

Measurement of Camber

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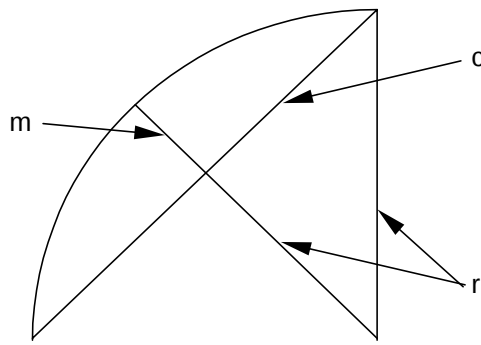
Measurement of Camber

The measurement of camber is easily misunderstood. Mathematically, camber is the measurement of the midpoint (m) of an arc across a specific chord length (c). On a given sample, the radius (r) is constant, so if the chord length changes, the midpoint (or camber) will also change. See the formulas and depiction below

$$r = (m^2 + c^2/4)/2m$$

$$m = r - \sqrt{r^2 - c^2/4}$$

$$c = 2\sqrt{2mr - m^2}$$



There is not a linear relationship when comparing camber measurements of different length samples. For example, if camber is measured as 1mm in 250mm, the same piece of tape that is 750mm long would not measure a camber of 3mm, but rather 9mm (the square of the multiplier).

Equivalent Midpoints (or camber) for various chord lengths are shown below. These equivalents are all based on the EIA 481 camber maximum of 1mm per 250mm

Input	Measured	Midpoint	Chord
	Equivalent	1	250
Outputs		Equivalent	Based on
		Midpoint	Chord Length
	Radius	0.16	100
	7813	1.00	250
		16.0	1000
		23.8	1219
		6.0	610

EIA 481 Requirement

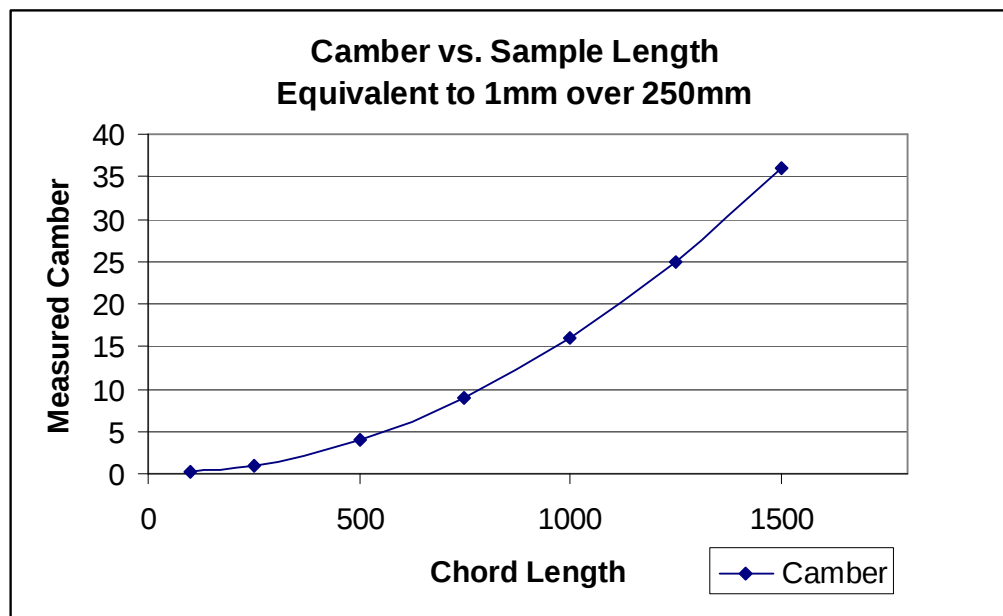
1 meter sample

Equivalent Measurement on 4' Advantek Gauge

2' Sample

All dimensions in mm

By plotting the amount of camber for various chord lengths, we can see the exponential (non-linear) growth exhibited, as a sample gets longer.



The following is a pictorial representation of the camber measurement of an arc with different chord lengths. The radius of the arc is constant, but as the chord length grows, the measured camber grows at a faster rate. Doubling the chord length increases the camber measurement by 4 times (2 squared)

