

There are some important numbers to bear in mind when looking at technical data sheets and you should be able to obtain these either by looking at the sheets or asking the oil company for the figures.

COMPARING TECHNICAL SPECIFICATIONS (If you can get hold of them!)

When comparing several oils for use in your vehicle, the most important thing to do is to compare the technical specifications of the same viscosity oils.

This is the only way to objectively determine which oil has the best protection and performance characteristics.

There are some useful specifications you might see on the technical data sheet for any given oil viscosity although many manufacturers do not publish the full story which just confuses the matter as you need to compare the same figures to make a true assessment so you may need to ask!

Kinematic Viscosity @ 100 degrees C
Kinematic Viscosity @ 40 degrees C
Viscosity Index (VI)
Pour Point
Flash Point
High Temperature/High Shear Viscosity

Comparisons can be difficult without the full picture, but not impossible. Here are some of the specifications which are the most important when looking for the best performing oil.

WHAT DOES EACH SPECIFICATION MEAN?

The most commonly found specs are kinematic viscosity at 100 degrees and 40 degrees C, VI (viscosity index), pour point, flash point, and the HTHS number (high temperature/high shear).

Kinematic Viscosity @ 40 degrees C

Although this test is not used specifically for classification of the oil as a certain viscosity, it is used for establishing the Viscosity Index of the oil. If the VI Index is listed then you can safely ignore this specification, even though it's on all tech sheets.

Kinematic Viscosity @ 100 degrees C

Once again this test is really only useful for establishing the viscosity classification of the oil and for determining its Viscosity Index. If the VI Index is listed then you can safely ignore this specification, even though it's on all tech sheets.

Viscosity Index

An oil's VI rating refers to its ability to maintain a consistent viscosity over a wide temperature range. The higher the VI, the better this ability. I wouldn't purchase a multi-viscosity oil that has a viscosity index below 140. The VI of a good monograde oil should be at least above 100. One thing to keep in mind regarding VI numbers is that they only refer to an oil's ability to maintain consistent viscosity when new. They tell you nothing about how quickly the oil will lose this ability to maintain its viscosity over time.

The fact is, even if an oil has a VI of 180, it may only hold that VI rating for a couple thousand miles and this is extremely important! This is where the HTHS number is very important.

A rule of thumb is that Petroleum oils are much more likely to have declining viscosity indexes than synthetic oils. This is because synthetics require a far lower percentage of VI improvers to boost their VI numbers. VI improvers can break down very quickly. Hence, the less VI improver needed, the less likely an oil's VI will be affected over time.

Most tech sheets list the viscosity index.

Pour Point

The pour point of an oil is a temperature -15 degrees C above the temperature at which an oil shows no movement when its container is inclined for 5 seconds. In simple terms, the pour point is the lowest temperature at which an oil will actually flow. This does not mean that it would easily pump through an engine at this temperature - just that the oil still acts somewhat like a liquid at this temperature.

Keep in mind that in oils where pour point depressants are necessary (generally, petroleum oils), the pour point of the oil will rise slightly every time your oil sees cold temperature weather. This is because those pour point depressant additives are being used up. Synthetic oils do not use pour point depressants, so they will hold a consistent pour point for a much longer period of time.

This spec should be found on every tech sheet. Of course, if the oil is not designed for low temperature operation, this spec is obviously less important. But, if you're looking at the spec sheet for an oil that will see cold temperature operation, the pour point should be on there.

Flash Point

The flash point of an oil is the temperature at which the oil vaporizes enough for the gas to become momentarily flammable in the presence of a small flame. There are other conditions and requirements for this test, but in general it is that an oil reaches its flash point when it begins to significantly vaporize.

In today's modern engines a flash point under 180 degrees C is unacceptable. Look for an oil with a flash point of 200 degrees C if you want the good stuff. A good quality synthetic will be higher than this. If this specification is not available, find another oil.

High-Temperature/High-Shear

This test is a simulation of the shearing effects that would occur within an engine. In fact, it's actually designed to simulate motor oil viscosity in operating crankshaft bearings.

Under high stress conditions where shearing can occur, the VI Improvers (polymers) break down. As they do, the viscosity of the oil decreases. This is what the High Temperature/High Shear test checks for.

The HT/HS test is measured in Centipoise (cP) as the Cold Crank Simulator test is. However, in this case, because you're hoping for the least loss of viscosity with an increase in heat and stress, you want the cP value to remain high.

Each SAE multi-viscosity grade has a specific lower limit for the HT/HS cP value. If a multi-viscosity oil cannot achieve a cP value above that limit, it cannot be classified under that viscosity grade. For instance, according to the SAE specifications, an oil must achieve an HT/HS cP value of 3.7 or higher in order to be classified at the 15w40 viscosity grade. The thinner the oil the lower the number.

So, whether this data appears on a manufacturer's tech spec sheets or not, the company always has the data and it should be available on request.

MEETS OR EXCEEDS ALL REQUIREMENTS

Other companies might list a test specification (standard or non-standard) and then put something like "Meets or Exceeds All Requirements". This can be a cop out unless the oil in question is a specialist "race" oil which is tested on the track (Motul 300V is one of these specialist "race" oils).

Any oil on the market should meet or exceed any standardized requirements, otherwise, it shouldn't be on the market.

A good tip is to look for oils manufactured by companies that are not afraid to publish the results of testing for comparison to other oils.

Be aware that some companies will utilize non-standardized testing procedures so they can provide information which looks impressive but can't be compared to other oils in the industry which is generally unacceptable.