GEARS

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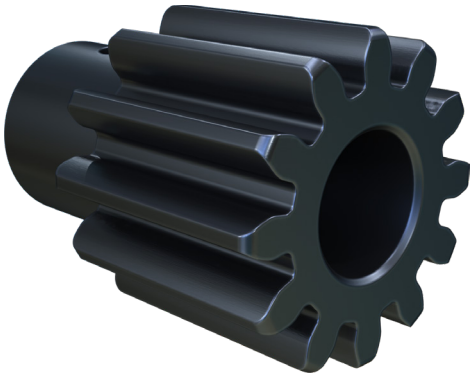
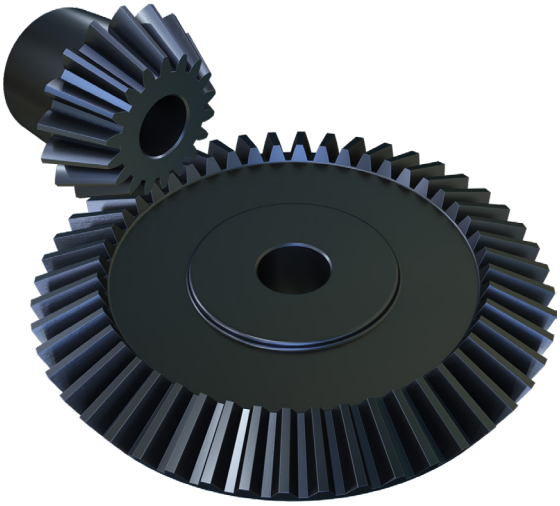
Stock Gears



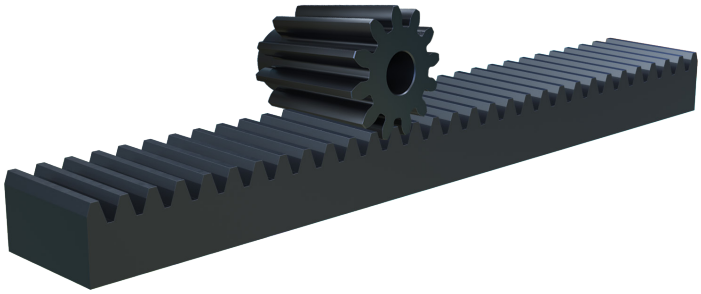
Spur Gears



Bevel Gears

Miter Gears

Worm And Worm Gears

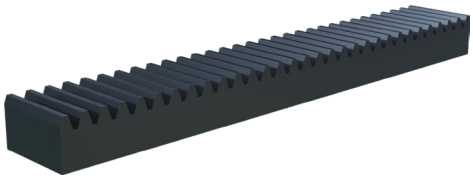


Gear Rack


MARTIN

Stock Gears
Numbering System

Letters (Prefix) Indicate Material and Type Gear.
Letters (Suffix) Indicate Hardened, Number of Threads, Direction of Rotation and KW and SS.
Numbers Indicate Pitch, Number of Teeth, and Ratio (Suffix).



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:

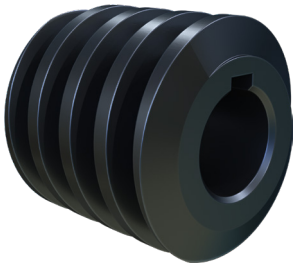
B1060-3	Cast Iron 10DP 60T 3:1 Ratio
B1020-3	Steel 10DP 20T 3:1 Ratio
BS1040-2	Steel 10DP 40T 2:1 Ratio
BS1020-2	Steel 10DP 20T 2:1 Ratio

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

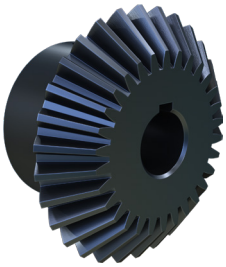


Worm

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

Styles of Spur Gears

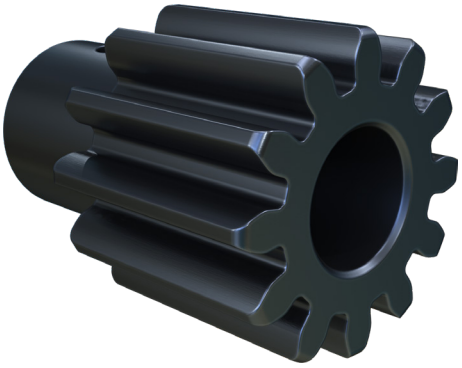
Martin stock spur gears are available in five different styles. Steel gears are furnished in plain style and plain style with hub. Cast gears are furnished, plain with hub, web with lightening holes, and spoke. Cast gears are machined on all operating surFace. Martin cast gears are cast with larger hub to provide extra strength and to allow for larger bores.

Type A

- Plain without hubs
- All steel

Type B_1

- Web
- All steel
- Cast



Type B

- Plain with hubs
- All steel
- Cast

Type B_2

- Web with lighten holes
- All steel
- Cast

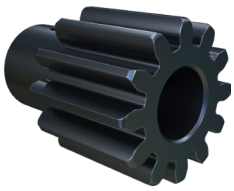
Type B_3

- Spoke style
- Cast

3 DP
3" Face

Steel Stock Spur Gears
14½°Pressure Angle

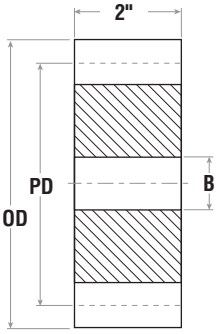
Type A
Plain without hubs



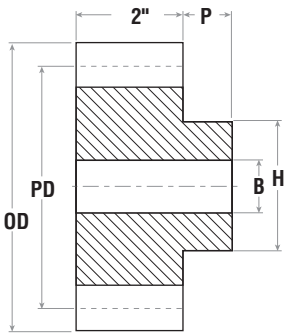
Type B
Plain with hubs

Type B_1
Web

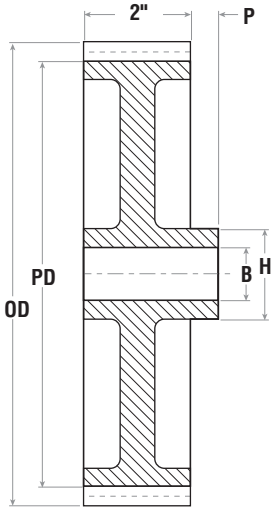
Type B_2
Web with lighten holes



Type A



Type B



Type B_1, B_2

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S311	14 1/2	4.000 • †	4.666	A	1 5/16	2	–	–	12.0
12	S312	14 1/2	4.000 •	4.666	A	1 5/16	2	–	–	11.0
13	S313	14 1/2	4.333	5.000	A	1 5/16	2 1/4	–	–	10.7
14	S314	14 1/2	4.667	5.333	A	1 5/16	2 3/8	–	–	12.8
15	S315	14 1/2	5.000	5.666	A	1 5/16	2 3/4	–	–	14.8
16	S316	14 1/2	5.333	6.000	A	1 5/16	2 13/16	–	–	17.0
18	S318	14 1/2	6.000	6.666	A	1 5/16	3 1/4	–	–	22.0
20	S320	14 1/2	6.667	7.333	A	1 7/16	3 5/8	–	–	27.4
21	S321	14 1/2	7.000	7.666	A	1 7/16	3 7/8	–	–	30.7
24	S324	14 1/2	8.000	8.666	B	1 7/16	3 1/4	5 1/2	1 1/4	48.2
30	S330	14 1/2	10.000	10.666	B	1 9/16	3 7/8	6 1/4	1 1/4	74.5
36	S336	14 1/2	12.000	12.666	B	1 9/16	4 1/8	6 1/2	1 3/4	114.0
42	S342	14 1/2	14.000	14.666	B1	1 9/16	4 1/8	6 1/2	1 3/4	106.0
48	S348	14 1/2	16.000	16.666	B1	1 9/16	4 1/8	6 1/2	1 3/4	120.0
54	S354	14 1/2	18.000	18.666	B2	1 9/16	4 1/8	6 1/2	1 3/4	134.0
60	S360	14 1/2	20.000	20.666	B2	1 9/16	4 1/8	6 1/2	1 3/4	150.0
72	S372	14 1/2	24.000	24.666	B2	1 9/16	4 1/2	7	1 3/4	180.0
84	S384	14 1/2	28.000	28.666	B2	1 9/16	4 1/2	7	1 3/4	215.0
96	S396	14 1/2	32.000	32.666	B2	1 11/16	4 1/2	7	1 3/4	264.0
108	S3108	14 1/2	36.000	36.666	B2	1 15/16	4 1/2	7	1 3/4	305.0
120	S3120	14 1/2	40.000	40.666	B2	1 15/16	5	7 1/2	1 3/4	367.0

* Recommended maximum bore with keyway and setscew.
† Enlarged pitch diameter with special tooth form.
• 4" Face.

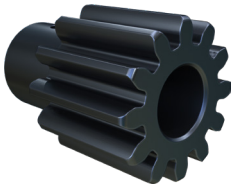
14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

14½°Pressure Angle

3 DP

3" Face



Type B

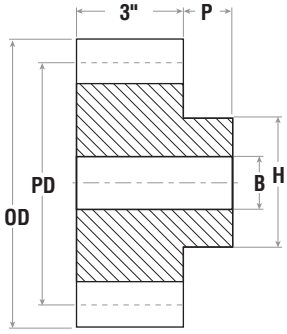
Plain with hubs

Type B_2

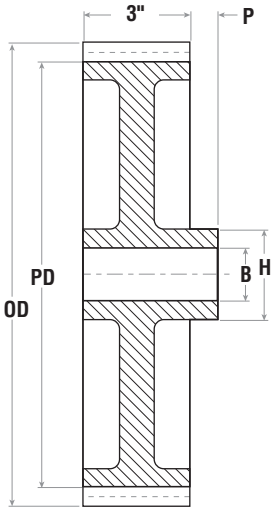
Web with lighten holes

Type B_3

Spoke style



Type B



Type B_2, B_3

Cast — Style B

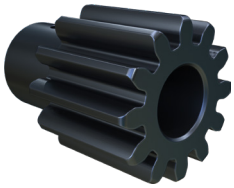
No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
24	C324	14 1/2	8.000	8.666	B	1 7/16	2 11/16	4 1/2	1 1/4	40.4
28	C328	14 1/2	9.333	10.000	B	1 7/16	3 3/16	5 1/4	1 1/4	54.2
30	C330	14 1/2	10.000	10.666	B	1 7/16	3 3/16	5 1/4	1 1/4	57.1
32	C332	14 1/2	10.667	11.333	B	1 7/16	3 3/16	5 1/4	1 1/4	62.4
36	C336	14 1/2	12.000	12.666	B2	1 7/16	3 1/4	5 1/2	1 3/4	71.3
40	C340	14 1/2	13.333	14.000	B2	1 7/16	3 1/4	5 1/2	1 3/4	75.9
42	C342	14 1/2	14.000	14.666	B2	1 7/16	3 1/4	5 1/2	1 3/4	79.5
45	C345	14 1/2	15.000	15.666	B2	1 7/16	3 1/4	5 1/2	1 3/4	85.0
48	C348	14 1/2	16.000	16.666	B3	1 9/16	3 1/4	5 1/2	1 3/4	92.9
54	C354	14 1/2	18.000	18.666	B3	1 9/16	3 1/4	5 1/2	1 3/4	104.0
60	C360	14 1/2	20.000	20.666	B3	1 9/16	3 1/4	5 1/2	1 3/4	115.0
72	C372	14 1/2	24.000	24.666	B3	1 9/16	3 11/16	6	1 3/4	153.0
75	C375	14 1/2	25.000	25.666	B3	1 9/16	3 11/16	6	1 3/4	155.0
84	C384	14 1/2	28.000	28.666	B3	1 11/16	3 11/16	6	1 3/4	178.0
90	C390	14 1/2	30.000	30.666	B3	1 11/16	3 11/16	6	1 3/4	185.0
96	C396	14 1/2	32.000	32.666	B3	1 11/16	3 11/16	6	1 3/4	205.0
105	C3105	14 1/2	35.000	35.666	B3	1 11/16	3 11/16	6	1 3/4	216.0
108	C3108	14 1/2	36.000	36.666	B3	1 15/16	3 11/16	6	1 3/4	228.0
120	C3120	14 1/2	40.000	40.666	B3	1 15/16	4 1/8	6 1/2	1 3/4	226.0

* Recommended maximum bore with keyway and setscew.

14½° P.A. gears will not operate with 20° P.A.

4 DP
2" Face

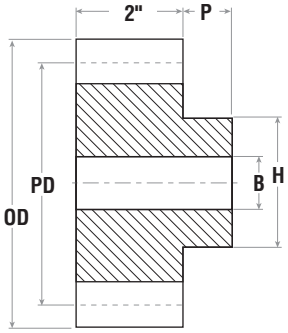
Steel Stock Spur Gears
14½°Pressure Angle



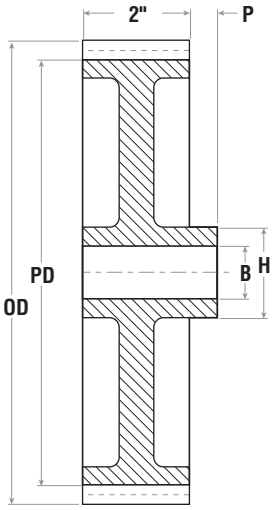
Type B
Plain with hubs

Type B_1
Web

Type B_2
Web with lighten holes



Type B



Type B_1, B_2

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S411	14 1/2	3.000 †	3.500	B	1 1/8	1 5/16	2 1/4	7/8	4.0
12	S412	14 1/2	3.000	3.500	B	1 1/8	1 5/16	2 1/4	7/8	3.9
13	S413	14 1/2	3.250	3.750	B	1 1/8	1 5/16	2 1/4	7/8	4.6
14	S414	14 1/2	3.500	4.000	B	1 1/8	1 5/8	2 3/4	7/8	5.7
15	S415	14 1/2	3.750	4.250	B	1 1/8	1 3/4	3	7/8	6.8
16	S416	14 1/2	4.000	4.500	B	1 1/8	1 3/4	3 1/4	7/8	8.0
17	S417	14 1/2	4.250	4.750	B	1 1/8	2	3 1/2	7/8	9.2
18	S418	14 1/2	4.500	5.000	B	1 1/8	2 1/4	3 3/4	7/8	10.4
19	S419	14 1/2	4.750	5.250	B	1 1/8	2 1/4	4	7/8	10.5
20	S420	14 1/2	5.000	5.500	B	1 1/8	2 3/8	4 1/4	7/8	13.4
21	S421	14 1/2	5.250	5.750	B	1 1/8	2 5/8	4 1/2	7/8	14.9
22	S422	14 1/2	5.500	6.000	B	1 1/8	2 3/4	4 3/4	7/8	16.5
24	S424	14 1/2	6.000	6.500	B	1 1/8	2 3/4	4 3/4	1 1/2	22.8
26	S426	14 1/2	6.500	7.000	B	1 1/8	2 3/4	4 3/4	1 1/2	24.8
28	S428	14 1/2	7.000	7.500	B	1 1/8	2 3/4	4 3/4	1 1/2	27.8
30	S430	14 1/2	7.500	8.000	B	1 1/4	2 3/4	4 3/4	1 1/2	31.0
32	S432	14 1/2	8.000	8.500	B	1 1/4	2 3/4	4 3/4	1 1/2	34.4
36	S436	14 1/2	9.000	9.500	B	1 1/4	2 3/4	4 3/4	1 1/2	41.7
40	S440	14 1/2	10.000	10.500	B	1 1/4	3 1/8	5 1/8	1 1/2	51.8
42	S442	14 1/2	10.500	11.000	B	1 1/4	3 1/8	5 1/8	1 1/2	56.0
44	S444	14 1/2	11.000	11.500	B	1 1/4	3 1/8	5 1/8	1 1/2	60.8
48	S448	14 1/2	12.000	12.500	B	1 1/4	3 1/8	5 1/8	1 1/2	70.8
54	S454	14 1/2	13.500	14.000	B1	1 1/4	3	5	1 1/2	57.4
56	S456	14 1/2	14.000	14.500	B1	1 1/4	3	5	1 1/2	59.9
60	S460	14 1/2	15.000	15.500	B2	1 1/4	3	5	1 1/2	62.8
64	S464	14 1/2	16.000	16.500	B2	1 1/4	3	5	1 1/2	66.2
72	S472	14 1/2	18.000	18.500	B2	1 1/4	3 1/4	5 1/2	1 1/2	82.9
80	S480	14 1/2	20.000	20.500	B2	1 3/8	3 1/4	5 1/2	1 1/2	95.0
84	S484	14 1/2	21.000	21.500	B2	1 3/8	3 1/4	5 1/2	1 1/2	92.0
88	S488	14 1/2	22.000	22.500	B2	1 3/8	3 3/4	6 1/8	1 3/4	95.8
96	S496	14 1/2	24.000	24.500	B2	1 3/8	3 3/4	6 1/8	1 3/4	124.0
120	S4120	14 1/2	30.000	30.500	B2	1 3/8	3 5/8	6	1 3/4	155.0
144	S4144	14 1/2	36.000	36.500	B2	1 3/8	4	6 1/2	1 3/4	208.0

* Recommended maximum bore with keyway and setscew.
† Enlarged pitch diameter with special tooth form.

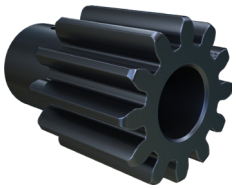
14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

14½°Pressure Angle

4 DP

2" Face



Type B

Plain with hubs

Type B_1

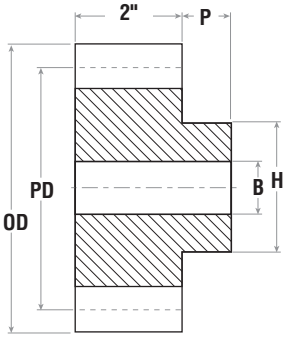
Web

Type B_2

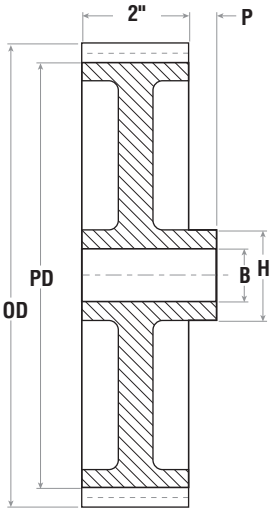
Web with lighten holes

Type B_3

Spoke style



Type B



Type B_1, B_2, B_3

Cast — Style B

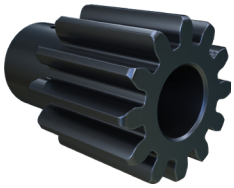
No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
24	C424	14 1/2	6.000	6.500	B	1 1/8	2 1/8	3 1/2	1 1/2	17.0
28	C428	14 1/2	7.000	7.500	B1	1 1/4	2 1/8	3 1/2	1 1/2	20.2
30	C430	14 1/2	7.500	8.000	B1	1 1/4	2 1/8	3 1/2	1 1/2	21.1
32	C432	14 1/2	8.000	8.500	B1	1 1/4	2 1/8	3 1/2	1 1/2	23.2
36	C436	14 1/2	9.000	9.500	B2	1 1/4	2 1/4	3 3/4	1 1/2	30.5
40	C440	14 1/2	10.000	10.500	B2	1 1/4	2 1/2	4	1 1/2	26.4
42	C442	14 1/2	10.500	11.000	B2	1 1/4	2 1/2	4	1 1/2	33.9
44	C444	14 1/2	11.000	11.500	B2	1 1/4	2 1/2	4	1 1/2	32.0
48	C448	14 1/2	12.000	12.500	B3	1 1/4	2 1/2	4	1 1/2	38.4
52	C452	14 1/2	13.000	13.500	B3	1 1/4	2 1/2	4	1 1/2	42.5
54	C454	14 1/2	13.500	14.000	B3	1 1/4	2 1/2	4	1 1/2	44.7
56	C456	14 1/2	14.000	14.500	B3	1 1/4	2 1/2	4	1 1/2	46.7
60	C460	14 1/2	15.000	15.500	B3	1 1/4	2 1/2	4	1 1/2	49.5
64	C464	14 1/2	16.000	16.500	B3	1 1/4	2 1/2	4	1 1/2	54.5
68	C468	14 1/2	17.000	17.500	B3	1 1/4	2 1/2	4	1 1/2	56.0
72	C472	14 1/2	18.000	18.500	B3	1 1/4	2 11/16	4 1/2	1 1/2	63.0
80	C480	14 1/2	20.000	20.500	B3	1 3/8	2 11/16	4 1/2	1 1/2	72.0
84	C484	14 1/2	21.000	21.500	B3	1 3/8	2 11/16	4 1/2	1 1/2	73.0
88	C488	14 1/2	22.000	22.500	B3	1 3/8	2 11/16	4 1/2	1 3/4	75.0
96	C496	14 1/2	24.000	24.500	B3	1 3/8	2 11/16	4 1/2	1 3/4	86.0
100	C4100	14 1/2	25.000	25.500	B3	1 3/8	2 11/16	4 1/2	1 3/4	91.0
104	C4104	14 1/2	26.000	26.500	B3	1 3/8	2 11/16	4 1/2	1 3/4	105.0
112	C4112	14 1/2	28.000	28.500	B3	1 3/8	3 1/8	5	1 3/4	108.0
120	C4120	14 1/2	30.000	30.500	B3	1 3/8	3 1/8	5	1 3/4	115.0
132	C4132	14 1/2	33.000	33.500	B3	1 3/8	3 1/8	5	1 3/4	129.0
144	C4144	14 1/2	36.000	36.500	B3	1 3/8	3 1/4	5 1/2	1 3/4	140.0

* Recommended maximum bore with keyway and setscew.

14½° P.A. gears will not operate with 20° P.A.

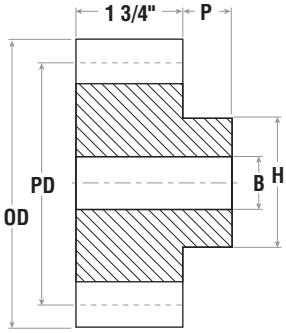
5 DP
1¾" Face

Steel Stock Spur Gears
14½°Pressure Angle

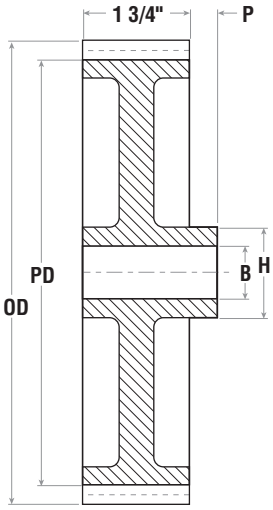


Type B
Plain with hubs

Type B_2
Web with lighten holes



Type B



Type B_2

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S511	14 1/2	2.400 †	2.800	B	1 1/16	1 1/16	1 25/32	7/8	2.0
12	S512	14 1/2	2.400	2.800	B	1 1/16	1 1/16	1 25/32	7/8	2.0
13	S513	14 1/2	2.600	3.000	B	1 1/16	1 1/4	2	7/8	2.6
14	S514	14 1/2	2.800	3.200	B	1 1/16	1 5/16	2 3/16	7/8	3.1
15	S515	14 1/2	3.000	3.400	B	1 1/16	1 7/16	2 3/8	7/8	3.7
16	S516	14 1/2	3.200	3.600	B	1 1/16	1 5/8	2 19/32	7/8	4.5
17	S517	14 1/2	3.400	3.800	B	1 1/16	1 13/16	2 7/8	7/8	5.2
18	S518	14 1/2	3.600	4.000	B	1 1/16	1 7/8	3	7/8	5.9
19	S519	14 1/2	3.800	4.200	B	1 1/16	2 1/8	3 1/4	7/8	6.7
20	S520	14 1/2	4.000	4.400	B	1 1/16	2 1/4	3 3/8	7/8	7.5
21	S521	14 1/2	4.200	4.600	B	1 1/16	2 1/4	3 3/8	7/8	8.1
22	S522	14 1/2	4.400	4.800	B	1 1/16	2 1/4	3 3/8	7/8	8.8
23	S523	14 1/2	4.600	5.000	B	1 1/16	2 1/4	3 3/8	7/8	9.5
24	S524	14 1/2	4.800	5.200	B	1 1/16	2 1/4	3 3/8	1 1/4	11.0
25	S525	14 1/2	5.000	5.400	B	1 1/16	2 1/4	3 3/8	1 1/4	11.8
26	S526	14 1/2	5.200	5.600	B	1 1/16	2 1/4	3 3/8	1 1/4	12.9
28	S528	14 1/2	5.600	6.000	B	1 1/16	2 1/4	3 3/8	1 1/4	14.3
30	S530	14 1/2	6.000	6.400	B	1 1/16	2 1/4	3 3/8	1 1/4	16.0
35	S535	14 1/2	7.000	7.400	B	1 3/16	2 5/8	4 1/4	1 1/4	22.8
40	S540	14 1/2	8.000	8.400	B	1 3/16	2 5/8	4 1/4	1 1/4	28.5
45	S545	14 1/2	9.000	9.400	B	1 3/16	2 11/16	4 5/8	1 1/4	35.0
50	S550	14 1/2	10.000	10.400	B	1 3/16	2 13/16	4 3/4	1 1/4	43.6
55	S555	14 1/2	11.000	11.400	B	1 3/16	2 13/16	4 3/4	1 1/4	52.0
60	S560	14 1/2	12.000	12.400	B	1 3/16	2 13/16	4 3/4	1 1/4	60.9
70	S570	14 1/2	14.000	14.400	B2	1 3/16	3 1/8	5	1 1/4	48.4
80	S580	14 1/2	16.000	16.400	B2	1 3/16	3 1/8	5	1 1/4	57.0
90	S590	14 1/2	18.000	18.400	B2	1 3/16	3 1/8	5	1 1/4	67.0
100	S5100	14 1/2	20.000	20.400	B2	1 5/16	3 1/4	5 1/2	1 1/2	62.0
110	S5110	14 1/2	22.000	22.400	B2	1 5/16	3 1/4	5 1/2	1 1/2	87.6
120	S5120	14 1/2	24.000	24.400	B2	1 5/16	3 1/2	6 1/8	1 1/2	113.0

* Recommended maximum bore with keyway and setscew.
† Enlarged pitch diameter with special tooth form.

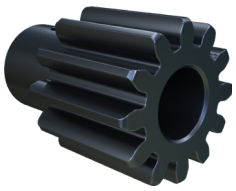
14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

14½°Pressure Angle

5 DP

1¾" Face



Type B

Plain with hubs

Type B_1

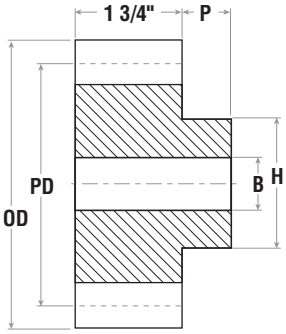
Web

Type B_2

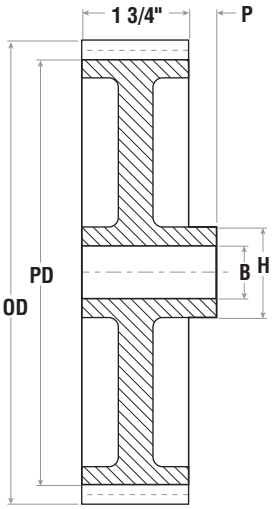
Web with lighten holes

Type B_3

Spoke style



Type B



Type B_1, B_2, B_3

Cast — Style B

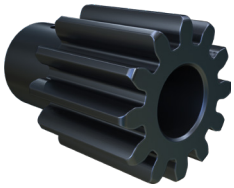
No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
24	C524	14 1/2	4.800	5.200	B	1 1/16	2 1/16	3 1/4	1 1/4	9.9
25	C525	14 1/2	5.000	5.400	B	1 1/16	2 1/16	3 1/4	1 1/4	10.6
28	C528	14 1/2	5.600	6.000	B1	1 1/16	2 1/16	3 1/4	1 1/4	12.1
30	C530	14 1/2	6.000	6.400	B1	1 1/16	2 1/16	3 1/4	1 1/4	13.9
32	C532	14 1/2	6.400	6.800	B1	1 1/16	2 1/16	3 1/4	1 1/4	13.5
35	C535	14 1/2	7.000	7.400	B1	1 3/16	2 1/16	3 1/4	1 1/4	16.9
36	C536	14 1/2	7.200	7.600	B1	1 3/16	2 1/16	3 1/4	1 1/4	15.5
40	C540	14 1/2	8.000	8.400	B1	1 3/16	2 1/16	3 1/4	1 1/4	17.4
45	C545	14 1/2	9.000	9.400	B2	1 3/16	2 1/16	3 1/4	1 1/4	20.3
48	C548	14 1/2	9.600	10.000	B2	1 3/16	2 5/16	3 3/4	1 1/4	25.2
50	C550	14 1/2	10.000	10.400	B3	1 3/16	2 5/16	3 3/4	1 1/4	23.7
54	C554	14 1/2	10.800	11.200	B3	1 3/16	2 5/16	3 3/4	1 1/4	25.1
55	C555	14 1/2	11.000	11.400	B3	1 3/16	2 5/16	3 3/4	1 1/4	26.0
60	C560	14 1/2	12.000	12.400	B3	1 3/16	2 5/16	3 3/4	1 1/4	30.6
64	C564	14 1/2	12.800	13.200	B3	1 3/16	2 5/16	3 3/4	1 1/4	31.2
66	C566	14 1/2	13.200	13.600	B3	1 3/16	2 5/16	3 3/4	1 1/4	30.8
70	C570	14 1/2	14.000	14.400	B3	1 3/16	2 9/16	4	1 1/4	34.5
72	C572	14 1/2	14.400	14.800	B3	1 3/16	2 9/16	4	1 1/4	35.0
75	C575	14 1/2	15.000	15.400	B3	1 3/16	2 9/16	4	1 1/4	36.7
80	C580	14 1/2	16.000	16.400	B3	1 3/16	2 9/16	4	1 1/4	40.8
84	C584	14 1/2	16.800	17.200	B3	1 3/16	2 9/16	4	1 1/4	40.0
90	C590	14 1/2	18.000	18.400	B3	1 3/16	2 9/16	4	1 1/4	45.4
96	C596	14 1/2	19.200	19.600	B3	1 3/16	2 9/16	4	1 1/4	48.6
100	C5100	14 1/2	20.000	20.400	B3	1 5/16	2 5/8	4 1/2	1 1/2	54.4
120	C5120	14 1/2	24.000	24.400	B3	1 5/16	2 13/16	4 3/4	1 1/2	56.1
130	C5130	14 1/2	26.000	26.400	B3	1 5/16	2 13/16	4 3/4	1 1/2	70.2

* Recommended maximum bore with keyway and setscew.
Quotes for large quantity discontinued cast iron sizes, contact your nearest Martin Facility.

14½° P.A. gears will not operate with 20° P.A.

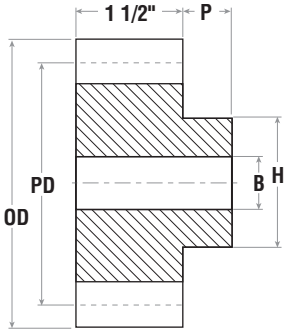
6 DP
1½" Face

Steel Stock Spur Gears
14½°Pressure Angle

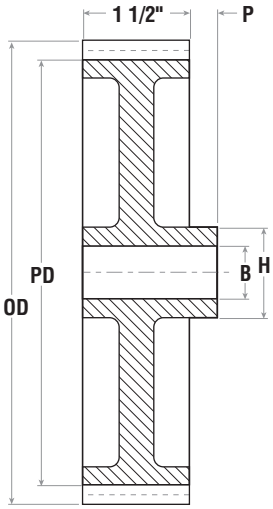


Type B
Plain with hubs

Type B_2
Web with lighten holes



Type B



Type B_2

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S611	14 1/2	2.000 †	2.333	B	1	**	1 1/2	7/8	1.1
12	S612	14 1/2	2.000	2.333	B	1	**	1 1/2	7/8	1.1
14	S614	14 1/2	2.333	2.666	B	1	1 1/16	1 13/16	7/8	1.8
15	S615	14 1/2	2.500	2.833	B	1	1 1/4	2	7/8	2.2
16	S616	14 1/2	2.666	3.000	B	1	1 5/16	2 5/32	7/8	2.6
18	S618	14 1/2	3.000	3.333	B	1	1 1/2	2 1/2	7/8	3.5
20	S620	14 1/2	3.333	3.666	B	1	1 3/4	2 27/32	7/8	4.6
21	S621	14 1/2	3.500	3.833	B	1	1 7/8	3	7/8	5.1
22	S622	14 1/2	3.666	4.000	B	1	1 7/8	3	7/8	5.5
24	S624	14 1/2	4.000	4.333	B	1 1/8	1 7/8	3	1	6.5
27	S627	14 1/2	4.500	4.833	B	1 1/8	1 7/8	3	1	6.6
28	S628	14 1/2	4.666	5.000	B	1 1/8	1 7/8	3	1	8.3
30	S630	14 1/2	5.000	5.333	B	1 1/8	2”	3 1/8	1	9.5
32	S632	14 1/2	5.333	5.666	B	1 1/8	2”	3 1/8	1	10.7
33	S633	14 1/2	5.500	5.833	B	1 1/8	2 1/8	3 1/4	1	11.3
36	S636	14 1/2	6.000	6.333	B	1 1/8	2 1/8	3 1/4	1	13.3
39	S639	14 1/2	6.500	6.833	B	1 1/8	2 1/2	4	1	16.6
40	S640	14 1/2	6.666	7.000	B	1 1/8	2 1/2	4	1	17.6
42	S642	14 1/2	7.000	7.333	B	1 1/8	2 1/2	4	1	18.9
45	S645	14 1/2	7.500	7.833	B	1 1/8	2 1/2	4	1	21.3
48	S648	14 1/2	8.000	8.333	B	1 1/8	2 1/2	4 1/8	1	24.3
52	S652	14 1/2	8.666	9.000	B	1 1/8	2 5/8	4 1/4	1	27.9
54	S654	14 1/2	9.000	9.333	B	1 1/8	2 5/8	4 3/8	1	30.4
58	S658	14 1/2	9.666	10.000	B	1 1/8	2 5/8	4 3/8	1	33.9
60	S660	14 1/2	10.000	10.333	B	1 1/4	2 5/8	4 3/8	1 1/4	34.3
64	S664	14 1/2	10.666	11.000	B	1 1/4	2 5/8	4 3/8	1 1/4	42.2
66	S666	14 1/2	11.000	11.333	B	1 1/4	2 5/8	4 3/8	1 1/4	50.0
72	S672	14 1/2	12.000	12.333	B	1 1/4	2 11/16	4 3/8	1 1/4	53.0
84	S684	14 1/2	14.000	14.333	B2	1 1/4	2 11/16	4 1/2	1 1/4	40.0
96	S696	14 1/2	16.000	16.333	B2	1 1/4	2 13/16	5 1/8	1 1/4	43.8
108	S6108	14 1/2	18.000	18.333	B2	1 1/4	2 13/16	5 1/8	1 1/4	53.0
120	S6120	14 1/2	20.000	20.333	B2	1 1/4	2 13/16	5 1/8	1 1/2	63.2
132	S6132	14 1/2	22.000	22.333	B2	1 1/4	2 13/16	5 1/8	1 1/2	68.3
144	S6144	14 1/2	24.000	24.333	B2	1 1/4	3 1/8	5	1 1/2	82.7

* Recommended maximum bore with keyway and setscew.
** Check application with factory.
† Enlarged pitch diameter with special tooth form.

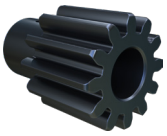
14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

14½°Pressure Angle

6 DP

1½" Face

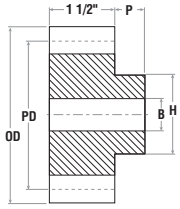


Type B
Plain with hubs

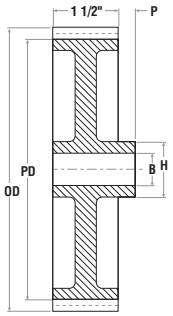
Type B_1
Web

Type B_2
Web with lighten holes

Type B_3
Spoke style



Type B



Type B_1, B_2, B_3

Cast — Style B

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
• 32	C632	14 1/2	5.333	5.666	B1	1 1/8	1 7/16	2 1/2	1	7.2
• 40	C640	14 1/2	6.666	7.000	B1	1 1/8	1 13/16	3	1	11.9
• 42	C642	14 1/2	7.000	7.333	B1	1 1/8	1 13/16	3	1	13.0
• 48	C648	14 1/2	8.000	8.333	B3	1 1/8	1 13/16	3	1	12.1
• 54	C654	14 1/2	9.000	9.333	B3	1 1/8	2 1/16	3 1/4	1	14.4
• 60	C660	14 1/2	10.000	10.333	B3	1 1/4	2 1/16	3 1/4	1 1/4	17.0
• 64	C664	14 1/2	10.666	11.000	B3	1 1/4	2 1/16	3 1/4	1 1/4	18.5
66	C666	14 1/2	11.000	11.333	B3	1 1/4	2 1/16	3 1/4	1 1/4	19.0
70	C670	14 1/2	11.666	12.000	B3	1 1/4	2 1/16	3 1/4	1 1/4	20.6
72	C672	14 1/2	12.000	12.333	B3	1 1/4	2 3/16	3 1/2	1 1/4	23.7
75	C675	14 1/2	12.500	12.833	B3	1 1/4	2 3/16	3 1/2	1 1/4	25.4
80	C680	14 1/2	13.333	13.666	B3	1 1/4	2 3/16	3 1/2	1 1/4	25.8
84	C684	14 1/2	14.000	14.333	B3	1 1/4	2 3/16	3 1/2	1 1/4	25.0
90	C690	14 1/2	15.000	15.333	B3	1 1/4	2 3/16	3 1/2	1 1/4	25.8
96	C696	14 1/2	16.000	16.333	B3	1 1/4	2 3/16	3 1/2	1 1/4	28.0
108	C6108	14 1/2	18.000	18.333	B3	1 1/4	2 5/16	3 3/4	1 1/4	32.0
120	C6120	14 1/2	20.000	20.333	B3	1 1/4	2 5/16	3 3/4	1 1/2	34.8
132	C6132	14 1/2	22.000	22.333	B3	1 1/4	2 5/16	3 3/4	1 1/2	43.4
144	C6144	14 1/2	24.000	24.333	B3	1 1/4	2 9/16	4	1 1/2	45.2
180	C6180	14 1/2	30.000	30.333	B3	1 1/4	2 9/16	4	1 1/2	58.3

Bored-To-Size

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
11	S611BS 1	14 1/2	2.000	2.333	B	1	1/4 × 1/8	(1) 1/4-20 @ 90	1 1/2	7/8	1.10
12	S612BS 1	14 1/2	2.000	2.333	B	1	1/4 × 1/8	(1) 1/4-20 @ 90	1 1/2	7/8	1.10
14	S614BS 1	14 1/2	2.333	2.667	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 13/16	7/8	1.80
14	S614BS 1 1/8	14 1/2	2.333	2.667	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	1 13/16	7/8	1.80
15	S615BS 1	14 1/2	2.500	2.833	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2	7/8	2.20
15	S615BS 1 1/8	14 1/2	2.500	2.833	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2	7/8	2.20
15	S615BS 1 3/16	14 1/2	2.500	2.833	B	1 3/16	1/4 × 1/8	(1) 5/16-18 @ 90	2	7/8	2.20
15	S615BS 1 1/4	14 1/2	2.500	2.833	B	1 1/4	1/4 × 1/8	(1) 5/16-18 @ 90	2	7/8	2.20
16	S616BS 1	14 1/2	2.667	3.000	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 5/32	7/8	2.60
16	S616BS 1 1/8	14 1/2	2.667	3.000	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2 5/32	7/8	2.60
16	S616BS 1 3/16	14 1/2	2.667	3.000	B	1 3/16	1/4 × 1/8	(1) 5/16-18 @ 90	2 5/32	7/8	2.60
16	S616BS 1 1/4	14 1/2	2.667	3.000	B	1 1/4	1/4 × 1/8	(1) 5/16-18 @ 90	2 5/32	7/8	2.60
18	S618BS 1	14 1/2	3.000	3.333	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/2	7/8	3.50
18	S618BS 1 1/8	14 1/2	3.000	3.333	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/2	7/8	3.50
18	S618BS 1 3/16	14 1/2	3.000	3.333	B	1 3/16	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/2	7/8	3.50
18	S618BS 1 1/4	14 1/2	3.000	3.333	B	1 1/4	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/2	7/8	3.50
20	S620BS 1	14 1/2	3.333	3.667	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 27/32	7/8	4.60
20	S620BS 1 1/8	14 1/2	3.333	3.667	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2 27/32	7/8	4.60
20	S620BS 1 3/16	14 1/2	3.333	3.667	B	1 3/16	1/4 × 1/8	(1) 5/16-18 @ 90	2 27/32	7/8	4.60
20	S620BS 1 1/4	14 1/2	3.333	3.667	B	1 1/4	1/4 × 1/8	(1) 5/16-18 @ 90	2 27/32	7/8	4.60

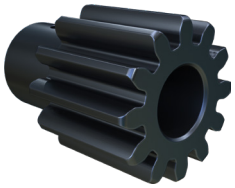
14½° P.A. gears will not operate with 20° P.A.

• Consult Factory.

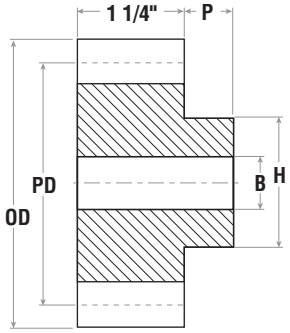
* Recommended maximum bore with keyway and setscew.

8 DP
1¼" Face

Steel Stock Spur Gears
14½°Pressure Angle



Type B
Plain with hubs



Type B

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S811	14 1/2	1.500 †	1.750	B	3/4	**	1 1/8	3/4	0.5
12	S812	14 1/2	1.500	1.750	B	3/4	**	1 1/8	3/4	0.5
13	S813	14 1/2	1.625	1.875	B	3/4	**	1 1/4	3/4	0.7
14	S814	14 1/2	1.750	2.000	B	3/4	13/16	1 3/8	3/4	0.9
15	S815	14 1/2	1.875	2.125	B	7/8	7/8	1 1/2	3/4	0.9
16	S816	14 1/2	2.000	2.250	B	7/8	15/16	1 5/8	3/4	1.1
17	S817	14 1/2	2.125	2.375	B	7/8	1	1 3/4	3/4	1.3
18	S818	14 1/2	2.250	2.500	B	7/8	1 1/8	1 7/8	3/4	1.6
19	S819	14 1/2	2.375	2.625	B	7/8	1 1/4	2	3/4	1.8
20	S820	14 1/2	2.500	2.750	B	7/8	1 5/16	2 1/8	3/4	2.0
21	S821	14 1/2	2.625	2.875	B	7/8	1 7/16	2 1/4	3/4	2.3
22	S822	14 1/2	2.750	3.000	B	7/8	1 5/8	2 3/8	3/4	2.6
24	S824	14 1/2	3.000	3.250	B	7/8	1 5/8	2 5/8	1	3.6
26	S826	14 1/2	3.250	3.500	B	7/8	1 5/8	2 5/8	1	3.9
28	S828	14 1/2	3.500	3.750	B	7/8	1 5/8	2 5/8	1	4.4
30	S830	14 1/2	3.750	4.000	B	7/8	1 3/4	2 3/4	1	5.1
32	S832	14 1/2	4.000	4.250	B	1	1 13/16	2 7/8	1	5.6
36	S836	14 1/2	4.500	4.750	B	1	1 7/8	3	1	7.0
40	S840	14 1/2	5.000	5.250	B	1	1 7/8	3	1	8.3
42	S842	14 1/2	5.250	5.500	B	1	1 7/8	3	1	9.0
44	S844	14 1/2	5.500	5.750	B	1	1 7/8	3	1	9.7
48	S848	14 1/2	6.000	6.250	B	1	1 7/8	3	1	11.3

* Recommended maximum bore with keyway and setscew.
** Check application with factory.
† Enlarged pitch diameter with special tooth form.

14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

14½°Pressure Angle

8 DP

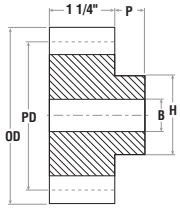
1¼" Face

Type B
Plain with hubs

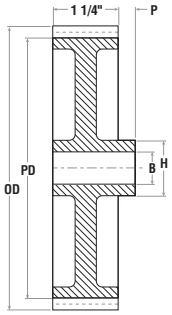
Type B_1
Web

Type B_2
Web with lighten holes

Type B_3
Spoke style



Type B



Type B_1, B_2, B_3

Cast — Style B

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
• 36	C836	14 1/2	4.500	4.750	B1	1	1 7/16	2 1/2	1	4.5
• 40	C840	14 1/2	5.000	5.250	B1	1	1 7/16	2 1/2	1	5.1
• 42	C842	14 1/2	5.250	5.500	B1	1	1 7/16	2 1/2	1	5.5
• 44	C844	14 1/2	5.500	5.750	B1	1	1 7/16	2 1/2	1	6.0
52	C852	14 1/2	6.500	6.750	B1	1	1 11/16	2 3/4	1	10.3
54	C854	14 1/2	6.750	7.000	B2	1	1 11/16	2 3/4	1	8.1
56	C856	14 1/2	7.000	7.250	B3	1	1 11/16	2 3/4	1	8.2
60	C860	14 1/2	7.500	7.750	B3	1	1 11/16	2 3/4	1	8.8
64	C864	14 1/2	8.000	8.250	B3	1	1 11/16	2 3/4	1	11.2
68	C868	14 1/2	8.500	8.750	B3	1	1 13/16	3	1	11.5
72	C872	14 1/2	9.000	9.250	B3	1	1 13/16	3	1	11.7
76	C876	14 1/2	9.500	9.750	B3	1	1 13/16	3	1	12.0
80	C880	14 1/2	10.000	10.250	B3	1 1/8	1 13/16	3	1 1/8	12.2
84	C884	14 1/2	10.500	10.750	B3	1 1/8	1 13/16	3	1 1/8	13.2
88	C888	14 1/2	11.000	11.250	B3	1 1/8	1 13/16	3	1 1/8	13.5
92	C892	14 1/2	11.500	11.750	B3	1 1/8	2 1/16	3 1/4	1 1/8	15.0
96	C896	14 1/2	12.000	12.250	B3	1 1/8	2 1/16	3 1/4	1 1/8	15.8
100	C8100	14 1/2	12.500	12.750	B3	1 1/8	2 1/16	3 1/4	1 1/8	16.5
112	C8112	14 1/2	14.000	14.250	B3	1 1/8	2 1/16	3 1/4	1 1/8	17.7
120	C8120	14 1/2	15.000	15.250	B3	1 1/8	2 1/16	3 1/4	1 1/8	18.4
128	C8128	14 1/2	16.000	16.250	B3	1 1/8	2 3/16	3 1/2	1 1/8	21.3
144	C8144	14 1/2	18.000	18.250	B3	1 1/8	2 3/16	3 1/2	1 1/8	24.2
160	C8160	14 1/2	20.000	20.250	B3	1 1/8	2 5/16	3 3/4	1 1/4	26.6
168	C8168	14 1/2	21.000	21.250	B3	1 1/8	2 5/16	3 3/4	1 1/4	28.9

Bored-To-Size

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
11	S811BS 3/4	14 1/2	1.500	1.750	B	3/4	3/16 × 3/32	(1) 10-24 @ 90	1 1/8	3/4	0.50
12	S812BS 3/4	14 1/2	1.500	1.750	B	3/4	3/16 × 3/32	(1) 10-24 @ 90	1 1/8	3/4	0.50
14	S814BS 3/4	14 1/2	1.750	2.000	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/8	3/4	0.90
15	S815BS 7/8	14 1/2	1.875	2.125	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/2	3/4	1.00
16	S816BS 7/8	14 1/2	2.000	2.250	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/8	3/4	1.10
16	S816BS 1	14 1/2	2.000	2.250	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 5/8	3/4	1.10
18	S818BS 7/8	14 1/2	2.250	2.500	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 7/8	3/4	1.60
18	S818BS 1	14 1/2	2.250	2.500	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 7/8	3/4	1.60
18	S818BS 1-1/8	14 1/2	2.250	2.500	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	1 7/8	3/4	1.60
20	S820BS 7/8	14 1/2	2.500	2.750	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	2 1/8	3/4	2.00
20	S820BS 1	14 1/2	2.500	2.750	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/8	3/4	2.00
20	S820BS 1-1/8	14 1/2	2.500	2.750	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/8	3/4	2.00
22	S822BS 7/8	14 1/2	2.750	3.000	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	2 3/8	3/4	2.60
22	S822BS 1	14 1/2	2.750	3.000	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 3/8	3/4	2.60
22	S822BS 1-1/8	14 1/2	2.750	3.000	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2 3/8	3/4	2.60

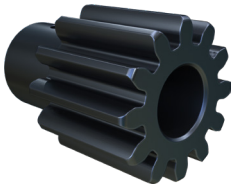
14½° P.A. gears will not operate with 20° P.A.

• Consult Factory.

* Recommended maximum bore with keyway and setscew.

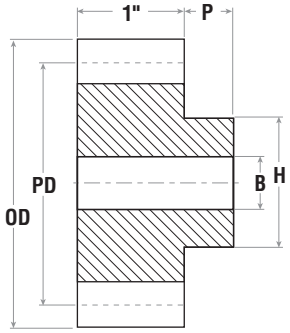
10 DP
1" Face

Steel Stock Spur Gears
14½°Pressure Angle



Type B

Plain with hubs



Type B

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S1011	14 1/2	1.200 †	1.400	B	5/8	**	15/16	5/8	0.3
12	S1012	14 1/2	1.200	1.400	B	5/8	**	15/16	5/8	0.3
13	S1013	14 1/2	1.300	1.500	B	5/8	**	1	5/8	0.3
14	S1014	14 1/2	1.400	1.600	B	5/8	5/8	1 1/8	5/8	0.4
15	S1015	14 1/2	1.500	1.700	B	3/4	3/4	1 7/32	5/8	0.5
16	S1016	14 1/2	1.600	1.800	B	3/4	3/4	1 5/16	5/8	0.6
17	S1017	14 1/2	1.700	1.900	B	3/4	13/16	1 3/8	5/8	0.6
18	S1018	14 1/2	1.800	2.000	B	3/4	7/8	1 17/32	5/8	0.8
19	S1019	14 1/2	1.900	2.100	B	3/4	7/8	1 9/16	5/8	0.9
20	S1020	14 1/2	2.000	2.200	B	3/4	1	1 23/32	5/8	1.0
21	S1021	14 1/2	2.100	2.300	B	3/4	1	1 3/4	5/8	1.2
22	S1022	14 1/2	2.200	2.400	B	3/4	1 1/8	1 7/8	5/8	1.3
24	S1024	14 1/2	2.400	2.600	B	3/4	1 1/4	2 1/8	5/8	1.6
25	S1025	14 1/2	2.500	2.700	B	3/4	1 1/2	2 7/32	5/8	1.8
26	S1026	14 1/2	2.600	2.800	B	3/4	1 1/4	2 1/8	5/8	1.9
28	S1028	14 1/2	2.800	3.000	B	3/4	1 1/4	2 1/8	7/8	2.3
30	S1030	14 1/2	3.000	3.200	B	3/4	1 1/4	2 1/8	7/8	2.6
32	S1032	14 1/2	3.200	3.400	B	3/4	1 1/4	2 1/8	7/8	2.9
35	S1035	14 1/2	3.500	3.700	B	3/4	1 5/16	2 1/4	7/8	3.4
36	S1036	14 1/2	3.600	3.800	B	3/4	1 5/16	2 1/4	7/8	3.5
38	S1038	14 1/2	3.800	4.000	B	3/4	1 5/16	2 1/4	7/8	3.8
40	S1040	14 1/2	4.000	4.200	B	7/8	1 5/16	2 1/4	7/8	4.1
42	S1042	14 1/2	4.200	4.400	B	7/8	1 5/16	2 1/4	7/8	4.5
45	S1045	14 1/2	4.500	4.700	B	7/8	1 1/2	2 1/2	7/8	5.3
48	S1048	14 1/2	4.800	5.000	B	7/8	1 1/2	2 1/2	7/8	5.9
50	S1050	14 1/2	5.000	5.200	B	7/8	1 1/2	2 1/2	7/8	6.4
54	S1054	14 1/2	5.400	5.600	B	7/8	1 1/2	2 1/2	7/8	7.8
55	S1055	14 1/2	5.500	5.700	B	7/8	1 1/2	2 1/2	7/8	7.9
60	S1060	14 1/2	6.000	6.200	B	7/8	1 1/2	2 1/2	7/8	8.7

* Recommended maximum bore with keyway and setscew.

** Check application with factory.

† Enlarged pitch diameter with special tooth form.

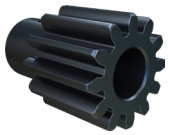
14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

14½°Pressure Angle

10 DP

1" Face

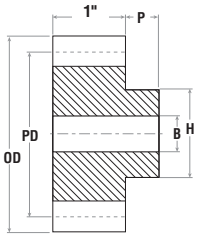


Type B
Plain with hubs

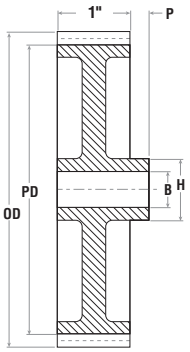
Type B_1
Web

Type B_2
Web with lighten holes

Type B_3
Spoke style



Type B



Type B_1, B_2, B_3

Cast — Style B

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
• 60	C1060	14 1/2	6.000	6.200	B3	7/8	1 3/16	2 1/8	7/8	4.3
64	C1064	14 1/2	6.400	6.600	B3	7/8	1 7/16	2 1/2	7/8	5.6
65	C1065	14 1/2	6.500	6.700	B3	7/8	1 7/16	2 1/2	7/8	5.6
70	C1070	14 1/2	7.000	7.200	B3	7/8	1 7/16	2 1/2	7/8	5.9
72	C1072	14 1/2	7.200	7.500	B3	7/8	1 7/16	2 1/2	7/8	6.3
75	C1075	14 1/2	7.500	7.700	B3	7/8	1 7/16	2 1/2	7/8	6.7
80	C1080	14 1/2	8.000	8.200	B3	7/8	1 7/16	2 1/2	7/8	7.0
84	C1084	14 1/2	8.400	8.600	B3	7/8	1 7/16	2 1/2	7/8	6.9
85	C1085	14 1/2	8.500	8.700	B3	7/8	1 7/16	2 1/2	7/8	7.3
90	C1090	14 1/2	9.000	9.200	B3	7/8	1 7/16	2 1/2	7/8	7.6
95	C1095	14 1/2	9.500	9.700	B3	7/8	1 7/16	2 1/2	7/8	8.1
96	C1096	14 1/2	9.600	9.800	B3	7/8	1 7/16	2 1/2	7/8	8.1
100	C10100	14 1/2	10.000	10.200	B3	1	1 7/16	2 1/2	7/8	10.3
105	C10105	14 1/2	10.500	10.700	B3	1	1 7/16	2 1/2	1	10.4
110	C10110	14 1/2	11.000	11.200	B3	1	1 11/16	2 3/4	1	10.0
112	C10112	14 1/2	11.200	11.400	B3	1	1 11/16	2 3/4	1	10.2
120	C10120	14 1/2	12.000	12.200	B3	1	1 11/16	2 3/4	1	11.1
130	C10130	14 1/2	13.000	13.200	B3	1	1 11/16	2 3/4	1	13.4
140	C10140	14 1/2	14.000	14.200	B1	1	1 11/16	2 3/4	1	30.8
150	C10150	14 1/2	15.000	15.200	B1	1	1 11/16	2 3/4	1	33.0
160	C10160	14 1/2	16.000	16.200	B1	1	1 11/16	2 3/4	1	38.3
180	C10180	14 1/2	18.000	18.200	B3	1	1 13/16	3	1	43.6

Bored-To-Size

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb.
			Pitch	Outside		Stock	Keyway		Diameter	Projection	(Approx.)
11	S1011BS 5/8	14 1/2	1.200	1.400	B	5/8	3/16 × 3/32	(1) 10-24 @ 90	15/16	5/8	0.30
12	S1012BS 5/8	14 1/2	1.200	1.400	B	5/8	3/16 × 3/32	(1) 10-24 @ 90	15/16	5/8	0.30
14	S1014BS 5/8	14 1/2	1.400	1.600	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/8	5/8	0.40
15	S1015BS 3/4	14 1/2	1.500	1.700	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 7/32	5/8	0.50
16	S1016BS 3/4	14 1/2	1.600	1.800	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/16	5/8	0.60
18	S1018BS 3/4	14 1/2	1.800	2.000	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 17/32	5/8	0.80
18	S1018BS 7/8	14 1/2	1.800	2.000	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 17/32	5/8	0.80
20	S1020BS 3/4	14 1/2	2.000	2.200	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 23/32	5/8	1.00
20	S1020BS 7/8	14 1/2	2.000	2.200	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 23/32	5/8	1.00
20	S1020BS 1	14 1/2	2.000	2.200	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 23/32	5/8	1.00
24	S1024BS 3/4	14 1/2	2.400	2.600	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	2 1/8	5/8	1.60
24	S1024BS 7/8	14 1/2	2.400	2.600	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	2 1/8	5/8	1.60
24	S1024BS 1	14 1/2	2.400	2.600	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 3/8	5/8	1.60

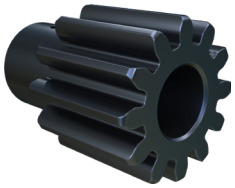
14½° P.A. gears will not operate with 20° P.A.

• Consult Factory.

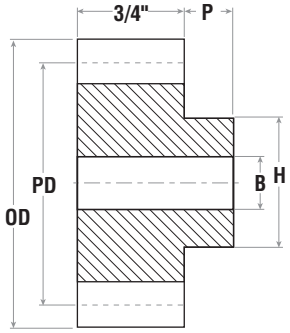
* Recommended maximum bore with keyway and setscew.

12 DP
¾" Face

Steel Stock Spur Gears
14½°Pressure Angle



Type B
Plain with hubs



Type B

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S1211	14 1/2	1.000 †	1.167	B	1/2	**	3/4	1/2	0.14
12	S1212	14 1/2	1.000	1.167	B	1/2	**	3/4	1/2	0.16
13	S1213	14 1/2	1.083	1.250	B	1/2	**	13/16	1/2	0.20
14	S1214	14 1/2	1.167	1.333	B	1/2	**	29/32	1/2	0.24
15	S1215	14 1/2	1.250	1.417	B	5/8	**	1	1/2	0.27
16	S1216	14 1/2	1.333	1.500	B	5/8	5/8	1 1/16	1/2	0.34
17	S1217	14 1/2	1.417	1.580	B	5/8	5/8	1 1/8	1/2	0.36
18	S1218	14 1/2	1.500	1.667	B	5/8	11/16	1 1/4	1/2	0.42
19	S1219	14 1/2	1.583	1.750	B	5/8	3/4	1 5/16	1/2	0.48
20	S1220	14 1/2	1.667	1.833	B	5/8	13/16	1 13/32	1/2	0.56
21	S1221	14 1/2	1.750	1.917	B	5/8	7/8	1 1/2	1/2	0.64
22	S1222	14 1/2	1.833	2.000	B	5/8	7/8	1 9/16	1/2	0.70
23	S1223	14 1/2	1.917	2.083	B	5/8	15/16	1 5/8	1/2	0.78
24	S1224	14 1/2	2.000	2.166	B	5/8	1	1 3/4	1/2	0.88
25	S1225	14 1/2	2.083	2.250	B	5/8	1 1/16	1 27/32	1/2	0.96
26	S1226	14 1/2	2.167	2.333	B	5/8	1 3/16	1 15/16	5/8	1.14
28	S1228	14 1/2	2.333	2.500	B	5/8	1 1/2	2 1/16	5/8	1.34
30	S1230	14 1/2	2.500	2.667	B	5/8	1 5/16	2 1/4	5/8	1.60
32	S1232	14 1/2	2.667	2.833	B	5/8	1 5/16	2 1/4	5/8	1.72
34	S1234	14 1/2	2.833	3.000	B	5/8	1 5/16	2 1/4	5/8	1.88
36	S1236	14 1/2	3.000	3.167	B	5/8	1 1/2	2 1/2	5/8	2.20
38	S1238	14 1/2	3.167	3.333	B	5/8	1 1/2	2 1/2	5/8	2.38
40	S1240	14 1/2	3.333	3.500	B	5/8	1 1/2	2 1/2	5/8	2.54
42	S1242	14 1/2	3.500	3.666	B	5/8	1 1/2	2 1/2	5/8	2.72
44	S1244	14 1/2	3.667	3.833	B	5/8	1 1/2	2 1/2	5/8	2.94
48	S1248	14 1/2	4.000	4.166	B	5/8	1 1/2	2 1/2	3/4	3.50
54	S1254	14 1/2	4.500	4.666	B	3/4	1 3/4	2 3/4	3/4	4.40
56	S1256	14 1/2	4.667	4.833	B	3/4	1 3/4	2 3/4	3/4	4.60
60	S1260	14 1/2	5.000	5.166	B	3/4	1 3/4	2 3/4	3/4	5.14
64	S1264	14 1/2	5.333	5.500	B	3/4	1 3/4	2 3/4	3/4	5.74
66	S1266	14 1/2	5.500	5.666	B	3/4	1 3/4	2 3/4	3/4	6.02
72	S1272	14 1/2	6.000	6.166	B	3/4	1 3/4	2 3/4	3/4	7.02

* Recommended maximum bore with keyway and setscew.
** Check application with factory.
† Enlarged pitch diameter with special tooth form.

14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

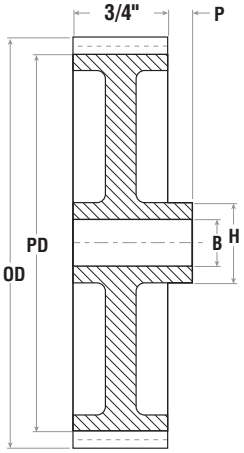
14½°Pressure Angle

12 DP

¾" Face

Type B_1
Web

Type B_3
Spoke style



Type B_1, B_3

Cast — Style B

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
78	C1278	14 1/2	6.500	6.666	B3	3/4	1 7/16	2 1/2	3/4	4.1
84	C1284	14 1/2	7.000	7.166	B3	3/4	1 7/16	2 1/2	3/4	4.4
90	C1290	14 1/2	7.500	7.666	B3	3/4	1 11/16	2 3/4	3/4	5.2
96	C1296	14 1/2	8.000	8.166	B3	3/4	1 11/16	2 3/4	3/4	5.5
102	C12102	14 1/2	8.500	8.666	B3	3/4	1 11/16	2 3/4	3/4	5.9
108	C12108	14 1/2	9.000	9.166	B3	3/4	1 11/16	2 3/4	3/4	6.4
112	C12112	14 1/2	9.333	9.500	B3	3/4	1 11/16	2 3/4	3/4	6.4
114	C12114	14 1/2	9.500	9.666	B3	3/4	1 11/16	2 3/4	3/4	6.4
120	C12120	14 1/2	10.000	10.166	B3	7/8	1 11/16	2 3/4	3/4	8.1
126	C12126	14 1/2	10.500	10.666	B3	7/8	1 13/16	3	3/4	7.4
144	C12144	14 1/2	12.000	12.166	B3	7/8	1 13/16	3	1	10.1
168	C12168	14 1/2	14.000	14.166	B1	7/8	1 13/16	3	1	10.6

Bored-To-Size

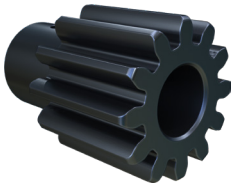
No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
11	S1211BS 1/2	14 1/2	1.000	1.167	B	1/2	NONE	(1) 10-24	3/4	1/2	0.14
12	S1212BS 1/2	14 1/2	1.000	1.167	B	1/2	NONE	(1) 10-24	3/4	1/2	0.16
13	S1213BS 1/2	14 1/2	1.083	1.250	B	1/2	NONE	(1) 10-24	13/16	1/2	0.20
14	S1214BS 1/2	14 1/2	1.167	1.333	B	1/2	NONE	(1) 10-24	29/32	5/8	0.24
15	S1215BS 5/8	14 1/2	1.250	1.417	B	5/8	3/16 × 3/32	(1) 10-24 @ 90	1	1/2	0.27
16	S1216BS 5/8	14 1/2	1.333	1.500	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/16	1/2	0.34
18	S1218BS 5/8	14 1/2	1.500	1.667	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/4	1/2	0.42
20	S1220BS 5/8	14 1/2	1.667	1.833	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/32	1/2	0.56
20	S1220BS 3/4	14 1/2	1.667	1.833	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/32	1/2	0.56
21	S1221BS 5/8	14 1/2	1.750	1.917	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/32	1/2	0.56
21	S1221BS 3/4	14 1/2	1.750	1.917	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/32	1/2	0.56
21	S1221BS 7/8	14 1/2	1.750	1.917	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/32	1/2	0.56
22	S1222BS 5/8	14 1/2	1.833	2.000	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 9/16	1/2	0.70
22	S1222BS 3/4	14 1/2	1.833	2.000	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 9/16	1/2	0.70
22	S1222BS 7/8	14 1/2	1.833	2.000	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 9/16	1/2	0.70
22	S1222BS 1	14 1/2	1.833	2.000	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 9/16	1/2	0.70
24	S1224BS 5/8	14 1/2	2.000	2.167	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.88
24	S1224BS 3/4	14 1/2	2.000	2.167	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.88
24	S1224BS 7/8	14 1/2	2.000	2.167	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.88
24	S1224BS 1	14 1/2	2.000	2.167	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 3/4	1/2	0.88

14½° P.A. gears will not operate with 20° P.A.

* Recommended maximum bore with keyway and setscew.

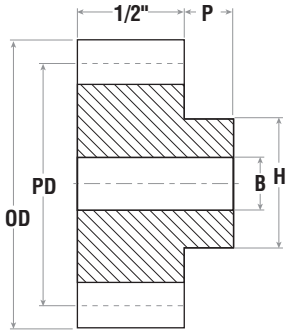
16 DP
½" Face

Steel Stock Spur Gears
14½°Pressure Angle



Type B

Plain with hubs



Type B

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S1611	14 1/2	0.750†	0.875	B	3/8	**	9/16	7/16	0.06
12	S1612	14 1/2	0.750	0.875	B	3/8	**	9/16	7/16	0.06
13	S1613	14 1/2	0.812	0.937	B	3/8	**	5/8	7/16	0.08
14	S1614	14 1/2	0.875	1.000	B	3/8	**	11/16	7/16	0.08
15	S1615	14 1/2	0.937	1.062	B	1/2	**	3/4	7/16	0.10
16	S1616	14 1/2	1.000	1.125	B	1/2	**	13/16	7/16	0.12
17	S1617	14 1/2	1.062	1.187	B	1/2	**	7/8	7/16	0.14
18	S1618	14 1/2	1.125	1.250	B	1/2	**	15/16	7/16	0.16
19	S1619	14 1/2	1.187	1.312	B	1/2	1/2	1	7/16	0.20
20	S1620	14 1/2	1.250	1.375	B	1/2	9/16	1 1/16	7/16	0.22
21	S1621	14 1/2	1.312	1.438	B	1/2	5/8	1 1/8	7/16	0.24
22	S1622	14 1/2	1.375	1.500	B	1/2	5/8	1 3/16	7/16	0.28
23	S1623	14 1/2	1.437	1.562	B	1/2	11/16	1 1/4	7/16	0.32
24	S1624	14 1/2	1.500	1.625	B	1/2	3/4	1 5/16	7/16	0.34
26	S1626	14 1/2	1.625	1.750	B	1/2	7/8	1 7/16	7/16	0.42
28	S1628	14 1/2	1.750	1.875	B	1/2	7/8	1 1/2	1/2	0.52
30	S1630	14 1/2	1.875	2.000	B	1/2	15/16	1 5/8	1/2	0.60
32	S1632	14 1/2	2.000	2.125	B	1/2	1	1 3/4	1/2	0.70
34	S1634	14 1/2	2.125	2.250	B	1/2	1 1/8	1 7/8	1/2	0.80
36	S1636	14 1/2	2.250	2.375	B	1/2	1 1/4	2	1/2	0.92
38	S1638	14 1/2	2.375	2.500	B	1/2	1 1/4	2	1/2	0.98
40	S1640	14 1/2	2.500	2.626	B	1/2	1 1/4	2	1/2	1.10
44	S1644	14 1/2	2.750	2.875	B	1/2	1 1/4	2	1/2	1.20
48	S1648	14 1/2	3.000	3.125	B	1/2	1 1/4	2	1/2	1.40
52	S1652	14 1/2	3.250	3.375	B	1/2	1 1/4	2	1/2	1.50
54	S1654	14 1/2	3.375	3.500	B	1/2	1 1/4	2	1/2	1.60
56	S1656	14 1/2	3.500	3.625	B	1/2	1 1/4	2	1/2	1.70
60	S1660	14 1/2	3.750	3.875	B	1/2	1 1/4	2	1/2	1.30
64	S1664	14 1/2	4.000	4.125	B	5/8	1 1/4	2	5/8	2.20
68	S1668	14 1/2	4.250	4.375	B	5/8	1 5/16	2 1/4	5/8	2.50
72	S1672	14 1/2	4.500	4.625	B	5/8	1 5/16	2 1/4	5/8	2.80
80	S1680	14 1/2	5.000	5.125	B	5/8	1 5/16	2 1/4	5/8	3.40
84	S1684	14 1/2	5.250	5.375	B	5/8	1 5/16	2 1/4	5/8	3.60
88	S1688	14 1/2	5.500	5.625	B	5/8	1 5/16	2 1/4	5/8	3.90
96	S1696	14 1/2	6.000	6.125	B	5/8	1 5/16	2 1/4	5/8	4.60
104	S16104	14 1/2	6.500	6.625	B	5/8	1 5/16	2 1/4	5/8	5.20

* Recommended maximum bore with keyway and setscew.
** Check application with factory.
† Enlarged pitch diameter with special tooth form.

14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

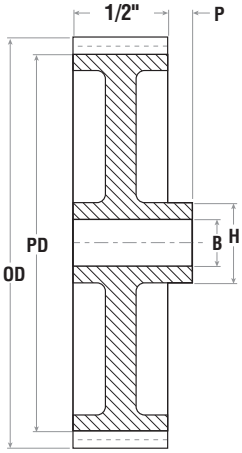
14½°Pressure Angle

16 DP

½" Face

Type B_1
Web

Type B_3
Spoke style



Type B_1, B_3

Cast — Style B

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
112	C16112	14 1/2	7.000	7.125	B3	5/8	1 7/16	2 1/2	5/8	3.4
120	C16120	14 1/2	7.500	7.625	B3	5/8	1 7/16	2 1/2	5/8	3.5
128	C16128	14 1/2	8.000	8.125	B3	5/8	1 7/16	2 1/2	5/8	3.7
144	C16144	14 1/2	9.000	9.125	B3	5/8	1 11/16	2 3/4	3/4	5.0
160	C16160	14 1/2	10.000	10.125	B3	5/8	1 11/16	2 3/4	3/4	5.2
192	C16192	14 1/2	12.000	12.125	B1	5/8	1 11/16	2 3/4	3/4	8.1

Bored-To-Size

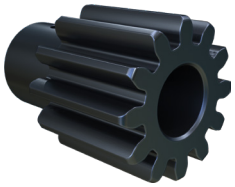
No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
11	S1611BS 3/8	14 1/2	0.750	0.875	B	3/8	None	(1) 8-32	9/16	7/16	0.06
12	S1612BS 3/8	14 1/2	0.752	0.875	B	3/8	None	(1) 8-32	9/16	7/16	0.06
13	S1613BS 3/8	14 1/2	0.812	0.937	B	3/8	None	(1) 8-32	5/8	7/16	0.08
14	S1614BS 3/8	14 1/2	0.875	1.000	B	3/8	None	(1) 10-24	11/16	7/16	0.08
15	S1615BS 1/2	14 1/2	0.937	1.062	B	1/2	None	(1) 10-24	3/4	7/16	0.10
16	S1616BS 1/2	14 1/2	1.000	1.125	B	1/2	None	(1) 10-24	13/16	7/16	0.12
18	S1618BS 1/2	14 1/2	1.125	1.250	B	1/2	None	(1) 1/4-20	15/16	7/16	0.16
20	S1620BS 1/2	14 1/2	1.250	1.375	B	1/2	None	(1) 1/4-20	1 1/16	7/16	0.22
20	S1620BS 5/8	14 1/2	1.250	1.375	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/16	7/16	0.22
22	S1622BS 1/2	14 1/2	1.375	1.500	B	1/2	None	(1) 1/4-20	1 3/16	7/16	0.28
22	S1622BS 5/8	14 1/2	1.375	1.500	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/16	7/16	0.28
24	S1624BS 1/2	14 1/2	1.500	1.625	B	1/2	None	(1) 1/4-20	1 5/16	7/16	0.34
24	S1624BS 5/8	14 1/2	1.500	1.625	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/16	7/16	0.34
24	S1624BS 3/4	14 1/2	1.500	1.625	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/16	7/16	0.34
26	S1626BS 1/2	14 1/2	1.625	1.750	B	1/2	None	(1) 1/4-20	1 7/16	7/16	0.42
26	S1626BS 5/8	14 1/2	1.625	1.750	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 7/16	7/16	0.42
26	S1626BS 3/4	14 1/2	1.625	1.750	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 7/16	7/16	0.42
28	S1628BS 1/2	14 1/2	1.750	1.875	B	1/2	None	(1) 1/4-20	1 1/2	1/2	0.52
28	S1628BS 5/8	14 1/2	1.750	1.875	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/2	1/2	0.52
28	S1628BS 3/4	14 1/2	1.750	1.875	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/2	1/2	0.52
28	S1628BS 7/8	14 1/2	1.750	1.875	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/2	1/2	0.52
30	S1630BS 1/2	14 1/2	1.875	2.000	B	1/2	None	(1) 1/4-20	1 5/8	1/2	0.60
30	S1630BS 5/8	14 1/2	1.875	2.000	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/8	1/2	0.60
30	S1630BS 3/4	14 1/2	1.875	2.000	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/8	1/2	0.60
30	S1630BS 7/8	14 1/2	1.875	2.000	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/8	1/2	0.60
30	S1630BS 1	14 1/2	1.875	2.000	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 5/8	1/2	0.60
32	S1632BS 1/2	14 1/2	2.000	2.125	B	1/2	None	(1) 1/4-20	1 3/4	1/2	0.70
32	S1632BS 5/8	14 1/2	2.000	2.125	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.70
32	S1632BS 3/4	14 1/2	2.000	2.125	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.70
32	S1632BS 7/8	14 1/2	2.000	2.125	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.70
32	S1632BS 1	14 1/2	2.000	2.125	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 3/4	1/2	0.70

14½° P.A. gears will not operate with 20° P.A.

* Recommended maximum bore with keyway and setscew.

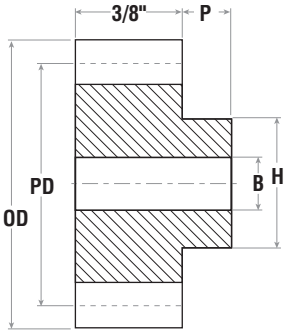
20 DP
3/8" Face

Steel Stock Spur Gears
14½°Pressure Angle



Type B

Plain with hubs



Type B

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S2011	14 1/2	0.600 †	0.700	B	5/16	**	15/32	3/8	0.02
12	S2012	14 1/2	0.600	0.700	B	5/16	**	15/32	3/8	0.02
13	S2013	14 1/2	0.650	0.750	B	5/16	**	1/2	3/8	0.04
14	S2014	14 1/2	0.700	0.800	B	5/16	**	35/64	3/8	0.04
15	S2015	14 1/2	0.750	0.850	B	3/8	**	39/64	3/8	0.04
16	S2016	14 1/2	0.800	0.900	B	3/8	**	21/32	3/8	0.04
17	S2017	14 1/2	0.850	0.950	B	3/8	**	45/64	3/8	0.08
18	S2018	14 1/2	0.900	1.000	B	3/8	**	3/4	3/8	0.08
19	S2019	14 1/2	0.950	1.050	B	3/8	**	51/64	3/8	0.10
20	S2020	14 1/2	1.000	1.100	B	3/8	**	55/64	3/8	0.12
21	S2021	14 1/2	1.050	1.150	B	3/8	**	7/8	3/8	0.12
22	S2022	14 1/2	1.100	1.200	B	3/8	**	31/32	3/8	0.14
23	S2023	14 1/2	1.150	1.250	B	3/8	**	31/32	3/8	0.16
24	S2024	14 1/2	1.200	1.300	B	3/8	9/16	1 1/16	3/8	0.19
25	S2025	14 1/2	1.250	1.350	B	3/8	5/8	1 7/64	3/8	0.20
28	S2028	14 1/2	1.400	1.500	B	3/8	11/16	1 17/64	3/8	0.26
30	S2030	14 1/2	1.500	1.600	B	3/8	13/16	1 23/64	3/8	0.30
32	S2032	14 1/2	1.600	1.700	B	3/8	7/8	1 7/16	1/2	0.40
35	S2035	14 1/2	1.750	1.850	B	3/8	7/8	1 9/16	1/2	0.50
36	S2036	14 1/2	1.800	1.900	B	3/8	15/16	1 5/8	1/2	0.52
40	S2040	14 1/2	2.000	2.100	B	3/8	1 1/16	1 13/16	1/2	0.64
45	S2045	14 1/2	2.250	2.350	B	3/8	1 1/4	2	1/2	0.82
48	S2048	14 1/2	2.400	2.500	B	3/8	1 1/4	2	1/2	0.88
50	S2050	14 1/2	2.500	2.600	B	3/8	1 1/4	2	1/2	0.90
55	S2055	14 1/2	2.750	2.850	B	3/8	1 1/4	2	1/2	1.04
60	S2060	14 1/2	3.000	3.100	B	3/8	1 1/4	2	1/2	1.16
64	S2064	14 1/2	3.200	3.300	B	3/8	1 1/4	2	1/2	1.26
70	S2070	14 1/2	3.500	3.600	B	3/8	1 1/4	2	1/2	1.40
72	S2072	14 1/2	3.600	3.700	B	3/8	1 5/16	2 1/4	1/2	1.60
75	S2075	14 1/2	3.750	3.850	B	3/8	1 5/16	2 1/4	1/2	1.70
80	S2080	14 1/2	4.000	4.100	B	1/2	1 5/16	2 1/4	1/2	1.82
84	S2084	14 1/2	4.200	4.300	B	1/2	1 5/16	2 1/4	1/2	1.96
90	S2090	14 1/2	4.500	4.600	B	1/2	1 5/16	2 1/4	1/2	2.20
96	S2096	14 1/2	4.800	4.900	B	1/2	1 5/16	2 1/4	1/2	2.42
100	S20100	14 1/2	5.000	5.100	B	1/2	1 5/16	2 1/4	1/2	2.60
112	S20112	14 1/2	5.600	5.700	B	1/2	1	1 3/4	1/2	2.86
120	S20120	14 1/2	6.000	6.100	B1	1/2	1	1 3/4	1/2	3.24
132	S20132	14 1/2	6.600	6.700	B	1/2	1	1 3/4	1/2	3.80

* Recommended maximum bore with keyway and setscew.
† Enlarged pitch diameter with special tooth form.
** Check application with factory.

14½° P.A. gears will not operate with 20° P.A.

Cast Iron Stock Spur Gears

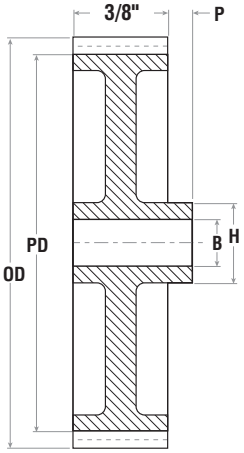
14½°Pressure Angle

20 DP

3/8" Face

Type B_1
Web

Type B_3
Spoke style



Type B_1, B_3

Cast — Style B

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
• 48	C2048	14 1/2	2.400	2.500	B1	3/8	9/16	1 1/8	1/2	0.50
• 64	C2064	14 1/2	3.200	3.300	B1	3/8	9/16	1 1/8	1/2	0.68
140	C20140	14 1/2	7.000	7.100	B1	1/2	1	1 3/4	1/2	2.00
160	C20160	14 1/2	8.000	8.100	B1	1/2	1	1 3/4	5/8	2.34
180	C20180	14 1/2	9.000	9.100	B1	1/2	1	1 3/4	5/8	2.66
200	C20200	14 1/2	10.000	10.100	B1	1/2	1	1 3/4	5/8	2.84

Bored-To-Size

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
11	S2011BS 5/16	14 1/2	0.600	0.700	B	5/16	None	#35 P.H.	15/32	3/8	0.02
12	S2012BS 5/16	14 1/2	0.600	0.700	B	5/16	None	#35 P.H.	15/32	3/8	0.02
13	S2013BS 5/16	14 1/2	0.650	0.750	B	5/16	None	#35 P.H.	1/2	3/8	0.04
14	S2014BS 5/16	14 1/2	0.700	0.800	B	5/16	None	#35 P.H.	35/64	3/8	0.04
15	S2015BS 3/8	14 1/2	0.750	0.850	B	3/8	None	(1) 8-32	39/64	3/8	0.04
16	S2016BS 3/8	14 1/2	1.800	0.900	B	3/8	None	(1) 8-32	21/32	3/8	0.04
18	S2018BS 3/8	14 1/2	1.900	1.000	B	3/8	None	(1) 10-24	3/4	3/8	0.08
20	S2020BS 3/8	14 1/2	1.000	1.100	B	3/8	None	(1) 10-24	55/64	3/8	0.12
20	S2020BS 1/2	14 1/2	1.000	1.100	B	1/2	None	(1) 10-24	55/64	3/8	0.12
22	S2022BS 3/8	14 1/2	1.100	1.200	B	3/8	None	(1) 1/4-20	31/32	3/8	0.14
22	S2022BS 1/2	14 1/2	1.100	1.200	B	1/2	None	(1) 1/4-20	31/32	3/8	0.14
24	S2024BS 3/8	14 1/2	1.200	1.300	B	3/8	None	(1) 1/4-20	1 1/16	3/8	0.19
24	S2024BS 1/2	14 1/2	1.200	1.300	B	1/2	None	(1) 1/4-20	1 1/16	3/8	0.19
25	S2025BS 3/8	14 1/2	1.250	1.350	B	3/8	None	(1) 1/4-20	1 7/64	3/8	0.20
25	S2025BS 1/2	14 1/2	1.250	1.350	B	1/2	None	(1) 1/4-20	1 7/64	3/8	0.20
28	S2028BS 3/8	14 1/2	1.400	1.500	B	3/8	None	(1) 1/4-20	1 17/64	3/8	0.26
28	S2028BS 1/2	14 1/2	1.400	1.500	B	1/2	None	(1) 1/4-20	1 17/64	3/8	0.26
30	S2030BS 3/8	14 1/2	1.500	1.600	B	3/8	None	(1) 1/4-20	1 23/64	3/8	0.30
30	S2030BS 1/2	14 1/2	1.500	1.600	B	1/2	None	(1) 1/4-20	1 23/64	3/8	0.30
32	S2032BS 3/8	14 1/2	1.600	1.700	B	3/8	None	(1) 1/4-20	1 7/16	1/2	0.40
32	S2032BS 1/2	14 1/2	1.600	1.700	B	1/2	None	(1) 1/4-20	1 7/16	1/2	0.40
35	S2035BS 3/8	14 1/2	1.750	1.850	B	3/8	None	(1) 1/4-20	1 9/16	1/2	0.50
35	S2035BS 1/2	14 1/2	1.750	1.850	B	1/2	None	(1) 1/4-20	1 9/16	1/2	0.50
36	S2036BS 3/8	14 1/2	1.800	1.900	B	3/8	None	(1) 1/4-20	1 5/8	1/2	0.52
36	S2036BS 1/2	14 1/2	1.800	1.900	B	1/2	None	(1) 1/4-20	1 5/8	1/2	0.52
40	S2040BS 3/8	14 1/2	2.000	2.100	B	3/8	None	(1) 1/4-20	1 13/16	1/2	0.64
40	S2040BS 1/2	14 1/2	2.000	2.100	B	1/2	None	(1) 1/4-20	1 13/16	1/2	0.64
40	S2040BS 5/8	14 1/2	2.000	2.100	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/16	1/2	0.64
40	S2040BS 3/4	14 1/2	2.000	2.100	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/16	1/2	0.64

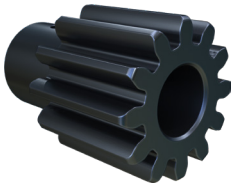
14½° P.A. gears will not operate with 20° P.A.

• Consult Factory.

* Recommended maximum bore with keyway and setscew.

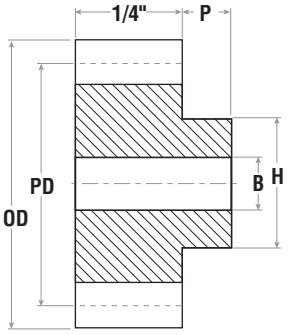
24 DP
¼" Face

Steel Stock Spur Gears
14½°Pressure Angle



Type B

Plain with hubs



Type B

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	S2411	14 1/2	0.500 †	0.583	B	1/4	**	3/8	5/16	0.02
12	S2412	14 1/2	0.500	0.583	B	1/4	**	3/8	5/16	0.02
14	S2414	14 1/2	0.583	0.666	B	1/4	**	15/32	5/16	0.04
15	S2415	14 1/2	0.625	0.708	B	1/4	**	1/2	5/16	0.04
16	S2416	14 1/2	0.666	0.750	B	5/16	**	35/64	5/16	0.04
17	S2417	14 1/2	0.709	0.791	B	5/16	**	9/16	5/16	0.04
18	S2418	14 1/2	0.750	0.833	B	5/16	**	5/8	5/16	0.04
19	S2419	14 1/2	0.791	0.875	B	5/16	**	5/8	5/16	0.06
20	S2420	14 1/2	0.833	0.917	B	5/16	**	23/32	5/16	0.06
21	S2421	14 1/2	0.875	0.959	B	3/8	**	3/4	5/16	0.06
22	S2422	14 1/2	0.917	1.000	B	3/8	**	3/4	5/16	0.06
24	S2424	14 1/2	1.000	1.083	B	3/8	**	7/8	3/8	0.10
26	S2426	14 1/2	1.083	1.166	B	3/8	**	7/8	3/8	0.10
27	S2427	14 1/2	1.125	1.208	B	3/8	**	7/8	3/8	0.12
30	S2430	14 1/2	1.250	1.333	B	3/8	1/2	1	3/8	0.16
32	S2432	14 1/2	1.333	1.416	B	3/8	1/2	1	3/8	0.20
33	S2433	14 1/2	1.375	1.458	B	3/8	5/8	1 1/8	3/8	0.20
36	S2436	14 1/2	1.500	1.583	B	3/8	5/8	1 1/8	3/8	0.20
40	S2440	14 1/2	1.666	1.750	B	3/8	5/8	1 1/8	3/8	0.24
42	S2442	14 1/2	1.750	1.833	B	3/8	11/16	1 1/4	3/8	0.28
44	S2444	14 1/2	1.833	1.917	B	3/8	11/16	1 1/4	3/8	0.30
45	S2445	14 1/2	1.875	1.959	B	3/8	11/16	1 1/4	3/8	0.30
48	S2448	14 1/2	2.000	2.083	B	3/8	11/16	1 1/4	3/8	0.32
54	S2454	14 1/2	2.250	2.333	B	3/8	11/16	1 1/4	3/8	0.38
56	S2456	14 1/2	2.333	2.416	B	3/8	11/16	1 1/4	3/8	0.40
60	S2460	14 1/2	2.500	2.583	B	3/8	11/16	1 1/4	3/8	0.46
66	S2466	14 1/2	2.750	2.833	B	3/8	11/16	1 1/4	3/8	0.52
72	S2472	14 1/2	3.000	3.083	B	1/2	13/16	1 3/8	1/2	0.64
84	S2484	14 1/2	3.500	3.583	B	1/2	7/8	1 1/2	1/2	0.88
96	S2496	14 1/2	4.000	4.083	B	1/2	7/8	1 1/2	1/2	1.08
120	S24120	14 1/2	5.000	5.083	B	1/2	7/8	1 1/2	1/2	2.60
144	S24144	14 1/2	6.000	6.083	B	1/2	15/16	1 5/8	17/32	2.28

* Recommended maximum bore with keyway and setscew.
** Check application with factory.
† Enlarged pitch diameter with special tooth form.

14½° P.A. gears will not operate with 20° P.A.

14½° Spur Gear Horsepower Ratings

(S) = Steel (CI) = Cast Iron

3 D.P. — 3" Face

No. Teeth	50 RPM		100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	6.14		11.37		19.8		26.3		39.14		46.74		51.78			
15	8.76		15.96		27.06		35.24		50.49		59.01					
18	11.37		20.38		33.75		43.2		60		68.93					
21	13.92		24.59		39.84		50.24		67.96							
24	16.32	9.67	28.53	16.84	45.16	26.76	56.19	33.3	74.34	44.05						
48	32.28	19.5	51.3	30.98	72.69	43.9	84.44	51.39								
72	45.01	27.06	66.98	40.29	88.62	53.32										
96	54.74	32.95	77.57	46.7	98.01	59.01										
120	62.89	37.74	85.79	51.48	104.88	62.93										

4 D.P. — 2" Face

No. Teeth	50 RPM		100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	2.35		4.42		7.92		10.77		16.8		20.65		23.33		27	
16	3.81		6.85		11.92		15.82		23.6		28.18		31.23			
20	5.06		9.22		15.65		20.38		29.19		31.11					
24	6.27	3.77	11.25	6.75	18.64	11.19	23.86	14.32	33.14	19.88	38.17	22.84				
36	10.03	5.96	17.23	10.24	28.01	15.98	33.05	16.94	42.89	25.49						
48	12.94	7.82	21.44	12.95	31.91	19.28	38.12	23.02	47.31	28.58						
72		11.1		17.32		24.05		27.65								
96		13.78		20.5		27.12										
144		18		25		31										

5 D.P. — 1 3/4" Face

No. Teeth	50 RPM		100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	1.32		2.54		4.63		6.4		10.33		12.98		14.9		17.48	
18	2.5		4.66		8.22		11		16.67		20.13		22.45			
24	3.64	2.16	6.55	3.95	11.18	6.73	14.62	8.79	21.09	12.69	24.74	14.88				
30	4.68	2.79	8.45	5.02	14	8.31	17.92	10.65	24.88	14.79	28.58	17				
45	7.59	4.32	12.2	7.43	19.03	11.59	23.41	14.27	30.38	18.52						
60		5.62		9.31		13.86		16.56		20.55						
80	11.96	7.25	19	11.54	26.92	16.35	31.28	18.99								
100		8.51		13.07		17.84										
120	16.23	9.74	24.16	14.49	31.95	19.18										
160		11.77		16.68		21.09										

Note:

1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.
2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

14½° Spur Gear Horsepower Ratings

(S) = Steel (CI) = Cast Iron

6 D.P. — 1 1/2" Face

No. Teeth	100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	1.54		2.83		3.97		6.57		8.4		9.78		11.69	
18	2.83		5.09		6.91		10.8		13.28		14.98		17.22	
24	4.02		7.02		9.32		13.86		16.56		18.35			
30	5.16		8.75		11.41		16.35		19.1					
36	6.26	3.77	10.37	6.24	13.28	7.98	18.44	11.09						
48	7.56	4.88	12.91	7.75	15.98	9.64	20.66	12.75						
84	12.86	7.6	17.62	11.02	20.51	12.96								
120	15.99	9.5	20.86	12.95										
180		12		15										

8 D.P. — 1 1/4" Face

No. Teeth	100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	0.72		1.37		1.95		3.32		4.36		5.21		6.38	
18	1.37		2.52		3.49		5.69		7.2		8.30		9.8	
24	1.98	1.18	3.59	2.13	4.81	2.86	7.55	4.48	9.25	5.49	10.48	6.22	12.08	7.17
36	3.02		5.13		6.73		9.85							
48	4.08	2.5	6.76	4.14	8.58	5.26	11.91	7.29						
60		2.98		4.79		5.98								
72		3.47		5.45		6.67								
96		4.4		6.49		7.75								
112		4.83		7.01										
120		5.05		7.22										
160		6.02		8.21										

10 D.P. — 1" Face

No. Teeth	100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	0.38		0.75		1.08		1.88		2.50		3.00		3.75	
18	0.72		1.33		1.87		3.15		4.07		4.76		5.75	
24	1.08		1.98		2.71		4.33		5.41		7.21		7.21	
28	1.24	0.80	2.24	1.44	3.06	1.94	4.83	3.03	5.98	3.71	6.79	4.85	7.85	
48	2.26	1.31	3.77	2.23	4.94	2.91	7.13	4.2	8.23	4.92				
60	2.68	1.61	4.45	2.66	5.65	3.41	7.84	4.73	9.04	5.43				
72		1.88		3.02		3.80		5.16						
96		2.37		3.65		4.46		5.73						
120		2.80		4.17		4.98		6.18						
140		3.12		4.52		5.33								
180		3.63		5.04		5.81								
200		3.88		5.29		6.02								

Note:

1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.
2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

14½° Spur Gear Horsepower Ratings

12 D.P. — 3/4" Face

No. Teeth	100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	0.21		0.39		0.55		0.99		1.33		1.64		2.09	
18	0.38		0.71		1.01		1.73		2.28		2.70		3.32	
24	0.56		1.05		1.43		2.37		3.01		3.50		4.17	
36	0.88	0.53	1.57	0.95	2.13	1.28	3.33	2.01	4.09	2.46	4.62	2.46	5.31	3.21
48	1.16	0.70	2.02	1.22	2.70	1.62	3.99	2.41	4.76	2.88	4.76	3.19		
60	1.46	0.87	2.44	1.47	3.19	1.91	4.61	2.74	5.32	3.21				
72	1.71	1.04	2.84	1.72	3.60	2.18	5.00	3.03	5.76	3.49				
96		1.30		2.06		2.56		3.39						
120		1.54		2.37		2.90		3.68						
200		2.19		3.08		3.56								

16 D.P. — 1/2" Face

No. Teeth	100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	0.08		0.14		0.21		0.40		0.53		0.66		0.87	
18	0.14		0.27		0.39		0.70		0.94		1.14		1.44	
24	0.21		0.39		0.56		0.96		1.26		1.50		1.84	
36	0.32	0.14	0.60	0.27	0.82	0.37	1.35	0.60	1.71	0.68	1.97	0.87	2.33	1.03
48	0.45		0.82		1.10		1.72		2.11		2.39		2.75	
60		0.34		0.60		0.80		1.20		1.44		1.60		
72		0.40		0.69		0.91		1.33		1.57				
80	0.76	0.45	1.26	0.75	1.65	0.99	2.38	1.43	2.75	1.64				
120		0.63		1.00		1.25		1.68						
160		0.78		1.21		1.48		1.78						
200		0.93		1.34		1.60		1.78						

20 D.P. — 3/8" Face

No. Teeth	100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	0.05		0.07		0.10		0.19		0.27		0.33		0.46	
18	0.07		0.13		0.19		0.35		0.48		0.59		0.76	
24	0.11		0.20		0.29		0.51		0.68		0.81		1.02	
48	0.22	0.14	0.43	0.26	0.58	0.35	0.93	0.56	1.16	0.70	1.34	0.81	1.55	0.94
60	0.28		0.50		0.67		1.06		1.29		1.47		1.69	
80		0.22		0.39		0.52		0.76		0.91		1.01		
96	0.46	0.26	0.76		0.99		1.44		1.66		1.70			
120		0.32		0.53		0.66		0.92		1.06				
160		0.40		0.64		0.79		1.05		1.16				
200		0.47		0.73		0.89		1.08		1.14				

24 D.P. — 1/4" Face

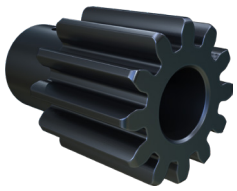
No. Teeth	100 RPM		200 RPM		300 RPM		600 RPM		900 RPM		1200 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
12	0.017		0.033		0.049		0.092		0.131		0.165	
18	0.030		0.060		0.090		0.170		0.230		0.290	
24	0.047		0.091		0.132		0.236		0.321		0.391	
36	0.080		0.150		0.210		0.360		0.470		0.550	
48	0.105		0.197		0.275		0.455		0.583		0.679	
60	0.130		0.240		0.330		0.530		0.670		0.760	
96	0.210		0.360		0.480		0.710		0.850		0.940	
144	0.291		0.482		0.617		0.857		0.984			

Note:

1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.
2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

4 DP
3½" Face

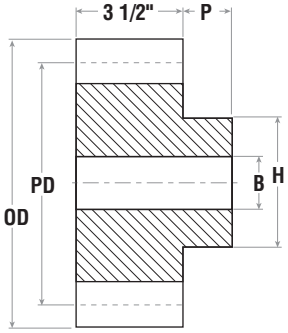
Steel Stock Spur Gears
20°Pressure Angle



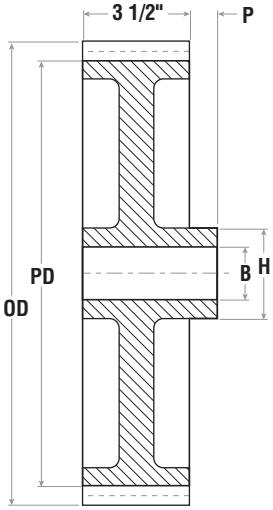
Type B
Plain with hubs

Type B_1
Web

Type B_2
Web with lighten holes



Type B



Type B_1, B_2

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
12	TS412	20	3.000	3.500	B	1 1/8	1 5/16	2 17/64	7/8	6.8
14	TS414	20	3.500	4.000	B	1 1/8	1 3/4	2 49/64	7/8	9.8
15	TS415	20	3.750	4.250	B	1 1/8	1 7/8	3 1/64	7/8	11.5
16	TS416	20	4.000	4.500	B	1 1/8	2 1/8	3 17/64	7/8	13.3
18	TS418	20	4.500	5.000	B	1 1/8	2 3/8	3 49/64	7/8	17.3
20	TS420	20	5.000	5.500	B	1 1/8	2 3/4	4 17/64	7/8	21.8
22	TS422	20	5.500	6.000	B	1 1/8	3	4 49/64	7/8	26.7
24	TS424	20	6.000	6.500	B	1 1/8	3 1/8	5	1 1/4	33.7
28	TS428	20	7.000	7.500	B	1 1/8	3 1/8	5	1 1/4	43.8
30	TS430	20	7.500	8.000	B	1 1/8	3 1/8	5	1 1/4	49.4
32	TS432	20	8.000	8.500	B	1 1/4	3 1/8	5	1 1/2	56.8
36	TS436	20	9.000	9.500	B	1 1/4	3 1/8	5	1 1/2	70.0
40	TS440	20	10.000	10.500	B	1 1/4	3 1/8	5 1/8	1 1/2	85.2
44	TS444	20	11.000	11.500	B	1 1/4	3 1/8	5 1/8	1 1/2	101.6
48	TS448	20	12.000	12.500	B	1 1/4	3 1/8	5 1/8	1 1/2	119.5
56	TS456	20	14.000	14.500	B1	1 1/4	3 1/4	5 1/2	1 1/2	96.9
60	TS460	20	15.000	15.500	B2	1 1/4	3 1/4	5 1/2	1 1/2	88.1
64	TS464	20	16.000	16.500	B2	1 1/4	3 1/4	5 1/2	1 1/2	86.9
72	TS472	20	18.000	18.500	B2	1 1/4	3 1/4	5 1/2	1 1/2	86.5
80	TS480	20	20.000	20.500	B2	1 1/4	3 1/4	5 1/2	1 1/2	90.9

* Recommended maximum bore with keyway and setscew.

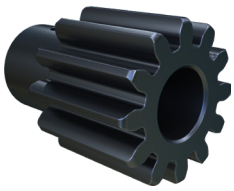
20° P.A. gears will not operate with 14 1/2° P.A.

Steel Stock Spur Gears

20°Pressure Angle

5 DP

2½" Face

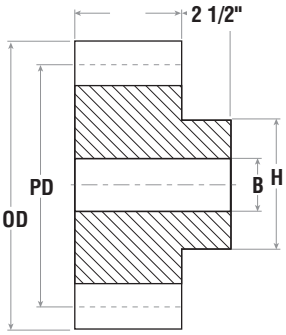


Type B

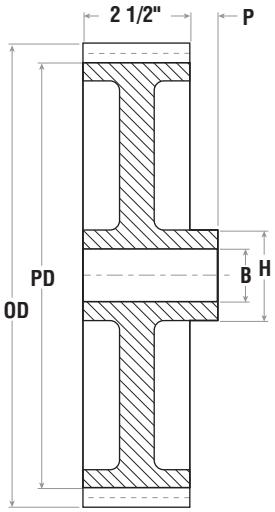
Plain with hubs

Type B_2

Web with lighten holes



Type B



Type B_2

Steel

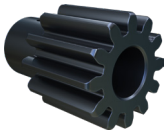
No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
12	TS512	20	2.400	2.800	B	1 1/8	1 1/8	1 25/32	7/8	2.9
14	TS514	20	2.800	3.200	B	1 1/8	1 5/16	2 3/16	7/8	4.3
15	TS515	20	3.000	3.400	B	1 1/8	1 7/16	2 3/8	7/8	5.2
16	TS516	20	3.200	3.600	B	1 1/8	1 5/8	2 19/32	7/8	6.1
18	TS518	20	3.600	4.000	B	1 1/8	1 7/8	3	7/8	8.0
20	TS520	20	4.000	4.400	B	1 1/8	2 1/4	3 3/8	7/8	10.2
24	TS524	20	4.800	5.200	B	1 1/8	2 3/8	3 3/4	1 1/4	15.7
25	TS525	20	5.000	5.400	B	1 1/8	2 3/8	3 3/4	1 1/4	20.3
28	TS528	20	5.600	6.000	B	1 1/8	2 3/8	3 3/4	1 1/4	22.9
30	TS530	20	6.000	6.400	B	1 1/8	2 3/8	3 3/4	1 1/4	23.9
35	TS535	20	7.000	7.400	B	1 1/4	2 3/8	3 3/4	1 1/4	29.9
40	TS540	20	8.000	8.400	B	1 1/4	2 3/8	3 3/4	1 1/4	38.2
45	TS545	20	9.000	9.400	B	1 1/4	2 3/8	3 3/4	1 1/4	47.7
50	TS550	20	10.000	10.400	B	1 1/4	2 13/16	4 5/8	1 1/4	60.3
60	TS560	20	12.000	12.400	B	1 1/4	2 13/16	4 5/8	1 1/4	84.7
70	TS570	20	14.000	14.400	B2	13/16	3 1/8	5 1/4	1 1/4	51.6
80	TS580	20	16.000	16.400	B2	13/16	3 1/8	5 1/4	1 1/4	55.8
90	TS590	20	18.000	18.400	B2	13/16	3 1/8	5 1/4	1 1/4	59.7
100	TS5100	20	20.000	20.400	B2	15/16	3 1/4	5 3/4	1 1/2	69.2
110	TS5110	20	22.000	22.400	B2	15/16	3 1/4	5 3/4	1 1/2	72.3
120	TS5120	20	24.000	24.400	B2	15/16	3 1/2	6 1/4	1 1/2	80.2

* Recommended maximum bore with keyway and setscew.

20° P.A. gears will not operate with 14 1/2° P.A.

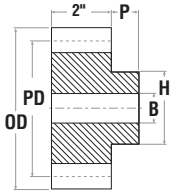
6 DP
2" Face

Steel Stock Spur Gears
20°Pressure Angle

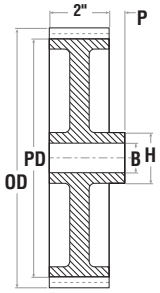


Type B
Plain with hubs

Type B_2
Web with lighten holes



Type B



Type B_2

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
11	TS611†	20	2.000	2.333	B	1	1	1 1/2	7/8	1.6
12	TS612	20	2.000	2.333	B	1	1	1 1/2	7/8	1.6
14	TS614	20	2.333	2.666	B	1	1	1 13/16	7/8	2.4
15	TS615	20	2.500	2.833	B	1	1 1/4	2	7/8	2.9
16	TS616	20	2.666	3.000	B	1	1 5/16	2 1/8	7/8	3.4
18	TS618	20	3.000	3.333	B	1	1 1/2	2 1/2	7/8	4.6
21	TS621	20	3.500	3.833	B	1	1 7/8	3	7/8	6.6
24	TS624	20	4.000	4.333	B	1 1/8	1 7/8	3	7/8	8.1
27	TS627	20	4.500	4.833	B	1 1/8	2 1/8	3 1/2	7/8	10.6
30	TS630	20	5.000	5.333	B	1 1/8	2 1/2	4	7/8	13.4
33	TS633	20	5.500	5.833	B	1 1/8	2 1/2	4	1 1/2	17.8
36	TS636	20	6.000	6.333	B	1 1/8	2 1/2	4	1 1/2	20.4
42	TS642	20	7.000	7.333	B	1 1/8	2 1/2	4	1 1/2	26.2
48	TS648	20	8.000	8.333	B	1 1/8	2 1/2	4	1 1/2	32.8
54	TS654	20	9.000	9.333	B	1 1/8	2 1/2	4	1 1/2	40.4
60	TS660	20	10.000	10.333	B	1 1/4	2 11/16	4 5/8	1 1/2	50.0
64	TS664	20	10.666	11.000	B	1 1/4	2 11/16	4 5/8	1 1/2	56.5
66	TS666	20	11.000	11.333	B	1 1/4	2 11/16	4 5/8	1 1/2	59.8
72	TS672	20	12.000	12.333	B	1 1/4	2 11/16	4 5/8	1 1/2	70.0
84	TS684	20	14.000	14.333	B2	1 1/4	2 13/16	5	1 1/2	42.8
96	TS696	20	16.000	16.333	B2	1 1/4	2 13/16	5	1 1/2	46.0
108	TS6108	20	18.000	18.333	B2	1 1/4	2 13/16	5	1 1/2	48.8
120	TS6120	20	20.000	20.333	B2	1 1/4	2 13/16	5	1 1/2	51.3

Bored-To-Size

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
12	TS612BS 1	20	2.000	2.333	B	1	1/4 × 1/8	(1) 1/4-20 @90	1 1/2	7/8	1.60
14	TS614BS 1	20	2.333	2.667	B	1	1/4 × 1/8	(1) 5/16-18 @90	1 13/16	7/8	2.40
14	TS614BS 1-1/8	20	2.333	2.667	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @90	1 13/16	7/8	2.40
15	TS615BS 1	20	2.500	2.833	B	1	1/4 × 1/8	(1) 5/16-18 @90	2	7/8	2.90
15	TS615BS 1-1/8	20	2.500	2.833	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @90	2	7/8	2.90
15	TS615BS 1-3/16	20	2.500	2.833	B	1 3/16	1/4 × 1/8	(1) 5/16-18 @90	2	7/8	2.90
15	TS615BS 1-1/4	20	2.500	2.833	B	1 1/4	1/4 × 1/8	(1) 5/16-18 @90	2	7/8	2.90
16	TS616BS 1	20	2.667	3.000	B	1	1/4 × 1/8	(1) 5/16-18 @90	2 1/8	7/8	3.40
16	TS616BS 1-1/8	20	2.667	3.000	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @90	2 1/8	7/8	3.40
16	TS616BS 1-3/16	20	2.667	3.000	B	1 3/16	1/4 × 1/8	(1) 5/16-18 @90	2 1/8	7/8	3.40
16	TS616BS 1-1/4	20	2.667	3.000	B	1 1/4	1/4 × 1/8	(1) 5/16-18 @90	2 1/8	7/8	3.40
18	TS618BS 1	20	3.000	3.333	B	1	1/4 × 1/8	(1) 5/16-18 @90	2 1/2	7/8	4.60
18	TS618BS 1-1/8	20	3.000	3.333	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @90	2 1/2	7/8	4.60
18	TS618BS 1-3/16	20	3.000	3.333	B	1 3/16	1/4 × 1/8	(1) 5/16-18 @90	2 1/2	7/8	4.60
18	TS618BS 1-1/4	20	3.000	3.333	B	1 1/4	1/4 × 1/8	(1) 5/16-18 @90	3	7/8	4.60
21	TS621BS 1	20	3.500	3.833	B	1	1/4 × 1/8	(1) 5/16-18 @90	3	7/8	6.60
21	TS621BS 1-1/8	20	3.500	3.833	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @90	3	7/8	6.60
21	TS621BS 1-3/16	20	3.500	3.833	B	1 3/16	1/4 × 1/8	(1) 5/16-18 @90	3	7/8	6.60
21	TS621BS 1-1/4	20	3.500	3.833	B	1 1/4	1/4 × 1/8	(1) 5/16-18 @90	3	7/8	6.60

20° P.A. gears will not operate with 14 1/2° P.A.

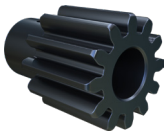
* Recommended maximum bore with keyway and setscew.

Steel & Cast Stock Spur Gears

20°Pressure Angle

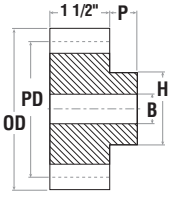
8 DP

1½" Face

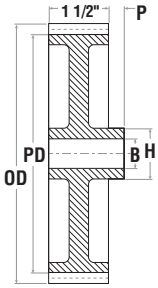


Type B
Plain with hubs

Type B_3
Spoke style



Type B



Type B_3

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
12	TS812	20	1.500	1.750	B	3/4	3/4	1 1/8	3/4	0.7
14	TS814	20	1.750	2.000	B	3/4	13/16	1 5/16	3/4	1.0
15	TS815	20	1.875	2.125	B	3/4	7/8	1 7/16	3/4	1.2
16	TS816	20	2.000	2.250	B	7/8	15/16	1 9/16	7/8	1.4
18	TS818	20	2.250	2.500	B	7/8	1 1/8	1 13/16	7/8	1.9
19	TS819	20	2.375	2.625	B	7/8	1 1/4	2	7/8	2.3
20	TS820	20	2.500	2.750	B	7/8	1 5/16	2 1/16	7/8	2.5
22	TS822	20	2.750	3.000	B	7/8	1 1/2	2 5/16	7/8	3.2
24	TS824	20	3.000	3.250	B	7/8	1 5/8	2 9/16	7/8	3.9
26	TS826	20	3.250	3.500	B	7/8	1 3/4	2 3/4	7/8	4.6
28	TS828	20	3.500	3.750	B	7/8	1 3/4	2 3/4	7/8	5.2
30	TS830	20	3.750	4.000	B	1	1 3/4	2 3/4	7/8	5.6
32	TS832	20	4.000	4.250	B	1	1 7/8	3 1/4	7/8	6.6
36	TS836	20	4.500	4.750	B	1	2 1/8	3 1/2	7/8	8.6
40	TS840	20	5.000	5.250	B	1	2 1/8	3 1/2	7/8	10.2
42	TS842	20	5.250	5.500	B	1	2 1/8	3 1/2	1	11.4
44	TS844	20	5.500	5.750	B	1	2 1/8	3 1/2	1	12.3
48	TS848	20	6.000	6.250	B	1	2 1/8	3 1/2	1	14.2

Cast

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
52	TC852	20	6.500	6.750	B	1	1 7/8	3	1	11.9
56	TC856	20	7.000	7.250	B	1	1 7/8	3	1	13.0
60	TC860	20	7.500	7.750	B2	1	1 7/8	3	1	12.0
64	TC864	20	8.000	8.250	B3	1	1 7/8	3	1	12.1
72	TC872	20	9.000	9.250	B3	1	2 1/16	3 1/4	1	14.4
80	TC880	20	10.000	10.250	B3	1 1/8	2 1/16	3 1/4	1 1/4	17.0
88	TC888	20	11.000	11.250	B3	1 1/8	2 1/16	3 1/4	1 1/4	19.0
96	TC896	20	12.000	12.250	B3	1 1/8	2 1/8	3 1/2	1 1/4	23.7
112	TC8112	20	14.000	14.250	B3	1 1/8	2 1/8	3 1/2	1 1/4	25.0
120	TC8120	20	15.000	15.250	B3	1 1/8	2 1/8	3 1/2	1 1/4	25.8
128	TC8128	20	16.000	16.250	B3	1 1/8	2 1/8	3 1/2	1 1/4	28.0
144	TC8144	20	18.000	18.250	B3	1 1/8	2 1/4	3 3/4	1 1/4	32.0
160	TC8160	20	20.000	20.250	B3	1 1/4	2 1/4	3 3/4	1 1/2	34.8

Bored-To-Size

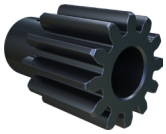
No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
12	TS812BS 3/4	20	1.500	1.750	B	3/4	3/16 × 3/32	(1) 10-24 @ 90	1 1/8	3/4	0.70
14	TS814BS 3/4	20	1.750	2.000	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/16	3/4	1.00
15	TS815BS 3/4	20	1.875	2.125	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 7/16	3/4	1.20
15	TS815BS 7/8	20	1.875	2.125	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 7/16	3/4	1.20
16	TS816BS 7/8	20	2.000	2.250	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 9/16	7/8	1.40
16	TS816BS 1	20	2.000	2.250	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 9/16	7/8	1.40
18	TS818BS 7/8	20	2.250	2.500	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/16	7/8	1.90
18	TS818BS 1	20	2.250	2.500	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 13/16	7/8	1.90
18	TS818BS 1-1/8	20	2.250	2.500	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	1 13/16	7/8	1.90
20	TS820BS 7/8	20	2.500	2.750	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	2 1/16	7/8	2.50
20	TS820BS 1	20	2.500	2.750	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/16	7/8	2.50
20	TS820BS 1-1/8	20	2.500	2.750	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/16	7/8	2.50
22	TS822BS 7/8	20	2.750	3.000	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	2 5/16	7/8	3.20
22	TS822BS 1	20	2.750	3.000	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 5/16	7/8	3.20
22	TS822BS 1-1/8	20	2.750	3.000	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2 5/16	7/8	3.20
24	TS824BS 7/8	20	3.000	3.250	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	2 9/16	7/8	3.90
24	TS824BS 1	20	3.000	3.250	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 9/16	7/8	3.90
24	TS824BS 1-1/8	20	3.000	3.250	B	1 1/8	1/4 × 1/8	(1) 5/16-18 @ 90	2 9/16	7/8	3.90

20° P.A. gears will not operate with 14 1/2° P.A.

* Recommended maximum bore with keyway and setscew.

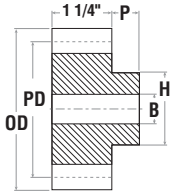
10 DP
1¼" Face

Steel & Cast Stock Spur Gears
20°Pressure Angle

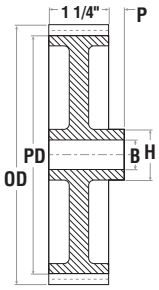


Type B
Plain with hubs

Type B_3
Spoke style



Type B



Type B_3

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
12	TS1012	20	1.200	1.400	B	5/8	5/8	29/32	5/8	0.4
14	TS1014	20	1.400	1.600	B	5/8	5/8	1 7/64	5/8	0.6
15	TS1015	20	1.500	1.700	B	3/4	3/4	1 7/32	5/8	0.6
16	TS1016	20	1.600	1.800	B	3/4	3/4	1 5/16	5/8	0.7
18	TS1018	20	1.800	2.000	B	3/4	13/16	1 11/32	5/8	0.9
20	TS1020	20	2.000	2.200	B	7/8	7/8	1 39/64	5/8	1.2
22	TS1022	20	2.200	2.400	B	7/8	1 1/16	1 13/16	5/8	1.5
24	TS1024	20	2.400	2.600	B	7/8	1 3/16	2 1/64	5/8	1.8
25	TS1025	20	2.500	2.700	B	7/8	1 1/4	2 7/64	5/8	2.0
26	TS1026	20	2.600	2.800	B	7/8	1 1/4	2 1/8	5/8	2.2
28	TS1028	20	2.800	3.000	B	7/8	1 5/16	2 13/32	5/8	2.7
30	TS1030	20	3.000	3.200	B	7/8	1 3/8	2 1/2	7/8	3.4
32	TS1032	20	3.200	3.400	B	7/8	1 3/8	2 1/2	7/8	3.7
35	TS1035	20	3.500	3.700	B	1	1 3/8	2 1/2	7/8	4.2
36	TS1036	20	3.600	3.800	B	1	1 3/8	2 1/2	7/8	4.3
40	TS1040	20	4.000	4.200	B	1	2 1/8	3 1/2	7/8	6.4
45	TS1045	20	4.500	4.700	B	1	2 1/8	3 1/2	7/8	7.5
48	TS1048	20	4.800	5.000	B	1	2 3/8	3 3/4	7/8	8.7
50	TS1050	20	5.000	5.200	B	1	2 1/2	4	7/8	9.6
55	TS1055	20	5.500	5.700	B	1	2 1/2	4	1	11.5
60	TS1060	20	6.000	6.200	B	1	2 1/2	4	1	13.1

Cast

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
70	TC1070	20	7.000	7.200	B3	1	1 11/16	2 3/4	1	8.2
80	TC1080	20	8.000	8.200	B3	1	1 11/16	2 3/4	1	11.2
90	TC1090	20	9.000	9.200	B3	1	1 13/16	3	1	11.7
100	TC10100	20	10.000	10.200	B3	1 1/8	1 13/16	3	1 1/8	12.2

Bored-To-Size

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
12	TS1012BS 5/8	20	1.200	1.400	B	5/8	3/16 × 3/32	(1) 10-24 @ 90	29/32	5/8	0.40
14	TS1014BS 5/8	20	1.400	1.600	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 7/64	5/8	0.60
15	TS1015BS 3/4	20	1.500	1.700	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 7/32	5/8	0.60
16	TS1016BS 3/4	20	1.600	1.800	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/16	5/8	0.70
18	TS1018BS 3/4	20	1.800	2.000	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 11/32	5/8	0.88
18	TS1018BS 7/8	20	1.800	2.000	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 11/32	5/8	0.90
20	TS1020BS 7/8	20	2.000	2.200	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 39/64	5/8	1.20
20	TS1020BS 1	20	2.000	2.200	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 39/64	5/8	1.20
24	TS1024BS 7/8	20	2.400	2.600	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/16	5/8	1.50
24	TS1024BS 1	20	2.400	2.600	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 13/16	5/8	1.50
25	TS1025BS 7/8	20	2.500	2.700	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	2 7/64	5/8	2.00
25	TS1025BS 1	20	2.500	2.700	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 7/64	5/8	2.00
28	TS1028BS 7/8	20	2.800	3.000	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	2 13/32	5/8	2.70
28	TS1028BS 1	20	2.800	3.000	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 13/32	5/8	2.70

20° P.A. gears will not operate with 14 1/2° P.A.

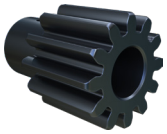
* Recommended maximum bore with keyway and setscew.

Steel& Cast Stock Spur Gears

20°Pressure Angle

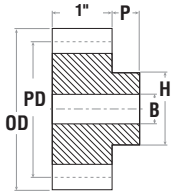
12 DP

1" Face

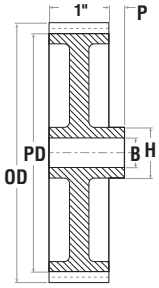


Type B
Plain with hubs

Type B_3
Spoke style



Type B



Type B_3

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
12	TS1212	20	1.000	1.167	B	1/2	1/2	3/4	5/8	0.21
13	TS1213	20	1.083	1.250	B	5/8	5/8	13/16	5/8	0.21
14	TS1214	20	1.167	1.333	B	5/8	5/8	29/32	5/8	0.28
15	TS1215	20	1.250	1.417	B	5/8	5/8	63/64	5/8	0.34
16	TS1216	20	1.333	1.500	B	5/8	5/8	1 1/16	5/8	0.41
18	TS1218	20	1.500	1.667	B	3/4	3/4	1 1/4	5/8	0.51
19	TS1219	20	1.583	1.750	B	3/4	3/4	1 5/16	5/8	0.59
20	TS1220	20	1.667	1.833	B	3/4	3/4	1 5/16	5/8	0.65
21	TS1221	20	1.750	1.917	B	3/4	13/16	1 25/64	5/8	0.75
22	TS1222	20	1.833	2.000	B	3/4	7/8	1 9/16	5/8	0.88
24	TS1224	20	2.000	2.166	B	3/4	15/16	1 41/64	5/8	1.06
25	TS1225	20	2.083	2.250	B	3/4	1 1/16	1 13/16	5/8	1.22
26	TS1226	20	2.167	2.333	B	3/4	1 1/8	1 7/8	5/8	1.33
28	TS1228	20	2.333	2.500	B	3/4	1 1/4	2 1/16	5/8	1.60
30	TS1230	20	2.500	2.667	B	3/4	1 5/16	2 5/32	5/8	1.83
32	TS1232	20	2.667	2.833	B	3/4	1 5/16	2 1/4	5/8	2.08
36	TS1236	20	3.000	3.167	B	3/4	1 3/8	2 1/2	7/8	2.98
42	TS1242	20	3.500	3.666	B	3/4	1 3/8	2 1/2	7/8	3.71
48	TS1248	20	4.000	4.166	B	7/8	1 7/8	3	7/8	4.99
54	TS1254	20	4.500	4.666	B	7/8	2 1/8	3 1/2	7/8	6.57
60	TS1260	20	5.000	5.166	B	7/8	2 1/8	3 1/2	7/8	7.63
66	TS1266	20	5.500	5.666	B	7/8	2 1/8	3 1/2	7/8	8.80
72	TS1272	20	6.000	6.166	B	7/8	2 1/8	3 1/2	7/8	10.08

Cast

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
84	TC1284	20	7.000	7.166	B3	7/8	1 7/16	2 1/2	7/8	5.9
96	TC1296	20	8.000	8.166	B3	7/8	1 7/16	2 1/2	7/8	7.0
108	TC12108	20	9.000	9.166	B3	7/8	1 7/16	2 1/2	7/8	7.6
120	TC12120	20	10.000	10.166	B3	1	1 7/16	2 1/2	7/8	10.3
144	TC12144	20	12.000	12.166	B3	1	1 11/16	2 3/4	1	10.4

Bored-To-Size

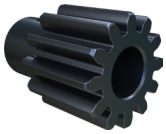
No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*		Diameter	Projection	
12	TS1212BS 1/2	20	1.000	1.167	B	1/2	NONE	(1) 10-24	3/4	5/8	0.21
13	TS1213BS 5/8	20	1.083	1.250	B	5/8	NONE	(1) 1/4-20 @ 90	13/16	5/8	0.21
14	TS1214BS 5/8	20	1.167	1.333	B	5/8	3/16 × 3/32	(1) 10-24 @ 90	29/32	5/8	0.28
15	TS1215BS 5/8	20	1.250	1.417	B	5/8	3/16 × 3/32	(1) 10-24 @ 90	63/64	5/8	0.34
16	TS1216BS 5/8	20	1.333	1.500	B	5/8	3/16 × 3/32	(1)1/4-20 @ 90	1 1/16	5/8	0.41
18	TS1218BS 3/4	20	1.500	1.667	B	3/4	3/16 × 3/32	(1)1/4-20 @ 90	1 1/4	5/8	0.51
20	TS1220BS 3/4	20	1.667	1.833	B	3/4	3/16 × 3/32	(1)1/4-20 @ 90	1 5/16	5/8	0.65
21	TS1221BS 3/4	20	1.750	1.917	B	3/4	3/16 × 3/32	(1)1/4-20 @ 90	1 25/64	5/8	0.75
21	TS1221BS 7/8	20	1.750	1.917	B	7/8	3/16 × 3/32	(1)1/4-20 @ 90	1 25/64	5/8	0.75
24	TS1224BS 3/4	20	2.000	2.167	B	3/4	3/16 × 3/32	(1)1/4-20 @ 90	1 41/64	5/8	1.06
24	TS1224BS 7/8	20	2.000	2.167	B	7/8	3/16 × 3/32	(1)1/4-20 @ 90	1 41/64	5/8	1.06
24	TS1224BS 1	20	2.000	2.167	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 41/64	5/8	1.06
28	TS1228BS 3/4	20	2.333	2.500	B	3/4	3/16 × 3/32	(1)1/4-20 @ 90	2 1/16	5/8	1.60
28	TS1228BS 7/8	20	2.333	2.500	B	7/8	3/16 × 3/32	(1)1/4-20 @ 90	2 1/16	5/8	1.60
28	TS1228BS 1	20	2.333	2.500	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	2 1/16	5/8	1.60

20° P.A. gears will not operate with 14 1/2° P.A.

* Recommended maximum bore with keyway and setscew.

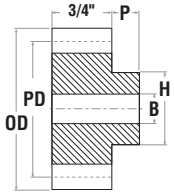
16 DP
¾" Face

Steel & Cast Stock Spur Gears
20°Pressure Angle

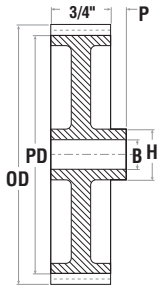


Type B
Plain with hubs

Type B_3
Spoke style



Type B



Type B_3

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
12	TS1612	20	0.750	0.875	B	3/8	3/8	9/16	1/2	0.09
13	TS1613	20	0.812	0.938	B	3/8	3/8	5/8	1/2	0.11
14	TS1614	20	0.875	1.000	B	3/8	3/8	11/16	1/2	0.14
15	TS1615	20	0.937	1.063	B	3/8	1/2	3/4	1/2	0.17
16	TS1616	20	1.000	1.125	B	1/2	1/2	13/16	1/2	0.17
17	TS1617	20	1.062	1.188	B	1/2	1/2	7/8	1/2	0.20
18	TS1618	20	1.125	1.250	B	1/2	1/2	15/16	1/2	0.24
20	TS1620	20	1.250	1.375	B	5/8	5/8	11/16	1/2	0.28
21	TS1621	20	1.312	1.438	B	5/8	5/8	11/8	1/2	0.32
22	TS1622	20	1.375	1.500	B	5/8	5/8	13/16	1/2	0.36
24	TS1624	20	1.500	1.625	B	5/8	3/4	15/16	1/2	0.46
26	TS1626	20	1.625	1.750	B	5/8	7/8	1 7/16	1/2	0.56
28	TS1628	20	1.750	1.875	B	5/8	7/8	1 1/2	1/2	0.65
30	TS1630	20	1.875	2.000	B	5/8	15/16	1 5/8	1/2	0.77
32	TS1632	20	2.000	2.125	B	5/8	1	1 3/4	1/2	0.90
36	TS1636	20	2.250	2.375	B	5/8	1 1/4	2	1/2	1.18
40	TS1640	20	2.500	2.625	B	5/8	1 1/4	2	5/8	1.48
48	TS1648	20	3.000	3.125	B	5/8	1 1/4	2	5/8	1.94
56	TS1656	20	3.500	3.625	B	5/8	1 3/8	2 1/2	5/8	2.79
60	TS1660	20	3.750	3.875	B	5/8	1 1/2	2 3/4	5/8	3.28
64	TS1664	20	4.000	4.125	B	3/4	1 1/2	2 3/4	3/4	3.74
72	TS1672	20	4.500	4.625	B	3/4	1 7/8	3	3/4	4.69
80	TS1680	20	5.000	5.125	B	3/4	2 1/8	3 1/2	3/4	6.03
84	TS1684	20	5.250	5.375	B	3/4	2 1/8	3 1/2	3/4	6.46
96	TS1696	20	6.000	6.125	B	3/4	2 1/8	3 1/2	3/4	7.86

Cast

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
112	TC16112	20	7.000	7.125	B3	3/4	1 7/16	2 1/2	3/4	4.4
128	TC16128	20	8.000	8.125	B3	3/4	1 11/16	2 3/4	3/4	5.5
144	TC16144	20	9.000	9.125	B3	3/4	1 11/16	2 3/4	3/4	6.4
160	TC16160	20	10.000	10.125	B3	7/8	1 11/16	2 3/4	3/4	8.1
192	TC16192	20	12.000	12.125	B3	7/8	1 13/16	3	1	10.1

Bored-To-Size

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*		Diameter	Projection	
12	TS1612BS 3/8	20	0.750	0.875	B	3/8	NONE	(1) 8-32	9/16	1/2	0.09
14	TS1614BS 3/8	20	0.875	1.000	B	3/8	NONE	(1) 10-24	11/16	1/2	0.14
15	TS1615BS 3/8	20	0.937	1.063	B	3/8	NONE	(1) 10-24	3/4	1/2	0.17
15	TS1615BS 1/2	20	0.937	1.063	B	1/2	NONE	(1) 10-24	3/4	1/2	0.17
16	TS1616BS 1/2	20	1.000	1.125	B	1/2	NONE	(1) 10-24	13/16	1/2	0.17
18	TS1618BS 1/2	20	1.125	1.250	B	1/2	NONE	(1) 1/4-20	15/16	1/2	0.24
20	TS1620BS 5/8	20	1.250	1.375	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/16	1/2	0.28
24	TS1624BS 5/8	20	1.500	1.625	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/16	1/2	0.46
24	TS1624BS 3/4	20	1.500	1.625	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/16	1/2	0.46
28	TS1628BS 5/8	20	1.750	1.875	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/2	1/2	0.65
28	TS1628BS 3/4	20	1.750	1.875	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 1/2	1/2	0.65
30	TS1630BS 5/8	20	1.875	2.000	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/8	1/2	0.77
30	TS1630BS 3/4	20	1.875	2.000	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/8	1/2	0.77
30	TS1630BS 7/8	20	1.875	2.000	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 5/8	1/2	0.77
32	TS1632BS 5/8	20	2.000	2.125	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.90
32	TS1632BS 3/4	20	2.000	2.125	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.90
32	TS1632BS 7/8	20	2.000	2.125	B	7/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 3/4	1/2	0.90
32	TS1632BS 1	20	2.000	2.125	B	1	1/4 × 1/8	(1) 5/16-18 @ 90	1 3/4	1/2	0.90

20° P.A. gears will not operate with 14 1/2° P.A.

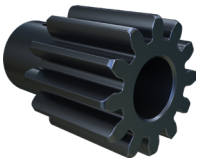
* Recommended maximum bore with keyway and setscew.

Steel Stock Spur Gears

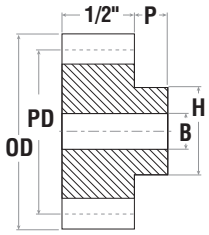
20°Pressure Angle

20 DP

½" Face



Type B
Plain with hubs



Type B

Steel

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Max.*	Diameter	Projection	
12	TS2012	20	0.600	0.700	B	5/16	5/16	15/32	7/16	0.04
14	TS2014	20	0.700	0.800	B	5/16	5/16	35/64	7/16	0.06
15	TS2015	20	0.750	0.850	B	3/8	3/8	39/64	7/16	0.07
16	TS2016	20	0.800	0.900	B	3/8	3/8	21/32	7/16	0.08
18	TS2018	20	0.900	1.000	B	3/8	3/8	3/4	7/16	0.12
20	TS2020	20	1.000	1.100	B	1/2	1/2	55/64	7/16	0.13
21	TS2021	20	1.050	1.150	B	1/2	1/2	7/8	7/16	0.15
22	TS2022	20	1.100	1.200	B	1/2	1/2	31/32	7/16	0.17
24	TS2024	20	1.200	1.300	B	1/2	9/16	1 1/16	7/16	0.22
25	TS2025	20	1.250	1.350	B	1/2	5/8	1 7/64	7/16	0.24
28	TS2028	20	1.400	1.500	B	1/2	11/16	1 17/64	7/16	0.32
30	TS2030	20	1.500	1.600	B	1/2	13/16	1 23/64	7/16	0.38
32	TS2032	20	1.600	1.700	B	1/2	7/8	1 7/16	1/2	0.46
35	TS2035	20	1.750	1.850	B	1/2	7/8	1 9/16	1/2	0.56
36	TS2036	20	1.800	1.900	B	1/2	15/16	1 5/8	1/2	0.60
40	TS2040	20	2.000	2.100	B	1/2	1 1/16	1 13/16	1/2	0.76
45	TS2045	20	2.250	2.350	B	1/2	1 1/4	2	1/2	0.95
50	TS2050	20	2.500	2.600	B	1/2	1 1/4	2	1/2	1.08
60	TS2060	20	3.000	3.100	B	1/2	1 5/16	2 1/8	1/2	1.45
70	TS2070	20	3.500	3.600	B	1/2	1 7/16	2 3/8	1/2	1.93
72	TS2072	20	3.600	3.700	B	1/2	1 7/16	2 3/8	1/2	2.01
80	TS2080	20	4.000	4.100	B	5/8	1 1/2	2 1/2	5/8	2.35
84	TS2084	20	4.200	4.300	B	5/8	1 1/2	2 1/2	5/8	2.53
90	TS2090	20	4.500	4.600	B	5/8	1 1/2	2 1/2	5/8	2.82
96	TS2096	20	4.800	4.900	B	5/8	1 1/2	2 1/2	5/8	3.14
100	TS20100	20	5.000	5.100	B	5/8	1 1/2	2 1/2	5/8	3.35
120	TS20120	20	6.000	6.100	B	5/8	1 1/2	2 1/2	5/8	4.58

Bored-To-Size

No. Teeth	Part Number	Pressure Angle	Diameter		Type	Bore (Inches)		Setscrew	Hub (Inches)		Weight Lb. (Approx.)
			Pitch	Outside		Stock	Keyway		Diameter	Projection	
12	TS2012BS 5/16	20	0.600	0.700	B	5/16	NONE	#35 P.H.	15/32	7/16	0.04
14	TS2014BS 5/16	20	0.700	0.800	B	5/16	NONE	#35 P.H.	35/64	7/16	0.06
15	TS2015BS 3/8	20	0.750	0.850	B	3/8	NONE	(1) 8-32	39/64	7/16	0.07
16	TS2016BS 3/8	20	0.800	0.900	B	3/8	NONE	(1) 8-32	21/32	7/16	0.08
18	TS2018BS 3/8	20	0.900	1.000	B	3/8	NONE	(1) 10-24	3/4	7/16	0.12
20	TS2020BS 1/2	20	1.000	1.100	B	1/2	NONE	(1) 10-24	55/64	7/16	0.13
24	TS2024BS 1/2	20	1.200	1.300	B	1/2	NONE	(1) 1/4-20	1 1/16	7/16	0.22
25	TS2025BS 1/2	20	1.250	1.350	B	1/2	NONE	(1) 1/4-20	1 7/64	7/16	0.24
30	TS2030BS 1/2	20	1.500	1.600	B	1/2	NONE	(1) 1/4-20	1 23/64	7/16	0.38
35	TS2035BS 1/2	20	1.750	1.850	B	1/2	NONE	(1) 1/4-20	1 9/16	1/2	0.56
40	TS2040BS 1/2	20	2.000	2.100	B	1/2	NONE	(1) 1/4-20	1 13/16	1/2	0.76
40	TS2040BS 5/8	20	2.000	2.100	B	5/8	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/16	1/2	0.76
40	TS2040BS 3/4	20	2.000	2.100	B	3/4	3/16 × 3/32	(1) 1/4-20 @ 90	1 13/16	1/2	0.76

20° P.A. gears will not operate with 14 1/2° P.A.

* Recommended maximum bore with keyway and setscew.

20° Horsepower Ratings (Approximate)

For Class I Service (Service Factor = 1.0)

4 Diametral Pitch **20° Pressure Angle** **3 1/2" Face**

No. Teeth	25 RPM		50 RPM		100 RPM		200 RPM		300 RPM		500 RPM		600 RPM		900 RPM		1200 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
11	2.62		5.09		9.64		17.41		23.81		33.72		37.64		46.69		53.06	
12 •	3.10		6.02		11.40		20.59		28.15		39.88		44.52		55.21		62.75	
13	3.62		7.03		13.30		24.03		32.86		46.55		51.97		64.45		73.25	
14 •	4.07		7.91		14.98		27.06		37.00		52.41		58.51		72.57		82.48	
15 •	4.57		8.88		16.80		30.35		41.51		58.80		65.64		81.41		92.53	
16 •	4.97		9.67		18.30		33.05		45.20		64.03		71.47		88.64		100.75	
17	5.41		10.51		19.90		35.95		49.16		69.64		77.74		96.42			
18 •	5.84		11.35		21.49		38.82		53.09		75.20		83.95		104.12			
19	6.29		12.22		23.13		41.77		57.13		80.93		90.33		112.04			
20 •	6.74		13.11		24.81		44.81		61.29		86.81		96.91					
21	7.19		13.98		26.46		47.79		65.36		92.58		103.34					
22 •	7.65		14.87		28.14		50.83		69.52		98.48		109.93					
24 •	8.52		16.56		31.35		56.63		77.45		109.71		122.47					
25	8.96		17.41		32.95		59.52		81.39		115.30		128.70					
26	9.43		18.32		34.67		62.63		85.65		121.32		135.43					
27	9.90		19.24		36.42		65.79		89.97		127.45		142.27					
28 •	10.39		20.18		38.21		69.01		94.38		133.69		149.24					
30 •	11.32		22.00		41.63		75.20		102.84		145.69							
32 •	12.27		23.85		45.15		81.56		111.54		158.00							
33	12.76		24.80		46.95		84.80		115.97		164.28							
35	13.79		26.81		50.74		91.66		125.35		177.56							
36 •	14.30		27.79		52.61		95.03		129.96		184.10							
40 •	16.40		31.87		60.32		108.95		149.00									
42	17.39		33.80		63.98		115.58		158.06									
44 •	18.41		35.77		67.71		122.31		167.27									
45	18.92		36.77		69.60		125.72		171.93									
48 •	20.54		39.91		75.54		136.46		186.61									
50	21.50		41.78		79.08		142.84		195.35									
52	22.52		43.77		82.85		149.65		204.66									
54	23.56		45.78		86.66		156.54		214.08									
55	24.00		46.63		88.26		159.44		218.04									
56 •	24.49		47.59		90.09		162.73											
60 •	26.62		51.73		97.92		176.87											
64 •	28.60		55.57		105.19		190.01											
66	29.63		57.58		108.99		196.87											
70	31.65		61.50		116.41		210.27											
72 •	32.55		63.26		119.73		216.28											
80 •	36.76		71.43		135.21		244.23											
84	38.86		75.52		142.94		258.21											
88	40.80		79.30		150.09													
90	41.83		81.28		153.85													
96	44.92		87.29		165.23													
100	46.90		91.13		172.50													
108	50.87		98.87		187.14													
110	51.93		100.92		191.03													
112	52.88		102.76		194.50													
120	57.03		110.84		209.79													
144	54.18		105.28		199.28													
160	77.39		150.40		284.68													
200	97.58		189.64		358.95													

ALL STEEL

Ratings are based on strength calculation.

• Designates stock sizes for this pitch.

Note: 1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.

2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

20° Horsepower Ratings (Approximate)

For Class I Service (Service Factor = 1.0)

5 Diametral Pitch — **20° Pressure Angle** — **2 1/2" Face**

No. Teeth	25 RPM		50 RPM		100 RPM		200 RPM		300 RPM		500 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
11 •	1.20		2.35		4.50		8.28		11.49		16.67		18.78		23.82		27.50		32.54	
12	1.42		2.78		5.32		9.79		13.59		19.71		22.21		28.17		32.53			
13 •	1.66		3.25		6.21		11.43		15.86		23.01		25.93		32.88		37.97			
14 •	1.87		3.66		7.00		12.87		17.86		25.90		29.19		37.02		42.75			
15 •	2.10		4.10		7.85		14.44		20.04		29.06		32.75		41.53		47.96			
16	2.29		4.47		8.55		15.72		21.82		31.64		35.66		45.22		52.22			
17 •	2.49		4.86		9.30		17.10		23.73		34.42		38.79		49.19		56.80			
18	2.69		5.25		10.04		18.46		25.63		37.17		41.88		53.11		61.34			
19 •	2.89		5.65		10.80		19.87		27.58		40.00		45.07		57.16		66.01			
20	3.10		6.06		11.59		21.31		29.58		42.91		48.35		61.31					
21	3.31		6.46		12.36		22.73		31.55		45.76		51.56		65.39					
22 •	3.52		6.87		13.15		24.18		33.56		48.67		54.85		69.55					
24 •	3.92		7.66		14.65		26.93		37.39		54.22		61.10		77.49					
25	4.12		8.05		15.39		28.30		39.29		56.98		64.21		81.43					
26	4.33		8.47		16.20		29.78		41.34		59.96		67.57							
27 •	4.55		8.90		17.02		31.29		43.43		62.99		70.98							
28 •	4.78		9.33		17.85		32.82		45.56		66.08		74.46							
30	5.20		10.17		19.45		35.76		49.64		72.00		81.14							
32	5.64		11.03		21.09		38.79		53.84		78.09		88.00							
33 •	5.87		11.47		21.93		40.33		55.98		81.19		91.49							
35	6.34		12.40		23.70		43.59		60.51		87.76		98.89							
36 •	6.58		12.85		24.58		45.19		62.73		90.99									
40	7.54		14.73		28.18		51.81		71.92		104.32									
42	8.00		15.63		29.89		54.96		76.30		110.66									
44 •	8.46		16.54		31.63		58.17		80.74		117.11									
45	8.70		17.00		32.51		59.79		82.99											
48 •	9.44		18.45		35.29		64.89		90.08											
50	9.89		19.32		36.94		67.93		94.30											
52	10.36		20.24		38.70		71.17		98.79											
54	10.83		21.17		40.48		74.44		103.34											
55	11.03		21.56		41.23		75.82		105.25											
56 •	11.26		22.01		42.08		77.39		107.42											
60	12.24		23.92		45.74		84.11		116.76											
64	13.15		25.70		49.14		90.36		125.43											
66 •	13.62		26.62		50.91		93.62		129.96											
70	14.55		28.44		54.38		100.00		138.81											
72 •	14.97		29.25		55.93		102.85													
80	16.90		33.03		63.16		116.15													
84	17.87		34.92		66.78		122.79													
88 •	18.76		36.67		70.12		128.93													
90	19.23		37.58		71.87		132.16													
96 •	20.65		40.36		77.19		141.93													
100	21.56		42.14		80.58															
108 •	23.39		45.71		87.42															
110	23.88		46.67		89.24															
112 •	24.31		47.51																	
120	26.23		51.25																	
144	24.91		48.68																	
160	35.59		69.54																	
200	44.87		87.69																	

ALL STEEL

Ratings are based on strength calculation.

• Designates stock sizes for this pitch.

Note: 1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.

2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

20° Horsepower Ratings (Approximate)

For Class I Service (Service Factor = 1.0)

6 Diametral Pitch **20° Pressure Angle** **2" Face**

No. Teeth	25 RPM		50 RPM		100 RPM		200 RPM		300 RPM		500 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
11 •	0.67		1.32		2.54		4.73		6.63		9.79		11.11		14.34		16.78		20.21	
12 •	0.79		1.56		3.00		5.59		7.84		11.58		13.14		16.96		19.84		23.91	
13	0.93		1.82		3.50		6.52		9.15		13.51		15.34		19.80		23.16		27.91	
14 •	1.04		2.05		3.94		7.35		10.31		15.21		17.27		22.29		26.08		31.42	
15 •	1.17		2.30		4.43		8.24		11.56		17.07		19.37		25.01		29.26		35.25	
16 •	1.28		2.50		4.82		8.97		12.59		18.58		21.10		27.23		31.85		38.38	
17	1.39		2.72		5.24		9.76		13.69		20.21		22.95		29.61		34.65			
18 •	1.50		2.94		5.66		10.54		14.79		21.83		24.78		31.98		37.42			
19	1.61		3.16		6.09		11.34		15.91		23.49		26.66		34.41		40.26			
20	1.73		3.39		6.53		12.17		17.07		25.20		28.60		36.92		43.19			
21 •	1.84		3.62		6.97		12.97		18.21		26.87		30.50		39.37		46.06			
22	1.96		3.85		7.41		13.80		19.37		28.59		32.45		41.88		49.00			
24 •	2.19		4.29		8.26		15.38		21.57		31.85		36.15		46.65		54.59			
25	2.30		4.51		8.68		16.16		22.67		33.47		37.99		49.03					
26	2.42		4.74		9.13		17.00		23.86		35.22		39.97		51.59					
27 •	2.54		4.98		9.59		17.86		25.06		37.00		41.99		54.20					
28	2.66		5.22		10.06		18.74		26.29		38.81		44.05		56.85					
30 •	2.90		5.69		10.97		20.42		28.65		42.29		48.00		61.95					
32	3.15		6.17		11.89		22.14		31.07		45.86		52.06							
33 •	3.27		6.42		12.36		23.02		32.31		47.69		54.13							
35	3.54		6.94		13.36		24.88		34.92		51.54		58.50							
36 •	3.67		7.19		13.86		25.80		36.20		53.44		60.66							
40	4.21		8.25		15.89		29.58		41.51		61.27		69.54							
42 •	4.46		8.75		16.85		31.38		44.03		64.99		73.77							
44	4.72		9.26		17.83		33.21		46.59		68.78		78.07							
45	4.85		9.52		18.33		34.13		47.89		70.70		80.25							
48 •	5.27		10.33		19.90		37.05		51.98		76.73									
50	5.51		10.81		20.83		38.78		54.42		80.32									
52	5.78		11.33		21.82		40.63		57.01		84.15									
54 •	6.04		11.85		22.82		42.50		59.63		88.02									
55	6.15		12.07		23.25		43.29		60.74											
56	6.28		12.32		23.73		44.18		61.99											
60 •	6.83		13.39		25.79		48.02		67.38											
64 •	7.33		14.39		27.70		51.59		72.38											
66 •	7.60		14.91		28.71		53.45		75.00											
70	8.12		15.92		30.66		57.09		80.10											
72 •	8.35		16.37		31.54		58.72		82.39											
80	9.43		18.49		35.61		66.31		93.04											
84 •	9.97		19.55		37.65		70.10		98.36											
88	10.46		20.53		39.53		73.61		103.28											
90	10.73		21.04		40.52		75.45													
96 •	11.52		22.60		43.52		81.03													
100	12.03		23.59		45.43		84.60													
108 •	13.05		25.59		49.29		91.77													
110	13.32		26.12		50.31		93.68													
112	13.56		26.60		51.23		95.39													
120 •	14.63		28.69		55.25															
144	13.89		27.25		52.49															
160	19.85		38.93		74.98															
200	25.03		49.09		94.54															

ALL STEEL

Ratings are based on strength calculation.

• Designates stock sizes for this pitch.

Note: 1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.

2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

20° Horsepower Ratings (Approximate)

For Class I Service (Service Factor = 1.0)

8 Diametral Pitch — **20° Pressure Angle** — **1 1/2" Face**

No. Teeth	25 RPM		50 RPM		100 RPM		200 RPM		300 RPM		500 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
11	0.28		0.56		1.09		2.06		2.94		4.45		5.10		6.76		8.07		10.00	
12 •	0.34		0.66		1.29		2.44		3.48		5.26		6.03		7.99		9.54		11.83	
13	0.39		0.78		1.51		2.85		4.06		6.14		7.04		9.33		11.14		13.81	
14 •	0.44		0.87		1.70		3.21		4.57		6.91		7.93		10.50		12.54		15.55	
15 •	0.50		0.98		1.90		3.60		5.13		7.76		8.90		11.78		14.07		17.45	
16 •	0.54		1.07		2.07		3.92		5.58		8.44		9.69		12.83		15.31		18.99	
17	0.59		1.16		2.25		4.26		6.07		9.18		10.53		13.95		16.66		20.66	
18 •	0.64		1.25		2.43		4.61		6.56		9.92		11.38		15.07		17.99		22.31	
19 •	0.68		1.35		2.62		4.96		7.06		10.67		12.24		16.22		19.36		24.01	
20 •	0.73		1.45		2.81		5.32		7.57		11.45		13.13		17.40		20.77		25.76	
21	0.78		1.54		3.00		5.67		8.07		12.21		14.00		18.55		22.14			
22 •	0.83		1.64		3.19		6.03		8.59		12.99		14.90		19.73		23.56			
24 •	0.93		1.83		3.55		6.72		9.56		14.47		16.60		21.98		26.24			
25	0.97		1.92		3.73		7.06		10.05		15.21		17.44		23.10		27.58			
26 •	1.02		2.02		3.93		7.43		10.58		16.00		18.35		24.31		29.02			
27	1.08		2.12		4.12		7.80		11.11		16.81		19.28		25.54		30.49			
28 •	1.13		2.23		4.33		8.19		11.66		17.63		20.22		26.79		31.98			
30 •	1.23		2.43		4.71		8.92		12.70		19.21		22.04		29.19		34.85			
32 •	1.33		2.63		5.11		9.68		13.77		20.84		23.90		31.66					
33	1.39		2.73		5.31		10.06		14.32		21.67		24.85		32.92					
35	1.50		2.96		5.74		10.87		15.48		23.42		26.86		35.58					
36 •	1.56		3.06		5.96		11.27		16.05		24.28		27.85		36.89					
40 •	1.78		3.51		6.83		12.92		18.40		27.84		31.93		42.29					
42 •	1.89		3.73		7.24		13.71		19.52		29.53		33.87		44.86					
44 •	2.00		3.94		7.67		14.51		20.66		31.25		35.84		47.48					
45	2.06		4.05		7.88		14.91		21.23		32.12		36.84				**STEEL**			
48 •	2.23		4.40		8.55		16.19		23.05		34.86		39.99							
50		1.12		2.21		4.30		8.13		11.58		17.52		20.09			**CAST**			
52 •		1.18		2.32		4.50		8.52		12.13		18.35		21.05						
54		1.23		2.42		4.71		8.91		12.69		19.20		22.02						
55		1.25		2.47		4.80		9.08		12.93		19.55		22.43						
56 •		1.28		2.52		4.90		9.27		13.19		19.96		22.89						
60 •		1.39		2.74		5.32		10.07		14.34		21.69		24.88						
64 •		1.49		2.94		5.72		10.82		15.40		23.30								
66		1.55		3.05		5.92		11.21		15.96		24.14								
70		1.65		3.26		6.33		11.97		17.05		25.79								
72 •		1.70		3.35		6.51		12.32		17.53										
80 •		1.92		3.78		7.35		13.91		19.80										
84		2.03		4.00		7.77		14.70		20.93										
88 •		2.13		4.20		8.16		15.44		21.98										
90		2.18		4.30		8.36		15.82		22.53										
96 •		2.34		4.62		8.98		16.99		24.20										
100		2.45		4.82		9.37		17.74		25.26										
108		2.66		5.23		10.17		19.25		27.40										
110		2.71		5.34		10.38		19.65		27.97										
112 •		2.76		5.44		10.57		20.01		28.48										
120 •		2.98		5.87		11.40		21.58		30.72										
144 •		2.83		5.57		10.83		20.50												
160 •		4.04		7.96		15.47		29.28												
200		5.09		10.04		19.51		36.92												

Ratings are based on strength calculation.

• Designates stock sizes for this pitch.

Note: 1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.

2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

20° Horsepower Ratings (Approximate)

For Class I Service (Service Factor = 1.0)

10 Diametral Pitch | **20° Pressure Angle** | **1 1/4" Face**

No. Teeth	25 RPM		50 RPM		100 RPM		200 RPM		300 RPM		500 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
11	0.15		0.30		0.59		1.13		1.62		2.49		2.87		3.88		4.70		5.95	
12 •	0.18		0.36		0.70		1.33		1.91		2.94		3.40		4.58		5.55		7.04	
13	0.21		0.42		0.81		1.55		2.23		3.43		3.97		5.35		6.48		8.22	
14 •	0.24		0.47		0.91		1.75		2.51		3.87		4.47		6.02		7.30		9.25	
15 •	0.27		0.53		1.03		1.96		2.82		4.34		5.01		6.76		8.19		10.38	
16 •	0.29		0.57		1.12		2.14		3.07		4.72		5.45		7.36		8.91		11.30	
17	0.31		0.62		1.22		2.32		3.34		5.14		5.93		8.00		9.70		12.30	
18 •	0.34		0.67		1.31		2.51		3.61		5.55		6.41		8.64		10.47		13.28	
19	0.37		0.72		1.41		2.70		3.88		5.97		6.89		9.30		11.27		14.29	
20 •	0.39		0.78		1.52		2.90		4.16		6.40		7.40		9.98		12.09		15.33	
21	0.42		0.83		1.62		3.09		4.44		6.83		7.89		10.64		12.89		16.35	
22 •	0.44		0.88		1.72		3.29		4.72		7.26		8.39		11.32		13.71		17.39	
24 •	0.50		0.98		1.91		3.66		5.26		8.09		9.35		12.61		15.28		19.37	
25 •	0.52		1.03		2.01		3.85		5.53		8.50		9.82		13.25		16.05		20.36	
26 •	0.55		1.08		2.12		4.05		5.82		8.95		10.34		13.94		16.89			
27	0.58		1.14		2.22		4.25		6.11		9.40		10.86		14.65		17.75			
28 •	0.60		1.19		2.33		4.46		6.41		9.86		11.39		15.37		18.61			
30 •	0.66		1.30		2.54		4.86		6.99		10.74		12.41		16.74		20.28			
32 •	0.71		1.41		2.76		5.27		7.58		11.65		13.46		18.16		22.00			
33	0.74		1.47		2.87		5.48		7.88		12.11		14.00		18.88		22.87			
35 •	0.80		1.59		3.10		5.93		8.52		13.09		15.13		20.41		24.72			
36 •	0.83		1.64		3.21		6.14		8.83		13.58		15.68		21.16		25.63			
40 •	0.95		1.88		3.68		7.04		10.12		15.56		17.98		24.26					
42	1.01		2.00		3.91		7.47		10.74		16.51		19.07		25.73					
44	1.07		2.12		4.14		7.91		11.36		17.47		20.19		27.23					
45 •	1.10		2.18		4.25		8.13		11.68		17.96		20.75		27.99					
48 •	1.19		2.36		4.61		8.82		12.68		19.49		22.52		30.38					
50 •	1.25		2.47		4.83		9.24		13.27		20.41		23.57							
52	1.31		2.59		5.06		9.68		13.90		21.38		24.70							
54	1.37		2.71		5.29		10.12		14.54		22.36		25.83							
55 •	1.40		2.76		5.39		10.31		14.81		22.78		26.31							
56	1.42		2.82		5.50		10.52		15.12		23.25		26.86				**STEEL**			
60 •	1.55		3.06		5.98		11.44		16.43		25.27		29.19							
64		0.80		1.58		3.08		5.90		8.47		13.03		15.05			**CAST**			
66		0.83		1.63		3.19		6.11		8.78		13.50		15.60						
70 •		0.88		1.75		3.41		6.53		9.38		14.42		16.66						
72		0.91		1.80		3.51		6.71		9.65		14.83		17.13						
80 •		1.03		2.03		3.96		7.58		10.89		16.75								
84		1.08		2.14		4.19		8.01		11.52		17.71								
88		1.14		2.25		4.40		8.41		12.09		18.59								
90 •		1.17		2.31		4.51		8.62		12.39		19.06								
96		1.25		2.48		4.84		9.26		13.31										
100 •		1.31		2.59		5.06		9.67		13.90										
108		1.42		2.81		5.49		10.49		15.08										
110		1.45		2.87		5.60		10.71		15.39										
112		1.48		2.92		5.70		10.90		15.67										
120		1.59		3.15		6.15		11.76		16.90										
144		1.51		2.99		5.84		11.17		16.05										
160		2.16		4.27		8.35		15.96		22.93										
200		2.72		5.38		10.52		20.12		28.92										

Ratings are based on strength calculation.

• Designates stock sizes for this pitch.

Note: 1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.

2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

20° Horsepower Ratings (Approximate)

For Class I Service (Service Factor = 1.0)

12 Diametral Pitch **20° Pressure Angle** **1" Face**

No. Teeth	25 RPM		50 RPM		100 RPM		200 RPM		300 RPM		500 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
11	0.08		0.17		0.33		0.63		0.92		1.43		1.66		2.27		2.78		3.58	
12 •	0.10		0.20		0.39		0.75		1.09		1.69		1.96		2.68		3.28		4.24	
13 •	0.12		0.23		0.45		0.88		1.27		1.97		2.29		3.13		3.83		4.95	
14 •	0.13		0.26		0.51		0.99		1.43		2.22		2.58		3.52		4.32		5.57	
15 •	0.15		0.29		0.57		1.11		1.60		2.49		2.89		3.95		4.84		6.25	
16 •	0.16		0.32		0.63		1.20		1.74		2.71		3.15		4.30		5.27		6.81	
17	0.18		0.35		0.68		1.31		1.90		2.95		3.42		4.68		5.74		7.40	
18 •	0.19		0.37		0.73		1.42		2.05		3.18		3.70		5.06		6.19		7.99	
19 •	0.20		0.40		0.79		1.52		2.20		3.43		3.98		5.44		6.67		8.60	
20 •	0.22		0.43		0.85		1.63		2.36		3.68		4.27		5.84		7.15		9.23	
21 •	0.23		0.46		0.90		1.74		2.52		3.92		4.55		6.22		7.63		9.84	
22 •	0.25		0.49		0.96		1.85		2.68		4.17		4.84		6.62		8.11		10.47	
24 •	0.28		0.55		1.07		2.06		2.99		4.64		5.39		7.38		9.04		11.66	
25 •	0.29		0.57		1.13		2.17		3.14		4.88		5.67		7.75		9.50		12.26	
26 •	0.31		0.60		1.19		2.28		3.30		5.14		5.96		8.16		9.99		12.90	
27	0.32		0.63		1.25		2.40		3.47		5.40		6.27		8.57		10.50		13.55	
28 •	0.34		0.67		1.31		2.52		3.64		5.66		6.57		8.99		11.01		14.21	
30 •	0.37		0.73		1.42		2.74		3.96		6.17		7.16		9.79		12.00		15.49	
32 •	0.40		0.79		1.54		2.97		4.30		6.69		7.77		10.62		13.01			
33	0.41		0.82		1.61		3.09		4.47		6.95		8.08		11.05		13.53			
35	0.45		0.88		1.73		3.34		4.83		7.52		8.73		11.94		14.63			
36 •	0.46		0.92		1.80		3.46		5.01		7.79		9.05		12.38		15.16			
40	0.53		1.05		2.06		3.97		5.74		8.94		10.38		14.19		17.39			
42 •	0.56		1.12		2.19		4.21		6.09		9.48		11.01		15.05		18.44			
44	0.60		1.18		2.32		4.46		6.45		10.03		11.65		15.93		19.52			
45	0.61		1.21		2.38		4.58		6.63		10.31		11.97		16.37		20.06			
48 •	0.66		1.32		2.58		4.97		7.19		11.19		13.00		17.77					
50	0.70		1.38		2.70		5.21		7.53		11.71		13.60		18.60					
52	0.73		1.44		2.83		5.45		7.89		12.27		14.25		19.49					
54 •	0.76		1.51		2.96		5.71		8.25		12.84		14.91		20.39					
55	0.78		1.54		3.02		5.81		8.41		13.08		15.18		20.77					
56	0.79		1.57		3.08		5.93		8.58		13.35		15.50		21.19					
60 •	0.86		1.71		3.35		6.45		9.33		14.51		16.84		23.04					
64	0.93		1.83		3.60		6.93		10.02		15.58		18.10		24.75					
66 •	0.96		1.90		3.73		7.18		10.38		16.15		18.75							
70	1.02		2.03		3.98		7.66		11.09		17.24		20.03				**STEEL**			
72 •	1.05		2.09		4.09		7.88		11.40											
80		0.57		1.13		2.22		4.27		6.18		9.61		11.16			**CAST**			
84 •		0.60		1.20		2.35		4.52		6.53		10.16		11.80						
88		0.63		1.26		2.46		4.74		6.86		10.67		12.39						
90		0.65		1.29		2.52		4.86		7.03		10.94								
96 •		0.70		1.38		2.71		5.22		7.55		11.75								
100		0.73		1.44		2.83		5.45		7.89		12.27								
108 •		0.79		1.57		3.07		5.91		8.55		13.31								
110		0.81		1.60		3.13		6.04		8.73		13.58								
112		0.82		1.63		3.19		6.15		8.89										
120 •		0.89		1.76		3.44		6.63		9.59										
144 •		0.84		1.67		3.27		6.30		9.11										
160		1.20		2.38		4.67		9.00		13.01										
200		1.52		3.00		5.89		11.34		16.41										

Ratings are based on strength calculation.

• Designates stock sizes for this pitch.

Note: 1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.

2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

20° Horsepower Ratings (Approximate)

For Class I Service (Service Factor = 1.0)

16 Diametral Pitch **20° Pressure Angle** **3/4" Face**

No. Teeth	25 RPM		50 RPM		100 RPM		200 RPM		300 RPM		500 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
11	0.04		0.07		0.14		0.27		0.40		0.63		0.73		1.02		1.28		1.69	
12 •	0.04		0.08		0.17		0.32		0.47		0.74		0.87		1.21		1.51		2.00	
13 •	0.05		0.10		0.19		0.38		0.55		0.87		1.01		1.41		1.76		2.33	
14 •	0.06		0.11		0.22		0.42		0.62		0.98		1.14		1.59		1.98		2.63	
15 •	0.06		0.12		0.24		0.48		0.69		1.10		1.28		1.79		2.22		2.95	
16 •	0.07		0.14		0.27		0.52		0.76		1.19		1.40		1.94		2.42		3.21	
17 •	0.07		0.15		0.29		0.56		0.82		1.30		1.52		2.12		2.63		3.49	
18 •	0.08		0.16		0.31		0.61		0.89		1.40		1.64		2.28		2.84		3.77	
19	0.09		0.17		0.34		0.65		0.95		1.51		1.76		2.46		3.06		4.05	
20 •	0.09		0.18		0.36		0.70		1.02		1.62		1.89		2.64		3.28		4.35	
21 •	0.10		0.20		0.39		0.75		1.09		1.73		2.02		2.81		3.50		4.64	
22 •	0.10		0.21		0.41		0.80		1.16		1.84		2.15		2.99		3.72		4.93	
24 •	0.12		0.23		0.46		0.89		1.29		2.04		2.39		3.33		4.15		5.50	
25	0.12		0.24		0.48		0.93		1.36		2.15		2.51		3.50		4.36		5.78	
26 •	0.13		0.26		0.50		0.98		1.43		2.26		2.64		3.69		4.59		6.08	
27	0.14		0.27		0.53		1.03		1.50		2.38		2.78		3.87		4.82		6.38	
28 •	0.14		0.28		0.56		1.08		1.58		2.49		2.91		4.06		5.06		6.70	
30 •	0.15		0.31		0.61		1.18		1.72		2.72		3.18		4.43		5.51		7.30	
32 •	0.17		0.33		0.66		1.28		1.86		2.94		3.44		4.80		5.98		7.91	
33	0.17		0.35		0.68		1.33		1.94		3.06		3.58		4.99		6.21		8.23	
35	0.19		0.37		0.74		1.44		2.09		3.31		3.87		5.39		6.72		8.89	
36 •	0.20		0.39		0.77		1.49		2.17		3.43		4.01		5.59		6.96		9.22	
40 •	0.22		0.45		0.88		1.71		2.49		3.93		4.60		6.41		7.98		10.57	
42	0.24		0.47		0.93		1.81		2.64		4.17		4.88		6.80		8.47			
44	0.25		0.50		0.99		1.92		2.80		4.42		5.16		7.20		8.96			
45	0.26		0.51		1.01		1.97		2.87		4.54		5.31		7.40		9.21			
48 •	0.28		0.56		1.10		2.14		3.12		4.93		5.76		8.03		10.00			
50	0.29		0.58		1.15		2.24		3.26		5.16		6.03		8.41		10.47			
52	0.31		0.61		1.21		2.34		3.42		5.40		6.32		8.81		10.96			
54	0.32		0.64		1.26		2.45		3.58		5.65		6.61		9.21		11.47			
55	0.33		0.65		1.29		2.50		3.64		5.76		6.73		9.38		11.68			
56 •	0.34		0.67		1.31		2.55		3.72		5.88		6.87		9.58					
60 •	0.36		0.72		1.43		2.77		4.04		6.39		7.47		10.41					
64 •	0.39		0.78		1.53		2.98		4.34		6.86		8.02		11.18					
66	0.41		0.81		1.59		3.08		4.50		7.11		8.31		11.58					
70	0.43		0.86		1.70		3.29		4.81		7.59		8.88		12.37					
72 •	0.45		0.88		1.74		3.39		4.94		7.81		9.13		12.73					
80 •	0.50		1.00		1.97		3.83		5.58		8.82		10.31		14.37					
84 •	0.53		1.06		2.08		4.05		5.90		9.32		10.90		15.19					
88 •	0.56		1.11		2.19		4.25		6.20		9.79		11.45							
90	0.57		1.14		2.24		4.35		6.35		10.03		11.73							
96 •	0.62		1.22		2.41		4.68		6.82		10.78		12.60							
100	0.64		1.27		2.51		4.88		7.12		11.25		13.16							
108		0.33		0.66		1.31		2.54		3.71		5.86		6.85						
110		0.34		0.68		1.34		2.60		3.79		5.98		6.99						
112 •		0.35		0.69		1.36		2.64		3.85		6.09		7.12						
120		0.37		0.74		1.47		2.85		4.16		6.57		7.68						
144 •		0.36		0.71		1.39		2.71		3.95		6.24								
160 •		0.51		1.01		1.99		3.87		5.64		8.91								
200		0.64		1.27		2.51		4.88		7.11		11.24								

STEEL

CAST

Ratings are based on strength calculation.

• Designates stock sizes for this pitch.

Note: 1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.

2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

20° Horsepower Ratings (Approximate)

For Class I Service (Service Factor = 1.0)

20 Diametral Pitch **20° Pressure Angle** **1/2" Face**

No. Teeth	25 RPM		50 RPM		100 RPM		200 RPM		300 RPM		500 RPM		600 RPM		900 RPM		1200 RPM		1800 RPM	
	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI	S	CI
11	0.02		0.03		0.06		0.12		0.17		0.28		0.32		0.46		0.57		0.78	
12 •	0.02		0.04		0.07		0.14		0.20		0.33		0.38		0.54		0.68		0.92	
13	0.02		0.04		0.08		0.16		0.24		0.38		0.45		0.63		0.79		1.07	
14 •	0.02		0.05		0.09		0.18		0.27		0.43		0.50		0.71		0.89		1.20	
15 •	0.03		0.05		0.11		0.21		0.30		0.48		0.56		0.80		1.00		1.35	
16 •	0.03		0.06		0.11		0.22		0.33		0.52		0.61		0.87		1.09		1.47	
17	0.03		0.06		0.12		0.24		0.36		0.57		0.67		0.94		1.19		1.60	
18 •	0.03		0.07		0.13		0.26		0.38		0.61		0.72		1.02		1.28		1.73	
19	0.04		0.07		0.14		0.28		0.41		0.66		0.78		1.10		1.38		1.86	
20 •	0.04		0.08		0.16		0.30		0.44		0.71		0.83		1.18		1.48		2.00	
21 •	0.04		0.08		0.17		0.32		0.47		0.76		0.89		1.25		1.58		2.13	
22 •	0.04		0.09		0.18		0.34		0.50		0.80		0.94		1.33		1.68		2.26	
24 •	0.05		0.10		0.20		0.38		0.56		0.90		1.05		1.49		1.87		2.52	
25 •	0.05		0.10		0.21		0.40		0.59		0.94		1.11		1.56		1.96		2.65	
26	0.06		0.11		0.22		0.42		0.62		0.99		1.16		1.64		2.07		2.79	
27	0.06		0.12		0.23		0.44		0.65		1.04		1.22		1.73		2.17		2.93	
28 •	0.06		0.12		0.24		0.47		0.68		1.09		1.28		1.81		2.28		3.07	
30 •	0.07		0.13		0.26		0.51		0.75		1.19		1.40		1.97		2.48		3.35	
32 •	0.07		0.14		0.28		0.55		0.81		1.29		1.52		2.14		2.69		3.63	
33	0.07		0.15		0.29		0.57		0.84		1.34		1.58		2.22		2.80		3.78	
35 •	0.08		0.16		0.32		0.62		0.91		1.45		1.70		2.40		3.03		4.08	
36 •	0.08		0.17		0.33		0.64		0.94		1.50		1.77		2.49		3.14		4.23	
40 •	0.10		0.19		0.38		0.74		1.08		1.72		2.02		2.86		3.60		4.85	
42	0.10		0.20		0.40		0.78		1.15		1.83		2.15		3.03		3.81		5.15	
44	0.11		0.21		0.42		0.83		1.21		1.93		2.27		3.21		4.04		5.45	
45 •	0.11		0.22		0.44		0.85		1.25		1.99		2.34		3.30		4.15		5.60	
48	0.12		0.24		0.47		0.92		1.35		2.16		2.54		3.58		4.50		6.08	
50 •	0.13		0.25		0.49		0.97		1.42		2.26		2.65		3.75		4.71		6.36	
52	0.13		0.26		0.52		1.01		1.48		2.37		2.78		3.92		4.94		6.66	
54	0.14		0.27		0.54		1.06		1.55		2.48		2.91		4.10		5.17			
55	0.14		0.28		0.55		1.08		1.58		2.52		2.96		4.18		5.26			
56	0.14		0.28		0.56		1.10		1.61		2.57		3.02		4.27		5.37			
60 •	0.16		0.31		0.61		1.20		1.75		2.80		3.29		4.64		5.84			
64	0.17		0.33		0.66		1.28		1.88		3.01		3.53		4.98		6.27			
66	0.17		0.34		0.68		1.33		1.95		3.11		3.66		5.16		6.50			
70 •	0.19		0.37		0.73		1.42		2.08		3.33		3.91		5.51		6.94			
72 •	0.19		0.38		0.75		1.46		2.14		3.42		4.02		5.67		7.14			
80 •	0.22		0.43		0.85		1.65		2.42		3.86		4.54		6.40					
84 •	0.23		0.45		0.89		1.75		2.56		4.08		4.80		6.77					
88	0.24		0.47		0.94		1.83		2.69		4.29		5.04		7.11					
90 •	0.24		0.49		0.96		1.88		2.76		4.40		5.16		7.29					
96 •	0.26		0.52		1.03		2.02		2.96		4.72		5.55		7.83					
100 •	0.27		0.55		1.08		2.11		3.09		4.93		5.79		8.17					
108	0.30		0.59		1.17		2.29		3.35		5.35		6.28							
110	0.30		0.60		1.19		2.33		3.42		5.46		6.41							
112	0.31		0.62		1.22		2.38		3.48		5.56		6.53							
120 •	0.33		0.66		1.31		2.56		3.76		5.99		7.04							
144	0.32		0.63		1.25		2.43		3.57		5.69		6.69							
160	0.45		0.90		1.78		3.48		5.10		8.13		9.56							
200	0.57		1.14		2.24		4.38		6.43		10.26		12.05							

ALL STEEL

Ratings are based on strength calculation.

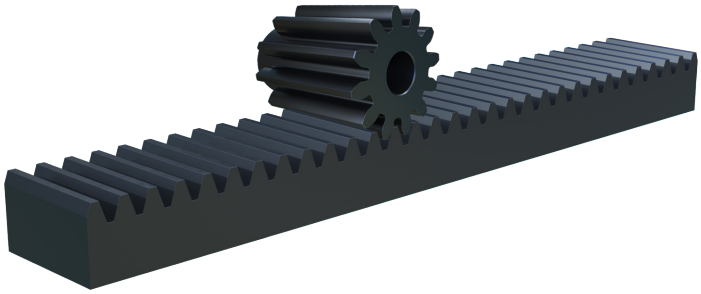
• Designates stock sizes for this pitch.

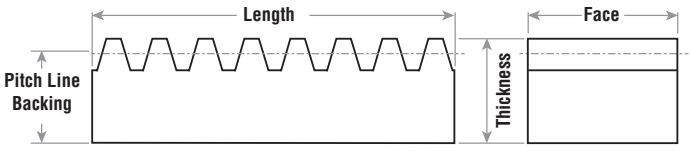
Note: 1. Pitch line velocities exceeding 1000 feet per minute are not recommended. They should be used for interpolation purposes only.

2. Non-metallic gears are most commonly used for the driving pinion of a pair of gears, with mating gear made of cast iron or steel, where pitch line velocities exceed 1000 FPM and are not subjected to shock loads.

Machined Gear Rack

Martin rack is made from low carbon cold drawn steel. It is available in 14½° and 20° pressure angle in 2, 4, and 6 foot lengths. Allowance is made for cutting and machining. Pinions to run with the rack may be selected from the spur gear section of the catalog. Special rack can be supplied in other materials, sizes, and pitches.





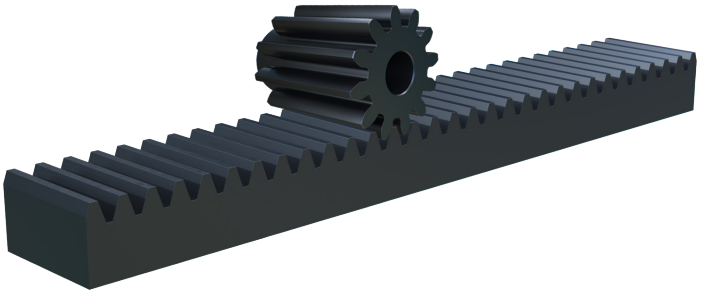
Rack in lengths up to 12' available on request

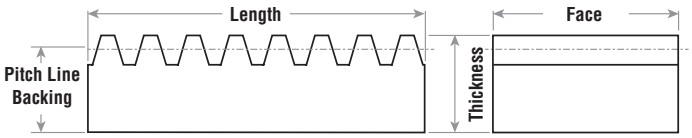
Standard Face Width
Steel — 14½° & 20° Pressure Angle

Part Number		Pitch	Face Width	Overall Thickness	Pitch Line Backing	App. Wt. lb/pc
14½° P.A.	20° P.A.					
R3x2	TR3x2	3	3	1 1/2	1.167	24.00
R3x4	TR3x4	3	3	1 1/2	1.167	48.00
R3x6	TR3x6	3	3	1 1/2	1.167	72.00
R4x2	TR4x2	4	2	1 1/2	1.250	17.40
R4x4	TR4x4	4	2	1 1/2	1.250	34.80
R4x6	TR4x6	4	2	1 1/2	1.250	52.20
RA4x2		4	2	2	1.750	23.60
RA4x4		4	2	2	1.750	47.20
RA4x6		4	2	2	1.750	70.80
R5x2	TR5x2	5	1 3/4	1 1/4	1.050	12.80
R5x4	TR5x4	5	1 3/4	1 1/4	1.050	25.60
R5x6	TR5x6	5	1 3/4	1 1/4	1.050	38.40
RA5x2		5	1 3/4	1 1/2	1.300	16.00
RA5x4		5	1 3/4	1 1/2	1.300	32.00
RA5x6		5	1 3/4	1 1/2	1.300	48.00
R6x2		6	1 1/2	1	0.833	8.60
R6x4		6	1 1/2	1	0.833	17.20
R6x6		6	1 1/2	1	0.833	25.80
RA6x2	TR6x2	6	1 1/2	1 1/2	1.333	13.80
RA6x4	TR6x4	6	1 1/2	1 1/2	1.333	27.60
RA6x6	TR6x6	6	1 1/2	1 1/2	1.333	41.40
R8x2		8	1 1/4	3/4	0.625	5.20
R8x4		8	1 1/4	3/4	0.625	10.40
R8x6		8	1 1/4	3/4	0.625	15.60
RA8x2	TR8x2	8	1 1/4	1 1/4	1.125	9.80
RA8x4	TR8x4	8	1 1/4	1 1/4	1.125	19.60
RA8x6	TR8x6	8	1 1/4	1 1/4	1.125	29.40
R10x2		10	1	5/8	0.525	3.60
R10x4		10	1	5/8	0.525	7.20
R10x6		10	1	5/8	0.525	10.80
RA10x2	TR10x2	10	1	1	0.900	6.00
RA10x4	TR10x4	10	1	1	0.900	12.00
RA10x6	TR10x6	10	1	1	0.900	18.00
R12x2		12	3/4	1/2	0.417	2.00
R12x4		12	3/4	1/2	0.417	4.00
R12x6		12	3/4	1/2	0.417	6.00
RA12x2	TR12x2	12	3/4	3/4	0.667	3.40
RA12x4	TR12x4	12	3/4	3/4	0.667	6.80
RA12x6	TR12x6	12	3/4	3/4	0.667	10.20
R16x2		16	5/16	5/16	0.250	0.50
R16x4		16	5/16	5/16	0.250	1.00
R16x6		16	5/16	5/16	0.250	1.50
RA16x2	TR16x2	16	1/2	1/2	0.438	1.52
RA16x4	TR16x4	16	1/2	1/2	0.438	3.04
RA16x6	TR16x6	16	1/2	1/2	0.438	4.56
R20x2	TR20x2	20	3/8	3/8	0.325	0.84
R20x4	TR20x4	20	3/8	3/8	0.325	1.68
R20x6	TR20x6	20	3/8	3/8	0.325	2.52
R24x2		24	1/4	1/4	0.208	0.38
R24x4		24	1/4	1/4	0.208	0.76
R24x6		24	1/4	1/4	0.208	1.14

Machined Gear Rack

Martin Rack is made from low carbon cold drawn steel. It is available in 14½° and 20° pressure angle in 2, 4, and 6 foot lengths. Allowance is made for cutting and machining. Pinions to run with the rack may be selected from the Spur Gear section of the catalog. Special rack can be supplied in other materials, sizes, and pitches.





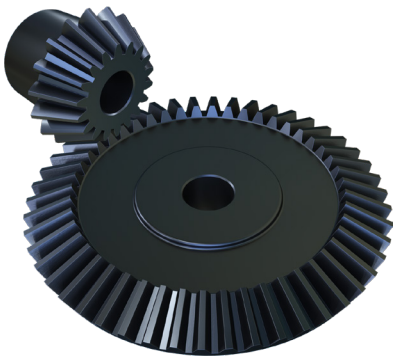
Wide Face Width
Steel — 20° Pressure Angle

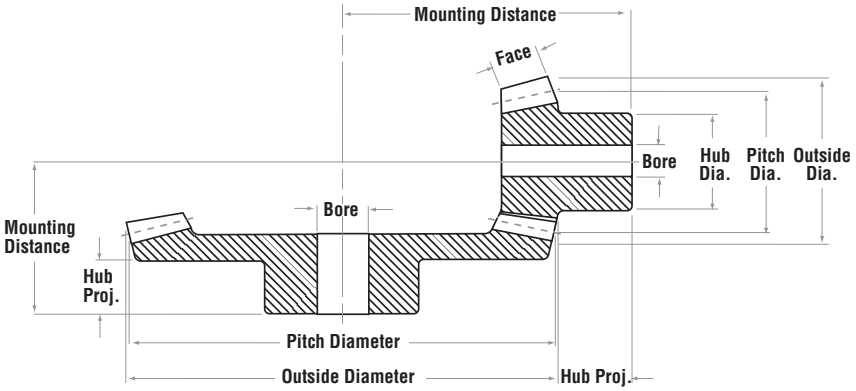
Part Number	Pitch	Face Width	Overall Thickness	Pitch Line Backing	App. Wt. lb/pc
R204x2	4	3 1/2	2	1.750	41.0
R204x4	4	3 1/2	2	1.750	82.0
R204x6	4	3 1/2	2	1.750	123.0
R205x2	5	2 1/2	1 1/2	1.300	22.4
R205x4	5	2 1/2	1 1/2	1.300	44.8
R205x6	5	2 1/2	1 1/2	1.300	67.2
R206x2	6	2	1 1/2	1.333	17.0
R206x4	6	2	1 1/2	1.333	34.0
R206x6	6	2	1 1/2	1.333	51.0
R208x2	8	1 1/2	1 1/2	1.375	13.8
R208x4	8	1 1/2	1 1/2	1.375	27.6
R208x6	8	1 1/2	1 1/2	1.375	41.3
R2010x2	10	1 1/4	1 1/4	1.150	9.0
R2010x4	10	1 1/4	1 1/4	1.150	18.0
R2010x6	10	1 1/4	1 1/4	1.150	27.0
R2012x2	12	1	1	0.917	6.4
R2012x4	12	1	1	0.917	12.8
R2012x6	12	1	1	0.917	19.2
R2016x2	16	3/4	3/4	0.688	3.4
R2016x4	16	3/4	3/4	0.688	6.8
R2016x6	16	3/4	3/4	0.688	10.2
R2020x2	20	1/2	1/2	0.450	0.8
R2020x4	20	1/2	1/2	0.450	1.6
R2020x6	20	1/2	1/2	0.450	2.5

Martin Stocks 14½°and 20° Spur Gears

Rack in lengths up to 12' available on request

Bevel Gears
20° Pressure Angle





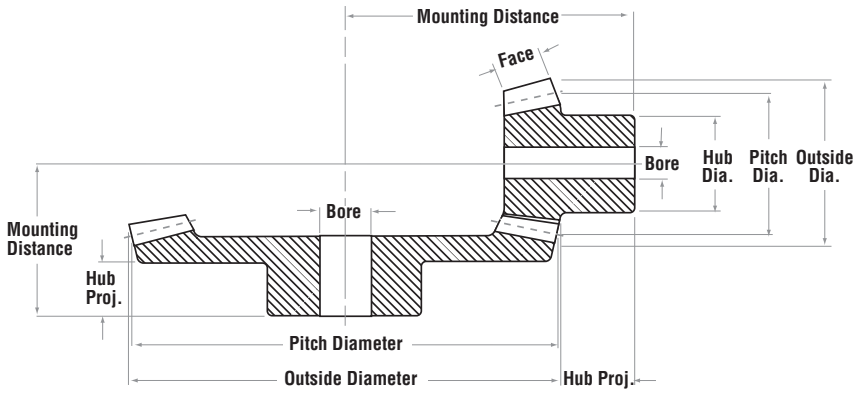
Bevel gears are used as right angle drives where high efficiency is required. They are carried in stock as 1:1 to 6:1 ratios. Bevel gears are cut with the long and short addendum system and 20 degree pressure angle to compensate for tooth undercut in gears and pinions having low numbers of teeth. Most all of Martin bevel gears are cut with the "coniflex" tooth form to allow for a slight misalignment at assembly and during operation. Gears should be mounted at the correct distance from the core of apex center with thrust bearings being used in back of hubs to absorb the backward thrust created in this type of gearing.

Cast Iron Gears With Steel Pinions

Number of Teeth	Part Number	Diameter		Face (Inches)	Bore (inches)		Mounting (Inches)	Hub (Inches)		Wt. Lb. (Approx.)
		Pitch	Outside		Diameter	Length		Diameter	Projection	
3 Pitch										
30	B330-2	10.00	10.19	1.87	1 1/4	3 19/32	5 1/2	5	2	32.8
15	B315-2	5.00	5.80	1.87	1 1/8	4 1/32	7 1/4	3 3/4	1 15/16	13.4
4 Pitch										
32	B432-2	8.00	8.10	1.40	1 1/8	2 11/16	4 1/4	3 3/4	1 9/16	14.7
16	B416-2	4.00	4.60	1.40	1 1/8	3 11/32	6	3 1/4	1 13/16	7.5
42	B442-3	10.50	10.59	1.42	1 1/8	2 11/16	4	3 3/4	1 1/2	20.5
14	B414-3	3.50	4.17	1.42	1 1/8	3 27/64	7 1/4	3 1/4	1 15/16	6.8
56	B456-4	14.00	14.07	1.69	1 1/4	2 7/8	4 1/4	4 1/4	1 5/8	37.8
14	B414-4	3.50	4.20	1.69	1 1/8	3 45/64	9	3 1/4	1 15/16	7.6
5 Pitch										
30	B530-2	6.00	6.12	1.04	1 1/8	2 1/4	3 1/2	3 1/4	1 3/8	8.6
15	B515-2	3.00	3.48	1.04	1	2 25/64	4 3/8	2 5/8	1 9/32	3.1
45	B545-3	9.00	9.07	1.31	1 1/4	2 1/2	3 3/4	3 3/4	1 11/16	14.6
15	B515-3	3.00	3.54	1.31	1	2 11/16	5 7/8	2 5/8	1 5/16	3.6
60	B560-4	12.00	12.05	1.70	1 1/4	2 5/8	3 3/4	4	1 9/16	23.2
15	B515-4	3.00	3.56	1.70	1	3 13/64	7 1/2	3	1 1/2	5.0
6 Pitch										
36	BS636-2	6.00	6.10	1.06	11/8	2 1/4	3 1/2	3 1/4	1 1/2	7.5
18	B618-2	3.00	3.42	1.06	1	2 49/64	4 3/4	2 1/2	1 5/8	3.3
42	B642-2	7.00	7.10	1.05	11/8	2 19/64	3 3/4	3 1/2	1 1/2	9.5
21	B621-2	3.50	3.90	1.05	1	2 33/64	5	2 1/2	1 1/4	3.8
45	B645-3	7.50	7.56	1.07	1 1/8	2 1/8	3	3 1/4	1 1/4	8.9
15	B615-3	2.50	2.94	1.07	7/8	2 9/16	5 1/4	2 1/8	1 7/16	2.2
48	B648-2	8.00	8.10	1.17	1 1/8	1 57/64	3 7/16	3 1/4	1	11.6
24	B624-2	4.00	4.40	1.17	1	2 35/64	5 7/16	2 5/8	1 1/4	4.9
60	B660-4	10.00	10.04	1.21	1 1/8	2 1/4	3 1/4	3 1/4	1 3/8	14.3
15	B615-4	2.50	2.97	1.21	1	2 31/32	6 3/4	21/2	1 3/4	3.2

Steel Bevel Gears may be furnished with hardened teeth at slight additional cost.

Bevel Gears
20° Pressure Angle

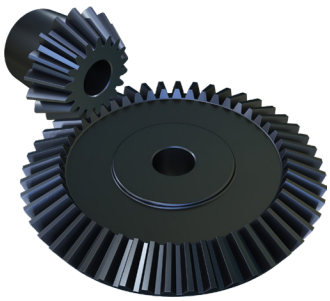


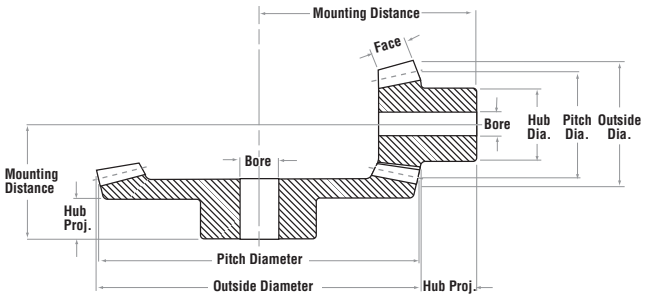
Cast Iron Gears With Steel Pinions

Number of Teeth	Part Number	Diameter		Face (Inches)	Bore (inches)		Mounting (Inches)	Hub (Inches)		Wt. Lb. (Approx.)
		Pitch	Outside		Diameter	Length		Diameter	Projection	
8 Pitch										
40	BS840-2	5.00	5.07	0.82	1	1 27/32	2 7/8	3	1 1/4	4.9
20	B820-2	2.50	2.80	0.82	7/8	2 9/32	4	2 1/8	1 13/32	1.9
48	B848-3	6.05	6.20	0.84	7/8	1 5/8	2 3/8	2 3/4	1	4.5
16	B816-3	2.00	2.33	0.84	3/4	2 5/64	4 1/4	1 3/4	1 3/16	1.2
64	B864-4	8.00	8.03	0.84	1	1 7/8	2 3/4	2 3/4	1 1/4	9.0
16	B816-4	2.00	2.35	0.84	7/8	2 3/32	5 1/4	1 7/8	1 7/32	1.3
72	B872-4	9.00	9.03	1.22	1 1/8	2 5/16	3 1/4	3	1 11/16	12.2
18	B818-4	2.25	2.60	1.22	7/8	2 15/32	5 3/4	2 1/8	1 7/32	1.9
10 Pitch										
60	B1060-3	6.00	6.04	0.78	7/8	1 29/32	2 3/4	3	1 3/8	5.1
20	B1020-3	2.00	2.27	0.78	3/4	2 5/32	4 3/8	1 3/4	1 5/16	1.3
60	B1060-4	6.00	6.03	0.72	7/8	1 5/8	2 1/4	2 1/2	1 1/8	4.5
15	B1015-4	1.50	1.78	0.72	5/8	1 39/64	3 7/8	1 7/16	27/32	0.6
90	B1090-6	9.00	9.03	0.86	1	1 13/16	2 1/2	2 3/4	1 5/16	9.7
15	B1015-6	1.50	1.79	0.86	5/8	1 55/64	5 1/2	1 7/16	31/32	0.7
12 Pitch										
36	B1236-2	3.00	3.05	0.46	5/8	7/8	1 1/2	1 7/16	1/2	0.8
18	B1218-2	1.50	1.70	0.46	1/2	1 13/64	2 1/4	1 1/4	11/16	0.5
72	B1272-4	6.00	6.02	0.60	3/4	1 5/16	2	2	61/64	2.6
18	B1218-4	1.50	1.73	0.60	1/2	1 23/64	3 3/4	1 1/4	23/32	0.4
72	B1272-6	6.00	6.02	0.74	3/4	1 5/16	1 3/4	2	61/64	2.6
12	B1212-6	1.00	1.24	0.74	1/2	1 31/64	3 3/4	15/16	23/32	0.4

Steel Bevel Gears may be furnished with hardened teeth at slight additional cost.

Bevel Gears
20° Pressure Angle





Steel Gears With Steel Pinions

Number of Teeth	Part Number	Diameter		Face (Inches)	Bore (inches)		Mounting (Inches)	Hub (Inches)		Wt. Lb. (Approx.)
		Pitch	Outside		Diameter	Length		Diameter	Projection	
6 Pitch										
36	BS636-2	6.00	6.10	1.06	1 1/8	2 1/4	3 1/2	3 1/4	1 1/2	8.70
18	BS618-2	3.00	3.42	1.06	1 1/8	2 49/64	4 3/4	2 1/2	1 19/32	3.20
8 Pitch										
40	BS840-2	5.00	5.07	0.82	1	1 27/32	2 7/8	3	1 1/4	4.90
20	BS820-2	2.50	2.80	0.82	1	2 9/32	4	2 1/8	1 13/32	1.80
10 Pitch										
30	BS1030-15	3.00	3.08	0.57	3/4	1 7/16	2 1/4	2 1/2	1	2.00
20	BS1020-15	2.00	2.21	0.57	3/4	1 33/64	2 1/2	1 3/4	29/32	0.80
40	BS1040-2	4.00	4.06	0.71	7/8	1 11/16	2 1/2	3	1 3/16	3.70
20	BS1020-2	2.00	2.24	0.71	3/4	1 51/64	3 1/8	1 3/4	1 1/16	1.00
50	BS1050-2	5.00	5.06	0.70	3/4	1 19/32	2 5/8	2	1	4.00
25	B1025-2	2.50	2.74	0.70	3/4	1 35/64	3 3/8	2	3/4	1.50
60	BS1060-3	6.00	6.04	0.78	1	1 55/64	2 3/4	3	1 3/8	6.00
20	BS1020-3	2.00	2.27	0.78	7/8	2 5/32	4 3/8	1 3/4	1 5/16	0.90
12 Pitch										
27	BS1227-15	2.25	2.32	0.41	1/2	1 1/8	1 3/4	1 1/2	25/32	0.60
18	BS1218-15	1.50	1.67	0.41	1/2	1 1/8	1 7/8	1 1/4	21/32	0.30
36	BS1236-2	3.00	3.05	0.53	1	1 17/64	1 7/8	2 1/8	7/8	1.30
18	BS1218-2	1.50	1.70	0.53	3/4	1 3/8	2 3/8	15/16	13/16	0.30
36	BS1236-2A	3.00	3.05	0.53	5/8	1 17/64	1 7/8	2 1/8	7/8	1.40
18	BS1218-2A	1.50	1.70	0.53	1/2	1 3/8	2 3/8	15/16	13/16	0.40
48	BS1248-2	4.00	4.05	0.59	5/8	1 11/64	2	1 5/8	3/4	1.60
24	B1224-2	2.00	2.20	0.59	1/2	1 7/16	2 7/8	1 1/2	3/4	0.80
54	BS1254-3	4.50	4.53	0.60	5/8	1 1/16	1 3/4	1 3/4	3/4	1.90
18	B1218-3	1.50	1.72	0.60	1/2	1 11/32	3	1 1/4	11/16	0.40
14 Pitch										
28	BS1428-2	2.00	2.04	0.35	1/2	15/16	1 3/8	1 5/8	21/32	0.50
14	BS1414-2	1.00	1.17	0.35	1/2	31/32	1 5/8	13/16	9/16	0.10
16 Pitch										
24	BS1624-2	1.50	1.54	0.19	1/2	5/8	1	1	7/16	0.15
12	BS1612-2	0.75	0.91	0.19	3/8	37/64	1 1/8	21/32	11/32	0.08
24	BS1624-15	1.50	1.55	0.25	1/2	3/4	13/16	1 1/8	9/16	0.40
16	BS1616-15	1.00	1.13	0.25	3/8	47/64	1 1/4	13/16	7/16	0.09
32	BS1632-2	2.00	2.04	0.35	1/2	49/64	13/16	1 1/8	1/2	0.30
16	BS1616-2	1.00	1.15	0.35	3/8	27/32	1 1/2	13/16	7/16	0.04
48	BS1648-3	3.00	3.02	0.42	5/8	7/8	15/16	1 1/2	9/16	0.74
16	B1616-3	1.00	1.17	0.42	7/16	59/64	2	7/8	15/32	0.13
64	BS1664-4	4.00	4.02	0.48	5/8	57/64	1 3/8	2 1/4	9/16	1.70
16	B1616-4	1.00	1.17	0.48	1/2	63/64	2 1/2	13/16	15/32	0.12

Steel Bevel Gears may be furnished with hardened teeth at slight additional cost.

Bevel Gears
Horsepower Ratings

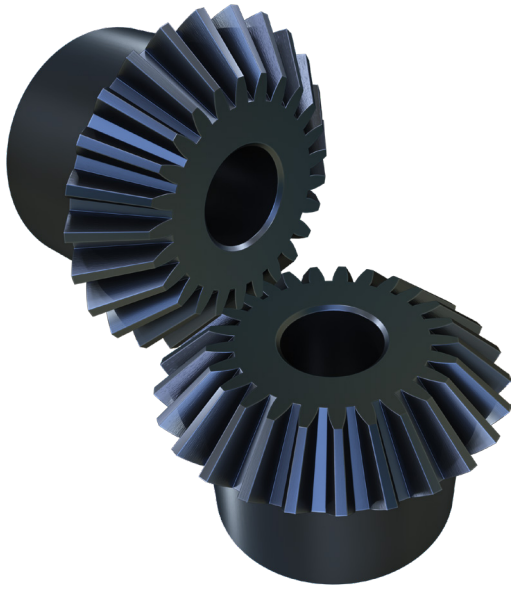
Cast Iron

Part Number	Revolutions per Minute							
	50	100	200	300	600	900	1200	1800
B330-2	2.50	4.50	7.7	10.0	15.3			
B315-2	2.50	4.50	7.7	10.0	15.3			
B432-2	1.33	2.30	4.0	5.3	8.0	9.5		
B416-2	1.33	2.30	4.0	5.3	8.0	9.5		
B442-3	1.10	2.00	3.7	5.0	7.5	9.0		
B414-3	1.10	2.00	3.7	5.0	7.5	9.0		
B456-4	1.40	2.50	4.4	6.0	9.0	10.9		
B414-4	1.40	2.50	4.4	6.0	9.0	10.9		
B530-2	0.50	1.00	1.9	2.5	3.9	4.8	5.5	
B515-2	0.50	1.00	1.9	2.5	3.9	4.8	5.5	
B545-3	0.70	1.40	2.4	3.3	5.2	6.4	7.2	
B515-3	0.70	1.40	2.4	3.3	5.2	6.4	7.2	
B560-4	1.00	1.80	3.3	4.4	6.9	8.4	9.5	
B515-4	1.00	1.80	3.3	4.4	6.9	8.4	9.5	
B636-2	0.50	1.00	1.7	2.3	3.7	4.4	5.0	
B618-2	0.50	1.00	1.7	2.3	3.7	4.4	5.0	
B642-2	0.60	1.10	2.0	2.7	4.0	5.0		
B621-2	0.60	1.10	2.0	2.7	4.0	5.0		
B645-3	0.40	0.80	1.4	2.0	3.2	3.9	4.6	
B615-3	0.40	0.80	1.4	2.0	3.2	3.9	4.6	
B648-2	0.80	1.50	2.5	3.4	5.1	6.1		
B624-2	0.80	1.50	2.5	3.4	5.1	6.1		
B660-4	0.50	0.90	1.7	2.3	3.7	4.6	5.2	
B615-4	0.50	0.90	1.7	2.3	3.7	4.6	5.2	
B840-2	0.40	0.70	1.3	1.8	2.9	3.7	4.2	
B820-2	0.40	0.70	1.3	1.8	2.9	3.7	4.2	
B848-3	0.20	0.40	0.7	1.0	1.7	2.2	2.5	2.9
B816-3	0.20	0.40	0.7	1.0	1.7	2.2	2.5	2.9
B864-4	0.20	0.40	0.7	1.0	1.7	2.2	2.5	
B816-4	0.20	0.40	0.7	1.0	1.7	2.2	2.5	
B872-4	0.40	0.70	1.2	1.8	2.8	3.6	4.2	
B818-4	0.40	0.70	1.2	1.8	2.8	3.6	4.2	
B1060-3	0.17	0.30	0.6	0.8	1.3	1.7	1.9	2.3
B1020-3	0.17	0.30	0.6	0.8	1.3	1.7	1.9	2.3
B1060-4	0.10	0.20	0.4	0.5	0.9	1.2	1.4	1.8
B1015-4	0.10	0.20	0.4	0.5	0.9	1.2	1.4	1.8
B1090-6	0.14	0.25	0.5	0.7	1.2	1.7	1.9	2.3
B1015-6	0.14	0.25	0.5	0.7	1.2	1.7	1.9	2.3
B1236-2	0.05	0.11	0.2	0.3	0.5	0.6	0.8	1.0
B1218-2	0.05	0.11	0.2	0.3	0.5	0.6	0.8	1.0
B1254-3	0.07	0.15	0.3	0.4	0.7	0.9	1.0	1.3
B1218-3	0.07	0.15	0.3	0.4	0.7	0.9	1.0	1.3
B1272-4	0.07	0.15	0.3	0.4	0.7	0.9	1.1	1.4
B1218-4	0.07	0.15	0.3	0.4	0.7	0.9	1.1	1.4
B1272-6	0.06	0.11	0.2	0.3	0.6	0.8	1.0	1.2
B1212-6	0.06	0.11	0.2	0.3	0.6	0.8	1.0	1.2

Steel

Part Number	Revolutions per Minute							
	50	100	200	300	600	900	1200	1800
BS636-2	0.9	1.70	3.00	4.10	6.40	8.00	9.00	
BS618-2	0.9	1.70	3.00	4.10	6.40	8.00	9.00	
BS840-2	0.5	0.90	1.50	2.10	3.50	4.40	5.00	
BS820-2	0.5	0.90	1.50	2.10	3.50	4.40	5.00	
BS1030-15	0.2	0.40	0.70	1.00	1.70	2.10	2.30	2.9
BS1020-15	0.2	0.40	0.70	1.00	1.70	2.10	2.30	2.9
BS1040-2	0.25	0.50	0.90	1.30	2.10	2.70	3.00	3.7
BS1020-2	0.25	0.50	0.90	1.30	2.10	2.70	3.00	3.7
BS1050-2	0.33	0.64	1.20	1.60	2.50	3.20	3.70	
BS1025-2	0.33	0.64	1.20	1.60	2.50	3.20	3.70	
BS1060-3	0.3	0.50	1.00	1.40	2.40	3.00	3.50	4.3
BS1020-3	0.3	0.50	1.00	1.40	2.40	3.00	3.50	4.3
BS1227-15	0.09	0.17	0.33	0.50	0.80	1.00	1.20	1.6
BS1218-15	0.09	0.17	0.33	0.50	0.80	1.00	1.20	1.6
BS1236-2	0.12	0.25	0.40	0.60	1.00	1.40	1.70	2.0
BS1218-2	0.12	0.25	0.40	0.60	1.00	1.40	1.70	2.0
BS1236-2A	0.12	0.25	0.40	0.60	1.00	1.40	1.70	2.0
BS1218-2A	0.12	0.25	0.40	0.60	1.00	1.40	1.70	2.0
BS1248-2	0.18	0.37	0.70	0.90	1.60	2.00	2.30	2.8
B1224-2	0.18	0.37	0.70	0.90	1.60	2.00	2.30	2.8
BS1254-3	0.14	0.28	0.50	0.70	1.20	1.60	1.90	2.3
B1218-3	0.14	0.28	0.50	0.70	1.20	1.60	1.90	2.3
BS1428-2	0.05	0.08	0.16	0.20	0.40	0.54	0.70	0.8
BS1414-2	0.05	0.08	0.16	0.20	0.40	0.54	0.70	0.8
BS1624-2	0.02	0.03	0.05	0.08	0.14	0.20	0.25	0.3
BS1612-2	0.02	0.03	0.05	0.08	0.14	0.20	0.25	0.3
BS1624-15	0.03	0.05	0.09	0.14	0.25	0.33	0.40	0.5
BS1612-15	0.03	0.05	0.09	0.14	0.25	0.33	0.40	0.5
BS1632-2	0.03	0.08	0.14	0.20	0.37	0.50	0.60	0.8
BS1616-2	0.03	0.08	0.14	0.20	0.37	0.50	0.60	0.8
BS1648-3	0.05	0.09	0.17	0.25	0.50	0.60	0.80	1.0
BS1616-3	0.05	0.09	0.17	0.25	0.50	0.60	0.80	1.0
BS1664-4	0.05	0.10	0.20	0.33	0.50	0.70	0.90	1.1
BS1616-4	0.05	0.10	0.20	0.33	0.50	0.70	0.90	1.1

Miter Gears
20° Pressure Angle



Miter gears are ordinarily used as right angle drives, transmitting horsepower between intersecting shafts at a 1:1 ratio. They are used where high efficiency is required. Only miters of the same number of teeth, pitch, and pressure angle can be operated together. More than two miters may be used in sets, as in a differential.

The thrust of miter gears causes the gears to separate; therefore, ball bearings or roller bearings should be used rather than sleeve bearings. Provisions should be made using thrust bearings to absorb backward thrust.

All standard stock miter gears must be mounted at right angles (90 degrees) for proper tooth bearing.

All Martin miter and bevel gears are generated with the "coniflex" tooth form. A slight misalignment of gears is permissible because of the localized tooth bearing running lengthwise along the gear tooth.

The mounting distance must be held in order to maintain proper backlash between gears. This will also insure that the ends of the gear teeth will be flush with each other. The use of a straight mineral oil as a lubricant is recommended for most miter gear applications.

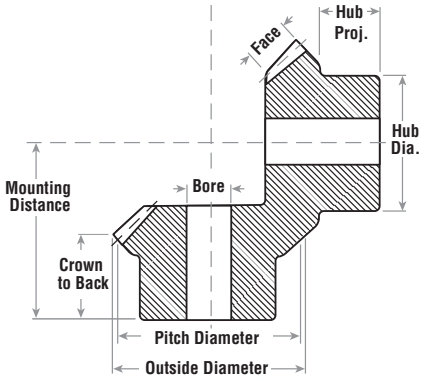
Martin stock miter gears are manufactured from 1144 Carbon steel.

The “M” series is furnished unhardened with plain bore. The “HM” series is furnished hardened teeth with plain bore. The “HMK” series is furnished hardened teeth with keyway and setscrew for installation on the shaft.

Hardened miter gears have approximately 50% more horsepower capacity and provide greater gear wear than untreated gears.

All Martin miter gears are cut with the 20° pressure angle system. They will not operate with any other pressure angle system.

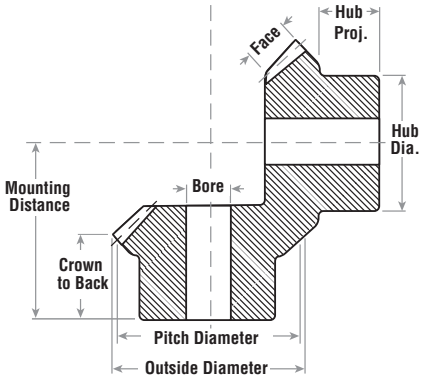
Miter Gears
20° Pressure Angle



Steel - Plain Bore — Unhardened Teeth

Number of Teeth	Part Number	Diameter		Face (Inches)	Bore (inches)		Mounting (Inches)	Hub (Inches)		Wt. Lb. (Approx.)
		Pitch	Outside		Diameter	Length		Diameter	Projection	
4 Pitch										
24	M424	6.00	6.36	1.33	1 1/2	3 9/16	5 1/2	4	1 15/16	14.4
24	M424A	6.00	6.36	1.33	1 3/4	3 9/16	5 1/2	4	1 15/16	13.7
28	M428	7.00	7.36	1.43	2	3 5/8	6	5	1 15/16	21.1
5 Pitch										
25	M525	5.00	5.29	1.10	1 3/8	3	4 5/8	3 1/2	1 3/4	8.5
25	M525A	5.00	5.29	1.10	1 1/2	3	4 5/8	3 1/2	1 3/4	8.3
25	M525B	5.00	5.29	1.10	1 3/4	3	4 5/8	3 1/2	1 3/4	7.8
6 Pitch										
24	M624	4.00	4.24	0.86	1 1/4	2 5/16	3 5/8	3	1 5/16	4.4
24	M624A	4.00	4.24	0.86	1 1/2	2 5/16	3 5/8	3	1 5/16	4.3
27	M627	4.50	4.74	0.96	1 1/4	2 5/8	4 1/8	3 1/4	1 1/2	6.3
27	M627A	4.50	4.74	0.96	1 1/2	2 5/8	4 1/8	3 1/4	1 1/2	5.9
8 Pitch										
24	M824	3.00	3.18	0.64	3/4	1 37/64	2 9/16	1 3/4	13/16	1.5
24	M824A	3.00	3.18	0.64	1	1 49/64	2 3/4	2 1/2	1	2.1
24	M824B	3.00	3.18	0.64	1 1/4	1 49/64	2 3/4	2 1/2	1	1.9
28	M828	3.50	3.68	0.75	1	2 3/32	3 1/4	2 1/2	1 1/4	2.9
28	M828A	3.50	3.68	0.75	1 3/16	2 3/32	3 1/4	2 1/2	1 1/4	2.8
28	M828B	3.50	3.68	0.75	1 1/4	2 3/32	3 1/4	2 1/2	1 1/4	2.6
32	M832	4.00	4.18	0.84	1	2 9/32	3 5/8	3	1 1/8	4.8
10 Pitch										
20	M1020A	2.00	2.14	0.44	1/2	1 23/64	2	1 5/8	13/16	0.75
20	M1020B	2.00	2.14	0.44	5/8	1 23/64	2	1 5/8	13/16	0.72
20	M1020	2.00	2.14	0.44	3/4	1 23/64	2	1 5/8	13/16	0.67
20	M1020C	2.00	2.14	0.44	7/8	1 23/64	2	1 5/8	13/16	0.58
25	M1025	2.50	2.64	0.55	3/4	1 5/8	2 7/16	2	15/16	1.20
25	M1025A	2.50	2.64	0.55	7/8	1 5/8	2 7/16	2	15/16	1.20
25	M1025B	2.50	2.64	0.55	1	1 5/8	2 7/16	2	15/16	1.20
30	M1030	3.00	3.14	0.64	3/4	1 3/4	2 3/4	2	1	1.80

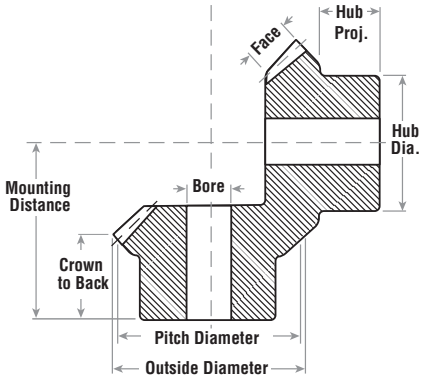
Miter Gears
20° Pressure Angle



Steel - Plain Bore — Unhardened Teeth

Number of Teeth	Part Number	Diameter		Face (Inches)	Bore (inches)		Mounting (Inches)	Hub (Inches)		Wt. Lb. (Approx.)
		Pitch	Outside		Diameter	Length		Diameter	Projection	
12 Pitch										
15	M1215	1.25	1.37	0.27	3/8	55/64	1 1/4	1	1/2	0.17
15	M1215A	1.25	1.37	0.27	7/16	55/64	1 1/4	1	1/2	0.16
15	M1215B	1.25	1.37	0.27	1/2	55/64	1 1/4	1	1/2	0.15
18	M1218	1.50	1.62	0.32	1/2	1 1/64	1 1/2	1 1/4	5/8	0.30
18	M1218A	1.50	1.62	0.32	5/8	1 1/64	1 1/2	1 1/4	5/8	0.25
18	M1218B	1.50	1.62	0.32	3/4	1 1/64	1 1/2	1 1/4	5/8	0.22
21	M1221	1.75	1.87	0.39	1/2	1 3/16	1 3/4	1 3/8	11/16	0.45
21	M1221A	1.75	1.87	0.39	9/16	1 3/16	1 3/4	1 3/8	11/16	0.45
21	M1221B	1.75	1.87	0.39	5/8	1 3/16	1 3/4	1 3/8	11/16	0.43
21	M1221C	1.75	1.87	0.39	3/4	1 3/16	1 3/4	1 3/8	11/16	0.38
24	M1224	2.00	2.12	0.43	1/2	1 7/32	1 7/8	1 1/2	11/16	0.62
30	M1230	2.50	2.62	0.54	5/8	1 31/64	2 5/16	1 3/4	27/32	1.10
14 Pitch										
14	M1414	1.00	1.11	0.19	3/8	47/64	1 1/16	7/8	1/2	0.10
14	M1414A	1.00	1.11	0.19	7/16	47/64	1 1/16	7/8	1/2	0.09
16 Pitch										
12	M1612	0.75	0.84	0.16	5/16	37/64	13/16	5/8	3/8	0.05
16	M1616	1.00	1.09	0.22	3/8	3/4	1 1/16	3/4	7/16	0.07
20	M1620	1.25	1.34	0.27	7/16	27/32	1 1/4	1	1/2	0.16
24	M1624	1.50	1.59	0.31	1/2	7/8	1 3/8	1	1/2	0.20
20 Pitch										
20	M2020	1.00	1.07	0.23	3/8	13/16	1 1/8	3/4	1/2	0.06
25	M2025	1.25	1.32	0.25	3/8	3/4	1 3/16	1	3/8	0.14
24 Pitch										
24	M2424	1.00	1.06	0.20	1/4	9/16	29/32	5/8	9/32	0.12

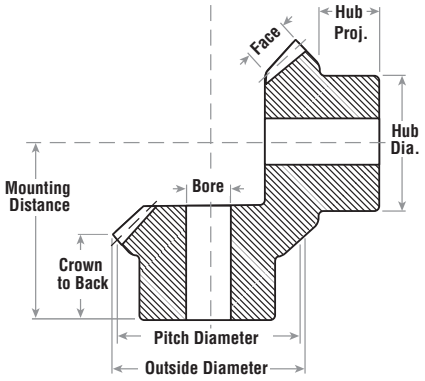
Miter Gears
20° Pressure Angle



Steel - Plain Bore — Hardened Teeth

Number of Teeth	Part Number	Diameter		Face (Inches)	Bore (inches)		Mounting (Inches)	Hub (Inches)		Wt. Lb. (Approx.)
		Pitch	Outside		Diameter	Length		Diameter	Projection	
4 Pitch										
24	HM424	6.00	6.36	1.33	1 1/2	3 9/16	5 1/2	4	1 15/16	14.4
24	HM424A	6.00	6.36	1.33	1 3/4	3 9/16	5 1/2	4	1 15/16	13.7
28	HM428	7.00	7.36	1.43	2	3 5/8	6	5	1 15/16	21.1
5 Pitch										
25	HM525	5.00	5.29	1.10	1 3/8	3	4 5/8	3 1/2	1 3/4	8.5
25	HM525A	5.00	5.29	1.10	1 1/2	3	4 5/8	3 1/2	1 3/4	8.3
25	HM525B	5.00	5.29	1.10	1 3/4	3	4 5/8	3 1/2	1 3/4	7.5
6 Pitch										
24	HM624	4.00	4.24	0.86	1 1/4	2 5/16	3 5/8	3	1 5/16	4.4
24	HM624A	4.00	4.24	0.86	1 1/2	2 5/16	3 5/8	3	1 5/16	4.0
27	HM627	4.50	4.74	0.96	1 1/4	2 5/8	4 1/8	3 1/4	1 1/2	6.3
27	HM627A	4.50	4.74	0.96	1 1/2	2 5/8	4 1/8	3 1/4	1 1/2	5.9
8 Pitch										
24	HM824	3.00	3.18	0.64	3/4	1 37/64	2 9/16	1 3/4	13/16	1.5
24	HM824A	3.00	3.18	0.64	1	1 49/64	2 3/4	2 1/2	1	2.1
24	HM824B	3.00	3.18	0.64	1 1/4	1 49/64	2 3/4	2 1/2	1	2.6
28	HM828	3.50	3.68	0.75	1	2 3/32	3 1/4	2 1/2	1 1/4	3.0
28	HM828A	3.50	3.68	0.75	1 3/16	2 3/32	3 1/4	2 1/2	1 1/4	2.8
28	HM828B	3.50	3.68	0.75	1 1/4	2 3/32	3 1/4	2 1/2	1 1/4	2.6
32	HM832	4.00	4.18	0.85	1	2 9/32	3 5/8	3	1 1/8	4.7
10 Pitch										
20	HM1020A	2.00	2.14	0.44	1/2	1 23/64	2	1 5/8	13/16	0.76
20	HM1020B	2.00	2.14	0.44	5/8	1 23/64	2	1 5/8	13/16	0.70
20	HM1020	2.00	2.14	0.44	3/4	1 23/64	2	1 5/8	13/16	0.64
20	HM1020C	2.00	2.14	0.44	7/8	1 23/64	2	1 5/8	13/16	0.58
25	HM1025	2.50	2.64	0.55	3/4	1 5/8	2 7/16	2	15/16	1.30
25	HM1025A	2.50	2.64	0.55	7/8	1 5/8	2 7/16	2	15/16	1.20
25	HM1025B	2.50	2.64	0.55	1	1 5/8	2 7/16	2	15/16	1.20
30	HM1030	3.00	3.14	0.64	3/4	1 3/4	2 3/4	2	1	1.80

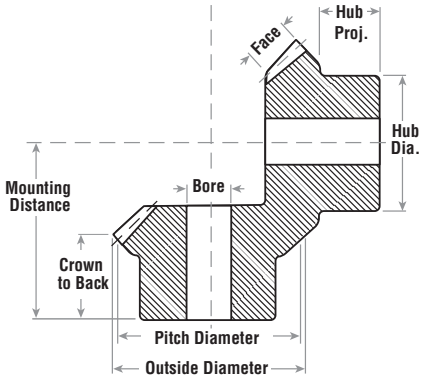
Miter Gears
20° Pressure Angle



Steel - Plain Bore — Hardened Teeth

Number of Teeth	Part Number	Diameter		Face (Inches)	Bore (inches)		Mounting (Inches)	Hub (Inches)		Wt. Lb. (Approx.)
		Pitch	Outside		Diameter	Length		Diameter	Projection	
12 Pitch										
15	HM1215	1.25	1.37	0.27	3/8	55/64	1 1/4	1	1/2	0.15
15	HM1215B	1.25	1.37	0.27	1/2	55/64	1 1/4	1	1/2	0.15
18	HM1218	1.50	1.62	0.32	1/2	1 1/64	1 1/2	1 1/4	5/8	0.30
18	HM1218A	1.50	1.62	0.32	5/8	1 1/64	1 1/2	1 1/4	5/8	0.25
18	HM1218B	1.50	1.62	0.32	3/4	1 1/64	1 1/2	1 1/4	5/8	0.22
21	HM1221	1.75	1.87	0.39	1/2	1 3/16	1 3/4	1 3/8	11/16	0.22
21	HM1221B	1.75	1.87	0.39	5/8	1 3/16	1 3/4	1 3/8	11/16	0.42
24	HM1224	2.00	2.12	0.43	1/2	1 7/32	1 7/8	1 1/2	11/16	0.62
30	HM1230	2.50	2.62	0.54	5/8	1 31/64	2 5/16	1 3/4	27/32	1.10
14 Pitch										
14	HM1414	1.00	1.11	0.19	3/8	47/64	1 1/16	7/8	1/2	0.10
14	HM1414A	1.00	1.11	0.19	7/16	47/64	1 1/16	7/8	1/2	0.10
16 Pitch										
16	HM1616	1.00	1.09	0.22	3/8	3/4	1 1/16	3/4	7/16	0.07
24	HM1624	1.50	1.59	0.31	1/2	7/8	13/8	1	1/2	0.20
24 Pitch										
24	HM2424	1.00	1.06	0.20	1/4	9/16	29/32	5/8	9/32	0.06

Miter Gears
20° Pressure Angle



Steel - Furnished with Keyway and Set Screw — Hardened Teeth

Number of Teeth	Part Number	Diameter		Face (Inches)	Bore (inches)		Mounting (Inches)	Hub (Inches)		Wt. Lb. (Approx.)
		Pitch	Outside		Diameter	Length		Diameter	Projection	
4 Pitch										
24	HMK424A	6.00	6.36	1.33	1 3/4	3 9/16	5 1/2	4	1 15/16	13.7
5 Pitch										
25	HMK525	5.00	5.29	1.10	1 3/8	3	4 5/8	3 1/2	1 3/4	8.5
25	HMK525B	5.00	5.29	1.10	1 3/4	3	4 5/8	3 1/2	1 3/4	7.5
6 Pitch										
24	HMK624	4.00	4.24	0.86	1 1/4	2 5/16	3 5/8	3	1 5/16	4.4
24	HMK624A	4.00	4.24	0.86	1 1/2	2 5/16	3 5/8	3	1 5/16	4.0
27	HMK627	4.50	4.74	0.96	1 1/4	2 5/8	4 1/8	3 1/4	1 1/2	6.3
27	HMK627A	4.50	4.74	0.96	1 1/2	2 5/8	4 1/8	3 1/4	1 1/2	5.9
8 Pitch										
24	HMK824	3.00	3.18	0.64	3/4	1 37/64	2 9/16	1 3/4	13/16	1.5
24	HMK824A	3.00	3.18	0.64	1	1 49/64	2 3/4	2 1/2	1	2.1
24	HMK824B	3.00	3.18	0.64	1 1/4	1 49/64	2 3/4	2 1/2	1	1.8
28	HMK828	3.50	3.68	0.75	1	2 3/32	3 1/4	2 1/2	1 1/4	2.9
28	HMK828A	3.50	3.68	0.75	1 3/16	2 3/32	3 1/4	2 1/2	1 1/4	2.7
28	HMK828B	3.50	3.68	0.75	1 1/4	2 3/32	3 1/4	2 1/2	1 1/4	2.6
10 Pitch										
20	HMK1020A	2.00	2.14	0.44	1/2	1 23/64	2	1 5/8	13/16	0.74
20	HMK1020B	2.00	2.14	0.44	5/8	1 23/64	2	1 5/8	13/16	0.70
20	HMK1020	2.00	2.14	0.44	3/4	1 23/64	2	1 5/8	13/16	0.63
20	HMK1020C	2.00	2.14	0.44	7/8	1 23/64	2	1 5/8	13/16	0.58
25	HMK1025	2.50	2.64	0.55	3/4	1 5/8	2 7/16	2	15/16	1.30
25	HMK1025A	2.50	2.64	0.55	7/8	1 5/8	2 7/16	2	15/16	1.20
25	HMK1025B	2.50	2.64	0.55	1	1 5/8	2 7/16	2	15/16	1.10
12 Pitch										
15	HMK1215B	1.25	1.37	0.27	1/2	55/64	1 1/4	1	1/2	0.14
18	HMK1218A	1.50	1.62	0.32	5/8	1 1/64	1 1/2	11/4	5/8	0.25
21	HMK1221B	1.75	1.87	0.39	5/8	1 3/16	1 3/4	1 3/8	11/16	0.41
30	HMK1230	2.50	2.62	0.54	5/8	1 31/64	2 5/16	1 3/4	27/32	1.10
16 Pitch										
16	HMK1616	1.00	1.09	0.22	3/8	3/4	1 1/16	3/4	7/16	0.07
24	HMK1624	1.50	1.59	0.31	1/2	7/8	1 3/8	1	1/2	0.20

Miter Gear Horsepower Ratings

Steel

Part Number	Revolutions Per Minute									
	10	25	50	100	200	300	600	900	1200	1800
M424	0.80	1.90	3.60	6.40	10.60	13.5	18.8	21.5	23.0	
HM424	1.40	3.33	6.30	11.20	18.60	23.6	33.0	38.0	40.0	
M428	1.07	2.50	4.80	8.40	13.60	17.2	23.3	26.5	28.5	
HM428	1.90	4.50	8.40	14.70	23.80	30.0	40.0	46.0	50.0	
M525	0.45	1.05	2.00	3.70	6.30	8.1	11.6	13.6	15.0	
HM525	0.75	1.90	3.60	6.50	11.00	14.2	20.0	24.0	26.0	
M624	0.25	0.55	1.10	2.00	3.50	4.6	6.9	8.2	19.0	10.2
HM624	0.40	1.00	1.90	3.50	6.10	8.0	12.0	14.5	16.0	18.0
M627	0.30	0.75	1.40	2.50	4.30	5.7	8.5	9.9	11.0	12.0
HM627	0.50	1.33	2.50	4.40	7.50	10.0	1.5	17.5	19.0	21.0
M824	0.10	0.25	0.50	0.90	1.50	2.1	3.3	4.0	4.5	5.3
HM824	0.20	0.40	0.80	1.50	2.60	3.7	5.8	7.0	8.0	9.3
M828	0.15	0.33	0.70	1.20	2.20	2.9	4.4	5.3	6.0	6.8
HM828	0.25	0.60	1.20	2.10	3.90	5.0	7.7	9.3	10.5	12.0
M832	0.20	0.45	0.90	1.60	2.80	3.7	5.5	6.5	7.2	8.0
HM832	0.33	0.80	1.50	2.80	4.90	6.5	9.6	11.4	12.5	14.2
M1020	0.03	0.08	0.20	0.30	0.60	0.8	1.3	1.7	2.0	2.4
HM1020	0.05	0.15	0.30	0.50	1.00	1.4	2.3	3.0	3.5	4.2
M1025	0.06	0.15	0.30	0.50	0.90	1.3	2.0	2.5	2.9	3.5
HM1025	0.10	0.25	0.50	0.90	1.60	2.3	3.5	4.4	5.0	6.0
M1030	0.08	0.20	0.40	0.70	1.30	1.8	2.8	3.5	3.9	4.5
HM1030	0.15	0.33	0.70	1.30	2.30	3.2	4.9	6.1	6.8	8.0
M1215	0.01	0.02	0.05	0.10	0.20	0.3	0.5	0.6	0.8	0.9
HM1215	0.02	0.04	0.10	0.17	0.33	0.4	0.8	1.0	1.3	1.6
M1218	0.01	0.03	0.08	0.14	0.25	0.4	0.7	0.9	1.0	1.3
HM1218	0.02	0.05	0.15	0.25	0.47	0.7	1.1	1.5	1.8	2.2
M1221	0.02	0.05	0.11	0.20	0.40	0.5	0.9	1.2	1.4	1.7
HM1221	0.04	0.10	0.20	0.33	0.70	1.0	1.6	2.1	2.5	3.0
M1224	0.03	0.07	0.15	0.25	0.50	0.7	1.2	1.5	1.7	2.0
HM1224	0.05	0.12	0.25	0.47	0.90	1.2	2.1	2.6	3.0	3.5
M1230	0.05	0.12	0.25	0.44	0.80	1.1	1.8	2.2	2.5	3.0
HM1230	0.09	0.21	0.40	0.75	1.40	1.9	3.2	4.0	4.4	5.3
M1414		0.01	0.02	0.05	0.09	0.1	0.2	0.3	0.4	0.5
HM1414		0.02	0.04	0.09	0.16	0.2	0.4	0.6	0.7	0.9
M1616		0.01	0.02	0.05	0.09	0.1	0.2	0.3	0.4	0.5
HM1616		0.02	0.04	0.09	0.16	0.2	0.4	0.6	0.7	0.9
M1620		0.02	0.04	0.08	0.14	0.2	0.4	0.5	0.6	0.8
HM1620		0.04	0.07	0.15	0.25	0.4	0.7	0.9	1.0	1.3
M1624		0.03	0.06	0.12	0.20	0.3	0.5	0.7	0.8	1.0
HM1624		0.05	0.10	0.21	0.40	0.5	0.9	1.2	1.4	1.8
M2020		0.01	0.02	0.04	0.08	0.1	0.2	0.2	0.4	0.5
HM2020		0.02	0.04	0.07	0.14	0.2	0.4	0.5	0.6	0.8
M2025		0.02	0.03	0.06	0.12	0.2	0.3	0.4	0.5	0.6
HM2025		0.04	0.05	0.10	0.21	0.3	0.5	0.7	0.9	1.0

Ratings listed to right of dark line exceed recommended pitch line velocity.

Originally, worm gearing was used to secure, by compact means, a large reduction of speed between driving and driven shafts with a proportionate increase (except for frictional loss) in the torque of the driven shaft. Worm gearing is still used for this purpose, and frequently the wheel is driven by a single-thread worm of such low helix angle that the drive cannot be reversed; that is the wheel cannot drive the worm as the gearing automatically locks itself against backward rotation. (*See note below.)

Although a multiple-threaded worm when applied under like conditions is much more efficient than a single-threaded worm, it does not follow that the multiple-threaded worm should always be used.

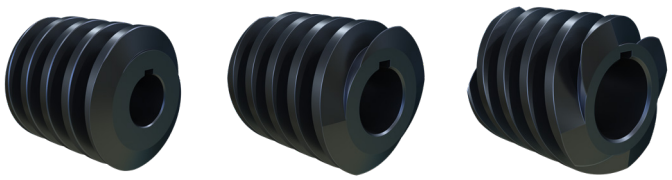
A single-threaded worm might be preferable when the most important requirement is to obtain a high ratio and especially if the worm must be self-locking.

When power is the primary factor, the multiple-threaded worms should be used.

LUBRICATION is an important factor when using worm gearing. An increase in heat generated means a decrease in efficiency. The amount of power which can be transmitted at a given temperature increases as the efficiency of the gearing increases.

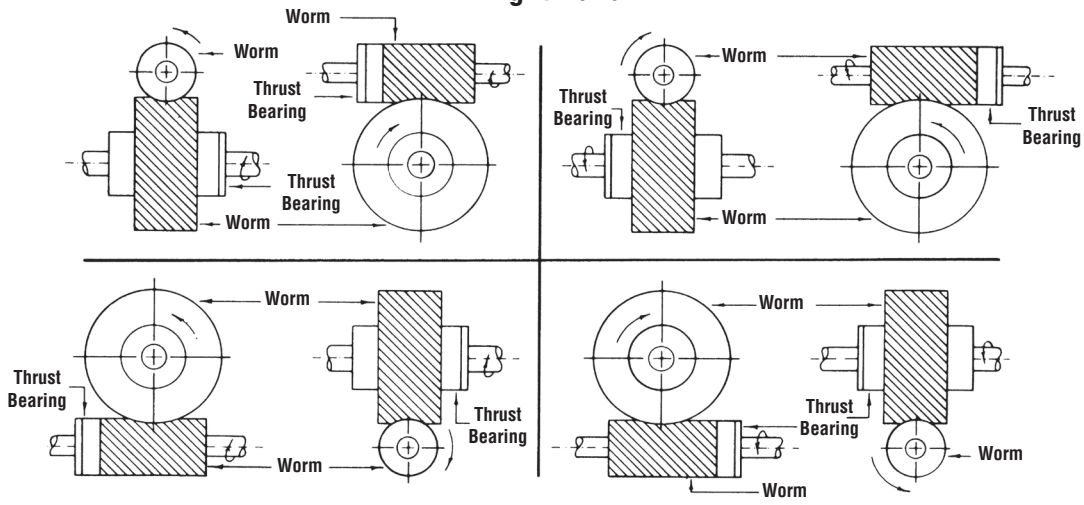
MATERIALS for worm and worm gears are generally confined to steel for worms and bronze or cast iron for gears. When steel worms are run with bronze gears at high speeds, the worm is usually hardened with ground threads.

Right Hand Worm and Gear



Single, Double, Quadruple Thread Worms

Direction of Rotation and Thrust
Right Hand

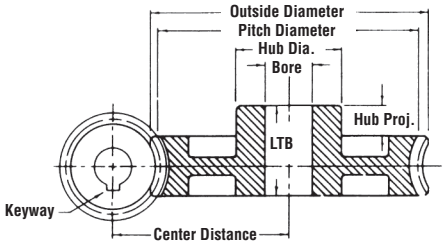


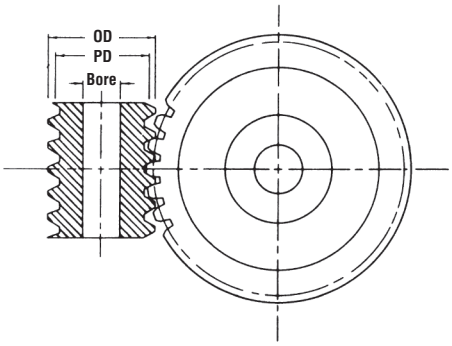
***NOTE: SELF-LOCKING ABILITY.** There is often some confusion as to the self-locking ability of a worm and gear set. Martin worm gear sets, under no condition should be considered to hold a load when at rest. The statement is made to cover the broad spectrum of variables affecting self-locking characteristics of a particular gear set in a specific application. Theoretically, a worm gear will not back drive if the friction angle is greater than the worm lead angle. However, the actual surface finish and lubrication may reduce this significantly. More important, vibration may cause motion at the point of mesh with further reduction in the friction angle.

Generally speaking, if the worm lead angle is less than 5°, there is reasonable expectation of self-locking. Again, no guarantee should be made and customer should be advised. **If safety is involved, a positive brake should be used.**

Worm and Worm Gears
3 Pitch • 2" Face • 14½° Pressure Angle

Right Hand Single Thread (Stocked Right Hand Only)

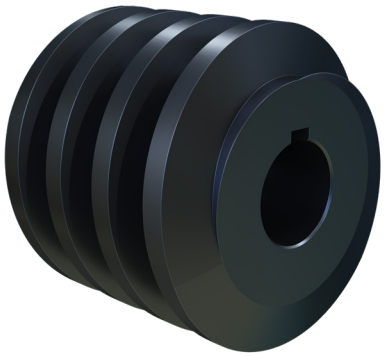




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (inches)	Hub (Inches)		Style
					Diameter	Projection	
18	W318	16.2	6.000	1	3	1 1/2	W
24	W324	22.8	8.000	1 1/2	3 1/2	1 1/2	W
30	W330	30.2	10.000	1 1/2	3 7/8	1 1/2	S
36	W336	36.4	12.000	1 1/2	3 1/2	1 1/2	S
54	W354	60.2	18.000	1 1/2	4	1 1/2	S

W = WEB S = SPOKE



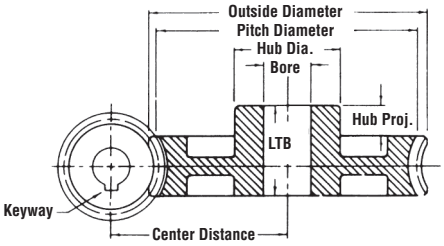
Steel — 4° 46' Helix Angle Worms

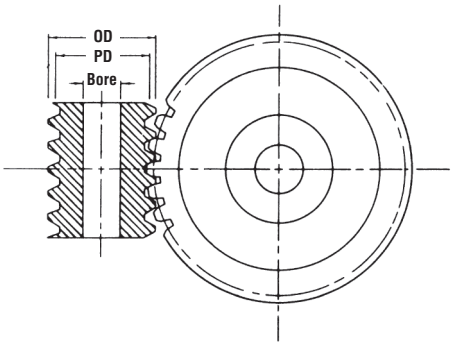
Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Keyway (inches)
W3	12.2	WG3	12.0	4	4.000	1 1/2	3/8 × 3/16

Case hardened worms have ground and polished threads (Indicated by letter “G” in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Worm and Worm Gears
4 Pitch • 1½" Face • 14½° Pressure Angle

Right Hand Single Thread (Stocked Right Hand Only)

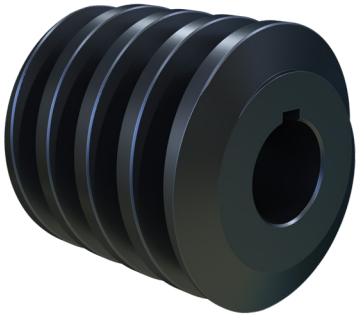




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W420	8.4	5.000	1	2 1/2	1 1/4	W
24	W424	12.9	6.000	1	2 1/2	1 1/4	W
32	W432	15.6	8.000	1 1/4	3	1 1/4	W
40	W440	27.5	10.000	1 1/4	3	1 1/4	W
48	W448	34.1	12.000	1 1/2	4	1 1/4	W
64	W464	43.9	16.000	1 1/2	4	1 1/4	S

W = WEB S = SPOKE



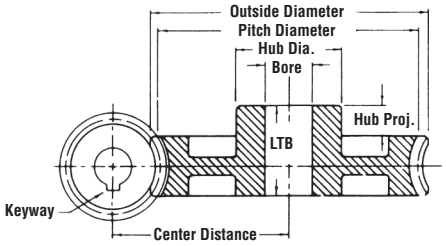
Steel — 4° 46' Helix Angle Worms

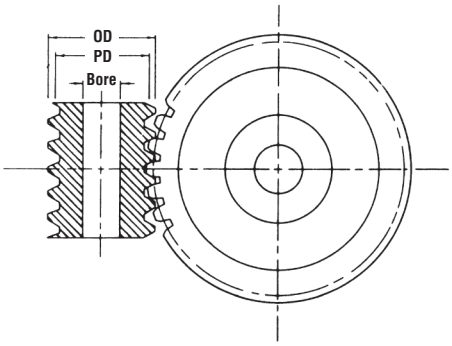
Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Keyway (inches)
W4	5.6	WG4	5.5	3 1/2	3.000	1 1/4	5/16 × 5/32

Case hardened worms have ground and polished threads (Indicated by letter “G” in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Worm and Worm Gears
6 Pitch • 1" Face • 14½° Pressure Angle

Right Hand Single Thread (Stocked Right Hand Only)

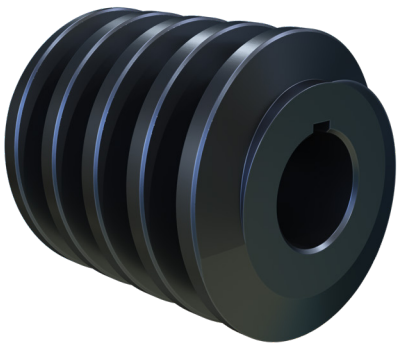




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W620	2.5	3.333	3/4	1 7/8	7/8	W
24	W624	3.6	4.000	3/4	1 7/8	7/8	W
30	W630	5.0	5.000	7/8	2 1/4	7/8	W
36	W636	6.0	6.000	1	2 1/2	7/8	W
40	W640	7.6	6.667	1	2 1/2	7/8	W
48	W648	9.2	8.000	1 1/4	2 3/4	1	W
60	W660	13.7	10.000	1 1/4	3	1 1/4	W
72	W672	14.9	12.000	1 1/4	3	1 1/4	W

W = WEB



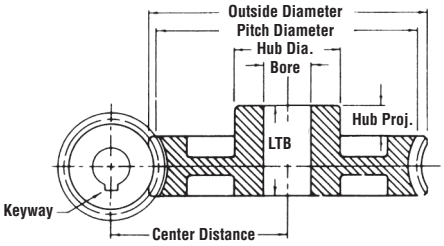
Steel — 4° 46' Helix Angle Worms

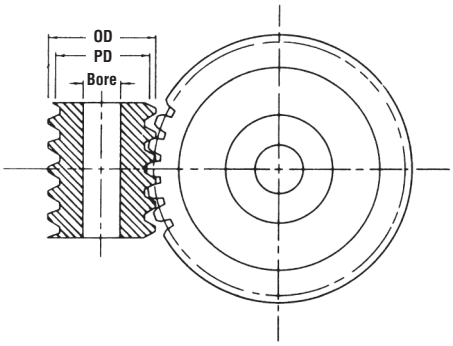
Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
							Diameter	Projection	
W6	1.8	WG6	1.7	2 1/2	2.000	7/8			3/16 × 3/32
WH6	2.7			2 1/2	2.000	7/8	1 9/16	3/4	3/16 × 3/32

Case hardened worms have ground and polished threads (Indicated by letter “G” in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Worm and Worm Gears
6 Pitch • 1" Face • 14½° Pressure Angle

Right Hand Double Thread (Stocked Right Hand Only)

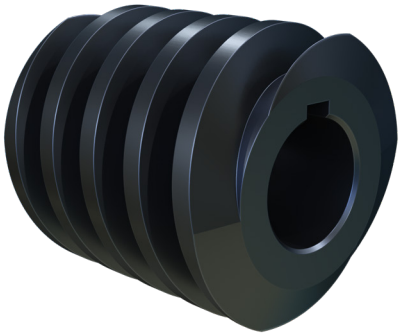




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W620D	3.3	3.333	1	2 3/4	1	PLAIN
24	W624D	4.1	4.000	1 1/4	2 3/4	1	PLAIN
30	W630D	5.2	5.000	1 1/4	2 3/4	1	W
40	W640D	7.6	6.667	1 1/4	2 3/4	1	W

W = WEB

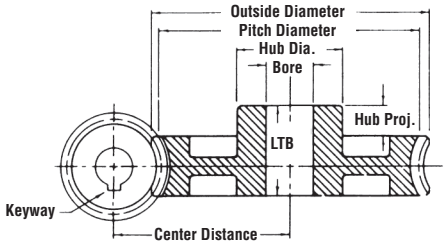


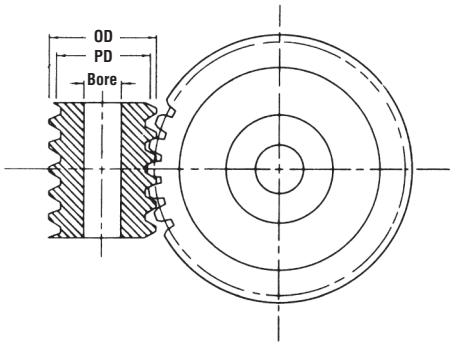
Steel — 9° 28' Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Keyway (inches)
W6D	1.6	2 1/2	2.000	1	1/4 × 1/8

Worm and Worm Gears
6 Pitch • 1" Face • 14½° Pressure Angle

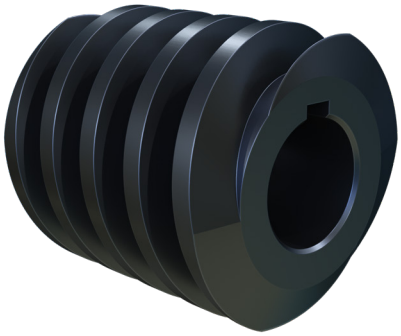
Right Hand Quadruple Thread (Stocked Right Hand Only)





Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W620Q	3.4	3.333	1	2 3/4	1	PLAIN
24	W624Q	4.1	4.000	1 1/4	2 3/4	1	PLAIN

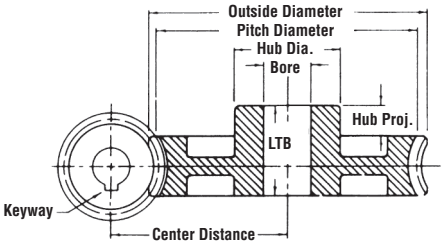


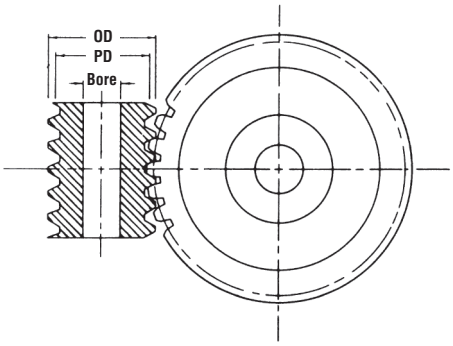
Steel — 18° 26' Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Keyway (inches)
W6D	1.6	2 1/2	2.000	1	1/4 × 1/8

Worm and Worm Gears
8 Pitch • ¾" Face • 14½° Pressure Angle

Right Hand Single Thread (Stocked Right Hand Only)

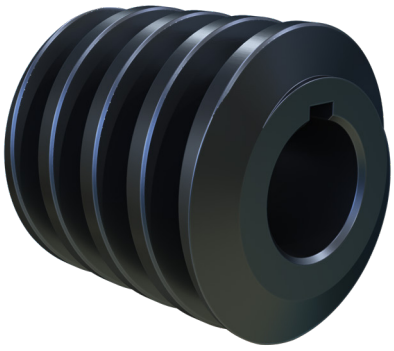




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W820	1.3	2.500	3/4	1 3/4	3/4	PLAIN
30	W830	2.4	3.750	3/4	1 3/4	3/4	W
40	W840	3.7	5.000	1	2 3/8	7/8	W
48	W848	4.5	6.000	1	2 3/8	7/8	W
50	W850	5.1	6.250	1	2 1/2	7/8	W
60	W860	6.1	7.500	1	2 1/2	7/8	W
80	W880	8.9	10.000	1 1/4	3	7/8	W

W = WEB



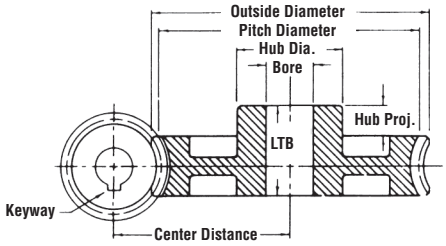
Steel — 4° 46' Helix Angle Worms

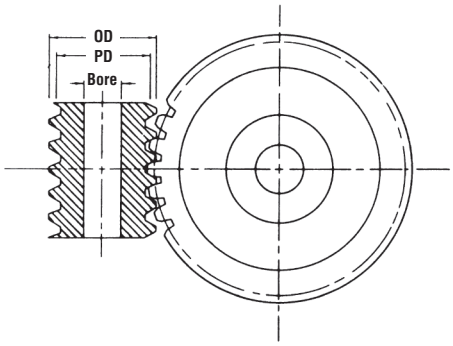
Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
							Diameter	Projection	
W8	0.64	WG8	0.62	1 3/4	1.500	3/4			3/16 × 3/32
WH8	0.74			1 3/4	1.500	3/4	1 3/16	5/8	

Case hardened worms have ground and polished threads (Indicated by letter “G” in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Worm and Worm Gears
8 Pitch • ¾" Face • 14½° Pressure Angle

Right Hand Double Thread (Stocked Right Hand Only)

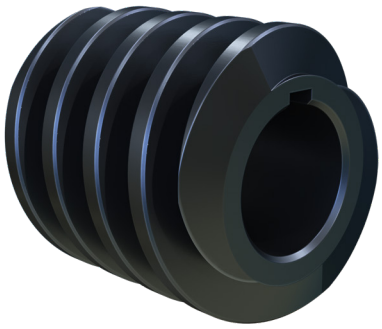




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W820D	1.2	2.500	1	2	3/4	PLAIN
30	W830D	2.5	3.750	1	2 1/4	3/4	W
40	W840D	3.4	5.000	1	2 1/4	3/4	W

W = WEB



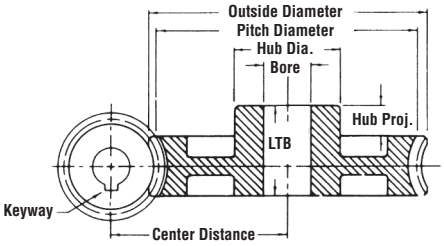
Steel — 9° 28' Helix Angle Worms

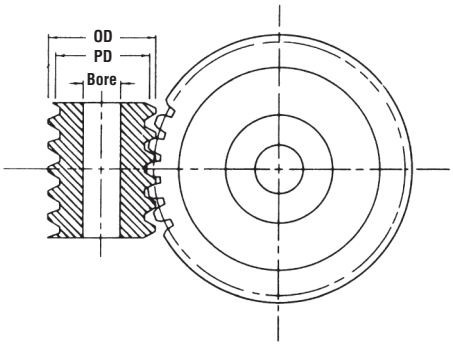
Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
							Diameter	Projection	
W8D	0.56	WG8D	0.54	1 3/4	1.500	7/8			3/16 × 3/32
WH8D	0.74			1 3/4	1.500	3/4	1 3/16	5/8	

Case hardened worms have ground and polished threads (Indicated by letter “G” in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Worm and Worm Gears
8 Pitch • ¾" Face • 14½° Pressure Angle

Right Hand Quadruple Thread (Stocked Right Hand Only)

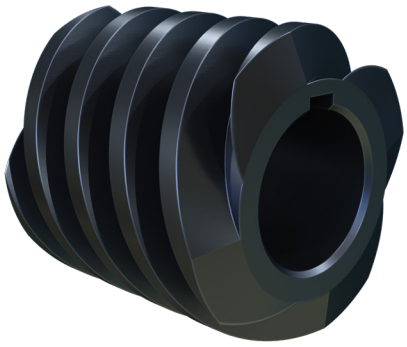




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W820Q	1.2	2.500	1	2	3/4	PLAIN
30	W830Q	2.5	3.750	1	2 1/4	3/4	W

W = WEB

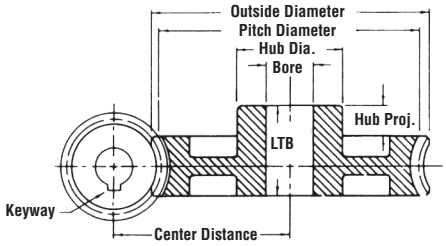


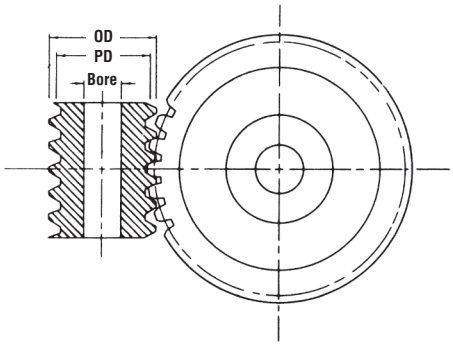
Steel — 18° 26' Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
					Diameter	Projection	
W8Q	0.58	1 3/4	1.500	7/8			3/16 × 3/32
WH8Q	0.76	1 3/4	1.500	3/4	13/16	5/8	

Worm and Worm Gears
10 Pitch • 5/8" Face • 14½° Pressure Angle

Right Hand Single Thread (Stocked Right Hand Only)

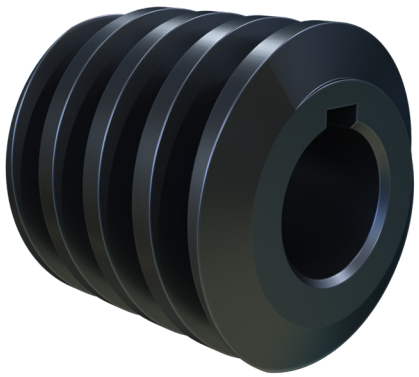




Cast Iron and Bronze

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style	Part Number Bronze	Wt. Lb. (Approx.)
					Diameter	Projection			
20	W1020	0.7	2.000	1/2	1 1/4	3/4	PLAIN	WB1020	.8
30	W1030	1.5	3.000	5/8	1 3/4	3/4	PLAIN	WB1030	1.7
40	W1040	1.8	4.000	5/8	1 3/4	3/4	W	WB1040	2.4
50	W1050	2.8	5.000	3/4	2	3/4	W		
60	W1060	3.6	6.000	3/4	2	3/4	W		
80	W1080	4.8	8.000	3/4	2	3/4	W		
100	W10100	6.0	10.000	3/4	2 1/2	3/4	W		

W = WEB



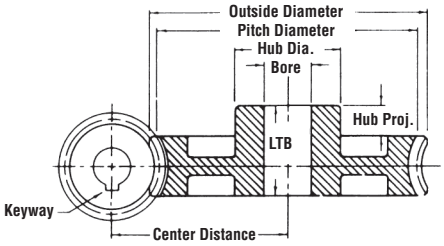
Steel — 4° 34'Helix Angle Worms

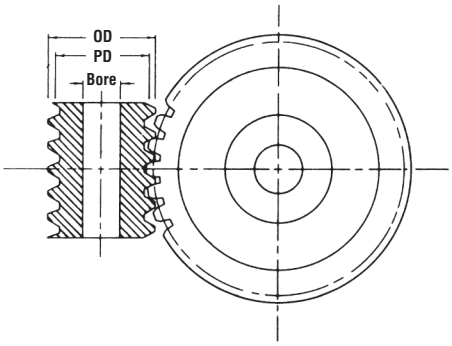
Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
							Diameter	Projection	
W10	0.36	WG10	0.32	1 3/8	1.250	5/8			3/16 × 3/32
WH10	0.42		0.38	1 3/8	1.250	5/8	1	1/2	

Case hardened worms have ground and polished threads (Indicated by letter "G" in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Worm and Worm Gears
10 Pitch • 5/8" Face • 14½° Pressure Angle

Right Hand Double Thread (Stocked Right Hand Only)

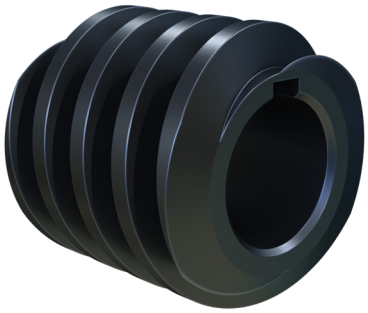




Cast Iron and Bronze

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style	Part Number Bronze	Wt. Lb. (Approx.)
					Diameter	Projection			
20	W1020D	0.65	2.000	7/8	1 5/8	5/8	PLAIN	WB1020D	0.75
30	W1030D	1.30	3.000	7/8	1 3/4	5/8	PLAIN	WB1030D	1.30
40	W1040D	1.60	4.000	7/8	1 3/4	5/8	W		
50	W1050D	2.90	5.000	7/8	2	1	W		
60	W1060D	3.00	6.000	7/8	2	1	W		

W = WEB

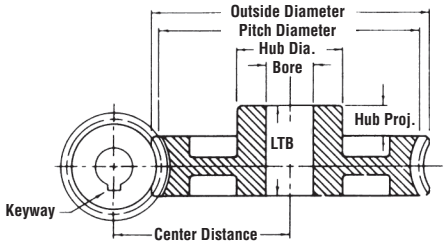


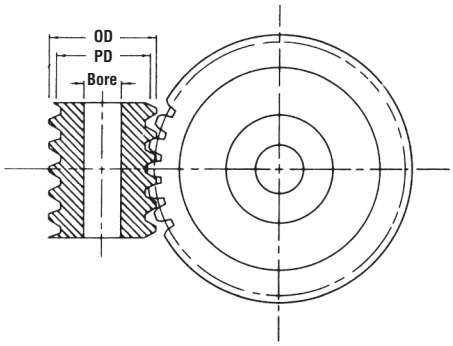
Steel — 9° 5'Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
					Diameter	Projection	
W10D	0.28	1 3/8	1.2500	3/4			3/16 × 3/32
WH10D	0.42	1 3/8	1.2500	5/8	1	1/2	

Worm and Worm Gears
10 Pitch • 5/8" Face • 14½° Pressure Angle

Right Hand Quadruple Thread (Stocked Right Hand Only)

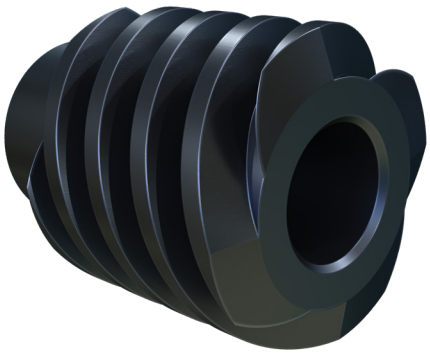




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W1020Q	0.64	2.000	7/8	1 5/8	5/8	PLAIN
30	W1030Q	1.30	3.000	7/8	1 3/4	5/8	W
40	W1040Q	1.60	4.000	7/8	1 3/4	5/8	W

W = WEB

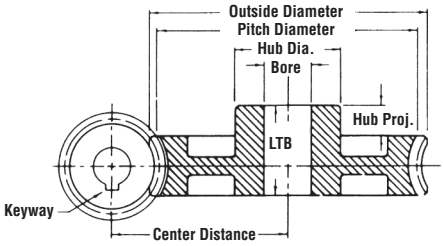


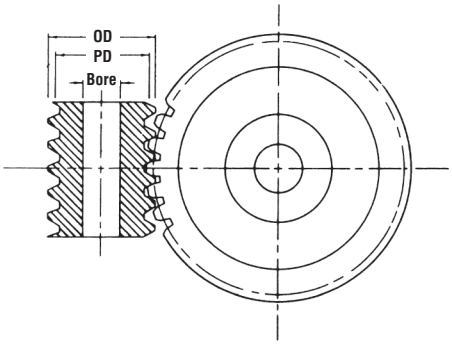
Steel — 17° 45'Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
					Diameter	Projection	
W10Q	0.28	1 3/8	1.250	3/4			3/16 × 3/32
WH10Q	0.40	1 3/8	1.250	5/8	1	1/2	

Worm and Worm Gears
12 Pitch • ½" Face • 14½° Pressure Angle

Right Hand Single Thread (Stocked Right Hand Only)

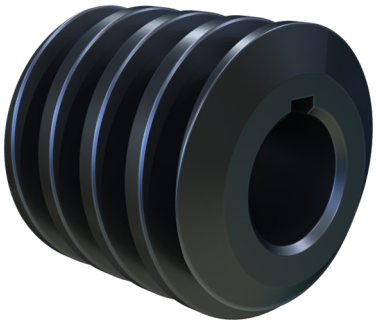




Cast Iron and Bronze

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style	Part Number Bronze	Wt. Lb. (Approx.)
					Diameter	Projection			
18	W1218	0.28	1.500	1/2	1 1/4	5/8	PLAIN		
20	W1220	0.35	1.667	1/2	1 1/4	5/8	PLAIN	WB1220	0.45
30	W1230	0.71	2.500	1/2	1 1/4	5/8	W		
40	W1240	1.20	3.333	5/8	1 1/2	3/4	W		
50	W1250	1.50	4.166	5/8	1 1/2	3/4	W		
60	W1260	2.00	5.000	5/8	1 3/4	3/4	W		
80	W1280	3.90	6.666	5/8	2 1/2	3/4	W		
100	W12100	4.40	8.333	3/4	2	3/4	W		

W = WEB



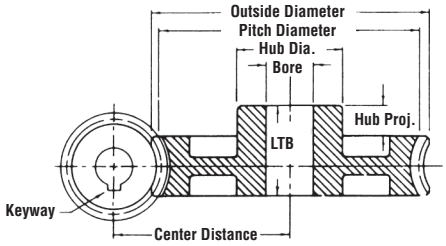
Steel — 4° 46'Helix Angle Worms

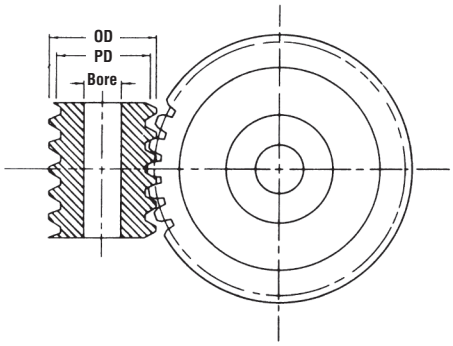
Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
							Diameter	Projection	
W12	0.17	WG12	0.14	1 1/8	1.000	1/2			1/8 × 1/16
WH12	0.20			1 1/8	1.000	1/2	3/4	3/8	

Case hardened worms have ground and polished threads (Indicated by letter "G" in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Worm and Worm Gears
12 Pitch • ½" Face • 14½° Pressure Angle

Right Hand Double Thread (Stocked Right Hand Only)

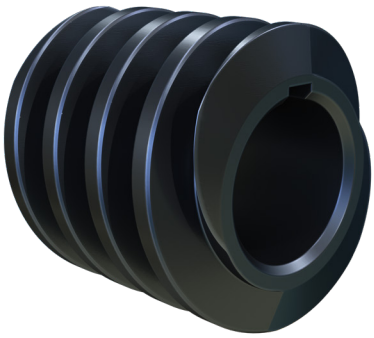




Cast Iron and Bronze

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style	Part Number Bronze	Wt. Lb. (Approx.)
					Diameter	Projection			
20	W1220D	0.32	1.666	1/2	1 1/4	1/2	PLAIN	WB1220D	0.40
30	W1230D	0.78	2.500	3/4	1 1/2	5./8	PLAIN		
40	W1240D	1.30	3.333	3/4	1 3/4	5/8	W		

W = WEB



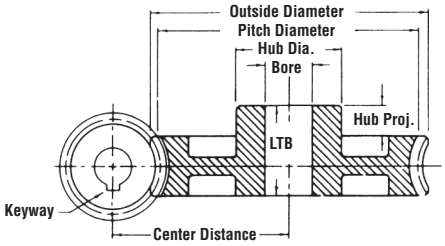
Steel — 9° 28' Helix Angle Worms

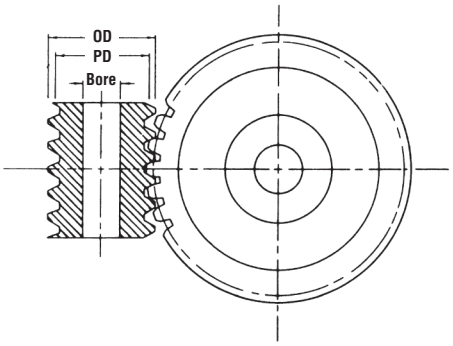
Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
							Diameter	Projection	
W12D	0.14	WG12D	0.14	1 1/8	1.000	5/8			1/8 × 1/16
WH12D			0.20	1 1/8	1.000	1/2	3/4	3/8	

Case hardened worms have ground and polished threads (Indicated by letter "G" in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Worm and Worm Gears
12 Pitch • ½" Face • 14½° Pressure Angle

Right Hand Quadruple Thread (Stocked Right Hand Only)

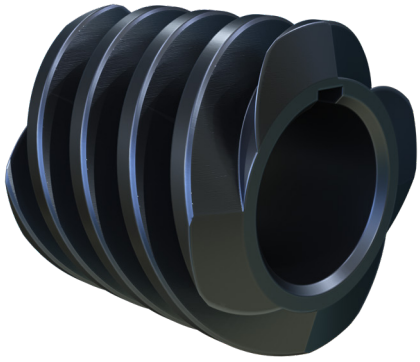




Cast Iron

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style
					Diameter	Projection	
20	W1220Q	0.32	1.666	1/2	1 1/4	1/2	PLAIN
30	W1230Q	0.38	2.500	3/4	1 1/2	5/8	PLAIN
40	W1240Q	0.80	3.333	3/4	1 3/4	5/8	W

W = WEB

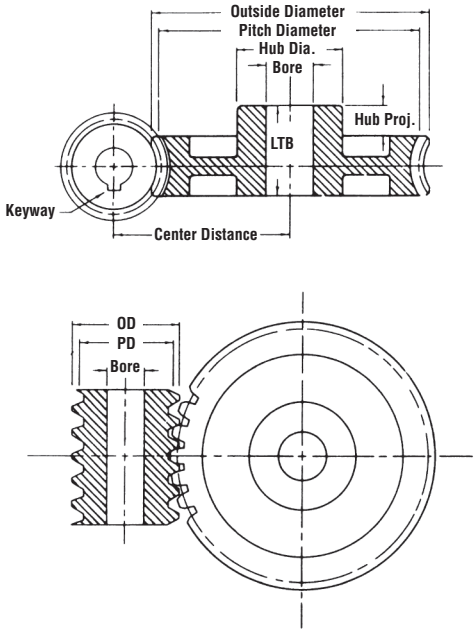


Steel — 18° 26' Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Keyway (inches)
							Diameter	Projection	
W12Q	0.14	WG12Q	0.14	1 1/8	1.000	5/8			1/8 × 1/16
WH12Q	0.20			1 1/8	1.000	1/2	3/4	3/8	

Worm and Worm Gears
16 Pitch • 5/16" Face • 14½° Pressure Angle

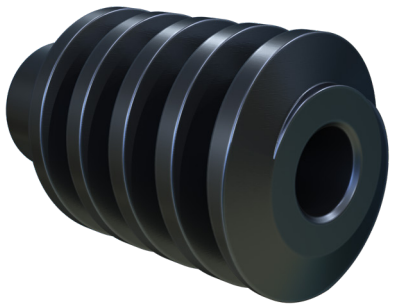
Right Hand Single Thread (Stocked Right Hand Only)



Bronze

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style
					Diameter	Projection	
20	WB1620	0.13	1.250	1/4	5/8	5/16	PLAIN
30	WB1630	0.28	1.875	5/16	3/4	3/8	W
40	WB1640	0.42	2.500	5/16	3/4	3/8	W
50	WB1650	0.50	3.125	3/8	7/8	7/16	W

W = WEB

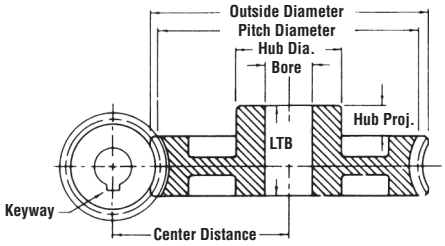


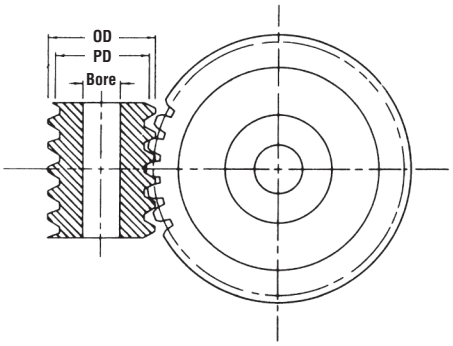
Steel — 5° 43'Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Part Number Hardened	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)	
							Diameter	Projection
WH16	0.08			1	0.625	1/4	0.46	1/4
		WHG16	0.07	1	0.625	5/16	0.46	1/4

Case hardened worms have ground and polished threads (Indicated by letter “G” in Part Number).
Please note: Stock bore sizes on ground worms may be difficult to modify.

Right Hand Double Thread (Stocked Right Hand Only)

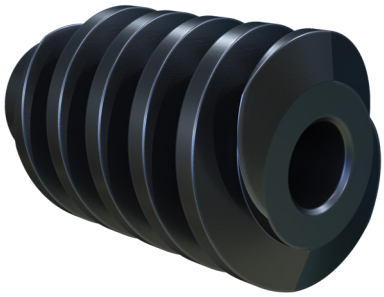




Bronze

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style
					Diameter	Projection	
20	WB1620D	0.14	1.250	1/4	5/8	5/16	PLAIN

W = WEB

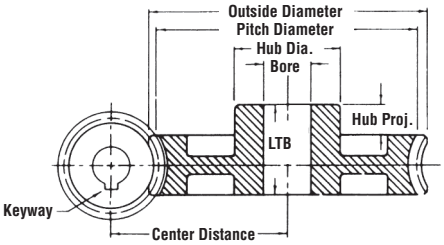


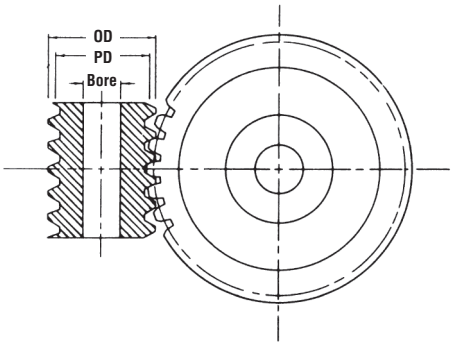
Steel — 11° 19'Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)	
					Diameter	Projection
WH16D	0.09	1	0.625	1/4	0.46	1/4

Worm and Worm Gears
16 Pitch • 5/16" Face • 20° Pressure Angle

Right Hand Quadruple Thread (Stocked Right Hand Only)

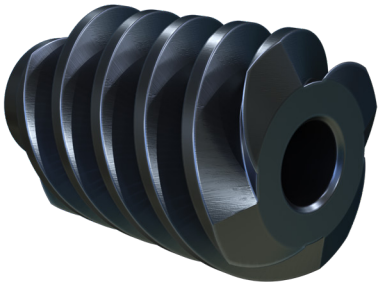




Bronze

Number of Teeth	Part Number Cast Iron	Wt. Lb. (Approx.)	Pitch Diameter	Bore (Inches)	Hub (Inches)		Style
					Diameter	Projection	
20	WB1620Q	0.14	1.250	1/4	5/8	5/16	PLAIN

W = WEB



Steel — 21° 48'Helix Angle Worms

Part Number Soft	Wt. Lb. (Approx.)	Face (Inches)	Pitch Diameter	Bore (Inches)	Hub (Inches)	
					Diameter	Projection
WH16Q	0.08	1	0.625	1/4	0.46	1/4

Ratio-Center Distance Listings With Approximate Horsepower and Torque** Ratings for Hardened and Ground Worms With Bronze Worm Gears

RPM of Worm			1800		900		300		100	
Center		*Gear	Input-Output		Input-Output		Input-Output		Input-Output	
Ratio	Distance		HP	Torque	HP	Torque	HP	Torque	HP	Torque
5.00	0.938	WB1620Q	0.37	60	0.25	70	0.09	80	0.03	80
5.00	1.333	WB1220Q	0.80	130	0.55	170	0.25	200	0.08	215
5.00	1.625	WB1020Q	1.25	200	0.90	275	0.40	350	0.15	370
5.00	2.000	WB820Q	2.00	315	1.50	460	0.80	890	0.33	965
5.00	2.667	WB620Q	3.70	600	2.75	880	1.40	1280	0.55	1430
6.00	3.000	WB624Q	4.50	880	3.40	1300	1.75	1900	0.70	2180
7.50	1.250	WB1630Q	0.50	130	0.33	160	0.14	180	0.05	185
7.50	1.750	WB1230Q	1.25	300	0.85	390	0.33	460	0.13	490
7.50	2.125	WB1030Q	1.90	450	1.33	560	0.60	790	0.25	850
7.50	2.625	WB830Q	3.00	725	2.25	1060	1.00	1400	0.40	1520
7.50	3.500	WB630Q	5.75	1400	4.33	2060	2.20	2960	0.87	3330
9.67	4.050	WB529T	8.40	2615	6.25	3785	3.33	5730	1.33	6540
10.00	0.938	WB1620D	0.25	70	0.15	85	0.06	90	0.02	95
10.00	1.333	WB1220D	0.50	155	0.33	205	0.16	240	0.60	250
10.00	1.562	WB1640Q	0.75	240	0.50	285	0.18	320	0.06	330
10.00	1.625	WB1020D	0.80	230	0.60	325	0.25	400	0.10	430
10.00	2.000	WB820D	1.25	365	0.90	525	0.45	690	0.15	750
10.00	2.167	WB1240Q	1.67	530	1.10	700	0.50	830	0.17	880
10.00	2.625	WB1040Q	2.50	805	1.75	1120	0.80	1400	0.30	1500
10.00	2.667	WB620D	2.40	735	1.80	1075	0.95	1540	0.37	1700
10.00	3.250	WB840Q	4.00	1300	3.00	1880	1.40	2500	0.50	2700
10.00	4.333	WB640Q	7.75	2500	5.75	3675	3.00	5333	1.15	5980
12.00	3.000	WB624D	2.85	1050	2.20	1550	1.15	2200	0.45	2450
12.5	1.875	WB1650Q	0.95	375	0.60	445	0.25	500	0.08	515
12.5	2.583	WB1250Q	2.00	820	1.40	1080	0.60	1300	0.20	1370
12.5	3.125	WB1050Q	3.00	1250	2.25	1740	1.00	2200	0.33	2340
12.5	3.875	WB850Q	4.90	2000	3.70	2900	1.70	3840	0.65	4170
12.5	5.167	WB650Q	9.50	3800	7.00	5600	3.60	8200	1.40	9200
13.33	5.150	WB540T	11.00	4720	8.20	6830	4.40	10360	1.75	11800
15.00	1.250	WB1630D	0.33	155	0.25	180	0.08	200	0.03	210
15.00	1.750	WB1230D	0.75	350	0.50	450	0.25	535	0.07	560
15.00	2.125	WB1030D	1.20	520	0.87	725	0.37	900	0.15	965
15.00	2.188	WB1660Q	1.10	570	0.70	680	0.25	760	0.10	790
15.00	2.625	WB830D	1.67	750	1.25	1080	0.60	1415	0.25	1530
15.00	3.000	WB1260Q	2.50	1170	1.67	1540	0.70	1800	0.25	1930
15.00	3.500	WB630D	3.50	1620	2.70	2375	1.40	3370	0.55	3770
15.00	3.625	WB1060Q	3.75	1700	2.67	2500	1.17	3100	0.50	3300
15.00	4.500	WB860Q	5.75	2820	4.33	4100	2.00	5470	0.75	6000
15.00	6.000	WB660Q	11.33	5550	8.50	8000	4.33	11700	1.70	13100
16.67	6.150	WB550T	13.50	7250	10.00	10500	5.40	16000	2.20	18000
18.00	5.000	WB318	6.00	3100	4.67	4570	3.00	8000	1.50	10000
18.00	7.000	WB672Q	13.50	7800	10.00	11400	5.00	16500	2.00	18500
20.00	0.938	WB1620	0.15	75	0.10	90	0.04	100	0.02	105
20.00	1.333	WB1220	0.33	170	0.25	220	0.10	260	0.04	275
20.00	1.562	WB1640D	0.50	270	0.30	310	0.10	350	0.04	350
20.00	1.625	WB1020	0.50	250	0.33	350	0.20	440	0.07	470

* Ratings listed are for bronze worm gears operating with hardened and ground steel worms. For ratings of cast iron worm gears with hardened steel worm, multiply listed ratings by 30%. For cast iron with hardened and ground steel worm, multiply by 50%.*

Torque ratings in inch pounds.

Ratio-Center Distance Listings With Approximate Horsepower and Torque Ratings for Hardened and Ground Worms With Bronze Worm Gears

RPM of Worm			1800		900		300		100	
Center		*Gear	Input-Output		Input-Output		Input-Output		Input-Output	
Ratio	Distance		HP	Torque	HP	Torque	HP	Torque	HP	Torque
20	2.000	WB820	0.75	400	0.60	600	0.33	775	0.12	850
20	2.167	WB1240D	1.00	600	0.67	775	0.33	920	0.10	970
20	2.625	WB1040D	1.50	900	0.85	1230	0.50	1500	0.20	1650
20	2.667	WB620	1.50	800	1.15	1170	0.75	1660	0.25	1850
20	2.812	WB1680Q	1.40	900	0.90	1075	0.33	1200	0.12	1240
20	3.250	WB840D	2.30	1400	1.75	2000	0.80	2580	0.33	2800
20	3.833	WB1280Q	3.12	2000	2.12	2600	0.90	3120	0.33	3300
20	4.000	WB420	3.50	2000	2.75	2880	1.75	4700	0.75	5600
20	4.333	WB640D	4.50	2780	3.40	4050	1.75	5800	0.70	6500
20	4.625	WB1080Q	4.75	3000	3.40	4250	1.50	5340	0.50	5700
20	5.750	WB880Q	7.50	4800	5.60	7000	2.60	9400	1.00	10200
20	7.667	WB680Q	15.00	9500	10.75	13800	5.50	20000	2.20	22500
24	3.000	WB624	1.75	1120	1.33	1630	0.75	2300	0.33	2600
24	4.500	WB424	4.00	2800	3.00	4000	2.00	6600	0.90	7800
24	6.000	WB324	7.50	5300	5.90	7750	3.90	13500	1.90	17000
25	1.875	WB1650D	0.50	370	0.33	470	0.12	520	0.05	540
25	2.583	WB1250D	1.20	890	0.80	1150	0.33	1380	0.12	1450
25	3.125	WB1050D	1.80	1340	1.33	1850	0.60	2300	0.25	2500
25	3.438	WB16100Q	1.75	1300	1.00	1575	0.40	1750	0.12	1800
25	3.875	WB850D	3.00	2200	2.25	3250	1.00	4200	0.40	4500
25	4.667	WB12100Q	3.67	2800	2.50	3660	1.00	4400	0.40	4630
25	5.167	WB650D	5.50	4000	4.00	6000	2.15	8700	0.87	9700
25	5.625	WB10100Q	5.70	4500	4.10	6380	1.75	8000	0.67	8500
25	7.000	WB8100Q	10.00	9700	7.00	11500	4.00	17500	1.25	19000
25	9.333	WB6100Q	17.50	14250	13.00	20750	6.66	30000	2.60	33000
29	4.050	WB529	3.50	2800	2.75	4200	1.50	6300	0.67	7000
30	1.250	WB1630	0.20	160	0.12	190	0.06	210	0.02	215
30	1.750	WB1230	0.50	350	0.33	450	0.15	540	0.06	570
30	2.125	WB1030	0.70	530	0.50	750	0.25	925	0.10	1000
30	2.188	WB1660	0.60	590	0.40	700	0.15	760	0.05	800
30	2.625	WB830	1.00	870	0.85	1260	0.40	1600	0.17	1750
30	3.000	WB1260D	1.33	1230	1.00	1600	0.40	1900	0.15	2000
30	3.500	WB630	2.00	1700	1.60	2430	0.87	3500	0.33	3800
30	3.625	WB1060D	2.00	1850	1.50	2500	0.70	3200	0.25	3430
30	4.500	WB860D	3.25	2900	2.50	4300	1.12	5650	0.50	6000
30	6.000	WB660D	6.30	5800	4.80	6075	2.50	12110	1.00	13510
30	7.000	WB330	9.05	7880	7.00	11570	4.60	20280	2.25	25560
32	5.500	WB432	5.15	4680	4.00	6750	2.50	11140	1.10	13200
36	4.000	WB636	2.33	2310	1.80	3380	1.00	4800	0.42	5360
36	7.000	WB672D	7.25	8010	5.50	11670	2.87	16700	1.15	18650
36	8.000	WB336	10.40	10900	8.10	15960	5.35	27950	2.60	35280
40	1.562	WB1640	0.25	266	0.12	330	0.07	350	0.02	360
40	2.167	WB1240	0.55	580	0.30	825	0.18	900	0.07	940
40	2.625	WB1040	0.87	890	0.65	1220	0.30	1520	0.12	1630
40	2.812	WB1680D	0.75	910	0.33	1140	0.20	1200	0.07	1230

* Ratings listed are for bronze worm gears operating with hardened and ground steel worms. For ratings of cast iron worm gears with hardened steel worm, multiply listed ratings by 30%. For cast iron with hardened and ground steel worm, multiply by 50%.*

Torque ratings in inch pounds.

Ratio-Center Distance Listings With Approximate Horsepower and Torque Ratings for Hardened and Ground Worms With Bronze Worm Gears

RPM of Worm			1800		900		300		100	
Center		*Gear	Input-Output		Input-Output		Input-Output		Input-Output	
Ratio	Distance		HP	Torque	HP	Torque	HP	Torque	HP	Torque
40	3.250	WB840	1.35	1440	0.85	2350	0.50	2700	0.20	2900
40	3.833	WB1280D	1.70	2040	1.15	2675	0.50	3160	0.20	3330
40	4.333	WB640	2.50	2770	2.00	4033	1.00	5760	0.45	6420
40	4.625	WB1080D	2.60	3070	1.90	4270	0.85	5315	0.33	5680
40	5.150	WB540	4.33	4930	3.40	7145	2.00	10725	0.83	12170
40	5.750	WB880D	4.00	4740	3.00	6850	1.40	8940	0.55	9680
40	6.500	WB440	6.00	5520	4.65	7950	3.00	13200	1.33	15480
40	7.667	WB680D	7.83	9600	6.00	14000	3.00	20025	1.25	22340
48	3.750	WB848	1.50	1950	1.20	2820	0.60	3650	0.25	3960
48	5.000	WB648	2.80	3730	2.25	5460	1.25	7750	0.50	8640
48	7.500	WB448	6.80	9320	5.25	13400	3.33	22200	1.50	26160
48	10.000	WB348	12.70	17640	9.87	25920	6.50	45360	3.16	57120
50	1.875	WB1650	0.30	380	0.20	450	0.08	490	0.03	515
50	2.583	WB1250	0.66	840	0.50	1090	0.20	1300	0.08	1360
50	3.125	WB1050	1.00	1280	0.75	1770	0.33	2200	0.14	2340
50	3.438	WB16100D	0.90	1290	0.50	1525	0.25	1690	0.08	1730
50	3.875	WB850	1.60	2140	1.25	3130	0.66	4090	0.25	4430
50	4.667	WB12100D	2.00	2875	1.33	3600	0.50	4460	0.22	4700
50	5.167	WB650	2.90	4000	2.25	5825	1.25	8310	0.50	9260
50	5.625	WB10100D	3.00	4440	2.16	6110	1.00	7675	0.33	8000
50	6.150	WB550	5.12	7120	4.00	10320	2.25	15480	1.00	17570
50	7.000	WB8100D	4.10	5000	2.75	7500	1.50	8000	0.60	10000
50	9.333	WB6100D	9.00	13800	6.75	20200	3.50	28930	1.40	32280
54	11.000	WB354	13.50	21230	10.50	31200	7.00	54480	3.33	68760
59	7.050	WB559	5.50	9230	4.50	13900	2.50	20075	1.00	23160
60	2.188	WB1660	0.33	550	0.20	650	0.08	720	0.03	740
60	3.000	WB1260	0.75	1100	0.50	1440	0.25	1700	0.09	1790
60	3.625	WB1060	1.00	1690	0.80	2330	0.33	2890	0.16	3080
60	4.500	WB860	1.66	2660	1.33	3900	0.66	5090	0.25	5500
60	6.000	WB660	3.20	5240	2.50	7670	1.40	1080	0.60	1225
64	9.500	WB464	7.87	14280	6.00	20640	3.80	34080	1.70	40320
72	7.000	WB672	3.33	6610	2.50	9660	1.50	13700	0.60	15360
80	2.812	WB1680	0.33	705	0.22	830	0.09	920	0.04	950
80	3.833	WB1280	0.75	1550	0.50	2030	0.25	2375	0.10	2520
80	4.625	WB1080	1.15	2375	0.87	3275	0.40	4050	0.16	4330
80	5.750	WB880	1.80	3800	1.40	5500	0.70	7140	0.30	7750
80	7.667	WB680	3.33	7380	2.66	10750	1.50	15350	0.60	17110
96	6.750	WB896	1.50	4200	1.00	6000	0.50	7000	0.20	8500
96	9.000	WB696	3.25	8490	2.50	12370	1.33	17660	0.50	19680
100	3.438	WB16100	0.33	810	0.20	960	0.09	1060	0.33	1100
100	4.667	WB12100	0.75	1790	0.50	2330	0.25	2730	0.90	2800
100	5.625	WB10100	1.00	2780	0.80	3850	0.33	4775	0.16	5100
100	7.000	WB8100	1.67	4450	1.25	6300	0.67	8000	0.24	9000
100	9.333	WB6100	3.20	8700	2.50	12675	1.33	18090	0.55	20160

* Ratings listed are for bronze worm gears operating with hardened and ground steel worms. For ratings of cast iron worm gears with hardened steel worm, multiply listed ratings by 30%. For cast iron with hardened and ground steel worm, multiply by 50%.*

Torque ratings in inch pounds.

Gear Standards

Quality is the most important factor in buying a gear. We have established standards and tolerances to insure our customers of accurate, dependable and long-lasting gears. All gears are checked with precision pins to assure correct backlash and center distances.

BACKLASH: The recommended backlash for mating gears when assembled is:

3 DP	.009 — .014	10 DP	.003 — .005
4 DP	.007 — .011	12 DP	.003 — .005
5 DP	.006 — .009	16 DP	.002 — .004
6 DP	.005 — .008	20 DP	.002 — .004
8 DP	.004 — .006	24 DP	.002 — .004

CONCENTRICITY of pitch line with bore (Total Indicator Reading) is held within:

3 DP	.006	10 DP	.0040
4 DP	.006	12 DP	.0040
5 DP	.005	16 DP	.0025
6 DP	.005	20 DP	.0025
8 DP	.005	24 DP	.0025

Stock bores are reamed, honed or ground to a smooth finish and standard commercial tolerances or closer. For rust prevention on distributor's shelf and for better appearance when received by the user, all stock gears go through a special finishing process. They present a pleasing appearance when on display or on the shelf. They are not boxed. All gears are identified by part numbers.

GEAR ENGINEERING DATA

PAGE

GEAR DRIVE SELECTION . . . . . G-80 – G-82
HORSEPOWER FORMULA. G-83
GEAR STANDARDS G-84
SPUR FORMULAS . . . . . G-85 – G-90
BEVEL AND MITER GEAR FORMULAS G-91
WORM GEAR FORMULAS G-92

Stock Spur Gear Drive Selection

When designing a stock gear drive using the horsepower tables in this catalog, the following steps must be taken:

I. Find out these five necessary things:

a. Exact center distance in inches
b. Ratio and speeds
c. Service factor (from page G-84)
d. Actual horsepower
e. Bore sizes of both gears

II. Determine design horsepower using formula:

$$DHP = HP \times SF$$

Where: DHP = Design horsepower
HP = Actual horsepower
SF = Service factor (from page G-84)

III. Determine pitch diameters using the formulas:

$$PD_1 = \frac{CD \times 2}{Ratio + 1}$$

$$PD_2 = PD_1 \times Ratio$$

Where: PD_1 = Pitch diameter of pinion (small gear)
PD_2 = Pitch diameter of gear (large gear)
CD = Center distance

IV. Check the center distance:

$$CD = \frac{PD_1 + PD_2}{2}$$

V. Select pitch from horsepower tables on pages G-25 — G-27.

VI. Check selected pitch for necessary pitch diameters.

VII. Check horsepower capacity of large gear.

VIII. Check maximum bore capacity of selected gears.

Spur Gear Drive Selection II (Other Than Stock)

When designing a gear drive when horsepower and speeds exceed the stock gear tables on pages G-25 – G-27, the following steps must be taken:

I. We must obtain all of the following data:

a. Exact center distance in inches
b. Ratio and speeds
c. Service factor (from page G-84)
d. Actual horsepower
e. Bore sizes of both gears

II. We must obtain all of the following data:

$$DHP = HP \times SF$$

Where: DHP = Design horsepower
HP = Actual horsepower
SF = Service factor (from page G-84)

III. Determine pitch diameters using the formulas:

$$PD_1 = \frac{CD \times 2}{Ratio + 1}$$

$$PD_2 = PD_1 \times Ratio$$

Where: PD_1 = Pitch diameter of pinion (small gear)
PD_2 = Pitch diameter of gear (large gear)
CD = Center distance

IV. Determine velocity using the formula:

$$V = .262 \times PD \times RPM$$

Where: V = Velocity in feet per minute @ pitch line
PD = Pitch diameter
RPM = Revolutions per minute of either gear*

V. Determine approximate pitch using the formula:

$$DP = \sqrt{\frac{3.1416 \times S \times 3 \times V \times .25}{DHP \times 27.5\ (1200 + V)}}$$

Where: DP = Diametral Pitch
S = Safe Static Stress per Square Inch of material (see table one, page G-84)
V = Velocity in FPM
DHP = Design Horsepower

Note: To round off answers, go to the nearest DP (standard DP's larger than 3 DP are: 1 DP, 1 1/4 DP, 1 1/2 DP, 1 3/4 DP, 2 DP, 2 1/2 DP)

VI. Determine number of teeth on both gears:

$$N = PD \times DP$$

Where: N = Number of teeth
PD = Pitch diameter of gear
DP = Diametral pitch of gear

VII. Determine face width:

$$F = \frac{DP\left(\frac{DHP \times 33{,}000}{V}\right)}{SY\left(\frac{600}{600 + V}\right)}$$

Where: F = Face Width
DP = Diametral Pitch
V = Velocity in FPM
S = Safe Static Stress per Square Inch of material (Table 1, page G-84)
Y = Outline formula from Table 2, page G-84

Note: To round off each answer, go to the next one inch.

VIII. Check HP rating of selected pinion using the formula::

$$HP = \frac{LV}{33{,}000}$$

Where: $$L = \frac{SYF}{DP} \times \frac{600}{600 + V}$$

From horsepower formulas on page G-83.

Note: If the horsepower capacity is below the design horsepower, the following options can be taken:

a. Harden pinion (check gear HP capacity first)
b. Increase face
c. Increase pitch

* NOTE: Velocities of both gears will always be the same. When using the above formula make sure to use the proper speed (RPM) with the proper pitch diameter.

Center Distance, Pitch Diameters and Ratios of Spur Gears

I. To determine the pitch diameters of a gear set, we must find two basic things:
   a. Required ratio
   b. Required center distance

II. Knowing this, first figure out the pitch diameter of the pinion (smaller gear) using the formula:

$$PD_1 = \frac{CD \times 2}{Ratio + 1}$$

Where: PD_1 = Pitch diameter of pinion (small gear)
CD = Center distance

III. Then, find the pitch diameter of the larger gear, PD2, by using the formula:

$$PD_2 = PD_1 \times Ratio$$

Where: PD_1 = Pitch diameter of pinion (small gear)
PD_2 = Pitch diameter of gear (large gear)
CD = Center distance

IV. Then check the center distance by using the formula:

$$CD = \frac{PD_1 + PD_2}{2}$$

Where: PD_1 = Pitch diameter of pinion (small gear)
PD_2 = Pitch diameter of gear (large gear)
CD = Center distance

Horsepower Formulas

See page G-84 for tables one, two and three.

Engineering Data

Lewis formula (with Barth revision)

L = Load in pounds at pitch line

S = Safe static stress per square inch of material (see table one)

DP = Diametral Pitch

F = Face width of gear

Y = Strength factor based on Pressure Angle and Number of Teeth (See table two)

V = Velocity in feet per minute

V = .262 × PD × RPM

PD = Pitch Diameter

RPM = Revolutions Per Minute

HP = Horsepower

$$L = \frac{SYF}{DP} \times \frac{600}{600 + V}$$

Maximum allowable torque (T) that should be imposed on a gear will be the safe tooth load (L) multiplied by:

$$\frac{DP}{2} \text{ or } T = \frac{L \times PD}{2}$$

The safe Horsepower capacity of the gear (at a given RPM) can be calculated from:

$$HP = \frac{T \times RPM}{63{,}025}$$

Or directly from (L) and (V):

$$*HP = \frac{LV}{33{,}000}$$

For a known HP:

$$T = \frac{63025 \times HP}{RPM}$$

For NON-METALLIC GEARS, the modified Lewis formula shown below may be used with (S) values of 6000 PSI for phenolic laminated material.

$$L = \frac{SYF}{DP}\left(\frac{150}{200 + V} + .25\right)$$

* Apply SERVICE FACTOR (table three) for required horsepower.

Gear Standards

Table One
(S) Average values in pounds per square inch

Material	S
Steel — .40 Carbon	25000
— .20 Carbon	20000
Steel — .40 Carbon Heat Treated	35000
Cast Iron	12000
Bronze	10000
Non-Metallic	6000

Table Two
Outline factor Y for use with Diametral Pitch

Number of Teeth	14 1/2 P.A. Involute	20 P.A. Involute	Number of Teeth	14 1/2 P.A. Involute	20 P.A. Involute
10	.176	.201	26	.308	.344
11	.192	.226	28	.314	.352
12	.210	.245	30	.318	.358
13	.223	.264	35	.327	.373
14	.235	.276	40	.336	.389
15	.245	.289	45	.340	.399
16	.255	.295	50	.346	.408
17	.264	.302	60	.355	.421
18	.270	.308	70	.360	.429
19	.277	.314	80	.363	.436
20	.283	.320	90	.366	.442
21	.289	.326	100	.368	.446
22	.292	.330	150	.375	.458
23	.296	.333	200	.378	.463
24	.302	.337	RACK	.390	.484
25	.305	.340			

Table Three
Service factors
Multiply required horsepower by service factor recommended for type of service

Type of Load	Intermittent Of 3 Hours Per Day	8-10 Hours Per Day	Continuous 24 Hours Per Day
UNIFORM	0.80	1.00	1.25
LIGHT SHOCK	1.00	1.25	1.50
MEDIUM SHOCK	1.25	1.50	1.80
HEAVY SHOCK	1.50	1.80	2.00

Spur Gear Dimensional Formulas Diametral Pitch

Rules and Formulas For Spur Gear Calculations

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

To Find	Having	Rule	Formula
Diametrical Pitch (DP)	Circular Pitch (CP)	Divide 3.1416 by Circular Pitch (CP)	$DP = \frac{3.1416}{CP}$
	Pitch Diameter (PD) and Number of Teeth (N)	Divide Number of Teeth (N) by Pitch Diameter (PD)	$DP = \frac{N}{PD}$
	Outside Diameter (OD) and Number of Teeth (N)	Divide Number of Teeth (N) plus 2 by Outside Diameter (OD)	$DP = \frac{N + 2}{OD}$
Pitch Diameter (PD)	Number of Teeth (N) and Diametral Pitch (DP)	Divide Number of Teeth (N) by Diametral Pitch (DP)	$PD = \frac{N}{DP}$
	Number of Teeth (N) and Outside Diameter (OD)	Divide product of Outside Diameter (OD) and Number of Teeth (N) by Number of Teeth (N) plus 2	$PD = \frac{OD \times N}{N + 2}$
	Outside Diameter (OD) and Diametral Pitch (DP)	Subtract from Outside Diameter (OD) quotient of 2 divided by Diametral Pitch (DP)	$PD = OD - (2 \div DP)$
	Addendum (a) and Number of Teeth (N)	Multiply Addendum (a) by Number of Teeth (N)	$PD = a \times N$
Outside Diameter (OD)	Number of Teeth (N) and Diametral Pitch (DP)	Divide Number of Teeth (N) plus 2 by Diametral Pitch (DP)	$OD = \frac{N + 2}{DP}$
	Pitch Diameter (PD) and Diametral Pitch (DP)	Add to Pitch Diameter (PD) quotient of 2 divided by Diametral Pitch (DP)	$OD = PD + \frac{2}{DP}$
	Pitch Diameter (PD) and Number of Teeth (N)	Divide Number of Teeth (N) plus 2 by quotient of Number of Teeth (N) divided by Pitch Diameter (PD)	$OD = \frac{N + 2}{N \div PD}$
	Number of Teeth (N) and Addendum (a)	Multiply Number of Teeth (N) plus 2 by Addendum (a)	$OD = (N + 2) \times a$
Number Of Teeth (N)	Pitch Diameter (PD) and Diametral Pitch (DP)	Multiply Pitch Diameter (PD) by Diametral Pitch (DP)	$N = PD \times DP$
	Outside Diameter (OD) and Diametral Pitch (DP)	Multiply Outside Diameter (OD) by Diametral Pitch (DP) and subtract 2	$N = (OD \times DP) - 2$
Thickness Of Tooth (t)	Diametral Pitch (DP)	Divide 1.5708 By Diametral Pitch (DP)	$t = \frac{1.5708}{DP}$
Addendum (a)	Diametral Pitch (DP)	Divide 1 by Diametral Pitch (DP)	$a = \frac{1}{DP}$
Dedendum (b)	Diametral Pitch (DP)	Divide 1.157 By Diametral Pitch (DP)	$b = \frac{1.157}{DP}$
Working Depth (hk)	Diametral Pitch (DP)	Divide 2 by Diametral Pitch (DP)	$hk = \frac{2}{DP}$
Whole Depth (ht)	Diametral Pitch (DP)	Divide 2.157 By Diametral Pitch (DP)	$ht = \frac{2.157}{DP}$
Clearance (c)	Diametral Pitch (DP)	Divide .157 By Diametral Pitch (DP)	$c = \frac{.157}{DP}$
	Thickness of Tooth (t)	Divide Thickness of Tooth (t) at Pitch Line by 10	$c = \frac{t}{10}$

Note: Rules and formulas relating to tooth depth and outside diameter apply to full-depth, equal addendum gears.

Diametral Pitch
Tooth Dimensions

Dimensions of Standard Full-depth Teeth

Diametral Pitches and Equivalent Circular Pitches

Diametral Pitch	Circular Pitch	Module	Arc thickness of Tooth on Pitch Line	Addendum	Working Depth of tooth	Dedendum of Depth of Space Below Pitch Line	Whole Depth of Tooth*
1/2	6.2832	50.8	3.1416	2.0000	4.0000	2.3142	4.3142
3/4	4.1888	33.8667	2.0944	1.3333	2.6666	1.5428	2.8761
1	3.1416	25.4	1.5708	1.0000	2.0000	1.1571	2.1571
1 1/4	2.5133	20.32	1.2566	0.8000	1.6000	0.9257	1.7257
1 1/2	2.0944	16.9333	1.0472	0.6666	1.3333	0.7714	1.4381
1 3/4	1.7952	14.5143	0.8976	0.5714	1.1429	0.6612	1.2326
2	1.5708	12.7	0.7854	0.5000	1.0000	0.5785	1.0785
2 1/4	1.3963	11.2889	0.6981	0.4444	0.8888	0.5143	0.9587
2 1/2	1.2566	10.16	0.6283	0.4000	0.8000	0.4628	0.8628
2 3/4	1.1424	9.2364	0.5712	0.3636	0.7273	0.4208	0.7844
3	1.0472	8.4667	0.5236	0.3333	0.6666	0.3857	0.7190
3 1/2	0.8976	7.2571	0.4488	0.2857	0.5714	0.3306	0.6163
4	0.7854	6.35	0.3927	0.2500	0.5000	0.2893	0.5393
5	0.6283	5.08	0.3142	0.2000	0.4000	0.2314	0.4314
6	0.5236	4.2333	0.2618	0.1666	0.3333	0.1928	0.3595
7	0.4488	3.6286	0.2244	0.1429	0.2857	0.1653	0.3081
8	0.3927	3.175	0.1963	0.1250	0.2500	0.1446	0.2696
9	0.3491	2.8222	0.1745	0.1111	0.2222	0.1286	0.2397
10	0.3142	2.54	0.1571	0.1000	0.2000	0.1157	0.2157
11	0.2856	2.3091	0.1428	0.0909	0.1818	0.1052	0.1961
12	0.2618	2.1167	0.1309	0.0833	0.1666	0.0964	0.1798
13	0.2417	1.9538	0.1208	0.0769	0.1538	0.0890	0.1659
14	0.2244	1.8143	0.1122	0.0714	0.1429	0.0826	0.1541
15	0.2094	1.6933	0.1047	0.0666	0.1333	0.0771	0.1438
16	0.1963	1.5875	0.0982	0.0625	0.1250	0.0723	0.1348
17	0.1848	1.4941	0.0924	0.0588	0.1176	0.0681	0.1269
18	0.1745	1.4111	0.0873	0.0555	0.1111	0.0643	0.1198
19	0.1653	1.3368	0.0827	0.0526	0.1053	0.0609	0.1135
20	0.1571	1.27	0.0785	0.0500	0.1000	0.0579	0.1079
22	0.1428	1.1545	0.0714	0.0455	0.0909	0.0526	0.0980
24	0.1309	1.0583	0.0654	0.0417	0.0833	0.0482	0.0898
26	0.1208	0.9769	0.0604	0.0385	0.0769	0.0445	0.0829
28	0.1122	0.9071	0.0561	0.0357	0.0714	0.0413	0.0770
30	0.1047	0.8467	0.0524	0.0333	0.0666	0.0386	0.0719
32	0.0982	0.7938	0.0491	0.0312	0.0625	0.0362	0.0674
34	0.0924	0.7471	0.0462	0.0294	0.0588	0.0340	0.0634
36	0.0873	0.7056	0.0436	0.0278	0.0555	0.0321	0.0599
38	0.0827	0.6684	0.0413	0.0263	0.0526	0.0304	0.0568
40	0.0785	0.635	0.0393	0.0250	0.0500	0.0289	0.0539

*NOTE: Dimensions listed are for HOB CUT TEETH ONLY. Shaper cut teeth may be slightly larger. Consult factory for exact measurement.

Spur Gear Dimensional Formulas Circular Pitch

Rules and Formulas For Spur Gear Calculations

Circular Pitch is the distance from the center of one tooth to the center of the next tooth, measured along the pitch circle.

To Find	Having	Rule	Formula
Circular Pitch (CP)	Diametral Pitch (DP)	Divide 3.1416 by Diametral Pitch (DP)	$CP = \frac{3.1416}{DP}$
	Pitch Diameter (PD) and Number of Teeth (N)	Divide Pitch Diameter (PD) by product of .3183 and Number of Teeth (N)	$CP = \frac{PD}{.3183 \times N}$
	Outside Diameter (OD) and Number of Teeth (N)	Divide Outside Diameter (OD) by product of .3183 and Number of Teeth (N) plus 2	$CP = \frac{OD}{.3183 (N + 2)}$
Pitch Diameter (PD)	Number of Teeth (N) and Circular Pitch (CP)	The continued product of Number of Teeth (N), Circular Pitch (CP) and .3183	PD = N x CP x .3183
	Number of Teeth (N) and Outside Diameter (OD)	Divide product of Number of Teeth (N) and Outside Diameter (OD) by Number of Teeth (N) plus 2	$PD = \frac{N \times OD}{N + 2}$
	Outside Diameter (OD) and Circular Pitch (CP)	Subtract from Outside Diameter (OD) product of Circular Pitch (CP) and .6366	PD = OD – (CP x .6366)
	Addendum (a) and Number of Teeth (N)	Multiply Number of Teeth (N) by Addendum (a)	PD = N x a
Outside Diameter (OD)	Number of Teeth (N) and Circular Pitch (CP)	The continued product of Number of Teeth (N) plus 2, Circular Pitch (CP) and .3183	OD = (N + 2) CP x .3183
	Pitch Diameter (PD) and Circular Pitch (CP)	Add to Pitch Diameter (PD) product of Circular Pitch (CP) and .6366	OD = PD+ (CP x .3183)
	Number of Teeth (N) and Addendum (a)	Multiply Addendum (a) by Number of Teeth (N) plus 2	D = a x (N + 2)
Number of Teeth (N)	Pitch Diameter (PD) and Circular Pitch (CP)	Divide product of Pitch Diameter (PD) and 3.1416 by Circular Pitch (CP)	$N = \frac{PD \times 3.1416}{CP}$
Thickness of Tooth (t)	Circular Pitch (CP)	One-half Circular Pitch (CP)	$t = \frac{CP}{2}$
Addendum (a)	Circular Pitch (CP)	Multiply Circular Pitch (CP) by .3183	a = CP × .3183
Dedendum (b)	Circular Pitch (CP)	Multiply Circular Pitch (CP) by .3683	b = CP × .3683
Working Depth (hk)	Circular Pitch (CP)	Multiply Circular Pitch (CP) by .6366	hk = CP × .6366
Whole Depth (ht)	Circular Pitch (CP)	Multiply Circular Pitch (CP) by .6866	ht = CP × .6366
Clearance (c)	Circular Pitch (CP)	Multiply Circular Pitch (CP) by .05	c = CP × .05
	Thickness of Tooth (t)	One-Tenth the Thickness of Tooth (t) at Pitch Line	$c = \frac{t}{10}$

Note: Rules and formulas relating to tooth depth and outside diameter apply to full-depth, equal addendum gears.

Circular Pitch Gears Made-To-Order Only

Circular Pitch
Tooth Dimensions

Dimensions of Standard Full-depth Teeth

Circular Pitches and Equivalent Diametral Pitches

Diametral Pitch	Diametral Pitch	Module	Arc thickness of Tooth on Pitch Line	Addendum	Working Depth of tooth	Dedendum of Depth of Space Below Pitch Line	Whole Depth of Tooth*
4	0.7854	32.3402	2.0000	1.2732	2.5464	1.4732	2.7464
3 1/2	0.8976	28.2581	1.7500	1.1140	2.2281	1.2890	2.4031
3	1.0472	24.2552	1.5000	0.9549	1.9098	1.1049	2.0598
23/4	1.1424	22.2339	1.3750	0.8753	1.7506	1.0128	1.8881
2 1/2	1.2566	20.2117	1.2500	0.7957	1.5915	0.9207	1.7165
2 1/4	1.3963	18.1913	1.1250	0.7162	1.4323	0.8287	1.5448
2	1.5708	16.1701	1.0000	0.6366	1.2732	0.7366	1.3732
1 7/8	1.6755	15.1595	0.9375	0.5968	1.1937	0.6906	1.2874
1 3/4	1.7952	14.1488	0.8750	0.5570	1.1141	0.6445	1.2016
1 5/8	1.9333	13.1382	0.8125	0.5173	1.0345	0.5985	1.1158
1 1/2	2.0944	12.1276	0.7500	0.4775	0.9549	0.5525	1.0299
1 7/16	2.1855	11.6223	0.7187	0.4576	0.9151	0.5294	0.9870
1 3/8	2.2848	11.1169	0.6875	0.4377	0.8754	0.5064	0.9441
1 5/16	2.3936	10.6116	0.6562	0.4178	0.8356	0.4834	0.9012
1 1/4	2.5133	10.1062	0.6250	0.3979	0.7958	0.4604	0.8583
1 3/16	2.6456	9.6010	0.5937	0.3780	0.7560	0.4374	0.8154
1 1/8	2.7925	9.0958	0.5625	0.3581	0.7162	0.4143	0.7724
1 1/16	2.9568	8.5904	0.5312	0.3382	0.6764	0.3913	0.7295
1	3.1416	8.0851	0.5000	0.3183	0.6366	0.3683	0.6866
15/16	3.3510	7.5798	0.4687	0.2984	0.5968	0.3453	0.6437
7/8	3.5904	7.0744	0.4375	0.2785	0.5570	0.3223	0.6007
13/16	3.8666	6.5692	0.4062	0.2586	0.5173	0.2993	0.5579
3/4	4.1888	6.0639	0.3750	0.2387	0.4775	0.2762	0.5150
11/16	4.5696	5.5586	0.3437	0.2189	0.4377	0.2532	0.4720
2/3	4.7124	5.3903	0.3333	0.2122	0.4244	0.2455	0.4577
5/8	5.0265	5.0532	0.3125	0.1989	0.3979	0.2301	0.4291
9/16	5.5851	4.5479	0.2812	0.1790	0.3581	0.2071	0.3862
1/2	6.2832	4.0426	0.2500	0.1592	0.3183	0.1842	0.3433
7/16	7.1808	3.5373	0.2187	0.1393	0.2785	0.1611	0.3003
2/5	7.8540	3.2340	0.2000	0.1273	0.2546	0.1473	0.2746
3/8	8.3776	3.0319	0.1875	0.1194	0.2387	0.1381	0.2575
1/3	9.4248	2.6947	0.1666	0.1061	0.2122	0.1228	0.2289
5/16	10.0531	2.5266	0.1562	0.0995	0.1989	0.1151	0.2146
2/7	10.9956	2.3100	0.1429	0.0909	0.1819	0.1052	0.1962
1/4	12.5664	2.0213	0.1250	0.0796	0.1591	0.0921	0.1716
2/9	14.1372	1.7967	0.1111	0.0707	0.1415	0.0818	0.1526
1/5	15.7080	1.6170	0.1000	0.0637	0.1273	0.0737	0.1373
3/16	16.7552	1.5160	0.0937	0.0597	0.1194	0.0690	0.1287
1/6	18.8496	0.5053	0.0833	0.0531	0.1061	0.0614	0.1144

*NOTE: Dimensions listed are for HOB CUT TEETH ONLY. Shaper cut teeth may be slightly larger. Consult factory for exact measurement.

All Circular Pitch Gears Are Made-To-Order

Rules and Formulas
For Module (Metric) Spur Gear Calculations

(Module Represents the Amount of Pitch Diameter per Tooth)

To Find	Having	Rule	Formula
Metric Module (m)	Pitch Diameter (PD) and Number of Teeth (N)	Divide Pitch Diameter (PD) in millimeters (*mm*) by Number of Teeth (N)	$m = \frac{PD\ mm}{N}$
	Circular Pitch (DP) in millimeter	Divide Circular Pitch (DP) in millimeters (*mm*) by Pi (3.1416)	$m = \frac{CP\ mm}{3.1416}$
	Diametral Pitch (DP)	Divide 25.4 by Diametral Pitch (DP)	$m = \frac{25.4}{DP}$
	Outside Diameter (OD) and Number of Teeth (N)	Divide Outside Diameter (OD) in millimeters (*mm*) by Number of Teeth (N) plus 2	$m = \frac{OD}{N + 2}$
Pitch Diameter (PD)	Module (m) and Number of Teeth (N)	Multiply Module (m) by Number of Teeth (N)	$PD\ mm = m \times N$
	Number of Teeth (N) and Outside Diameter (OD)	Divide the product of Outside Diameter (OD) and Number of Teeth (N) by Number of Teeth (N) plus 2	$PD = \frac{OD \times N}{N + 2}$
	Outside Diameter (OD) and Module (m)	Multiply Module (m) by 2 and subtract from Outside Diameter (OD)	$PD = OD - (m \times 2)$
Outside Diameter (OD)	Module (m) and Number of Teeth (N)	Number of Teeth (N) plus 2 multiplied by Module (m)	$OD\ mm = (N + 2) \times m$
Diametral Pitch (DP)	Module (m)	Divide 25.4 by Module (m)	$DP = \frac{25.4}{m}$
Circular Pitch (DP)	Module (m)	Multiply Module (m) by Pi (3.1416)	$CP\ mm = m \times 3.1416$
Addendum (a)	Module (m)	Addendum (a) equals Module (m)	$a = m$
Whole Depth (ht)	Module (m)	Multiply 2.157 by Module (m)	$ht\ mm = 2.157 \times m$
Thickness of Tooth (t)	Module (m) and Outside Diameter (OD)	Multiply Pitch Diameter (PD) in millimeters (*mm*) by sine of angle of 90 divided by Number of Teeth (N)	$t\ mm = PD\ mm \times \text{Sine}\ \frac{90}{N}$
ANSI Module (m)	Pitch Diameter (PD) in inches and Number of Teeth (N)	Divide Pitch Diameter (PD) in inches by Number of Teeth (N)	$m'' = \frac{PD''}{N}$ (Answer in fraction)

Note: Rules and formulas relating to tooth depth and outside diameter apply to full-depth, equal addendum gears.

Module Pitch
Tooth Dimensions

Tooth Dimensions Based Upon Module System
(One millimeter equals 0.03937 inch)

Module (DIN Standard Series)	Equivalent Diametrical Pitch	Circular Pitch		Addendum (mm)	Dedendum * (mm)	Whole Depth * (mm)	Whole Depth ** (mm)
		Millimeters	Inches				
0.30	84.667	0.943	0.0371	0.30	0.350	0.650	0.647
0.40	63.500	1.257	0.0495	0.40	0.467	0.867	0.863
0.50	50.800	1.571	0.0618	0.50	0.583	1.083	1.079
0.60	42.333	1.885	0.0742	0.60	0.700	1.300	1.294
0.70	36.286	2.199	0.0865	0.70	0.817	1.517	1.510
0.80	31.750	2.513	0.0989	0.80	0.933	1.733	1.726
0.90	28.222	2.827	0.1113	0.90	1.050	1.950	1.941
1.00	25.400	3.142	0.1237	1.00	1.167	2.167	2.157
1.25	20.320	3.927	0.1546	1.25	1.458	2.708	2.697
1.50	16.933	4.712	0.1855	1.50	1.750	3.250	3.236
1.75	14.514	5.498	0.2164	1.75	2.042	3.792	3.774
2.00	12.700	6.283	0.2474	2.00	2.333	4.333	4.314
2.25	11.289	7.069	0.2783	2.25	2.625	4.875	4.853
2.50	10.160	7.854	0.3092	2.50	2.917	5.417	5.392
2.75	9.236	8.639	0.3401	2.75	3.208	5.958	5.932
3.00	8.466	9.425	0.3711	3.00	3.500	6.500	6.471
3.25	7.815	10.210	0.4020	3.25	3.791	7.041	7.010
3.50	7.257	10.996	0.4329	3.50	4.083	7.583	7.550
3.75	6.773	11.781	0.4638	3.75	4.375	8.125	8.089
4.00	6.350	12.566	0.4947	4.00	4.666	8.666	8.628
4.50	5.644	14.137	0.5566	4.50	5.250	9.750	9.707
5.00	5.080	15.708	0.6184	5.00	5.833	10.833	10.785
5.50	4.618	17.279	0.6803	5.50	6.416	11.916	11.864
6.00	4.233	18.850	0.7421	6.00	7.000	13.000	12.942
6.50	3.908	20.420	0.8035	6.50	7.583	14.083	14.021
7.00	3.628	21.991	0.8658	7.00	8.166	15.166	15.099
8.00	3.175	25.132	0.9895	8.00	9.333	17.333	17.256
9.00	2.822	28.274	1.1132	9.00	10.499	19.499	19.413
10.00	2.540	31.416	1.2368	10.00	11.666	21.666	21.571
11.00	2.309	34.558	1.3606	11.00	12.833	23.833	23.728
12.00	2.117	37.699	1.4843	12.00	14.000	26.000	25.884
13.00	1.954	40.841	1.6079	13.00	15.166	28.166	28.041
14.00	1.814	43.982	1.7317	14.00	16.332	30.332	30.198
15.00	1.693	47.124	1.8541	15.00	17.499	32.499	32.355
16.00	1.587	50.266	1.9790	16.00	18.666	34.666	34.512
18.00	1.411	56.549	2.2263	18.00	21.000	39.000	38.826
20.00	1.270	62.832	2.4737	20.00	23.332	43.332	43.142
22.00	1.155	69.115	2.7210	22.00	25.665	47.665	47.454
24.00	1.058	75.398	2.9685	24.00	28.000	52.000	51.768
27.00	0.941	84.823	3.339	27.00	31.498	58.498	58.239
30.00	0.847	94.248	3.711	30.00	35.000	65.000	64.713
33.00	0.770	103.673	4.082	33.00	38.498	71.498	71.181
36.00	0.706	113.097	4.453	36.00	41.998	77.998	77.652
39.00	0.651	122.522	4.824	39.00	45.497	84.497	84.123
42.00	0.605	131.947	5.195	42.00	48.997	90.997	90.594
45.00	0.564	141.372	5.566	45.00	52.497	97.497	97.065
50.00	0.508	157.080	6.184	50.00	58.330	108.330	107.855
55.00	0.462	172.788	6.803	55.00	64.163	119.163	118.635
60.00	0.423	188.496	7.421	60.00	69.996	129.996	129.426
65.00	0.391	204.204	8.040	65.00	75.829	140.829	140.205
70.00	0.363	219.911	8.658	70.00	81.662	151.662	150.997
75.00	0.339	235.619	9.276	75.00	87.495	162.495	161.775

* Dedendum and total depth when clearance = 0.1666 x module, or one-sixth module.

** Total Depth equivalent to American standard full-depth teeth. (Clearance = 0.157 x Module.).

Bevel & Miter Gear Formulas

To Find	Rule	Formula
Pitch Diameter (PD)	Divide Number of Teeth (N) by Diametral Pitch (DP)	$PD = \frac{N}{DP}$
Tangent of Pitch Angle (Pα) of Driven	Divide Number of Teeth (N) in Driven by Number of Teeth (N) in Driver	$\tan(P\alpha\ Driven) = \frac{N\ Driven}{N\ Driver} = Ratio$
Pitch Angle (Pα) of Driver	Subtract Pitch Angle (Pα) of Driven from 90°	$P\alpha\ \Gamma\ Driver = 90° - \alpha\ Driven$
Pitch Cone Radius (Pr)	Divide Pitch Diameter (PD) by Twice the Sine of Pitch Angle (Pα)	$Pr = \frac{PD}{2\sin(P\alpha)}$
Tangent of Addendum Angle (α)	Divide Addendum (a) by Pitch Cone Radius (Cr)	$\tan(\alpha) = \frac{a}{Cr}$
Face Angle (Fα)	Add Addendum Angle (α) to Pitch Angle (Pα)	$F\alpha = \alpha + P\alpha$
Tangent of Dedendum Angle (dα)	Divide Dedendum (d) by Pitch Cone Radius (Cr)	$\tan(d\alpha) = \frac{d}{Cr}$
Root Angle (Rα)	Subtract Dedendum Angle (dα) from Pitch Angle (Pα)	$R\alpha = P\alpha - d\alpha$
Angular Addendum (aΦ)	Multiply Addendum (a) by cosine of Pitch Angle (Pα)	$a\Phi = a \times \cos(P\alpha)$
Outside Diameter (OD)	Add 2 Angular Addendum (aΦ) to Pitch Diameter (PD)	$OD = 2\ a\Phi \times PD$
Mounting Distance (MD)	Add one-half the Pitch Diameter of Mating (PDg) plus Backing to Pitch Line (BL)	$MD = \frac{PDg}{2} + BL$
Distance From Cone Center to Crown (Cc)	Multiply one-half Outside Diameter (OD) by cotangent of Face Angle (Fα)	$Cc = \frac{OD}{2} \times \cot(F\alpha)$
Backing to Crown (Bc)	Subtract Cone Center to Crown (Cc) from Mounting Distance (MD)	$Bc = MD - Cc$
Ratio	Divide Number of Teeth (N) in Driven by Number of Teeth (N) in Driver	$Ratio = \frac{N\ Driven}{N\ Driver}$

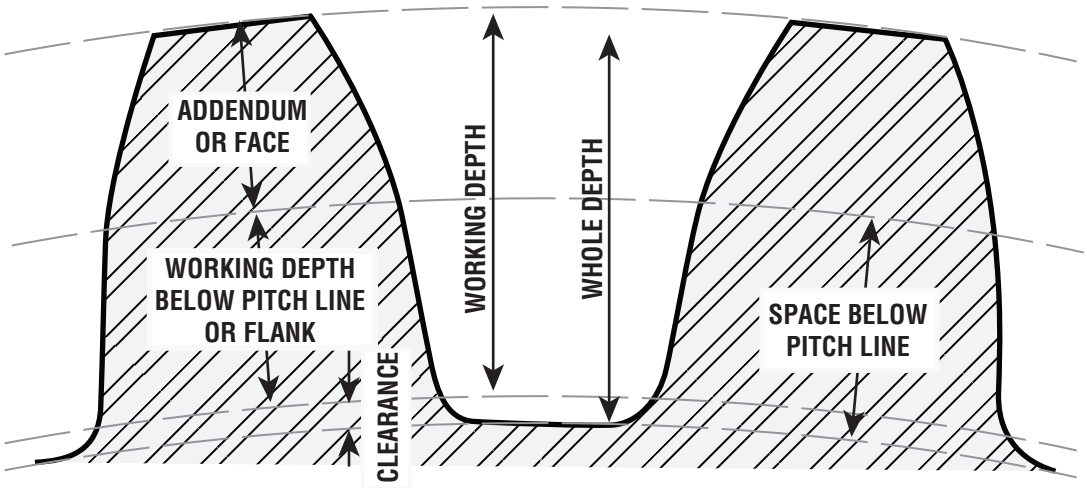
Formula For Worm Gears

(Based on Diametral Pitch)

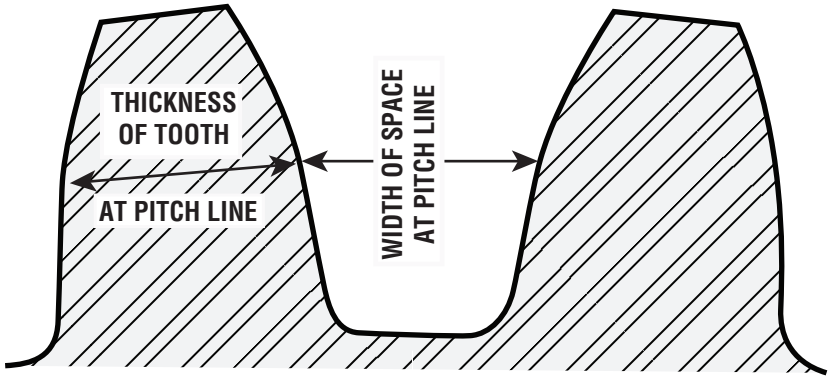
To Find	Rule	Formula
Worm Gear Pitch Diameter (PDg)	Divide Number of Teeth(N) by Diametral Pitch (DP)	$PDg = \frac{N}{DP}$
Worm Gear Throat Diameter (TDg)	Add 2 Addendum (a) to Pitch Diameter (PD)	TDg = 2 a + PD
Worm Gear Outside Diameter (ODg)	Add 3 Addendum (a) to Pitch Diameter (PD)	ODg = 3 a + PD
Worm Pitch Diameter (PDw)	Subtract the Worm Gear Pitch Diameter (PDg) from twice the Center Distance (CD)	PDw = 2 CD - PDg
Worm Outside Diameter (ODw)	Add 2 Addendum (a) to Worm Pitch Diameter (PDw)	ODw = PDw + 2 a
Worm Lead (Lw)	Divide 3.1416 by Diametral Pitch (DP) and multiply by Number of Threads (NT) in Worm	$Lw = \frac{3.1416}{DP} \times NT$
Cotangent of Worm Helix Angle (Hα)	Multiply Worm Pitch Diameter (PDw) by Diametral Pitch (DP) and divide by Number of Worm Threads (T)	$\cot(H\alpha) = \frac{PDw \times DP}{T}$
Center Distance (CD)	Add Worm Pitch Diameter to Worm Gear Pitch Diameter and divide sum by 2	$CD = \frac{PDw + PDg}{2}$
Ratio	Divide Number of Teeth in Worm Gear (N) by Number of Worm Threads (T)	$Ratio = \frac{N}{T}$

NOTE: Tooth data (Addendum, Full Depth, Etc.) is same as for spur gears.

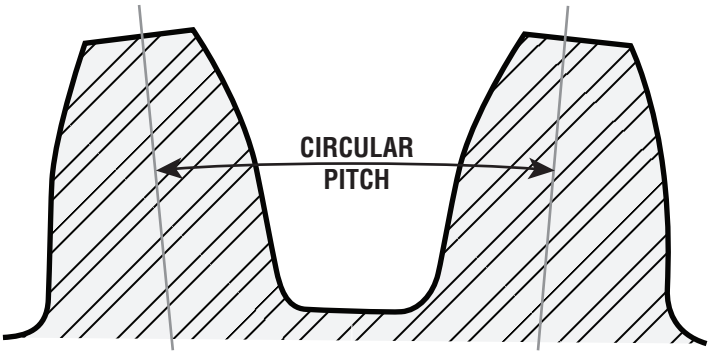
Comparative Sizes of Involute Gear Teeth



1 Diametral Pitch
3.1416" Circular Pitch



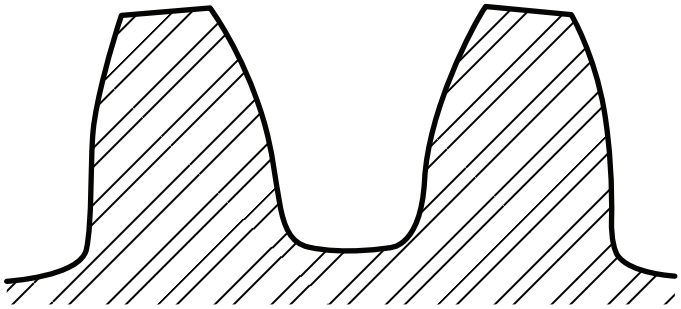
1 1/4 Diametral Pitch
2.5133" Circular Pitch



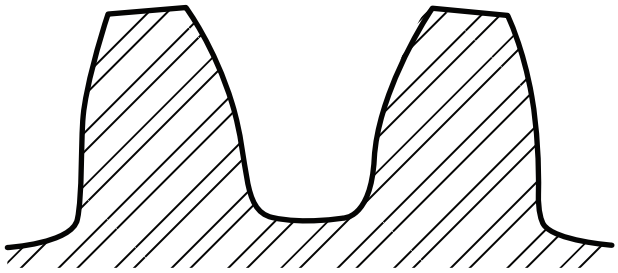
1 1/2 Diametral Pitch
2.0944" Circular Pitch

Formula For Worm Gears

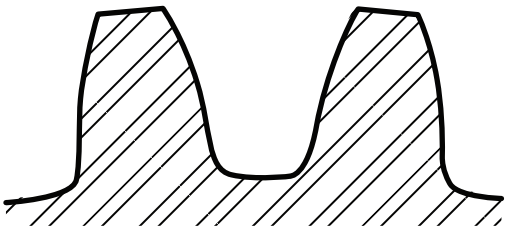
Comparative Sizes of Involute Gear Teeth



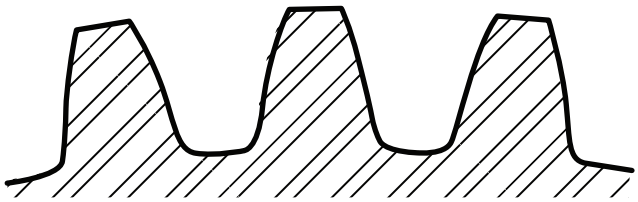
1 3/4 Diametral Pitch
1.7952" Circular Pitch



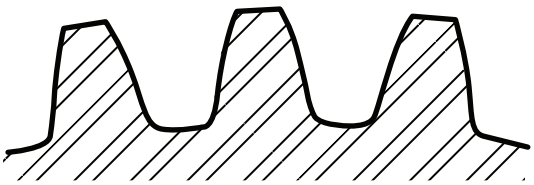
2 Diametral Pitch
1.5708" Circular Pitch



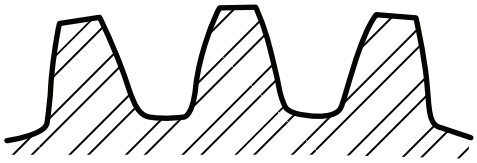
2 1/2 Diametral Pitch
1.2566" Circular Pitch



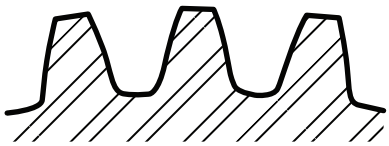
3 Diametral Pitch
1.0472" Circular Pitch



3 1/2 Diametral Pitch
.8976" Circular Pitch



4 Diametral Pitch
.7854" Circular Pitch



5 Diametral Pitch
.6283" Circular Pitch

6 Diametral Pitch
.5236" Circular Pitch

Comparative Sizes of Involute Gear Teeth

7 Diametral Pitch
.4488" Circular Pitch

8 Diametral Pitch
.3927" Circular Pitch

10 Diametral Pitch
.3142" Circular Pitch

12 Diametral Pitch
.2618" Circular Pitch

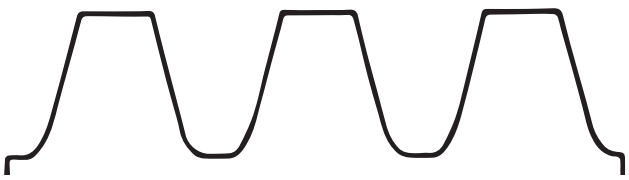
14 Diametral Pitch
.2244" Circular Pitch

16 Diametral Pitch
.1963" Circular Pitch

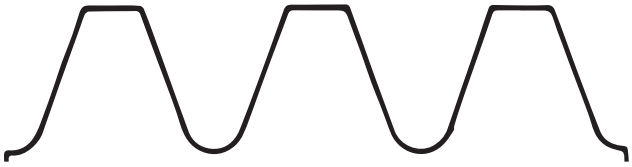
18 Diametral Pitch
.1745" Circular Pitch

20 Diametral Pitch
.1571" Circular Pitch

Gear Rack Comparison — 14½° and 20°

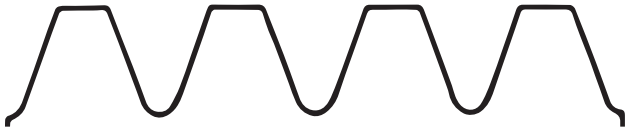


3 DP — 14½°



3 DP — 20°

4 DP — 14½°



4 DP — 20°

5 DP — 14½°

5 DP — 20°

6 DP — 14½°

6 DP — 20°

Formula For Worm Gears

Stock Steel Gears

Martin steel gears are manufactured from high quality carbon steel material. This material is used for strength and good hardening characteristics. These gears may be hardened by any method acceptable to good practice such as flame or induction hardening. Flame hardening is preferred so that only the teeth are hardened. Distortion is virtually eliminated and the bore is left soft for subsequent work.

Cast Gears

Martin cast iron gears are manufactured from high quality close grained controlled specification irons.

Reboring of Stock Gears

Most of Martin's Stock Gears may be rebored. The maximum recommended bore size is given for each gear. In reboring gears, care must be taken to hold the bore concentric with the pitch diameter. In most cases this would require a great amount of time. To cut costly set-up time when reboring, Martin holds the outside diameter of its gears concentric with the bore which in turn is concentric with the pitch diameter. The outside diameter is held to a closer total indicator reading than the pitch diameter. In the finer pitches, care should be taken not to distort the outside diameter when chucking.

Martin's steel gears are machined all over.

Rebore or rework may be accomplished by chucking on the hub. Concentricity must be controlled in order for gears to run at maximum efficiency.