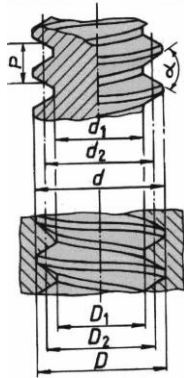


INFORMATION ON STANDARD M, UNC, PIPE THREADS (G & NPSM) PLUS PITCH DIAMETER TOLERANCES (Inch version)



EXTERNAL THREAD

d = Major diameter
 d_2 = Pitch diameter
 d_1 = Minor diameter

INTERNAL THREAD

D = Major diameter
 D_2 = Pitch diameter
 D_1 = Minor diameter

P = Pitch
 α = Flank angle

Important:

These tables are made as a guideline for calculating pitch diameter tolerances. As the primary purpose is to measure with a digital caliper and thread inserts, most dimensions are calculated to the nearest 0.0001".

When a tolerance in a table is used it should be remembered that the tolerance will often be slightly larger for a finer pitch than standard. i.e. the pitch diameter tolerance for M60x2 is larger than for M36x2, which again is larger than that for M16x2 – which is standard.

For exact tolerances use the relevant, approved standard.

UN (ISO Inch) - 60°		Pitch diameter tolerances	
TPI	PD _N	Nut (2B)	Bolt (2A)
24	0.0272	+ 0.0043 / - 0	-0.0010 / - 0.0043
20	0.0325	+ 0.0047 / - 0	- 0.0012 / - 0.0047
18	0.0362	+ 0.0055 / - 0	- 0.0012 / - 0.0051
16	0.0406	+ 0.0059 / - 0	- 0.0012 / - 0.0059
14	0.0465	+ 0.0063 / - 0	- 0.0016 / - 0.0063
13	0.0500	+ 0.0067 / - 0	- 0.0016 / - 0.0067
12	0.0539	+ 0.0067 / - 0	- 0.0016 / - 0.0067
11	0.0591	+ 0.0071 / - 0	- 0.0016 / - 0.0071
10	0.0650	+ 0.0079 / - 0	- 0.0020 / - 0.0079
9	0.0720	+ 0.0083 / - 0	- 0.0020 / - 0.0083
8	0.0811	+ 0.0087 / - 0	- 0.0020 / - 0.0087
7	0.0929	+ 0.0094 / - 0	- 0.0024 / - 0.0094
6	0.1083	+ 0.0102 / - 0	- 0.0024 / - 0.0102
5	0.1299	+ 0.0118 / - 0	- 0.0028 / - 0.0118
4½	0.1443	+ 0.0126 / - 0	- 0.0028 / - 0.0126
4	0.1624	+ 0.0134 / - 0	- 0.0031 / - 0.0134

Denom.	Parallel pipe threads OD & TPI			
	Whitworth 55° (G)		American 60° (NPSM)	
	OD	TPI	OD	TPI
1/16	0.304	28		
1/8	0.383	28	0.405	27
1/4	0.518	19	0.540	18
3/8	0.656	19	0.675	18
1/2	0.825	14	0.840	14
5/8	0.902	14		
3/4	1.041	14	1.050	14
7/8	1.189	14		
1	1.309	11	1.315	11.5
1 1/8	1.492	11		
1 1/4	1.650	11	1.660	11.5
1 1/2	1.882	11	1.900	11.5
1 3/4	2.116	11		
2	2.347	11	2.375	8
2 1/4	2.587	11		
2 1/2	2.960	11	2.875	8
2 3/4	3.210	11		
3	3.460	11	3.500	8
3 1/2	3.950	11		
4	4.450	11	4.000	8
4 1/2	4.950	11		
5	5.450	11	5.563	8
5 1/2	5.950	11		
6	6.450	11	6.625	8

Pitch diameter tolerances for NPSM are usually 2A and 2B

ISO 228/1-G (55°)		Pitch diameter tolerances	
TPI	PD _N	Nut	Bolt
19	0.0034	+ 0.0049 / - 0	A + 0 / - 0.0049 B + 0 / - 0.0098
14	0.0457	+ 0.0055 / - 0	A + 0 / - 0.0055 B + 0 / - 0.0110
11	0.0583	+ 0.0071 / - 0	A + 0 / - 0.0071 B + 0 / - 0.0142
up to G2			A + 0 / - 0.0142
11	0.0583	+ 0.0087 / - 0	A + 0 / - 0.0087 B + 0 / - 0.0173
over G2			B + 0 / - 0.0173

N.B. The standards used to make this are: ISO 965, ASME B1.1, ISO 228/1 and ANSI/ASME B1.20.1

ISO METRIC - 60°		Pitch diameter tolerances	
Thread	OD"	Nut (6H)	Bolt (6g)
M16x2	0.6230	+0.0083 / - 0	-0.0015 / -0.0078 (0.0063)
M36x2	1.4173	+0.0088 / - 0	-0.0015 / -0.0082 (0.0067)
M60x2	2.3622	+0.0093 / - 0	-0.0015 / -0.0086 (0.0071)
M120x2	4.7244	+0.0098 / - 0	-0.0015 / -0.0090 (0.0075)

Nominal Pitch diameter = Nominal Major diameter - (minus) PD_N

i.e. Nominal Pitch diameter for :

M20 x2 = 0.7874 - 0.0512 = **0.7362**

and 1-8UNC = 1.000 - 0.0811 = **0.9189**

ISO METRIC - 60°		Pitch diameter tolerances	
Pitch	PD _N	Nut (6H)	Bolt (6g)
1	0.0256	+ 0.0059 / - 0	- 0.0012 / - 0.0055
1.25	0.0319	+ 0.0063 / - 0	- 0.0012 / - 0.0059
1.5	0.0382	+ 0.0071 / - 0	- 0.0012 / - 0.0063
1.75	0.0449	+ 0.0079 / - 0	- 0.0012 / - 0.0071
2	0.0512	+ 0.0083 / - 0	- 0.0016 / - 0.0079
2.5	0.0638	+ 0.0087 / - 0	- 0.0016 / - 0.0083
3	0.0768	+ 0.0102 / - 0	- 0.0020 / - 0.0098
3.5	0.0894	+ 0.0110 / - 0	- 0.0020 / - 0.0102
4	0.1024	+ 0.0118 / - 0	- 0.0024 / - 0.0110
4.5	0.1150	+ 0.0122 / - 0	- 0.0024 / - 0.0118
5	0.1280	+ 0.0130 / - 0	- 0.0028 / - 0.0126
5.5	0.1406	+ 0.0138 / - 0	- 0.0028 / - 0.0134
6	0.1535	+ 0.0146 / - 0	- 0.0031 / - 0.0142