





Bitumen Test Equipment

OLD and NEW



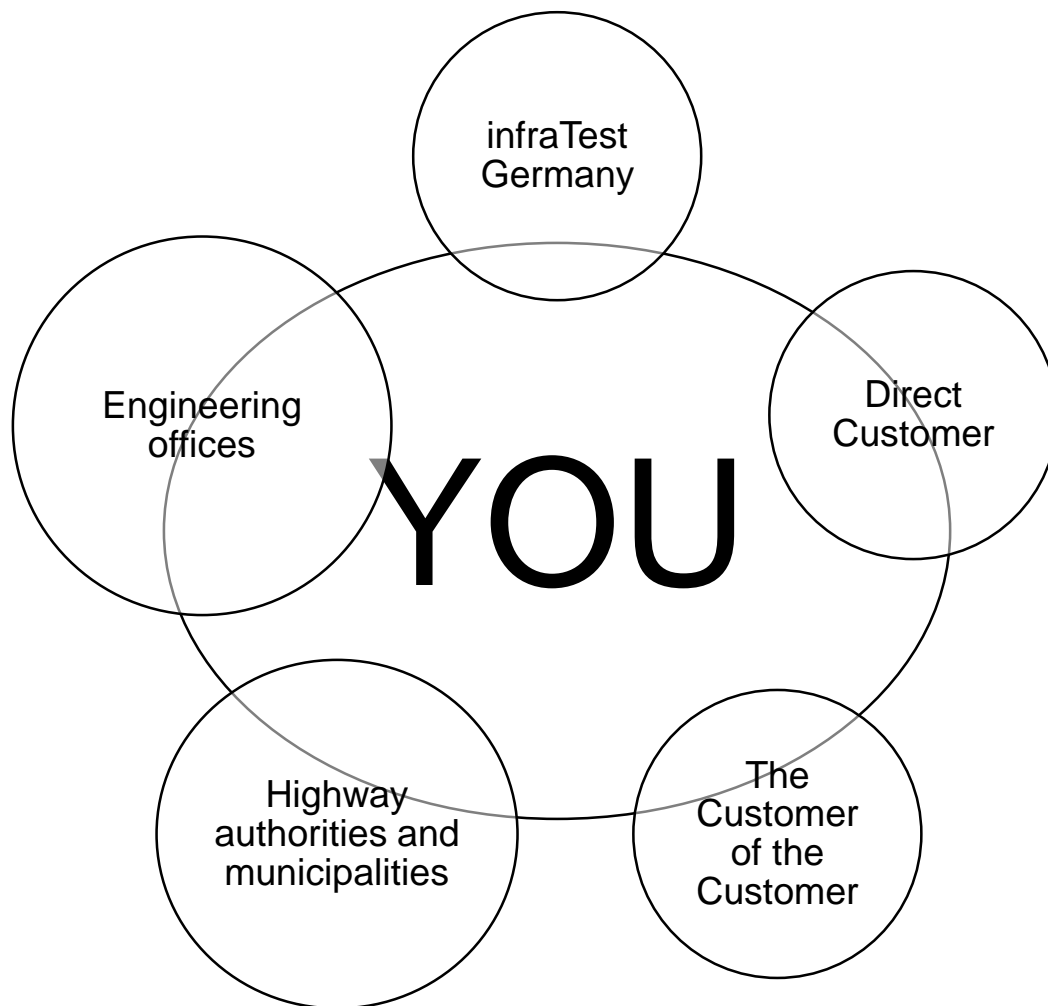


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Who



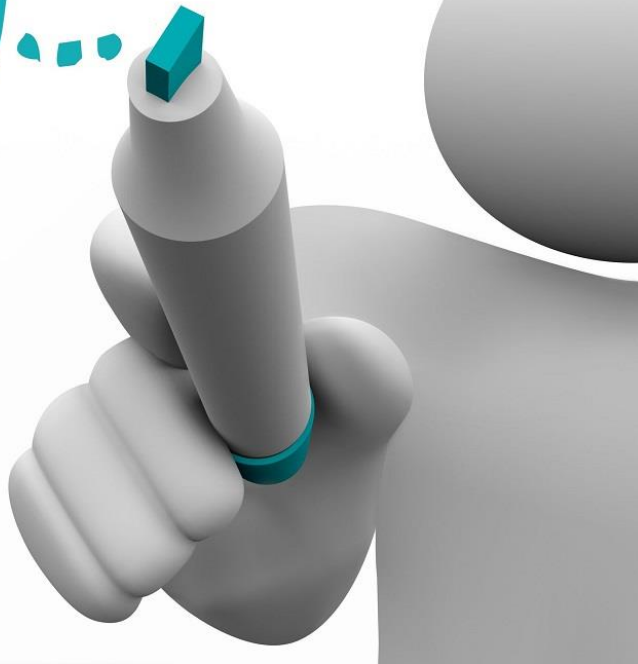


WHEN?





HOW
TO...







Bitumen Aging

Rolling Thin Film Oven Test - RTFOT



- Heating temperature 163 °C
- Rotation speed 15 1/ min
- Airflow 4.000 ml/min.
- Up to 8 test cups
- Dimension optimized
 - 770 x 730 x 610
- Weight 110 kg



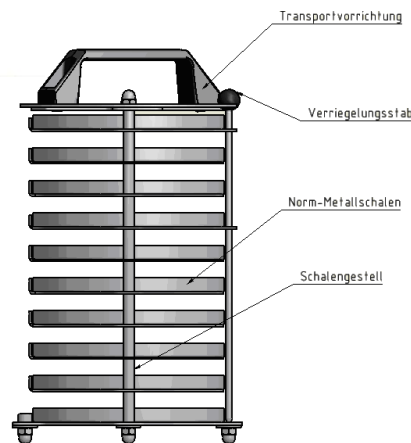
Rolling Thin Film Oven Test - RTFOT



Additional needed

- Glass Test Cup RTFOT – concave opening
- Glass Test Cup RTFOT – convex opening
- Compressed – Air Unit RTFOT

Pressure Aging Vessel - PAV

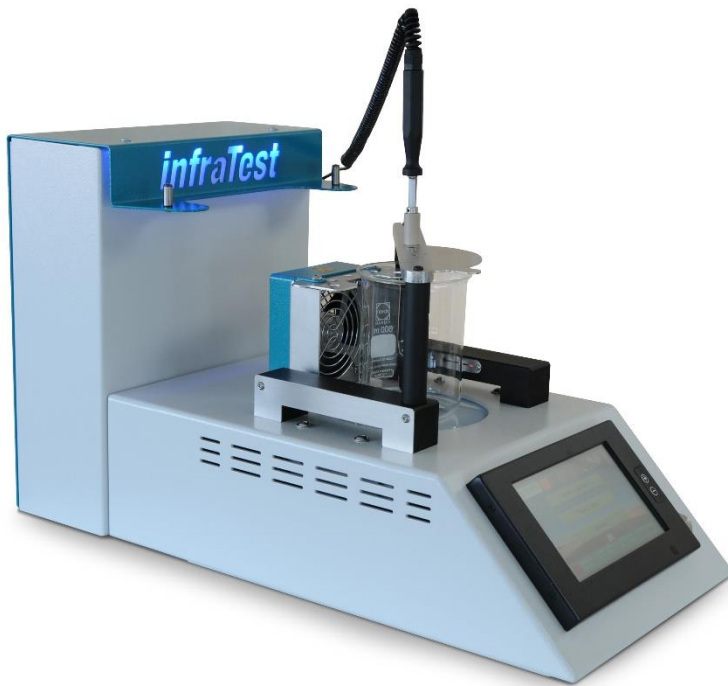


- Simulates the aging of bitumen after 5 – 10 years
- Dimension
560 x 520 x 470 mm
- Weight: 50 kg
- Working pressure:
min. 21 bar / max. 25 bar



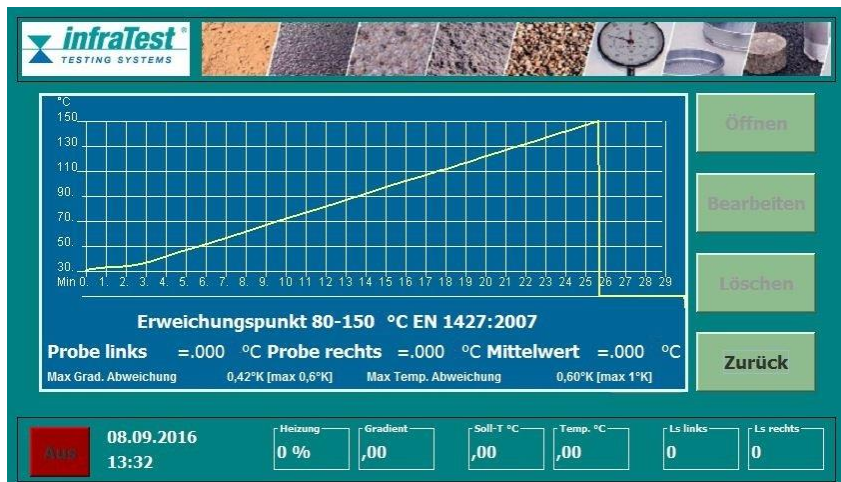
Softening Point Ring & Ball

Softening Point Ring & Ball

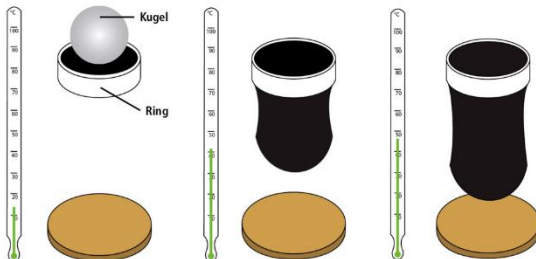


- Glass – ceramic heating plate
- Infrared heating
- Magnetic stirring motor with variable speed range

Softening Point Ring & Ball



- Microprocessor controlled system
 - Provides temperature rise of 5 K/min
- Two test options
 - 30 °C to 80 °C
 - 80 °C to 150 °C





Penetration test

Penetrometers



Automatic Digital Penetrometer



Digital Penetrometer



Penetrometer with Timer Controller

Penetrometers



Automatic Digital Penetrometer



Digital Penetrometer



Penetrometer with Timer Controller

Penetrometers



Automatic Digital Penetrometer



Digital Penetrometer

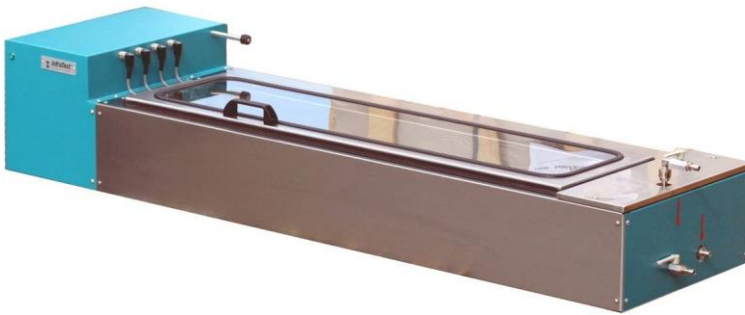


Penetrometer with Timer Controller



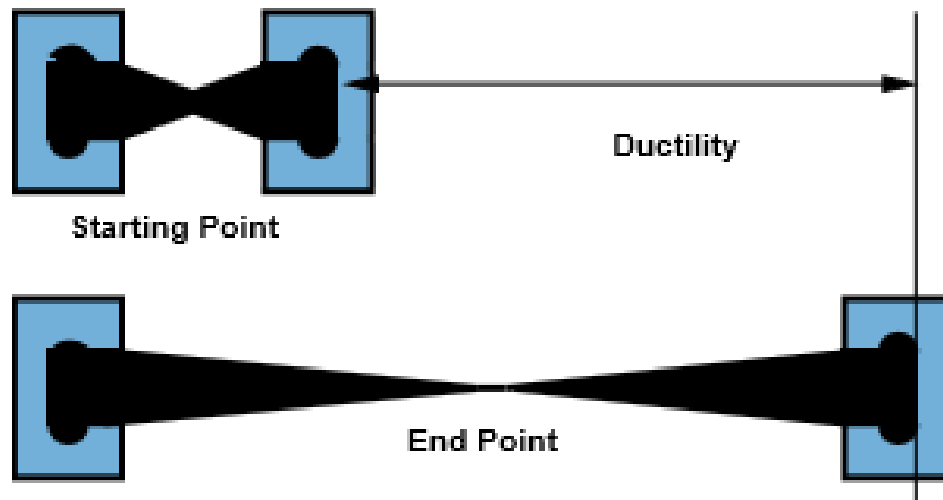
Ductility

Ductilometer 1500 mm digital

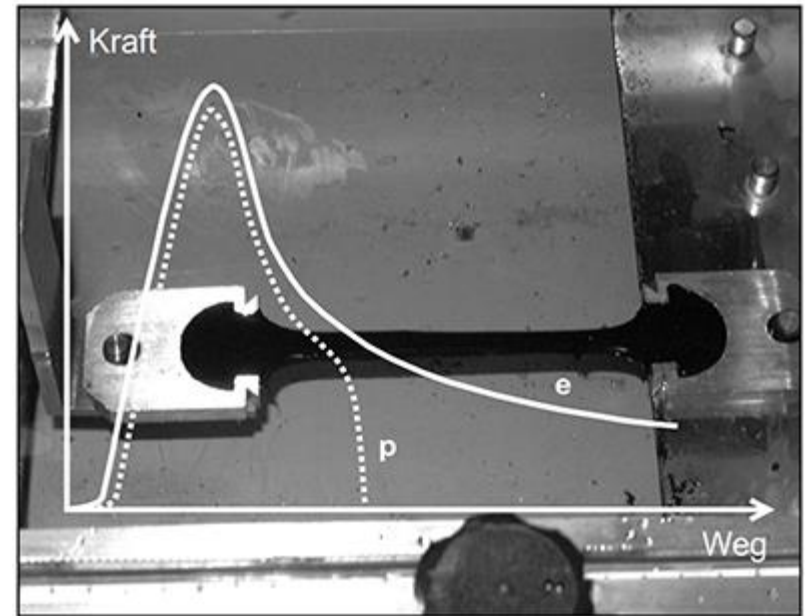
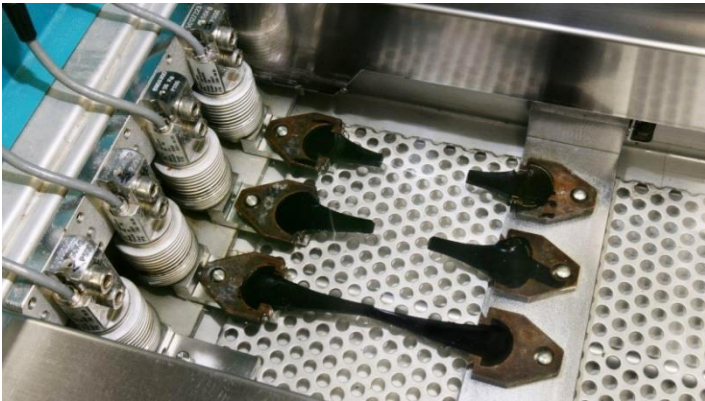


- Measurement of
 - Ductility
 - Elastic Recovery
 - Force Ductility
- Stainless steel casing with isolated water bath
- stepper motor providing a variable speed range 1 to 50 mm/min
- 4 samples simultaneously
- One measure place is equipped with electronic load transducer / optional 4

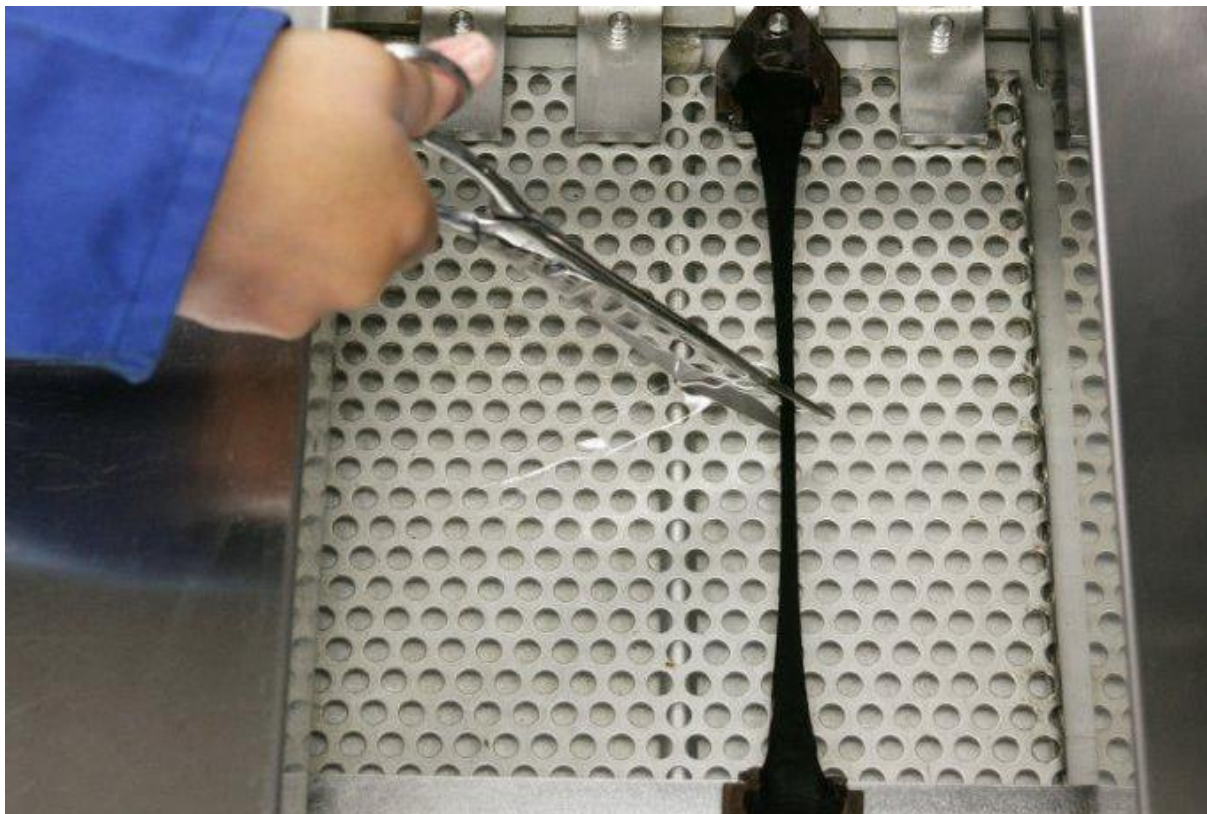
Ductility



Force Ductility



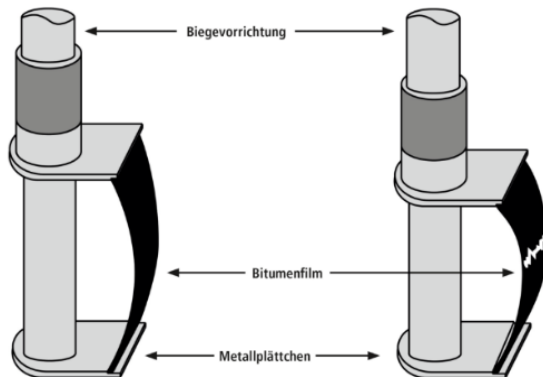
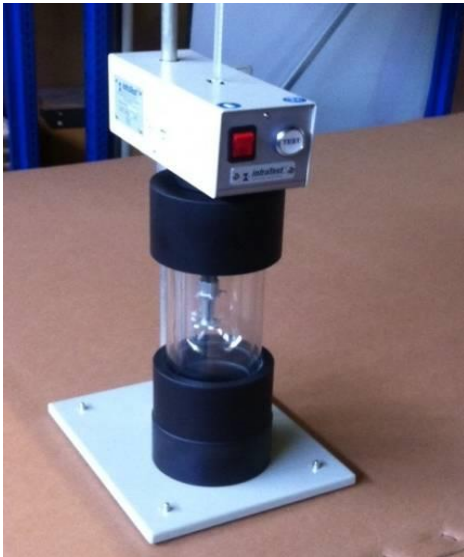
Elastic Recovery





Fraas Breaking Point

Breaking Point according Fraass



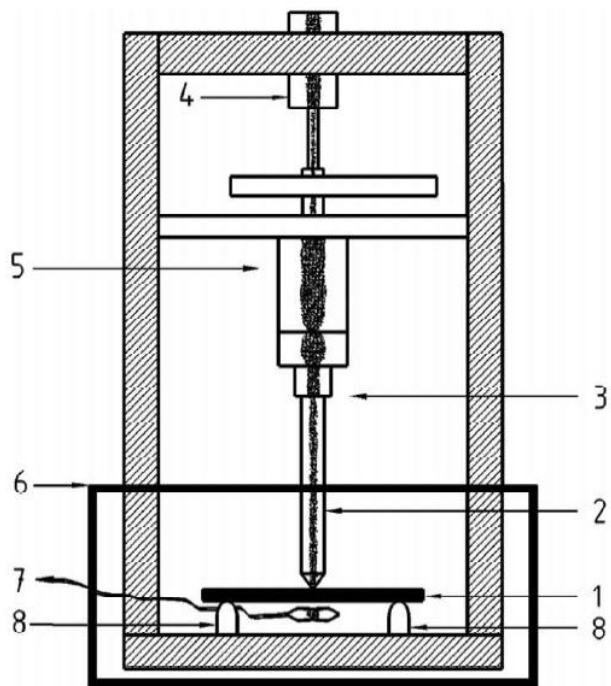
- Gives an idea on the behaviour of bitumen at cold temperatures
- Determination of the breaking point of bitumen
- Bending apparatus is motorized
- Test temperature is obtained by use of dry ice or carbon dioxide

Bending Beam Rheometer (BBR)

- Low temperature behaviour
- Characterisation of RAP-Bitumen
- High bitumen amount (much more than Fraass)



Scheme of BBR



Legende

- | | |
|--------------------|------------------------|
| 1 Probekörper | 5 Luftlager |
| 2 Belastungsschaft | 6 Flüssigkeitsbad |
| 3 Kraftmesszelle | 7 Temperaturmessfühler |
| 4 Wegaufnehmer | 8 Probenauflager |

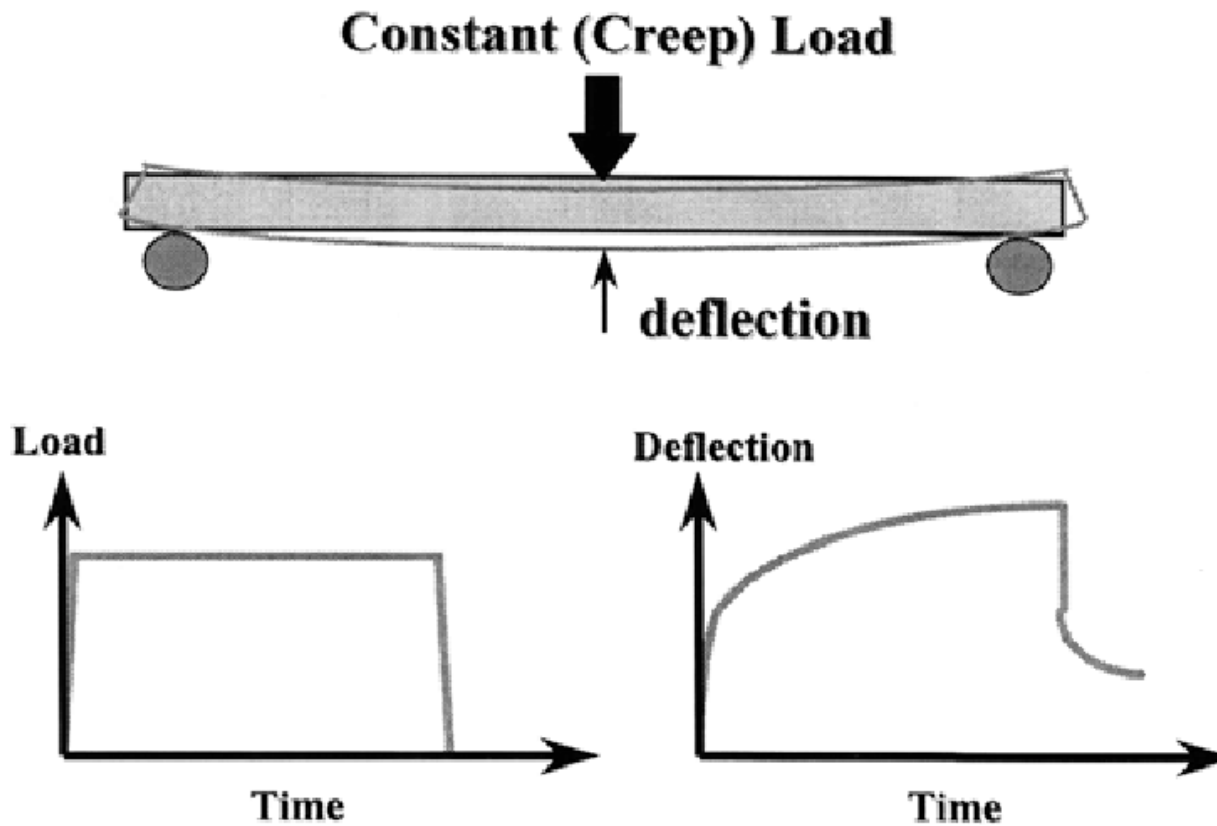
1. Sample
2. Load shaft
3. Load cell
4. Displacement measurement
5. Air bearing
6. Bath for liquid
7. Temperature measurement
8. Supports for sample

Bild 1: Schematische Darstellung eines Biegebalkenrheometers



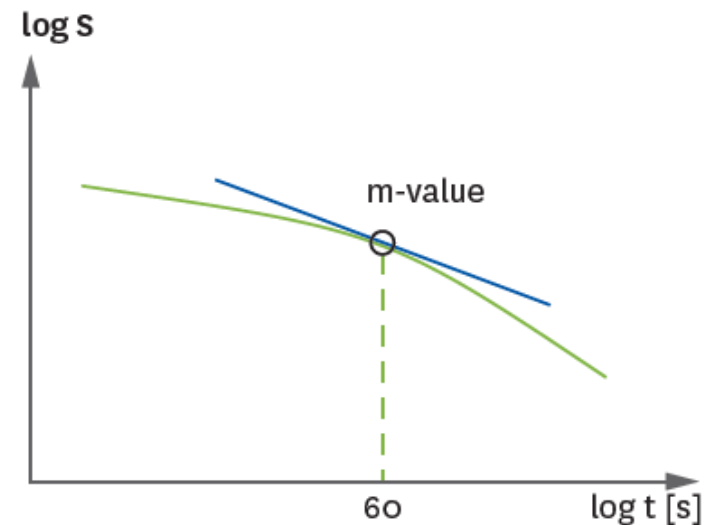
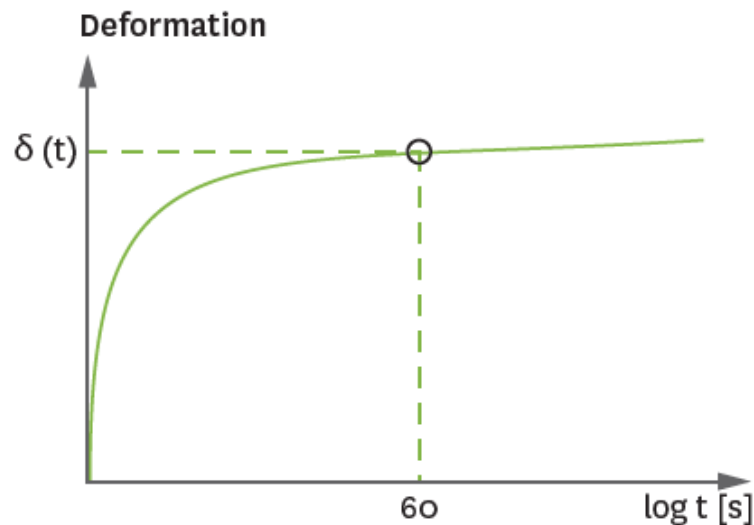
EN 14771: Bitumen and bituminous binders – Determination of the flexural creep stiffness – Bending Beam Rheometer (BBR)

Test Method



Results you get

- FLEXURAL CREEP STIFFNESS S
- m-VALUE





Let's go to the machines