POLIPLEX® PE100

PHYSICAL CHARACTERISTICS

TENSILE STRENGTH AND MODULUS

A standard test method for determining tensile properties of plastics such as ISO 527 or ASTM D 638 can be used to determine short term, tensile properties but the results obtained must be heavily qualified in view of this viscoelasticity. For direct comparison of materials it is recommended that test specimens of identical dimensions are used, as variations in the surface area to volume ratio can also cause differences. Test specimens can be of the flat dumbell type or tubular. The rate of straining in ISO 527 is 50mm per minute (or 1mm/min for the modulus) and ASTM D 638 is the lowest speed that produces rupture in 0.5 to 5 minutes.

The tensile strength, if not defined, is calculated as the highest of either the yield or the breaking load divided by the original cross-sectional area. A typical tensile stress-strain curve for polyethylene is shown in Figure 1.0.

The percent elongation, if not defined, is calculated at yield if the yield load is higher than the breaking load, otherwise it is calculated at break.

The modulus of elasticity is calculated from the initial linear portion of the stress-strain data, ie tangent modulus.

The secant modulus is used where no linearity is apparent in the stress-strain data and is given for a designated stress or strain value. See Figure 2.0 which illustrates the difference between the secant and elastic deformation moduli.

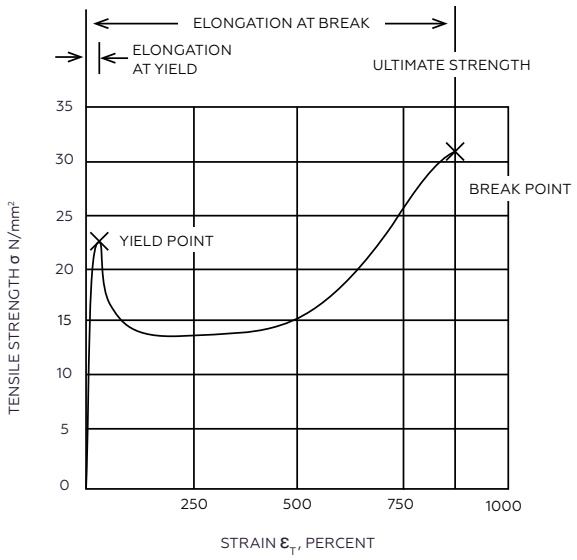

Figure 1.0 Tensile characteristics of polyethelene

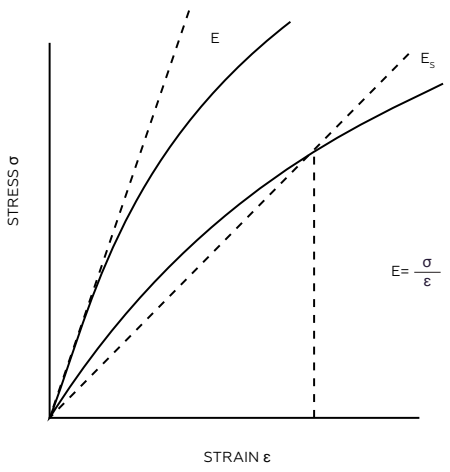

Figure 2.0 Creep effect on deformation moduli

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