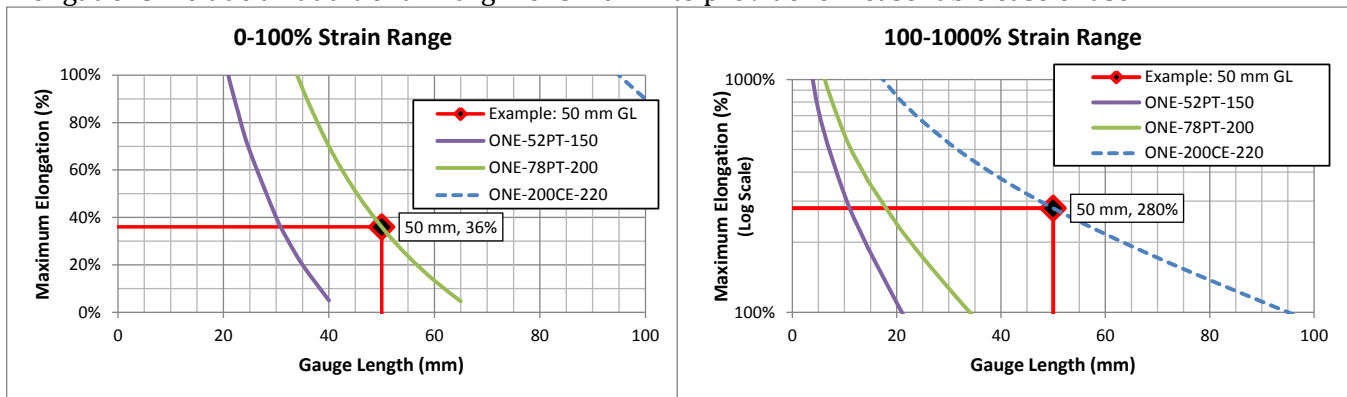


Epsilon ONE – Optics Package Selection

Author: Wesley Womack, PE, PhD

Selecting a suitable Field of View

Listed elongation ranges for Epsilon ONE Optics Packages (see next page) are estimates for *typical* applications with standard ASTM E8 specimens, *assuming elongation occurs within the gauge length*. Elongations include an additional margin of 5-10mm to provide for reasonable ease of use.



Example: For a 50mm Gauge Length, **ONE-78PT-200** and **ONE-200CE-220** will accommodate up to 36%(18mm) and 280%(140mm) elongation, respectively. **ONE-52PT-150** does not leave enough margin for a 50mm Gauge Length.

If significant elongation of the specimen may occur outside the marked gauge section, the marks could leave the Field of View at a smaller elongation. A minimum Field of View sufficient for any specific application can be calculated from a quick test using your specimen:

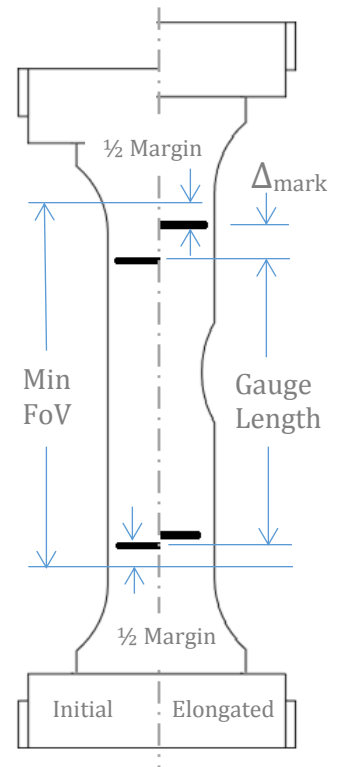
$$\text{Minimum FoV} = \text{Gauge Length} + \text{Maximum Displacement of Marks} + \text{Margin}$$

A tape measure may be used to determine the displacement of marked lines made on the specimen during a test. Alternatively, use the displacement of the crosshead. This method is more conservative. A margin of at least 5mm is *required* and 10mm is recommended; greater margin will provide the best ease of use.

Precision Telecentric vs Conventional Optics



An important factor in selection of any optical extensometer is the choice of either Precision Telecentric (ONE-PT-xx) or Conventional Entocentric (ONE-CE-xx) Optics systems. Be sure to consider and understand the *Out-of-plane Sensitivity* specification when purchasing any optical extensometer, by any manufacturer. For more information, see [Epsilon Tech Note – Precision Telecentric Optics](#).

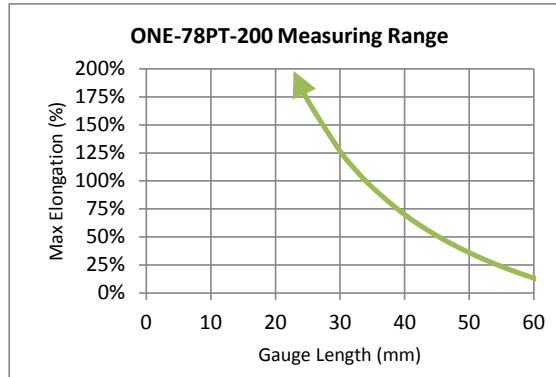


Precision Telecentric Lens Systems

Model Number:

ONE-78PT-System

Premium performance.
Precision telecentric lens.
78 mm Field of View and
200 mm Working Distance

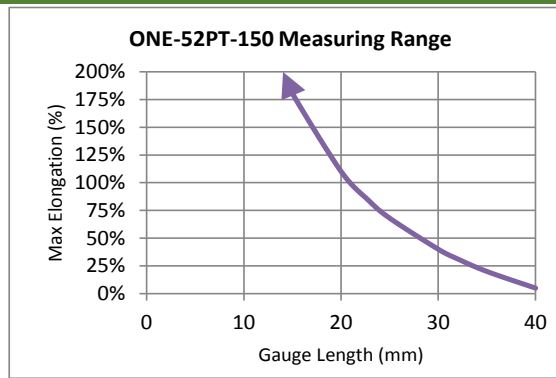


Gauge Length	Max Strain	Max Elongation
2 mm	>1000%	66 mm
5 mm	>1000%	63 mm
10 mm	580%	58 mm
12 mm	470%	56 mm
20 mm	240%	48 mm
25 mm	170%	43 mm
50 mm	35%	18 mm
65 mm	5%	3 mm

Model Number:

ONE-52PT-System

Precision telecentric lens.
52 mm Field of View and
150 mm Working Distance.



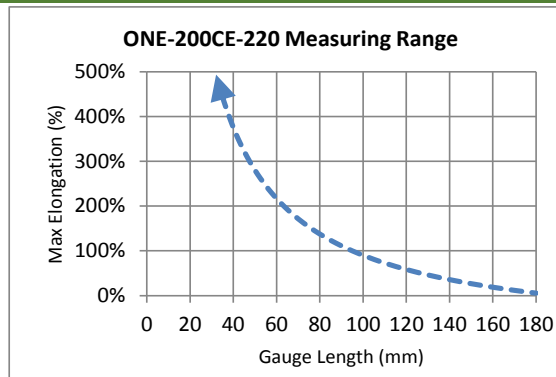
Gauge Length	Max Strain	Max Elongation
2 mm	>1000%	40 mm
5 mm	740%	37 mm
10 mm	320%	32 mm
12 mm	250%	30 mm
20 mm	110%	22 mm
25 mm	65%	17 mm
30 mm	40%	12 mm
40 mm	5%	2 mm

Conventional Entocentric Lens Systems

Model Number:

ONE-200CE-System

Conventional entocentric lens.
200 mm Field of View and
220 mm Working Distance.



Gauge Length	Max Strain	Max Elongation
2 mm	>1000%	188 mm
12 mm	>1000%	178 mm
25 mm	660%	165 mm
50 mm	280%	140 mm
75 mm	150%	115 mm
100 mm	90%	90 mm
150 mm	25%	40 mm
181 mm	5%	9 mm

Epsilon ONE will work with any gauge length that is within the stated range for the Optics Package. Indicated maximum tensile strain values are approximate and include a margin of 5-10mm to provide for reasonable ease of use. See page 1 for details. $\geq 4x$ the specimen width or diameter is recommended for most applications.



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