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SAE International	SURFACE VEHICLE STANDARD	SAE J476 FEB2013
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Dryseal Pipe Threads

RATIONALE

Current requirements for Dry Seal Threads and their tolerances are contained in ASME B1.20.3 - Drywall Thread Seals (Inch). SAE J476 contains useful information for design of bosses and manufacturing guidance.

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Foreword—This Document has not changed other than to put it into the new SAE Technical Standards Board Format.

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1. ***Scope***—The Dryseal American Standard Taper Pipe Thread, the Dryseal American Fuel Internal Straight Pipe Thread and the Dryseal American Intermediate Internal Straight Pipe Thread covered by this standard conform with the American Standard ASA-B2.2. The Dryseal SAE-Short Taper Pipe Thread in this standard conforms with the Dryseal American Standard Taper Pipe Thread except for the length of thread, which is shortened for increased clearance and economy of material.

The significant feature of the Dryseal thread is controlled truncation at the crest and root to assure metal to metal contact coincident with or prior to flank contact. Contact at the crest and root prevents spiral leakage and insures pressure-tight joints without the use of a lubricant or sealer.

Lubricants, if not functionally objectionable, may be used to minimize the possibility of galling in assembly.

2. ***References***

2.1 Applicable Publications—The following publications form a part of the specification to the extent specified herein. Unless otherwise indicated the latest revision of SAE publications shall apply.

2.1.1 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

ASA B2.2—Dryseal Pipe Threads
SAE Standards Screw Threads

3. ***Truncation—Dryseal American Standard External And Internal Pipe Threads For Pressure-Tight Joints Without Lubricant Or Sealer***

3.1 Thread Form—The angle between the flanks of the thread is 60 deg when measured on an axial plane and the line bisecting this angle is perpendicular to the axis of both the taper and straight threads.

Diametral taper of tapered threads is 0.75 in. ± 0.06 in. per 12.00 in. of length.

Although the crests and roots of the Dryseal threads are theoretically flat, they may be rounded provided their contour is within the limits specified in Table 1.

3.2 Thread Series Symbols—The identification symbols which have been adopted for designating the various Dryseal Pipe Thread Series are as follows:

NPTF for Dryseal American Standard Taper Pipe Thread.
PTF—SAE for Dryseal SAE Short Taper Pipe Thread.
NPSF for Dryseal American Fuel Internal Straight Pipe Thread.
NPSI for Dryseal American Intermediate Internal Straight Pipe Thread.

Where: N stands for American Standard [formerly American (National) Standard].

P stands for Pipe
T stands for Taper
F stands for Fuel
S stands for Straight
I stands for Intermediate

3.3 Thread Designation—Dryseal pipe threads are designated by specifying in sequence the nominal size, number of threads per inch, form (Dryseal), and symbol of the thread series.

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EXAMPLE—1/8—27 DRYSEAL NPTF

1/8—27 DRYSEAL PTF—SAE SHORT

1/8—27 DRYSEAL NPSF

1/8—27 DRYSEAL NPSI

3.4 Straight Pipe Threads—An assembly with straight internal pipe threads and taper external pipe threads is frequently more advantageous than an all taper thread assembly, particularly in automotive and other allied industries where economy and rapid production are paramount considerations. Dryseal threads are not used on assemblies in which both components have straight pipe threads.

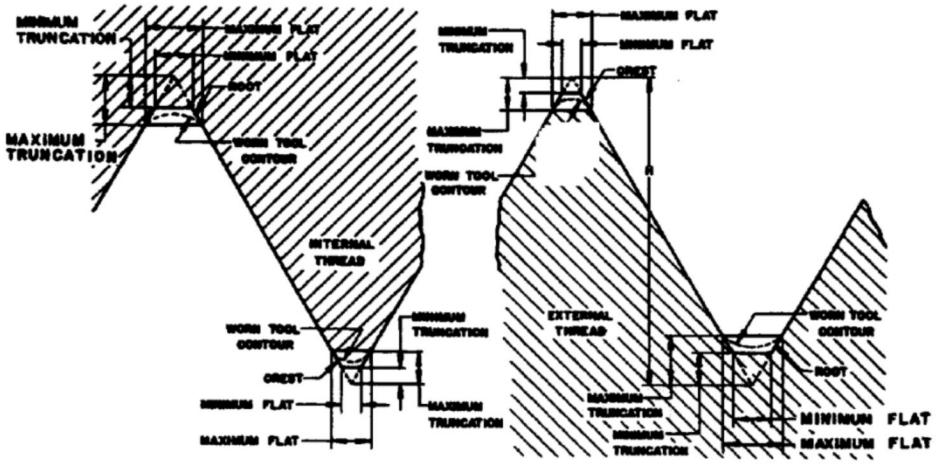


FIGURE 1—

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TABLE 1—LIMITS ON CREST AND ROOT TRUNCATION

Threads per in.		Depth of Sharp-V Thread, H in.	Truncation Min Formula	Truncation Min in.	Truncation Max Formula	Truncation Max in.	Equalivalent Width of Flat(1) Min Formula	Equivalent Width of Flat(1) Min in.	Equivalent Width of Flat(1) Max Formula	Equivalent Width of Flat(1) Max in.
27	Crest	0.03208	0.047p	0.0017	0.094p	0.0035	0.054p	0.0020	0.108p	0.0040
	Root		0.094p	0.0035	0.140p	0.0052	0.108p	0.0040	0.162p	0.0060
18	Crest	0.04811	0.047p	0.0026	0.078p	0.0043	0.054p	0.0030	0.090p	0.0050
	Root		0.078p	0.0043	0.109p	0.0061	0.090p	0.0050	0.126p	0.0070
14	Crest	0.06186	0.036p	0.0026	0.060p	0.0043	0.042p	0.0030	0.070p	0.0050
	Root		0.060p	0.0043	0.085p	0.0061	0.070p	0.0050	0.098p	0.0070
11-1/2	Crest	0.07531	0.040p	0.0035	0.060p	0.0052	0.046p	0.0040	0.069p	0.0060
	Root		0.060p	0.0052	0.090p	0.0078	0.069p	0.0060	0.103p	0.0090
8	Crest	0.10825	0.042p	0.0052	0.055p	0.0069	0.048p	0.0060	0.064p	0.0080(2)
	Root		0.055p	0.0069	0.076p	0.0095	0.064p	0.0080	0.088p	0.0110

1. The major diameter of plug gages and minor diameter of ring gages used for gaging dryseal threads shall be truncated an amount sufficient to produce a flat width as shown in Appendix C, Tables C1-1 to C12-1 inclusive.
2. There is reason to doubt the correctness of the 8 threads per in. flat widths on account of the volume of metal to be displaced.

4. Dryseal American Standard Taper Pipe Thread (NPTF)—This series applies to both the external and internal threads of all full length and is suitable for pipe joints in practically every type of service. These threads are generally conceded to be superior for strength and seal. Use of the tapered internal thread in hard or brittle materials having thin sections will minimize trouble from fracture. Dimensional data for (NPTF) threads is given in Table 2. See Appendix D for limitations of assembly of NPTF threads with other series Dryseal pipe threads.

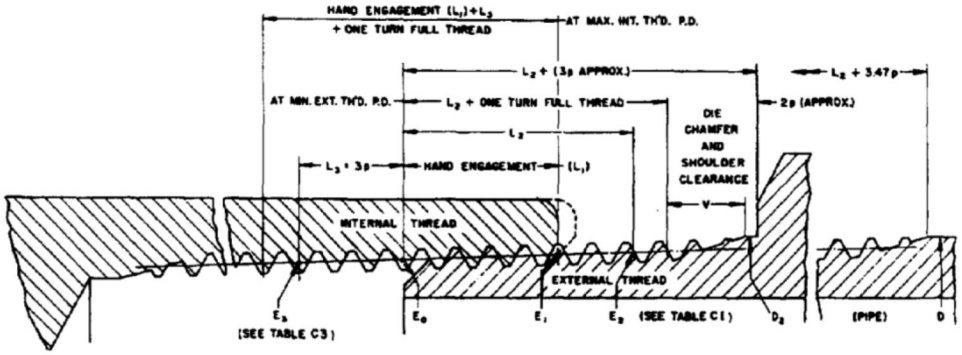


FIGURE 2—

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TABLE 2—BASIC DIMENSIONS OF DRYSEAL AMERICAN STANDARD TAPER PIPE THREAD(1)

NPTF Size 1	Pitch, P in. 2	Pitch Diameter at End of External Thread, E_0 in. 3	Pitch Diameter at End of Internal Thread, E_1 in. 4	Hand Engagement, L_1 in. 5	Hand Engagement, L_1 Thread 6	Length of Full Thread,(2) L_2 in. 7	Length of Full Thread(2), L_2 Thread 8	Vanish Threads V Plus Full Thread Tolerance Plus Shoulder Clearance (V + 1p + 1/2 p) in. 9	Vanish Threads V Plus Full Thread Tolerance Pluls Shoulder Clearance (V + 1p + 1/2 p) Thread 10	Shoulder Length L_2 + (3p Approx) in. 11	External Thread for Draw (L_2 - L_1) in. 12	External Thread for Draw (L_2 - L_1) Thread 13	Length of Internal Full Thread,(3) (L_1 + L_3) in. 14	Length of Internal Full Thread(3) (L_1 + L_3) Thread 15	OD of Fitting, D_2 in. 16	OD of Pipe, D
1/16-27	0.03704	0.27118	0.28118	0.160	4.32	0.2611	7.05	0.1139	3.075	0.3750	0.1011	2.73	0.2711	7.32	0.315	0.3125
1/8 -27	0.03704	0.36351	0.37360	0.1615	4.36	0.2639	7.12	0.1112	3.072	0.3750	0.1024	2.76	0.2726	7.36	0.407	0.405
1/4 -18	0.05556	0.47739	0.49163	0.2278	4.10	0.4018	7.23	0.1607	2.892	0.5625	0.1740	3.13	0.3945	7.10	0.546	0.540
3/8 -18	0.05556	0.61201	0.62701	0.240	4.32	0.4078	7.34	0.1547	2.791	0.5625	0.1678	3.02	0.4067	7.32	0.681	0.675
1/2 -14	0.07143	0.75843	0.77843	0.320	4.48	0.5337	7.47	0.2163	3.028	0.7500	0.2137	2.99	0.5343	7.48	0.850	0.840
3/4 -14	0.07143	0.96768	0.98887	0.339	4.75	0.5457	7.64	0.2043	2.860	0.7500	0.2067	2.89	0.5533	7.75	1.060	1.050
1 -11-1/2	0.08696	1.21363	1.23863	0.400	4.60	0.6828	7.85	0.2547	2.929	0.9375	0.2828	3.25	0.6609	7.60	1.327	1.315
1-1/4 -11-1/2	0.08696	1.55713	1.58338	0.420	4.83	0.7068	8.13	0.2620	3.013	0.9688	0.2868	3.30	0.6809	7.83	1.672	1.660
1-1/2 -11-1/2	0.08696	1.79609	1.82234	0.420	4.83	0.7235	8.32	0.2765	3.180	1.0000	0.3035	3.49	0.6809	7.83	1.912	1.900
-11-1/2	0.08696	2.26902	2.29627	0.436	5.01	0.7565	8.70	0.2747	3.159	1.0312	0.3205	3.69	0.6969	8.01	2.387	2.375
2-1/2 -8	0.12500	2.71953	2.76216	0.682	5.46	1.1375	9.10	0.3781	3.025	1.5156	0.4555	3.64	1.0570	8.46	2.893	2.875
3 -8	0.12500	3.34062	3.38850	0.766	6.13	1.2000	9.60	0.3781	3.025	1.5781	0.4340	3.47	1.1410	9.13	3.518	3.500

1. See general specifications preceding tables.
   For gaging methods, gages, cut thread blanks, taps, drilled hole sizes, hole depths, and full thread lengths, see Appendixes A, B, and C.
2. External thread tabulated full thread lengths include chamfers not exceeding one and one-half pitches (threads) length.
3. Internal thread tabulated full thread lengths do not include countersink beyond the intersection of the pitch line and the chamfer cone (gaging reference point).

5. ***Dryseal SAE Short External Taper Pipe Thread (PTF—SAE Short External) For Assembly With Dryseal American Intermediate Internal Straight (Table 6) or Dryseal American Standard Taper (Table 2) Pipe Threads***—External threads of this series conform in all respects with the NPTF threads except that the full thread length has been shortened by eliminating one thread from the small end. These threads are primarily intended for assembly with NPSI internal threads but may also be used with NPTF internal threads. They are not designed for and at extreme tolerance limits may not assemble with PTF—SAE Short or NPSF internal threads. Dimensional data for PTF—SAE Short External Threads is given in Table 3. See Appendix D for limitations of assembly of PTF—SAE Short external threads with other series Dryseal pipe threads.

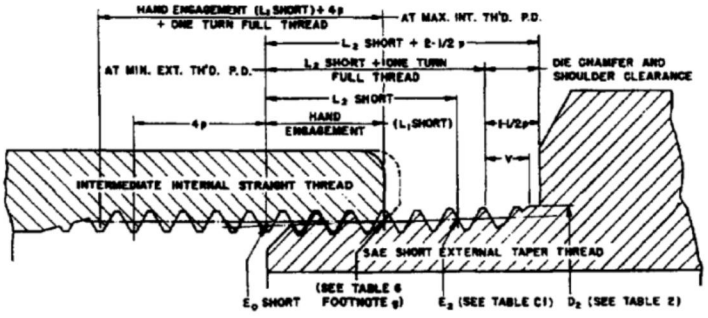


FIGURE 3—

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TABLE 3—BASIC DIMENSIONS OF DRYSEAL SAE SHORT EXTERNAL TAPER PIPE THREAD(1)

PTF—SAE Short Size 1	Pitch, P in. 2	Pitch Diameter at End of External Thread, E_0 Short in. 3	L_1 in. 4	L_1 Thread 5	Hand Engagement, L_1 Short in. 6	Hand Engagement, L_1 Short Thread 7	Length of Full Thread,(2) L_2 Short 8	Length of Full Thread,(2) L2 Short Thread 9	Vanish Threads V Plus Full Thread Tolerance Plus Shoulder Clearance (V + 1p + 1/2 p) in. 10	Vanish Threads V Plus Full Thread Tolerance Plus Shoulder Clearance (V + 1p + 1/2 p) Thread 11	Min Shoulder Length (L_2 Short +2-1/2 p) in. 12	External Thread for Draw (L_2 Short—L1 Short) in. 13	External Thread for Draw (L_2 Short—L1 Short) Thread 14	Length of Internal Full Thread,(3) (L_1 Short + 4p) in. 15	Length of Internal Full Thread(3), (L_1 Short + 4p) Thread 16
1/16-27	0.03704	0.27349	0.160	4.32	0.1230	3.32	0.2241	6.05	0.0926	2.50	0.3167	0.1011	2.73	0.2711	7.32
1/8 -27	0.03704	0.36582	0.1615	4.36	0.1244	3.36	0.2268	6.12	0.0926	2.50	0.3194	0.1024	2.76	0.2726	7.36
1/4 -18	0.05556	0.48086	0.2278	4.10	0.1722	3.10	0.3462	6.23	0.1389	2.50	0.4851	0.1740	3.13	0.3945	7.10
3/8 -18	0.05556	0.61548	0.240	4.32	0.1844	3.32	0.3522	6.34	0.1389	2.50	0.4911	0.1678	3.02	0.4067	7.32
1/2 -14	0.07143	0.76289	0.320	4.48	0.2486	3.48	0.4623	6.47	0.1786	2.50	0.6409	0.2137	2.99	0.5343	7.48
3/4 -14	0.07143	0.97214	0.339	4.75	0.2676	3.75	0.4743	6.64	0.1786	2.50	0.6528	0.2067	2.89	0.5533	7.75
1 -11-1/2	0.08696	1.21906	0.400	4.60	0.3130	3.60	0.5958	6.85	0.2174	2.50	0.8132	0.2828	3.25	0.6609	7.60
1-1/4 -11-1/2	0.08696	1.56256	0.420	4.83	0.3330	3.83	0.6198	7.13	0.2174	2.50	0.8372	0.2868	3.30	0.6809	7.83
1-1/2 -11-1/2	0.08696	1.80152	0.420	4.83	0.3330	3.83	0.6365	7.32	0.2174	2.50	0.8539	0.3035	3.49	0.6809	7.83
2 -11-1/2	0.08696	2.27445	0.436	5.01	0.3490	4.01	0.6695	7.70	0.2174	2.50	0.8869	0.3205	3.69	0.6969	8.01
2-1/2 -8	0.12500	2.72734	0.682	5.46	0.5570	4.46	1.0125	8.10	0.3125	2.50	1.3250	0.4555	3.64	1.0570	8.46
-8	0.12500	3.34844	0.766	6.13	0.6410	5.13	1.0750	8.60	0.3125	2.50	1.3875	0.4340	3.47	1.1410	9.13

1. See general specifications preceding tables.
   For gaging methods, gages, cut thread blanks, taps, drilled hole sizes, hole depths, and full thread lengths, see Appendixes A, B, and C.
2. External thread tabulated full thread lengths include camfers not exceeding one and one-half pitches (threads) lengths.
3. Internal thread tabulated full thread lengths do not include countersink beyond the intersection of the pitch line and the camfer cone (gaging reference point).

6. ***Dryseal SAE Short Internal Taper Pipe Thread (PTF—SAE Short Internal) For Assembly With American Standard External Taper Pipe Thread (Table 2)***—Internal Threads of this series conform in all respects with the NPTF threads except that the full thread length has been shortened by eliminating one thread from the large end. These threads are primarily intended for assembly with NPTF external threads. They are not designed for and at extreme tolerance limits may not assemble with PTF—SAE Short external threads. Dimensional data for PTF—SAE Short Internal Threads is given in Table 4. See Appendix D for limitations of assembly of PTF—SAE Short internal threads with other series Dryseal pipe threads.

Trouble-free assemblies and pressure-tight joints without the use of lubricant or sealer can best be assured where both components are threaded with NPTF (full length) threads. This should be considered before specifying PTF—SAE Short External or Internal Thread.

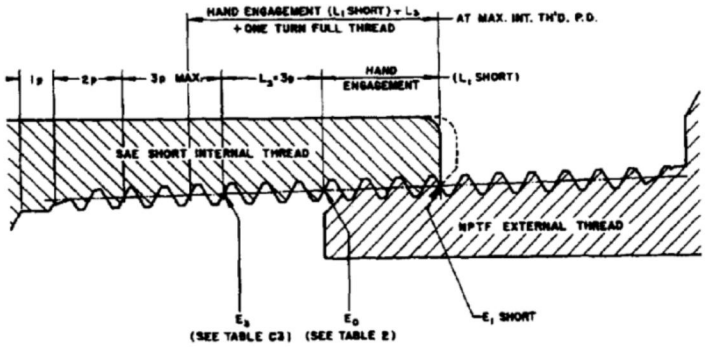


FIGURE 4—

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TABLE 4—BASIC DIMENSIONS OF DRYSEAL SAE SHORT INTERNAL TAPER PIPE THREAD(1)

PTF—SAE Short Size 1	Pitch P in. 2	Pitch Diameter at End of Internal Thread E_1 Short in. 3	L_1 in. 4	L_1 Thread 5	Hand Engagement,(2) L_1 Short 6	Hand Engagement,(2) L_1 Short Thread 7	Length of Internal Full Thread(2) (L_1 Short + L_3) in. 8	Length of Internal Full Thread(2) (L_1 Short + L_3) Thread 9	Hole Depth for SAE Short Tap (Table B3) in. 10
1/16-27	0.03704	0.27887	0.160	4.32	0.1230	3.32	0.2341	6.32	0.4564
1/8 -27	0.03704	0.37129	0.1615	4.36	0.1244	3.36	0.2356	6.36	0.4578
1/4 -18	0.05556	0.48815	0.2278	4.10	0.1722	3.10	0.3389	6.10	0.6722
3/8 -18	0.05556	0.62354	0.240	4.32	0.1844	3.32	0.3511	6.32	0.6844
1/2 -14	0.07143	0.77397	0.320	4.48	0.2486	3.48	0.4629	6.48	0.8915
3/4 -14	0.07143	0.98441	0.339	4.75	0.2676	3.75	0.4819	6.75	0.9105
1 -11-1/2	0.08696	1.23320	0.400	4.60	0.3130	3.60	0.5739	6.60	1.0956
1-1/4 -11-1/2	0.08696	1.57795	0.420	4.83	0.3330	3.83	0.5939	6.83	1.1156
1-1/2 -11-1/2	0.08696	1.81691	0.420	4.83	0.3330	3.83	0.5939	6.83	1.1156
2 -11-1/2	0.08696	2.29084	0.436	5.01	0.3490	4.01	0.6099	7.01	1.1316
2-1/2 -8	0.12500	2.75435	0.682	5.46	0.5570	4.46	0.9320	7.46	1.6820
3 -8	0.12500	3.38069	0.766	6.13	0.6410	5.13	1.0160	8.13	1.7660

1. See general specification preceding table.
   For gaging methods, gages, taps, drilled hole sizes, hole depths, and full thread lengths, see Appendixes A, B, and C.
2. Internal thread tabulated full thread lengths do not include countersink beyond the intersection of the pitch line and the chamfer cone (gaging reference point).

7. ***Dryseal American Standard Fuel Internal Straight Pipe Thread (NPSF) For Assembly With Dryseal American Standard External Taper Pipe Thread (Table 2)***—Threads of this series are straight (cylindrical) instead of tapered. They are generally used in soft or ductile materials which will adjust at assembly to the taper of external threads but may also be used in hard or brittle materials where the section is heavy. These threads are primarily intended for assembly with full length NPTF external taper threads. Dimensional data for NPSF threads is given in Table 5. See Appendix D for limitations of assembly of NPSF internal threads with other series Dryseal pipe threads.

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TABLE 5—DRYSEAL AMERICAN STANDARD FUEL INTERNAL STRAIGHT PIPE THREAD LIMITS[1]

NPSF Size 1	Pitch Diameter[2] Max[3],[4] 2	Pitch Diameter[2] Min[4],[5] 3	Minor Diameter[6] Min 4	Desired Min Length of Full Thread[7] in. 5	Desired Min Length of Full Thread[7] Thread 6
1/16-27	0.2803	0.2768	0.2482	0.31	8.44
1/8 -27	0.3727	0.3692	0.3406	0.31	8.44
1/4 -18	0.4904	0.4852	0.4422	0.47	8.44
3/8 -18	0.6257	0.6205	0.5776	0.50	9.00
1/2 -14	0.7767	0.7700	0.7133	0.66	9.19
3/4 -14	0.9872	0.9805	0.9238	0.66	9.19
1 -11-1/2	1.2365	1.2284	1.1600	0.78	8.98

1. See general specifications preceding tables. For gaging methods, gages, taps, drilled hole sizes, hole depths, and full thread lengths, see Appendixes A, B, and C.
2. The pitch diameter of the tapped hole as indicated by the taper plug gage is slightly larger than the values given due to the gage having to enter approximately 3/8 turn to engage first full thread.
3. Column 2 is the E_1 pitch diameter of thread at large end of internal thread (Table 2) plus (largel) 5/8 thread taper.
4. Taps specified in Table B4 produce tapped holes to the above limits in cast iron, steel, and brass. In zinc and similar soft metals, they produce tapped holes approximately 0.001 smaller. Plug-gage turns engagement should be reduced accordingly.
5. Column 3 is Column 2 reduced by 1-1/2 turns.
6. As the Dryseal American Standard pipe thread form is maintained, the major and minor diameters of the internal thread vary with the pitch diameter.
7. Internal thread tabulated full thread lengths do not include countersink beyond the intersection of the pitch line and the chamfer cone (gaging reference point).

8. ***Dryseal American Intermediate Internal Straight Pipe Thread (NPSI) For Assembly With Dryseal SAE Short External Taper (Table 3) or American Standard Taper Pipe Thread (Table 2)***—Threads of this series are straight (cylindrical) instead of tapered. They are generally used in hard or brittle materials where the section is heavy and where there is little expansion at assembly with the external taper threads. These threads are primarily intended for assembly with PTF—SAE Short External Taper Threads, but will also assemble with full length NPTF External Taper Threads. Dimensional data for NPSI threads is given in Table 6. See Appendix D for limitations of assembly of NPSI internal threads with other series Dryseal pipe threads.

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TABLE 6—DRYSEAL AMERICAN INTERMEDIATE INTERNAL STRAIGHT PIPE THREAD LIMITS(1)

	NPSF Size 1	Pitch Diamete(2) Max(3),(4) 2	Pitch Diameter(2) Min(3),(5) 3	Minor Diameter(6) Min 4	Desired Min Length of Full Thread(7) in. 5	Desired Min Length of Full Thread(7) Thread 7
	1/16-27	0.2826	0.2791	0.2505	0.31	8.44
	1/8 -27	0.3750	0.3715	0.3429	0.31	8.44
	1/4 -18	0.4938	0.4886	0.4457	0.47	8.44
	3/8 -18	0.6292	0.6240	0.5811	0.50	9.00
	1/2 -14	0.7812	0.7745	0.7180	0.66	9.19
	3/4 -14	0.9917	0.9850	0.9283	0.66	9.19
1	-11-1/2	1.2420	1.2338	1.1655	0.78	8.98

1. See general specifications preceding tables.
   For gaging methods, gages, taps, drilled hole sizes, hole depths, and full thread lengths, see Appendixes A, B, and C.
2. The pitch diameter of the tapped hole as indicated by the taper plug gage is slightly larger than the values given due to the gage having to enter approximately 3/8 turn to engage first full thread.
3. Column 2 is the same as the E_1 pitch diameter of thread at large end of internal thread (Table 2) minus (small) 3/8 thread taper.
4. Taps specified in Table B5 produce tapped holes to the above limits in cast iron, steel, and brass. In zinc and similar soft metals, they produce tapped holes approximately 0.001 smaller. Plug-gage turns engagement should be reduced accordingly.
5. Column 3 is Column 2 reduced by 1-1/2 turns.
6. As the Dryseal American Standard pipe thread form is maintained, the major and minor diameters of the internal thread vary with the pitch diameter.
7. Internal thread tabulated full thread lengths do not include countersink beyond the intersection of the pitch line and the chamfer cone (gaging reference point).

9. *Notes*

9.1 Marginal Indicia—The change bar (l) located in the left margin is for the convenience of the user in locating areas where technical revisions have been made to the previous issue of the report. An (R) symbol to the left of the document title indicates a complete revision of the report.

PREPARED BY THE SAE SCREW THREADS COMMITTEE

STABILIZED BY THE SAE FASTENERS COMMITTEE

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APPENDIX A

SUPPLEMENTARY THREAD INFORMATION

A.1 Terminology—For definitions of terms relating to size of parts, geometrical elements, or dimensions of threads see SAE Standards Screw Threads, Appendix A—Terminology.

A.2 Dryseal American Standard And SAE Short External Taper Pipe Thread Blanks, Cut Threads

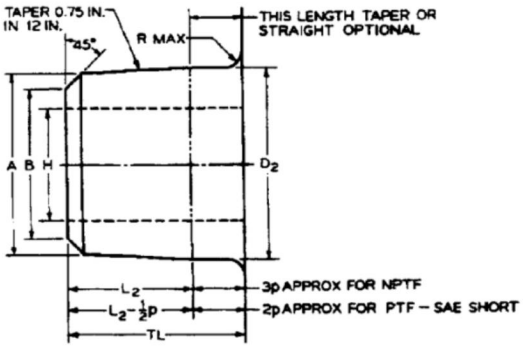


FIGURE A1—

A.2.1 Formulas for Diameter and Length of Thread—Basic diameter and length of thread for different sizes given in Tables 2, 3, and 4, are based on the following formulas:

Basic pitch diameter of thread at small end of NPTF External Thread.

$$E_0 = D - (0.05D + 1.1)p \quad \text{(Eq. A1)}$$

Basic pitch diameter of thread at small end of PTF—SAE Short External Thread.

$$E_0\text{Short} = D - (0.05D + 1.037)p \quad \text{(Eq. A2)}$$

Basic pitch diameter of thread at large end of NPTF Internal Thread.

$$E_1 = E_0 + (0.0625XL_1\ \text{Basic}) \quad \text{(Eq. A3)}$$

Basic pitch diameter of thread at large end of PTF—SAE Short Internal Thread.

$$E_1\text{Short} = E_0 + (0.0625XL_1\ \text{Short}) \quad \text{(Eq. A4)}$$

Basic length of NPTF external full and effective length thread.

$$L_2 = (0.8D + 6.8)p \quad \text{(Eq. A5)}$$

Basic length of PTF—SAE Short external full and effective length thread.

$$L_2\text{Short} = (0.8D + 5.8)p \quad \text{(Eq. A6)}$$

Basic length of NPTF internal full and effective length thread = L_1 Basic + L_3

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Basic length of PTF—SAE Short internal full and effective length thread = L_1 Short + L_3

Where

D = outside of diameter of pipe
P = pitch of thread in inches

NPSG (for oil and grease cup) is Dryseal American Standard Pipe Thread Form—use NPSF tap drill sizes.

The drilled hole sizes given above for Dryseal straight and taper internal pipe threads are the diameters produced by drills which are closest to the minimum minor diameters as shown in Table A2.

They represent the diameters of the holes which would be cut with a twist drill correctly ground when drilling a material without tearing or flow of metal. This is approximately the condition obtained when a correctly sharpened twist drill is cutting a hole in SAE 1112 or 1113 steel, or SAE 72 brass. When Dryseal taps are used, these holes produce an acceptable pipe thread with the required thread height.

When flat drills are used, the width of the cutting edge may have to be adjusted to produce a hole of the required diameter.

When hard metals and other similar materials are to be drilled and tapped, it may be found necessary to use a drill of slightly smaller diameter to produce a hole of a size that will make it possible for the tap to cut an acceptable pipe thread with the required thread height.

When soft metals and other similar materials are to be drilled and tapped, it may be found necessary to use a drill of slightly larger diameter to produce a hole of a size that will allow for a flow of the metal or material without loading the tap or tearing the material and make it possible for the tap to produce an acceptable pipe thread with the required thread height.

TABLE A1—DIMENSIONS OF DRYSEAL AMERICAN STANDARD EXTERNAL TAPER PIPE THREAD BLANKS (CUT THREADS)

Size	OD at Large End NPTF at L_2 Length D_2 PTF—SAE Short at L_2 - 1/2p Length (Basic Thread One Turn Large with Max Truncation) +0.003 - 0.000	OD at Small End, A NPTF (Basic Thread Two Turns Large with Max Truncation) +0.003 - 0.000	OD at Small End, A PTF-SAE Short (Basic Thread 2-1/2 Turns Lare with Max Truncation) +0.003 - 0.000	Chamfer Dia[1], B (Minor Dia[1] at Small End)	Min Length from Small End to Shoulder, TL NPTF L_2 + (3p Approx)	Min Length from Small End to Shoulder, TL PTF-SAE Short L_2 Short + (2-1/2p Approx)	Corner Radius, R Max	Recommended Hole Size[2], H
1/16-27	0.315	0.301	0.302	0.23	0.38	0.3167	0.03	0.12
1/8 -27	0.407	0.393	0.394	0.32	0.38	0.3194	0.03	0.19
1/4 -18	0.546	0.523	0.525	0.42 +0.00	0.56	0.4851	0.06	0.28
3/8 -18	0.681	0.658	0.660	0.55	0.56	0.4911	0.06	0.41
1/2 -14	0.850	0.820	0.822	0.68 -0.02	0.75	0.6409	0.08	0.56
3/4 -14	1.060	1.029	1.031	0.89	0.75	0.6528	0.08	0.72
1 -11-1/2	1.327	1.289	1.292	1.12	0.94	0.8132	0.09	0.94
1-1/4 -11-1/2	1.672	1.633	1.636	1.46 +0.00	0.97	0.8372	0.09	1.25
1-1/2 -11-1/2	1.912	1.872	1.875	1.70	1.00	0.8539	0.09	1.47
2 -11-1/2	2.387	2.345	2.348	2.17 -0.03	1.03	0.8869	0.09	1.94
2-1/2 -8	2.893	2.829	2.833	2.59	1.52	1.3250	0.12	2.31
3 -8	3.518	3.450	3.454	3.21	1.58	1.3875	0.12	2.91

1. External pipe threads shall be chamfered from a diameter (rounded to a two-place decimal) obtained by subtracting 0, .016 in. for sizes below 1 in. and 0.025 in. for larger sizes from the minimum minor diameter at small end to produce a length of chamfered or partial thread equivalent to 1 to 1-1.2 times the pitch (rounded to a three-place decimal).
2. The hole sizes recommended respresent a desirable maximum, strength of wall being considered. However, as considerations other than wall strength frequently control the hole size in specific applications, the recommendations should not be construed as a requirement of this SAE Standard.