

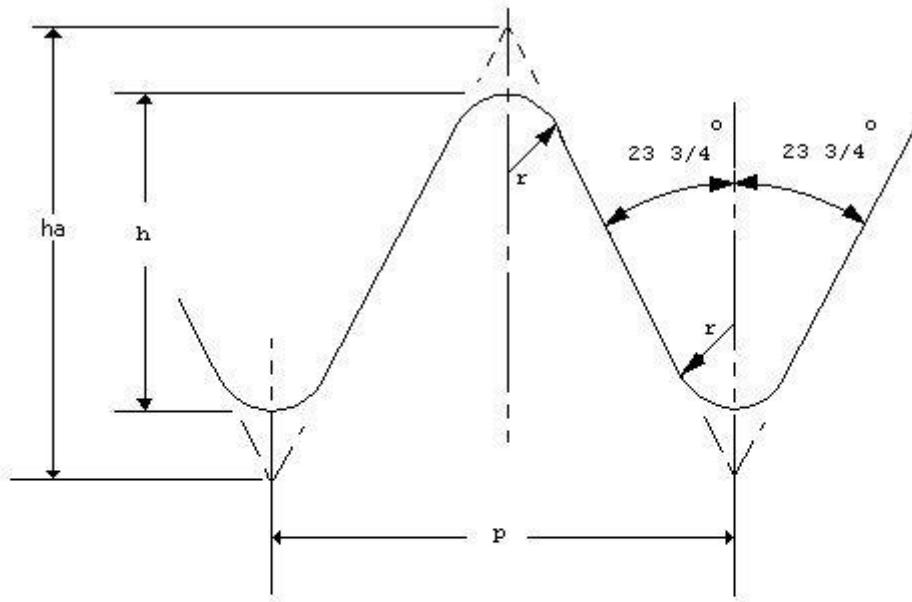
Thread data

Summary of Thread Included Angles.

BA 47½°; **BSW, BSF, BSP 55°**; Acme 29°; UNF, UNC, ANF, ANC 60°;
 Metric or ISO 60°; British Standard Cycle Thread (BSC) = Cycle Engineers' Institute (CEI) 60°.

BA Tread Form - Angle of thread = 47.5 degrees, rounded at top and bottom

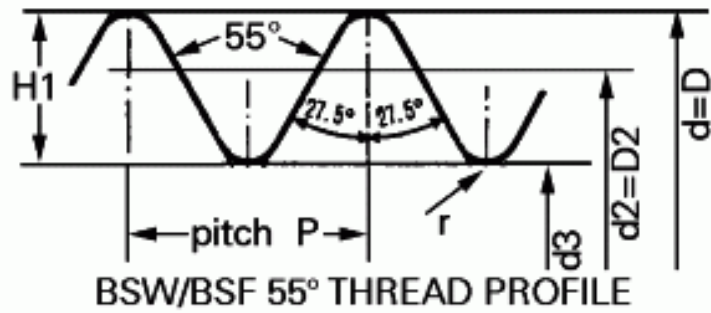
BA number	Major Dia		tpi Ref. Only	Pitch Metric mm	Tapping dia size		Clearance dia		Hex Across Flats	
	inch	mm			inch	mm	inch	mm	inch	mm
0	0.2362	6.0	25.3807	1.00	0.2007	5.10	0.240	6.10	0.413	10.50
1	0.2087	5.3	28.2486	0.90	0.1768	4.49	0.213	5.40	0.365	9.28
2	0.1850	4.7	31.3480	0.81	0.1563	3.97	0.189	4.80	0.324	8.22
3	0.1614	4.1	34.8432	0.73	0.1356	3.44	0.165	4.20	0.282	7.17
4	0.1417	3.6	38.4615	0.66	0.1183	3.00	0.146	3.70	0.248	6.30
5	0.1260	3.2	43.1034	0.59	0.1051	2.67	0.130	3.30	0.221	5.60
6	0.1102	2.8	47.8469	0.53	0.0914	2.32	0.114	2.90	0.193	4.90



BA (British Association) Thread Profile

$r = \text{Basic Radius} = 0.1808346 p$
 $h = \text{Basic Depth of Thread} = 0.6 p$
 $p = \text{Pitch} = \text{Pitch}(\text{mm}) = (0.9)n$
 $n = \text{Designated Number of the Screw}$
 $ha = \text{Angular Depth of Thread} = 1.13p$
 Angle of Thread = 47.5o Degrees

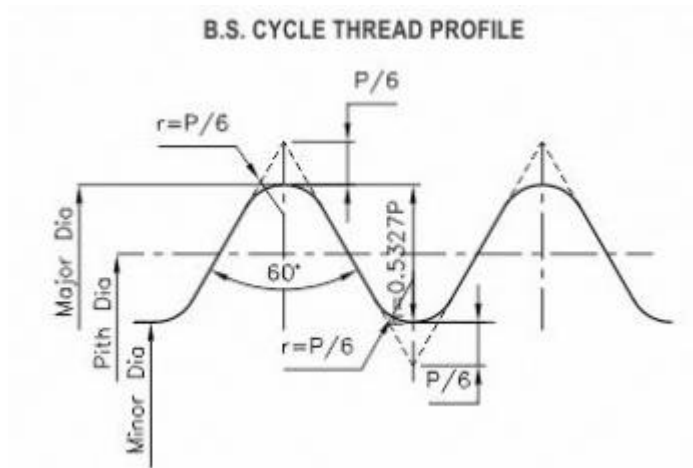
Thread data



BSF - 55° included angle thread								
Major Dia		tpi	Tapping dia size		Clearance dia		Hex Across flats	
inch	decimal"		inch	mm	inch	mm	inch	Mm
7/32	0.2188	28	0.182	4.63	0.224	5.70	0.413	10.49
1/4	0.2500	26	0.211	5.35	0.256	6.50	0.445	11.30
5/16	0.3125	22	0.266	6.75	0.319	8.10	0.525	13.34
3/8	0.3750	20	0.324	8.22	0.382	9.70	0.600	15.24
7/16	0.4375	18	0.381	9.67	0.445	11.30	0.710	18.03
1/2	0.5000	16	0.436	11.07	0.512	13.00	0.820	20.83
9/16	0.5625	16	0.498	12.66	0.571	14.50	0.920	23.37
5/8	0.6250	14	0.552	14.02	0.640	16.25	1.010	25.65
11/16	0.6875	14	0.614	15.60	0.699	17.75	1.100	27.94
3/4	0.7500	12	0.665	16.88	0.758	19.25	1.200	30.48
7/8	0.8750	11	0.782	19.86	0.886	22.50	1.300	33.02
1	1.0000	10	0.898	22.80	1.014	25.75	1.480	37.59

BSW - 55° included angle thread								
Major Dia		tpi	Tapping dia size		Clearance dia		Hex Across flats	
Inch	decimal"		inch	mm	inch	mm	inch	Mm
1/4	0.2500	20	0.1988	5.05	0.256	6.50	0.525	13.34
5/16	0.3125	18	0.256	6.49	0.319	8.10	0.600	15.24
3/8	0.3750	16	0.311	7.90	0.382	9.70	0.709	18.03
7/16	0.4375	14	0.364	9.25	0.445	11.30	0.820	20.83
1/2	0.5000	12	0.415	10.53	0.512	13.00	0.919	23.37
9/16	0.5625	12	0.477	12.12	0.571	14.50	1.010	25.65
5/8	0.6250	11	0.532	13.51	0.640	16.25	1.100	27.9
11/16	0.6875	11	0.594	15.10	0.699	17.75	1.200	30.46
3/4	0.7500	10	0.648	16.45	0.758	19.25	1.300	33.02

Thread data



Cycle Engineers' Institute (CEI) or British Standard Cycle (BSC)

British Standard Cycle Thread Chart (BSC - CEI)			
Thread Angle 60 degrees			
OD	Decimal	TPI	Pitch
1/8 RH	0.125	40	0.0250
3/16 RH	0.1875	32	0.0312
1/4 RH	0.250	26	0.0385
5/16 RH	0.3125	26	0.0385
3/8 RH	0.375	26	0.0385
7/16 RH	0.4375	26	0.0385
7/16 RH	0.4375	20	0.0500
1/2 RH	0.500	26	0.0385
1/2 RH	0.500	20	0.0500
9/16 RH	0.5625	26	0.0385
9/16 RH	0.5625	20	0.0500
5/8 RH	0.625	26	0.0385
5/8 RH	0.625	20	0.0500

British Standard Pipe – parallel (BSPP) and taper (BSPT)

BSP & BSPT - 55° included angle thread (BSPT taper is 1:16 on dia)						
Nom Size (inch)	tpi	Major Dia (inch)	BSP Tapping drill size		BSPT Tapping drill size	
			inch	mm	inch	Mm
1/8	28	0.383	0.343	8.8	0.328	8.4
1/4	19	0.518	0.453	11.8	0.437	11.2
3/8	19	0.656	0.593	15.25	0.578	14.75
1/2	14	0.825	0.750	19.0	0.718	18.25

Thread Comparison Chart

Nominal Screw Sizes			Major Dia (Max.)	Threads per inch (pitch)
British	Unified	Metric		
8 BA	2 UNC	2	.078 (1.98)	63.5 (.40)
			.085	56
	2 UNF	2.2	.085	64
			.086 (2.18)	56.4 (.45)
7 BA			.086	59.1 (.43)
6 BA	3 UNC	2.5	.097	52.9 (.48)
			.098 (2.48)	56.4 (.45)
	3 UNF		.098	48
			.109	47.5 (.53)
1/8 BSW	4 UNC	3	.111	40
			.111	48
	4 UNF		.117 (2.98)	50.8 (.50)
			.124	40
5 BA	5 UNC		.124	40
	5 UNF		.124	44
4 BA	6 UNC	3.5	.125	43.1 (.59)
			.137 (3.48)	42.3 (.60)
	6 UNF		.137	32
			.137	40
3 BA		4	.141	38.5 (.66)
			.157 (3.98)	36.3 (.70)
2 BA	8 UNC	4.5	.160	34.8 (.73)
			.163	32
	8 UNF		.163	36
			.177 (4.48)	33.9 (.75)
3/16 BSW			.184	31.4 (.81)
3/16 BSF			.186	24
1 BA	10 UNC	5	.186	32
			.189	24
	10 UNF		.189	32
			.196 (4.98)	31.8 (.80)
7/32 BSF	12 UNC		.208	28.2 (.90)
			.215	24
0 BA	12 UNF		.215	28
			.218	28
1/4 BSW		6	.235 (5.97)	25.4 (1.00)
1/4 BSF			.235	25.4 (1.00)
5/32 BSF	1/4 UNC	7	.249	20
			.249	20
	1/4 UNF		.249	28
			.275 (6.97)	25.4 (1.00)
9/32 BSW			.280	26
5/16 BSW			.311	18
5/16 BSF			.311	22
3/8 BSW	5/16 UNC	8	.311	18
			.311	24
	5/16 UNF		.314 (7.97)	20.3 (1.25)
			.353 (8.97)	20.3 (1.25)
3/8 BSF			.374	16
7/16 BSW	3/8 UNC	10	.374	20
			.374	24
	3/8 UNF		.393 (9.97)	16.9 (1.50)
			.431 (10.97)	16.9 (1.50)
7/16 BSF			.436	14
1/2 BSW	7/16 UNC	12	.436	18
			.436	14
	7/16 UNF		.436	20
			.471 (11.97)	14.5 (1.75)
1/2 BSF			.499	12
1/2 BSF	1/2 UNC		.499	16
	1/2 UNF		.499	20

Thread data

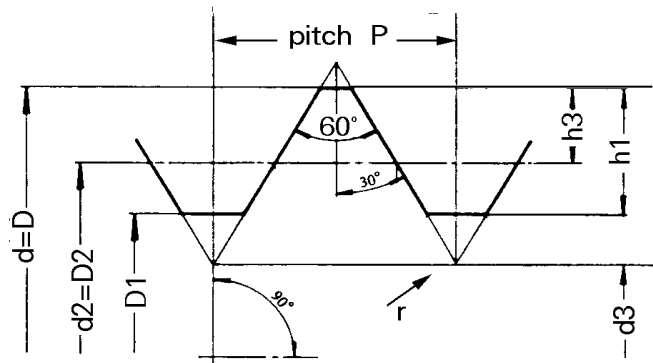
Equivalents table

Decimal inch - Fractions inch - mm - Wood Screw Gauge - Imperial Standard Wire Gauge

Inches		mm	Wood Screw Gauge	IMP. SWG	Inches		mm	Wood Screw Gauge	IMP. SWG	Inches		mm	Wood Screw Gauge	IMP. SWG
Decimal	Fraction				Decimal	Fraction				Decimal	Fraction			
.0124				30	.176				7	.511		13.00		
.0136				29	.178		4.520	9		.515	33/64	13.09		
.0148				28	.187	3/16	4.762			.531	17/32	13.49		
.0156	1/64	0.3969			.192		4.880	10	6	.546	35/64	13.89		
.0164				27	.196		5.000			.551		14.00		
.018				26	.203	13/64	5.159			.562	9/16	14.28		
.020				25	.212				5	.578	37/64	14.68		
.022				24	.218	7/32	5.566			.590		15.00		
.024				23	.220		5.590	12		.593	19/32	15.08		
.028				22	.232				4	.609	39/64	15.47		
.031	1/32	0.7938			.234	15/64	5.953			.625	5/8	15.87		
.032				21	.236		6.000			.629		16.00		
.036				20	.248		6.300	14		.640	41/64	16.27		
.039		1.000			.250	1/4	6.350			.656	21/32	16.66		
.040				19	.252				3	.669		17.00		
.046	3/64	1.190			.265	17/64	6.746			.671	43/64	17.06		
.048				18	.275		7.000			.687	11/16	17.46		
.056				17	.276		7.010	16	2	.703	45/64	17.85		
.060		1.520	0		.281	9/32	7.143			.708		18.00		
.062	1/16	1.587			.296	19/64	7.540			.718	23/32	18.25		
.064				16	.300				1	.734	47/64	18.65		
.070		1.780	1		.304		7.720	18		.748		19.00		
.072				15	.312	5/16	7.937			.750	3/4	19.05		
.078	5/64	2.000			.315		8.000			.765	49/64	19.44		
.080				14	.324				0	.781	25/32	19.84		
.082		2.080	2		.328	21/64	8.334			.787		20.00		
.092				13	.332		8.430	20		.796	51/64	20.24		
.093	3/32	2.381			.343	11/32	8.731			.812	13/16	20.63		
.094		2.390	3		.348				2/0	.826		21.00		
.104				12	.354		9.000			.828	53/64	21.03		
.108		2.740	4		.359	23/64	9.128			.843	27/32	21.43		
.109	7/64	2.778			.372				3/0	.859	55/64	21.82		
.116				11	.375	3/8	9.525			.866		22.00		
.118		3.000			.390	25/64	9.921			.875	7/8	22.22		
.122		3.100	5		.393		10.000			.890	57/64	22.62		
.125	1/8	3.175			.400				4/0	.905		23.00		
.128				10	.406	13/32	10.318			.906	29/32	23.01		
.136		3.450	6		.421	27/64	10.715			.921	59/64	23.41		
.140	9/64	3.571			.432				5/0	.937	15/16	23.81		
.144				9	.433		11.000			.944		24.00		
.150		3.810	7		.437	7/16	11.112			.953	61/64	24.20		
.156	5/32	3.968			.453	29/64	11.509			.968	31/32	24.60		
.157		4.000			.464				6/0	.984	63/64	25.00		
.160				8	.468	15/32	11.906			1.000	1	25.40		
.164		4.170	8		.472		12.000							
.171	11/64	4.365			.484	31/64	12.303							

Thread data

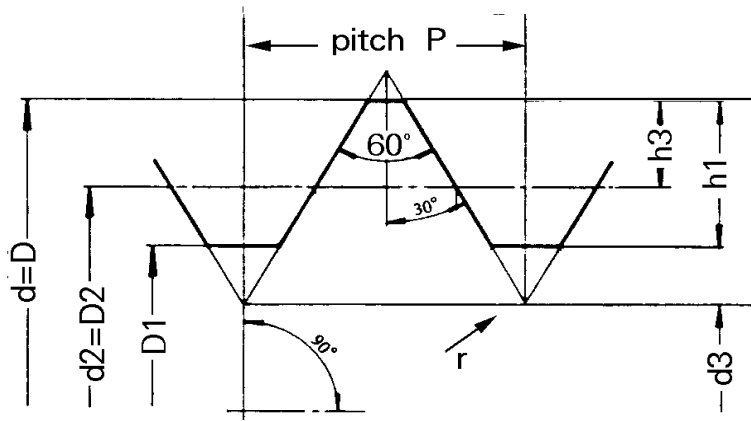
METRIC THREAD -- COARSE PITCH – M (1.0 – 20mm)



METRIC THREAD 60° PROFILE

THREAD DATA CHART: Metric Thread -- Coarse Pitch										
Nominal Size ISO M	Thread Form Type	Major Diameter mm d=D	Pitch mm p	Root Radius mm r	Pitch Diameter mm d2=D2	Minor Diameter Male Thd. d3	Minor Diameter Female Thd. D1	Thread Height Male Thd. h3	Thread Height Female Thd. H1	Tap Drill Diameter mm
1.00	M	1.00	0.25	0.036	0.838	0.693	0.729	0.153	0.135	0.75
1.10	M	1.10	0.25	0.036	0.938	0.793	0.829	0.153	0.135	0.85
1.20	M	1.20	0.25	0.036	1.038	0.893	0.929	0.153	0.135	0.95
1.40	M	1.40	0.30	0.043	1.205	1.032	1.075	0.184	0.162	1.10
1.60	M	1.60	0.35	0.051	1.373	1.171	1.221	0.215	0.189	1.25
1.80	M	1.80	0.35	0.051	1.573	1.371	1.421	0.215	0.189	1.45
2.00	M	2.00	0.40	0.058	1.740	1.509	1.567	0.245	0.217	1.60
2.20	M	2.20	0.45	0.065	1.908	1.648	1.713	0.276	0.244	1.75
2.50	M	2.50	0.45	0.065	2.208	1.948	2.013	0.276	0.244	2.05
3.00	M	3.00	0.50	0.072	2.675	2.387	2.459	0.307	0.271	2.50
3.50	M	3.50	0.60	0.087	3.110	2.764	2.850	0.368	0.325	2.90
4.00	M	4.00	0.70	0.101	3.545	3.141	3.242	0.429	0.379	3.30
4.50	M	4.50	0.75	0.108	4.013	3.580	3.688	0.460	0.406	3.80
5.00	M	5.00	0.80	0.115	4.480	4.019	4.134	0.491	0.433	4.20
6.00	M	6.00	1.00	0.144	5.350	4.773	4.917	0.613	0.541	5.00
7.00	M	7.00	1.00	0.144	6.350	5.773	5.917	0.613	0.541	6.00
8.00	M	8.00	1.25	0.180	7.188	6.466	6.647	0.767	0.677	6.80
9.00	M	9.00	1.25	0.180	8.188	7.466	7.647	0.767	0.677	7.80
10.00	M	10.00	1.50	0.217	9.026	8.160	8.376	0.920	0.812	8.50
11.00	M	11.00	1.50	0.217	10.026	9.160	9.376	0.920	0.812	9.50
12.00	M	12.00	1.75	0.253	10.863	9.853	10.106	1.074	0.947	10.20
14.00	M	14.00	2.00	0.289	12.701	11.546	11.835	1.227	1.083	12.00
16.00	M	16.00	2.00	0.289	14.701	13.546	13.835	1.227	1.083	14.00
18.00	M	18.00	2.50	0.361	16.376	14.933	15.394	1.534	1.353	15.50
20.00	M	20.00	2.50	0.361	18.376	16.933	17.294	1.534	1.353	17.50

Thread data

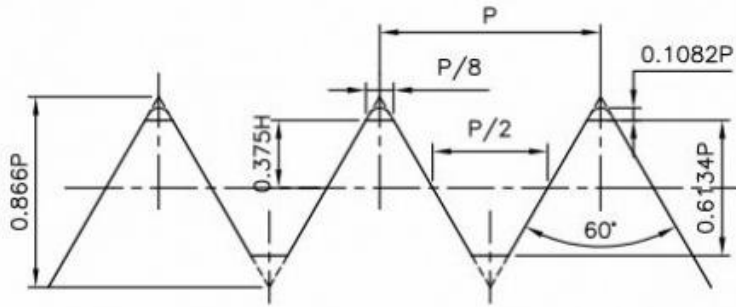


METRIC THREAD 60° PROFILE

Metric Fine										
Nominal Size ISO MF	Thread Form Type	Major Diameter mm d=D	Pitch mm p	Root Radius mm r	Pitch Diameter mm d2=D2	Minor Diameter Male Thd. d3	Minor Diameter Female Thd. D1	Thread Height Male Thd. h3	Thread Height Female Thd. H1	Tap Drill Diameter mm
1.0x0.2	M	1.00	0.20	0.029	0.870	0.755	0.783	0.123	0.108	0.80
1.1x0.2	M	1.10	0.20	0.029	0.970	0.855	0.883	0.123	0.108	0.90
1.2x0.2	M	1.20	0.20	0.029	1.070	0.955	0.983	0.123	0.108	1.00
1.4x0.2	M	1.40	0.20	0.029	1.270	1.155	1.183	0.123	0.108	1.20
1.6x0.2	M	1.60	0.20	0.029	1.470	1.355	1.383	0.123	0.108	1.40
1.8x0.2	M	1.80	0.20	0.029	1.670	1.555	1.583	0.123	0.108	1.60
2x0.25	M	2.00	0.25	0.036	1.838	1.693	1.729	0.153	0.135	1.75
2.2x0.25	M	2.20	0.25	0.036	2.038	1.893	1.929	0.153	0.135	1.95
2.5x0.35	M	2.50	0.35	0.051	2.273	2.071	2.121	0.215	0.189	2.10
3x0.35	M	3.00	0.35	0.051	2.773	2.571	2.621	0.215	0.189	2.60
3.5x0.35	M	3.50	0.35	0.051	3.273	3.071	3.121	0.215	0.189	3.10
4x0.5	M	4.00	0.50	0.072	3.675	3.387	3.459	0.307	0.271	3.50
4.5x0.5	M	4.50	0.50	0.072	4.175	3.887	3.959	0.307	0.271	4.00
5x0.5	M	5.00	0.50	0.072	4.675	4.387	4.459	0.307	0.271	4.50
5.5x0.5	M	5.50	0.50	0.072	5.175	4.887	4.959	0.307	0.271	5.00
6x0.75	M	6.00	0.75	0.108	5.513	5.080	5.188	0.460	0.406	5.20
7x0.75	M	7.00	0.75	0.108	6.513	6.080	6.188	0.460	0.406	6.20
8x0.75	M	8.00	0.75	0.108	7.513	7.080	7.188	0.460	0.406	7.20
8x1.0	M	8.00	1.00	0.144	7.350	6.773	6.917	0.613	0.541	7.00
9x0.75	M	9.00	0.75	0.108	8.513	8.080	8.188	0.460	0.406	8.20
9x 1	M	9.00	1.00	0.144	8.350	7.773	7.917	0.613	0.541	8.00
10x0.75	M	10.00	0.75	0.108	9.513	9.080	9.188	0.460	0.406	9.20
10x1	M	10.00	1.00	0.144	9.350	8.773	8.917	0.613	0.541	9.00
10x1.25	M	10.00	1.25	0.180	9.188	8.466	8.647	0.767	0.677	8.80
11x0.75	M	11.00	0.75	0.108	10.513	10.080	10.188	0.460	0.406	10.20
11x1	M	11.00	1.00	0.144	10.350	9.773	9.917	0.613	0.541	10.00
12x1	M	12.00	1.00	0.144	11.350	10.773	10.917	0.613	0.541	11.00
12x1.25	M	12.00	1.25	0.180	11.188	10.466	10.647	0.767	0.677	10.80
12x1.5	M	12.00	1.50	0.217	11.026	10.160	10.376	0.920	0.812	10.50

Thread data

UNIFIED THREAD PROFILE



UNC

No. Size	tpi	Pitch	Major Diameter	Tapping Size mm	Tapping Size imp	Clearance mm	Clearance imp	Across flats imp	Across flats fraction
1	64	0.0156	0.0730	1.55	0.061	1.95	0.077	0.1563	5/32
2	56	0.0179	0.0860	1.85	0.073	2.30	0.091	0.1870	3/16
3	48	0.0208	0.0990	2.10	0.083	2.65	0.104	0.1870	3/16
4	40	0.0250	0.1120	2.35	0.093	2.95	0.116	0.2500	1/4
5	40	0.0250	0.1250	2.65	0.104	3.30	0.130	0.3125	5/16
6	32	0.0313	0.1380	2.85	0.112	3.60	0.142	0.3125	5/16
8	32	0.0313	0.1640	3.50	0.138	4.30	0.169	0.3440	11/32
10	24	0.0417	0.1900	3.90	0.154	4.90	0.193	0.3750	9/32
12	24	0.0417	0.2160	4.50	0.177	5.60	0.220	0.4375	7/16
1/4	20	0.0500	0.2500	5.10	0.201	6.50	0.256	0.4375	7/16
5/16	18	0.0556	0.3125	6.60	0.260	8.10	0.319	0.5000	1/2
3/8	16	0.0625	0.3750	8.00	0.315	9.70	0.382	0.5625	9/16
7/16	14	0.0714	0.4375	9.40	0.370	11.30	0.445	0.6250	5/8
1/2	13	0.0769	0.5000	10.80	0.425	13.00	0.512	0.7500	3/4
9/16	12	0.0833	0.5625	12.20	0.480	14.50	0.571	0.8125	13/16
5/8	11	0.0909	0.6250	13.50	0.531	16.25	0.640	0.9375	15/16
3/4	10	0.1000	0.7500	16.50	0.650	19.25	0.758	1.1250	1 1/8
7/8	9	0.1111	0.8750	19.50	0.768	22.50	0.886	1.3125	1 5/16
1	8	0.1250	1.0000	22.25	0.876	25.75	1.014	1.5000	1 1/2

UNF

No. Size	tpi	Pitch	Major Diameter	Tapping Size mm	Tapping Size imp	Clearance mm	Clearance imp	Across Flats imp	Across flats fraction
0	80	0.0125	0.0600	1.25	0.049	1.60	0.063	0.1563	5/32
1	72	0.0139	0.0730	1.55	0.061	1.95	0.077	0.1563	5/32
2	64	0.0156	0.0860	1.90	0.075	2.30	0.091	0.1875	3/16
3	56	0.0179	0.0990	2.15	0.085	2.65	0.104	0.1875	3/16
4	48	0.0208	0.1120	2.40	0.094	2.95	0.116	0.2500	1/4
5	44	0.0227	0.1250	2.70	0.106	3.30	0.130	0.3125	5/16
6	40	0.0250	0.1380	2.95	0.116	3.60	0.142	0.3125	5/16
8	36	0.0278	0.1640	3.50	0.138	4.30	0.169	0.3440	11/32
10	32	0.0313	0.1900	4.10	0.161	4.90	0.193	0.3750	3/8
12	28	0.0357	0.2160	4.70	0.185	5.60	0.220	0.4375	7/16
1/4	28	0.0357	0.2500	5.50	0.217	6.50	0.256	0.4375	7/16
5/16	24	0.0417	0.3125	6.90	0.272	8.10	0.319	0.5000	1/2
3/8	24	0.0417	0.3750	8.50	0.335	9.70	0.382	0.5625	9/16
7/16	20	0.0500	0.4375	9.90	0.390	11.30	0.445	0.6250	5/8
1/2	20	0.0500	0.5000	11.50	0.453	13.00	0.512	0.7500	3/4
9/16	18	0.0556	0.5625	12.90	0.508	14.50	0.571	0.8125	13/16
5/8	18	0.0556	0.6250	14.50	0.571	16.25	0.640	0.9375	15/16
3/4	16	0.0625	0.7500	17.50	0.689	19.25	0.758	1.1250	1 1/8
7/8	14	0.0714	0.8750	20.40	0.803	22.50	0.886	1.3125	1 5/16
1	12	0.0833	1.0000	23.25	0.915	25.75	1.014	1.5000	1 1/2

Thread data

Thread data

Maximum recommended torque dry (ft.lbs)								
Thread Dia	A quality 15 tons/sq. in. Bright mild steel		B quality 34 tons/sq. in. High Tensile steel				T quality 44 tons/sq. in. Extra high tensile steel.	
	BSF	Whit.	BSF	Whit.	BSF	Whit		
1/4"	3.6	4	8.2	9.1	11	12		
5/16"	7.4	7.9	17	18	22	23		
3/8"	13	14	30	32	38	41		
7/16"	21	23	48	51	62	67		
1/2"	31	34	70	77	91	100		
5/8"	64	68	144	154	187	200		
3/4"	113	118	256	268	331	347		
7/8"	181	191	411	433	532	560		
1.0"	272	288	617	652	799	844		

Multiply by this factor depending upon finish and lubrication					
		BOLT			
		SEL F	ZIN C	CADMIU M	PHOSHATE
NUT	SELF	1	1	0.8	0.9
	ZINC	1.15	1.2	1.35	1.15
	CAD	0.85	0.9	1.2	1
	PHOS + OIL	0.7	0.65	0.7	0.75
	ZINC + OIL	0.6	0.55	0.65	0.55