The data point recorded during the experiment showed a strain decrease of 0.001506. Using this value and the can’s dimensions, it was possible to calculate the initial internal pressure using the equation:

*P = (4tEεh) / D(2 - v)*

Where *P* is the can’s internal pressure, *t* is the thickness of the can’s walls, *E* is young’s modulus for aluminum, εh is the recorded strain, *D* is the internal diameter of the can, and *v* is poisson’s ratio for aluminum. The pressure was found to be slightly less than 576 kPa, consistent with a can of soda that has been shaken.

The axial stress was found using the equation for a thin-walled pressure vessel:

*σa = Pr / 2t*

Where r is the internal radius of the can. Axial stress was found to be 62.37 MPa.

*σa*

*σh*

To construct Mohr’s Circle, the x and y stresses must be found. Axial stress is parallel to the centerline axis of the can, and is thus σy. Hoop stress is thus σx.

*σh = Pr / t*

Hoop stress was found to be 125.3 MPa. Average stress was calculated using the equation:

*σavg = (σx + σy) / 2*

And was found to be 93.85 MPa.

As the soda can can be approximated as a simple thin-walled pressure vessel, only the axial and hoop stresses are required to contain the pressure, and are also the principal stresses. Thus, Mohr’s Circle is:

*σa*

*σh*

τmax

σavg

τxy +

*σ +*

0

With τmax found to be 15.73 MPa. The theoretical maximum shear stress was found using the equation:

*τmax = | σ1 σ3 | / 2 = Pr / 2t*

And was found to be 62.37 MPa.