

1. **What advantages does Motul have against the competitor's product?**
 - Motul has a history of more than 150 years and is the pioneer in ester formulation. Ester is the highest quality in the base oil category.
 - Motul pay attention to details and quality and has been developing and formulating lubricating oil using the highest quality in the base oil category.
 - For the 300 V series, the difference from its competitors is these oils are develop and use for racing. Thus, what is used in the racing circuit is the same as consumer purchase from the market.
 - All its 300 V surpass all API performance levels
 - Some motorcycle products contains a piece of racing technology from 300 V

2. **What is the difference between mineral, synthetic fortified/ semi -synthetic, full synthetic & synthetic ester oils?**
 - Base oils are the building block of finished lubricating oil. It is like baking different type of cakes, bread and making noodles, the base ingredient in making all these is flour. Every one would agree that flour has different quality and grading.
 - In analogy to lubricating oil, base oil has different quality too. The quality of lubricating oil is very much determined by the type of base oil used. That's where it draws the difference between mineral, semi-synthetic, fully synthetic and synthetic ester oils.
 - In the nut shell, the difference between different group of base oils is govern by the stability and resistance of oil break down during its application. Carbon will start to form when oil breakdown and oxidized. Just like when cooking oil is oxidized, you can find residue carbon form at the bottom of frying pan. Just imagine when you use an unstable engine oil in your car, carbon will start to build up in your piston and valves when the oils breakdown. This will lead to higher wear rate and reduce engine life.
 - The order of good resistance to oil break down and good oxidation stability is as follows;
 - Synthetic Ester base
 - Synthetic base
 - Semi-Synthetic
 - Mineral
 - In a semi-synthetic oil, the lubricating oil is formulated by using a combination of synthetic and mineral base oils. Thus in terms of quality, it is better than a mineral grade but lower than a fully synthetic and synthetic Ester grade.

3. What is ester? What is double ester?

- Double ester technology is recognized as the best base oil technology today. It is a combination of two esters to provide outstanding performance than single ester.
- They are very stable and can withstand very high operating pressure and temperature.
- Its has properties that has high oxidation stability and viscosity index
- Esters base oil also have a unique properties, i.e. the polar ends on ester molecules act like magnets and has a good inclination to stick to metals surfaces. With this special property of ester base oil, it will provides a film of oil on metal surfaces and this provide good protection during start up thereby minimized engine wear.

4. What are viscosity ratings for?

- Engine oil viscosity classification is developed by the Society of Automotive Engineers (SAE) base on the measured of viscosity at a certain temperature.
- Example of SAE Engine Oil Viscosity Classification (SAE J300)

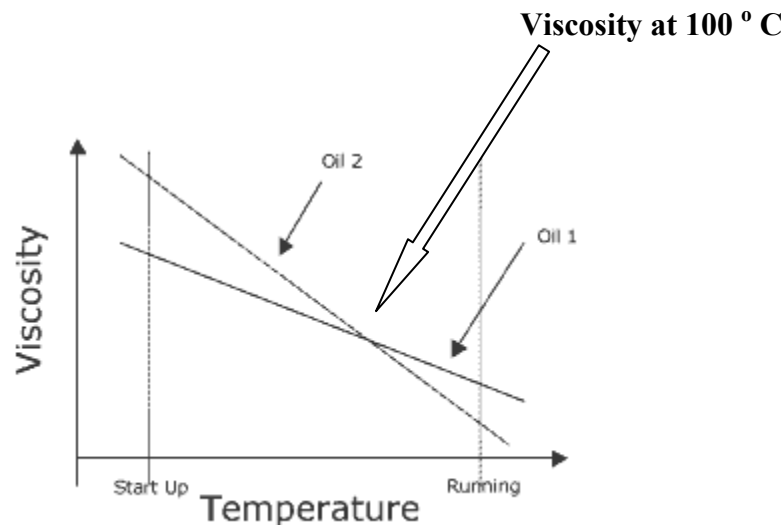
SAE Viscosity Grade	Viscosity at Borderline Cranking Temperature	Viscosity at Borderline Pumping Temperature	Viscosity at 100 C (ASTM D - 445) cST	
	cP @ degree C Maximum	cP @ degree C Maximum	Minimum	Maximum
0 W	6,200 @ -35	60,000 @ -40	3.8	-
5 W	6,600 @ -30	60,000 @ -35	3.8	-
10 W	7,000 @ -25	60,000 @ -30	4.1	-
15 W	7,000 @ -20	60,000 @ -25	5.6	-
20 W	9,500 @ -15	60,000 @ -20	6.6	-
25 W	13,000 @ -10	60,000 @ -15	9.3	-
20	-	-	5.6	<9.3
30	-	-	9.3	<12.5
40	-	-	12.5	<16.3
50	-	-	16.3	<21.9
60	-	-	21.9	26.1

- Viscosity is a measure of oil thickness and its unit measurement is in centistokes. It is a measurement of a fluid's resistance to flow and its thickness changes with temperature changes. Oils will thin down when it subject to temperature increase the reverse situation take place as when temperature drop.

- Example of viscosity rating for monograde oil is SAE 10, 20, 30, 40, 50 and 60. The higher the SAE number it means that the viscosity of the oil is thicker and the oil has a higher resistance of flow. For example the viscosity of a SAE 50 oil is thinner than SAE 60 and thicker than SAE 40.
- The SAE rating numbers provide us a guide as to which oil to use under different operating conditions. In summer with a higher operating temperature higher viscous oil is needed. In winter, lower viscosity of oil is needed and this will help to start up cold engine easier.

5. What are the differences in viscosity ratings, eg: 10W-40?

- For multigrade oil, it has a dual viscosity rating, for example SAE 10W-40. The W stands for winter or cold temperature viscosity, where as the number follow after “W” is hot temperature viscosity. For instance 10W is applicable to low temperature operating condition in winter and 40 is for high temperature operating condition in summer.
- Refer to the table above (question 4), the lower the number before the “W” the lower the operating temperature it can allow. For example, if you are operating in a severe cold winter with a temperature of -26 degree C, then the recommended oil to use is a SAE 5W-XX and below.
- What is the advantage to use a grade of oil with an SAE 5W-40 verse SAE 15W-40 in summer?



Note: Oil 1 – SAE 5W-40
Oil 2 – SAE 15W-40

In comparison to these two grades (refer to the above diagram), the viscosity of the oil at 100⁰ C will be similar (the last two SAE number for both oil is the same i.e. 40). However, at ambient temperature, let say, 20 degree C, the oil with SAE 5W-40 has a lower viscosity when compare to SAE 15W-40. The advantage is with a lower viscosity the oil is easily pumped up from the oil sump to lubricate the engine. This will help to reduce wear at initial start up and prolong engine life. On the other hand at higher temperature, like in the combustion chamber, the SAE 5W-40 has a higher viscosity than SAE 15W-40. This oil will has thicker oil film to protect the moving parts, thus better protection and prolong engine life.

6. What are ACEA & API ratings used for, eg: A4/B4 & SJ , etc?

- API (American Petroleum Institute) and ACEA (European Motor Vehicle Manufacturers Association) are independent organization based in the USA and Europe respectively who would determine the performance service level of the engine oil. The objective is to ensure a minimum performance level for engine oils that are able to meet the ever changing demand of modern engine. It is also to ensure that when consumers purchase the engine oil, they will be assured of the minimum standard performance level by engine oil manufacturers.
- Beside these two organizations, each individual car manufacturer also develops their own criteria and performance service level.
- These performance service classifications are intended to use as guides to aid in the selection of proper engine oils for significantly different engine service conditions.
- The service level would determine the performance level of the oil. For API the gasoline service performance level is classified as API SA, SB, SC, SD, SE, SF, SG, SH, SJ, SL. Oil meeting API SL, may also be used for other performance level, earlier category had been recommended. Similarly for diesel engine, the service performance level is classified as API CA, CB, CC, CD, CD II, CE, CF, CF4, CG4, CH4, CI4, CI4-plus
- ACEA performance level is basically divided into 3 groups. That is,
 - A for gasoline engine
 - B for light diesel engine
 - E for heavy duty engine
- In each group the different performance level is divided into classes, example 1, 2, 3, 4
- In order for the oil to meet these performance levels, the oil has to undergo and pass a series of engine test.

7. **Why should I use a dearer 5W-30 & not a cheaper 20W-50 in my new model car?**
- Grade with SAE 5W-30 meet the performance level with an energy conservation specification. That is, it has better running efficiency as it has lower viscosity as compared to SAE 20W-50 oil. Thus it has less viscous drag and as a result it will give you better fuel consumption.
 - A lot of car manufacturers have move their recommendation towards SAE 5W-30. This is also due to global warming environmental issue. With this lighter oil, it provides a better fuel efficiency, thereby produce less carbon dioxide, thus it is more environmental friendly.
8. **How often should I change my oil?**
- Normally for mineral grade the recommended oil change interval is 3 months or 5,000 km. For synthetic oil the recommended oil change interval is 6 months or 10,000 km. It is strongly for driver to follow car's manufacturer's oil change interval to avoid unnecessary warranty claims issue.
 - In today modern engine, a lot of car manufacturer has been pursing long drain oil change interval. One of their strategies is to advocate to consumer that maintenance cost is cheaper as they the frequency to service their car has been reduced. On the other hand it is environmental friendly too.
9. **I've heard that once you use a mineral oil, you cannot change to synthetic oil. Is this true?**
- That is not true. In today engine oil formulation, the formulation has to take care of oil mixing compatibility. Lubricants that are formulated with castor oil (vegetable base) will not be compatible with petroleum base lubricants. In today technology, castor oil is seldom used to formulate lubricants
10. **I've heard that you can't use synthetic oil in a rotary engine? True or false?**
- In the past synthetic oil cannot be use in Madza RX 7 which is a rotary engine because it has seal compatibility problems. However, this issue has been resolve by Motul in today synthetic oil technology. Motul strongly recommend its 300 V series, H-Tech 100 Plus 5W-30 and H-Tech 100 10W-40 for Madza RX 7.