Whether the application is to transfer motion or transmit power, PIC Design has the complete range of gearing needed to fulfill any application requirement. Standard gears and assemblies are available for operation on parallel and right-angle shafts, linear motion applications can also be satisfied.

PIC Design Gears — A Brief Overview

1. Spur Gears

Designed and manufactured to mount on parallel shafts. Available in (inch) Diametral Pitch and (metric) Modules.

2. Miter & Bevel Gears

Designed and manufactured to operate on intersecting shafts positioned at a right angle.

3. Spiral Gears

Designed to operate at right angles with the pinion able to be mounted to mesh with any part of the 360° of the gear.

4. Cluster Gears

Spur gears manufactured to be mounted on a shaft and another gear to be mounted on the cluster for use in multiple gear ratios in a gear box.

5. Helical Gears

Designed with a 45° Helix angle to operate on parallel or right angle shafts.

6. Anti-Backlash Gears

Two independent gears mounted to same hub with a spring between the two providing a constant full-tooth engagement with the mating spur gear, thereby eliminating backlash in the mesh. Available in Spur, Worm and Miter Gears.

7. Differential

Used in application with one input shaft driving two output shafts at right angles to the input.

8. Worm & Worm Wheels

High ratios attainable in a single reduction with shafts at right angles to each other in limited space.

9. Pinion Shafts

Designed to be either supported by bearings or pressed into hollow shaft to operate with spur gear mounted on parallel shaft.

10. Racks

A gear with the teeth in a straight line, which produces linear motion when meshed with a circular spur gear.

Tooth Proportions and Formulas for Spur Gears

	To Find:	English (Inches)	Metric (Millimeters)
Formulas	Circular Pitch (p)	$p = \frac{\pi D}{N}$ or $\frac{\pi d}{n}$	$p = \pi M$ or $\pi \frac{D}{N}$
	Pitch Diameter Pinion (d)	$\frac{n}{P}$	nM
	Pitch Diameter Gear (D)	$\frac{N}{P}$	NM
	Outside Diameter Pinion (d_o)	$\frac{n+2}{P}$	$(n+2)M$
	Outside Diameter Gear (D_o)	$\frac{N+2}{P}$	$(N+2)M$
	Center Distance (C)	$\frac{N+n}{2P}$	$\frac{(N+n)M}{2}$
Tooth Proportions	Addendum (a)	$\frac{1.000}{P}$	M
	Dedendum (b)	$\frac{1.200}{P} + 0.002$ (min.)	$M + c = 1.16M$
	Working Depth (h_k)	$\frac{2.000}{P}$	$2.000M$
	Whole Depth (h_t)	$\frac{2.200}{P} + 0.002$ (min.)	$2.16M$
	Clearance (c) (Standard)	$\frac{0.200}{P} + 0.002$ (min.)	.1M to .3M (.166M typically)
	Tooth Thickness (t) at Pitch Diameter	$t = \frac{1.5708}{P}$	$t = \frac{\pi M}{2}$

The tooth proportions and formulas for Spur Gears for both inch (Diametral Pitch) and metric (Module) enable the designer or engineer to design the appropriate spur gear for a particular application.

Where P = Diametral Pitch
M = Module (Metric)
n = Number of Pinion Teeth
N = Number of Gear Teeth

Conversions

Diametral Pitch (P) $= \frac{25.4}{M}$

Module (M) $= \frac{25.4}{P}$

Millimeters (mm) $= \frac{\text{Inches}}{.03937} = 25.4$ Inches

Inches $= .03937$ mm $= \frac{\text{mm}}{25.4}$

TOOTH-TO-TOOTH AND TOTAL COMPOSITE TOLERANCE

AGMA Standards for Inch, DIN Standards for Metric

The AGMA and DIN Fine-Pitch Gear Tolerances for inch and metric spur gears will assist the designer in selecting the AGMA or DIN quality level that will satisfy a particular application.

AGMA FINE-PITCH GEAR TOLERANCES

PIC Quality Number	AGMA Quality Number	Number of Teeth and Pitch Diameter	Diametral Pitch Range	Tooth-to-Tooth Composite Tolerance	Total Composite Tolerance
Std.	10*	Up to 20 Teeth Incl.	20 to 200	.0007	.0010
		Over 20 Teeth Up to 1.999"	20 to 200	.0005	.0010
		Over 20 Teeth 2" to 3.999"	20 to 200	.0005	.0012
		Over 20 Teeth 4" and over	20 to 200	.0005	.0014
—Q12	12**	Up to 20 Teeth Incl.	20 to 200	.0004	.0005
		Over 20 Teeth Up to 1.999"	20 to 200	.0003	.0005
		Over 20 Teeth 2" to 3.999"	20 to 200	.0003	.0006
		Over 20 Teeth 4" and over	20 to 200	.0003	.0007
—Q14	14***	Up to 20 Teeth Incl.	20 to 200	.00019	.00027
		Over 20 Teeth Up to 1.999"	20 to 200	.00014	.00027
		Over 20 Teeth 2" to 3.999"	20 to 200	.00014	.00032
		Over 20 Teeth 4" and over	20 to 200	.00014	.00037

DIN FINE-PITCH GEAR TOLERANCES

PIC Quality Number	DIN Quality Number	Pitch Diameter	Metric Module Range	Tooth-to-Tooth Composite Tolerance μm	Total Composite Tolerance μm
T7 Std.	7	Up to 12mm	Up to 0.6 Module	7	20
		Over 12 to 50mm		9	25
		Over 50 to 100mm		10	28
		Over 100mm		11	32
		Up to 12mm	Over 0.6 Module	8	22
		Over 12 to 50mm		10	28
		Over 50 to 100mm		11	32
		Over 100mm		12	36
T6	6	Up to 12mm	Up to 0.6 Module	5	14
		Over 12 to 50mm		5.5	16
		Over 50 to 100mm		6	18
		Over 100mm		7	20
		Up to 12mm	Over 0.6 Module	5.5	16
		Over 12 to 50mm		6	18
		Over 50 to 100mm		7	20
		Over 100mm		8	22
T5	5	Over 50 to 100mm	Up to 0.6 Module	3.5	10
		Up to 12mm		4	11
		Over 12 to 50mm		4.5	12
		Over 100mm		5	14
		Up to 12mm	Over 0.6 Module	3.5	11
		Over 12 to 50mm		4.5	12
		Over 50 to 100mm		5	14
		Over 100mm		5	16

  * AGMA 10 Similar to Old PIC Standard Prec. 1
 ** AGMA 12 Similar to Old PIC Standard Prec. 2
*** AGMA 14 Similar to Old PIC Standard Prec. 3

PIC DESIGN

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Table of Pitch Diameters

The Pitch Diameter Tables will enable the designer or engineer to find the pitch diameter of the spur gear using the Diametral Pitch and the number of teeth. To find the Outside Diameter, add Two Teeth to the Number of Teeth and use Pitch Diameter for Outside Diameter.

Example: 72 Diametral Pitch
88 Teeth
Pitch Diameter = 1.2222″
Outside Diameter (Pitch Diameter for 90 Teeth) = 1.2500

	DIAMETRAL PITCH						
	32	48	64	72	80	96	120
18	0.5625	0.3750	0.2812	0.2500	0.2250	0.1875	0.1500
19	0.5937	0.3958	0.2969	0.2639	0.2375	0.1979	0.1583
20	0.6250	0.4167	0.3125	0.2778	0.2500	0.2083	0.1667
21	0.6562	0.4375	0.3281	0.2917	0.2625	0.2187	0.1750
22	0.6875	0.4583	0.3437	0.3056	0.2750	0.2292	0.1833
23	0.7187	0.4792	0.3594	0.3194	0.2875	0.2396	0.1917
24	0.7500	0.5000	0.3750	0.3333	0.3000	0.2500	0.2000
25	0.7812	0.5208	0.3906	0.3472	0.3125	0.2604	0.2083
26	0.8125	0.5417	0.4062	0.3611	0.3250	0.2708	0.2167
27	0.8437	0.5625	0.4219	0.3750	0.3375	0.2812	0.2250
28	0.8750	0.5833	0.4375	0.3889	0.3500	0.2917	0.2333
29	0.9062	0.6042	0.4531	0.4028	0.3625	0.3021	0.2417
30	0.9375	0.6250	0.4687	0.4167	0.3750	0.3125	0.2500
31	0.9687	0.6458	0.4844	0.4306	0.3875	0.3229	0.2583
32	1.0000	0.6667	0.5000	0.4444	0.4000	0.3333	0.2667
33	1.0312	0.6875	0.5156	0.4583	0.4125	0.3437	0.2750
34	1.0625	0.7083	0.5312	0.4722	0.4250	0.3542	0.2833
35	1.0937	0.7292	0.5469	0.4861	0.4375	0.3646	0.2917
36	1.1250	0.7500	0.5625	0.5000	0.4500	0.3750	0.3000
37	1.1562	0.7708	0.5781	0.5139	0.4625	0.3854	0.3083
38	1.1875	0.7917	0.5937	0.5278	0.4750	0.3958	0.3167
39	1.2187	0.8125	0.6094	0.5417	0.4875	0.4062	0.3250
40	1.2500	0.8333	0.6250	0.5556	0.5000	0.4167	0.3333
41	1.2812	0.8542	0.6406	0.5694	0.5125	0.4271	0.3417
42	1.3125	0.8750	0.6562	0.5833	0.5250	0.4375	0.3500
43	1.3437	0.8958	0.6719	0.5972	0.5375	0.4479	0.3583
44	1.3750	0.9167	0.6875	0.6111	0.5500	0.4583	0.3667
45	1.4062	0.9375	0.7031	0.6250	0.5625	0.4687	0.3750
46	1.4375	0.9583	0.7187	0.6389	0.5750	0.4792	0.3833
47	1.4687	0.9792	0.7344	0.6528	0.5875	0.4896	0.3917
48	1.5000	1.0000	0.7500	0.6667	0.6000	0.5000	0.4000
49	1.5312	1.0208	0.7656	0.6806	0.6125	0.5104	0.4083
50	1.5625	1.0417	0.7812	0.6944	0.6250	0.5208	0.4167
51	1.5937	1.0625	0.7969	0.7083	0.6375	0.5312	0.4250
52	1.6250	1.0833	0.8125	0.7222	0.6500	0.5417	0.4333
53	1.6562	1.1042	0.8281	0.7361	0.6625	0.5521	0.4417
54	1.6875	1.1250	0.8437	0.7500	0.6750	0.5625	0.4500
55	1.7187	1.1458	0.8594	0.7639	0.6875	0.5729	0.4583
56	1.7500	1.1667	0.8750	0.7778	0.7000	0.5833	0.4667
57	1.7812	1.1875	0.8906	0.7917	0.7125	0.5937	0.4750
58	1.8125	1.2083	0.9062	0.8056	0.7250	0.6042	0.4833
59	1.8437	1.2292	0.9219	0.8194	0.7375	0.6146	0.4917
60	1.8750	1.2500	0.9375	0.8333	0.7500	0.6250	0.5000
61	1.9062	1.2708	0.9531	0.8472	0.7625	0.6354	0.5083
62	1.9375	1.2917	0.9687	0.8611	0.7750	0.6458	0.5167
63	1.9687	1.3125	0.9844	0.8750	0.7875	0.6562	0.5250
64	2.0000	1.3333	1.0000	0.8889	0.8000	0.6667	0.5333
65	2.0312	1.3542	1.0156	0.9028	0.8125	0.6771	0.5417
66	2.0625	1.3750	1.0312	0.9167	0.8250	0.6875	0.5500
67	2.0937	1.3958	1.0469	0.9306	0.8375	0.6979	0.5583
68	2.1250	1.4167	1.0625	0.9444	0.8500	0.7083	0.5667
69	2.1562	1.4375	1.0781	0.9583	0.8625	0.7187	0.5750
70	2.1875	1.4583	1.0937	0.9722	0.8750	0.7292	0.5833
71	2.2187	1.4792	1.1094	0.9861	0.8875	0.7396	0.5917
72	2.2500	1.5000	1.1250	1.000	0.9000	0.7500	0.6000
73	2.2812	1.5208	1.1406	1.0139	0.9125	0.7604	0.6083
74	2.3125	1.5417	1.1562	1.0278	0.9250	0.7708	0.6167
75	2.3437	1.5625	1.1719	1.0417	0.9375	0.7812	0.6250
76	2.3750	1.5833	1.1875	1.0556	0.9500	0.7917	0.6333
77	2.4062	1.6042	1.2031	1.0694	0.9625	0.8021	0.6417
78	2.4375	1.6250	1.2187	1.0833	0.9750	0.8125	0.6500
79	2.4687	1.6458	1.2344	1.0972	0.9875	0.8229	0.6583
80	2.5000	1.6667	1.2500	1.1111	1.0000	0.8333	0.6667

	DIAMETRAL PITCH						
	32	48	64	72	80	96	120
81	2.5312	1.6875	1.2656	1.1250	1.0125	0.8437	0.6750
82	2.5625	1.7083	1.2812	1.1389	1.0250	0.8542	0.6833
83	2.5937	1.7292	1.2969	1.1528	1.0375	0.8646	0.6917
84	2.6250	1.7500	1.3125	1.1667	1.0500	0.8750	0.7000
85	2.6562	1.7708	1.3281	1.1806	1.0625	0.8854	0.7083
86	26875	1.7917	1.3437	1.1944	1.0750	0.8958	0.7167
87	2.7187	1.8125	1.3594	1.2083	1.0875	0.9062	0.7250
88	2.7500	1.8333	1.3750	1.2222	1.1000	0.9167	0.7333
89	2.7812	1.8542	1.3906	1.2361	1.1125	0.9271	0.7417
90	2.8125	1.8750	1.4062	1.2500	1.1250	0.9375	0.7500
91	2.8437	1.8958	1.4219	1.2639	1.1375	0.9479	0.7583
92	2.8750	1.9167	1.4375	1.2778	1.1500	0.9583	0.7667
93	2.9062	1.9375	1.4531	1.2917	1.1625	0.9687	0.7750
94	2.9375	1.9583	1.4687	1.3056	1.1750	0.9792	0.7833
95	2.9687	1.9792	1.4844	1.3194	1.1875	0.9896	0.7917
96	3.0000	2.0000	1.5000	1.3333	1.2000	1.0000	0.8000
97	3.0312	2.0208	1.5156	1.3472	1.2125	1.0104	0.8083
98	3.0625	2.0417	1.5312	1.3611	1.2250	1.0208	0.8167
99	3.0937	2.0625	1.5469	1.3750	1.2375	1.0312	0.8250
100	3.1250	2.0833	1.5625	1.3889	1.2500	1.0417	0.8333
101	3.1562	2.1042	1.5781	1.4028	1.2625	1.0521	0.8417
102	3.1875	2.1250	1.5937	1.4167	1.2750	1.0625	0.8500
103	3.2187	2.1458	1.6094	1.4306	1.2875	1.0729	0.8583
104	3.2500	2.1667	1.6250	1.4444	1.3000	1.0833	0.8667
105	3.2812	2.1875	1.6406	1.4583	1.3125	1.0937	0.8750
106	3.3125	2.2083	1.6562	1.4722	1.3250	1.1042	0.8833
107	3.3437	2.2292	1.6719	1.4861	1.3375	1.1146	0.8917
108	3.3750	2.2500	1.6875	1.5000	1.3500	1.1250	0.9000
109	3.4062	2.2708	1.7031	1.5139	1.3625	1.1354	0.9083
110	3.4375	2.2917	1.7187	1.5278	1.3750	1.1458	0.9167
111	3.4687	2.3125	1.7344	1.5417	1.3875	1.1562	0.9250
112	3.5000	2.3333	1.7500	1.5556	1.4000	1.1667	0.9333
113	3.5312	2.3542	1.7656	1.5694	1.4125	1.1771	0.9417
114	3.5625	2.3750	1.7812	1.5833	1.4250	1.1875	0.9500
115	3.5937	2.3958	1.7969	1.5972	1.4375	1.1979	0.9583
116	3.6250	2.4167	1.8125	1.6111	1.4500	1.2083	0.9667
117	3.6562	2.4375	1.8281	1.6250	1.4625	1.2187	0.9750
118	3.6875	2.4583	1.8437	1.6389	1.4750	1.2292	0.9833
119	3.7187	2.4792	1.8594	1.6528	1.4875	1.2396	0.9917
120	3.7500	2.5000	1.8750	1.6667	1.5000	1.2500	1.0000
121	3.7812	2.5208	1.8906	1.6806	1.5125	1.2604	1.0083
122	3.8125	2.5417	1.9062	1.6944	1.5250	1.2708	1.0167
123	3.8437	2.5625	1.9219	1.7083	1.5375	1.2812	1.0250
124	3.8750	2.5833	1.9375	1.7222	1.5500	1.2917	1.0333
125	3.9062	2.6042	1.9531	1.7361	1.5625	1.3021	1.0417
126	3.9375	2.6250	1.9687	1.7500	1.5750	1.3125	1.0500
127	3.9687	2.6458	1.9844	1.7639	1.5875	1.3229	1.0583
128	4.0000	2.6667	2.0000	1.7778	1.6000	1.3333	1.0667
129	4.0312	2.6875	2.0156	1.7917	1.6125	1.3437	1.0750
130	4.0625	2.7083	2.0312	1.8056	1.6250	1.3542	1.0833
131	4.0937	2.7292	2.0469	1.8194	1.6375	1.3646	1.0917
132	4.1250	2.7500	2.0625	1.8333	1.6500	1.3750	1.1000
133	4.1562	2.7708	2.0781	1.8472	1.6625	1.3854	1.1083
134	4.1875	2.7917	2.0937	1.8611	1.6750	1.3958	1.1167
135	4.2187	2.8125	2.1094	1.8750	1.6875	1.4062	1.1250
136	4.2500	2.8333	2.1250	1.8889	1.7000	1.4167	1.1333
137	4.2812	2.8542	2.1406	1.9028	1.7125	1.4271	1.1417
138	4.3125	2.8750	2.1562	1.9167	1.7250	1.4375	1.1500
139	4.3437	2.8958	2.1719	1.9306	1.7375	1.4479	1.1583
140	4.3750	2.9167	2.1875	1.9444	1.7500	1.4583	1.1667
141	4.4062	2.9375	2.2031	1.9583	1.7625	1.4687	1.1750
142	4.4375	2.9583	2.2187	1.9722	1.7750	1.4792	1.1833
143	4.4687	2.9792	2.2344	1.9861	1.7875	1.4896	1.1917

	DIAMETRAL PITCH						
	32	48	64	72	80	96	120
144	4.5000	3.0000	2.2500	2.0000	1.8000	1.5000	1.2000
145	4.5312	3.0208	2.2656	2.0139	1.8125	1.5104	1.2083
146	4.5625	3.0417	2.2812	2.0278	1.8250	1.5208	1.2167
147	4.5937	3.0625	2.2969	2.0417	1.8375	1.5312	1.2250
148	4.6250	3.0833	2.3125	2.0556	1.8500	1.5417	1.2333
149	4.6562	3.1042	2.3281	2.0694	1.8625	1.5521	1.2417
150	4.6875	3.1250	2.3437	2.0833	1.8750	1.5625	1.2500
151	4.7187	3.1458	2.3594	2.0972	1.8875	1.5729	1.2583
152	4.7500	3.1667	2.3750	2.1111	1.9000	1.5833	1.2667
153	4.7812	3.1875	2.3906	2.1250	1.9125	1.5937	1.2750
154	4.8125	3.2083	2.4062	2.1389	1.9250	1.6042	1.2833
155	4.8437	3.2292	2.4219	1.1528	1.9375	1.6146	1.2917
156	4.8750	3.2500	2.4375	2.1667	1.9500	1.6250	1.3000
157	4.9062	3.2708	2.4531	2.1806	1.9625	1.6354	1.3083
158	4.9375	3.2917	2.4687	2.1944	1.9750	1.6458	1.3167
159	4.9687	3.3125	2.4844	2.2083	1.9875	1.6562	1.3250
160	5.0000	3.3333	2.5000	2.2222	2.0000	1.6667	1.3333
161	5.0312	3.3542	2.5156	2.2361	2.0125	1.6771	1.3417
162	5.0625	3.3750	2.5312	2.2500	2.0250	1.6875	1.3500
163	5.0937	3.3958	2.5469	2.2639	2.0375	1.6979	1.3583
164	5.1250	3.4167	2.5625	2.2778	2.0500	1.7083	1.3667
165	5.1562	3.4375	2.5781	2.2917	2.0625	1.7187	1.3750
166	5.1875	3.4583	2.5937	2.3056	2.0750	1.7292	1.3833
167	5.2187	3.4792	2.6094	2.3194	2.0875	1.7396	1.3917
168	5.2500	3.5000	2.6250	2.3333	2.1000	1.7500	1.4000
169	5.2812	3.5208	2.6406	2.3472	2.1125	1.7604	1.4083
170	5.3125	3.5417	2.6562	2.3611	2.1250	1.7708	1.4167
171	5.3437	3.5625	2.6719	2.3750	2.1375	1.7812	1.4250
172	5.3750	3.5833	2.6875	2.3889	2.1500	1.7917	1.4333
173	5.4062	3.6042	2.7031	2.4028	2.1625	1.8021	1.4417
174	5.4375	3.6250	2.7187	2.4167	2.1750	1.8125	1.4500
175	5.4687	3.6458	2.7344	2.4306	2.1875	1.8229	1.4583
176	5.5000	3.6667	2.7500	2.4444	2.2000	1.8333	1.4667
177	5.5312	3.6875	2.7656	2.4583	2.2125	1.8437	1.4750
178	5.5625	3.7083	2.7812	2.4722	2.2250	1.8542	1.4833
179	5.5937	3.7292	2.7969	2.4861	2.2375	1.8646	1.4917
180	5.6250	3.7500	2.8125	2.5000	2.2500	1.8750	1.5000
181	5.6562	3.7708	2.8281	2.5139	2.2625	1.8854	1.5083
182	5.6875	3.7917	2.8437	2.5278	2.2750	1.8958	1.5167
183	5.7187	3.8125	2.8594	2.5417	2.2875	1.9062	1.5250
184	5.7500	3.8333	2.8750	2.5556	2.3000	1.9167	1.5333
185	5.7812	3.8542	2.8906	2.5694	2.3125	1.9271	1.5417
186	5.8125	3.8750	2.9062	2.5833	2.3250	1.9375	1.5500
187	5.8437	3.8958	2.9219	2.5972	2.3375	1.9479	1.5583
188	5.8750	3.9167	2.9375	2.6111	2.3500	1.9583	1.5667
189	5.9062	3.9375	2.9531	2.6250	2.3625	1.9687	1.5750
190	5.9375	3.9583	2.9687	2.6389	2.3750	1.9792	1.5833
191	5.9687	3.9792	2.9844	2.6528	2.3875	1.9896	1.5917
192	6.0000	4.0000	3.0000	2.6667	2.4000	2.0000	1.6000
193	6.0312	4.0208	3.0156	2.6806	2.4125	2.0104	1.6083
194	6.0625	4.0417	3.0312	2.6944	2.4250	2.0208	1.6167
195	6.0937	4.0625	3.0469	2.7083	2.4375	2.0312	1.6250
196	6.1250	4.0833	3.0625	2.7222	2.4500	2.0417	1.6333
197	6.1562	4.1042	3.0781	2.7361	2.4625	2.0521	1.6417
198	6.1875	4.1250	3.0937	2.7500	2.4750	2.0625	1.6500
199	6.2187	4.1458	3.1094	2.7639	2.4875	2.0729	1.6583
200	6.2500	4.1667	3.1250	2.7778	2.5000	2.0833	1.6667
201	6.2812	4.1875	3.1406	2.7917	2.5125	2.0937	1.6750
202	6.3125	4.2083	3.1562	2.8056	2.5250	2.1042	1.6833
203	6.3437	4.2292	3.1719	2.8194	2.5375	2.1146	1.6917
204	6.3750	4.2500	3.1875	2.8333	2.5500	2.1250	1.7000
205	6.4062	4.2708	3.2031	2.8472	2.5625	2.1354	1.7083
206	6.4375	4.2917	3.2187	2.8611	2.5750	2.1458	1.7167

Odd Series — Stainless Steel
Even Series — Aluminum
*Bronze
  instead of Aluminum

INCH SPUR GEAR INDEX

Diametral Pitch	Face Width (inches)	Bore (inches)	Hub Style	Series No.	Page No.
20	3/8	3/8	Pin	G77 & G78*	12-5
24	1/8	1/4	Split	H23 & H24	12-7
		3/8	Hubless	J21 & J22	
	3/16	3/16	Pin	G57 & G58	12-6
		1/4	Pin	G41 & G42	
	3/8	3/8	Pin	G79 & G80*	12-6
1/10th Cir. Pitch	3/16	1/4	Pin	G75	12-5
	1/4		Pin	G83	12-5
32	1/8	1/4	Split	H25 & H26	12-9
		3/8	Hubless	J23 & J24	
	3/16	3/16	Pin	G59 & G60	12-8
		1/4	Pin	G43 & G44	
	3/8	3/8	Pin	G81 & G82*	12-8
48	1/8	1/8	Pin	G61 & G62	12-10
			Split	H55 & H56	12-12
		3/16	Pin	G1 & G2	12-10
			Split	H57 & H58	12-12
		1/4	Pin	G3 & G4	12-10
			Split	H1 & H2	12-12
		3/8	Hubless	J1 & J2	12-12
	3/16	3/16	Pin	G5 & G6	12-11
		1/4	Pin	G7 & G8	

METRIC SPUR GEAR INDEX

Module	Face Width (MM)	Bore (MM)	Hub Style	Series No.	Page No.
.25	1.58	9.525	Hubless	MHS1 & MHS2	
	2.38	3	Pin	MSG3 & MSG4	12-52
	3.18		Split	MSG35 & MSG36	
.30	3.18	3	Pin	MSG5 & MSG6	
			Split	MSG37 & MSG38	12-53
		9.525	Hubless	MHS3 & MHS4	
.40	3.18	3	Pin	MSG7 & MSG8	12-54
		4	Pin	MSG9 & MSG10	12-54
			Split	MSG39 & MSG40	12-56
		6	Pin	MSG11 & MSG12	12-55
			Split	MSG41 & MSG42	12-56
		9.525	Hubless	MHS5 & MHS6	12-56
	4.76	6	Pin	MSG13 & MSG14	12-55
.50	3.18	3	Pin	MSG15 & MSG16	12-57
		4	Pin	MSG17 & MSG18	12-57
			Split	MSG43 & MSG44	12-59
		6	Pin	MSG19 & MSG20	12-58
			Split	MSG45 & MSG46	12-59
		9.525	Hubless	MHS7 & MHS8	12-59
	4.76	6	Pin	MSG21 & MSG22	12-58
.60	4.76	6	Pin	MSG23 & MSG24	12-60
.70	4.76	6	Pin	MSG25 & MSG26	12-61
.80	3.18	6	Split	MSG47 & MSG48	12-62
		9.52	Hubless	MHS9 & MHS10	
	4.76	6	Pin	MSG27 & MSG28	12-62
	9.52	10	Pin	MSG29 & MSG30	12-63
1.0	3.18	6	Split	MSG49 & MSG50	12-64
		9.52	Hubless	MHS11 & MHS12	
	4.76	6	Pin	MSG31 & MSG32	12-64
	9.52	10	Pin	MSG33 & MSG34	12-63

INCH SPUR GEAR INDEX

Diametral Pitch	Face Width (inches)	Bore (inches)	Hub Style	Series No.	Page No.
64	1/8	1/8	Pin	G9 & G10	12-13
			Split	H47 & H48	12-15
		3/16	Pin	G11 & G12	12-13
			Split	H3 & H4	12-15
		1/4	Pin	G13 & G14	12-13
			Split	H49 & H50	12-15
		3/8	Hubless	J3 & J4	12-15
	3/16	3/16	Pin	G15 & G16	12-14
		1/4	Pin	G17 & G18	
72	1/8	1/8	Pin	G19 & G20	12-16
		3/16	Pin	G21 & G22	12-16
			Split	H5 & H6	12-18
		1/4	Split	H59 & H60	12-18
		3/8	Hubless	J5 & J6	12-18
	3/16	3/16	Pin	G23 & G24	12-17
		1/4	Pin	G25 & G26	
80	1/8	1/8	Pin	G45 & G46	12-19
		3/16	Pin	G47 & G48	
		3/8	Hubless	J25 & J26	
96	1/16	1/8	Pin	G51 & G52	12-20
		3/8	Hubless	J27 & J28	12-21
	3/32	1/8	Pin	G27 & G28	12-20
	1/8	1/8	Pin	G29 & G30	12-20
			Split	H7 & H8	12-21
		3/8	Hubless	J7 & J8	12-21
120	1/16	1/8	Pin	G55 & G56	12-22
	3/32	1/8	Pin	G35 & G36	12-22
	1/8	3/8	Hubless	J9 & J10	12-22

GEAR MATERIALS

Materials stated on the gear drawings are the commonly referred to designations (303, 2024-T4). This provides the designer with a ready reference for properties such as corrosion resistance, weight, yield and tensile strength. Detailed specifications are summarized in the following table.

Catalog Part Designation	Aluminum	Stainless Steel
Spur, Helical, Bevel & Worm: CO, CN, F, G, H, J	2024-T4/T351 (Bar)	303 (Bar)
MHS, MSG, Q (2, 4, 6, 8, 10, 12)		
Racks: AG	2024-T4 (Bar)	416
Anti-backlash:		
P (2, 3, 4, 12, 13, 14, 22, 24, 26)	2024-T3 (Sheet)	
P (20, 30, 40)	2024-T4/T351 (Bar)	
P (5, 6, 7, 15, 16, 17, 21, 23, 25)		303 (Sheet)
P (50, 60, 70)		303 (Bar)

For Cut Nylon and Delrin, See Pages 12-26 through 12-30.

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