

Product Information

Lever arm Creep Testing Machine Kappa LA

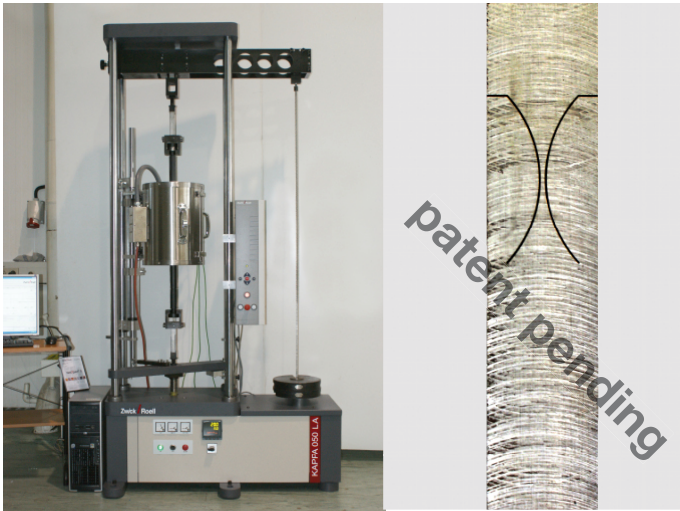


figure 1: Kappa 50 LA - Dead weight loaded

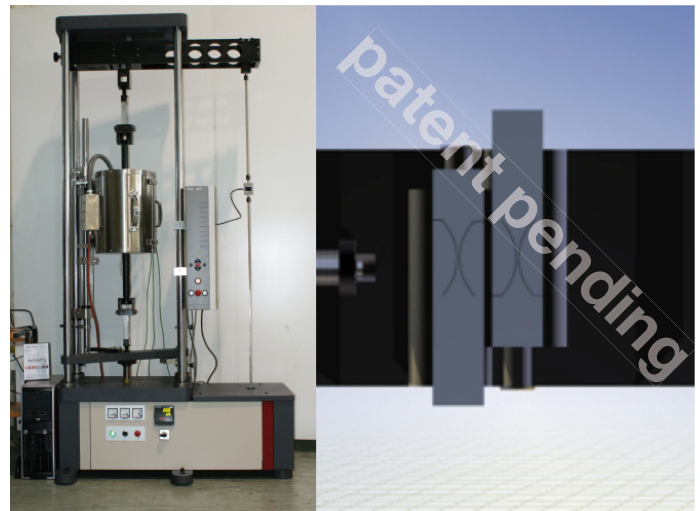


figure 2: Kappa 50 LA-spring loaded

Application

- Creep tests
- Creep rupture tests
- Stress rupture tests
- Relaxation tests (only with spring loaded system)
- Creep crack tests
- Definition of individual stepless sequences of temperature
- Ambient or elevated temperature
- For long term tests (reaching more than 10.000h)

Lever arm

- 20:1 lever arm ratio
- Proximity switches are used for auto-leveling
- Wear free elastic hinges for high quality of lever-arm bearing
- Accuracy of class 1 acc. to ISO 7500-1 from 0,5% to 100% of nominal load (LA-spring loaded).

Load Frame and drive system

- Stand-alone floor machine
- High stiffness, precision and durability by 4-columns-design
- High precision guiding crosshead
- Includes vibration isolation with sylomer-damper under the load frame
- Integration of high temperature controller in Kappa LA base

Automatic drive system

- The drive system is designed to adjust automatically the lever arm to the horizontal position. This ensures a precise lever arm ratio and a precise and constant load on the specimen.
- Drive control sampling frequency 6 ms
- Drive adjustment frequency 500 ms

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Specification Kappa 50/100 LA-DW

Weight train with dead weights

- Calibrated dead weights
- Wear-free elastic hinges for high quality of lever arm bearing
- Wear free elastic hinges for axial alignment acc. to ASTM E 292 and NADCAP-requirements
- Manual or motorized loading without shock
- Accuracy of class 1 acc. to ISO 7500-2 from 4% to 100% of nominal load.

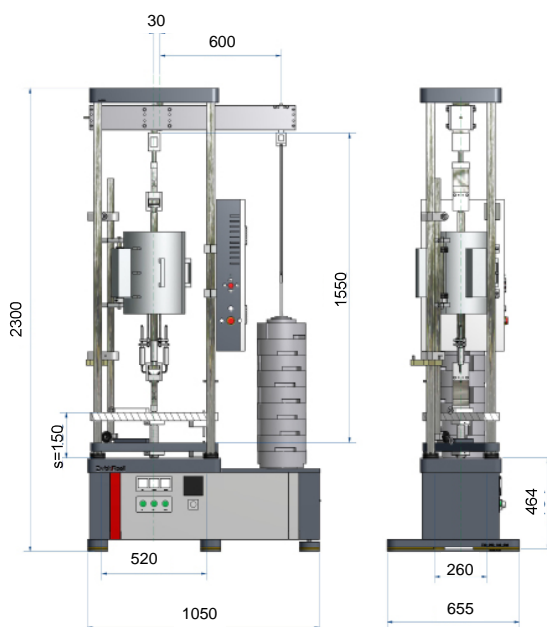


Figure 3: Weight train with dead weights

Specification 50/100 LA-Spring

Weight train with preloaded spring

- Preloaded spring
- Wear-free elastic hinges for high quality of lever arm bearing
- Wear free elastic hinges for axial alignment acc. to ASTM E 292 and NADCAP-requirements
- Precision load cell
- Motorized loading without shock
- Accuracy of class 1 acc. to ISO 7500-1 from 0,5% to 100% of nominal load.

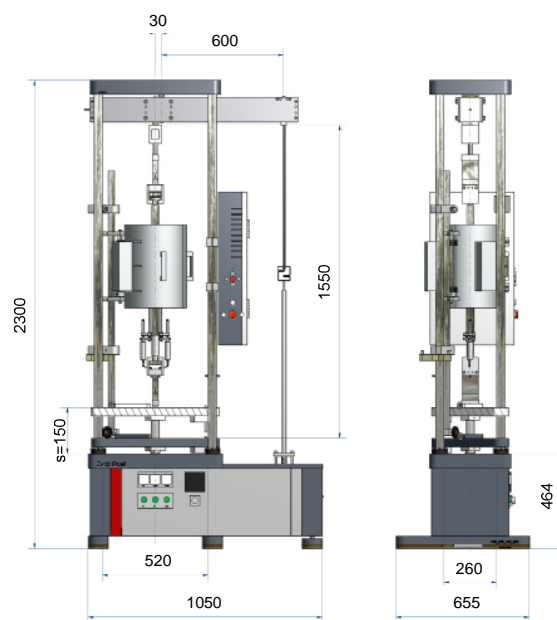


Figure 4: Weight train with preloaded spring

Technical data:

Load capacity	50 kN, 100 kN
Lever arm ratio	20 : 1
Test area-width	520 mm (between columns)
Test area-height	max. 1550 mm vertical clearance (without jigs- and fixtures/grips)
crosshead stroke s	150 mm
Frame Dimensions (W x D x H)	1050 x 655 x 2300 mm
Weight	603 kg
Power requirements	230 VAC, 1 kVA
Test speed 50 kN	max. 50 mm/min
Test speed 100 kN	max. 25 mm/min

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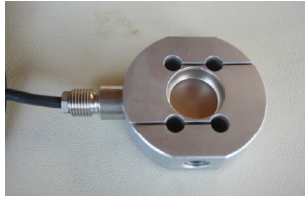
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Accessories

Load cells

- Electronic „Plug and Play“-Type (Calibration and technical data are saved in sensor plug)
- High accuracy (Linearity, Repeatability, Hysteresis, resolution) acc. to ASTM E 4 and ISO 7500-1
- High measurement range in class 1 acc. ISO 7500-1 from 0.4 %100% of nominal load



Pull rods

- Pull rods made of nickel-based superalloy
- Durability > 3 years at full load
- Upper pull rod with spherical bearing, lower pull rod with clamping lever
- Axial alignment acc. to ASTM E 292 and NADCAP-Requirements
- No additional alignment cardan joints necessary



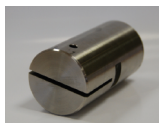
Specimen adapters

- Specimen adapters made of nickel-based superalloy

- Screw head
- Round specimen



- Clevis couplings
- Flat specimen

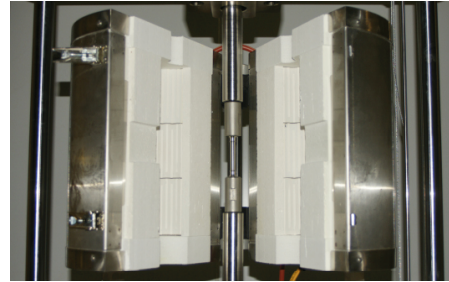


- Clevis couplings
- Pipe segment specimen



Accessories

High temperature furnace and controller



HT-furnace

- 3-zone furnace standard up to 1200 °C
- Internal diameter: 100 mm,
- Heated length: 300 mm
- Vertical positioning of furnace: furnace stays in the centre of the specimen during test
- Openings for load train, Thermocouples and Extensometers
- Optional side windows for optical strain measurement
- 3 Thermocouples for furnace controller, up to 3 additional Thermocouples for temperature control at the specimen



HT-controller

- Integrated, sophisticated Control-Algorithm for a precise Temperature along specimen and to prevent Temperature overshooting
- Empirically determined control parameters for different temperatures are no longer required
- Automatic Controller settings from 80°C...1200°C
- Temperature-tolerances acc. ASTM E 139
- Interface for 6 Thermocouples (3 for furnace, 3 for specimen special configurations possible)
- Digital display of temperatures
- Stand Alone or PC-operation possible

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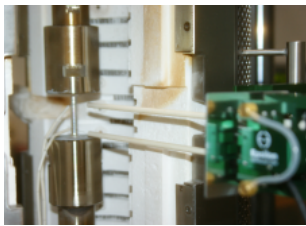
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Accessories

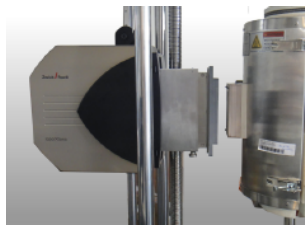
Extensometers

Measurement of axial strain

Side Entry:



Contacting Extensometer

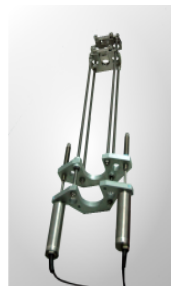


Optical Extensometer

Axial Entry:

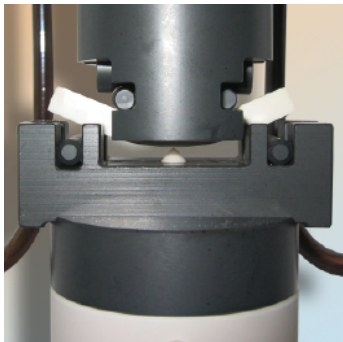


ME 31-400.1200°
(up to 1200°C - Ceramics)



ME 31-400.850°
(up to 850°C - metal)

Measurement of flexure and compression

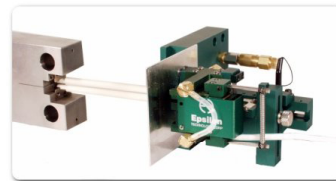


Highlights

- Simple attachment of feeler arms by use of adjustment wheel
- Quick set up for testing
- Measurement by reference feeler arms (2 x parallel to test axis to compensate temperature-caused extension of centric feelerarm (1x in test axis))
- Flexure: measurement of deflection of loaded specimen
- Compression: measurement of axial deformation of loaded specimen

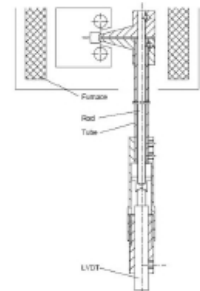
Measurement of Load line Deflection

Side entry



- up to 1200 °C
- high purity alumina rods
- mounted on the HT-furnace
- Option: water cooling

Axial entry

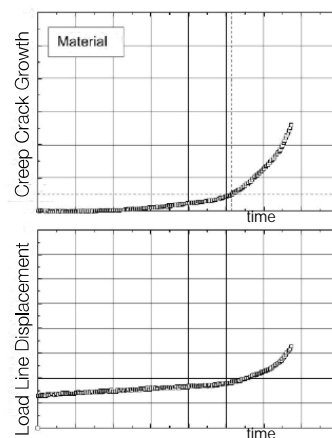


- up to 1200 °C
- rod-in-tube-Design

Creep Crack Growth measurement

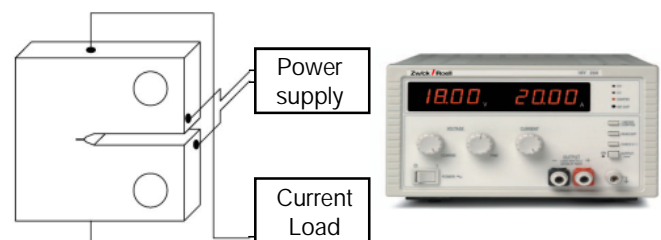
Typical presentation of Creep Crack Growth Test

- Load Line Deflection measured by rod-in-tube Extensometer
- Crack length measured by DCPD-System



Creep growth

Load Line
deflection



DCPD Connection