PET STORAGE MODULUS

What are the mechanical properties of PET films? Mechanical properties such as Young's modulus (Y), storage modulus (E a?2), glass transition temperature (Tg), tensile strength (I?), yield strength (I?y) of PET and metalized PET films have been calculated from temperature scan and stressa??strain scan at room temperature using DMA.

What are the mechanical properties of metallized polyethylene terephthalate (PET) films? Mechanical properties such as Young's modulus (Y), storage modulus (E a?2), glass transition temperature (Tg), tensile strength (I?), and yield strength (I?y) of metallized polyethylene terephthalate (PET) films have been measured using Dynamic Mechanical Analyser (DMA).

Is it possible to produce high modulus and high strength PET sheets? Even in such an ideal case,the pre-dicted value was less than 5 GPa. Accordingly,it was demonstrated to be impossibleto produce high modulus and high strength PET sheets in terms of the-oretical aspects,in spite of industrial production of high modulus and high strength polyethylene fibers and tapes.

Which polymer has maximum storage modulus (E') value at the glassy region? It can be observed that all the composites obtained maximum storage modulus (Ea??) value at the glassy region due to the characteristics of the main polymer which is PEThas good luminous transmittance,high birefringence and excellent mechanical strength.

Does metal coating increase storage modulus? It is found that the value of storage modulus increasesafter metal coating on PET sheet. The percentage rise in storage modulus with respect to PET film is found to be 47.5% for Al-PET whereas 70.8% for Pb-PET film.

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Does metallization increase tensile strength of PET film? An increasein the values of storage modulus (E a?2),glass transition temperature (Tg) and tensile strength (I?) of PET after metallization as determined using DMA indicates that the stiffness,stability and strength of PET film increase when coated with Al and Pb.

The storage modulus of PET, which is the plastic deformation energy of a polymeric material, is 2000a??4200 MPa at 25?C and 242 MPa at 80?C . Tensile strength, flexural strength, Young's modulus, elongation at break, a?|

a?c Complex modulus M*, Young's modulus E* for tension e??e?? shear modulus G*. a?c e??i?-i ?(reversible)i?'e3 i??i?+-i ?(elastic)i? 1/4 e!? i ?i?JPYe?? i??e??i??i?? e1?e!?i??e?? storage modulus M'' a?|

,i 1/4 ?a??,i 1/4 ?Storage Modulusi 1/4 ?a??i 1/4 ?Loss Modulusi 1/4 ?,i 1/4 ?Loss a?|

i 1/4 ?storagemodulusi 1/4 ?,a??i 1/4 ?i 1/4 ?i 1/4 ?i 1/4 ?i 1/4 ?i 1/4 ?i 1/4 ?i 1/4 ? a?|

(Storage Modulus) E'',a??a??E'' ,i 1/4 ?7. a?|

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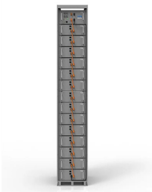
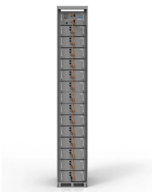
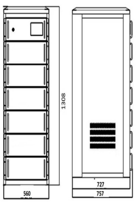


Mechanical properties such as Young's modulus (Y), storage modulus (E a?2), glass transition temperature (Tg), tensile strength (I?), yield strength (I?y) of PET and metalized PET a?|


i??eu-e3 e??i??i??i??i??eu!i??a?? i??i??e?? DMA(Dynamic mechanical analyzer) i?'i?(C)i??i?! e3 e??i?? film, i? i??i?? rubber, hardi?? sheete?+-i?? i ?i?(C)i?? modeeJPY 1/4 i? i ?i??i?! i?,e?? e3?i??eJPY 1/4 iGBP 1/4 i?' i??e3ue JPYe3 1/4 e3?i??i??i?? i,!i ?i??i?! i??i?+-i??(storage modulus), i?+-i??e3 1/4 i ?i?+-i??(loss a?|

Glass Transitions. Figure 2 shows the storage modulus response of the film. A T g is determined from the intersection of two lines that are drawn in two regions; one in the brittle glassy state and the other in the transition region. The a?|

a??,storage modules,(),() a?|


i1?i??e2 1/2 i??i??i?? e??i?? e'?i?!i?!e?? i|?e??i??e(C)'i?? PET e3? e? 1/4 e2?i?? PVC i??e|?i??i?? PET i??e|?i? 1/4 e!? e??i2'i??e ?e?? i??e??e?? i??i?'i??e3 i??e??[1-3]. PET i??e|?i?? e?'eu!i?+-i?? i??e??i??e,? i??i?'i??e?? i??e??, i??e??, i ? e,?, i??i?,i? a?|


(1) (Young's Modulus)i 1/4 ?,a??I?()=E*Iu(),I?,Iu,E,, a?|

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Measurement curves of PET recorded from 30 to 1000 ?C at a heating rate of 20 K/minute using a TGA/DSC 1 equipped with a DSC sensor. The TGA curve shows the change in mass of the sample and the DSC curve a?|


Figure 4 shows the storage modulus, loss modulus and Tan Delta dependences on temperature and ageing, respectively. The storage modulus behaviour in Figure 4 a shows that aged PET samples possessed a slightly a?|


storage modulus,a??,,, i 1/4 ?


The storage modulus of LDC PET was three times lower than that of HDC PET at 30 ?C and it started to decrease near the glass transition region. Furthermore, the rigidity of a?|

DMA results show that the storage modulus of the composites is improved with the increase of fiber content and CNT content. However, the loss modulus of CCF/PET composites is high, and the addition of CNT significantly a?|