

It's better not to touch

—

examples of application in optical extensometry

videoXtens - laserXtens - lightXtens

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Our optical measurement systems

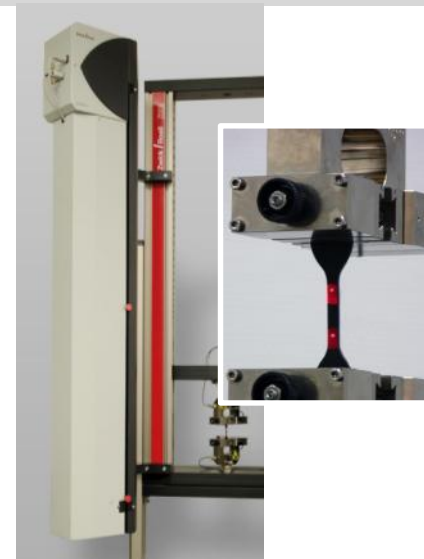
- videoXtens
- laserXtens
- lightXtens

Working principle:

camera-based detection of measuring marks

Laser speckle correlation

Light diodes



Application range:

All marked materials

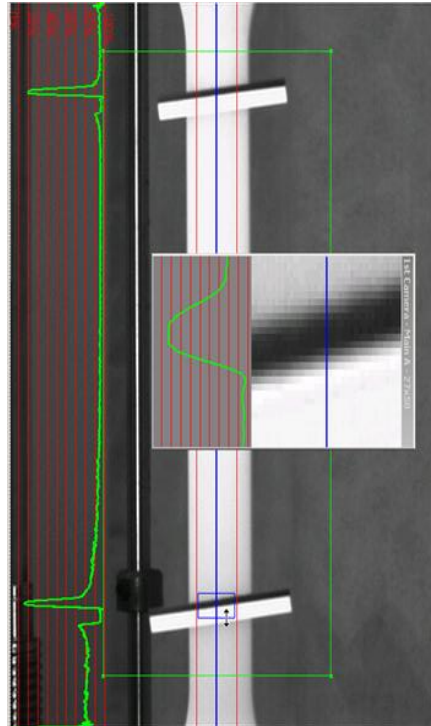
All laser reflecting materials

Materials with high strain or fracture energy
elastomers, films, ropes,
steel wires/wire strands

videoXtens – working principle & applications

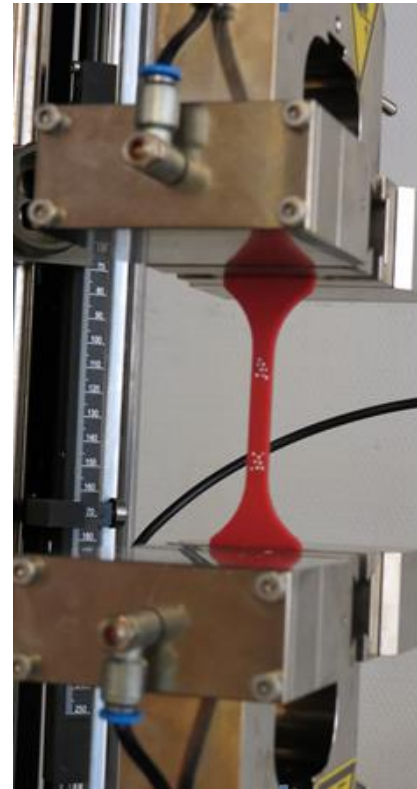
laserXtens – working principle & applications

videoXtens – camera-based detection of measuring marks



- Digitized pictures
- Measuring marks are automatically detected and at the same time the initial gage length is taken over
- Image-by-image comparison
- Possible specimen markings: lines markings, dot markings, clamped needles. manual or sprayed pattern

Testing rubber to ISO 37



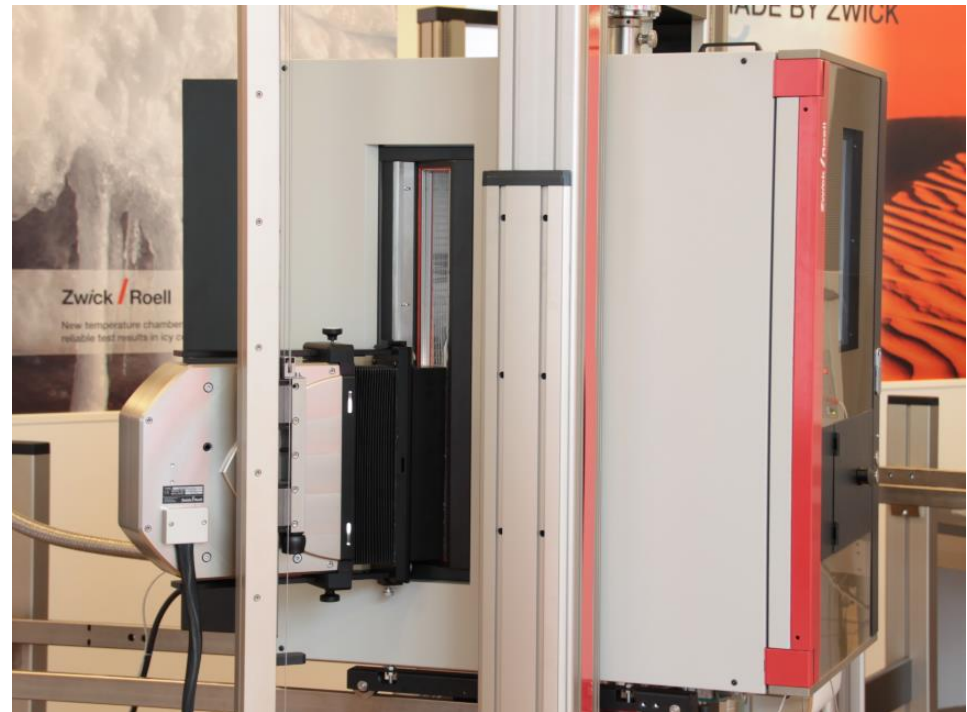
videoXtens 2-120 HP fulfills the high requirements for testing plastics acc. to ISO 527-1 including tensile modulus

- Complete system for testing of plastics and CFK acc. to ISO 527-1, -2, -4, -5
- Suitable for all measurement lengths acc. ISO 527-1
- Accuracy grade 0.5 to ISO 9513

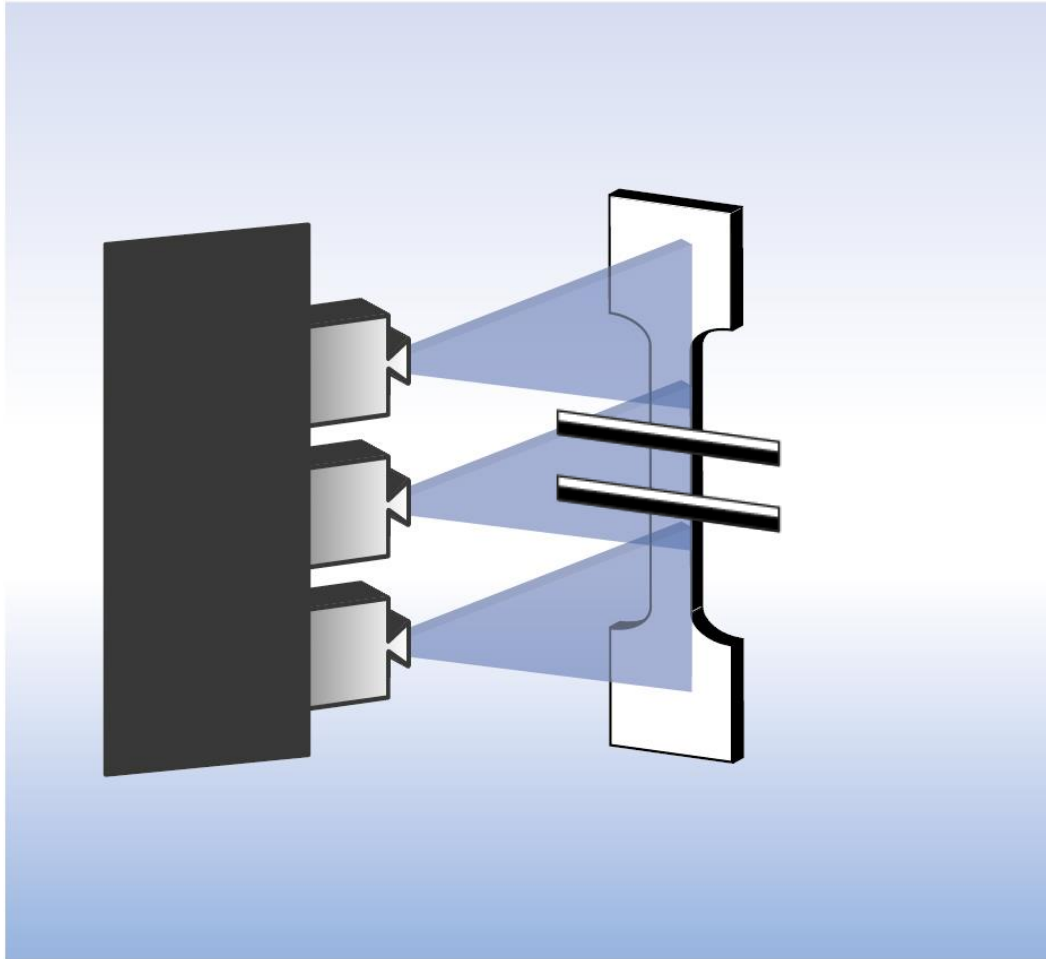


videoXtens 2-120 HP performs equally well at temperature when determining tensile modulus as per ISO 527-1 in the new Zwick temperature chambers.

- Temperature testing: heating & cooling
- In cooling mode, the option door in the door (handhole door) reduces ice formation and ensures safe test results.

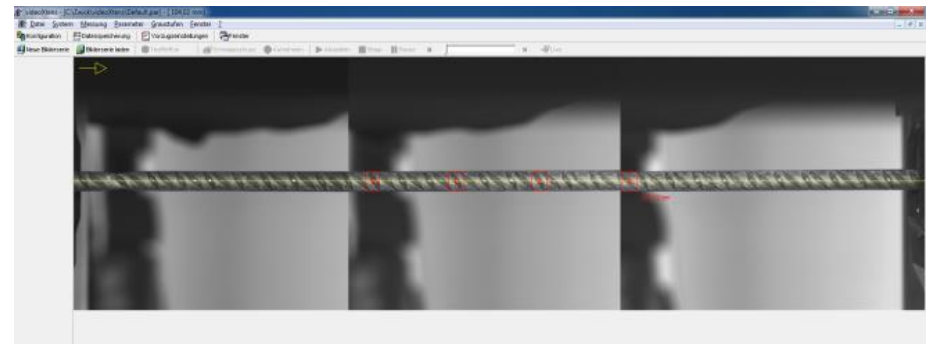
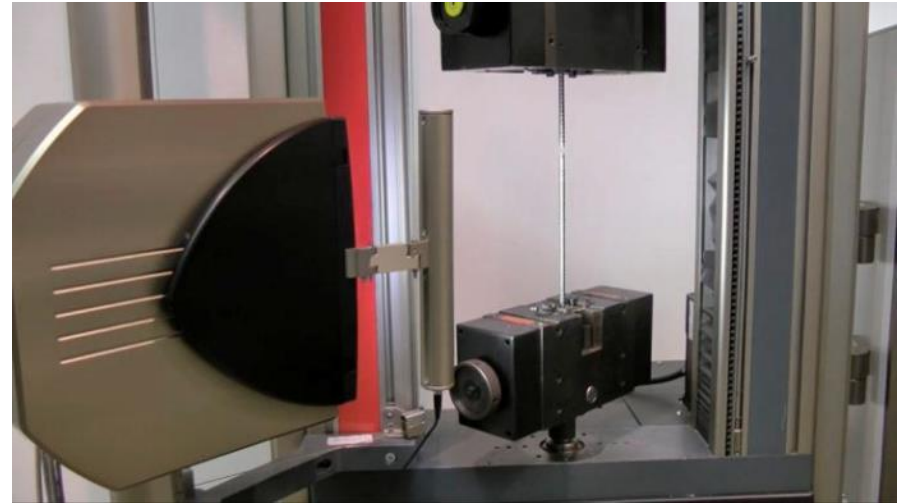


Zwick Roell Array Technology



videoXtens 3-300 - rebar testing with pattern recognition

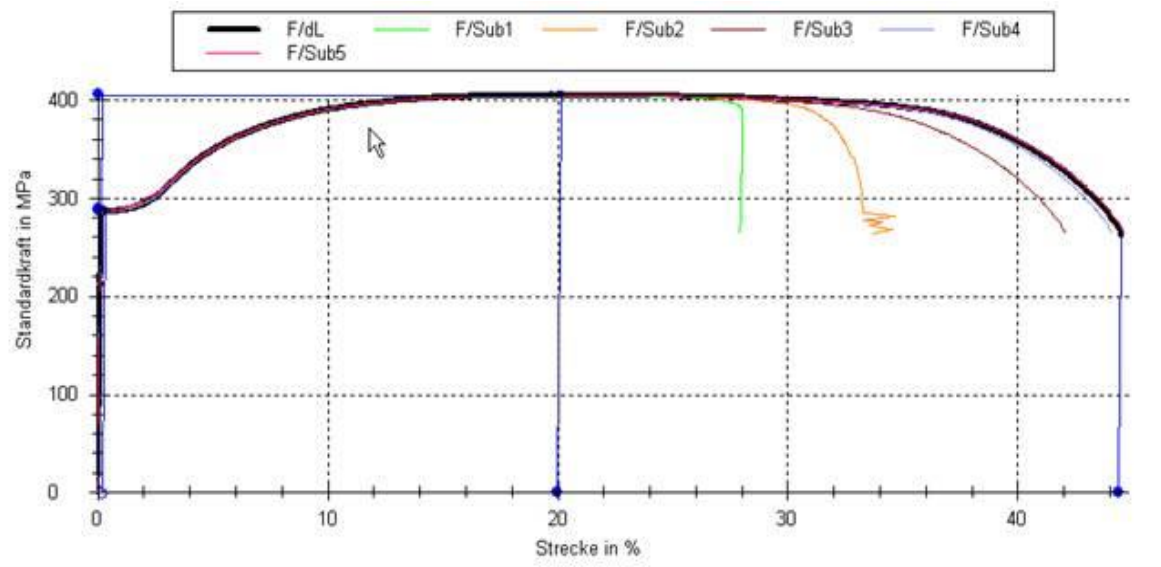
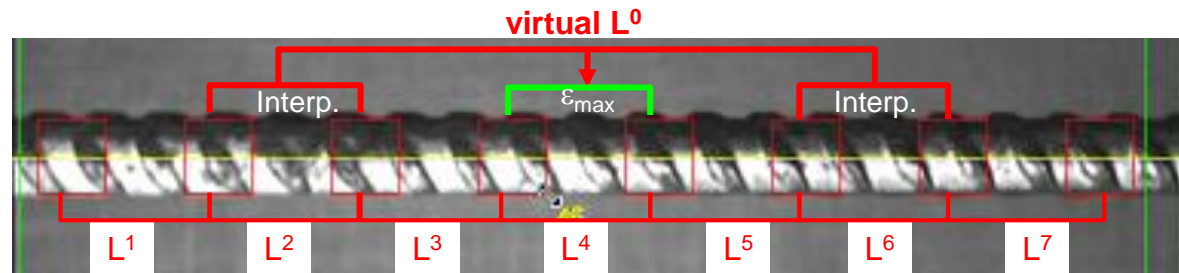
- Enlargement of measuring range without loss of resolution
- Rebars → expensive specimen material → no specimens are wasted due to break outside L_e
- safe time & costs by option strain distribution / test re-run



Software option strain distribution

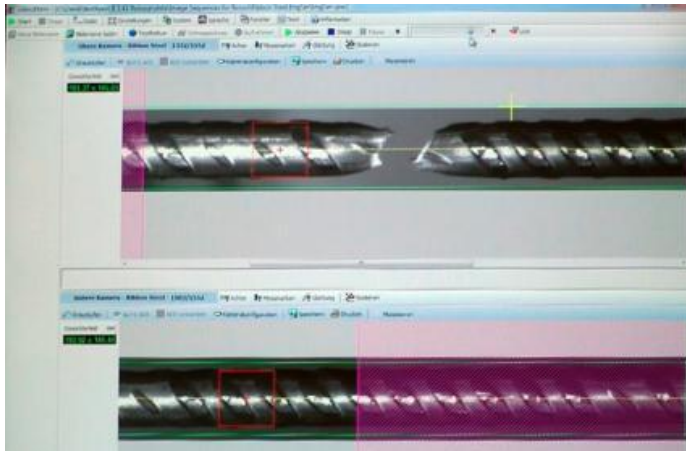
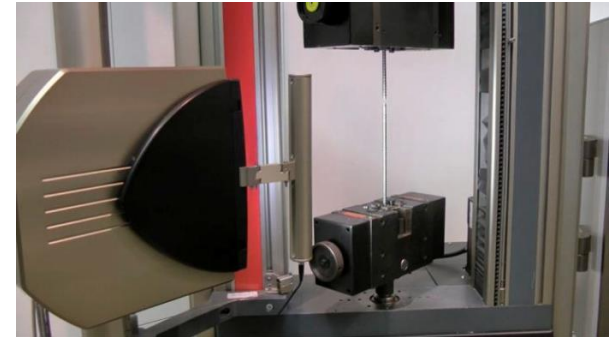
Strain distribution – reliable determination of elongation at fracture

- Simultaneous capture of up to 15 local strains
- Determination of local strains and balancing of L_e around break



videoXtens 3-300: testing rebars with pattern recognition

- Strain distribution:
determination of local strains and balancing of L_e around break
- Test re-run:
 - If break happens outside L_0 : subsequent recalculation of the strain with a different initial gage length
 - or just for analysis of test

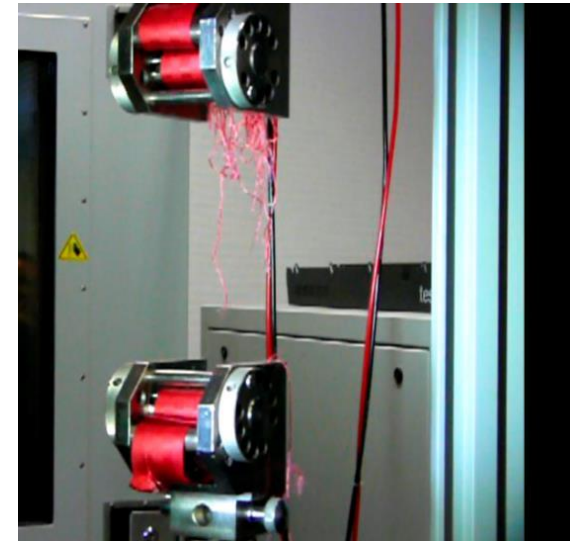
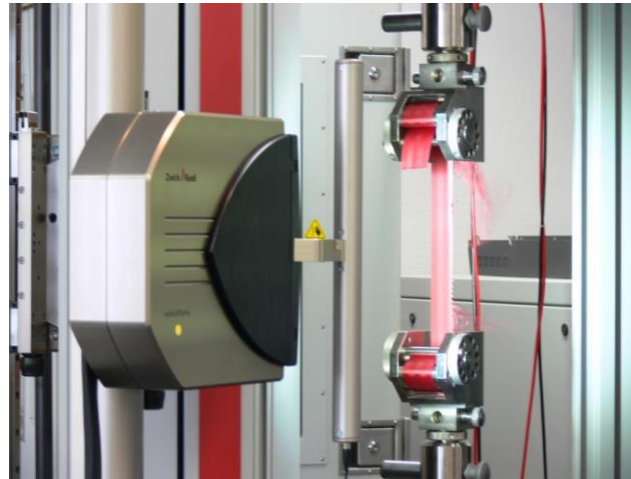
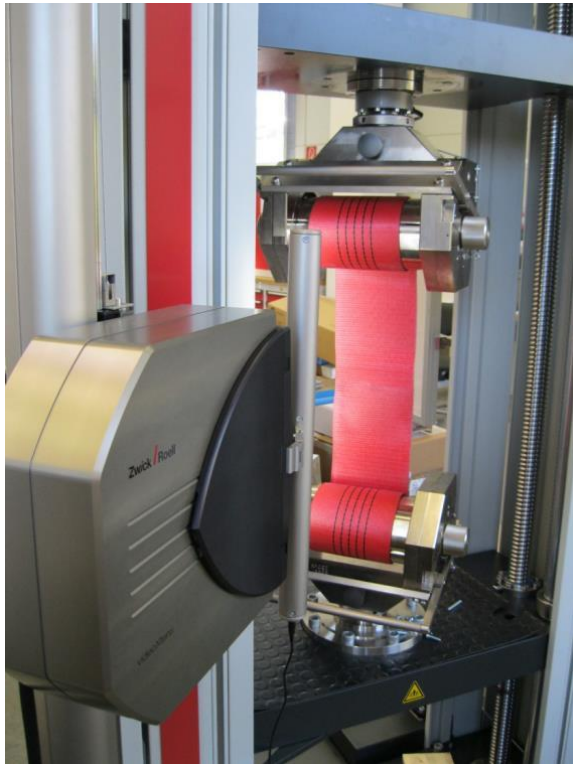


Test Re-Run: Analysis and recalculation of the strain



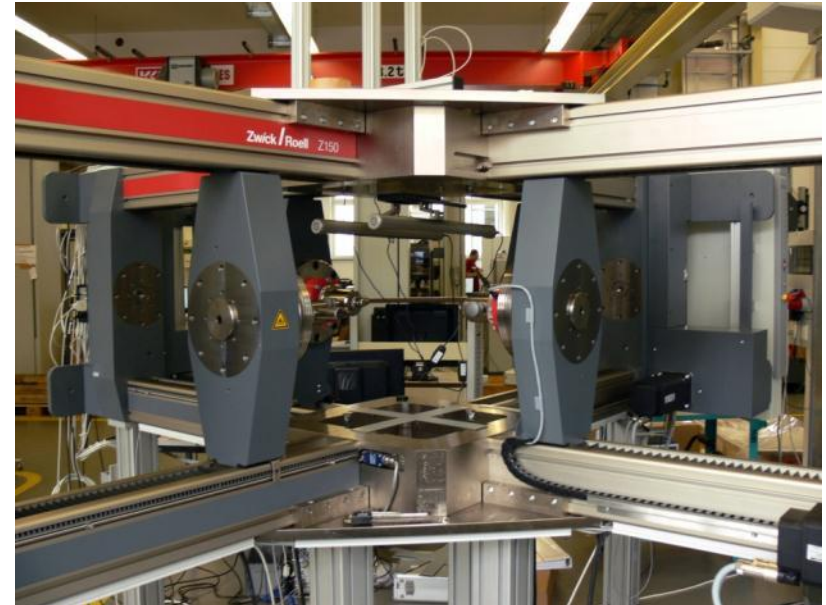
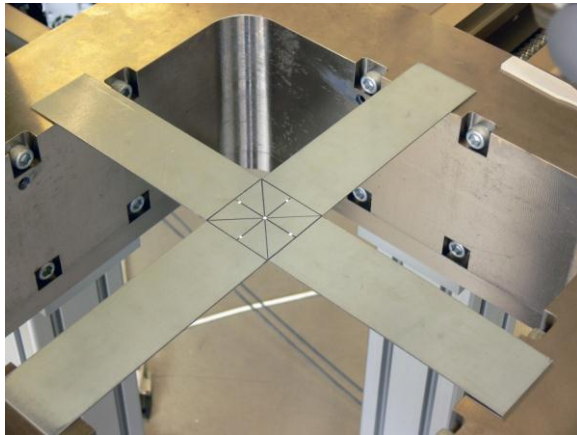
Strain distribution: the red squares mark the measurement marks

videoXtens 3-300: testing belts



Test in 4 axis with videoXtens and 2D dot matrix

- biaxial testing system with a videoXtens installed top-view, 2 incident light lamps
- Specimen is pulled in 4 directions
- Dot pattern marked on specimen by template, different channels defined to measure the change of their relation



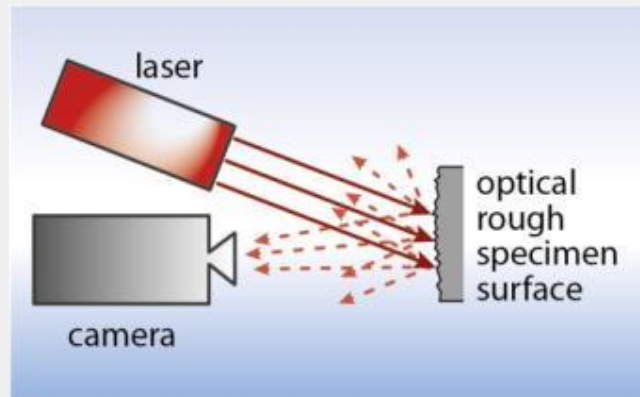
videoXtens – working principle & applications

laserXtens – working principle & applications

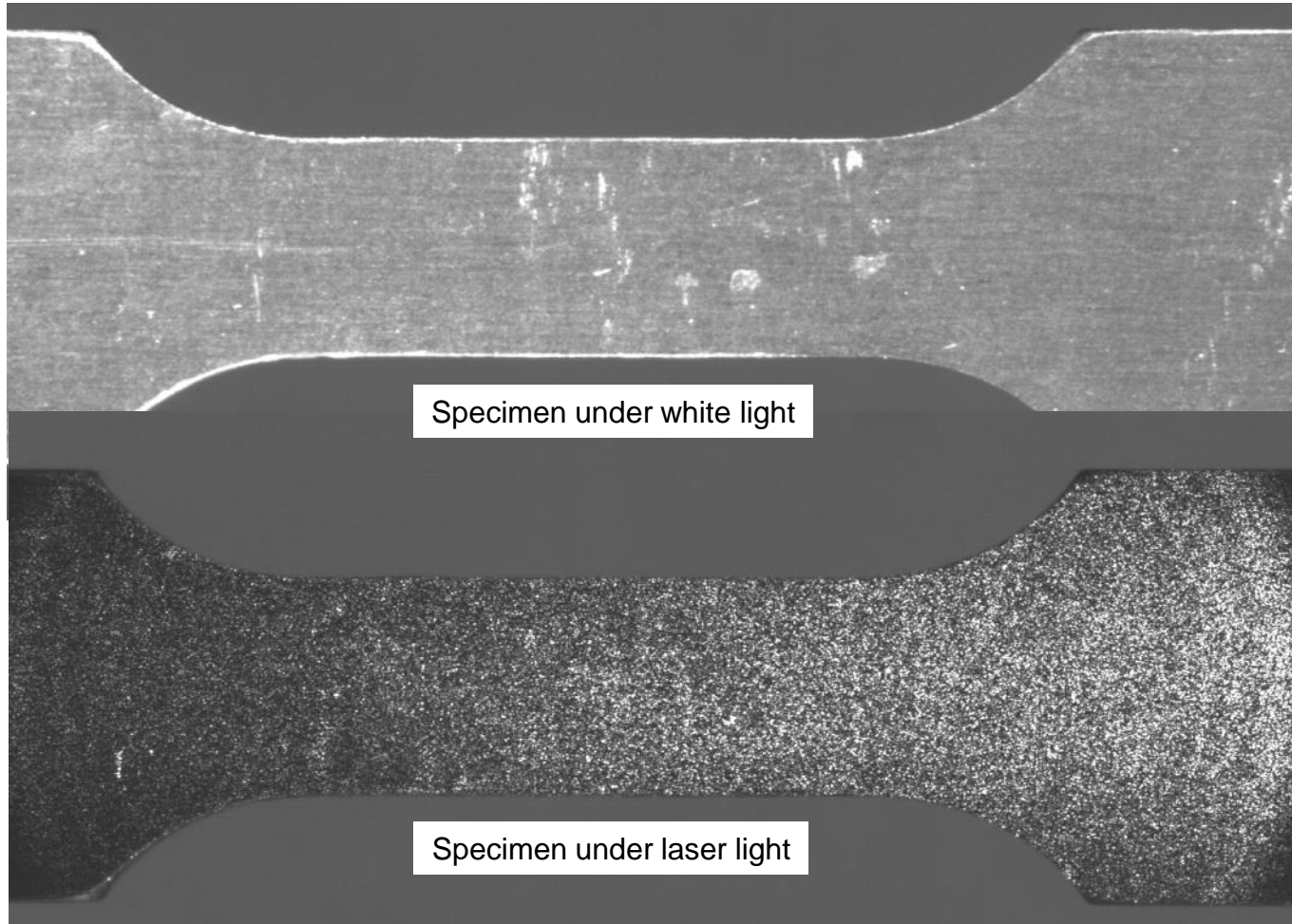
laserXtens – unique patented technology



Laser Speckle effekt
by diffusion of laser light at
specimens surface



Laser Speckle extensometer – measurement principle

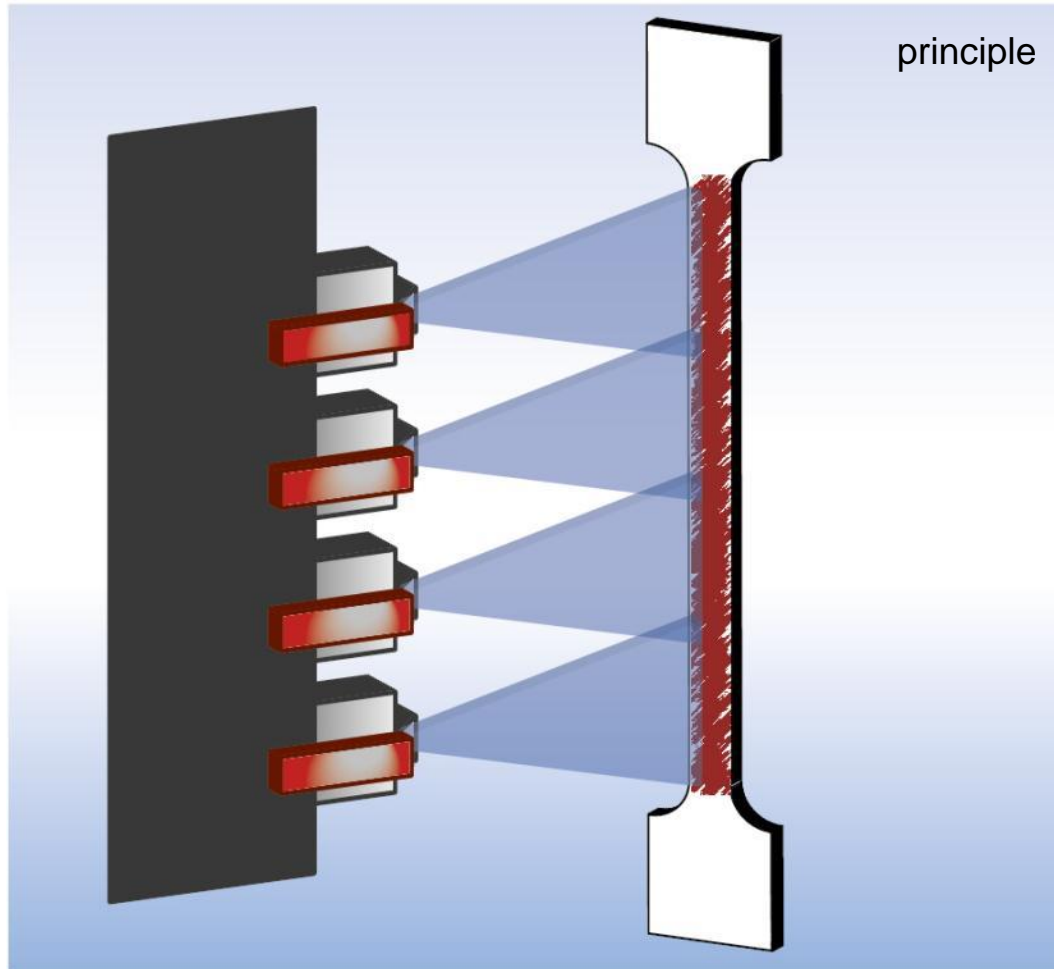


laserXtens 7-220 HP – perfect for metal testing acc. ISO 6892-1

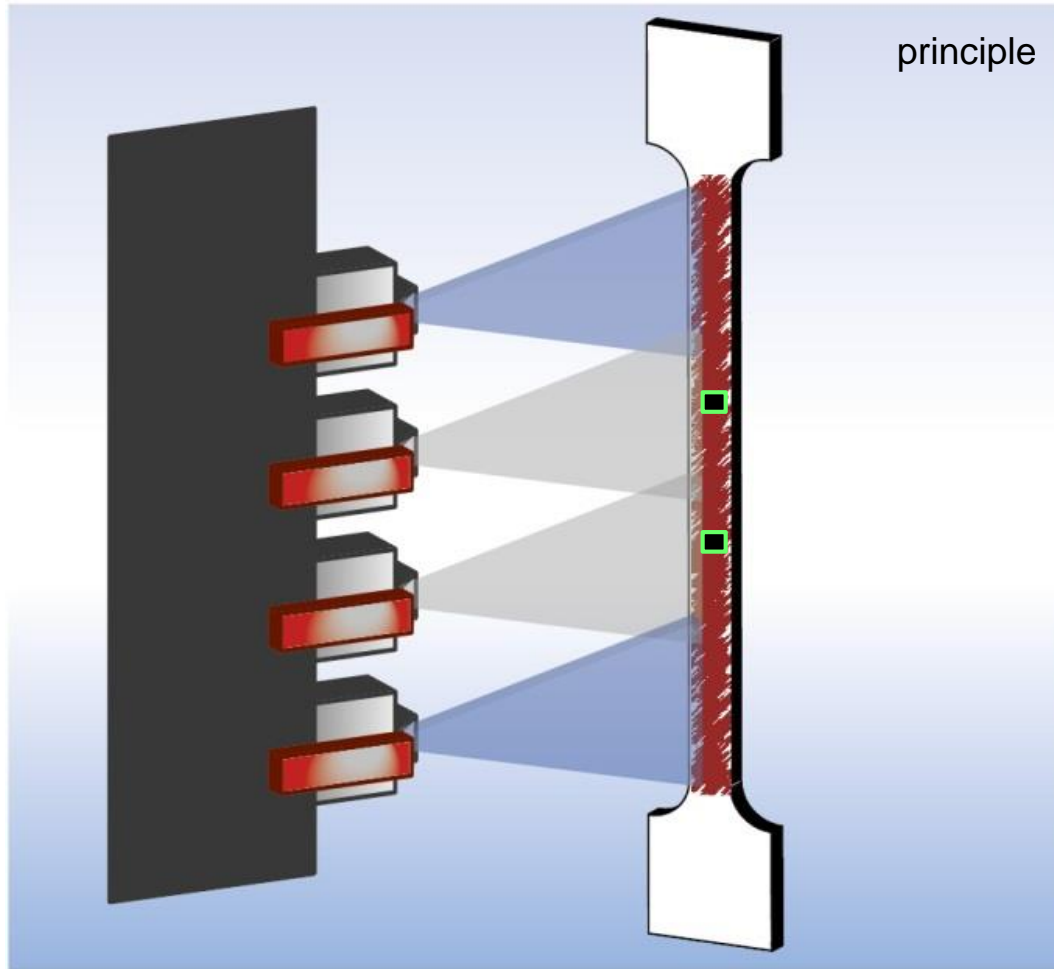
- Incl. strain rate control according to ISO 6892-1 method A1 “closed loop”
- No specimen preparation
- Patented Array technology
- Accuracy grade 0.5



laserXtens 7-220 HP: Expansion of measurement travel by array configuration



laserXtens 7-220 HP: Expansion of measurement travel by array configuration

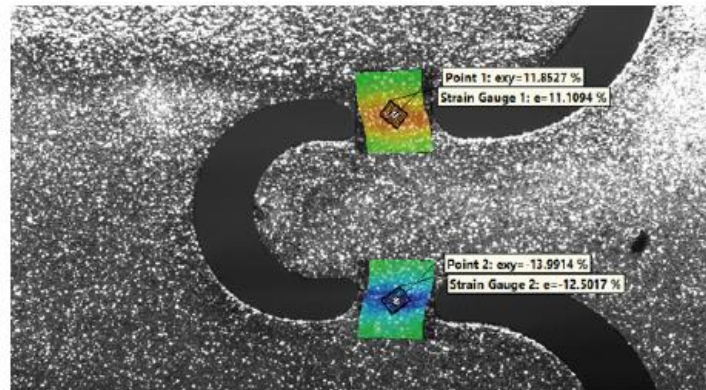


2D DIC (Digital Image Correlation)

laserXtens: the ultimate in DIC

- no specimen marking
- maximum resolution
- easy to operate

Save time and increase reproducibility! laserXtens technology completely eliminates the need for specimen marking. The specimen marking usual with other DIC systems, employing white developer spray and black paint markings, is time-consuming and produces very varied results. The quality of the pattern is however vital to the resolution and accuracy of the measurement! With laserXtens technology no specimen marking is needed. Resolution and consistent quality are guaranteed at all times.

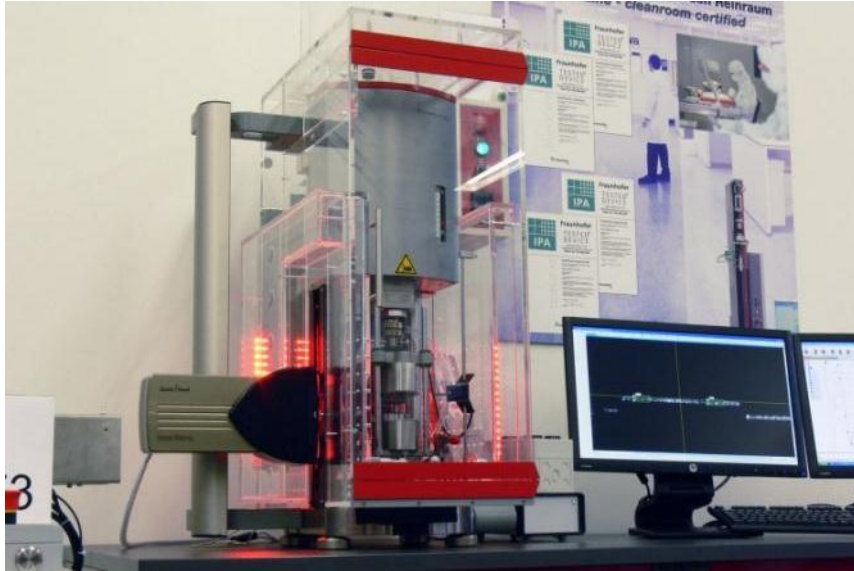


laserXtens 1-15 HP: made for mini & micro specimens

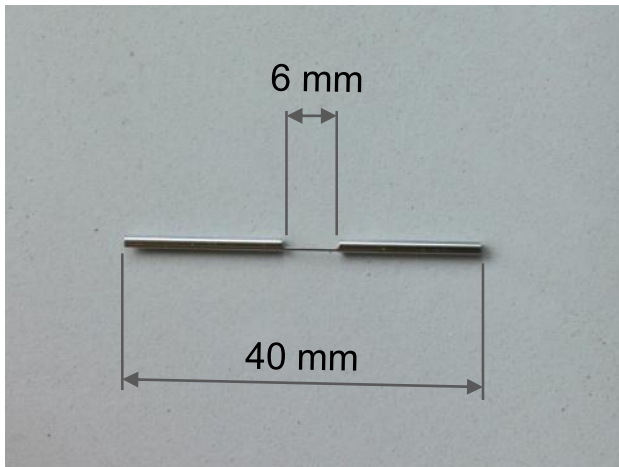
- Wire too sensitive for contact systems
- Small extensions, low load, but highly accurate extension measurement required
- Small specimens: telecentric objective is important to eliminate out-of-plane movements



laserXtens 1-15 HP: ideal for micro specimens

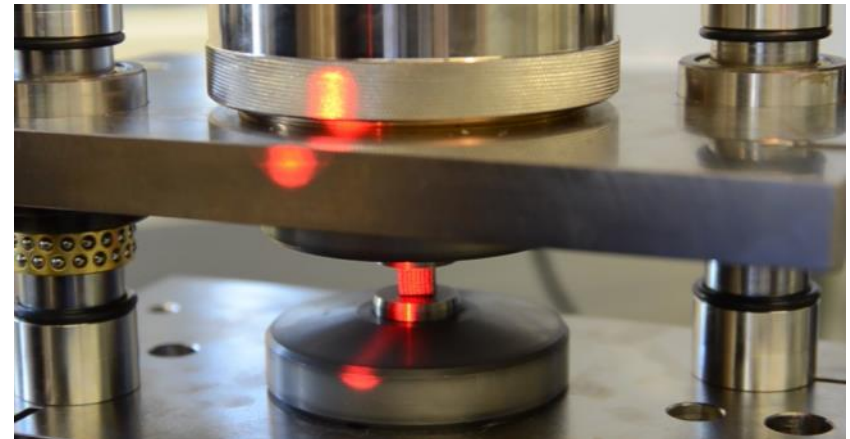
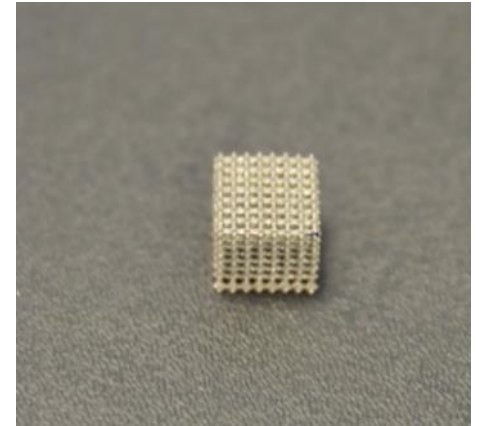


- Tensile tests in temperature chamber (37 °C)
- laserXtens 1-15 HP: High resolution of 0.04 μm
-> ideal system for micro specimens



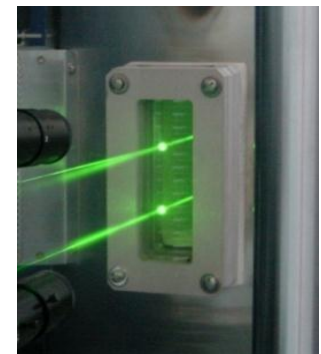
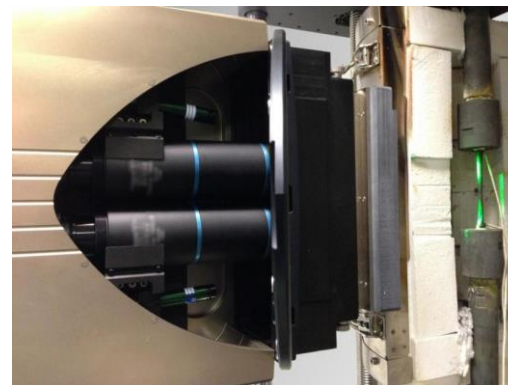
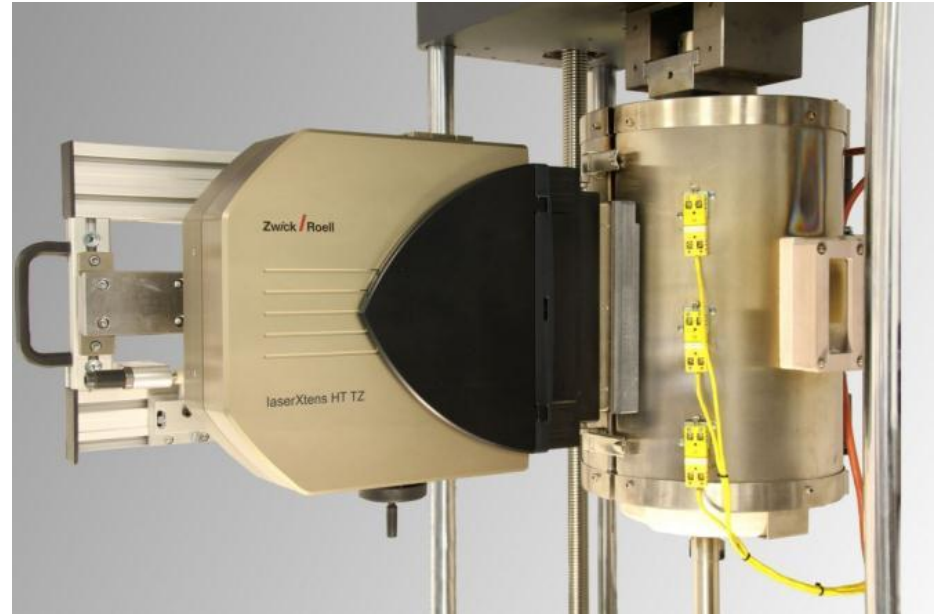
Compression tests with laserXtens

- Size 10x10 mm
- Compression test to ensure its stability / characteristics after implant (it's constantly under pressure after implant in body)
- Measurement at the grid, not at compression platens
- No hardware expansion for laserXtens required, only basic equipment and software



laserXtens HT/TZ – ideal for high temperature testing

- telecentric lenses for compensation of the specimens lateral movement
- With green laser diodes



High temperature

Thank you for your attention!