

# TECHNICAL DATA

## PITCH DIAMETER MEASUREMENT

### Three Wire System

It is essential in using this method that the micrometers used be accurate and the measuring faces flat and parallel; that the wires used be hardened. The surfaces must be properly finished and the set of wires the same diameter within .00003 inches if measurement within .0001 inch is desired.

In the table of thread elements below is a column headed "Diameter of Best-Size Wires." This column lists the size of the wire, of a given pitch, that touches the thread exactly on the pitch diameter when placed in between two threads.

Adjacent is a diagram showing the method of applying the wires for the measurement of a thread.

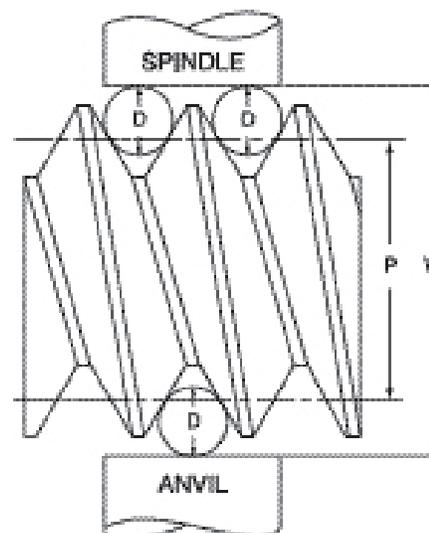
Below will be found the best size wires to use for the various pitches and the constant to subtract from the micrometer reading to obtain the pitch diameter.

The wire sizes and constants given are for use with a thread which has an included angle of 60°.

To calculate the "over wire measurement" when the "best-size" wires are available, refer to the table of thread elements. To the basic pitch diameter, add the constant for the "best-size" wire.

Example: The basic pitch diameter of a 3/8"-16 thread = .3344  
 The constant for the "best-size" wire = .0541  
 The measurement over wires = .3885

To calculate the "over wire measurement" when the "best-size" wires are not available, refer to the table of thread elements. Subtract from the pitch diameter, the single height V-thread and to the result add three times the diameter of the available wire.



P = Pitch Diameter  
 D = Wire Diameter  
 W = Measurement Over Wires

Example: The pitch diameter of a 3/8"-16 screw = .3344  
 Minus the single height V-thread = .0541  
 .2803  
 Plus three times .040" (available wire) = .1200  
 The measurement over wires = .4003

Table of Thread Elements

Threads Per Inch	Pitch	Diameter of "Best-Size" Wires	Constant for "Best-Size" Wires	Single* Height Symmetrical Thread Form 0.64952P	Width of Flat on Crest and Root NC and NF	Single Height V-Thread
140	.007143	.0041239	.006186	.004640	.0009	.006186
120	.008333	.0048112	.007217	.005412	.0010	.007217
100	.010000	.0057735	.008660	.006495	.0013	.008660
96	.010417	.0060141	.009021	.006766	.0013	.009021
90	.011111	.0064150	.009623	.007217	.0014	.009623
80	.012500	.0072168	.010825	.008119	.0016	.010825
72	.013888	.0080182	.012027	.009021	.0017	.012027
64	.015625	.0090210	.013531	.010149	.0020	.013531
60	.016667	.0096225	.014434	.010826	.0021	.014434
56	.017857	.0103097	.015464	.011598	.0022	.015464
50	.020000	.0115470	.017320	.012990	.0025	.017320
48	.020833	.0120279	.018041	.013531	.0026	.018041
44	.022727	.0131214	.019682	.014762	.0028	.019682
40	.025000	.0144337	.021650	.016238	.0031	.021650
36	.027777	.0160370	.024055	.018042	.0035	.024055
32	.031250	.0180421	.027063	.020297	.0039	.027063
30	.033333	.0192448	.028867	.021650	.0042	.028867
28	.035714	.0206194	.030929	.023197	.0045	.030929
27	.037037	.0213833	.032074	.024056	.0046	.032074
26	.038462	.0222057	.033308	.024982	.0048	.033308

Threads Per Inch	Pitch	Diameter of "Best-Size" Wires	Constant for "Best-Size" Wires	Single* Height Symmetrical Thread Form 0.64952P	Width of Flat on Crest and Root NC and NF	Single Height V-Thread
24	.041666	.0240558	.036083	.027063	.0052	.036083
22	.045454	.0262428	.039364	.029523	.0057	.039364
20	.050000	.0288675	.043301	.032476	.0062	.043301
18	.055555	.0320746	.048112	.036084	.0069	.048112
16	.062500	.0360843	.054126	.040595	.0078	.054126
14	.071428	.0412389	.061858	.046394	.0089	.061858
13	.076923	.0444114	.066617	.049963	.0096	.066617
12	.083333	.0481123	.072168	.054126	.0104	.072168
11 1/2	.086956	.0502040	.075306	.056480	.0108	.075306
11	.090909	.0524863	.078729	.059047	.0114	.078729
10	.100000	.0577350	.086602	.064952	.0125	.086602
9	.111111	.0641499	.096224	.072168	.0139	.096224
8	.125000	.0721687	.108253	.081190	.0156	.108253
7 1/2	.133333	.0769800	.115467	.086602	.0167	.115467
7	.142857	.0824784	.123717	.092788	.0179	.123717
6	.166666	.0962246	.144336	.108253	.0208	.144336
5 1/2	.181818	.1049726	.157458	.118094	.0227	.157458
5	.200000	.1154700	.173205	.129904	.0250	.173205
4 1/2	.222222	.1282998	.192449	.144338	.0278	.192449
4	.250000	.1443375	.216506	.162380	.0312	.216506

\*To calculate the pitch diameter of Unified and American National Form Threads, subtracts the figures found in this column from the Basic Outside Diameter. Use the "Three Wire Method" to convert pitch diameter calculations into Over Wire Measurements.

NOTE: Symmetrical thread height equivalent to the basic height, h, of the original American National Form.