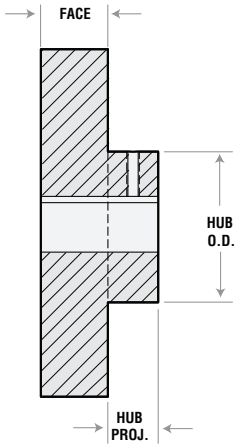
Martin

Pocket Guide

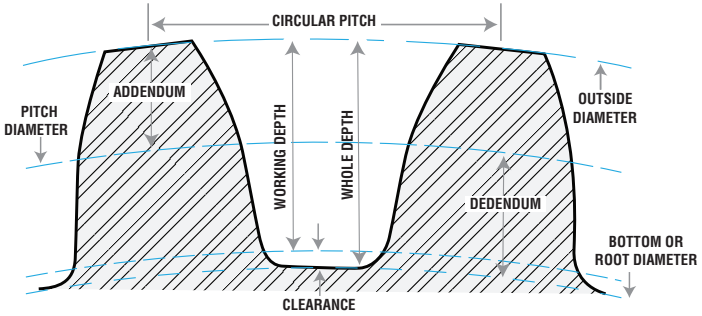
Gears

Information Needed to Quote Gears



1. **Pitch** (3DP, 4DP, 2CP, etc.)
2. **Number of teeth**
3. **Pressure angle** (14½°, 20°, etc.)
4. **Face width**
5. **Material** (1144, 1040, 4140, etc.)
6. **Hardened teeth?**
7. **Style of Gear** (A, B, C)
8. **Hub thru diameter**
9. **Length through bore or hub projection**
10. **Bore**
11. **Keyway size**
12. **Number and size of set screw(s)**
13. **Special features**

Common Formulas



$$OD = \frac{N + 2}{DP} \qquad DP = \frac{N}{PD}$$

$$CP = \frac{3.1416}{DP}$$

$$CD = \frac{PD\ (Dr) + PD\ (Dn)}{2}$$

$$\text{Module Pitch} = \frac{25.4}{DP}$$

$$\text{Ratio} = \frac{N\ \text{Large}}{N\ \text{Small}}$$

$$\text{Worm Ratio} = \frac{N\ \text{in Worm Gear}}{\#\ \text{Leads}}$$

CP	Circular Pitch
N	Number of Teeth
DP	Diametral Pitch
PD	Pitch Diameter
OD	Outside Diameter
CD	Center Distance
Dr	Driver
Dn	Driven

SIZING EXAMPLE:
Gear with 46 teeth has an OD of 6"

$$DP = \frac{46 + 2}{6} \qquad DP = 8$$

Sample Identification Hints

- Use Martin gear gauges to determine pitch and pressure angle.
- Available for diametral, circular and modular pitches.
- **Spur** gear teeth are cut straight across the face of the gear and run together or on rack.
- **Worm** gears have teeth cut at an angle to the axis.
- Threads of a right hand worm or worm gear lean to the right when placed on a flat surface, and lean to the left for left hand.
- The tooth portion of bevel and miter gears is in the shape of a
- section of a cone.
- **Bevel** gear pairs have a different number of teeth on each mating gear, while miter gears have the same number (1:1 ratio).
- Find Martin's online gear part number interchange at **https://martinsg.info/gear-interchange** or scan QR code.
- Contact Martin for help with those hard to identify samples!

Gear Troubleshooting

- Excessive gear wear can be caused by improper lubrication, environmental contaminants or the application H.P. being too high.
- Always check H.P. and speed to ensure safe operation.
- Gear breakage normally is caused by shock or overload conditions.
- Also check for adequate cover for drive from surrounding environmental materials.
- Excessive drive noise is caused by improper backlash, a misaligned drive, worn gears or too high a drive speed.
- Additional gear strength to correct wear & breakage can be achieved through hardening, changing pressure angle, increasing face width, increasing pitch and changing materials.
- And remember, 14.5° and 20° gears will not run together.

Typical Spur Gear Nomenclature

Pressure Angle
20°

Material
- **S** Steel
- **C** Cast Iron
- **NM** Non-Metallic

T S 3 24 BS 1

Bore Size
Bored with Keyway & Set Screws
# of Teeth
Diametral Pitch (DP)

Spur Gears

S	Steel
TS	Steel, 20°
C	Cast Iron
TC	Cast Iron, 20°
H	Hardened Teeth
NM	Non-Metallic

Examples:

S620	Steel 6DP 20T 14½°PA
TS621	Steel 6DP 21T 20°PA
C675	Cast Iron 6DP 75T 14½°PA
S620H	Steel 6DP 20T Hardened 14½°PA
NM620	Non-Metallic 6DP 20T 14½°PA
S612BS 1	Steel 6DP 12T 1" Bore 14½°PA
TS816BS 7/8	Steel 8DP 16T .875 Bore 20°PA

Worm

W	Steel
WH	Steel With Hub Projection
WG	Steel Hardened Ground Threads
WHG	Steel Hardened Ground Threads with Hub Projection
D / Q	(Suffix) Double or Quadruple Thread

Examples:

W6	Steel 6DP Right Hand
WH6	Steel w/Hub Projection 6DP Right Hand
WG6	Steel Case Hardened Ground Threads 6DP Right Hand
WHG6	Steel w/Hub Projection Hardened Ground Threads 6DP Right Hand
W6D	Steel 6DP Double Thread Right Hand

Miter Gears

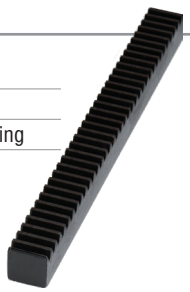
M	Miter Gear, Steel
A / B	Larger Bore (Suffix)
HM	Miter, Hardened Teeth
K	KW & SS

Notes:
ALWAYS 1: 1 RATIO.
Same number of teeth on each mating Gear.

Examples:

M824	Steel 8DP 24T
M824A	Steel 8DP 24T Larger Bore
HM1020	Steel Hardened Teeth 10DP 20T
HMK1020	Steel Hardened 10DP 20T with KW & SS

Racks



R	Steel
RA	Steel, Heavy Backing
TR	Steel, 20°, Heavy Backing
R20	Steel, 20°, Wide Face

Examples:

R6X2	14½° STD Backing 6DPX2' Long
RA6X4	14½° Heavy Backing 6DPX4' Long
TR6X6	20° STD Width 6DPX6' Long
R206X6	20° Wide Face 6DPX6' Long

Worm Gear

W	Worm, Cast Iron
WB	Worm, Bronze
D / Q	(Suffix) Double or Quadruple Thread

Worms and Worm Gears come standard as right hand. If left hand is needed, it must be specified.

Examples:

W660	Cast Iron 6DP 60T Right Hand
WB1020	Bronze 10DP 20T Right Hand
W640D	Cast Iron 6DP 40T Double Thread Right Hand

Bevel Gears

B	Bevel Gear, Cast Iron
B	Pinion, Steel
BS	Bevel Gear, Steel
BS	Pinion, Steel

Examples:

B1060-3	Cast Iron 10DP 60T 3:1 Ratio
B1020-3	Steel 10DP 20T 3:1 Ratio
BS1040-2	Steel 10DP 40T 2:1 Ratio
BS1020-2	Steel 10DP 20T 2:1 Ratio

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