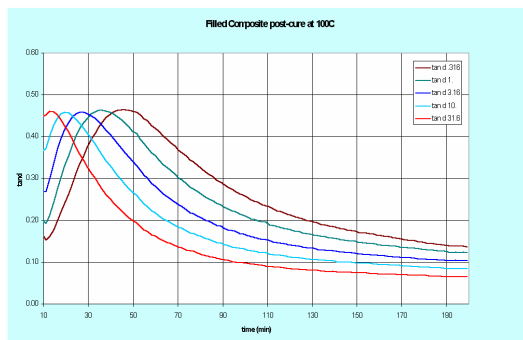


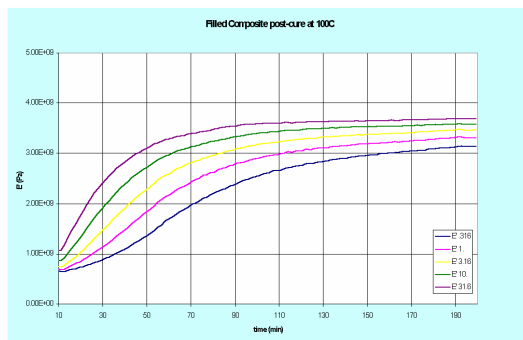


22. Multifrequency Filled Composite Analysis

Instrument: Tritec 2000 Dynamic Mechanical Analyser
Sample: 1.75mm Filled Composite bar
Geometry: Single cantilever bending 1.75mm x 10mm x 10mm
%RMS strain: 0.09
Frequencies (Hz): 0.316, 1, 3.16, 10, 31.6



Tan d



Modulus

Thermal profile:

10°C/minute to 100°C and then isotherm at 100°C for 200minutes

Comments:

Multifrequency analysis using a dynamic mechanical analyser allows the user to distinguish between frequency dependent processes and those that are not. Molecular relaxations e.g. α relaxations (or glass transitions) and β relaxations are always frequency dependent, as illustrated by the α (or glass transition) of the filled composite shown here. Examples of processes that are not frequency dependent are melting, thermal degradation, curing and crystallisation.

This experiment shows the same material as Application Note 21. A fresh sample was run in a slightly different manner. The sample was quickly heated to 100°C (around mid point of relaxation process) and isothermed to study post cure behaviour. Note that the order of the frequencies are reversed with this type of experiment.