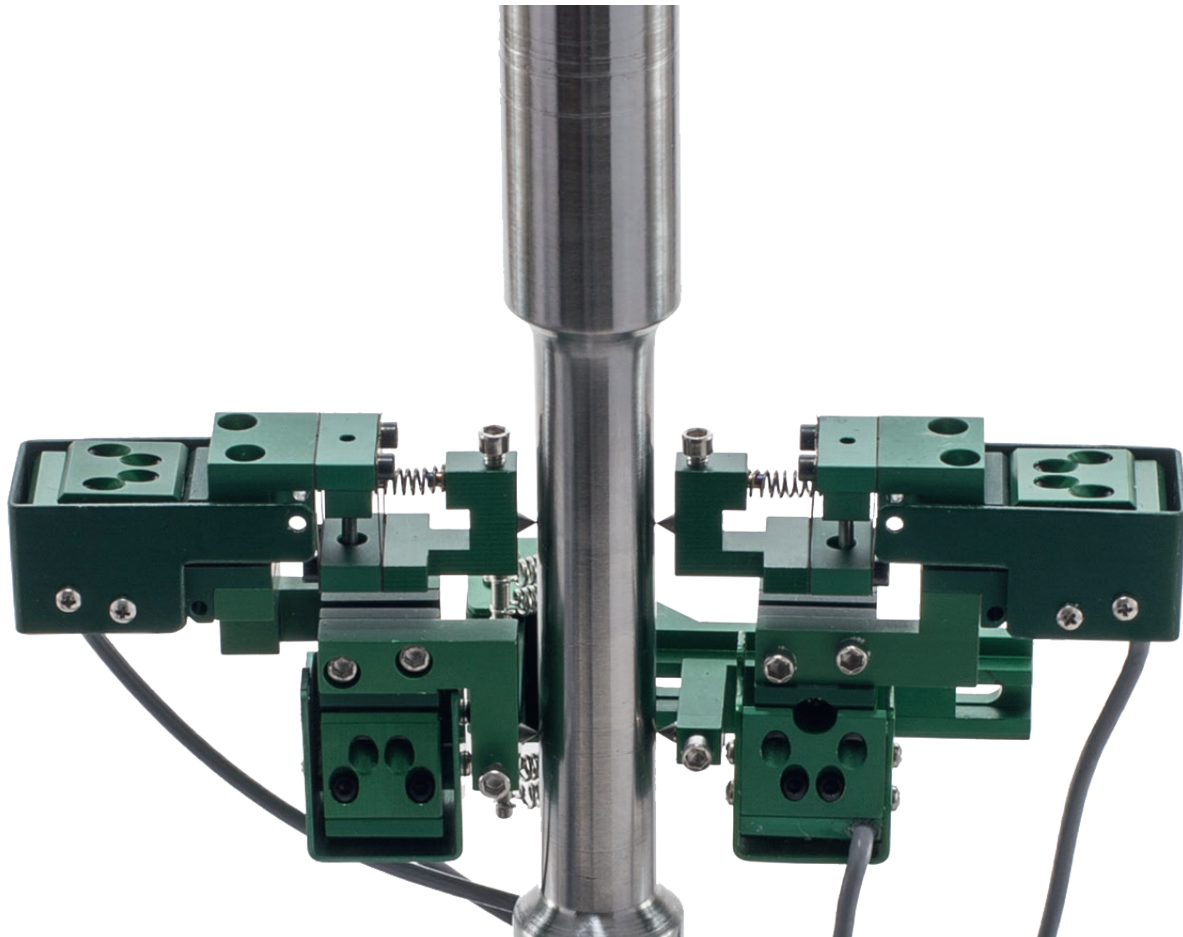


## Axial / Torsional Extensometer Series 3550

for simultaneous measuring axial deflection and torsional strain on specimens tested in axial / torsional machines.



This accurate, strain gaged extensometer is most often used on round specimens tested in bi-axial test machines capable of simultaneous axial and torsional loading.

The extensometer is often customized for particular applications.

All units are capable of bi-directional travel, so they may be used for cyclic testing under fully reversed loading conditions.

The standard sized model is self-supporting on the specimen, and works on specimens from 9.5 to 25.4 mm diameter, typically solid or tubular metal or composite specimens. The conical point contacts included with the extensometer are made from tungsten carbide.

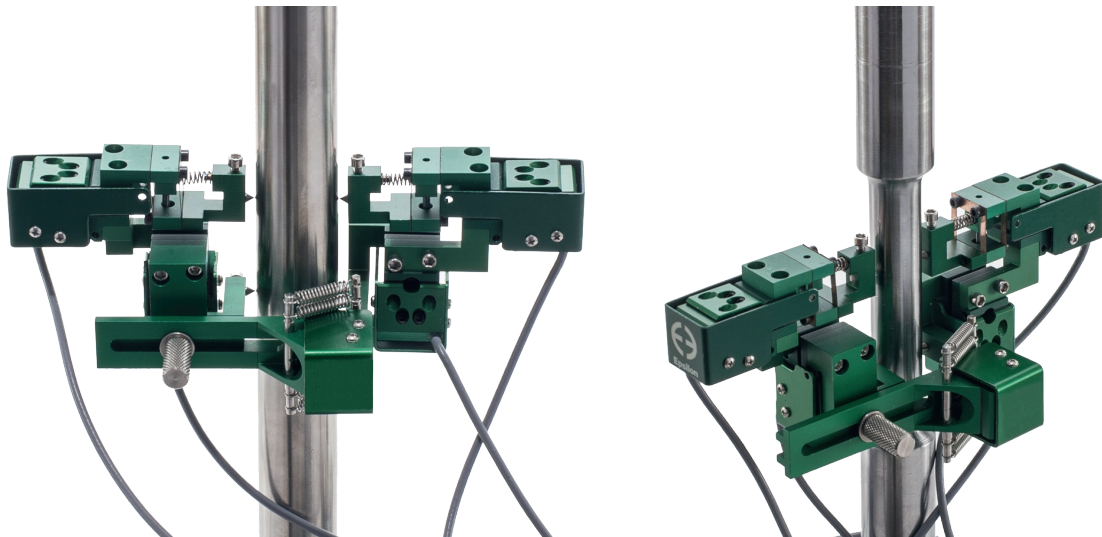
The unique design directly measures the surface shear strain angle, which allows operation on a wide range of specimen diameters without changing the calibration.

All models are designed specifically to minimize crosstalk between axes and to provide high accuracy measurements. All feature a strong, dual flexure design.

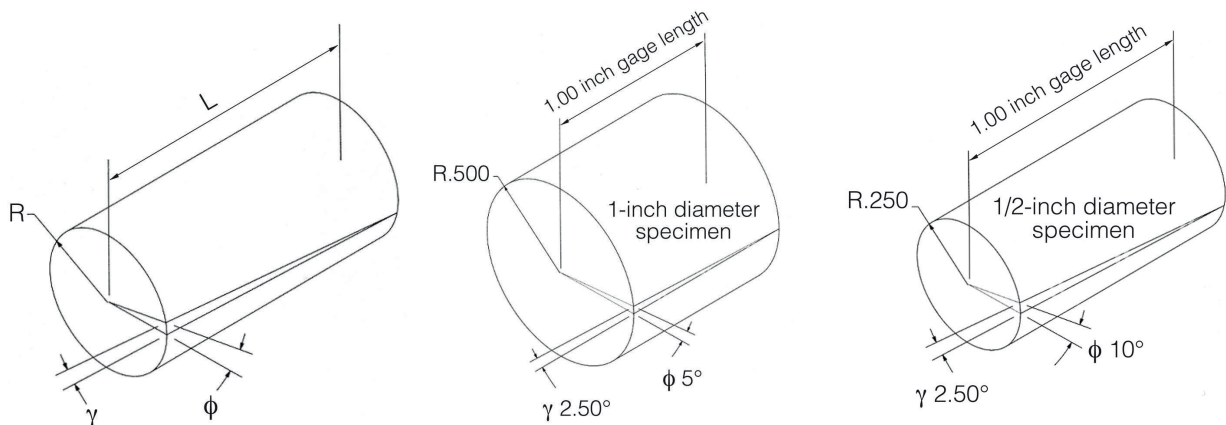
Because these transducers are so often used for specialized tests, contact us with your specific test needs. We can then recommend the ideal configuration specifically for your tests.

### The application range includes:

- Static to cyclic axial/torsional testing including reverse loading
- Can be used also for single axial or torsional measurements



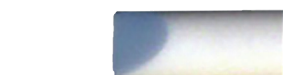
The Series 3550 was designed to directly measure the shear strain,  $\gamma$ , shown in the left figure below. This design allows the correct determination of the shear strain without having to know the radius of the specimen being tested,  $R_1$ . The shear strain is related to the angle of twist (a commonly referenced parameter in torsion testing),  $\phi$ , by the following relationship:  $\gamma = R_1 (\phi / dL_1)$ . For extensometers that measure  $\phi$  directly instead of  $\gamma$ , corrections need to be made for every different specimen diameter tested and for axial strain to correctly determine the shear strain. The two examples below show the variation of the angle of twist versus a change in specimen diameter relative to the constant resulting shear strain.



## Features

- Full bridge, 350 ohm strain gaged design for compatibility with nearly any test system.
- Self-supporting on the specimen.
- Cyclic testing may be performed at up to 2 Hz.
- Includes the Shunt Calibration System for on-site electrical calibration.
- Rugged, dual flexure design for strength and improved performance – much stronger than single flexure designs.
- Includes high quality foam lined case

## Available Rod Tip Styles



**STRAIGHT CHISEL**  
Flat and round specimens



**VEE CHISEL**  
Round specimens



**CONICAL TIP**  
Flat specimens

Straight Chisel: Most versatile, since they can be used with round for flat specimens

Vee chisel: For round specimens

Conical Chisel: For flat specimens

# w+b Materials Testing Systems

## Specification:

|                    |   |
|--------------------|---|
| Accuracy:          | Standard configurations meet ISO 9513 class 0.5 and ASTM E83 class B-1 requirements for accuracy in the axial direction. A test certificate is included. All standard configurations have linearity of 0.20% full scale measuring range or better in torsion. |
| Excitation:        | 5 to 10 VDC recommended, 12 VDC or VAC max.   |
| Output:            | 2 to 4 mV/V, nominal, depending on model  |
| Accuracy: S        | Standard configurations meet ASTM E83 class B-1 and ISO 9513 class 0,5 requirements for accuracy in the axial direction. A test certificate is included. All standard configurations have linearity of 0.20% full scale measuring range or better in torsion. |
| Linearity:         | ≤0.15% of full scale measuring range, depending on model  |
| Temperature Range: | Standard (-ST) is -40 °C to +100 °C (-40 °F to 210°F)   |
| Cable:             | Integral, ultra-flexible cable, 2.5 m (8 ft) standard   |
| Operating Force:   | <30 g typical   |
| Crosstalk:         | Less than 0.5%  |

## Options

- Temperature range -265°C to +200°C
- Shunt calibration
- High Temperature Versions for use in HT-Furnaces Series 3550 HT for Temperatures 1200 °C or 1600 °C available

## Technical Data

Ceramic rod lengths are made to fit furnaces as required. Provide furnace dimensions and electrical outlet type at time of ordering. Requires external mounting brackets and 110 - 240VAC / 4W electrical power. Water cooling is recommended; required for 1000 °C and above. Other configurations are available with special order; please contact us to discuss your requirements.

Model Number 3550 -  -  -  -

| Gauge Lengh         |         |
|---------------------|---------|
| -01-0M <sup>1</sup> | 10.0 mm |
| 012M <sup>2</sup>   | 12.5 mm |
| 025M <sup>3</sup>   | 25.0 mm |

| Measuring Range: |              |     |                              |
|------------------|--------------|-----|------------------------------|
|                  | Axial Strain |     | Torsional Shear Strain Angle |
| 005              | ±5%          | 002 | ±2.0°                        |
| 010              | ±10%         | 003 | ±3.0°                        |
| 020              | ±20%         | 004 | ±4.0°                        |

| Temperature Range |                      |
|-------------------|----------------------|
| Low               | - 265°C to + 100 °C  |
| Standard          | - 40 °C to + 100 °C  |
| High 1            | - 40 °C to + 150 °C  |
| High 2            | - 40 °C to + 175 °C  |
| Low-High          | -265 °C to + 175 °C3 |

<sup>1</sup> only available with Travel ± 5 % and Torsional Shear Strain Angle of ± 4 °

<sup>2</sup> only available with Travel ± 25 % and Torsional Shear Strain Angle of ± 2 °

<sup>3</sup> only available with Travel ± 5 % or ± 10 % and Torsional Shear Strain Angle of ± 2 ° or ± 3 °

