17.Oil Filter Material in Engine Oil

Instrument: Tritec 2000 Dynamic Mechanical Analyser

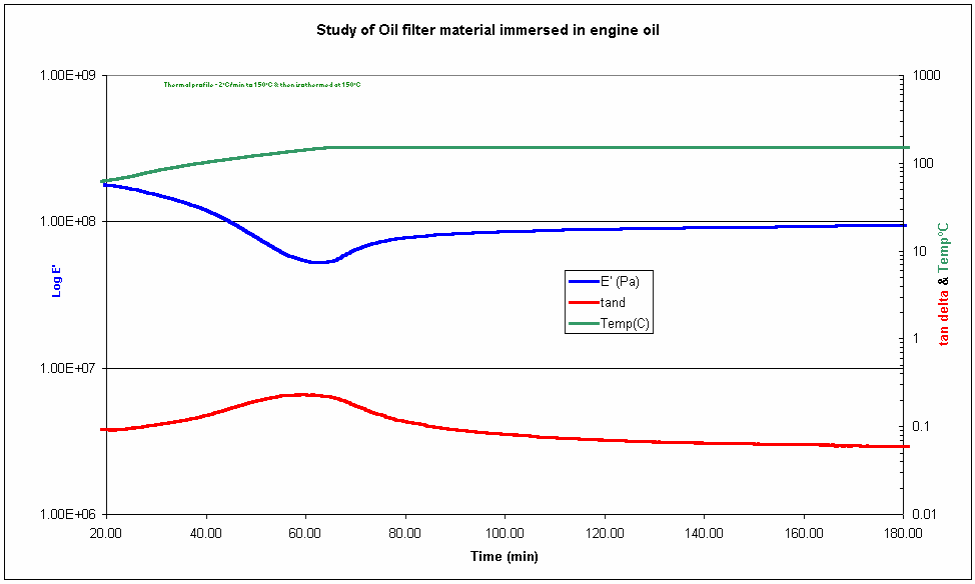
Sample: Oil Filter 'paper'

Geometry: Tension

%RMS strain: 0.35%

Frequencies (Hz): 1.0

Thermal profile: 2°C/minute to 150°C & then isothermed at 150°C for 2 hrs



Comments:

The above data illustrates the use of the fluid bath for studying the effect of environment on material used to construct an oil filter. The sample is physically immersed in a standard engine oil and the dynamic properties are gathered as the sample is heated to 150ºC and then as the sample is isothermed.

As the sample is heated to the start temperature the modulus falls and the tan delta rises. As soon as the sample reaches the isotherm temperature, the modulus starts to rise and the tan delta starts to fall. The most likely explanation is that the sample is impregnated with a material that cures at around 150ºC.

To confirm that the sample has a glass transition around 150ºC, the same material was run on a DMA in air. The result opposite confirms that, indeed, the material has a typical cured resin profile. However, the oil bath data shows that the resin is not totally cured as supplied and in use is clearly curing further and moving the glass transition to a higher temperature.