

Designed for simultaneously measuring axial and torsional deflections on specimens tested in axial/torsional machines. The 3550HT axial/torsional extensometers are available in versions rated to 1200 °C (2200 °F) or 1600 °C (2900 °F). These are externally supported and use a special bracket for load frame mounting.

The high temperature 3550HT is for use in materials testing furnaces and with induction heating. The units are provided with high purity alumina rods (to 1200 $^{\circ}$ C) for specimen contact. Silicon carbide rods are used to 1600 $^{\circ}$ C.

Model 3550HT extensometer with calibration stand

This model extensometer is most often used on round specimens tested in bi-axial test machines capable of

simultaneous axial and torsional loading. The extensioneter is often customized for particular applications. All units are capable of bi-directional displacement, so they may be used for cyclic testing under fully reversed loading conditions.

All models are designed specifically to minimize crosstalk between axes and to provide high accuracy measurements. All feature the strong, dual flexure design common to other Epsilon extensioneters.

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

The Model 3550HT extensometers are strain gaged devices, making them compatible with any electronics designed for strain gaged transducers. Most often they are connected to a test machine controller. The signal conditioning electronics for the extensometer is typically included with the test machine controller or may often be added. In this case the extensometer is shipped with the proper connector and wiring to plug directly into the electronics. For systems lacking the required electronics, Epsilon can provide a variety of solutions, allowing the extensometer output to be connected to data acquisition boards, chart recorders or other equipment.

See the electronics section of this catalog for available signal conditioners and strain meters.

Features

- Full bridge, 350 ohm strain gaged design for compatibility with nearly any test system.
- All standard units meet existing ASTM class B-1 and ISO 9513, class 0,5 requirements for accuracy in axial measuring range. All standard units have linearity readings of 0.20% or better in torsion.
- All units come with either high purity alumina ceramic rods (1200 °C) or alpha grade silicon carbide rods (1600 °C).
- Rugged, dual flexure design for improved performance.
- Includes high quality foam lined case and a spare set of ceramic rods.

SPECIFICATIONS

Excitation:	5 to 10 VDC recommended, 12 VDC or VAC max.
Output:	2 to 4 mV/V, nominal, depending on model
Linearity:	${\leq}0.15\%$ of full scale measuring range, depending on model
Temperature Range:	Standard (-ST) is to 1200 °C (2200 °F), optional (-HT) 1600 °C (2900 °F)
Cable:	Integral, ultra-flexible cable, 8 ft. (2.5 m) standard
Operating Force:	<30 g typical
Crosstalk:	Less than 0.5%

OPTIONS

Model 2050 constant temperature water re-circulating bath High temperature option (-HT suffix) for use to 1600 °C Connectors to interface to nearly any brand test equipment Custom mounting bases are available to fit the customer's test frame Shunt calibration module (see page 104)

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Model 2050 Constant Temperature Re-Circulation Bath

This bath provides the controlled temperature flow for water-cooled extensometers. Capable of cooling or heating the water, temperature is maintained within 0.1 °C. These units are ideal for obtaining the maximum stability of any water-cooled extensometer.









Epsilon's axial/torsional extensometer was designed to directly measure the shear strain, γ shown in the figure. This design allows the correct determination of the shear strain without having to know the radius of the specimen being tested, R₁.

The shear strain is related to the angle of twist (a commonly referenced parameter in torsion testing), ϕ , by the following relationship:

$$\gamma = R_1 \frac{d\phi}{dL_1}$$

For extensometers that measure ϕ directly instead of γ , corrections need to be made for every different specimen diameter tested and for axial strain to correctly determine the shear strain.

The example to the left shows the variation of the angle of twist versus a change in specimen diameter relative to the constant resulting shear strain.

Visit our website at **www.epsilontech.com** Contact us for your special testing requirements.





MODEL 3550HT EXAMPLE