



FAQs Sheet: Engine Oils - General

1. What does the “viscosity” of an oil mean?

Viscosity is a measure of the thickness of an oil. The viscosity (thickness) of the oil at low and high temperatures is measured on a scale determined by the Society of Automotive Engineers and given a number known as the SAE number. Therefore SAE 30 oil will be thinner than an SAE 40.

2. What is meant by multigrade?

Multigrade oils were developed in the 1960's and have a designation in the format 20w50. Prior to this, all oils were monogrades. This was made possible by the invention of polymers. Polymers are clever molecules that expand as they get hotter. Therefore a multigrade oil can have the viscosity of an SAE20 when it is cold and the viscosity of an SAE50 when hot. This removes the necessity to change from a thin oil in the winter to a thicker oil in the summer. The 20w number is the cold viscosity and the 50 number is the viscosity at 100 centigrade.

3. What is the difference between a mineral and synthetic oil?

Both types begin with crude oil. Mineral oil is obtained directly from the refining process, whereas synthetic oils are subjected to chemical processing which alters and improves its chemical structure. Synthetic oils therefore have better performance than mineral oils at higher and lower temperatures, but are inherently more expensive.

4. What are the specific characteristics and advantages of synthetic oils?

As with mineral oils, there are differing levels of quality within the definition of synthetic oils, but the general advantages are: Better flow at low temperatures enabling thinner oils to be manufactured. Thinner oils are required by modern engine designers to help reduce fuel consumption and emissions. Higher film strength thereby reducing wear. More stable and less volatile at high temperatures, reducing oil consumption (Note; for a detailed explanation, refer to the article from Race Engine Technology magazine in the Motorsport downloads section.)

5. What is a semi synthetic oil?

As the name suggests, a semi synthetic is a blend of mineral and synthetic base oils. The performance (and price) therefore falls roughly mid-way between a mineral and a full synthetic oil.

6. Do I need a different oil for a diesel and petrol engine?

Generally the answer is yes for older vehicles, as diesel engine oils have higher detergency levels. It is important to refer to the vehicle manufacturer's handbook to establish exactly which specification of oil is required. This is vital if your car has extended service intervals and you are still within the warranty period. However the latest trend on new vehicles is to use the same formulation on petrol and diesel versions.

7. Why are synthetic oils more expensive than mineral oils?

It is all about quality and performance. A synthetic oil is subjected to much more sophisticated manufacturing techniques and this means it is more expensive to manufacture. However, it has many performance advantages (see Q4) which justify the additional cost. For example, it enables longer service intervals, reduces oil consumption and contributes to improved fuel consumption. It follows that a semi synthetic oil will cost more than a mineral, but less than a full synthetic.





FAQs Sheet: Engine Oils - Motorsport Products

1. Are your Motorsport engine oils different to your road car oils and why?

Yes. Millers Motorsport engine oils have completely different formulations to our normal road oils. Road oil formulations must comply with the vehicle manufacturers' specifications, which are increasingly driven by factors such as fuel economy and lower emissions. Millers Motorsport oils make no such compromises and are formulated for maximum performance under the most arduous conditions.

2. OK, so what exactly are the differences?

Firstly, Millers Motorsport oils use the highest quality synthetic base oils and additives.

All Motorsport oils are multigrades, and you will recall that additives called polymers are added to make the base oils into a multigrade. The problem with polymers is that they "give up" in areas of high shear, e.g. in the crankshaft journals and between the camshaft and the cam follower. In other words, they become thinner in exactly the areas where they should not.

Millers Motorsport oils use additives called esters to replace the polymer and therefore improve the "strength" of the oil in areas of high shear. More detailed information on esters is available in the article from Race Engine Technology magazine in the motor sport downloads section.

3. Does it follow that the best oil will be 100% ester?

No. The best performance is obtained from a blend of esters and full synthetic base oils. This is why Millers use a blend of 3 different esters with full synthetic base oils and other sophisticated additives in their Motorsport range.

4. I notice you have some semi synthetic oils in the Motorsport range. Why is this?

Certain types of engine will perform very well on semi synthetic oil even in Motorsport applications. These are mainly engines from the 50's and 60's such as MG, Austin Healey, Jaguar and race engines developed from the Ford Kent and Pinto engines. These were designed to run on a 20w50 and Millers

semi synthetic CSS 20w50 is ideally suited to these applications. We also make COR 20w50, developed primarily for short circuit and oval racing. These oils are ideal for these applications and are less expensive than our full synthetic Motorsport oils.

5. Do I need a special running in oil for a motorsport engine?

We would recommend this, definitely. It is very difficult to get new piston rings and bores to run in on a full or semi synthetic oil. Millers therefore produce a competition running in oil CRO 10w40. This is a very high quality mineral oil which will protect the cams, followers etc. whilst still allowing the rings to bed in. It can be used for the running in process on both a dyno or on the road.

6. You seem to produce a lot of different viscosities, how do I decide which viscosity to use for my engine?

It depends on the state of tune. Start with the recommendation in the owner's handbook. If it suggests 5w40 for standard road use and this is your intended use, you should go for CFS 5w40. If the engine will be driven hard e.g. occasional track days, you can upgrade to CFS 10w40. If it is very highly tuned, raced, rallied, frequent track days etc, it is wise to upgrade to CFS 10w60. You can apply this principle to all applications.

