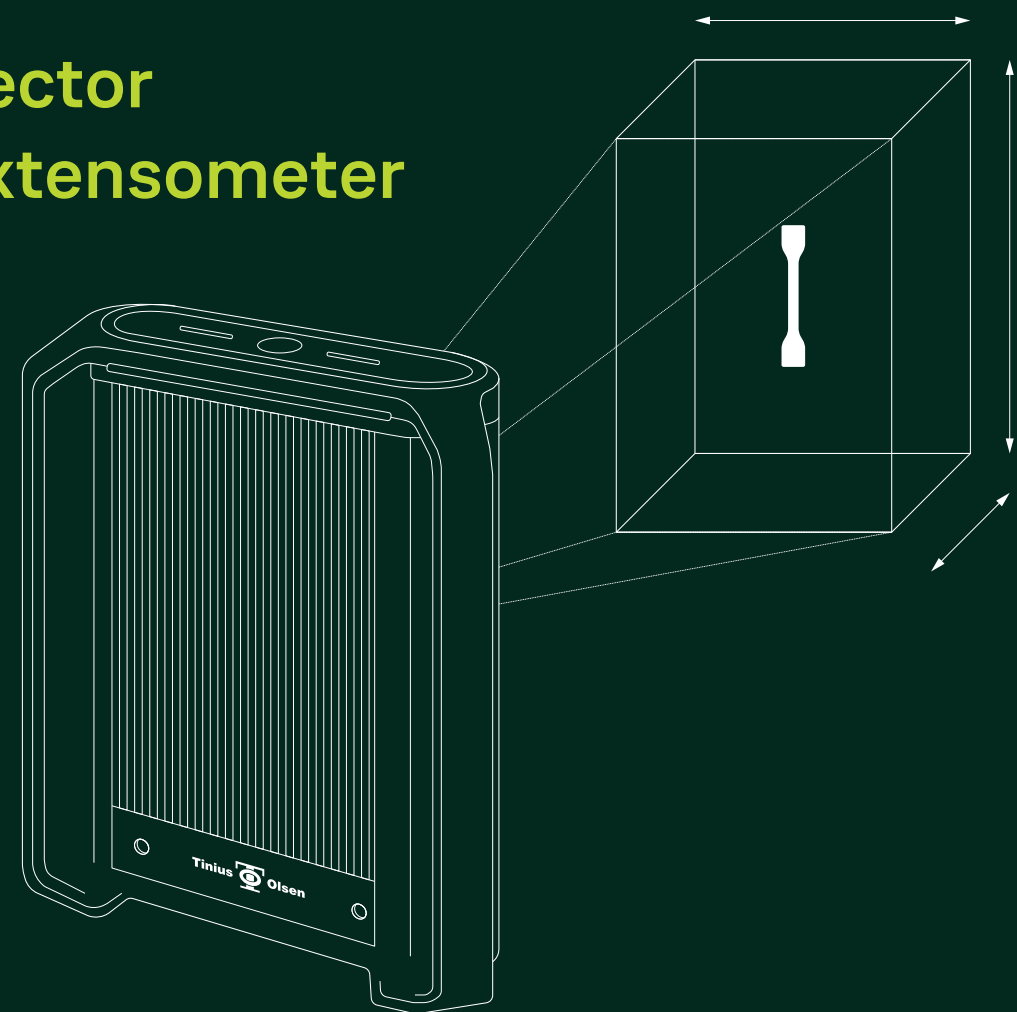# Vector Extensometer

Optical non-contact measurement:
The future of extensometry

Tinius 〇 Olsen

Vector Extensometer

The Tinius Olsen VectorExtensometer is a groundbreaking, non-contact device designed to replace traditional clip-on extensometers by redefining how we measure and control strain in tensile, compression, and flexural testing.

It integrates adaptive AI with optical hardware to automate strain measurement, improving accuracy, data consistency, and operator safety. With support for various marking options and high-resolution measurements, it is ideal for a wide range of testing applications.

The adaptive AI in the Vector Extensometer plays a crucial role in enhancing its functionality and efficiency. Here are some key aspects:

Automated Strain Capture

The process of capturing strain is automated, which reduces the need for manual intervention and increases the accuracy and consistency of measurements.

Dynamic Response

It dynamically adjusts to different specimen appearances and behaviors, ensuring accurate measurements even with varying test conditions.

Zero-Touch Operation

Enabled as a truly zero-touch operation, meaning the device can operate without the need for constant human oversight.

Error Reduction

By detecting specimen misalignment and compensating for out-of-plane errors, this device improves the reliability of the test results.

Enhanced Safety

Improved operator safety by reducing the need for physical contact with the specimens, which can be particularly important when testing fragile or hazardous materials.

Simplified Setup

It has a simplified setup process by automatically detecting specimen and gauge lengths, which speeds up the testing process and reduces the complexity of the operation.


Horizon Software and Vector GUI

Stereoscopic camera setup offers a volumetric field of view that eliminates out-of-plane movement and is very tolerant of positioning relevant to the test specimen.
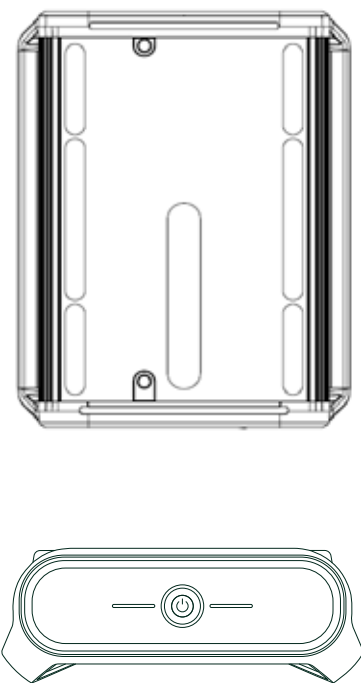
Key Features

Meets or exceeds 0.5 μm resolution (1.97e-5 inch), ISO 9513 Class 0.5 and ASTM E83 Class B1 capable

Non-contact measurement

Real-time digital or analog data output

Versatile marking options

Zero touch operation

Suitable for Strain rate control, Poisson's ratio, R Value, etc..

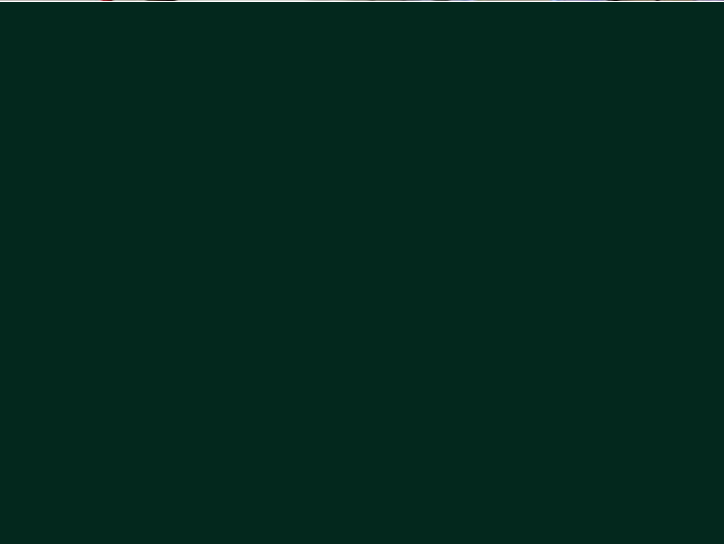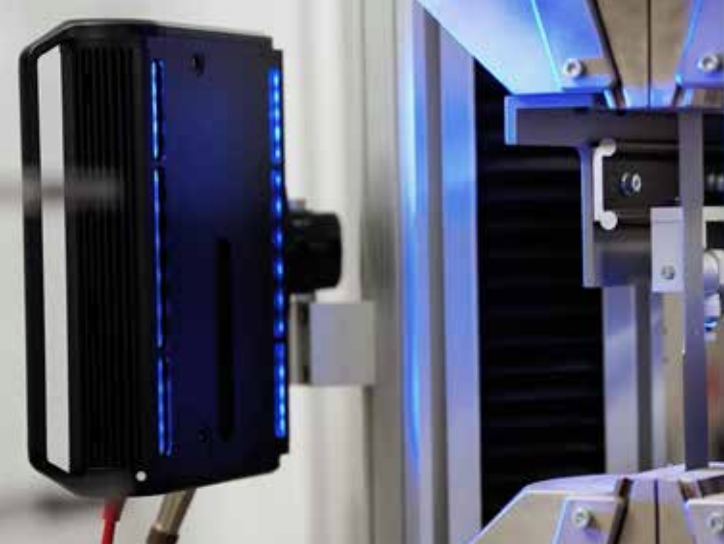Future of Extensometry
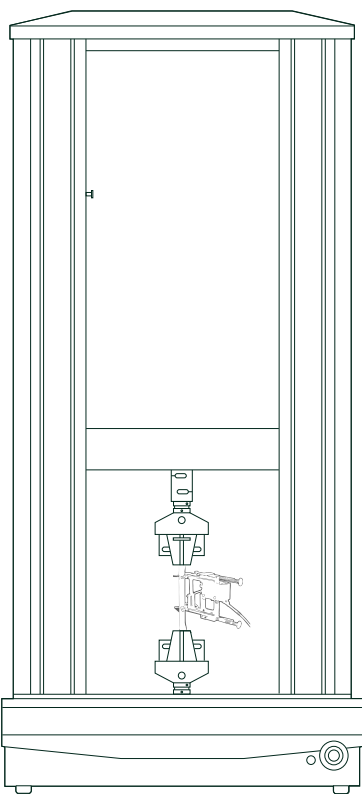
"Vector can replace almost all clip-on extensometers in a single unit while removing all issues related to clip-ons like mounting issues, breakage, consumables and calibration of multiple units."

The strain measurement device of the future
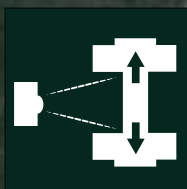
+ Easy integration into any materials testing system
+ Minimal user intervention
+ Non-contacting: multiple gauge lengths
+ Supports an automated process

Traditional Clip-on extensometer

Specifications

	U200	U70	B80
Field of View [HWD] cuboid	200x40x100mm	70x25x40mm	80x30x30mm
Real-Time Data Rate	150Hz	150Hz	150Hz
	Platform dependent. Full system from acquisition to output		
Strain Outputs	Digital output, selectable units and range;		
	Analog output, ±10V, short-protected, selectable units and range; includes 3m (10ft) shielded output cable		
Resolution	<0.5 μm quasistatic, and cyclic; Typical RMS resolution at typical settings. Resolution is a function of the marking data rate and filter settings		
Extensometer Accuracy Class	Meet or exceeds ISO 9513 Class 0,5 and ASTM E83 Class B-1 capable		
Minimum Specimen Width/Diameter [excluding marking accessories]	5mm wide (flat) or, 6mm diameter (round)	2mm wide (flat) or, 2.5mm diameter (round)	**Axial :** 1.5mm wide (flat), 2mm diameter (round) **Transverse :** 10mm wide (flat), 12.5mm diameter (round)
Gauge Length (minimum)	Variable, 25mm	Variable, 10 to 50mm	Variable, **Axial :** 7.5 to 70mm **Transverse :** 6 to 25mm *
Cyclic Testing	Speed and specimen dependent, typically up to 10Hz		Speed and specimen dependent, typically up to 5Hz
Strain Control	Suitable for monotonic and cyclic strain control applications; Compliant to ISO6892 and ASTM E8		
Out-of-Plane Sensitivity [from front of module]	300 ± 50mm	300 ± 20mm	300 ± 15mm
Ambient Operating Light Conditions	Suitable for use in a day light situation, artificial lab or room lighting situations		
Suitable for use with Temperature Chambers	Measuring strain in a temperature chamber at ambient, high and low temperature (min. window width 160mm), recommended temp. range -30° to 370°C		
Signals Integration Options	Control, information, and notification through Vector GUI interface and/or Horizon software or through test suite software (Manufacturer dependent)		
Power Supply	100-240 VAC, 50-60 Hz, 1.4A 120W max, IEC 320 C14 receptacle		
Power Consumption	8W (avg)		
Recycling Capability	Up to 60% of this product can be recycled; metals and cabling		
System Environment	10° to 40°C (50 to 100°F), for use and storage; 20-80% relative humidity noncondensing environments		
Dimensions [HWD]	252 x 201 x 73 mm		
Mechanical Integration Options	**Physical mounting schemes available for;** T-slotted single and twin column vertical testing frames. Multi-column vertical testing frames. Horizontal testing frames.		
Typical ROI	6 months		
Component defect warranty	12 months [extended warranty available, please inquire]		
Manufactured	In the UK		

* Minimum transverse gauge length for speckles is 7.5mm.

Vector Extensometer

www.tiniusolsen.com

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