

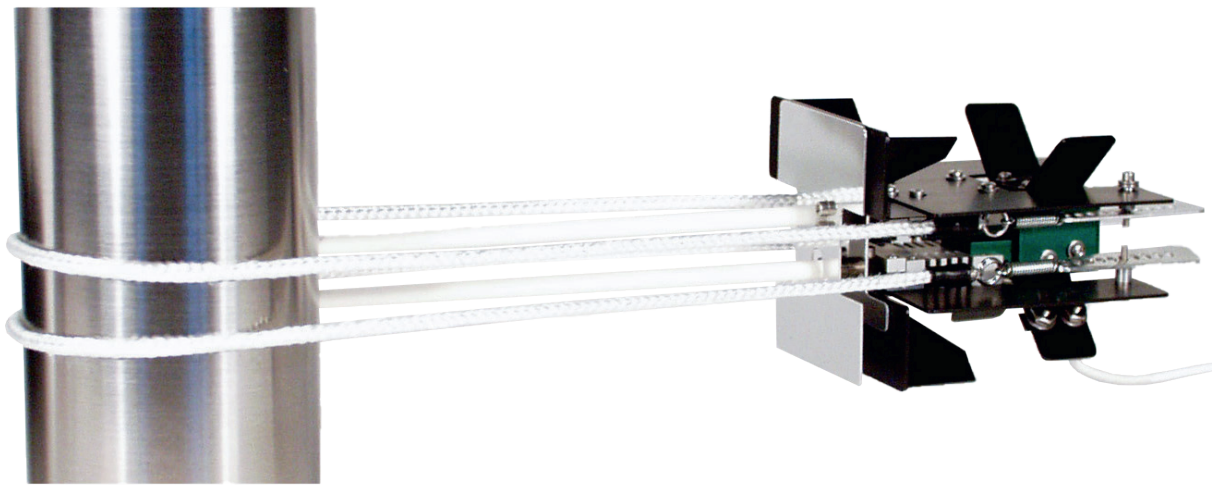
Self-Supporting High Temperature Extensometer Series 3448 up to 1200°C

Designed for use with furnaces with a slot or with induction heating systems.

The units are held on the specimen by light, flexible ceramic fiber cords. These make the extensometer self-supporting on the specimen.

This innovative high temperature extensometer has been developed for testing ceramics, metals and composites at high temperatures produced by induction heating systems and furnaces. A number of features together render these extensometers convenient for use and enables higher performance than other similar high temperature extensometers.

The units are positioned on the specimen by flexible, light ceramic fiber cords. These render the extensometer self-supporting on the specimen. There is no need for any furnace brackets. The side load on the test sample is considerably reduced due to the light weight and self-supporting design of the sensor.



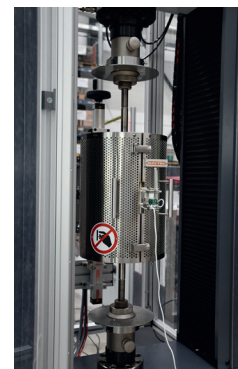
Model 3448 can be fitted with most materials testing furnaces having a side cut-out for an extensometer. In the case of induction heating systems, a distinct ceramic cord placement enables the extensometer to pass easily between the coils.

Convection cooling fins and radiant heat shields enable the use of this model at specimen temperatures 1200 °C (2200 °F) without any cooling. An optional miniature air fan is available that improves stability at the highest temperatures and can be used to obtain very high accuracy and for tests having small elongations.

The fan can be positioned at any location close to the extensometer as it has a magnetic base for support. For induction heated systems, fan cooling is not required. High purity alumina ceramic rods are used that are offered in customized lengths to fit the furnace. With every extensometer, a spare set is included. The customer can specify vee or conical chisel contact points as needed. In both compression and tension, most units operate perfectly.

Hence it is possible to perform compression, tensile and cyclic tests such as low cycle fatigue with one unit. Special models are available for vacuum furnaces. A radiant heat transfer cooled version can also be offered by Epsilon. This necessitates surrounding the extensometer module by a water-cooled enclosure having front slot for ceramic rods.

The side load on the test sample is mostly eliminated because of the self-supporting design and light weight of the sensor. The combination of radiant heat shields and convection cooling fins allow this model to be used at specimen temperatures up to 1200 °C without any cooling. An optional tiny air fan does enhance stability at the highest temperatures and is recommended for the highest accuracy and for tests with small elongations. The fan comes with a magnetic base for support so it can be mounted at any convenient location near the extensometer. Fan cooling is not generally needed for induction heated systems. High purity alumina (min 99.7%) ceramic rods are used. These are available in lengths as required to fit your furnace.



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Specify chisel, vee chisel or conical contact points as desired.

Most units operate equally well in tension and compression. Thus tensile, compression and cyclic tests like low cycle fatigue can all be performed with a single unit.

For testing in strain control or to get the highest performance during cyclic fatigue tests, models 3549, 7650A or 3648 are recommended. For vacuum furnaces, special models are available. Also a radiant heat transfer cooled version is available. This requires that the extensometer module be surrounded by a water cooled enclosure with a front slot for the ceramic rods.

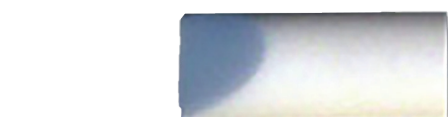
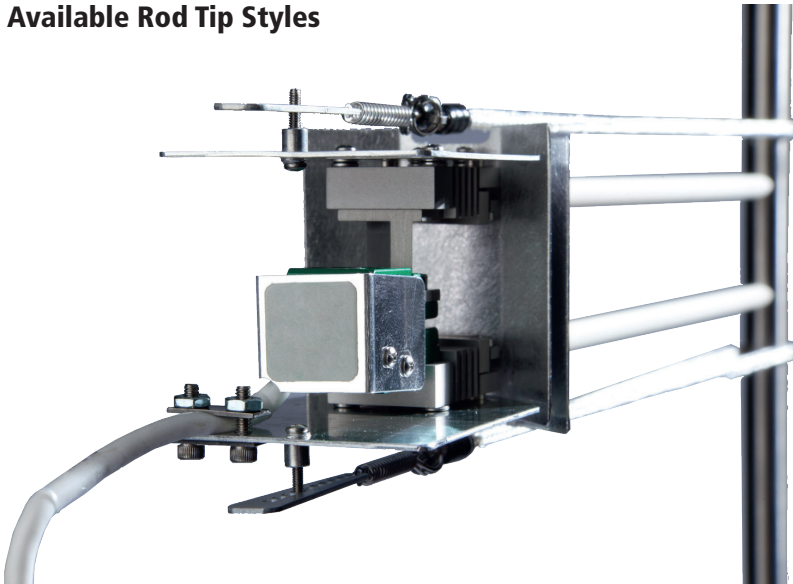
Features

- **May be left on through specimen failure.**
- Most standard units meet the requirements of ISO 9513 class 0.5 and ASTM class B-1 for accuracy. A test certificate is included. ISO 9513 class 0,5 test certificates are available on request. Rod length configurations can impact the final class rating.
- Rugged, dual flexure design facilitates improved strength and performance.
- Mechanical overtravel stops in both directions.
- Mount with flexible ceramic fiber cords. Very simple to install, this exclusive design eliminates the need for external support brackets. Low contact force does not vary during testing like some externally supported extensometers.
- Low contact force does not differ during testing like certain externally supported extensometers.
- All units come with high purity alumina ceramic rods.
- Use without cooling to 1200 °C. Optional small fan improves stability at highest temperatures.
- Use without cooling to 1200 °C (2200 °F). Optional small fan enhances stability at highest temperatures.
- It can be used on nearly any furnace with side entry cut-out for extensometers. Alternate configuration is available for insertion between coils of induction heaters.
- Versions available for use in controlled and vacuum atmospheres. Radiant heat transfer cooled versions are also available for these applications.

Supplied Parts

- One set of extension rods. Rod lengths are made to fit furnace as required or inductive heating system
- Includes high quality foam lined case

Available Rod Tip Styles



STRAIGHT CHISEL
Flat and round specimens



VEE CHISEL
Round specimens



CONICAL TIP
Flat specimens

Important Note

For high temperature tests based on strain rate control (including crosshead separation rate) this extensometer is not suitable. For strain-rate controlled high temperature testing we recommend PMA-12, 3549 or 7650A units.

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

Vee chisel: For round specimens

Conical Chisel: For flat specimens

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Specification:

Excitation: 5 to 10 VDC recommended, 12 VDC or VAC max.
 Output: 2 to 4 mV/V, nominal, depending on model
 Accuracy: Standard configurations meet ASTM E83 class B-1 and ISO 9513 class 0,5 requirements for accuracy. A test certificate is included.
 Rod lengths >250 mm (10") can affect the final class rating.
 Linearity: ≤0.15% of full scale measuring range, depending on model
 Temperature Range: Ambient to 1200 °C max (2200 °F), all versions
 Cable: Integral, ultra-flexible cable, 2.5 m (8 ft) standard
 Contact Force: Adjustable, approximately 200 g depending on configuration
 Operating Force: 10 to 20 g typica

Technical Data

Model 3448 Available Versions: ANY combination of gauge length and measuring range listed below is available, except as noted.
 Ceramic rod lengths are made to fit furnaces as required. Please provide furnace dimensions at the time of order.
 Other configurations may be available with special order; please contact us to discuss your requirements.

Model Number 3441	010M	005
Gage Length		
Travel		

Gage Length:	
-010M	10.0 mm
-025M	25.0 mm
-050M	50.0 mm

Measuring Range	
DESIGNATION	% STRAIN
-005M¹	±5%
-010M	±10%
-020M	+20%/-10%
-050M	+50%/-10%
-100M²	+100%/-10%

¹ For 10 mm and 0.5 inch gauge lengths, the 5% strain range is only available with shortceramic rods.
² Not available in 50 mm or 2.0 inch gauge lengths.

Options:

- Air cooling fan, add suffix -AC
- Ceramic cord orientation for furnaces or induction heaters (specify)
- Specify rod tip style desired; available choice are straight chisel, vee chisel, or conical tip
- Connectors to interface to nearly any brand of test equipment

