

Technical Bulletin

Viscosity Index (Vi)

What is Viscosity Index?

Viscosity Index(VI) is a value showing the variation of viscosity depending on temperatures.
A viscosity index of around 100 is accepted to be normal and a viscosity index of around 150 is accepted to be high.

Why High VI Engine Oils are preferred?

The variation of viscosity of high VI engine oils with respect to temperature is less than normal/low VI engine oils. Thus, they can be pumped easily at low operating temperatures and provide fast lubrication in the start-up, creating a thick oil film at high operating temperatures and thus, prevent metal-metal contact and abrasion.

How Do Viscosity Index Improvers Work?

The additives (polymer) used to regulate the variation of viscosity of oils against temperatures are known as Viscosity Index Improvers (Modifiers).
While VI improvers shrink in the cold and allow oil to flow, they tend to expand and grow in the hot conditions, preventing the oil from getting excessively thin.

Does Every VI Improver Show the Same Performance?

There are a high number of VI improvers (OCP, PMA, PIB, PAMA, SBR etc.) with different chemical structures, which are used in oils. The low and high temperature performances of two engine oils with the same VI value (e.g., VI value of 150) but different VI improvers used in their content may be different. It is important to take into consideration MRV, CCS and HTHS values as well as VI values.*

* MRV represents the pumping ability of oils at low temperatures.
CCS represents the first action of oils at low temperatures.
HTHS represents the durability of oils at high temperatures (150 °C) and under high shear conditions.

