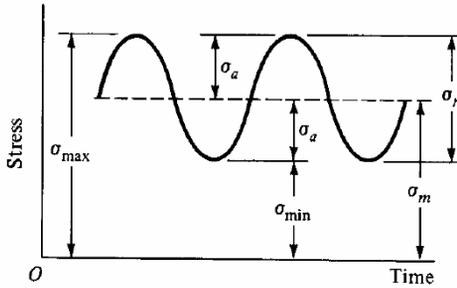


Definitions



Stress Range

$$\sigma_r = \sigma_{\max} - \sigma_{\min}$$

Alternating Stress

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

Mean Stress

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

Stress Ratio

$$R = \frac{\sigma_{\min}}{\sigma_{\max}}$$

Amplitude Ratio

$$A = \frac{\sigma_a}{\sigma_m}$$

Note that $R=-1$ for a completely reversed stress state with zero mean stress.

Endurance Limit Multiplying Factors (Marin Factors)

$$S_e = k_a \cdot k_b \cdot k_c \cdot k_d \cdot k_e \cdot k_f \cdot S'_e$$

$S_e \equiv$ Endurance limit of part

$S'_e \equiv$ Endurance limit of test specimen

$k_a \equiv$ Surface factor

$k_b \equiv$ Size factor

$k_c \equiv$ Load factor

$k_d \equiv$ Temperature factor

$k_e \equiv$ Reliability factor

$k_f =$ Miscellaneous effects factor

There are several factors that are known to result in differences between the endurance limits in test specimens and those found in machine elements.

See section 7-9 in Shigley
For a discussion on each factor