°C) each. The higher the molecular weight, the higher the density; The higher the temperature, the lower the density.

- **Molecular Weight**

The number average molecular weight (Mn) of EPO ranges between 1,900 and 7,200 while its polydispersity index ranges from 1,5 to 2 leading to stable and homogenous.

- **Viscosity**

EPO has a wide kinematic viscosity range of 40 to 2,000 cSt at 100°C. It varies by temperature and molecular weight, higher molecular weight and lower temperature lead to increased viscosity.

- **Viscosity Index**

EPO has a high viscosity index varying from 150 to 300. As the viscosity increases, so does the viscosity index. Its higher viscosity index enables it to maintain consistent viscosity at a wide range of temperatures.

- **Flash Point & Fire Point**

The flash point of EPO is at least 265°C and even higher as viscosity increases, proving reliable heat-resistance.

- **Pour Point**

EPO is non-crystalline and has a lower pour point, showing an excellent advantage at low cold temperatures such as -37°C.

- **Colour**

EPO is colourless and has reliable colour stability. Its APHA colour (Pt/Co scale) is 20 or lower.

Packaging

EPO is available in three types of packages as described below.

Drum (open/closed)	ISO Container	IBC Container
Net weight 170kg (gross weight 190kg)	24kl (19MT)	820kg (877kg with container)

Shelf Life

Kemat's supplier's drum packaging warranty is two years from the date of manufacture if the product is unopened and the specified handling and storage methods on the Safety Data Sheets are followed. For more information, please contact us via email.

Heating Temperature

The following table shows Kemat's recommendation for the use of a heating box. We strongly recommend that the following table is used, and that temperatures are not exceeded if using different heating tools.

	DS 40	DS 100	DS 600	DS 1100	DS 2000
Drum	266°F (130°C)	266°F (130°C)	302°F (150°C)	302°F (150°C)	302°F (150°C)
ISO Container	266°F (130°C)	266°F (130°C)	302°F (150°C)	302°F (150°C)	302°F (150°C)

Typical Applications

Viscosity Index Improver (VII)

EPO improves and conserves the viscosity index of a variety of lubricants: automotive/industrial gear oil, hydraulic fluid, compressor oil, etc. EPO has a high viscosity index varying from 150 to 300. As the viscosity increases, so does the index. Its higher viscosity index enables it to maintain a consistent viscosity at a wide range of temperatures.

Automotive Gear Oil – Viscosity Modifier

EPO is widely adopted as a viscosity modifier of automotive gear oil (differential oil/transmission oil) because of its excellent viscosity index control, thickening power, low-temperature property and shear strength. In particular, its higher viscosity index greatly enhances durability, and its lower wear property helps improve vehicle fuel economy.

Industrial Gear Oil / Hydraulic Oil / Compressor Oil – Viscosity Modifier

EPO is suitable as a viscosity modifier of highly viscous industrial gear oil due to its superior viscosity index, higher thickening power and improved film thickness. Stable properties and lower volatility prevent degradation due to long exposures or contamination from moisture or other impurities.

Grease – High Viscosity Synthetic Base Stock

EPO has similar physical properties to Group IV PAO and therefore the colour change will barely occur in a long term use as the viscosity index and the thickening power of the product is high with superior oxidation stability.

Rubber (TPE, EPDM) – Extrusion Oil / Compound Process Oil

EPO has a higher molecular weight than general process aids. It can improve extrusion processability, permanent compression set, weather resistance and mechanical strength of the finished products when used as a plasticizer or flexibilizer. Also, it has excellent compatibility due to its structural similarity with EPDM.

Paint and Coating – Defoamer

EPO is suitable as a defoaming agent for paints, and shows optimized performance in solvent based and non-solvent based urethane and epoxy coatings. Adding a small amount of EPO can deliver a smooth and clean surface.

Others

EPO can be used in various applications including wire/cable jelly, cosmetics, mould release for polyurethane, and insulating oil additives. Custom products are available through close collaboration between R&D and production.

Typical Properties

 **EPO** Liquid polymer product that selectively polymerizes ethylene and propylene with metallocene catalyst

EPO	Molecular Weight Mn	Kinematic Viscosity cSt		Flash Point °C		Colour ALPHA
		@ 40°C	@ 100°C	Cleveland Open Cup	Pensky-Martens Closed Cup	
DS 40	1,900	435	40	260	230	Max 20
DS 100	2,800	1,400	100	265	244	Max 20
DS 600	5,300	10,500	600	285	270	Max 20
DS 1100	6,400	20,500	1,100	285	270	Max 20
DS 2000	7,200	39,500	2,000	285	270	Max 20