$$= \left(\frac{6.5}{2}\right)\left[\left(1 - \frac{0.0115^2}{0.0344^2}\right) + \left(1 - \frac{0.0115^2}{0.0344^2}\right)\left(1 - \frac{3 * 0.0115^2}{0.0344^2}\right)\cos(2 * 90°)\right]$$

$$= 0.963\ MPa$$

$$\sigma_{\theta\theta} = \left(\frac{\sigma_n}{2}\right)\left[\left(1 + \frac{a^2}{r^2}\right) - \left(1 + \frac{3a^4}{r^4}\right)\cos 2\theta\right]$$

$$= \left(\frac{6.5}{2}\right)\left[\left(1 + \frac{0.0115^2}{0.0344^2}\right) - \left(1 + \frac{3 * 0.0115^4}{0.0344^4}\right)\cos(2 * 90°)\right]$$

$$= 6.981\ MPa$$

This is the calculation for the normalized difference of the hoop and radial stresses.

$$Y = \frac{\sigma_{\theta\theta} - \sigma_{rr}}{\sigma_n}$$

$$= \frac{6.981 - 0.963}{6.5} = 0.926$$

This is the theory calculation for the normalized radial distance.

$$X = \frac{r}{a}$$

$$= \frac{0.0344}{0.0115} = 3$$

This is the stress concentration calculation.

$$S_c = \frac{\sigma_{max}}{\sigma_n} = \frac{1}{\sigma_n}\frac{N_{max} f_\sigma}{h}$$

$$= \frac{1}{6.5}\left(\frac{14 * 6900}{0.0059}\right) * 10^{-6}$$

$$= 2.5189 = 2.5$$

This is the uncertainty calculation for stress concentration.

$$W_{S_c} = \sqrt{\left(\frac{f_\sigma}{h\sigma_n} W_{N_{max}}\right)^2 + \left(\frac{N_{max}}{h\sigma_n} W_{f_\sigma}\right)^2 + \left(-\frac{N_{max} f_\sigma}{h^2\sigma_n} W_h\right)^2 + \left(-\frac{N_{max} f_\sigma}{h{\sigma_n}^2} W_{\sigma_n}\right)^2} * 10^{-6}$$