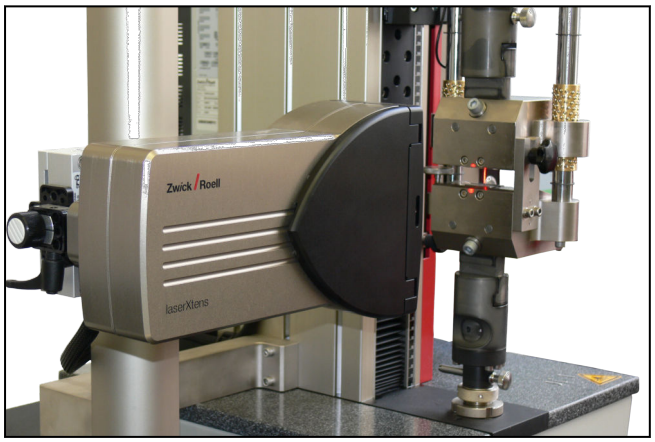
Zwick / Roell

Product Information

laserXtens 1-15 HP

CTA: 181236 43979



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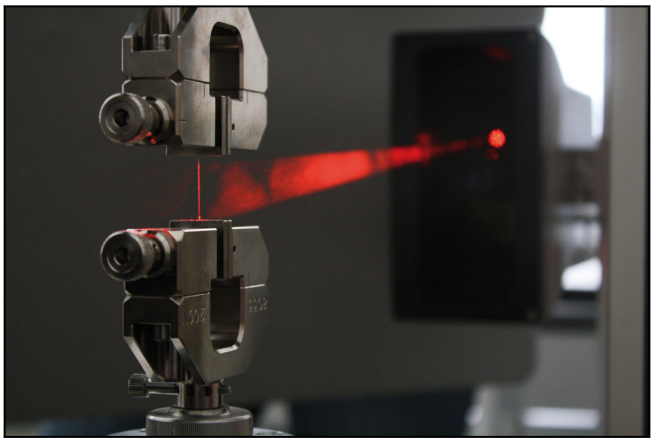


laserXtens 1-15 HP with specimen

Applications

Extensometers from the laserXtens systems series measure without contact and with the highest level of accuracy. The measuring principle eliminates the need to apply gauge marks. This allows the laserXtens systems to be used for a wide range of applications:

- Tensile, flexure and compression testing preferably on metals or other materials that disperse the laser light on the surface.
- Testing on contact-sensitive specimens or specimens with high fracture energy.
- Highly accurate testing in temperature chambers and high-temperature testing
- Applications in which more than two measuring points are used, e.g. biaxial deformation measurements or strain distribution.
- Measurements on small specimen geometries or components.

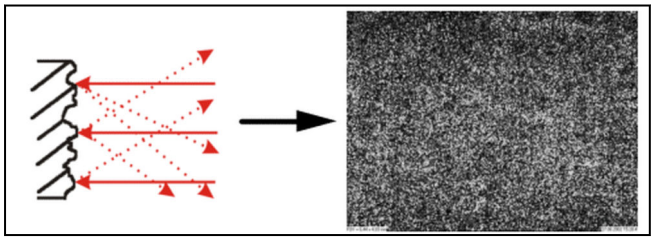
Due to its flexibility and easy handling the laserXtens is ideal for applications in the field of quality assurance, as well as in research and development.

Function description

laserXtens systems include one or more digital cameras and laser light sources.

The specimen surface is recorded with the full-frame digital cameras, while the laser light illuminates the specimen. The coherent laser light is dispersed on the specimen surface. This creates a speckled pattern.

CTA: 44005



A speckle pattern is created on the specimen surface by a laser light

Within the speckle pattern, evaluation fields are defined, which are known as virtual gauge marks. The laser-Xtens tracks these virtual gauge marks using a highly developed correlation algorithm. This process is known as speckle tracking.

The software calculates the strain on the specimen from the relative displacement of the virtual gauge marks from camera image to camera image.

Two or optionally more virtual gauge marks can be defined in the image, as standard, for example to record the transverse strain.

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If one of the gauge marks is on the edge of the overall field of view, you can switch to flow rate mode.

laserXtens 1-15 HP system principle
The laserXtens 1-15 HP is a high-accuracy testing system for testing small and very small specimens. Therefore, in addition to a camera and two laser light sources, it also has a special lens. This is because a telecentric lens can compensate for lateral specimen movements (see below).

Due to the short distance to the specimen, this laserXtens can be mounted only to the zwickiLine. It is not moved; it has no connection to the crosshead.

laserXtens 1-15 HP: Compensating for lateral specimen movements

With some specimens or test arrangements, the specimen is prone to moving out of the test axis. This is especially common with small specimens. A change in the specimen distance to the camera does however, in a trapezoidal field of view, result in an magnification/demagnification of the specimen, whereby the test results are influenced. The telecentric lens of the laserXtens 1-15 HP compensates for these lateral specimen movements and minimizes measurement error.

Advantages and features
High precision and resolution
- The laserXtens features high precision in the micro measurement range.
- The laserXtens fulfills the requirements of Class 0.5 of ISO 9513 (Class B2 of ASTM E83).

Even the smallest specimens can be measured
- Specimens can be tested starting at 1 mm width/diameter. After pretesting, possibly even smaller specimens can be tested.
- In contrast to contact extensometers or pure video solutions, the laserXtens can also measure strains on short specimens with gauge lengths of at least 3 mm.
- Small mini specimens or specimens that are difficult to access can be tested.

No specimen contact - no specimen marking
- The laserXtens does not make any contact with the specimen; the measurement is not influenced by the laser light.
- Specimen markings are not required. This significantly simplifies the specimen preparation and saves time.

Functions and options not offered by competitors
- The laserXtens is integrated into the testXpert III testing software.
- Strain distribution: Measurement of strain distribution on the specimen. Automatic symmetrical adjustment of the initial gauge length at the point of break reduces specimen waste.
- Test Re-Run: Due to recording an image series during a test, the initial gauge length can be subsequently changed and the test can be recalculated.
- 2D dot matrix measurement allows for the determination of local strain and inhomogeneities on a planar specimen surface in two directions (2D).
- Flexure testing: Measurement of deflection in 3- and 4-point flexure tests.

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Technical data

Type **Item No.**	**laserXtens 1-15 HP** **1043981**	
Initial gauge length	3 ... 14	mm
Measurement displacement with speckle tracking	15	mm - initial gauge length
Measurement displacement for flow measurement	After measurement displacement via speckle tracking, laserXtens switches to flow measurement.	
Resolution	0.04	µm to EN ISO 9513
Accuracy class		
To EN ISO 9513	0.5	
According to ASTM E83	W2	
Typical measurement frequency (adjustable)	70	Hz
Measurement speed, max. at the measurement point	250	mm/min
Specimen thickness		
Flat specimens	≤30	mm
Round specimens	0.5 ... 30[1)]	mm
Dimensions		
Height	175	mm
Width	306	mm
Depth	91	mm
Ambient temperature	+10 ... +35	°C
Laser safety class to DIN EN 60825-1 (11-2001)	2[2)]	
Scope of delivery	Measuring head with one digital camera including telecentric lenses, two red laser light sources, software for image acquisition, evaluation of the cross correlation and transfer to testXpert III, accessory case with scale aid	

1) Pre-tests are required for specimens with a specimen diameter < 1 mm.

2) No safety measures required.

All data at ambient temperature.