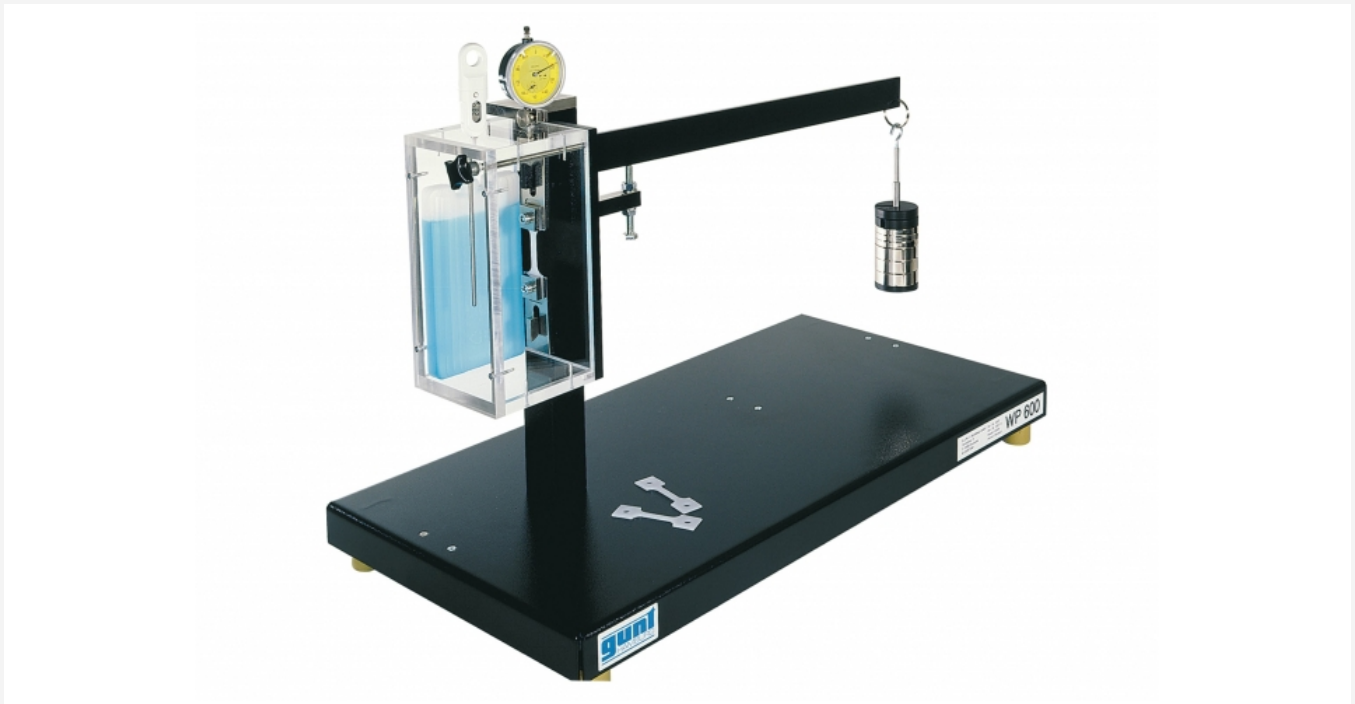


# WP 600

## Creep rupture test



### Description

- **typical phenomena of creep processes**
- **experiments at or below room temperature are possible**

Components that are subjected to long-term constant loads deform plastically. This material behaviour is called creep. The creep rupture test is a destructive test method for determining the material behaviour (creep) at constant test temperature (room temperature and below) and after prolonged exposure to a constant load.

The WP 600 experimental unit demonstrates typical phenomena such as phases of different creep rates or temperature-dependent creep behaviour. The clean layout and simple operation mean the experimental sequence can be observed in all details and phases. Lead and plastic specimens are used in order to achieve acceptable creep rates at room temperature.

Experiments can also be conducted below room temperature by means of a transparent temperature-controlled box with storage elements.

In the experiment, the specimen is subjected to a constant tensile load at a given, constant temperature. The tensile load is generated by a lever and stepped weights. The specimen holders are equipped with knife-edge bearings to avoid bending stresses on the specimen. An adjustable stop protects the dial gauge at fracture of the specimen and prevents the loads impacting the experimental unit.

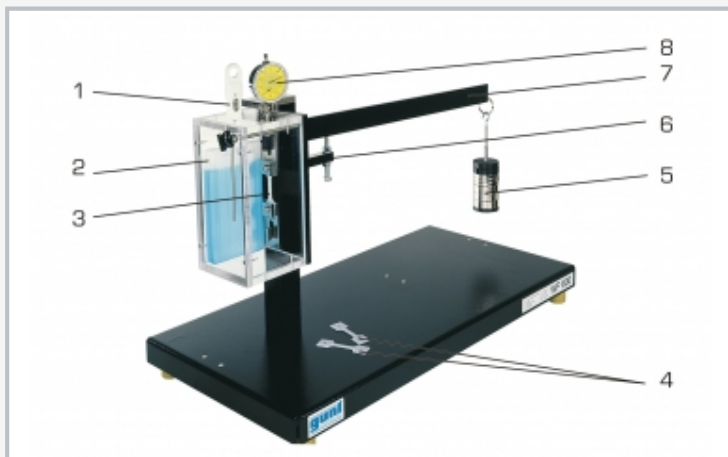
The elongation of the specimen over time is recorded by a dial gauge and a stopwatch and represented in a strain-time diagram as the so-called creep curve.

### Learning objectives/experiments

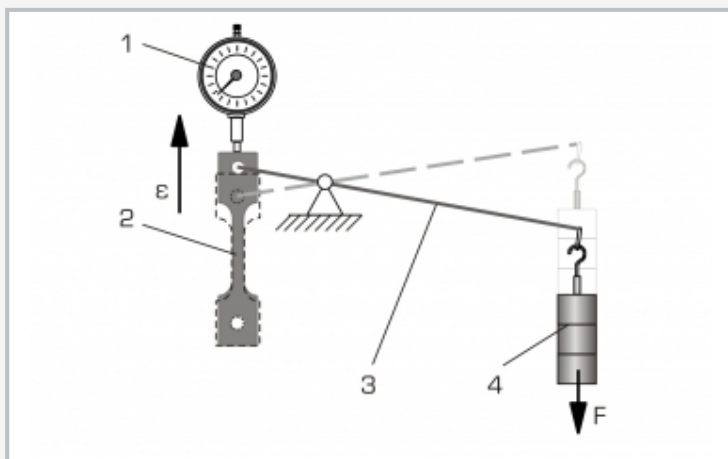
- creep in specimens of various materials
- record a strain-time diagram (creep curve)
- influence of temperature and load on the creep
- load and recovery in plastics

# WP 600

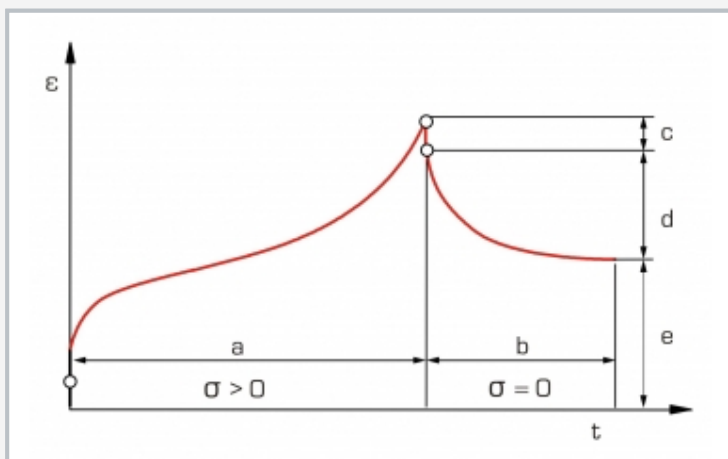
## Creep rupture test



1 thermometer for temperature-controlled box, 2 storage element for cooling the specimen, 3 clamped specimen, 4 specimens, 5 weight, 6 adjustable stop for the lever, 7 lever, 8 dial gauge



Principle of operation of the creep rupture test: 1 dial gauge, 2 specimen, 3 lever for load transfer, 4 weight; F force,  $\epsilon$  strain



Strain-time diagram (creep curve) of plastic: a load, b recovery, c elastic recovery, d plastic recovery, e permanent deformation,  $\epsilon$  strain,  $\sigma$  stress, t time

### Specification

- [1] investigation of creep behaviour of different materials in creep rupture test
- [2] constant load on the specimen via lever arm and stepped weights
- [3] flat lead and plastic (PE) specimens
- [4] experiments at or below room temperature are possible
- [5] transparent temperature-controlled box with storage elements for cooling the specimen
- [6] dial gauge for determining the elongation
- [7] stopwatch to record time

### Technical data

#### Specimens

- LxW: 25x5mm, thickness 2mm
- 10x lead
- 10x plastic (PE)

#### Weights

- 1x 1N (hanger)
- 2x 5N
- 3x 2N
- 3x 1N
- 2x 0,5N

#### Measuring ranges

- tension: 5...25N/mm<sup>2</sup>
- travel: 0...10mm, graduation: 0,01mm
- temperature: -50...300°C

LxWxH: 700x350x510mm

Weight: approx. 23kg

### Scope of delivery

- 1 experimental unit
- 1 set of specimens (20 pieces)
- 1 set of weights
- 1 stopwatch
- 1 temperature-controlled box with 2 storage elements and 1 thermometer
- 1 set of instructional material

# WP 600

## Creep rupture test

Creep testing machine

Optional accessories

020.60001	WP 600.01	Set of 10 specimens, PE
020.60002	WP 600.02	Set of 10 specimens, Pb
020.30009	WP 300.09	Laboratory trolley