Are Synthetics Better?

A question we often get asked is whether synthetic oils really are better than mineral oils or semi-synthetics.

The basic benefits of a synthetic oil are as follows:

Extended oil drain periods
Better wear protection and therefore extended engine life
Most synthetics give better MPG
They flow better when cold and are more thermally stable when hot
Esters are surface-active meaning a thin layer of oil on the surfaces at all times

If you want to know the reasons why then please read on…

Stable Basestocks

Synthetic oils are designed from pure, uniform synthetic basestocks, they contain no contaminants or unstable molecules which are prone to thermal and oxidative break down.
Because of their uniform molecular structure, synthetic lubricants operate with less internal and external friction than petroleum oils which have a non-uniform molecular structure.
The result is better heat control, and less heat means less stress to the lubricant.

Higher Percentage of Basestock

Synthetic oils contain a higher percentage of lubricant basestock than petroleum oils do.
This is because multi-viscosity oils need a great deal of pour point depressant and viscosity improvers to operate as a multigrade.

The basestocks actually do most of the lubricating. More basestocks mean a longer oil life.

Additives Used Up More Slowly

Petroleum basestocks are much more prone to oxidation than synthetic oils. Oxidation inhibitors are needed in greater quantities in petroleum oils as they are used up more quickly.
Synthetic oils do oxidize, but at a much slower rate therefore, oxidation inhibiting additives are used up more slowly.

Synthetic oils provide for better ring seal than petroleum oils do. This minimizes blow-by and reduces contamination by combustion by-products. As a result, corrosion inhibiting additives have less work to do and will last much longer in a synthetic oil.

Excellent Heat Tolerance

Synthetics are simply more tolerant to extreme heat than petroleum oils are. When heat builds up within an engine, petroleum oils quickly begin to burn off. They are more volatile. The lighter molecules within petroleum oils turn to gas and what's left are the large molecules that are harder to pump.
Synthetics have far more resistance as they are more thermally stable to begin with and can take higher temperatures for longer periods without losing viscosity.

Heat Reduction

One of the major factors affecting engine life is component wear and/or failure, which is often the result of high temperature operation. The uniformly smooth molecular structure of synthetic oils gives them a much lower coefficient friction (they slip more easily over one another causing less friction) than petroleum oils.
Less friction means less heat and heat is a major contributor to engine component wear and failure, synthetic oils significantly reduce these two detrimental effects.

Since each molecule in a synthetic oil is of uniform size, each is equally likely to touch a component surface at any given time, thus moving a certain amount of heat into the oil stream and away from the component. This makes synthetic oils far superior heat transfer agents than conventional petroleum oils.

Greater Film Strength

Petroleum motor oils have very low film strength in comparison to synthetics. The film strength of a lubricant refers to it's ability to maintain a film of lubricant between two objects when extreme pressure and heat are applied.
Synthetic oils will typically have a film strength of 5 to 10 times higher than petroleum oils of comparable viscosity.
Even though heavier weight oils typically have higher film strength than lighter weight oils, an sae 30 or 40

synthetic will typically have a higher film strength than an sae 50 or sae 60 petroleum oil.

A lighter grade synthetic can still maintain proper lubricity and reduce the chance of metal to metal contact. This means that you can use oils that provide far better fuel efficiency and cold weather protection without sacrificing engine protection under high temperature, high load conditions. Obviously, this is a big plus, because you can greatly reduce both cold temperature start-up wear and high temperature/high load engine wear using a low viscosity oil.

Engine Deposit Reduction

Petroleum oils tend to leave sludge, varnish and deposits behind after thermal and oxidative break down. They're better than they used to be, but it still occurs.
Deposit build-up leads to a significant reduction in engine performance and engine life as well as increasing the chance of costly repairs.
Synthetic oils have far superior thermal and oxidative stability and they leave engines virtually varnish, deposit and sludge-free.

Better Cold Temperature Fluidity

Synthetic oils do not contain the paraffins or other waxes which dramatically thicken petroleum oils during cold weather. As a result, they tend to flow much better during cold temperature starts and begin lubricating an engine almost immediately. This leads to significant engine wear reduction, and, therefore, longer engine life.

Improved Fuel Economy

Because of their uniform molecular structure, synthetic oils are tremendous friction reducers. Less friction leads to increased fuel economy and improved engine performance.

This means that more energy released from the combustion process can be transferred directly to the wheels due to the lower friction. Acceleration is more responsive and more powerful, using less fuel in the process.

In a petroleum oil, lighter molecules tend to boil off easily, leaving behind much heavier molecules which are difficult to pump. The engine loses more energy pumping these heavy molecules than if it were pumping lighter ones.

Since synthetic oils have more uniform molecules, fewer of these molecules tend to boil off and when they do, the molecules which are left are of the same size and pumpability is not affected.

Synthetics are better and in many ways, they are basically better by design as they are created by chemists in laboratories for a specific purpose.