

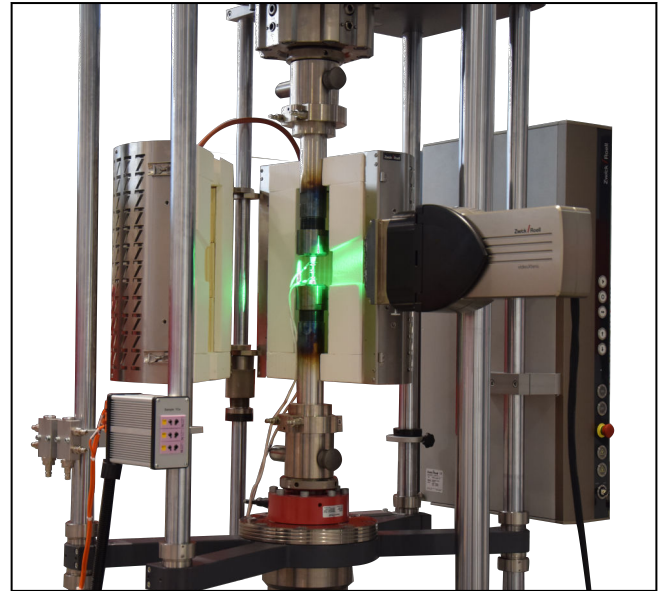
Product Information

videoXtens 1-32 HP/TZ – The High-Temperature Specialist for Any Application

CTA: 201183 265882



videoXtens 1-32 HP/TZ with closed furnace



videoXtens 1-32 HP/TZ with open furnace

Applications

The videoXtens 1-32 HP/TZ measures deformations on different materials in various environmental conditions, without making contact. The measuring principle requires application of gauge marks.

The videoXtens 1-32 HP/TZ is ideal for deformation measurement of small specimens starting at a gauge length of 1.5 to 32 mm in accuracy class 0.5 to EN ISO 9513. The strengths of this extensometer are particularly prominent with demanding applications and specimens such as glass.

- Tensile, compression, and flexure tests
- Cyclic applications (< 2 Hz load frequency)
- Long-term applications
- Tests at high temperature up to 1,400°C
- Tests in temperature chambers
- Tests at ambient temperature

High resolution and measurement accuracy

- Accuracy class 0.5 to EN ISO 9513. ZwickRoell extensometers exceed standard requirements and are calibrated over the entire measurement range to ISO 9513, in accuracy class 0.5.
- Accuracy class B1 to ASTM E83 from a gauge mark distance of 15 mm

Advantages and features

- Automatic gauge-mark recognition and acquisition of initial gauge-length L_0
- Exact synchronization of all measurement channels
- Minimization of environmental influences (e.g. air currents, variations in lighting conditions) through the high-temperature tunnel
- Optimum, uniform specimen illumination through integrated LEDs
- Strain-controlled tests are possible
- Specimens with structured surfaces can be measured via pattern recognition with no need for additional marks
- The entire test sequence can be followed on screen
- Video capturing: recording of the test, synchronized with the measured curve for retrospective viewing of the test
- Wear-free system, and as a result also low-maintenance
- Calibration at ambient temperature
- Green light and corresponding filters minimize the influence of the glowing specimen

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Prominent functions

- The videoXtens 1-32 HP/TZ can be used for testing to ISO 6892-2 (high-temperature) and ISO 6892-1 (ambient temperature).
- Strain-rate controlled tests to ISO 6892-2 Method A1 (closed loop) are possible using the videoXtens 1-32 HP/TZ. Since high-temperature materials sometimes display nonlinear strain increase, ZwickRoell recommends that you perform pre-tests.
- Measurement of the change in width and deflection without additional markings and without required hardware expansion is possible as a software option.

High precision and resolution

The videoXtens 1-32 HP/TZ features high precision and meets accuracy class 0.5 to EN ISO 9513. Since the system measures without making contact, there is no influence on the material characteristic values.

contrast for a suitable marking. Therefore, aluminum oxide (Al_2O_3) is selected, which has a temperature resistance up to 1700 °C and provides excellent contrast when combined with special lighting.

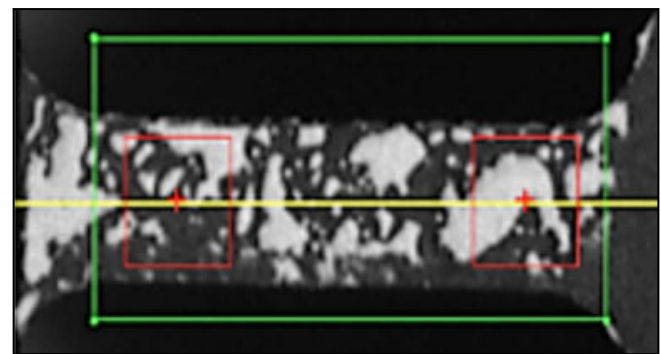
Additionally, we recommend tunneling the optical axis to prevent influences via thermal convection between the camera and the furnace.

Notes:

- For high temperature measurements, a very strong background radiation appears through the furnace and the specimen itself. You must work with a green, monochrome reflected light and a green filter on the lens.
- The marking is sprayed on using a mask and can be applied to almost any surface.
- Be careful when handling the specimen, since the marking is sensitive to the touch.

Aluminum oxide powder

Fine Al_2O_3 powder is applied to the specimen suspended in solvent. This allows for marking of both round and flat specimens using the appropriate mask.



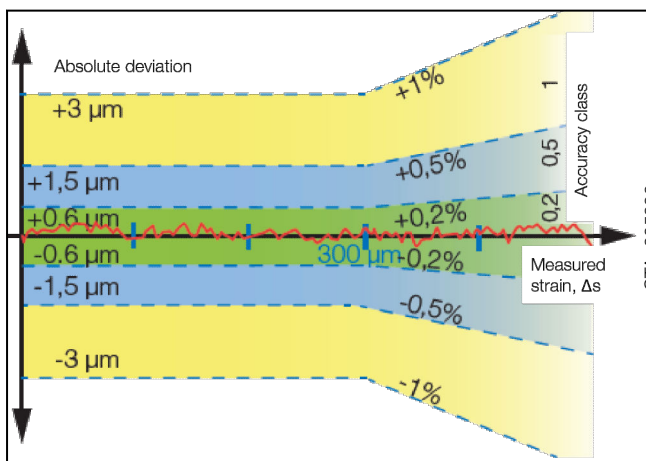
Specimen marking with aluminum oxide powder at high temperature (marking method: pattern)

High-temperature version – optical tunnel

When using the extensometer in connection with temperature chambers and high-temperature furnaces, it should be noted that the change in optical conditions can have a negative effect on the measurement signal. This basically concerns air currents in the temperature chamber or in the furnace and outside on the view window / furnace port. These influences are minimized by the optical tunnel. The extensometer therefore features an adjustable tunnel with an optical grade glass pane and an adapter plate including sealing cord, which lies snug against the glass pane of the temperature chamber or the high-temperature furnace port.

Subject to change in the course of further development.

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In accuracy class 0.5 the display deviations must fall within the blue funnel, in accuracy class 1 in the yellow

Telecentric lens

Telecentric lenses make the extensometer insensitive to distance changes between the lens and specimen. Load strings are used with temperature chambers and high-temperature furnaces to apply force on the specimen. If these load strings are not accurately aligned, or if they are self-aligning (spherically seated), alignment movements occur at the beginning of the test, in which the distance of the specimen to the lens changes. With ordinary lenses these movements lead to incorrect measurements. The telecentric lenses on this extensometer have a tolerance range of approx. ± 1.5 mm.

Marking methods for high temperature

There are only very few materials that can withstand temperatures over 1000 °C and still provide sufficient All data at ambient temperature.

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videoXtens 1-32 HP/TZ with optical tunnel on high-temperature furnace

Selected high-temperature applications

I) Creep fatigue test

The videoXtens 1-32 HP/TZ was developed to meet the high requirements of creep fatigue tests at temperatures up to 1200 °C.

Special features:

- Typical creep fatigue tests at temperatures of 900 °C with strain targets up to $\pm 1\%$
- Strain controlled, cyclic tests
- Non-contact measuring system
- No influence on the specimen (notch)
- No wear (low maintenance)

CTA: 253429



Round specimen with button head for creep fatigue test

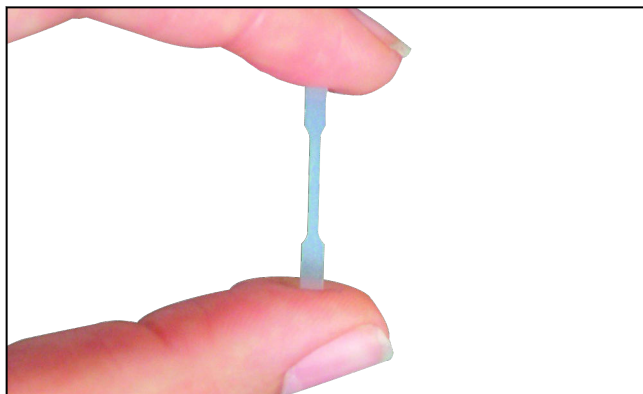
II) Creep test on microspecimens

The videoXtens 1-32 HP/TZ is used in high-temperature creep tests, on microspecimens with an initial gauge length (L_0) starting from 1.5 mm.

Special features:

- Very small L_0 are only possible with optical measuring technology
- Variable initial gauge lengths with videoXtens 1-32 HP/TZ

All data at ambient temperature.



Microspecimen for creep tests

III) High-temperature tensile test on glass specimens

The videoXtens 1-32 HP/TZ is ideal for high-temperature tensile tests on sensitive as well as transparent specimens. Glass, for example, becomes soft and malleable at temperatures starting at approximately 600 °C.

Special features:

- Contact extensometers deform the glass specimen when the sensor arms are attached (lateral force)
- Sufficient contrast to measure transparent specimens with the use of markings
- No mechanical influences on the specimen due to optical measurement

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Marked glass specimen before (left) and after (right) the high-temperature tensile test

Subject to change in the course of further development.

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Type	videoXtens 1-32 HP/TZ ¹⁾
Item No.	MP01220
Accuracy class	0.5 to EN ISO 9513
Resolution	0.25 µm to EN ISO 9513
Initial gauge length, L ₀	1.5 ... 32 mm
Measurement displacement ²⁾	32 mm - L ₀ mm with automatic tracking
Strain-rate control ³⁾	To ISO 6892-1 Method A1 and ISO 6892-2 Method A1
Max. tracking speed on the specimen	500 mm/min
Measurement frequency (for standard setting)	70 Hz
Scope of delivery	Measuring head with one digital camera incl. high-resolution telecentric lens, interference filter, green LED incident light lamp, high-temperature tunnel for reduction of environmental influences, software for image acquisition, accessory case with scaling aid, INC module (for tC: RS module). Incl. connection to crosshead: the extensometer is tracked at half test speed The videoXtens 1-32 HP/TZ works with testXpert III (Version 1.51 or higher) and in combination with testControl and testControl II. The required tC-RS module or INC module is included in the scope of delivery. A plug-in slot is required for this in testControl / testControl II.

1) Note: The laserXtens 1-32 HP/TZ and 2-120 HP/TZ can be expanded with videoXtens functionality. See: PI_88_961_laserXtens 1-32 HP TZ or PI_88_786_laserXtens 2-120 HP TZ

2) May be limited by furnace and temperature chamber design

3) Pre-tests required

Description	ArticleNumber
Basic package for videoXtens The basic package contains a multilingual workstation, optionally with Windows 10/64 bit, 23" TFT monitor and operating instructions in German or English	Diverse
Assembly kit For front center mounting	Diverse
Software options	
Second measurement axis for simultaneous determination of axial strain and transverse strain or change in width	013582
Measurement of deflection for 3- and 4-point flexure tests	077060
2D dot matrix for determination of local strains and inhomogeneities of a planar specimen surface in two axes (2D).	077059
Test re-run for storing image sequences and retrospective recalculation of strains	325932
Stand-alone operation	
High-resolution AD/DA converter, 4 inputs, 2 outputs	021661
High-resolution D/A converter, 4 outputs	032319
High-temperature marking set Consisting of: Airbrush, AL203, gauge length template for use with airbrush and gauge length clamps	MP01221