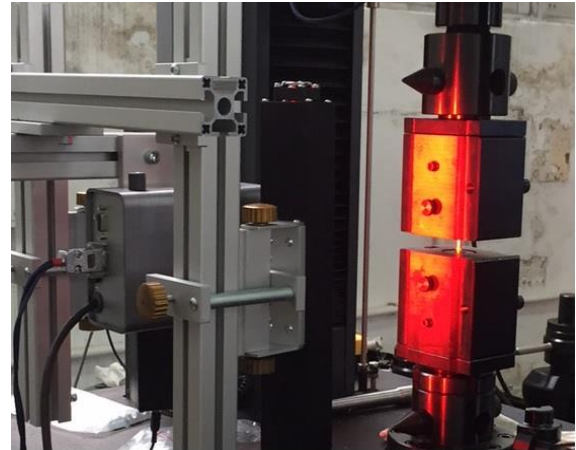


Advanced Video Extensometer

ACS Advanced Video Extensometer (AVN) is a non-contact, optical strain measurement device for measuring the average gauge length and width of a tensile specimen without locking in a particular procedure or assuming the material behaves in a particular way. Measurements can be taken throughout the entire testing period up to specimen fracture and hence all elongations can be automatically recorded for every specimen tested.

Simple Design, Easy to Install

The cameras are mounted in protective housings with integral light sources for stable, uniform, specimen illumination and the assemblies are attached to either an adjustable rack or a fixed post depending on the equipment configuration. One or two cameras systems in a variety of configurations are available for different test applications.



Diffuse specimen illumination is provided by linear LED arrays to achieve required field of view for testing metals, plastics, components and other materials.

One solution for all your needs

Any material, metal, plastic, polymers, belts, ropes, etc, can be used providing a defining set of marks can be applied. Including (with two cameras systems) strand, wire, reinforcing bar, rubber, etc

The camera frame rate is up to 500 frames per second depending on camera type, lighting, and the field of view. This allows for dynamic testing up to 20Hz depending on the number of data points required. The image processing can support this rate with either dots or lines defining the gauge marks.

Measurement output from the system can be either analog +/-10VDC, RS232 serial, or Ethernet to allow use on various testing machines and as a mechanical extensometer replacement.

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Combined or Separate PC

Imaging analysis can be performed in the same PC as the Testing System if a sufficiently high specification unit is used. A separate window allows display of the camera image, detected gauge marks and measured gauge length and width. The VNCX screen or Window on a single PC system displays the camera image, provides controls for setting up the test, and shows the current analysis to confirm that the measurements are correct.

Alternatively, with an optional separate PC as an imaging processing unit, the system can be portable and used on a number of testing machines in the facility.

For automated use "Start", "Stop" and "Measured Gauge Length" commands can be initiated by RS232 serial, Ethernet commands or digital inputs from the tensile testing PC.

TruForce

Advanced Video Non-Contact Extensometer | AVN

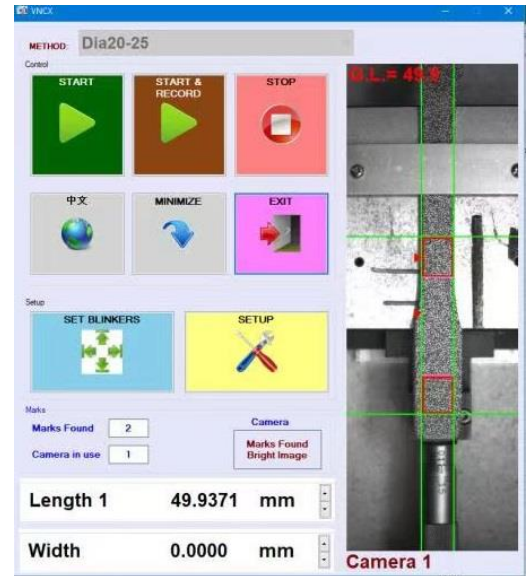
Static images can be recorded during a test and post-analysed for specific research or application purposes.

Specimen Marking

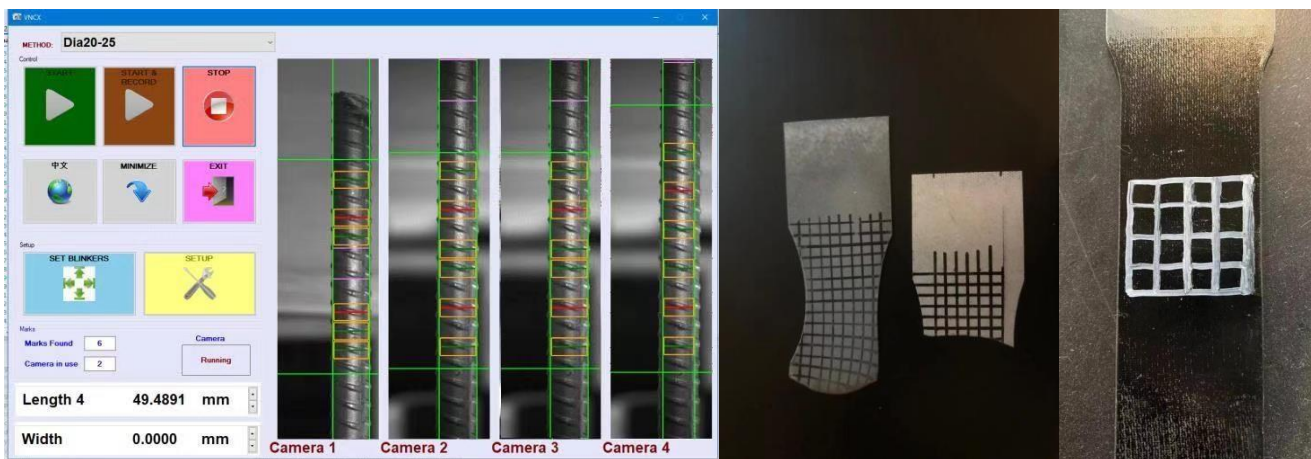
Specimen marking can be a minimum of 2 dots or 2 lines, or a 2-D dot matrix to analyse a coarse strain field, or up to 10 lines to accommodate specimen fracture anywhere within the parallel length. A random dot pattern can be used to analyse strain distributions in odd shaped specimens.

The system can also detect the textures or paints on the surface of the specimen as gauge marks, such as the ribs on the reinforcing bar. Using the texture eliminates the need to manually mark the sample with no influence on specimen properties and saves operator time

Transverse strain measurement can be taken from the average of a 2-D dot target; vertical lines on a specimen; or the specimen edges if a backlight is used.



Both multiple vertical lines and transverse lines can be monitored and measured at the same time



Other Recording Systems

With an analog option or Ethernet connection, 2 channels are available for output (such as length and width signals) and 4 channels for input from external equipment such as external strain measurement, temperature readings, etc. that are logged at the same time as video strain measurements. This allows AVN to be part of a larger instruments recording package.

For other non-tensile test applications a portable AVN system can be used for extension or strain measurements on equipment or large samples such as hydraulic cylinders, beams, concrete slabs, etc.

Specifications

Axial Measurement

Field of View (FOV)	100mm	200mm	300mm	>300mm*
Resolution	1.0 μ m	1.0 μ m	2.0 μ m	1.0 μ m
Accuracy	$\pm 3 \mu$ m or 1% reading	$\pm 3 \mu$ m or 1% reading	$\pm 5 \mu$ m or 1% reading	$\pm 3 \mu$ m or 1% reading
Data Rate	500 Hz	500 Hz	500 Hz	500 Hz
Marking (lines)	3 mm	3 mm	3 mm	3 mm
Marking (dots)	5 mm	5 mm	5 mm	5 mm
Minimum Gauge length	10mm	25mm	50mm	10mm
Classification to ISO 9513, EN10002-4	Class 1	Class 1	Class 2	Class 1
Classification to ASTM E83	B-1 (G.L \geq 30mm)	B-1 (G.L \geq 30mm)	B-1 (G.L \geq 50mm)	B-1 (G.L \geq 30mm)

* Requires a Dual camera system for Axial Strain Measurements

Transverse Measurement

Field of View (FOV)	15mm	25mm	50mm	75mm*
Resolution	1.0 μ m	1.0 μ m	2.0 μ m	1.0 μ m
Accuracy	$\pm 3 \mu$ m or 1% reading	$\pm 3 \mu$ m or 1% reading	$\pm 5 \mu$ m or 1% reading	$\pm 8 \mu$ m or 1% reading
Marking (lines)	3 mm	3 mm	3 mm	3 mm
Marking (dots)	5 mm	5 mm	5 mm	5 mm
Minimum Gauge length	6mm	10mm	15mm	20mm
Classification to ISO 9513, EN10002-4	Class 1	Class 1	Class 2	Class 1
Classification to ASTM E83	B-1 (G.L \geq 30mm)	B-1 (G.L \geq 30mm)	B-1 (G.L \geq 50mm)	B-1 (G.L \geq 30mm)

* Requires a Dual camera system with second Camera only for Transverse Strain Measurements

Typical Configurations

Model	FOV (mm)	Typical Measurements	Typical Configuration
AVN1-200MM	200	Modulus, r-value, axial and transverse strain, proof stress, elongations etc.	Single camera, suitable focal lens and LED strip light to achieve 200mm FOV; Typically for specimen test gauge length less than 100mm
AVN2-650MM	650	Modulus, axial extension (strain), proof stress.	Dual camera with joint FOV up to 650mm. Typically for specimen tests with large gauge length or large elongation. For example metal test with 200mm gauge length, or rubber test with over 1000% elongation
AVN1-60MM	60	Modulus, Poisson's ratio, r-value, axial and transverse strain, proof stress, elongations etc.	Single Camera with Telecentric Lens for up to 60mm FOV. Typically for metal or composite specimen with very low strain, ideal for Poisson's ratio, r-value measurement
AVN1-80MM	80	Modulus, Poisson's ratio, r-value, axial and transverse strain, proof stress, elongations etc.	Single Camera with Telecentric Lens for up to 80mm FOV. Typically for metal or composite specimen with very low strain, ideal for Poisson's ratio, r-value measurement

Typical Applications

- Ideal solution any material such as metal, plastic, polymers, etc
- With various two cameras configurations it is suitable for high-elongation material testing such as rubbers, and large gauge length testing such as Strand wire, reinforcing bar (typical gauge length 600mm), etc.
- Suitable for the measurement of Poisson's ratio, n-value, r-value, etc.
- Meets a broad range of international testing standards, including ISO 527, ASTM D3039 and ASTM D638, etc