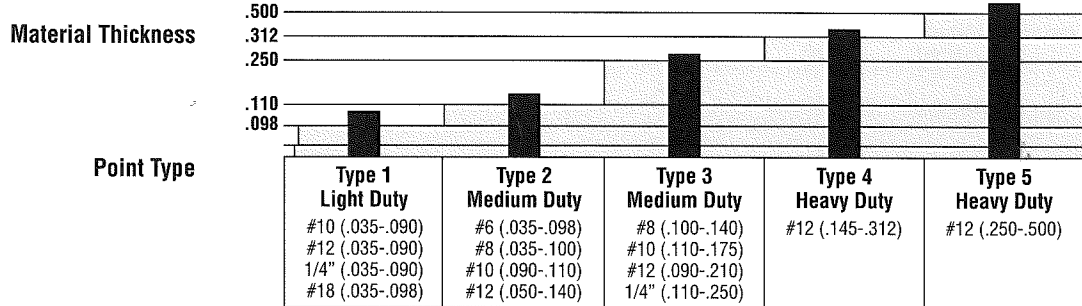


Technical Data

Metal-to-Metal Fastening

Drill Point Capabilities



Installation Recommendations

Recommended Driving Speed

Self-Drilling Fasteners

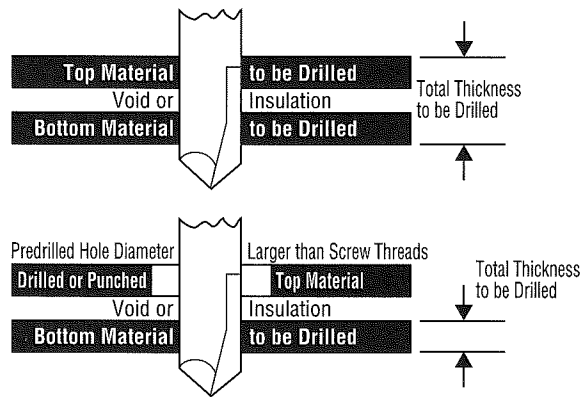
#6 through #10 Diameters 2500 RPM Max.
#12 through #18 Diameters ... 2000 RPM Max.

Self-Tapping Fasteners

Carbon & 410 Stainless Steel ... 1800 RPM Max.
300 Stainless Steel 800 RPM Max.

Self-Drilling Tip Length Determination

The length of the tip required on a self-drilling fastener is determined by adding up the thickness of the top material, any insulation or void between the top material and bottom material, and the thickness of the bottom material. If a hole larger than the screw thread has been pre-drilled or punched into the top material, only the thickness of the bottom material need be considered. (The threaded portion of the shank must be long enough to extend into and through the bottom material drilled.)



Fastener Selection Chart and Suggested Drill Sizes

#14 Type A		1/4" Type B & BP	
Steel Gauge	Hole Size	Steel Gauge	Hole Size
26 gauge	1/8"	3/16"	#2 Bit
24 gauge	5/32"	Thru	
22 gauge	5/32"	3/8"	
20 gauge	5/32"		
18 gauge	3/16"	Over	#1 Bit
16 gauge	3/16"	3/8"	
14 gauge	#7 Bit		

1/4" Type AB		#17 Type AB	
Steel Gauge	Hole Size	Steel Gauge	Hole Size
26 gauge	1/8"	26 gauge	3/16"
24 gauge	5/32"	24 gauge	3/16"
22 gauge	5/32"	22 gauge	3/16"
20 gauge	5/32"	20 gauge	1/4"
18 gauge	3/16"	18 gauge	1/4"
16 gauge	3/16"	16 gauge	1/4"
14 gauge	#7 Bit	14 gauge	1/4"
12 gauge	#7 Bit	12 gauge	17/64"
1/8" gauge	#2 Bit	10 gauge	17/64"
10 gauge	#2 Bit		

Decimal (Inch) Equivalents of Thread Diameters

Decimal (Inch) Equivalents of Sheet Metal Gauges

Thread Diameter	Decimal Equivalent	Gauge	Thickness (in.)
#6	.140	26	.018
#7	.150	24	.024
#8	.160	22	.030
#9	.180	20	.036
#10	.190	18	.048
#11	.200	16	.060
#12	.210	14	.075
#13	.230	12	.105
1/4	.240	10	.134
#14	.250	8	.164
#17	.285	4	.224
#18	.304	1/4	.250
11/32	.344	3/8	.375

Pull-Over Test Results for Self-Driller With Washer

Fastener Size: #12-14 Diameter Self-Driller
Point Type: TCP2
Sheet Thickness: 24 Gage (74 lb.)

Washer Type	Average Pull-Over (lbs.)
5/8" Neo-Bond	798 lbs.
5/8" Atlas-Two-Piece	787 lbs.
Flat Top	815 lbs.
UltiMate Head	895 lbs.
ColorMate Head	887 lbs.

Contact Technical Services for test procedures. Other results available.

Pullout Values (Lbs) for Carbon Steel Self-Drilling Fasteners

Size	Point	Gauge										
		26-26	24-24	22-22	20-20	18	16	14	12	1/8	3/16	1/4
8-18	T/2	122	196	268	301	494	706	962	1561	/	/	/
	T/3	123	194	242	288	473	666	913	1427	2290	/	/
10-16	T/1	151	244	314	360	568	829	1114	1799	/	/	/
	T/2	134	217	275	371	550	787	1036	1656	/	/	/
	T/3	127	211	269	302	502	711	970	1477	2080	/	/
10-24	T/3	124	203	254	336	498	704	903	1378	2073	2615	/
12-14	T/1	161	264	341	393	652	911	1262	1952	/	/	/
	T/2	159	246	286	378	608	851	1184	1859	2571	3523	/
	T/3	145	214	292	344	554	760	1066	1634	2423	3001	/
12-24	T/4	/	/	/	/	498	700	989	1535	2444	3488	3847
	T/5	/	/	/	/	490	702	916	1530	2210	3704	4002
1/4-14	T/1	211	332	431	565	803	1154	/	/	/	/	/
	T/2	169	268	317	433	648	925	1155	/	/	4696	/
	T/3	144	234	296	349	613	883	1148	1861	2409	4553	5036
1/4-20	T/3	143	228	274	366	559	784	1008	1681	2545	3557	/
	T/4	/	/	/	/	557	791	1119	1806	2553	4300	4592

For special applications, contact Atlas Technical Services

Pull-Out Test Results for Self-Tapping Fasteners

To determine the tension required to pull a properly applied screw out of a structural steel member.

Steel Thickness	Point Type	Drill Size	Average Ultimate Pullout
26 (.018)	A, AB	1/8" (.125)	519 lbs.
24 (.024)	A, AB	5/32" (.156)	967 lbs.
22 (.030)	A, AB	5/32" (.156)	641 lbs.
20 (.036)	A, AB	5/32" (.156)	662 lbs.
18 (.048)	A, AB, BP	3/16" (.187)	687 lbs.
16 (.060)	A, AB, B, BP	3/16" (.187)	860 lbs.
14 (.075)	AB, B, BP	#7 (.201)	1230 lbs.
12 (.105)	AB, B, BP	#7 (.201)	1681 lbs.
1/8" (.125)	AB, B, BP	#2 (.221)	1780 lbs.
10 (.134)	AB, B, BP	#2 (.221)	1812 lbs.
3/16" (.187)	B, BP	#2 (.221)	2660 lbs.
1/4" (.250)	B, BP	#2 (.221)	3179 lbs.
3/8" (.375)	B, BP	#2 (.221)	3500 lbs.*
1/2" (.500)	B, BP	#1 (.228)	3500 lbs.*

*Exceeds tensile strength of fastener.

Shear Values for Carbon Steel Self-Drilling Fasteners

Size	Point	Gauge										
		26-26	24-24	22-22	20-20	18-18	16-16	14-14	12-12	1/8-1/8	3/16-3/16	1/4-1/4
12-14	T/1	435	706	756	1021	1455	/	/	/	/	/	/
1/4-14	T/1	514	852	888	1247	1767	/	/	/	/	/	/
8-18	T/2	297	499	563	743	1063	1081	/	/	/	/	/
10-16	T/2	315	481	592	833	1209	1271	/	/	/	/	/
12-14	T/2	368	603	626	901	1373	1761	2141	/	/	/	/
8-18	T/3	/	/	/	733	1093	1213	1217	/	/	/	/
10-16	T/3	/	/	/	731	1269	1543	1555	/	/	/	/
10-24	T/3	/	/	/	754	1211	1557	1697	/	/	/	/
12-14	T/3	/	/	/	772	1361	1623	1973	1989	/	/	/
1/4-14	T/3	/	/	/	933	1445	2103	2587	2653	2823	/	/
12-24	T/4	/	/	/	/	/	/	/	2051	2033	/	/
12-24	T/5	/	/	/	/	/	/	/	/	2703	2723	2765

For special applications, contact Atlas Technical Services.

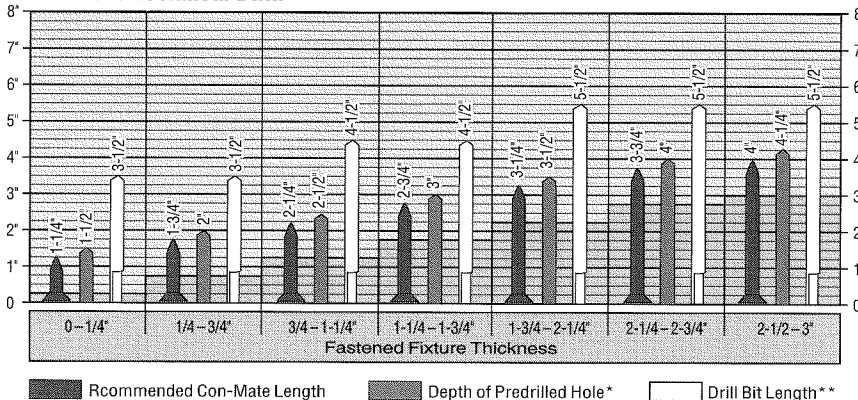
Strength Characteristics for Self-Drilling and Self-Tapping Fasteners

Fastener Size	Min. Tensile (Pounds)	Minimum Fastener Torque Strength (Inch-Pounds)	Fastener Shear (Pounds)
6-20	1125	25	750
10-16	2100	42	1000
10-24	2350	65	1500
12-14	2800	61	1400
12-24	3250	92	2000
1/4-14	3850	100	2100
1/4-20	4275	150	2600
17-14	5200	168	2700
18-9	4550	175	3125
		170	2575

pull-out strength

Masonry Fasteners

Con-Mate Technical Data



* Includes fixture thickness. Hole depth in concrete or masonry should be at least 1/4" deeper than the fastener length. 1" minimum thread engagement required to achieve listed pullout and shear values. (Recommended engagement range 1 - 1-3/4")

** Drill Bit Selection 5/32" bit for 3/16" fasteners, 3/16" bit for 1/4" fasteners.

Con-Mate Ultimate Pullout Values:

Material	Embedment	Pullout Value (lbs.†)									
3000 PSI Concrete	1"	610									2030
6380 PSI Concrete	1"	608					1150				
Hollow Block	1"								1408	1805	

† Prudent engineering requirements dictate that actual loads not exceed 25% of ultimate values. (4:1 Safety Factor.)

Con-Mate Ultimate Shear Values:

Material	Embedment	Shear Value (lbs.†)									
3000 PSI Concrete	1"				796					1261	
6380 PSI Concrete	1"							1038			1572
Hollow Block	1"			712						1591	

‡ Test Report #828-46315 Professional Services Industries.

See bulletin 712-109 for complete technical information.