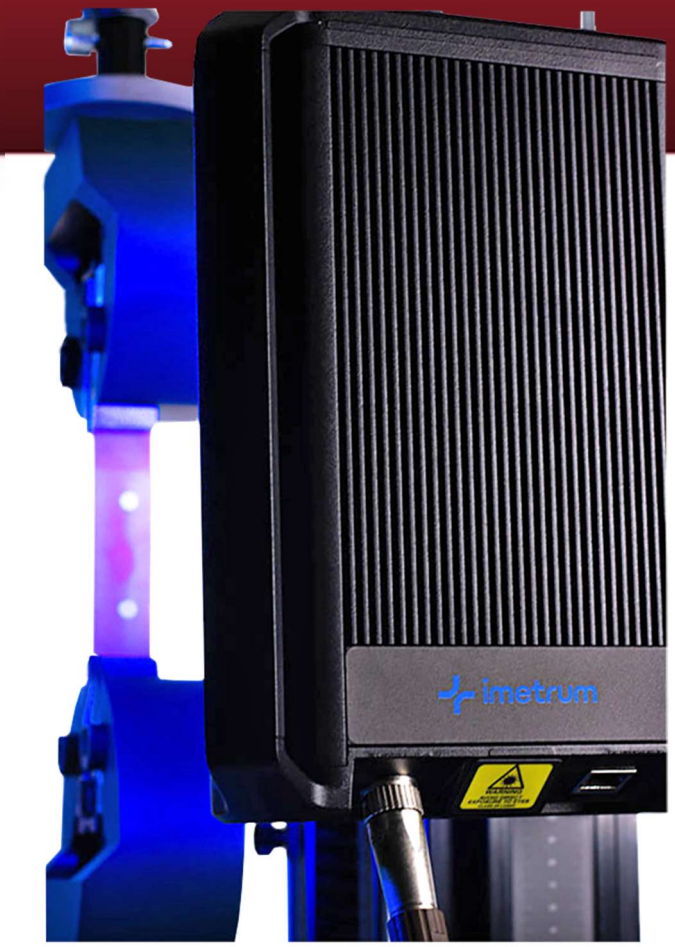
METROTEC



VECTORIAL EXTENSOMETER Vector U-200 model

Vector is the next generation of **non-contact uniaxial extensometers**. Designed to measure strains in both **metal** and **polymer** samples.

Adaptable to Universal Testing Machines to accurately measure the deformations between points in the specimens subjected to tensile stresses and to determine the modulus of elasticity or Young's modulus, elastic limit, elongation at break of the specimen.

TECHLABSYSTEMS

VECTORIAL UNIAXIAL EXTENSOMETER “VECTOR U200”

Vector replaces conventional contact and non-contact sensors with a single instrument specifically designed for this purpose. This uniaxial extensometer offers a 200 mm field of view.

CHALLENGE

When testing metals to ASTM and ISO standards, it may be necessary to test specimens of different sizes, geometries and gauge lengths. To remain competitive and efficient, a high throughput needs to be maintained by minimizing equipment setup for each specimen geometry.

APPLICABLE STANDARDS

ISO 9513 Class 0,5 - ASTM E83 Class B-1

ISO 9513 Class 0.5, part of ISO 9513, specifies the accuracy and resolution requirements for extensometer systems used in mechanical testing, ensuring accurate measurements of material strain. Extensometers in this classification have a maximum indicated relative bias error of 0.5%.

ASTM E83 Class B-1, part of ASTM E83, classifies extensometer systems according to their accuracy. Class B-1 represents high accuracy. Extensometers in this classification have a maximum indicated bias error of 0.5%.

- **Uniaxial extensometer**
- **Gauge length: 25 to 180 mm**
- **Minimum sample width: 5 mm**
- **Working distance: 250 to 350 mm**

STANDARDS

Metals are tested according to a variety of national and international standards. These standards ensure consistency and comparability of results obtained from material tests carried out across the world, using different equipment. They ensure that test methods are standardized and reproducible for the reliable evaluation of mechanical properties. This is critical for quality assurance, research and development, material selection and even safety. The effects of testing to these standards can be seen in different industries, including automotive, aerospace, construction and medical.

ASTM[1] and ISO[2] standards for materials tests on metals:

- ASTM E8 and E8M Standard Test Method for Tensile Testing of Metallic Materials
- ISO 6892-1 Tensile Test on Metals at Ambient Temperature
- ASTM E21 Elevated Temperature Tension Test on Metals
- ISO 6892-2 Tensile Test on Metals – Test Method at Elevated

SOLUTION

The Vector U200 uniaxial extensometer, can test multiple specimen geometries and gauge lengths from 25 to 180 mm. It locks onto and tracks several marking types, meaning a wide range of specimens can be tested. The automated control and simple marking solution, combined with quick setup and simple training requirements, means setting up each test only takes a few seconds.

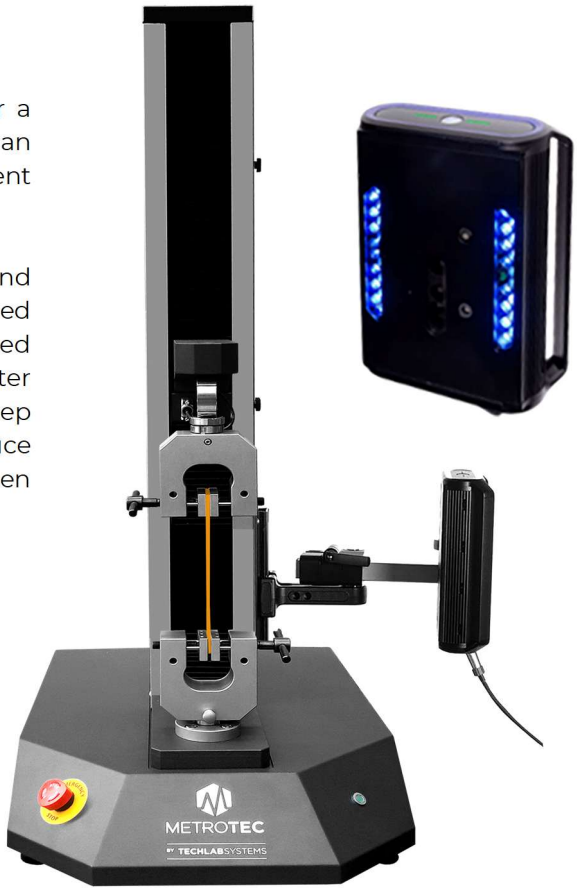
The accuracy of Vector's measurement technique and operation efficiency improves test reliability to meet the standards required for the tensile testing of metals.

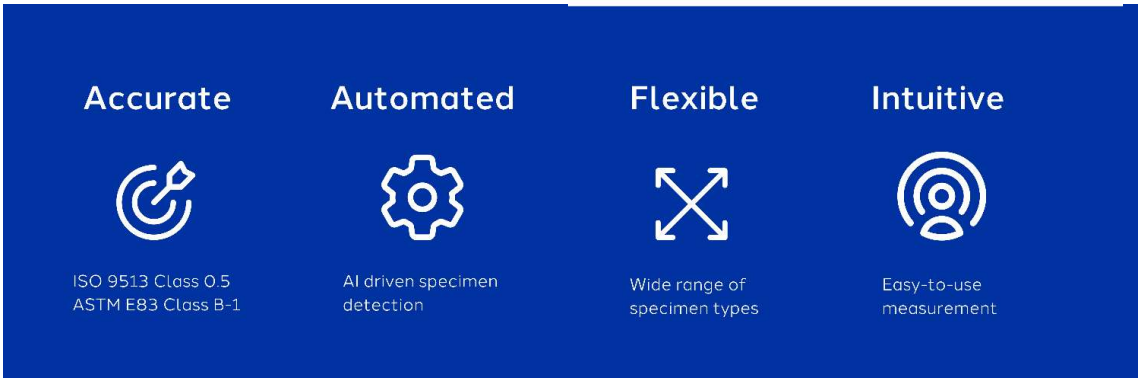
In addition, Vector U200 meets both Class B-1 for the ASTM standard B83 for the accuracy of controlled displacements to a simulated specimen and ISO 9513 Class 0.5 for the static calibration of extensometer systems used in uniaxial testing for all supported gauge lengths.

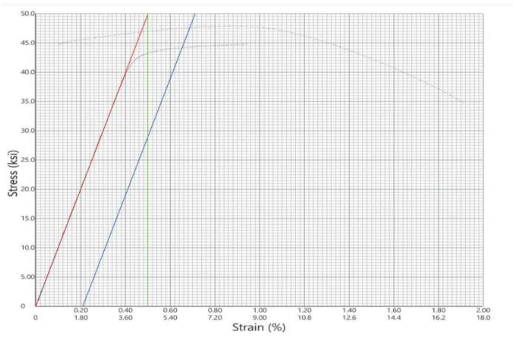
RESULTS

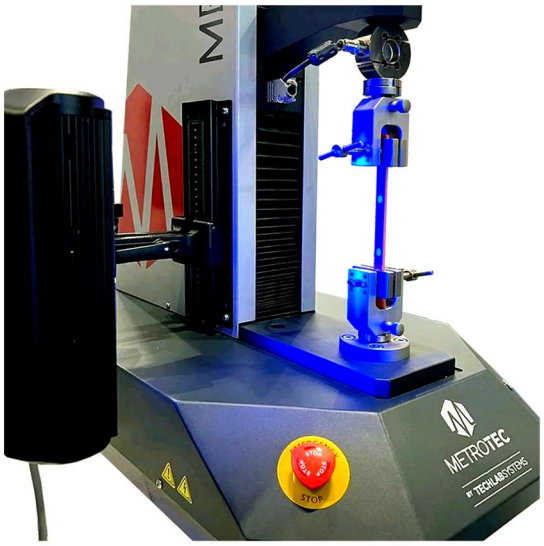
A single Vector U200 replaces the need for a suite of clip-on extensometers, and this can significantly reduce inventory costs, equipment setup time and ongoing calibration costs.

The automated operation saves time and increases throughput. Tests can also be tested to failure safely as the operator is not required to interact with the specimen or extensometer during the test. Vector will allow you to keep up with your testing requirements and reduce setup changes when alternating between different specimens, grips or test types.









INTEGRABLE IN 1 AND 2 COLUMN TESTING MACHINES

The Vector U200 Uniaxial Extensometer can be adapted to any Universal Testing Machine by means of couplings that allow easy positioning in relation to the specimens being tested.

INSTALL – MARK – ALIGN AND MEASURE

With an intuitive four-step setup, Vector is up and running in 40 seconds and ready to test the next sample in just 2 seconds, with easy-to-use features like alignment guidance and adaptive control through our Vector Interface app.

VERSATILE

The non-contact method allows operators to use the same extensometer for a wide variety of samples and test types. Without the need to touch or disturb the sample, the extensometer does not affect the measurement, which is especially important with delicate materials.

LOW COST INVESTMENT

The Vector range represents a significantly reduced capital investment compared to advanced extensometers such as video and automated systems, while offering a comparable lifetime cost to a single-clip extensometer system.

TECHNICAL FEATURES	
Extensometer measurement applications	Uniaxial; Tensile, Compressive or Flexural
Measurement modes	Strain (%) or displacement (mm/inches)
Field of view	200H x 100D x 40W mm cuboid
Resolution	<0.5 mm
Extensometer accuracy class	Meets or exceeds ISO 9513 Class 0.5 and ASTM E83 Class B-1 capable
Gauge lengths supported	25 to 180 mm
Real-time strain data rate	150Hz
Minimal specimen width	5 mm flat, 6 mm diameter round
Minimal recommended specimen parallel section	32 mm
Maximum tracking speed	2500 mm/min
Strain control	Compliant to ISO 6892 and ASTM E8
Operating distance	250 to 350 mm
Strain output interface*	Analogue: ±10V BNC Digital: RS232 serial 15 pin D-sub
Supported mark types**	Rings, filled circles and speckles automatically detected
Recommended specimen temperature range	-30 to +300°C
Dimensions	252H x 73D x 201W mm
Weight (Vector module only)	3.1 kg

* Digital output with select UTMs only, via specific adapter cable.
** Always use the marking kit provided.

CONTENTS OF THE STANDARD SUPPLY:

- Vector U200 Extensometer
- 1 Marking Kit
- 1 User Manual