

Spur Gear Formulation Calculations



DIAMETRAL PITCH (IMPERIAL)

Diametral pitch is the number of teeth to each inch of the pitch diameter.

Note: The formulae below relate to standard outside diameters and pitch diameters.

Trying to find...	When you have...	Formula
Diametral Pitch	Circular Pitch	$DP = \frac{3.1416}{CP}$
Diametral Pitch	Pitch Diameter and the Number of Teeth	$DP = \frac{N}{PD}$
Diametral Pitch	Outside Diameter and Number of Teeth	$DP = \frac{N+2}{OD}$
Diametral Pitch	Module	$DP = \frac{25.4}{MOD}$
Pitch Diameter	Number of Teeth and the Diametral Pitch	$PD = \frac{N}{DP}$
Pitch Diameter	Number of Teeth and the Outside Diameter	$PD = \frac{(OD)(N)}{N+2}$
Pitch Diameter	Outside Diameter and the Diametral Pitch	$PD = OD - \frac{2}{DP}$

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DIAMETRICAL PITCH (IMPERIAL)

Diametral pitch is the number of teeth to each inch of the pitch diameter.

Note: The formulae below relate to standard outside diameters and pitch diameters.

Trying to find...	When you have...	Formula
Outside Diameter	Number of Teeth and the Diametral Pitch	$OD = \frac{N+2}{DP}$
Outside Diameter	Pitch Diameter and the Diametral Pitch	$OD = PD + \frac{2}{DP}$
Outside Diameter	Pitch Diameter and the Number of Teeth	$OD = \frac{N+2}{(N \div PD)}$
Number of Teeth	Pitch Diameter and the Diametral Pitch	$N = (PD) \times (DP)$
Number of Teeth	Outside Diameter and the Diametral Pitch	$N = (OD) \times (DP) - 2$
Module	Diametral Pitch	$MOD = \frac{25.4}{DP}$

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Module (Metric)

Module represents the amount of Pitch Diameter (mm) per tooth.

Note: The formulae below relate to standard outside diameters and pitch diameters.

Trying to find...	When you have...	Formula
Module	Pitch Diameter and the Number of Teeth	$MOD = \frac{PD}{N}$
Module	Circular Pitch	$MOD = \frac{CP}{3.1416}$
Module	Diametral Pitch	$MOD = \frac{25.4}{DP}$
Module	Outside Diameter and the Number of Teeth	$MOD = \frac{OD}{N+2}$
Pitch Diameter	Module and the Number of Teeth	$PD = (MOD) \times (N)$

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Module (Metric)

Module represents the amount of Pitch Diameter (mm) per tooth.

Note: The formulae below relate to standard outside diameters and pitch diameters.

Trying to find...	When you have...	Formula
Pitch Diameter	Number of Teeth and the Outside Diameter	$PD = \frac{OD \times N}{N + 2}$
Pitch Diameter	Outside Diameter and the Module	$MOD = \frac{CP}{3.1416}$
Module	Diametral Pitch	$PD = OD - 2(MOD)$
Outside Diameter	Module and the Number of Teeth	$OD = (N + 2) \times (MOD)$
Diametral Pitch	Module	$DP = \frac{25.4}{MOD}$