



Understanding Racing Lubricants

OIL RATINGS

Oils typically carry two ratings that you are probably familiar with and that are listed on the bottle of production based motor oils, API and SAE.

API –stands for the American Petroleum Institute and they rate the composition and quality of the oils. All oils have many additives for purposes such as; increasing lubricity, reducing oxidation, reducing foaming, detergents for reducing deposits, etc. Passenger car oils have a rating that is called their S rating. It started with SA in 196... and today is up to SN. This rating is influenced by the additives as required by the new engines being developed by the auto manufacturers.

SAE – stands for the Society of Automotive Engineers and they set the standard for the viscosity of oils. This is the 10, 20, 30 etc. or 5w20, 5w30, 10w30, etc. that you see on the bottle. This number too is influenced by the requirements of today's automobile engines as designed by the manufacturers. Today, we even have a 0w30 and 0w20 oil that is used in new cars. However, due to the clearances, temperatures, load and RPM placed on modern racing engines, viscosity requirements of a racing engine will be greatly different than a passenger car engine.

OIL VISCOSITY

The technical definition is the measure of the oil's resistance to shear, commonly known as the resistance to flow.

High viscosity = high resistance to flow (*Like Molasses*)

Low Viscosity = low resistance to flow (*Like Water*)

Viscosity varies inversely with temperature.

Oil weight, or viscosity, refers to how thick or thin the oil is. The temperature requirements set for oil by the Society of Automotive Engineers (SAE) is 0 degrees F (low) and 210 degrees F (high).

Oils meeting the SAE's low temperature requirements have a "W" after the viscosity rating (example: 10W), and oils that meet the high ratings have no letter (example SAE 30). An oil is rated for viscosity by heating it to a specified temperature, and then allowing it to flow out of a



specifically sized hole. Its viscosity rating is determined by the length of time it takes to flow out of the hole. If it flows quickly, it gets a low rating. If it flows slowly, it gets a high rating.

Viscosity improvers are added to an oil to give it the ability to “adjust” for changes in temperatures. So, a 20w50 oil will have a winter weight at 0 degrees of a 20 weight oil, and then at high temperatures, 210 degrees, it will have a weight of a 50 weight oil. Multi viscosity oils give us greater protection by being thinner when cold to insure adequate flow and lubrication, and then becoming thicker when hot to insure adequate wear protection.

ZINC CONTENT

To the dismay of all cam manufacturers and most engine builders, the EPA has greatly reduced the legal limits of zinc and phosphates and oil can contain in recent years. This reduction has led to rapid cam lobe wear and other issues. Racing oils which do not carry the API certification are exempt from this reduction and therefore still have the zinc (ZDDP) at acceptable levels. In fact, Renegade Racing Oils have 3000 parts per million ZDDP, almost twice as much as the closest competitor.

FILM STRENGTH

Engines pump oil through them to both lubricate and cool them. The crankshaft and other moving components ride on a film of oil, they do not touch each other. It is the strength of the oil film that is a critical component of an oil. Using the right components and additives not only affect viscosity and the API ratings of an oil, they greatly impact film strength. If an oil has a strong film strength then you can use tighter oil clearances and thinner oil to do the same job that used to require larger clearances and heavier oil. While we need to have a thick enough oil to withstand the heat and pressure placed upon an engine, too thick of an oil will not pump easily in colder weather and reduces the amount of lubrication an engine receives. It also increases the amount of horsepower used to just drive the oil pump. This is why most racing engines today utilize a multi-viscosity oil such as 10w30 or 20w50.

POUR POINT

The lowest temperature at which an oil will flow. This property is crucial for oils that must flow at low temperatures. A commonly used rule of thumb when selecting oils is to ensure that the pour point is at least 10C (20F) lower than the lowest anticipated ambient temperature.

SYNTHETIC OIL



Motor oils are either mineral based (petroleum) or synthetic based (chemical). Modern chemistry has allowed refiners to build oils utilizing better formulations of chemicals instead of the paraffins utilized in the old days. These improvements give us stronger film strengths, better lubricity and longer oil life than conventional oils. Manufacturers claim the following benefits for synthetic oils:

- Improved viscosity at low temperatures. Mineral oils tend to include wax impurities which coagulate at lower temperatures. A typical 10W-30 oil remains liquid at -50 °C (-58 °F)
- Better high temperature performance. Synthetic oils have few low molecular weight hydrocarbons which evaporate at high temperatures.
- Higher purity
- Decreased oil consumption
- Reduced friction and engine wear
- Improved fuel consumption through better engine lubrication
- Longer intervals between oil changes
- Resistance to oil sludge problems
- Crude oil doesn't have to be used for the production of the lubricants

Disadvantages - The primary disadvantage of synthetic oils is that they cost significantly more than mineral oils. The manufacturers of synthetic oils argue that this is offset by an extended working life. As synthetic oils tend to be more fluid they are also more prone to leak through worn seals.

Many argue that the advantages of synthetic oils are only significant in high performance applications such as motor racing and aviation, road haulage, or for general lubrication in extreme environments.

SEMI-SYNTHETIC OIL

A semi-synthetic oil is a blend of mineral oil with a small percentage of synthetic oil. They are designed to provide many of the benefits of synthetic oil without increasing the cost too much.

Renegade offers both mineral based and semi-synthetic blends to meet your racing needs.



- ▶ **RENEGADE OILS- UNIQUE AND PRICED FRIENDLY**
- ▶ RENEGADE OILS HAVE THE HIGHEST “BALANCED ZINC” CONTENT OF ANY OIL ON THE MARKET AT 3,000 PPM OF ZDDP.
- ▶ RENEGADE OILS ARE SPECIALLY BLENDED FOR RACING METHANOL AND RACING FUEL. NO MORE MILK SHAKE!
- ▶ RENEGADE OILS HAVE NO API REGISTER ON THE BOTTLES
- ▶ RENEGADE OILS ARE UNIQUE IN THEIR COLOR
- ▶ OTHER RACING OILS DON'T HAVE THE PROPER AMOUNT OF ZINC CONTENT FOR FLAT TAPPET CAMSHAFT. BE CONFIDENT USING RENEGADE