

# Cast IRON Gear

$$\tau = 1.4636(.75^4) = 1.097740949 \text{ lb. in}$$

$$W_t = \frac{2\tau}{D_p} = \frac{2(1.097)}{1.5''} = 1.463654599 \text{ lb}$$

$$V = 60 \text{ rpm} \cdot \pi(1.5) \cdot \frac{1}{12} = 23.5619449 \text{ FPM}$$

$$\sigma = \frac{W_t D_p}{F_y} \left( \frac{12000 + V}{12000} \right)$$

$$\# \text{ Teeth} = 18$$

$$\text{Lewis Factor} = .270$$

$$\sigma = \frac{(1.4636)(1.5'')(12000 + 23.5619449)}{(.5)(.270)(12000)}$$

$$\sigma_{\text{bending}} = 16.29476087 \text{ Psi}$$

Modulus of Elasticity for Cast Iron = 9000 Ksi