Supplemental Material to:

Effect of the length of the superficial plate on bending stiffness, bending strength and strain distribution in stacked 2.0–2.7 veterinary cuttable plate constructs

An *in vitro* study

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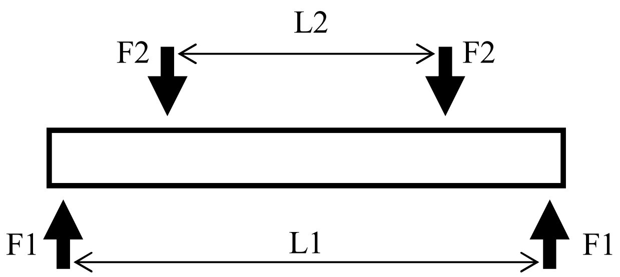
Appendix I:



F the measured load from the load cell, L1 the distance between the external rollers and L2 the distance between the internal rollers. The force applied on each external roller (F1) and each internal roller (F2) is half the force F applied to the jig by the load cell (F1=F2=F/2). The equation at equilibrium is:

Sum of moments at centre of sample = 0 = M - F1 * (L1 /2) + F2 * (L2 /2)

remembering F1 = F2 = F/2

M = F/2*(L1)/2-F/2* (L2)/2

M = F*(L1-L2)/4

In our example, M = F*0.063/4

Appendix 2:

During four-point bending:

Stress on the surface of an homogenous rod (σ) can be calculated from the bending moment (M), the distance from the neutral axis (y) and the moment of inertia (I) according to the formula:

$$\sigma = M*y/I$$

y = radius of the rod*cos 31.6 degrees,

For a rod:

$$I = \pi * radius^4.$$

The strain = Stress(σ)/Stiffness

The stiffness of the acetal rod was provided by the site www.matweb.com consulted on September 29th, 2010 and was $2.76*10^3$ MPa.

In our experiment:

$$I = \pi * 0.0065^4 = 2.803*10^{-9}m^4$$

$$\sigma = M*1.975*10^6 Mm^{-2}$$

$$\text{Strain at the strain gauge location} = M*0.716*10^{-3} = 2.480*10^3 \mu strains$$