



**THREAD CHECK INC.**

**PRECISION GAGE SOLUTIONS**

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UNIFIED MINIATURE SCREW THREADS - ASME B1.10M 2004  
DIMENSIONAL DATA

**Table 1 Thread Size Dimensions, Basic and Design**

Size Designation	Pitch $P$ , mm	Nominal and Basic Major Diameter, $D, d$ , mm	Basic Pitch Diameter, $D_2, d_2$ , mm	Design Minor External Threads $d - 1.145185P = d_s$ , mm	Design Minor Internal Diameter $D - 0.96P, D_1$ , mm	Design Major Diameter Internal Threads, $D + 0.07216889P$ , mm	Lead Angle at Basic Pitch Diameter, $\lambda$ , deg	Sectional Area at Minor Diameter, $d_s$ , sq mm
<b>0.30 UNM</b>	<b>0.080</b>	<b>0.300</b>	<b>0.248</b>	<b>0.208</b>	<b>0.223</b>	<b>0.306</b>	<b>5</b>	<b>0.034</b>
0.35 UNM	0.090	0.350	0.292	0.247	0.264	0.356	5	0.048
<b>0.40 UNM</b>	<b>0.100</b>	<b>0.400</b>	<b>0.335</b>	<b>0.285</b>	<b>0.304</b>	<b>0.407</b>	<b>5</b>	<b>0.064</b>
0.45 UNM	0.100	0.450	0.385	0.335	0.354	0.457	4	0.088
<b>0.50 UNM</b>	<b>0.125</b>	<b>0.500</b>	<b>0.419</b>	<b>0.357</b>	<b>0.380</b>	<b>0.509</b>	<b>5</b>	<b>0.100</b>
0.55 UNM	0.125	0.550	0.469	0.407	0.430	0.559	4	0.130
<b>0.60 UNM</b>	<b>0.150</b>	<b>0.600</b>	<b>0.503</b>	<b>0.428</b>	<b>0.456</b>	<b>0.611</b>	<b>5</b>	<b>0.144</b>
0.70 UNM	0.175	0.700	0.586	0.500	0.532	0.713	5	0.196
<b>0.80 UNM</b>	<b>0.200</b>	<b>0.800</b>	<b>0.670</b>	<b>0.571</b>	<b>0.608</b>	<b>0.814</b>	<b>5</b>	<b>0.256</b>
0.90 UNM	0.225	0.900	0.754	0.642	0.684	0.916	5	0.324
<b>1.00 UNM</b>	<b>0.250</b>	<b>1.000</b>	<b>0.838</b>	<b>0.714</b>	<b>0.760</b>	<b>1.018</b>	<b>5</b>	<b>0.400</b>
1.10 UNM	0.250	1.100	0.938	0.814	0.860	1.118	4	0.520
<b>1.20 UNM</b>	<b>0.250</b>	<b>1.200</b>	<b>1.038</b>	<b>0.914</b>	<b>0.960</b>	<b>1.218</b>	<b>4</b>	<b>0.656</b>
1.40 UNM	0.300	1.400	1.205	1.056	1.112	1.422	4	0.877

**GENERAL NOTES**

(a) Sizes shown in bold type are preferred. It is recommended that selection be confined to these sizes insofar as possible.

(b) For inch conversion of Table 1, see Table 2

**Table 2 Limits of Size and Tolerances**

Size Designation	Pitch $P$ , mm	External Threads, mm								Internal Threads, mm							
		Major Diameter			Pitch Diameter			Minor Diameter		Minor Diameter			Pitch Diameter			Major Diameter	
		Max.	Min.	Tol.	Max.	Min.	Tol.	Max.	Min. [Not (1)]	Min.	Max.	Tol.	Min.	Max.	Tol.	Min.	Max. [Note (1)]
<b>0.30 UNM</b>	<b>0.080</b>	<b>0.300</b>	<b>0.284</b>	<b>0.016</b>	<b>0.248</b>	<b>0.234</b>	<b>0.014</b>	<b>0.208</b>	<b>0.187</b>	<b>0.223</b>	<b>0.261</b>	<b>0.038</b>	<b>0.248</b>	<b>0.262</b>	<b>0.014</b>	<b>0.306</b>	<b>0.327</b>
0.35 UNM	0.090	0.350	0.333	0.017	0.292	0.277	0.015	0.247	0.225	0.264	0.305	0.041	0.292	0.307	0.015	0.356	0.379
<b>0.40 UNM</b>	<b>0.100</b>	<b>0.400</b>	<b>0.382</b>	<b>0.018</b>	<b>0.335</b>	<b>0.319</b>	<b>0.016</b>	<b>0.285</b>	<b>0.261</b>	<b>0.304</b>	<b>0.348</b>	<b>0.044</b>	<b>0.355</b>	<b>0.351</b>	<b>0.016</b>	<b>0.407</b>	<b>0.432</b>
0.45 UNM	0.100	0.450	0.432	0.018	0.385	0.369	0.016	0.335	0.311	0.354	0.398	0.044	0.385	0.401	0.016	0.457	0.482
<b>0.50 UNM</b>	<b>0.125</b>	<b>0.500</b>	<b>0.479</b>	<b>0.021</b>	<b>0.419</b>	<b>0.401</b>	<b>0.018</b>	<b>0.357</b>	<b>0.329</b>	<b>0.380</b>	<b>0.432</b>	<b>0.052</b>	<b>0.419</b>	<b>0.437</b>	<b>0.018</b>	<b>0.509</b>	<b>0.538</b>
0.55 UNM	0.125	0.550	0.529	0.021	0.469	0.451	0.018	0.407	0.379	0.430	0.482	0.052	0.469	0.487	0.018	0.559	0.588
<b>0.60 UNM</b>	<b>0.150</b>	<b>0.600</b>	<b>0.576</b>	<b>0.024</b>	<b>0.503</b>	<b>0.483</b>	<b>0.020</b>	<b>0.428</b>	<b>0.396</b>	<b>0.456</b>	<b>0.516</b>	<b>0.060</b>	<b>0.503</b>	<b>0.523</b>	<b>0.020</b>	<b>0.611</b>	<b>0.644</b>
0.70 UNM	0.175	0.700	0.673	0.027	0.586	0.564	0.022	0.500	0.464	0.532	0.600	0.068	0.586	0.608	0.022	0.713	0.750
<b>0.80 UNM</b>	<b>0.200</b>	<b>0.800</b>	<b>0.770</b>	<b>0.030</b>	<b>0.670</b>	<b>0.646</b>	<b>0.024</b>	<b>0.571</b>	<b>0.531</b>	<b>0.608</b>	<b>0.684</b>	<b>0.076</b>	<b>0.670</b>	<b>0.694</b>	<b>0.024</b>	<b>0.814</b>	<b>0.856</b>
0.90 UNM	0.225	0.900	0.867	0.033	0.754	0.728	0.026	0.642	0.598	0.684	0.768	0.084	0.754	0.780	0.026	0.916	0.962
<b>1.00 UNM</b>	<b>0.250</b>	<b>1.000</b>	<b>0.964</b>	<b>0.036</b>	<b>0.838</b>	<b>0.810</b>	<b>0.028</b>	<b>0.714</b>	<b>0.666</b>	<b>0.760</b>	<b>0.852</b>	<b>0.092</b>	<b>0.838</b>	<b>0.866</b>	<b>0.028</b>	<b>1.018</b>	<b>1.068</b>
1.10 UNM	0.250	1.100	1.064	0.036	0.938	0.910	0.028	0.814	0.766	0.860	0.952	0.092	0.938	0.966	0.028	1.118	1.168

1.20 UNM	0.250	1.200	1.164	0.036	1.038	1.010	0.028	0.914	0.866	0.960	1.052	0.092	1.038	1.066	0.028	1.218	1.268
1.40 UNM	0.300	1.400	1.358	0.042	1.205	1.173	0.032	1.056	1.000	1.112	1.220	0.108	1.205	1.237	0.032	1.422	1.480

**GENERAL NOTES**

(a) Sizes shown in bold type are preferred. It is recommended that selection be confined to these sizes insofar as possible.

(b) For inch conversion of Table 2, see Table 1

**NOTE:**

(1) Dimension is used in the design of tools. Generally, diameter acceptance is based upon maximum material condition gaging.

**Table 3 Thread Form Formulas**

Element	Symbol	Formula
<b>Basic Thread Form</b>		
Angle of thread	$2a$	60 deg
Half angle of thread	$a$	30deg
Pitch of thread	$P$	...
Height of sharp V thread	$H$	$0.8660254P$
Addendum of basic thread	$h_{ab}$	$0.3247595P$ ( $0.375H$ )
Height of basic thread	$h_b$	$0.4800P$ ( $0.554H$ )
<b>Design Form - External Thread</b>		
Addendum	$h_{as}$	$0.3247595P$ ( $0.375H$ )
Height	$h_s$	$0.5725907P$ ( $0.661H$ )
Flat at crest	$F_{cs}$	$0.12500P$
Radius at root	$r_{rs}$	$0.1851815P$
<b>Design Form - Internal Thread</b>		
Height of engagement	$h_e$	$0.4800P$ ( $0.554H$ )
Height of thread	$h_n$	$0.4800P$ ( $0.554H$ )
Flat at crest	$F_{en}$	$0.3207437P$
Radius at root	$r_m$	$0.0721688P$

GENERAL NOTE: For standardization, this tabular listing of thread values has been established based on a function of pitch,  $P$ . The thread values based on a functional height,  $H$ , are used as reference only.

**Table 4 Thread Form Dimensions, Basic and Design**

	Basic Thread Form,mm									
	Height of Sharp V,	Height of Internal Thread and Depth of Thread Engagement,	Dedendum of Internal Thread and Addendum of External Thread,	External Thread Design Form,mm			Internal Thread Design Form,mm			
		$h_b =$	$h_{as} =$	$h_s =$	Height	Flat at Crest,	Radius at Root,	Rounded Root,	Flat at Crest,	Radius at Root,
					$h =$	$F_{cs} =$	$r_{ra} =$	$h_e =$	$F_{en} =$	$r_m =$
Pitch, $P$	$H = 0.8660254P$	$(0.554H)$ $0.4800P$	$(0.375H)$ $0.3247595P$	$(0.661H)$ $0.5725907P$	$0.12500P$	$0.1851815P$	$(0.596H)$ $0.5160844P$	$0.3207437P$	$0.0721688P$	

0.080	0.06928	0.03840	0.02598	0.04581	0.0100	0.015	0.04129	0.0257	0.006
0.090	0.07794	0.04320	0.02923	0.05153	0.0113	0.017	0.04645	0.0289	0.006
0.100	0.08660	0.04800	0.03248	0.05726	0.0125	0.019	0.05161	0.0321	0.007
0.125	0.10825	0.06000	0.04059	0.07157	0.0156	0.023	0.06451	0.0401	0.009
0.150	0.12990	0.07200	0.04871	0.08589	0.0188	0.028	0.07741	0.0481	0.011
0.175	0.15155	0.08400	0.05683	0.10020	0.0219	0.032	0.09031	0.0561	0.013
0.200	0.17321	0.09600	0.06495	0.11452	0.0250	0.037	0.10322	0.0641	0.014
0.225	0.19486	0.10800	0.07307	0.12883	0.0281	0.042	0.11612	0.0722	0.016
0.250	0.21651	0.12000	0.08119	0.14315	0.0313	0.046	0.12902	0.0802	0.018
0.300	0.25981	0.14400	0.09743	0.17178	0.0375	0.056	0.15483	0.0962	0.022

#### GENERAL NOTES

(a) For standardization, this listing of tabulated thread values has been established based on a function of pitch,  $P$ . The thread values based on a functional height,  $H$ , are used as reference only.

(b) For inch conversion of Table 4, see Table 1

**Table 5 Thread Size Formulas, Basic and Design**

Dimensions	Symbol	Formula [Note(1)]
Major diameter, design and basic	$D_{bsc}, d_{bsc}$	
Major diameter of external thread, design	$d$	$d_{bsc}$
Major diameter of internal thread, design	$D$	$D_{bsc} + r_m = D_{bsc} + 0.0721688P$
Pitch diameter, basic	$D_2, d_2$	$D_2, d_2 = D_{bsc} - 2h_{ab} = D_{bsc} - 0.6495191P$
Pitch diameter of external thread, design	$d_2$	$d_2, d_{bsc}$
Pitch diameter of internal thread, design	$D_2$	$D_2, d_{bsc}$
Minor diameter, basic	$D_1, d_1$	$D_1, d_1 = D_{bsc} - 2h_{ab} = d_{bsc} - 0.6495191P$
Minor diameter of external thread, design	$d_1$	$d_{bsc} - 2h_s = d_{bsc} - 1.1451815P$
Minor diameter of internal thread, design	$D_1$	$D_{bsc} - 2h_n = d_{bsc} - 0.9600P$

**Table 6 Tolerance Formulas for Limits of Size**

Dimension	Formula
External thread, major diameter	$0.1200P + 0.006$
External thread, pitch diameter	$0.0800P + 0.008$
External thread, minor diameter [Note (1)]	$0.1600P + 0.008$
Internal thread, major diameter [Note (1)]	$0.1680P + 0.008$
Internal thread, pitch diameter	$0.0800P + 0.008$
Internal thread, minor diameter	$0.3200P + 0.012$

#### NOTE:

(1) Tolerance is used in the design of tools