

Gauge Length and Calibration

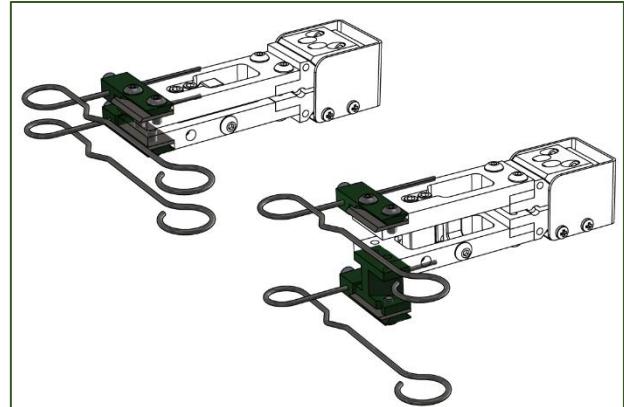
Ensuring accurate measurement results when reconfiguring an instrument

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Strain vs Elongation

The most significant effect to consider when changing an extensometer's gauge length using an adapter or spacer kit is the large proportional change in indicated *strain* for a given *elongation*. Changing the gauge length will have only a very small effect on the electrical output for a given *elongation*.

$$\varepsilon = \frac{\Delta L}{L_0}$$



Does my extensometer measure strain or elongation?

Whether your measurement is configured in units of strain or elongation is a user preference and is configured within the test frame's software settings. Most systems will accommodate either measurement. Depending on the application, it may be more convenient to work with one dimensional group or the other.



If you regularly change the gauge length of your extensometer, it may be more convenient to calibrate in elongation terms.

Recommendations for deflectometers, CODs, and variable gauge length devices

Some instruments do not have a meaningful gauge length (deflectometers), have a "gauge length" but do not measure strain (CODs), have variable gauge length (rebar and bolt extensometers), or have a gauge length defined by the specimen (transverse extensometers). In these applications, it is recommended to use units of *elongation* rather than *strain*.

Calibration and verification

Changing the gauge length will have only a very small effect on the electrical output for a given elongation, but standards ASTM E83 and ISO 9513 recommend reverifying the instrument after making such a change.

The original test certificate provided with your instrument may include shunt calibration information. If so, it will be set at the gauge length indicated on the test certificate and may not be optimal for use in recalibration at another gauge length. Manual calibration using a mechanical calibrator may be preferred. See [Epsilon Tech Note – Shunt Calibration & Gain Optimization](#) for details on optimizing calibration gain.



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