



Indopol Polybutenes – The Multi-Functional Solution for Gear Oils

Today's modern equipment operates under increasingly severe conditions that require longer service life, reduced maintenance and improved energy efficiency. Indopol polybutenes are synthetic hydrocarbon polymers made by controlled polymerization of C₄ olefins and are designed to maximize lubricant performance.

As health, safety and other environmental aspects of lubricants become increasingly important, low toxicity and high purity polybutenes are an excellent option for lubricant formulators. Many Indopol polybutene grades provide FDA approvals and are registered by NSF as H1 lubricants and HX-1 ingredients for incidental food contact applications.

Excellent thickening power

Indopol polybutenes are very **efficient thickeners** in mineral oil-based compositions and can be used to achieve target viscosity values with very low treat rates (Fig. 1).

Additionally, formulating with polybutenes has added advantages of improving the **viscosity index** (Fig. 2), **pour point**, and **low temperature viscosity** of finished lubricants.

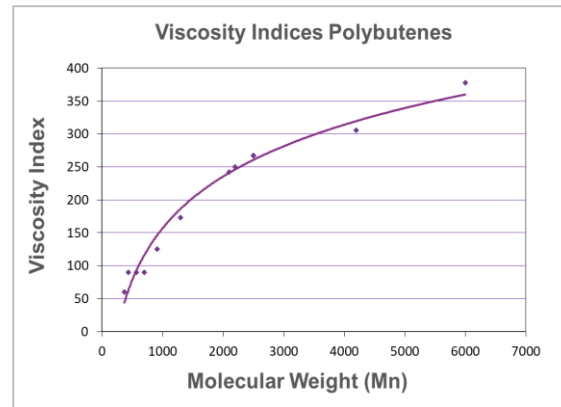


Fig. 2: Viscosity indices calculated according to ASTM D2270.

Good tack and water separation

In general, the **tack properties** of polybutenes improves as molecular weight increases. The tacky nature of high molecular weight polybutenes can enhance the adhesive and anti-fling characteristics of the base oil, thereby increasing the retention time of the lubricant on the gear surface.

In addition, polybutenes provide good **water separation** properties and **low volatility** which are often superior to that of mineral oils.

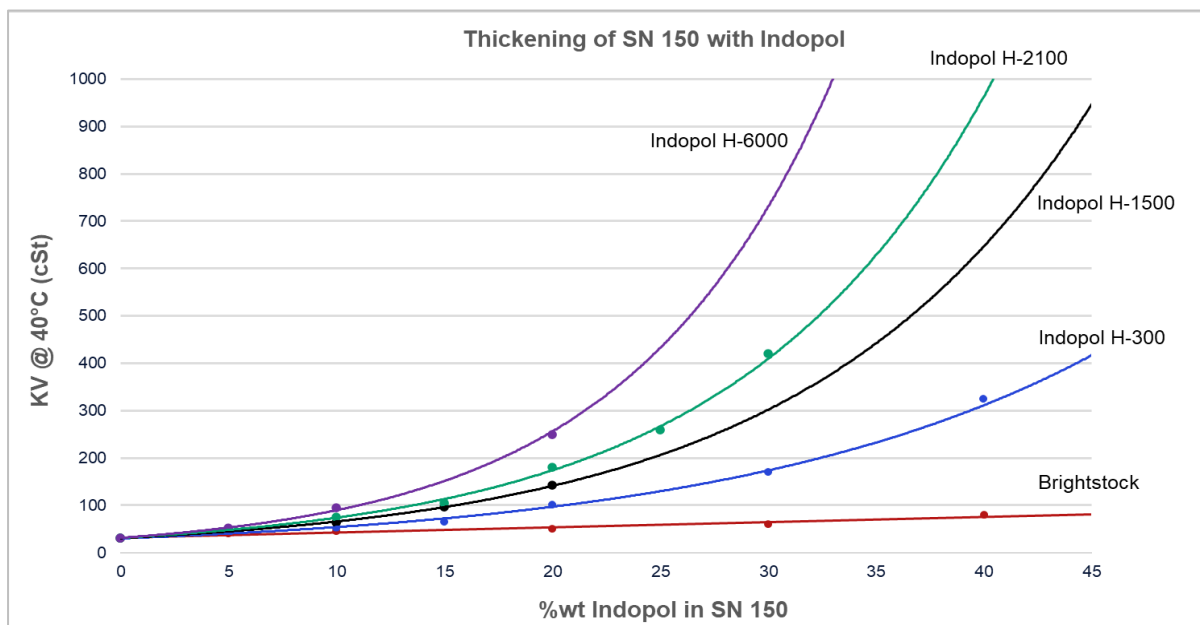


Fig. 1 Thickening efficiency of different polybutenes in SN 150 and compared to bright stock.



Excellent shear stability

One of the most severe shear tests used to differentiate between shear stable polymers is the KRL Tapered Roller Bearing Shear Test. Figure 3 compares the **shear stability** of different polybutenes and a PAMA product in SN150 mineral oil. Shear stability increases as polybutene molecular weight decreases and therefore grades such as H-100 and H-300 exhibit excellent shear stability.

Since our polybutenes are available in a wide molecular weight range, we can offer formulators and blenders a comprehensive set of grade offerings to optimize final properties of a myriad of formulations.

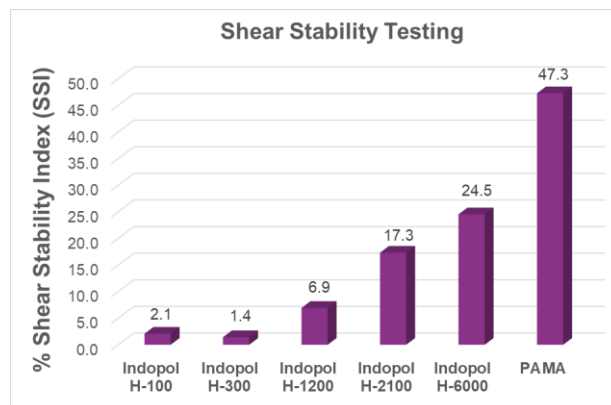


Fig. 3: KRL shear test @60°C and 20 hours (CEC L-45-99). 20 wt% polymer treat rate in SN 150 mineral oil. PAMA Mw ~65.000 g/mol.

Typical Properties Indopol Polybutenes

Property	Method	H-300	H-1200	H-2100	H-6000	H-18000
Kinematic Viscosity @100°C (mm ² /s)	ASTM D445	630	2500	4250	12150	40500
Viscosity Index	ASTM D2270	173	242	267	306	378
Flash Point (°C) min.	ASTM D93	160	165	170	175	180
Pour Point (°C)	ASTM D97	3	15	21	35	50
Molecular weight (Mn)	ASTM D3536 mod.	1300	2100	2500	4200	6000

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