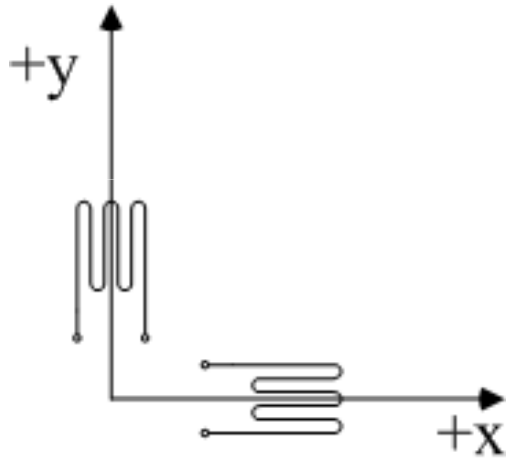
Correcting for Transverse Sensitivity Effects

Biaxial (Tee) Rosettes



- Denote measured strains as ε_{mx} and ε_{my}
- Strains corrected for transverse sensitivity effects are:

$$\varepsilon_x = \frac{(1-\nu_o K_t)}{(1-K_t^2)}\left[\varepsilon_{mx} - K_t \varepsilon_{my}\right]$$

$$\varepsilon_y = \frac{(1-\nu_o K_t)}{(1-K_t^2)}\left[\varepsilon_{my} - K_t \varepsilon_{mx}\right]$$

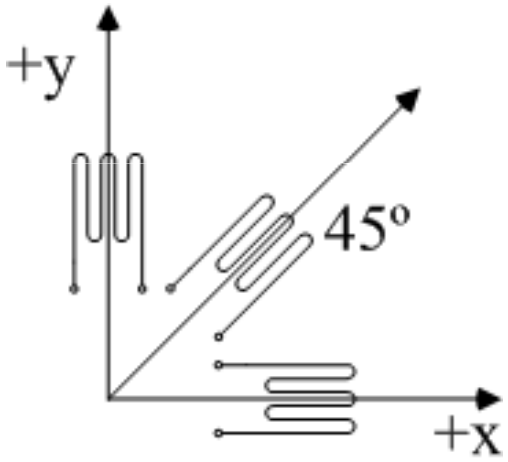
where:

K_t = transverse sensitivity coefficient

ν_o = Poisson ratio of the calibration material used by gage manufacturer (usually $\nu_o = 0.285$)

Correcting for Transverse Sensitivity Effects

3-Element Rectangular Rosettes



- Denote measured strains as ε_{mx}, ε_{m45}, and ε_{my}
- Strains corrected for transverse sensitivity effects are:

$$\varepsilon_x = \frac{(1-\nu_o K_t)}{(1-K_t^2)}\left[\varepsilon_{mx} - K_t \varepsilon_{my}\right]$$

$$\varepsilon_{45} = \frac{(1-\nu_o K_t)}{(1-K_t^2)}\left[\varepsilon_{m45} - K_t(\varepsilon_{mx} + \varepsilon_{my} - \varepsilon_{m45})\right]$$

$$\varepsilon_y = \frac{(1-\nu_o K_t)}{(1-K_t^2)}\left[\varepsilon_{my} - K_t \varepsilon_{mx}\right]$$

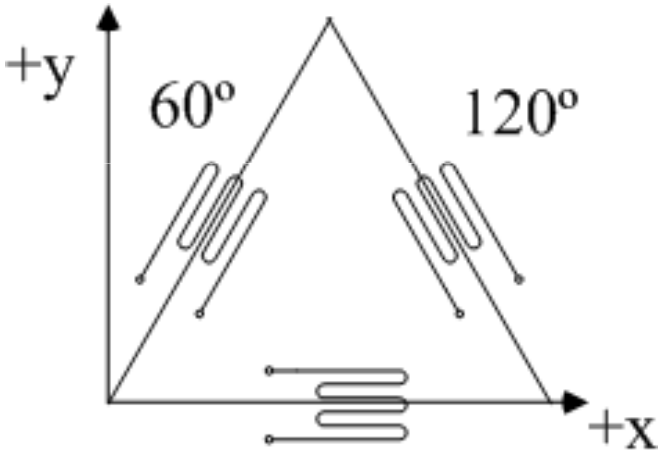
where:

K_t = transverse sensitivity coefficient

ν_o = Poisson ratio of the calibration material used by gage manufacturer (usually $\nu_o = 0.285$)

Correcting for Transverse Sensitivity Effects

3-Element Delta Rosettes



- Denote measured strains as ε_{mx}, ε_{m60}, and ε_{m120}
- Strains corrected for transverse sensitivity effects are:

$$\varepsilon_x = \frac{(1-\nu_o K_t)}{(1-K_t^2)}\left[\left(1+\frac{K_t}{3}\right)\varepsilon_{mx} - \frac{2K_t}{3}\left(\varepsilon_{m60}+\varepsilon_{m120}\right)\right]$$

$$\varepsilon_{60} = \frac{(1-\nu_o K_t)}{(1-K_t^2)}\left[\left(1+\frac{K_t}{3}\right)\varepsilon_{m60} - \frac{2K_t}{3}\left(\varepsilon_{mx}+\varepsilon_{m120}\right)\right]$$

$$\varepsilon_{120} = \frac{(1-\nu_o K_t)}{(1-K_t^2)}\left[\left(1+\frac{K_t}{3}\right)\varepsilon_{m120} - \frac{2K_t}{3}\left(\varepsilon_{mx}+\varepsilon_{m60}\right)\right]$$

where:

K_t = transverse sensitivity coefficient

ν_o = Poisson ratio of the calibration material used by gage manufacturer (usually $\nu_o = 0.285$)