

# Inputs

## Geometry

$$N_P := 14$$

$$N_G := 135$$

Number of gear teeth

$$P_{nd} := 14 \cdot \frac{1}{in}$$

Normal diametral pitch

$$\phi := 25 \cdot \text{deg}$$

Standard pressure angle

$$C_\psi := 1$$

Helical overlap factor (1 for spur gears)

$$m_N := 1$$

Load sharing ratio (1 for spur gears)

## AGMA 908-B89

$$C := \frac{N_G + N_P}{P_{nd}} \cdot \frac{1}{2}$$

$$C = 5.3214in$$

Standard center distance

$$m_G := \frac{N_G}{N_P}$$

Gear ratio

$$R_P := \frac{N_P}{2 \cdot P_{nd}}$$

Pinion pitch radius

$$R_{b1} := R_P \cdot \cos(\phi)$$

$$R_{b2} := R_{b1} \cdot m_G$$

Base circle radius for pinion and gear

$$\phi_r := \arccos\left(\frac{R_{b2} + R_{b1}}{C}\right)$$

$$\phi_r = 25 \cdot \text{deg}$$

Operating pressure angle

$$d := \frac{2 \cdot C}{m_G + 1}$$

$$d = 1in$$

Operating pitch diameter of pinion

$$R_{o1} := \frac{N_P + 2}{2 \cdot P_{nd}}$$

$$R_{o2} := \frac{N_G + 2}{2 \cdot P_{nd}}$$

Pinion, gear addendum radii  
("stanard", or actual outside radius?)

$$\rho_1 := \left| \begin{array}{l} p_b \leftarrow \frac{2 \cdot \pi \cdot R_{b1}}{N_P} \\ C_5 \leftarrow \sqrt{R_{o1}^2 - R_{b1}^2} \\ C_2 \leftarrow C_5 - p_b \\ C_2 \end{array} \right|$$

$$\rho_1 = 0.145in$$

$$\rho_2 := \left| \begin{array}{l} C_6 \leftarrow C \cdot \sin(\phi_r) \\ C_6 - \rho_1 \end{array} \right|$$

$$\rho_2 = 2.104in$$

$$I := \frac{\cos(\phi_r) \cdot C_\psi^2}{\left(\frac{1}{\rho_1} + \frac{1}{\rho_2}\right) \cdot d \cdot m_N}$$

$$I = 0.1227$$

$$I = 0.123$$

Pitting resistance geometry factor for external gear