

Basestock categories and descriptions

All oils are comprised of basestocks and additives. Basestocks make up the majority of the finished product and represent between 75-95%.

Not all basestocks are derived from petroleum, in fact the better quality ones are synthetics made in laboratories by chemists specifically designed for the application for which they are intended.

Basestocks are classified in 5 Groups as follows:

Group I

These are derived from petroleum and are the least refined. These are used in a small amount of automotive oils where the applications are not demanding.

Group II

These are derived from petroleum and are mainly used in mineral automotive oils. Their performance is acceptable with regards to wear, thermal stability and oxidation stability but not so good at lower temperatures.

Group III

These are derived from petroleum but are the most refined of the mineral oil basestocks. They are not chemically engineered like synthetics but offer the highest level of performance of all the petroleum basestocks. They are also known as "hydrocracked" or "molecularly modified" basestocks. They are usually labelled/marketed as synthetic or semi-synthetic oils and make up a very high percentage of the oils retailed today.

Group IV

These are polyalphaolefins known as PAO and are chemically manufactured rather than being dug out of the ground. These basestocks have excellent stability in both hot and cold temperatures and give superior protection due to their uniform molecules.

Group V

These special basestocks are also chemically engineered but are not PAO. The main types used in automotive oils are diesters and polyolesters. Like the group IV basestocks they have uniform molecules and give superior performance and protection over petroleum basestocks. These special stocks are used in all aviation engines due to their stability and durability. Esters are also polar (electro statically attracted to metal surfaces) which has great benefits. They are usually blended with Group IV stocks rather than being used exclusively.

It is common practice for oil companies to blend different basestocks to achieve a certain specification, performance or cost. The blending of group IV and V produces lubricants with the best overall performance which cannot be matched by any of the petroleum basestock groups.