



Most preferable Goodman

1. Machine component is subjected to fluctuating stress which have fluctuating between 300 MN/m^2 and -150 MN/m^2 . Determine the value of maximum ultimate strength according to Gerber relationship, Goodman relationship, Soderberg relationship.

Take $\sigma_y = 0.55$ ultimate strength. $\sigma_1 = 0.5 \sigma_u$

FOS = 2.

Given :-

$$\sigma_{\max} = 300 \text{ MN/m}^2$$

$$\sigma_{\min} = -150 \text{ MN/m}^2$$

$$\sigma_y = 0.55 \sigma_u$$

$$\sigma_1 = 0.5 \sigma_u$$

$$n = 2$$

Solu :-

$$\sigma_m = \frac{\sigma_{\max} + \sigma_{\min}}{2}$$

$$= \frac{300 - 150}{2} = 75 \text{ MN/m}^2$$

$$\sigma_a = \frac{\sigma_{\max} - \sigma_{\min}}{2} = \frac{300 + 150}{2}$$

$$= 225 \text{ MN/m}^2$$