

## **What is a multigrade?**

A good oil must be quite low in viscosity even when it's cold so that it gets around the engine in a fraction of a second when you turn that key!

On the other hand it needs to protect engine components like piston rings at very high temperatures as the engine gets hot without evaporating or carbonising and it must maintain oil pressure.

Unmodified thin oils simply can't perform this balancing act. The answer is to use a mixture of thin oil and temperature-sensitive polymer which as the oil gets thinner with increasing temperature expands and effectively "fights back", keeping the viscosity at a level to hold oil pressure and film thickness on the bearings.

So, these polymers are added to a thin base, 0w,5w,10w etc at cold temperatures they are "coiled up" and allow the oil to circulate very easily but as the engine and therefore the oil warms up, they begin to "uncoil" into long chains keeping the oil more viscous.

It is impossible to make a good 5w-40 or 10w-40 using only mineral oil. The base oil is too thin and evaporates away at high temperatures found in powerful engines that are highly stressed, this is why synthetics are used to build up the oil to cope with the stresses of modern engines.

This is called a multigrade.