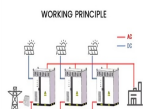
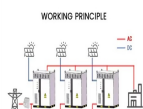


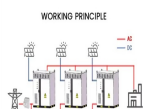
TREND OF DMA STORAGE MODULUS CHANGING WITH TEMPERATURE



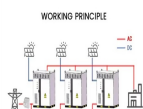
How do you find loss moduli from DMA? As shown in Figure 3, the storage and loss moduli obtained from DMA are found as functions of temperature. The glassy transition temperature, where the ratio of loss modulus and storage modulus ($\tan \delta$) dramatically changes, can be obtained from the DMA results, and the glassy transition temperature increases with the frequency. [1]



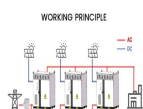
How is storage modulus transformed to elastic modulus? Storage modulus is transformed to elastic modulus over strain rates and temperatures. The transform is validated with experimental results and found to match closely. An adaptive design of experiments scheme is used for reduction in experiments. A single specimen can yield elastic modulus over temperature and strain rate ranges.



Can a dynamic tension mode be used to calibrate storage moduli? In a recent study by Hobbiebrunken et al., storage moduli of an epoxy resin measured by DMA using a dynamic tension mode were calibrated using the static mechanical testing data obtained at room temperature in order to incorporate the temperature-dependant elastic moduli into finite-element analysis models.

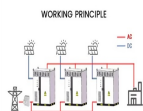


How does a DMA detect deformation? The DMA can discern the elastic and viscous components of deformation (6,7). It gives a very sensitive profile of the viscoelastic properties, including storage modulus, loss modulus and $\tan \delta$ as they change with temperature.

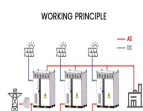


Do thermal transitions under low temperature affect modulus at high strain rate? Presence of thermal transitions below the lowest temperature covered in DMA experiments would result in the modulus at high strain rate to be underestimated by this transformation method [18].

TREND OF DMA STORAGE MODULUS CHANGING WITH TEMPERATURE



What does DMA measure? Conventionally, DMA measures the storage (elastic) modulus, the loss (viscous) modulus and damping. Depending on the loading mode, the elastic modulus may represent shear, tensile or flexural modulus.



Results of a DMA are the storage or elastic modulus (E''), the loss or viscous modulus (E''') and the tangent of the phase angle delta (E''/E'''). In the figure below, the storage modulus vs. temperature behavior of different high ???



DMA (Dynamic Mechanical Analyzer), (Storage Modulus), (Loss Modulus), (Tan delta) ASTM ??? IPC ???



As shown in Figure 3, the storage and loss moduli obtained from DMA are found as functions of temperature. The glassy transition temperature, where the ratio of loss modulus and storage



Comparing frequency and strain-rate domain results. The storage modulus master curve obtained fitting experimental $E''(f)$ data from DMA was integrated numerically according to Eq. 11 (Methods) to

TREND OF DMA STORAGE MODULUS CHANGING WITH TEMPERATURE



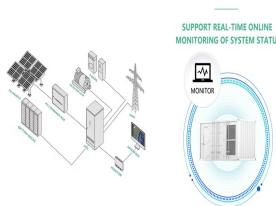
Glass transition and melting temperatures along with other thermal changes have been investigated to characterize the solid state of different foods, pharmaceuticals and polymers. ???



Mechanical properties such as Young's modulus (Y), storage modulus (E???), glass transition temperature (T_g), tensile strength (??), and yield strength (?? y) of metallized ???



This creates a worm-like micelle solution that behaves similarly to polymers [2]. This solution has a longer LVR at lower frequencies and a lower storage modulus and a more viscous response (loss modulus higher than storage modulus). ???



Dynamic Mechanical Analysis (DMA) is a characterization method that can be used to study the behavior of materials under various conditions, such as temperature, frequency, time, etc. The test methodology of DMA, which aims ???