

Design and material selection

Creep Test

Creep is defined as the time-dependent and permanent deformation of materials when subjected to a constant load or stress that is below its yield strength while maintaining the temperature constant.

Deformation or strain is measured and plotted as a function of elapsed time up to rupture. Most tests are the constant load type, which yields information about the engineering nature; constant stress tests are employed to provide a better understanding of the mechanisms of creep as indicated in Fig.(2.14). Creep often takes place in three stages. In the initial stage, strain occurs at a relatively rapid rate but the rate gradually decreases until it becomes approximately constant during the second stage. This constant creep rate is called the minimum creep rate or steady-state creep rate since it is the slowest creep rate during the test. The slope of the steady state portion of the creep curve is the creep rate.

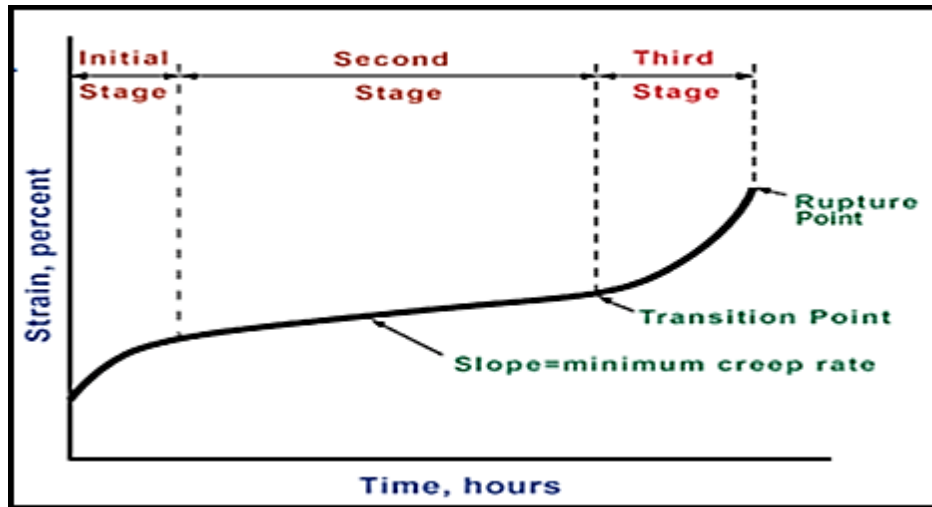
$$\text{Creep rate} = \Delta\epsilon / \Delta t$$

Where:-

$\Delta\epsilon$: Is strain change (mm/mm).

Δt : Is time change (min).

In the third stage, the strain rate increases, creep necking begins. The stress increases and the specimen deforms at an accelerated rate until failure occurs. The time required for failure to occur is the rupture time.



Stages of creep

Creep		D 2990
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Creep sample

Experimental part

Creep test of important tests which explains the behavior of polymeric material under the influence of a static load, gives a vision of the life of polymeric material for a particular application, has been using WP 600 Kriechtester creep testing machine device Found in the laboratories of College of Materials Engineering University of Babylon, shown in Figure (3-7), to conduct this examination. Creep Test was carried according to ASTM D 2990, This test method is used to find a property creep plastics reinforced and non-reinforced.