

Spur Gear Geometry

Mechanical Engineering

Module, pitch diameter, centre distance and the meshing condition.

Module sets tooth size, and two gears mesh only if they share a module and a pressure angle.

$$m = d \div z \cdot \text{centres} = m(z_1 + z_2) \div 2$$

$$m = 2 \text{ mm}, z = 40$$

$d = m \text{ times } z.$

Pitch diameter 80 mm

$$z_1 = 20, z_2 = 60, m = 2$$

$\text{Half the sum of } d.$

Centres at 80 mm

Same pair

$\text{Torque up, speed down.}$

Ratio 3 to 1

THE COMMON MISTAKE

× **Mixing module with diametral pitch**

✓ **They are reciprocals in different units**

Module is millimetres per tooth; diametral pitch is teeth per inch, and $m = 25.4 \div \text{DP}$. Gears from the two systems will not mesh.

A 20 degree pressure angle is the usual standard. Below about seventeen teeth, standard involute teeth undercut.