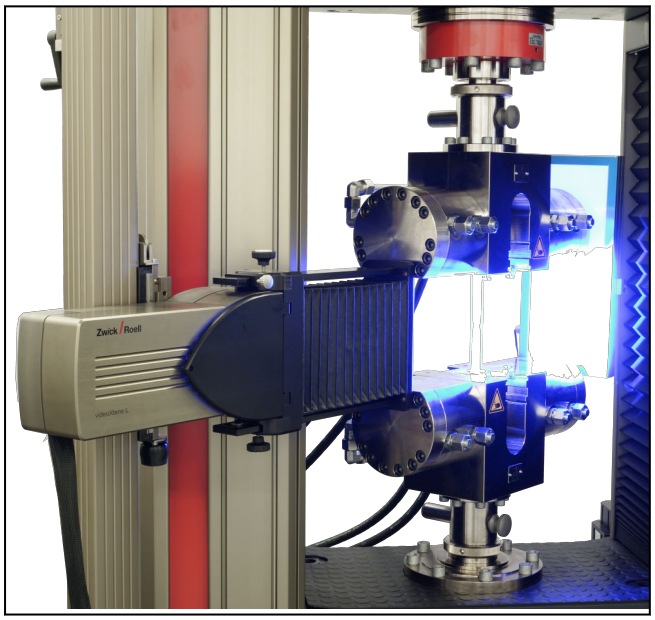
Zwick / Roell

Product Information

videoXtens L 3-205 HP/OPC

CTA: 300961 206108



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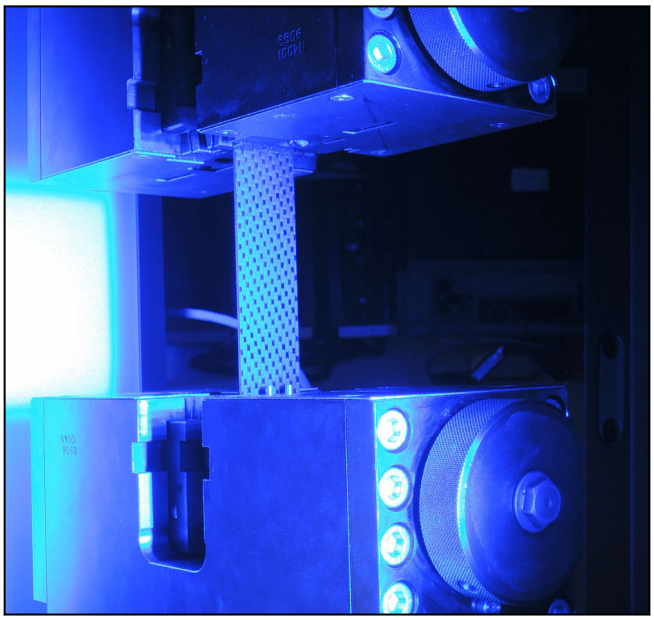

Non-contact measurement without gauge marks: blue pattern technology

Application example tensile test on metals to ISO 6892-1 and ASTM E8 including strain rate control and stress rate control, expandable for the determination of vertical anisotropy (r-value to ISO 10113 & ASTM E517) and the hardening exponent (n-value to ISO 10275 & ASTM E646)

Specific advantages in the application:

- The extensometer ensures reliable test results, even in the event of lateral specimen movement, through out of plane compensation. Any measurement deviations occurring in the initial measuring range are automatically corrected.
- Efficiency gain through mark-free measurement and automatic pattern recognition of specimen surfaces with the blue contrast light technology.
- Significant time and cost savings since the time-consuming application of gauge marks is no longer necessary.
- Meets the requirements for closed loop strain rate control to ISO 6892-1 Method A1 and ASTM E8 Method B. This results in globally reproducible test results and saves on preliminary tests.
- Accuracy class 0.5 to EN ISO 9513. ZwickRoell extensometers exceed the requirements of the standards and are calibrated over the entire measurement range to ISO 9513, in accuracy class 0.5. Proven standard compliance with the first calibration point starting at 10 µm.
- Every test is valid: The fracture is always within the initial gauge length. Annex I of ISO 6892 is intelligently implemented in the testXpert testing software and is applied automatically. By symmetrizing the initial gauge length around the fracture position, a previously invalid test can be converted into a valid test (Option: Strain Distribution and Test Re-Run).
- Accuracy class B1 to ASTM E83 from initial gauge length of 15 mm.
- Start testing right away: easy-to-learn, intuitive operation and the advantages of automated functions reduce training requirements and ensure measurement consistency.
- Metals with high break energy can also be tested up to the point of break without causing damage to the extensometer.
- The videoXtens is fully integrated in testXpert III. The extensometer and the materials testing machine are controlled with a single software solution.
- Resistant to environmental influences (e.g. air currents, variations in lighting): flexible tunnel minimizes signal interference.
- Optimum, uniform specimen illumination by blue contrast light incorporated into the tunnel.
- Robust, low-vibration mounting system with ergonomic operation. With automatic tracking, the testing operation automatically stays in focus and makes optimum use of the measuring range.

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Product Information

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Function description

The videoXtens L 3-205 HP/OPC features the patented array technology for high-accuracy testing in a wide measurement range.

The extensometer is optimized for measuring axial strain using three cameras with high resolution. The overlapping fields of view of the individual cameras are combined into one large field of view via our ZwickRoell array technology. Markings leaving the field of view of one camera are automatically transferred to that of the next camera. This results in one large field of view with high resolution.

For highly accurate measurement of transverse strain, you have the option to integrate an additional camera in the housing.

The flexible tunnel can be extended or retracted to suit individual requirements. By minimizing environmental influences, it creates the right conditions required for a low-noise measurement signal. In addition, it has an integrated blue contrast light which uniformly illuminates the specimen.

Measuring without gauge marks

Specimens from flat products, wire, rods, profiles and tubes have a surface texture that results from the manufacturing process. The natural surface texture of the specimen is enhanced into a high-contrast surface pattern by blue contrast light technology and used as virtual gauge marks.

A virtual gauge mark is an area on the specimen surface that is defined by the software. The pattern within this defined area is tracked during the test, This eliminates the process of manually marking the specimen and allows for mark-free measurements. In addition, a repeating naturally occurring specimen pattern, such as that found in concrete-reinforcing steel for example, can also be used for measurement purposes. In this case, the pattern recognition function is also implemented, which can be used for naturally occurring and manually applied specimen patterns.

Reliable test results, even in the event of lateral specimen movement, through out of plane compensation

Due to perspective imaging, out-of-plane movement of a specimen in the initial measuring range results in apparent strain and thus in measurement error. Using ZwickRoell array technology, the displacement of a measuring point is taken into account using several cameras whereby the out-of-plane displacement is determined. The measured axial strain is automatically compensated. This reduces the variance in the determined slope of the elastic slope line and thus ensures reliable test results.

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Product Information

videoXtens L 3-205 HP/OPC

Technical data

Type	videoXtens L 3-205 HP/OPC	
Item No.	**1108946**	
Field of view (FOV)		
With test area width 440 mm [AllroundLine]	210 x 85	mm
With test area width 640/1040 mm [AllroundLine]	240 x 100	mm
OPC	125	mm
Measurement travel, max.		
With test area width 440 mm [AllroundLine]	190 - initial gauge length	mm
With test area width 640/1040 mm [AllroundLine]	220 - initial gauge length	mm
OPC	125 - initial gauge length	mm
Measurement travel, max. at 50 mm initial gauge length		
With test area width 440 mm [AllroundLine]	140 (280 % strain)	mm
With test area width 640/1040 mm [AllroundLine]	170 (340 % strain)	
OPC	75 (150 % strain)	mm
Measurement travel, max. at 75 mm initial gauge length		
With test area width 440 mm [AllroundLine]	115 (150 % strain)	mm
With test area width 640/1040 mm [AllroundLine]	144 (190 % strain)	mm
OPC	50 (65 % strain)	mm
Initialgauge length	5 … 100	mm
Strain rate control to ISO 6892-1		
For test speed 0.00025/s	From L0 25	mm
For test speed 0.00007/s	From L0 50	mm
Resolution at ambient temperature	0.2	µm
Resolution to ISO 9513 in the ZwickRoell temperature chamber		
At -40 ... +250 °C	0.4	µm
At -55 °C	0.6	µm
At +250 … +360 °C	0.5	µm
System distance (distance between reference plane and center of test axis)		
Table-top testing machine, test-area width 440 mm	450	mm
Table-top/floor-standing testing machine, test-area width 640/1040 mm	570	mm
Frame rate / measured-value acquisition rate, max.	500	fps / Hz
Test speed, max.	1000	mm/min

All data at ambient temperature.

Subject to change in the course of further development.

Product Information

videoXtens L 3-205 HP/OPC

Type	videoXtens L 3-205 HP/OPC	
Item No.	**1108946**	
Dimensions		
Height	240	mm
Width	470 ... 720	mm
Depth	136.5	mm
Specimen thickness	0 ... 50	mm
Weight, approx.	15	kg
Minimum version	testXpert III V1.8 and above	
Accuracy class		
To EN ISO 9513	0.5	
To ASTM E83	B1 from gauge length 15 mm	
Scope of delivery		
Measuring head with three digital cameras, incl. three lenses and optical filter disc		
Software for image acquisition and evaluation		
Accessory case with alignment and marking aids		
INC module (for tC: RS module)		
Software-option Strain-distribution		

Accessories required

Basic packages (1x required)

A basic package is required for the installation of testXpert III and operation of the videoXtens. When working with testXpert III, we recommend a second monitor.

Description	ArticleNumber
Basic package Win 10 videoXtens L and videoXtens, core i7, includes PC multilingual workstation with software installation incl. in scope of delivery (testXpert III, videoXtens L, videoXtens); core i7 processor; graphics card for support of two monitors; Ethernet port for testControl II; 27" TFT monitor; Windows 10 / 64 – multilingual[1)]	**1123961**

1) Can easily be upgraded to windows 11.

Assembly/Mounting (1 x required)

Mounting occurs via a connection to the crosshead. With this connection the videoXtens tracks at half crosshead speed, keeping the testing operation automatically in focus and making optimum use of the measuring range.

The videoXtens can be mounted on all AllroundLine table-top and floor-standing testing machines, either at the front left or rear left, in each case with a 45° angle of view to the test area.

Description	ArticleNumber
Fixed mounting set at 45° front left on the AllroundLine table top & floor-standing testing machine with connection to the crosshead	**1031329**
Fixed mounting set at 45° rear left on the AllroundLine table top & floor-standing testing machine with connection to the crosshead Required for mounting with temperature chamber.	**1031330**

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Product Information

videoXtens L 3-205 HP/OPC

Optional accessories

Transverse strain camera hardware option for videoXtens L, type 3-205 HP/OPC

Description	ArticleNumber
Transverse strain camera hardware option; additional high-resolution camera with lens, which is specially aligned for measurement of the change in width, with highly accurate, intelligent algorithm for mark-free measurement at the specimen edge. Field of view, (width x height): 80 x 190 mm for AllroundLine with test area width 440 mm Field of view, (width x height): 80 x 160 mm for AllroundLine with test area width 640 mm Scope of delivery: Transverse strain camera with lens for installation in the existing housing with installation kit, software license for transverse strain determination via testXpert. **A backlight is required for this option!**	**1108947**

Description	ArticleNumber
Test re-run, testXpert III V1.8 or higher is required, for which a testXpert III master test program or the Export Editor option (Item No. 1035618) is needed.	**1121754**
Transverse strain software option for additional determination of local transverse strain via virtual gauge marks on the specimen. Only suitable for flat specimens. The option is not suitable for strain rate controlled tests to ISO 6892.	**011069**
Option 2D DIC - Digital Image Correlation 2D DIC module for display and evaluation of strain conditions, fully integrated in testXpert III	**1018509**
2D DIC test license, at not cost for a limited time of 6 months	**1055361**
Software option 2D dot matrix for videoXtens L For determination of local strains and inhomogeneities of a level specimen surface in two axes (2D). Up to 100 measurement dots in any desired arrangement or in matrix form, measurement of the X/Y coordinates or the distances between dots Required: Channel Editor or master test program (already includes the Channel Editor) testXpert II version 3.5 or higher. Note: Only one camera is used for this function, even for videoXtens Array systems.	**077070**
Software option Flexure test for videoXtens L in 3- and 4-point flexure test Measurement of deflection in the test axis Note: Only one camera is used for this function, even for videoXtens Array systems.	**077071**
videoXtens L 3-205 HP/OPC software package The software package is valid for videoXtens L 3-205 HP/OPC; The software package includes following software options: Test Re-Run, 2D dot-matrix, flexure tests, second measurement axis (local transverse strain)	**1125181**

SSD hard drive (1x required for test re-run option or 2D DIC in connection with multi-camera system)

Description	ArticleNumber
Additional SSD hard drive with very high lifespan and fast write speed for the 2D DIC option and the test re-run option	**1097529**

Backlight

The backlight is required for flexure tests or for measurement of the change in width directly at the specimen edge.

Description	ArticleNumber
Backlight 420 x 190 mm, incl. mounting arm, required for measurement at specimen edge	**013593**
Backlight 840 x 190 mm, incl. mounting arm, required for measurement at specimen edge	**013596**

Product Information

videoXtens L 3-205 HP/OPC

Screen / uniform specimen background

- For a uniform specimen background, recommended for disruptive background contrasts or narrow specimens (for example ≤ 5 mm with videoXtens)
- Screen to shield eyes from incident light
- Two colors: white on front for dark specimens, black on back for light specimens
- Mounting directly into T-slot of the table-top or floor-standing testing machine profile

Description	ArticleNumber
Screen/uniform specimen background, swivelable, white on front and black on back, dimensions 420 x 190 mm	**086060**

Testing in temperature chamber

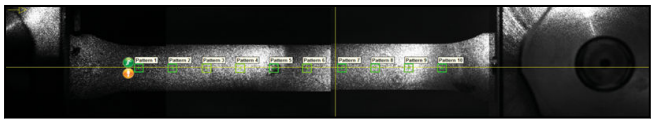
Can only be used with the current temperature chamber for AllroundLine testing machines form the Series portfolio Tunnel plus tunnel adapter required for tests in the ZwickRoell temperature chamber.

Description	ArticleNumber
Tunnel adapter for attaching videoXtens to ZwickRoell temperature chamber Magnetic tunnel adapter with sealing lip for attaching videoXtens to the temperature chamber glass module (viewing port).	**1047285**

Software option Test Re-Run and strain distribution

The optional Test ReRun module enables subsequent recalculation of strain on the basis of an image series recorded during a test, using a different initial gauge-length (provided multiple markings are present). This can be particularly advantageous in component testing, for example, when it is necessary to evaluate local strain at different locations, or in standard tensile tests when specimen necking has occurred outside the original initial gauge-length.

CTA: 44010



Automatic symmetrical adjustment of strain around necking to ISO 6892-1, Annex I

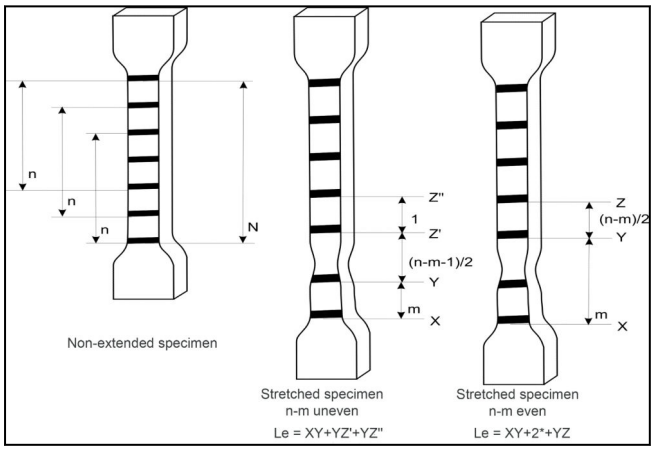
The recalculated strain can, of course, be synchronized subsequently with the other measurement values via the testXpert testing software.

The Strain Distribution option enables determination of local strains at multiple measuring locations along the specimen gauge-length. These are available as channels in testXpert. Up to 16 measuring locations are automatically recognized and evaluated during the test. This option also allows automatic real-time symmetrical adjustment of the initial gauge-length around the necking (to ISO 6892-1, Annex I).

Product Information

videoXtens L 3-205 HP/OPC

CTA: 44327



Strain Distribution option: automatic symmetrical adjustment of the initial gauge-length around the necking to ISO 6892-1, Annex I

Software option 2D dot matrix

This option allows two-dimensional measurement of dots applied to a planar specimen surface. This enables determination of local strains and specimen inhomogeneities under load. X and Y coordinates, as well as the distances between dots, are available as measured values.

Up to 100 measurement dots can be measured in any desired arrangement or in matrix form. Display in testXpert III is limited to 15 channels.

This option uses only one camera for measurement; any other cameras present are switched off beforehand.

Transverse strain software option

With this option, biaxial measurements can be performed: In addition to the longitudinal strain, transverse strains can also be recorded—for example the change in width. Alternatively, change in width can of course also be measured alone.

Two versions are available for measurement of transverse strain:

- Direct measurement on the specimen edge without additional markings (required for the determination of the r-value). For this version a backlight is required.
- Measurement of the specimen surface with dot markings or sprayed-on pattern. For this version the specimen is illuminated with an incident light lamp.

Software option measurement of deflection in 3 and 4-point flexure tests

videoXtens can also be used for flexure tests. There are several options for measuring specimen deflection, depending on the type of test and the specimen condition and properties:

- Measurement using incident light via marks on the specimen
- Measurement using backlight on the specimen lower edge
- Measurement of deflection in the test axis or of the polynomial approximation of the curve

Maximum deflection that can be measured: with videoXtens the maximum deflection corresponds to the FOV; with videoXtens Array to 1/3 of the total FOV (in this case deflection is measured with one camera only).