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AEROSPACE STANDARD

SAE AS8879

Issued 1996-10

Submitted for recognition as an American National Standard

SCREW THREADS - UNJ PROFILE, INCH

FOREWORD

This SAE Aerospace Standard (AS) was generated to provide a technically identical non-government specification to the government specification MIL-S-8879C for the UNJ profile, inch screw threads. The design requirements in this document, as well as the dimensional verification requirements are the same as in MIL-S-8879C.

The basic design profile of threads in this document; the diameter-pitch combinations and tolerances are based on the Unified Inch Standard. These profiles are not interchangeable with Metric (MJ) or UN profile inch screw threads.

This document specifies the thread characteristics to be inspected under two distinct classifications, category "Other Thread" and "Safety Critical Thread", to ensure dimensional conformance to the standard engineering drawings and diameter-pitch combination tables.

The dimensional inspection methods for thread characteristics are outlined in FED-STD-H28/20 and ASME/ANSI B1.3M.

This document supersedes the cancelled MIL-S-8879C specification and shall apply only to UNJ thread designations. There is a direct and exact cross reference of thread application interchangeability data of categories "Safety Critical" and "Category Other" in the cancelled MIL-S-8879C specification to the application categories listed in AS8879; page 27, Table 10.

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1. SCOPE:

This SAE Aerospace Standard (AS) specifies the characteristics of the UNJ profile inch series of screw threads, to include a mandatory controlled radius of 0.18042P to 0.15011P at the root of the external thread and with the minor diameter of both external and internal threads increased to provide a basic thread height of 0.5625H in order to accommodate the external thread maximum root radius. The following detailed requirements are included:

a. UNJ basic profile and design profiles.
b. Standard series of diameter-pitch combinations for nominal thread diameters from .060 to 6.000 inches.
c. Standard thread classes and form tolerances.
d. Formulae for thread dimensions and tolerances.
e. Method of designating UNJ threads.
f. Inspection and verification requirements.
g. Tables for selected diameter-pitch combinations for aerospace screws, bolts, nuts, shaft and bearing retaining screw threads, fluid fittings, and other component thread sizes.
h. Tables for UNJ screw threads limiting dimensions and tolerances.
i. Symbols for UNJ thread dimensions and tolerances.

1.1 Purpose:

This document specifies the geometric characteristics of the UNJ series threads and the verification requirements that are the exact and technical equivalent in the Military Specification MIL-S-8879C. In addition, the purpose of this specification is to:

a. Define the geometric requirements for a selected series of Unified Screw Threads, Classes 3A and 3B, of FED-STD-H28/2 modified to control the root radius and increase the minor diameter.

b. Establish requirements for continuous radius at the root of external threads.

c. Establish requirements for an increase in the minor diameter of both internal and external threads to accommodate the root radius.

d. Relate verification requirements to the intended service application of the threaded product.

e. Provide default verification requirements if not otherwise specified.

f. Allow the use of methods of verification found in FED-STD-H28/20 and ANSI/ASME B1.3M.

g. Encourage the use of new or more efficient methods of verification, such as on-line or statistical process controls.

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1.2 Field of Application:

The UNJ screw thread is intended for aerospace threaded parts and for highly stressed applications requiring high fatigue strength, high resistance to vibration, where parts are physical size and weight sensitive, and strength sensitive. It is also intended where there is a no allowance application found in Class 3 threads.

2. REFERENCES:

2.1 Applicable Documents:

2.1.1 Government Documents: Standards. The following standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 2.3.1).

STANDARDS

FEDERAL

FED-STD-H28/1	Nomenclature, Definitions, and Letter Symbols for Screw Threads
FED-STD-H28/2	Unified Inch Screw Threads - UN and UNR Thread Forms
FED-STD-H28/4	Controlled Radius Root Screw Threads, UNJ Symbol
FED-STD-H28/6	Gages and Gaging for Unified Screw Threads
FED-STD-H28/20	Inspection Method for Acceptability of UN, UNR, UNJ, M, and MJ Screw Threads

2.1.2 Nongovernment Publications: The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues in the documents which are DoD adopted are those listed in the issue of the DODISS specified in the solicitation (see 2.3.2).

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASME B1.1	Unified Inch Screw Threads (UN and UNR Thread Form)
ANSI/ASME B1.2	Gages and Gaging for Unified Inch Screw Threads
ANSI/ASME B1.3M	Screw Thread Gaging System for Dimensional Acceptability-Inch and Metric Screw Threads (UN, UNR, UNJ, M, MJ)
ANSI/ASME B1.7M	Nomenclature, Definitions, and Letter Symbols for Screw Threads
ANSI/ASME B46.1	Surface Texture (Surface Roughness, Waviness, and Lay)

2.2 Order of Precedence:

In the event of a conflict between the text of this specification and the references cited herein, the text of this document takes precedence.

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2.3 Sources of Document:

2.3.1 Military Specifications and Standards: Copies of the referenced federal and military specifications and standards are available from DODSSP, Subscription Services Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

2.3.2 Sources for Nongovernment Publications: Copies of ANSI and ANSI/ASME documents may be purchased from ANSI, 11 West 42nd Street, New York, NY 10036-8002. Copies of SAE publications may be purchased from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

3. REQUIREMENTS:

3.1 Application Category Requirements:

The application categories shall be determined and specified in either the thread designation, a general note, referenced specification, or the purchase order for the threaded product made in accordance with this document. These application categories determine the level of inspection requirements. The application categories are "Safety Critical Threads" (see 6.2.9) and "Other Threads" (see 6.2.7). If the "Safety Critical Threads" application category is not specified or the application category is not specified or the application category cannot be feasibly determined, the "Other Threads" application category shall be applied. The results of Durability and Damage Tolerance Analyses (DADTA), Failure Modes Effects and Criticality Analyses (FMECA) and critical parts identification will provide the basis for determining the application category of these threads. (See Figure 1 for a typical selection process for determining the application category of a threaded product.) "Safety Critical" designations shall be reviewed by the purchaser's cognizant engineering group. In those cases where identification of a category is not feasible, for example, replacement of inventory stock, the application category shall be "Other Threads".

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3.2 Thread Series:

The two series of threads recognized by this specification are standard UNJ and special UNJ. The use of standard UNJ threads shall be given first consideration in the design of new equipment. Within standard UNJ threads, the use of fine threads shall be given preference to facilitate the maximum usage of a limited number of threads. Terms for characteristics of thread shall be as defined in "Information for Guidance Only" section herein and by FED-STD-H28/1 and ANSI/ASME B1.7M.

3.2.1 Standard UNJ Series: The standard UNJ series of threads consists of three series with graded pitches (coarse, fine, and extra fine) and three series with constant pitches (8, 12, and 16 threads per inch). Standard UNJ threads shall be selected from those with diameter-pitch combinations listed in Tables 1 through 6.

3.2.2 Special UNJ Series: The special UNJ series of threads consists of all controlled root radius threads with combinations of diameter and pitch that are not included in the previous standard UNJ series.

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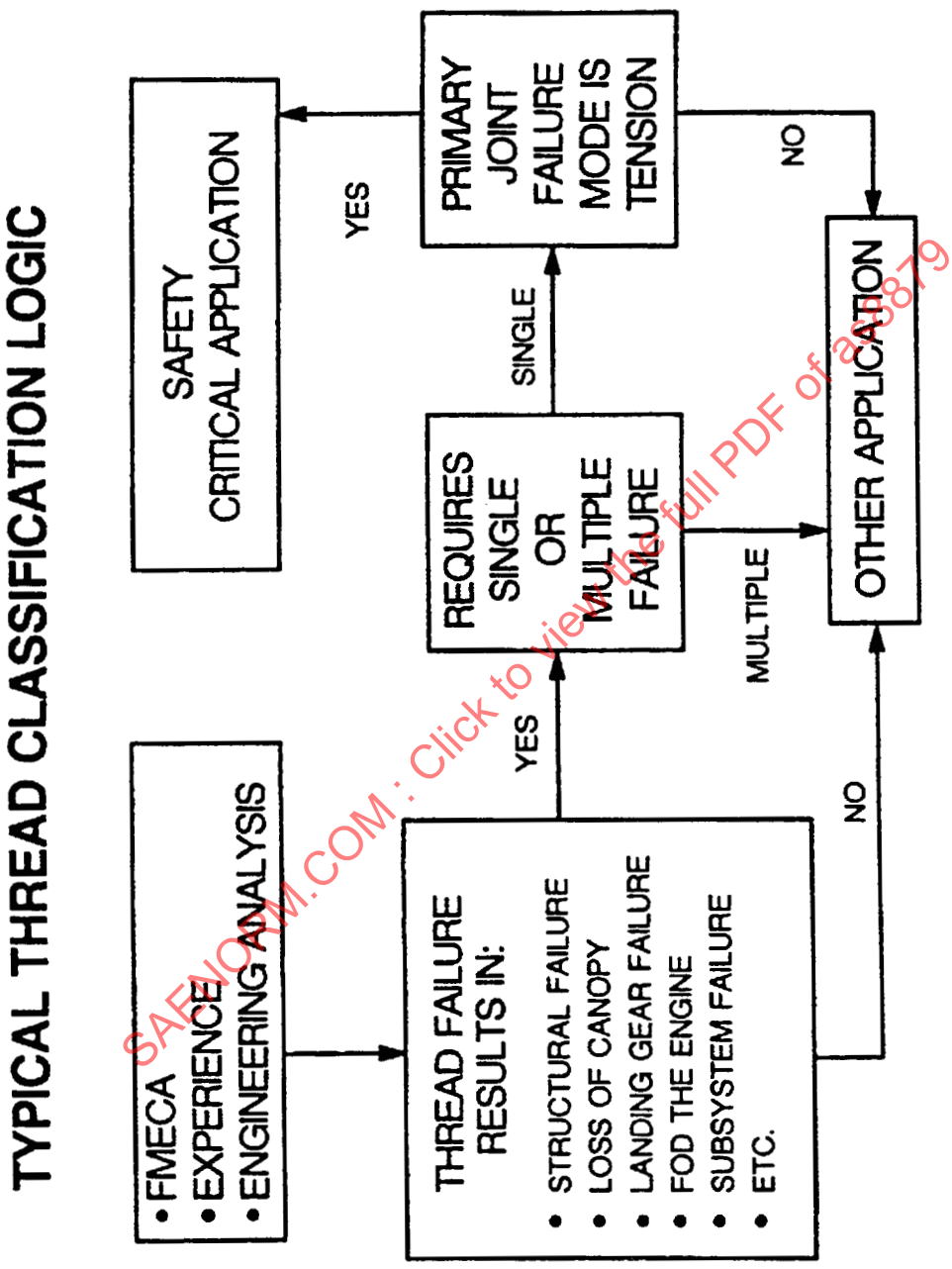

FIGURE 1 - Typical Thread Classification Logic

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TABLE 1 - Coarse Thread Series

BASIC SIZE			EXTERNAL THREAD - UNJC CLASS 3A								INTERNAL THREAD - UNJC CLASS 3B				
			MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		ROOT RADIUS		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA
PRI-MARY	SEC OND-ARY	THDS PER INCH	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	0.0730	64	0.0692	0.0730	0.0614	0.0629	0.0526	0.0550	0.0023	0.0028	0.0578	0.0619	0.0629	0.0648	0.0730
0.0860		56	0.0819	0.0860	0.0728	0.0744	0.0627	0.0654	0.0027	0.0032	0.0686	0.0732	0.0744	0.0765	0.0860
	0.0990	48	0.0945	0.0990	0.0838	0.0855	0.0720	0.0750	0.0031	0.0038	0.0787	0.0841	0.0855	0.0877	0.0990
0.1120		40	0.1069	0.1120	0.0939	0.0958	0.0798	0.0832	0.0038	0.0045	0.0877	0.0942	0.0958	0.0982	0.1120
0.1250		40	0.1199	0.1250	0.1069	0.1088	0.0928	0.0962	0.0038	0.0045	0.1007	0.1072	0.1088	0.1113	0.1250
0.1380		32	0.1320	0.1380	0.1156	0.1177	0.0979	0.1019	0.0047	0.0056	0.1076	0.1157	0.1177	0.1204	0.1380
0.1640		32	0.1580	0.1640	0.1415	0.1437	0.1238	0.1279	0.0047	0.0056	0.1336	0.1417	0.1437	0.1465	0.1640
0.1900		24	0.1828	0.1900	0.1604	0.1629	0.1368	0.1418	0.0063	0.0075	0.1494	0.1600	0.1629	0.1661	0.1900
	0.2160	24	0.2088	0.2160	0.1863	0.1889	0.1627	0.1678	0.0063	0.0075	0.1754	0.1852	0.1889	0.1922	0.2160
0.2500		20	0.2419	0.2500	0.2147	0.2175	0.1864	0.1922	0.0075	0.0090	0.2013	0.2121	0.2175	0.2211	0.2500
0.3125		18	0.3038	0.3125	0.2734	0.2764	0.2420	0.2493	0.0083	0.0100	0.2584	0.2690	0.2764	0.2803	0.3125
0.3750		16	0.3656	0.3750	0.3311	0.3344	0.2957	0.3028	0.0094	0.0113	0.3142	0.3251	0.3344	0.3387	0.3750
0.4375		14	0.4272	0.4375	0.3876	0.3911	0.3472	0.3550	0.0107	0.0129	0.3680	0.3795	0.3911	0.3957	0.4375
0.5000		13	0.4891	0.5000	0.4463	0.4500	0.4028	0.4111	0.0115	0.0139	0.4251	0.4368	0.4500	0.4548	0.5000
0.5625		12	0.5511	0.5625	0.5045	0.5084	0.4574	0.4663	0.0125	0.0150	0.4814	0.4914	0.5084	0.5135	0.5625
0.6250		11	0.6129	0.6250	0.5619	0.5660	0.5105	0.5201	0.0136	0.0164	0.5365	0.5474	0.5660	0.5714	0.6250
0.7500		10	0.7371	0.7500	0.6806	0.6850	0.6240	0.6345	0.0150	0.0180	0.6526	0.6646	0.6850	0.6907	0.7500
0.8750		9	0.8611	0.8750	0.7981	0.8028	0.7352	0.7467	0.0167	0.0200	0.7668	0.7801	0.8028	0.8089	0.8750
1.0000		8	0.9850	1.0000	0.9137	0.9188	0.8430	0.8556	0.0188	0.0226	0.8783	0.8933	0.9188	0.9254	1.0000
1.1250		7	1.1086	1.1250	1.0268	1.0322	0.9460	0.9600	0.0214	0.0258	0.9859	1.0030	1.0322	0.0393	1.1250
1.2500		7	1.2336	1.2500	1.1517	1.1572	1.0709	1.0850	0.0214	0.0258	1.1109	1.1280	1.1572	1.1644	1.2500
1.3750		6	1.3568	1.3750	1.2607	1.2667	1.1664	1.1825	0.0250	0.0301	1.2127	1.2327	1.2667	1.2745	1.3750
1.5000		6	1.4818	1.5000	1.3856	1.3917	1.2913	1.3075	0.0250	0.0301	1.3377	1.3577	1.3917	1.3996	1.5000
1.7500		5	1.7295	1.7500	1.6134	1.6201	1.5002	1.5191	0.0300	0.0361	1.5552	1.5792	1.6201	1.6288	1.7500

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TABLE 1 (Continued)

EXTERNAL THREAD - UNJC CLASS 3A										INTERNAL THREAD - UNJC CLASS 3B				
BASIC SIZE			MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		ROOT RADIUS		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA
PRI-MARY	SEC OND-ARY	THDS PER INCH	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
2.0000		4.5	1.9760	2.0000	1.8486	1.8557	1.7229	1.7434	0.0334	0.0401	1.7835	1.8102	1.8557	1.8650	2.0000
2.2500		4.5	2.2260	2.2500	2.0984	2.1057	1.9727	1.9934	0.0334	0.0401	2.0335	2.0602	2.1057	2.1152	2.2500
2.5000		4	2.4762	2.5000	2.3298	2.3376	2.1884	2.2113	0.0375	0.0451	2.2565	2.2865	2.3376	2.3477	2.5000
2.7500		4	2.7262	2.7500	2.5797	2.5876	2.4382	2.4613	0.0375	0.0451	2.5065	2.5365	2.5876	2.5979	2.7500
3.0000		4	2.9762	3.0000	2.8296	2.8376	2.6882	2.7113	0.0375	0.0451	2.7565	2.7865	2.8376	2.8480	3.0000
3.2500		4	3.2262	3.2500	3.0794	3.0876	2.9380	2.9613	0.0375	0.0451	3.0065	3.0365	3.0876	3.0982	3.2500
3.5000		4	3.4762	3.5000	3.3293	3.3376	3.1878	3.2113	0.0375	0.0451	3.2565	3.2865	3.3376	3.3484	3.5000
3.7500		4	3.7262	3.7500	3.5792	3.5876	3.4378	3.4613	0.0375	0.0451	3.5065	3.5365	3.5876	3.5985	3.7500
4.0000		4	3.9762	4.0000	3.8291	3.8376	3.6876	3.7113	0.0375	0.0451	3.7565	3.7865	3.8376	3.8487	4.0000

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TABLE 2 - Fine Thread Series

BASIC SIZE			EXTERNAL THREAD - UNJF CLASS 3A								INTERNAL THREAD - UNJF CLASS 3B					
			MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		ROOT RADIUS		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA
PRIMARY	SECONDARY	THDS PER INCH	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0.0600		80	0.0568	0.0600	0.0506	0.0519	0.0435	0.0456	0.0019	0.0023	0.0479	0.0511	0.0519	0.0536	0.0600
	0.0730	72	0.0695	0.0730	0.0626	0.0640	0.0547	0.0570	0.0021	0.0025	0.0595	0.0631	0.0640	0.0659	0.0730
0.0860		64	0.0822	0.0860	0.0744	0.0759	0.0656	0.0680	0.0023	0.0028	0.0708	0.0749	0.0759	0.0779	0.0860
	0.0990	56	0.0949	0.0990	0.0858	0.0874	0.0757	0.0784	0.0027	0.0032	0.0816	0.0862	0.0874	0.0895	0.0990
0.1120		48	0.1075	0.1120	0.0967	0.0985	0.0849	0.0880	0.0031	0.0038	0.0917	0.0971	0.0985	0.1008	0.1120
0.1250		44	0.1202	0.1250	0.1083	0.1102	0.0954	0.0987	0.0034	0.0041	0.1029	0.1088	0.1102	0.1126	0.1250
0.1380		40	0.1329	0.1380	0.1198	0.1218	0.1057	0.1092	0.0038	0.0045	0.1137	0.1202	0.1218	0.1243	0.1380
0.1640		36	0.1585	0.1640	0.1439	0.1460	0.1282	0.1320	0.0042	0.0050	0.1370	0.1442	0.1460	0.1487	0.1640
0.1900		32	0.1840	0.1900	0.1674	0.1697	0.1492	0.1539	0.0047	0.0056	0.1596	0.1675	0.1697	0.1726	0.1900
	0.2160	28	0.2095	0.2160	0.1904	0.1928	0.1702	0.1748	0.0054	0.0064	0.1812	0.1896	0.1928	0.1959	0.2160
0.2500		28	0.2435	0.2500	0.2243	0.2268	0.2041	0.2088	0.0054	0.0064	0.2152	0.2229	0.2268	0.2300	0.2500
0.3125		24	0.3053	0.3125	0.2827	0.2854	0.2591	0.2644	0.0063	0.0075	0.2719	0.2799	0.2854	0.2890	0.3125
0.3750		24	0.3678	0.3750	0.3450	0.3479	0.3214	0.3268	0.0063	0.0075	0.3344	0.3418	0.3479	0.3516	0.3750
0.4375		20	0.4294	0.4375	0.4019	0.4050	0.3736	0.3797	0.0075	0.0090	0.3888	0.3970	0.4050	0.4091	0.4375
0.5000		20	0.4919	0.5000	0.4643	0.4675	0.4360	0.4422	0.0075	0.0090	0.4513	0.4591	0.4675	0.4717	0.5000
0.5625		18	0.5538	0.5625	0.5230	0.5264	0.4916	0.4983	0.0083	0.0100	0.5084	0.5166	0.5264	0.5308	0.5625
0.6250		18	0.6163	0.6250	0.5834	0.5889	0.5540	0.5608	0.0083	0.0100	0.5709	0.5788	0.5889	0.5934	0.6250
0.7500		16	0.7406	0.7500	0.7036	0.7094	0.6702	0.6778	0.0094	0.0113	0.6892	0.6977	0.7094	0.7143	0.7500
0.8750		14	0.8647	0.8750	0.8245	0.8286	0.7841	0.7925	0.0107	0.0129	0.8055	0.8152	0.8286	0.8339	0.8750
1.0000		12	0.9886	1.0000	0.9415	0.9459	0.8944	0.9038	0.0125	0.0150	0.9189	0.9298	0.9459	0.9516	1.0000
1.1250		12	1.1136	1.1250	1.0664	1.0709	1.0192	1.0288	0.0125	0.0150	1.0439	1.0539	1.0709	1.0768	1.1250
1.2500		12	1.2386	1.2500	1.1913	1.1959	1.1442	1.1538	0.0125	0.0150	1.1689	1.1789	1.1959	1.2019	1.2500
1.3750		12	1.3636	1.3750	1.3162	1.3209	1.2690	1.2788	0.0125	0.0150	1.2939	1.3039	1.3209	1.3270	1.3750
1.5000		12	1.4886	1.5000	1.4411	1.4459	1.3940	1.4038	0.0125	0.0150	1.4189	1.4289	1.4459	1.4522	1.5000

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TABLE 3 - Extra Fine Thread Series

BASIC SIZE			EXTERNAL THREAD - UNJEF CLASS 3A								INTERNAL THREAD - UNJEF CLASS 3B				
			MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		ROOT RADIUS		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA
PRI-MARY	SEC OND-ARY	THDS PER INCH	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	0.216	32	0.2100	0.2160	0.1933	0.1957	0.1756	0.1799	0.0047	0.0056	0.1856	0.1929	0.1957	0.1988	0.2160
0.2500		32	0.2440	0.2500	0.2273	0.2297	0.2096	0.2139	0.0047	0.0056	0.2196	0.2263	0.2297	0.2328	0.2500
0.3125		32	0.3065	0.3125	0.2898	0.2922	0.2721	0.2764	0.0047	0.0056	0.2820	0.2880	0.2922	0.2953	0.3125
0.3750		32	0.3690	0.3750	0.3522	0.3547	0.3345	0.3389	0.0047	0.0056	0.3446	0.3501	0.3547	0.3580	0.3750
0.4375		28	0.4310	0.4375	0.4116	0.4143	0.3914	0.3963	0.0054	0.0064	0.4027	0.4086	0.4143	0.4178	0.4375
0.5000		28	0.4935	0.5000	0.4740	0.4768	0.4538	0.4588	0.0054	0.0064	0.4652	0.4708	0.4768	0.4804	0.5000
0.5625		24	0.5553	0.5625	0.5325	0.5354	0.5089	0.5144	0.0063	0.0075	0.5219	0.5281	0.5354	0.5392	0.5625
0.6250		24	0.6178	0.6250	0.5949	0.5979	0.5713	0.5768	0.0063	0.0075	0.5844	0.5904	0.5979	0.6018	0.6250
	0.6875	24	0.6803	0.6875	0.6574	0.6604	0.6338	0.6394	0.0063	0.0075	0.6469	0.6547	0.6604	0.6643	0.6875
0.7500		20	0.7419	0.7500	0.7142	0.7175	0.6859	0.6922	0.0075	0.0090	0.7013	0.7081	0.7175	0.7218	0.7500
	0.8125	20	0.8044	0.8125	0.7767	0.7800	0.7484	0.7547	0.0075	0.0090	0.7638	0.7706	0.7800	0.7843	0.8125
0.8750		20	0.8669	0.8750	0.8392	0.8425	0.8109	0.8172	0.0075	0.0090	0.8263	0.8331	0.8425	0.8468	0.8750
	0.9375	20	0.9294	0.9375	0.9016	0.9050	0.8733	0.8797	0.0075	0.0090	0.8888	0.8956	0.9050	0.9094	0.9375
1.0000		20	0.9919	1.0000	0.9641	0.9675	0.9358	0.9422	0.0075	0.0090	0.9513	0.9581	0.9675	0.9719	1.0000
	1.0625	18	1.0538	1.0625	1.0228	1.0264	0.9914	0.9983	0.0083	0.0100	1.0084	1.0159	1.0264	1.0310	1.0625
1.1250		18	1.1163	1.1250	1.0853	1.0889	1.0539	1.0608	0.0083	0.0100	1.0709	1.0784	1.0889	1.0935	1.1250
	1.1875	18	1.1788	1.1875	1.1478	1.1514	1.1164	1.1233	0.0083	0.0100	1.1334	1.1409	1.1514	1.1561	1.1875
1.2500		18	1.2413	1.2500	1.2103	1.2139	1.1789	1.1858	0.0083	0.0100	1.1959	1.2034	1.2139	1.2186	1.2500
	1.3125	18	1.3038	1.3125	1.2728	1.2764	1.2414	1.2483	0.0083	0.0100	1.2584	1.2659	1.2764	1.2811	1.3125
1.3750		18	1.3663	1.3750	1.3353	1.3389	1.3039	1.3108	0.0083	0.0100	1.3209	1.3284	1.3389	1.3436	1.3750
	1.4375	18	1.4288	1.4375	1.3977	1.4014	1.3663	1.3733	0.0083	0.0100	1.3834	1.3909	1.4014	1.4062	1.4375
1.5000		18	1.4913	1.5000	1.4602	1.4639	1.4288	1.4358	0.0083	0.0100	1.4459	1.4534	1.4639	1.4687	1.5000
	1.5625	18	1.5538	1.5625	1.5227	1.5264	1.4913	1.4983	0.0083	0.0100	1.5084	1.5159	1.5264	1.5312	1.5625
1.6250		18	1.6163	1.6250	1.5852	1.5889	1.5538	1.5608	0.0083	0.0100	1.5709	1.5784	1.5889	1.5937	1.6250
	1.6875	18	1.6788	1.6875	1.6476	1.6514	1.6162	1.6233	0.0083	0.0100	1.6334	1.6409	1.6514	1.6563	1.6875

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TABLE 4 - Eight Thread Series

BASIC SIZE		EXTERNAL THREAD - 8UNJ CLASS 3A ROOT RADIUS 0.0188 MIN 0.0226 MAX						INTERNAL THREAD - 8UNJ CLASS 3B				
		MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA
PRI-MARY	SEC OND-ARY	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13
	1.0625	1.0475	1.0625	0.9762	0.9813	0.9055	0.9182	0.9408	0.9558	0.9813	0.9880	1.0625
1.1250		1.1100	1.1250	1.0386	1.0438	0.9679	0.9806	1.0033	1.0183	1.0438	1.0505	1.1250
	1.1875	1.1725	1.1875	1.1011	1.1063	1.0304	1.0432	1.0658	1.0808	1.1063	1.1131	1.1875
1.2500		1.2350	1.2500	1.1635	1.1688	1.0928	1.1056	1.1283	1.1433	1.1688	1.1757	1.2500
	1.3125	1.2975	1.3125	1.2260	1.2313	1.1553	1.1682	1.1908	1.2058	1.2313	1.2382	1.3125
1.3750		1.3600	1.3750	1.2884	1.2938	1.2177	1.2306	1.2533	1.2683	1.2938	1.3008	1.3750
	1.4375	1.4225	1.4375	1.3509	1.3563	1.2802	1.2932	1.3158	1.3308	1.3563	1.3634	1.4375
1.5000		1.4850	1.5000	1.4133	1.4188	1.3426	1.3556	1.3783	1.3933	1.4188	1.4259	1.5000
	1.5625	1.5475	1.5625	1.4758	1.4813	1.4051	1.4182	1.4408	1.4558	1.4813	1.4885	1.5625
1.6250		1.6100	1.6250	1.5382	1.5438	1.4675	1.4806	1.5033	1.5183	1.5438	1.5510	1.6250
	1.6875	1.6725	1.6875	1.6007	1.6063	1.5300	1.5432	1.5658	1.5808	1.6063	1.6136	1.6875
1.7500		1.7350	1.7500	1.6631	1.6688	1.5924	1.6056	1.6283	1.6433	1.6688	1.6762	1.7500
	1.8125	1.7975	1.8125	1.7256	1.7313	1.6549	1.6682	1.6908	1.7058	1.7313	1.7387	1.8125
1.8750		1.8600	1.8750	1.7881	1.7938	1.7174	1.7306	1.7533	1.7683	1.7938	1.8013	1.8750
	1.9375	1.9225	1.9375	1.8505	1.8563	1.7798	1.7932	1.8158	1.8308	1.8563	1.8638	1.9375
2.0000		1.9850	2.0000	1.9130	1.9188	1.8423	1.8556	1.8783	1.8933	1.9188	1.9264	2.0000
	2.1250	2.1100	2.1250	2.0379	2.0438	1.9672	1.9806	2.0033	2.0183	2.0438	2.0515	2.1250
2.2500		2.2350	2.2500	2.1628	2.1688	2.0921	2.1056	2.1283	2.1433	2.1688	2.1766	2.2500
	2.3750	2.3600	2.3750	2.2878	2.2938	2.2171	2.2306	2.2533	2.2683	2.2938	2.3017	2.3750
2.5000		2.4850	2.5000	2.4127	2.4188	2.3420	2.3556	2.3783	2.3933	2.4188	2.4268	2.5000
	2.6250	2.6100	2.6250	2.5376	2.5438	2.4669	2.4806	2.5033	2.5183	2.5438	2.5518	2.6250
2.7500		2.7350	2.7500	2.6625	2.6688	2.5918	2.6056	2.6283	2.6433	2.6688	2.6769	2.7500
	2.8750	2.8600	2.8750	2.7875	2.7938	2.7168	2.7306	2.7533	2.7683	2.7938	2.8020	2.8750
3.0000		2.9850	3.0000	2.9124	2.9188	2.8417	2.8556	2.8783	2.8933	2.9188	2.9271	3.0000
	3.1250	3.1100	3.1250	3.0374	3.0438	2.9667	2.9806	3.0033	3.0183	3.0438	3.0522	3.1250
3.2500		3.2350	3.2500	3.1623	3.1688	3.0916	3.1056	3.1283	3.1433	3.1688	3.1773	3.2500
	3.3750	3.3600	3.3750	3.2872	3.2938	3.21765	3.2306	3.2533	3.2683	3.2938	3.3023	3.3750
3.5000		3.4850	3.5000	3.4122	3.4188	3.3415	3.3556	3.3783	3.3933	3.4188	3.4274	3.5000
	3.6250	3.6100	3.6250	3.5371	3.5438	3.4664	3.4806	3.5033	3.5183	3.5438	3.5525	3.6250
3.7500		3.7350	3.7500	3.6621	3.6688	3.5914	3.6056	3.6283	3.6433	3.6688	3.6776	3.7500
	3.8750	3.8600	3.8750	3.7870	3.7938	3.7163	3.7306	3.7533	3.7683	3.7938	3.8026	3.8750
4.0000		3.9850	4.0000	3.9120	3.9188	3.8413	3.8556	3.8783	3.8933	3.9188	3.9277	4.0000

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TABLE 5 - Twelve Thread Series

BASIC SIZE		EXTERNAL THREAD - 12UNJ CLASS 3A ROOT RADIUS 0.0125 MIN 0.0150 MAX						INTERNAL THREAD - 12 UNJ CLASS 3B					
		MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA	
PRIMARY	SECONDARY	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	
1	2	3	4	5	6	7	8	9	10	11	12	13	
0.6250		0.6136	0.6250	0.5668	0.5709	0.5196	0.5288	0.5439	0.5539	0.5709	0.5762	0.6250	
	0.6875	0.6761	0.6875	0.6293	0.6334	0.5822	0.5913	0.6064	0.6164	0.6334	0.6387	0.6875	
0.7500		0.7386	0.7500	0.6918	0.6959	0.6446	0.6538	0.6689	0.6789	0.6959	0.7013	0.7500	
	0.8125	0.8011	0.8125	0.7543	0.7584	0.7072	0.7163	0.7314	0.7414	0.7584	0.7638	0.8125	
0.8750		0.8636	0.8750	0.8168	0.8209	0.7696	0.7788	0.7939	0.8039	0.8209	0.8263	0.8750	
	0.9375	0.9261	0.9375	0.8793	0.8834	0.8320	0.8413	0.8564	0.8664	0.8834	0.8889	0.9375	
	1.0625	1.0511	1.0625	1.0042	1.0084	0.9570	0.9663	0.9814	0.9914	1.0084	1.0139	1.0625	
	1.1875	1.1761	1.1875	1.1291	1.1334	1.0820	1.0913	1.1064	1.1164	1.1334	1.1390	1.1875	
	1.3125	1.3011	1.3125	1.2541	1.2584	1.2070	1.2163	1.2314	1.2414	1.2584	1.2640	1.3125	
	1.4375	1.4261	1.4375	1.3790	1.3834	1.3318	1.3413	1.3564	1.3664	1.3834	1.3891	1.4375	
	1.5625	1.5511	1.5625	1.5040	1.5084	1.4568	1.4663	1.4814	1.4914	1.5084	1.5141	1.5625	
1.6250		1.6136	1.6250	1.5665	1.5709	1.5194	1.5288	1.5439	1.5539	1.5709	1.5766	1.6250	
	1.6875	1.6761	1.6875	1.6289	1.6334	1.5818	1.5913	1.6064	1.6164	1.6334	1.6392	1.6875	
1.7500		1.7386	1.7500	1.6914	1.6959	1.6442	1.6538	1.6689	1.6789	1.6959	1.7017	1.7500	
	1.8125	1.8011	1.8125	1.7539	1.7584	1.7068	1.7163	1.7314	1.7414	1.7584	1.7642	1.8125	
1.8750		1.8636	1.8750	1.8164	1.8209	1.7692	1.7788	1.7939	1.8039	1.8209	1.8267	1.8750	
	1.9375	1.9261	1.9375	1.8789	1.8834	1.8318	1.8413	1.8564	1.8664	1.8834	1.8893	1.9375	
2.0000		1.9886	2.0000	1.9414	1.9459	1.8942	1.9038	1.9189	1.9289	1.9459	1.9518	2.0000	
	2.1250	2.1136	2.1250	2.0664	2.0709	2.0192	2.0288	2.0439	2.0539	2.0709	2.0768	2.1250	
2.2500		2.2386	2.2500	2.1914	2.1959	2.1442	2.1538	2.1689	2.1789	2.1959	2.2018	2.2500	
	2.3750	2.3636	2.3750	2.3163	2.3209	2.2692	2.2788	2.2939	2.3039	2.3209	2.3269	2.3750	
2.5000		2.4886	2.5000	2.4413	2.4459	2.3942	2.4038	2.4189	2.4289	2.4459	2.4519	2.5000	
	2.6250	2.6136	2.6250	2.5663	2.5709	2.5192	2.5288	2.5439	2.5539	2.5709	2.5769	2.6250	
2.7500		2.7386	2.7500	2.6913	2.6959	2.6442	2.6538	2.6689	2.6789	2.6959	2.7019	2.7500	
	2.8750	2.8636	2.8750	2.8162	2.8209	2.7690	2.7788	2.7939	2.8039	2.8209	2.8271	2.8750	
3.0000		2.9886	3.0000	2.9412	2.9459	2.8940	2.9038	2.9189	2.9289	2.9459	2.9521	3.0000	
	3.1250	3.1136	3.1250	3.0662	3.0709	3.0190	3.0288	3.0439	3.0539	3.0709	3.0771	3.1250	
3.2500		3.2386	3.2500	3.1912	3.1959	3.1440	3.1538	3.1689	3.1789	3.1959	3.2021	3.2500	

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TABLE 5 (Continued)

BASIC SIZE		EXTERNAL THREAD - 12 UNJ CLASS 3A ROOT RADIUS 0.0125 MIN 0.0150 MAX						INTERNAL THREAD - 12 UNJ CLASS 3B				
		MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA
PRI-MARY	SEC OND-ARY	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13
	3.3750	3.3636	3.3750	3.3161	3.3209	3.2690	3.2788	3.2939	3.3039	3.3209	3.3272	3.3750
3.5000		3.4886	3.5000	3.4411	3.4459	3.3940	3.4038	3.4189	3.4289	3.4459	3.4522	3.5000
	3.6250	3.6136	3.6250	3.5661	3.5709	3.5190	3.5288	3.5439	3.5539	3.5709	3.5772	3.6250
3.7500		3.7386	3.7500	3.6911	3.6959	3.6440	3.6538	3.6689	3.6789	3.6959	3.7022	3.7500
	3.8750	3.8636	3.8750	3.8160	3.8209	3.7688	3.7788	3.7939	3.8039	3.8209	3.8273	3.8750
4.0000		3.9886	4.0000	3.9410	3.9459	3.8938	3.9038	3.9189	3.9289	3.9459	3.9523	4.0000
	4.1250	4.1136	4.1250	4.0660	4.0709	4.0188	4.0288	4.0439	4.0539	4.0709	4.0773	4.1250
4.2500		4.2386	4.2500	4.1910	4.1959	4.1438	4.1538	4.1689	4.1789	4.1959	4.2023	4.2500
	4.3750	4.3636	4.3750	4.3160	4.3209	4.2688	4.2788	4.2939	4.3039	4.3209	4.3273	4.3750
4.5000		4.4886	4.5000	4.4410	4.4459	4.3938	4.4038	4.4189	4.4289	4.4459	4.4523	4.5000
	4.6250	4.6136	4.6250	4.5659	4.5709	4.5188	4.5288	4.5439	4.5539	4.5709	4.5775	4.6250
4.7500		4.7386	4.7500	4.6909	4.6959	4.6438	4.6538	4.6689	4.6789	4.6959	4.7025	4.7500
	4.8750	4.8636	4.8750	4.8159	4.8209	4.7688	4.7788	4.7939	4.8039	4.8209	4.8275	4.8750
5.0000		4.9886	5.0000	4.9409	4.9459	4.8938	4.9038	4.9189	4.9289	4.9459	4.9525	5.0000
	5.1250	5.1136	5.1250	5.0659	5.0709	5.0188	5.0288	5.0439	5.0539	5.0709	5.0775	5.1250
5.2500		5.2386	5.2500	5.1909	5.1959	5.1438	5.1538	5.1689	5.1789	5.1959	5.2025	5.2500
	5.3750	5.3636	5.3750	5.3159	5.3209	5.2688	5.2788	5.2939	5.3039	5.3209	5.3275	5.3750
5.5000		5.4886	5.5000	5.4409	5.4459	5.3938	5.4038	5.4189	5.4289	5.4459	5.4525	5.5000
	5.6250	5.6136	5.6250	5.5657	5.5709	5.5186	5.5288	5.5439	5.5539	5.5709	5.5776	5.6250
5.7500		5.7386	5.7500	5.6907	5.6959	5.6436	5.6538	5.6689	5.6789	5.6959	5.7026	5.7500
	5.8750	5.8636	5.8750	5.8157	5.8209	5.7686	5.7788	5.7939	5.8039	5.8209	5.8276	5.8750
6.0000		5.9886	6.0000	5.9407	5.9459	5.8936	5.9038	5.9189	5.9289	5.9459	5.9526	6.0000

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TABLE 6 - Sixteen Thread Series

BASIC SIZE		EXTERNAL THREAD - 16 UNJ CLASS 3A ROOT RADIUS 0.0094 MIN 0.0113 MAX						INTERNAL THREAD - 16 UNJ CLASS 3B				
		MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA
PRI-MARY	SEC OND-ARY	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13
0.4375		0.4281	0.4375	0.3935	0.3969	0.3581	0.3653	0.3767	0.3869	0.3969	0.4014	0.4375
0.5000		0.4906	0.5000	0.4559	0.4594	0.4205	0.4278	0.4392	0.4488	0.4594	0.4640	0.5000
0.5625		0.5531	0.5625	0.5184	0.5219	0.4830	0.4903	0.5017	0.5109	0.5219	0.5265	0.5625
0.6250		0.6156	0.6250	0.5808	0.5844	0.5454	0.5528	0.5642	0.5731	0.5844	0.5890	0.6250
	0.6875	0.6781	0.6875	0.6433	0.6469	0.6079	0.6153	0.6267	0.6353	0.6469	0.6515	0.6875
	0.8125	0.8031	0.8125	0.7683	0.7719	0.7329	0.7403	0.7517	0.7602	0.7719	0.7766	0.8125
0.8750		0.8656	0.8750	0.8308	0.8344	0.7954	0.8028	0.8142	0.8227	0.8344	0.8391	0.8750
	0.9375	0.9281	0.9375	0.8932	0.8969	0.8578	0.8653	0.8767	0.8852	0.8969	0.9018	0.9375
1.0000		0.9906	1.0000	0.9557	0.9594	0.9203	0.9278	0.9392	0.9477	0.9594	0.9643	1.0000
	1.0625	1.0531	1.0625	1.0182	1.0219	0.9828	0.9903	1.0017	1.0102	1.0219	1.0268	1.0625
1.1250		1.1156	1.1250	1.0807	1.0844	1.0453	1.0528	1.0642	1.0727	1.0844	1.0893	1.1250
	1.1875	1.1781	1.1875	1.1431	1.1469	1.1077	1.1153	1.1267	1.1352	1.1469	1.1519	1.1875
1.2500		1.2406	1.2500	1.2056	1.2094	1.1702	1.1778	1.1892	1.1977	1.2094	1.2144	1.2500
	1.3125	1.3031	1.3125	1.2681	1.2719	1.2327	1.2403	1.2517	1.2602	1.2719	1.2769	1.3125
1.3750		1.3656	1.3750	1.3306	1.3344	1.2952	1.3028	1.3142	1.3227	1.3344	1.3394	1.3750
	1.4375	1.4281	1.4375	1.3930	1.3969	1.3576	1.3653	1.3767	1.3852	1.3969	1.4020	1.4375
1.5000		1.4906	1.5000	1.4555	1.4594	1.4201	1.4278	1.4392	1.4477	1.4594	1.4645	1.5000
	1.5625	1.5531	1.5625	1.5180	1.5219	1.4826	1.4903	1.5017	1.5102	1.5219	1.5270	1.5625
1.6250		1.6156	1.6250	1.5805	1.5844	1.5451	1.5528	1.5642	1.5727	1.5844	1.5895	1.6250
	1.6875	1.6781	1.6875	1.6429	1.6469	1.6075	1.6153	1.6267	1.6352	1.6469	1.6521	1.6875
1.7500		1.7406	1.7500	1.7054	1.7094	1.6700	1.6778	1.6892	1.6977	1.7094	1.7146	1.7500
	1.8125	1.8031	1.8125	1.7679	1.7719	1.7325	1.7403	1.7517	1.7602	1.7719	1.7771	1.8125
1.8750		1.8656	1.8750	1.8304	1.8344	1.7950	1.8028	1.8142	1.8227	1.8344	1.8396	1.8750
	1.9375	1.9281	1.9375	1.8929	1.8969	1.8575	1.8653	1.8767	1.8852	1.8969	1.9021	1.9375
2.0000		1.9906	2.0000	1.9554	1.9594	1.9200	1.9278	1.9392	1.9477	1.9594	1.9646	2.0000
	2.1250	2.1156	2.1250	2.0804	2.0844	2.0450	2.0528	2.0642	2.0727	2.0844	2.0896	2.1250
2.2500		2.2406	2.2500	2.2054	2.2094	2.1700	2.1778	2.1892	2.1977	2.2094	2.2146	2.2500
	2.3750	2.3656	2.3750	2.3303	2.3344	2.2949	2.3028	2.3142	2.3227	2.3344	2.3398	2.3750

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TABLE 6 (Continued)

BASIC SIZE		EXTERNAL THREAD - 16 UNJ CLASS 3A ROOT RADIUS 0.0094 MIN 0.0113 MAX						INTERNAL THREAD - 16 UNJ CLASS 3B				
		MAJOR DIAMETER		PITCH DIAMETER		MINOR DIAMETER		MINOR DIAMETER		PITCH DIAMETER		MAJOR DIA
PRI-MARY	SEC OND-ARY	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	2	3	4	5	6	7	8	9	10	11	12	13
2.5000		2.4906	2.5000	2.4553	2.4594	2.4199	2.4278	2.4392	2.4477	2.4594	2.4648	2.5000
	2.6250	2.6156	2.6250	2.5803	2.5844	2.5449	2.5528	2.5642	2.5727	2.5844	2.5898	2.6250
2.7500		2.7406	2.7500	2.7053	2.7094	2.6699	2.6778	2.6892	2.6977	2.7094	2.7148	2.7500
	2.8750	2.8656	2.8750	2.8302	2.8344	2.7948	2.8028	2.8142	2.8227	2.8344	2.8399	2.8750
3.0000		2.9906	3.0000	2.9552	2.9594	2.9198	2.9278	2.9392	2.9477	2.9594	2.9649	3.0000
	3.1250	3.1156	3.1250	3.0802	3.0844	3.0448	3.0528	3.0642	3.0727	3.0844	3.0899	3.1250
3.2500		3.2406	3.2500	3.2052	3.2094	3.1698	3.1778	3.1892	3.1977	3.2094	3.2149	3.2500
	3.3750	3.3656	3.3750	3.3301	3.3344	3.2947	3.3028	3.3142	3.3227	3.3344	3.3400	3.3750
3.5000		3.4906	3.5000	3.4551	3.4594	3.4197	3.4278	3.4392	3.4477	3.4594	3.4650	3.5000
	3.6250	3.6156	3.6250	3.5801	3.5844	3.5447	3.5528	3.5642	3.5727	3.5844	3.5900	3.6250
3.7500		3.7406	3.7500	3.7051	3.7094	3.6697	3.6778	3.6892	3.6977	3.7094	3.7150	3.7500
	3.8750	3.8656	3.8750	3.8300	3.8344	3.7946	3.8028	3.8142	3.8227	3.8344	3.8401	3.8750
4.0000		3.9906	4.0000	3.9550	3.9594	3.9196	3.9278	3.9392	3.9477	3.9594	3.9651	4.0000
	4.1250	4.1156	4.1250	4.0800	4.0844	4.0446	4.0528	4.0642	4.0727	4.0844	4.0901	4.1250
4.2500		4.2406	4.2500	4.2050	4.2094	4.1696	4.1778	4.1892	4.1977	4.2094	4.2151	4.2500
	4.3750	4.3656	4.3750	4.3300	4.3344	4.2946	4.3028	4.3142	4.3227	4.3344	4.3401	4.3750
4.5000		4.4906	4.5000	4.4550	4.4594	4.4196	4.4278	4.4392	4.4477	4.4594	4.4651	4.5000
	4.6250	4.6156	4.6250	4.5799	4.5844	4.5445	4.5528	4.5642	4.5727	4.5844	4.5903	4.6250
4.7500		4.7406	4.7500	4.7049	4.7094	4.6695	4.6778	4.6892	4.6977	4.7094	4.7153	4.7500
	4.8750	4.8656	4.8750	4.8299	4.8344	4.7945	4.8028	4.8142	4.8227	4.8344	4.8403	4.8750
5.0000		4.9906	5.0000	4.9549	4.9594	4.9195	4.9278	4.9392	4.9477	4.9594	4.9653	5.0000
	5.1250	5.1156	5.1250	5.0799	5.0844	5.0445	5.0528	5.0642	5.0727	5.0844	5.0903	5.1250
5.2500		5.2406	5.2500	5.2049	5.2094	5.1695	5.1778	5.1892	5.1977	5.2094	5.2153	5.2500
	5.3750	5.3656	5.3750	5.3299	5.3344	5.2945	5.3028	5.3142	5.3227	5.3344	5.3403	5.3750
5.5000		5.4906	5.5000	5.4549	5.4594	5.4195	5.4278	5.4392	5.4477	5.4594	5.4653	5.5000
	5.6250	5.6156	5.6250	5.5797	5.5844	5.5443	5.5528	5.5642	5.5727	5.5844	5.5905	5.6250
5.7500		5.7406	5.7500	5.7047	5.7094	5.6693	5.6778	5.6892	5.6977	5.7094	5.7155	5.7500
	5.8750	5.8656	5.8750	5.8297	5.8344	5.7943	5.8028	5.8142	5.8227	5.8344	5.8405	5.8750
6.0000		5.9906	6.0000	5.9547	5.9594	5.9193	5.9278	5.9392	5.9477	5.9594	5.9655	6.0000

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3.3 Designations:

The threads described herein shall be designated in the following manner indicating the nominal diameter, number of threads per inch, thread series symbol (that is, thread form, controlled root radius symbol, and thread series), thread class including the external "A" or internal "B" thread symbol and application category. The identifying letter "J" in the thread series symbol is restricted to use in the designation of threads defined by this document. Reference to AS8879 shall be made in either the threads designation, a general note, or in a reference document.

3.3.1 Standard UNJ Thread Designations: Threads selected from the standard UNJ series shall be designated in Figure 2.

Example

External thread:

0.2500 - 28 UNJF-3A Safety Critical Thread
AS8879

0.2500 - 28 UNJF-3A
AS8879

Internal thread:

0.2500 - 28 UNJF-3B Safety Critical Thread
AS8879

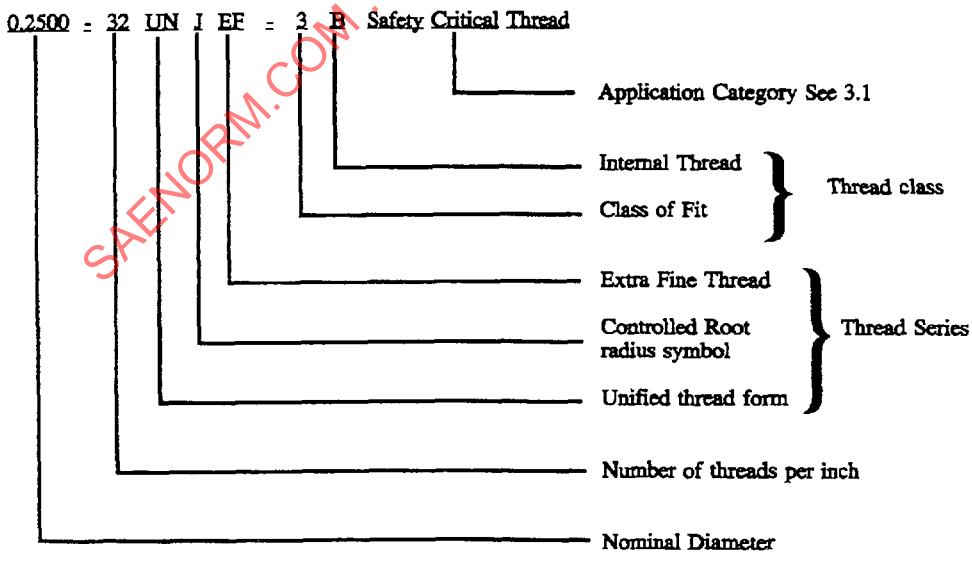

FIGURE 2

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3.3.2 Special UNJ Thread Designations: The identifying letter "S" shall be included in the thread series symbol to indicate a special thread. Special diameter-pitch combinations developed in accordance with this specification shall be designated in Figure 3:

Example

External thread:

8.8750 - 8 UNJS-3A Safety Critical Thread

Major diameter	8.735 to 8.750
Pitch diameter	8.6625 to 8.6688
Minor diameter	8.5918 to 8.6056
Root radius	0.0188 to 0.0226
AS8879	

Internal thread:

8.8750 - 8 UNJS-3B

Major diameter	8.750 MIN
Pitch diameter	8.6688 to 8.6769
Minor diameter	8.6283 to 8.6433
AS8879	

FIGURE 3

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3.4 Thread Characteristics:

3.4.1 Thread Data:

3.4.1.1 Basic Thread Data: The basic thread data for threads with standard pitches shall be in accordance with Table 7.

3.4.1.2 Standard UNJ Thread Data: Threads, in accordance with this specification, shall be within the limits of size specified in Tables 1 through 6, for the diameter-pitch combinations shown herein. Characteristics shall include pitch diameter size, major diameter size, and minor diameter size. "GO" functional diameter size shall be within pitch diameter limits.

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TABLE 7 - Basic Thread Data

Threads per inch n	Pitch p= 1/n	Truncation of internal thread crest 5H/16 = 0.27063p	Flat at internal thread root and external thread crest P/8 = 0.125p	Height of sharp V thread H= 0.866025p	Truncation of internal thread root and external thread crest H/8 = 0.10825p	Minimun root radius 0.15011p	Height from sharp "V" to external thread root and max. root radius 5H/24 = 0.18042p	Half addendum of external thread 3H/16 = 0.16238p	Flat at internal thread crest 5p/16 = 0.3125p
1	2	3	4	5	6	7	8	9	10
80	0.012500	0.00338	0.00156	0.010825	0.00135	0.0019	0.00226	0.00203	0.00391
72	0.013889	0.00376	0.00174	0.012028	0.00150	0.0021	0.00251	0.00226	0.00434
64	0.015625	0.00423	0.00195	0.013532	0.00169	0.0023	0.00282	0.00254	0.00488
56	0.017857	0.00483	0.00223	0.015465	0.00193	0.0027	0.00322	0.00290	0.00558
48	0.020833	0.00564	0.00260	0.018042	0.00226	0.0031	0.00376	0.00338	0.00651
44	0.022727	0.00615	0.00284	0.019682	0.00246	0.0034	0.00410	0.00369	0.00710
40	0.025000	0.00677	0.00312	0.021651	0.00271	0.0038	0.00451	0.00406	0.00781
36	0.027778	0.00752	0.00347	0.024056	0.00301	0.0042	0.00501	0.00451	0.00868
32	0.031250	0.00846	0.00391	0.027063	0.00338	0.0047	0.00564	0.00507	0.00977
28	0.035714	0.00967	0.00446	0.030929	0.00387	0.0054	0.00644	0.00580	0.01116
24	0.041667	0.01128	0.00521	0.036084	0.00451	0.0063	0.00752	0.00677	0.01302
20	0.050000	0.01353	0.00625	0.043301	0.00541	0.0075	0.00902	0.00812	0.01562
18	0.055556	0.01504	0.00694	0.048113	0.00601	0.0083	0.01002	0.00902	0.01736
16	0.062500	0.01691	0.00781	0.054127	0.00677	0.0094	0.01128	0.01015	0.01953
14	0.071429	0.01933	0.00893	0.061859	0.00773	0.0107	0.01289	0.01160	0.02232
13	0.076923	0.02082	0.00962	0.066617	0.00833	0.0115	0.01388	0.01249	0.02404
12	0.083333	0.02255	0.01042	0.072169	0.00902	0.0125	0.01503	0.01353	0.02604
11	0.090909	0.02460	0.01136	0.078730	0.00984	0.0136	0.01640	0.01476	0.02841
10	0.100000	0.02706	0.01250	0.086603	0.01083	0.0150	0.01804	0.01624	0.03125
9	0.111111	0.03007	0.01389	0.096225	0.01203	0.0167	0.02005	0.01804	0.03472
8	0.125000	0.03383	0.01562	0.108253	0.01353	0.0188	0.02255	0.02030	0.03906
7	0.142857	0.03866	0.01786	0.123718	0.01546	0.0214	0.02577	0.02320	0.04464
6	0.166667	0.04510	0.02083	0.144338	0.01804	0.0250	0.03007	0.02706	0.05208
5	0.200000	0.05413	0.02500	0.173205	0.02165	0.0300	0.03608	0.03248	0.06250
4.5	0.222222	0.06014	0.02778	0.192450	0.02406	0.0334	0.04009	0.03608	0.06944
4	0.250000	0.06766	0.03125	0.216506	0.02706	0.0375	0.04510	0.04059	0.07812

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TABLE 7 (Continued)

Addendum of external thread $\frac{3H}{8}$ = 0.32476p	Height of internal thread and depth of thread engagement $\frac{9H}{16}$ = 0.48714p	Height of external thread $\frac{2H}{3}$ = 0.57735p	Twice the external thread addendum $\frac{3H}{4}$ = 0.649519p	Difference between max-major and pitch diameters of internal thread $\frac{11H}{12}$ = 0.79386p	Double Height of internal thread $\frac{9H}{8}$ = 0.97428p	Double Height of external thread $\frac{4H}{3}$ = 1.1547p	Difference between max. pitch dia. and max. minor diameter external thread $\frac{7H}{12}$ = 0.50518p	Difference between min. pitch dia. and min. minor diameter of external thread .6533H= 0.56580p	Maj Dia Tolerance $.06\sqrt[3]{\rho^2}$
11	12	13	14	15	16	17	18	19	20
0.00406	0.00609	0.00722	0.008119	0.00992	0.01218	0.01443	0.00631	0.00707	0.0032
0.00451	0.00677	0.00802	0.009021	0.01103	0.01353	0.01604	0.00702	0.00786	0.0035
0.00507	0.00761	0.00902	0.010149	0.01240	0.01522	0.01804	0.00789	0.00884	0.0038
0.00580	0.00870	0.01031	0.011599	0.01418	0.01740	0.02062	0.00902	0.01010	0.0041
0.00677	0.01015	0.01203	0.013532	0.01654	0.02030	0.02406	0.01052	0.01179	0.0045
0.00738	0.01107	0.01312	0.014762	0.01804	0.02214	0.02624	0.01148	0.01286	0.0048
0.00812	0.01218	0.01443	0.016238	0.01985	0.02436	0.02887	0.01263	0.01414	0.0051
0.00902	0.01353	0.01604	0.018042	0.02205	0.02706	0.03208	0.01403	0.01572	0.0055
0.01015	0.01522	0.01804	0.020297	0.02481	0.03045	0.03608	0.01579	0.01768	0.0060
0.01160	0.01740	0.02062	0.023197	0.02835	0.03480	0.04124	0.01804	0.02021	0.0065
0.01353	0.02030	0.02406	0.027063	0.03308	0.04060	0.04811	0.02105	0.02358	0.0072
0.01624	0.02436	0.02887	0.032476	0.03969	0.04871	0.05774	0.02526	0.02829	0.0081
0.01804	0.02706	0.03208	0.036084	0.04410	0.05413	0.06415	0.02807	0.03143	0.0087
0.02030	0.03045	0.03608	0.040595	0.04962	0.06089	0.07217	0.03157	0.03536	0.0094
0.02320	0.03480	0.04124	0.046394	0.05670	0.06959	0.08248	0.03608	0.04041	0.0103
0.02498	0.03747	0.04441	0.049963	0.06107	0.07494	0.08882	0.03886	0.04352	0.0108
0.02706	0.04059	0.04811	0.054127	0.06615	0.08119	0.09622	0.04210	0.04715	0.0114
0.02952	0.04429	0.05249	0.059047	0.07217	0.08857	0.10497	0.04593	0.05144	0.0121
0.03248	0.04871	0.05774	0.064952	0.07939	0.09743	0.11547	0.05052	0.05658	0.0129
0.03608	0.05413	0.06415	0.072169	0.08821	0.10825	0.12830	0.05613	0.06287	0.0139
0.04059	0.06089	0.07217	0.081190	0.09923	0.12178	0.14434	0.06315	0.07072	0.0150
0.04639	0.06959	0.08248	0.092788	0.11341	0.13918	0.16496	0.07217	0.08083	0.0164
0.05413	0.08119	0.09623	0.108253	0.13231	0.16238	0.19245	0.08420	0.09430	0.0182
0.06495	0.09743	0.11547	0.129904	0.15877	0.19486	0.23094	0.10104	0.11316	0.0205
0.07217	0.10825	0.12830	0.144338	0.17641	0.21651	0.25660	0.11226	0.12573	0.0220
0.08119	0.12178	0.14434	0.162380	0.19846	0.24357	0.28868	0.12630	0.14145	0.0238

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3.4.1.3 Special UNJ Thread Data: Dimensions for threads of special diameter-pitch combinations shall be computed from the formulas in Table 8.

3.4.2 External Threads: External threads shall be of the Unified form, in accordance with FED-STD-H28/2 and ANSI/ASME B1.1 (Class 3A), altered at the root so that the flanks of the adjacent threads are joined by one continuous smoothly blended curve tangent to the flanks at a thread depth of 9H/16, where H is the height of the sharp V thread. The root radius (radius of curvature) tangent to the flanks shall be between 0.18042 pitch and 0.15011 pitch (see Figures 4 and 5).

3.4.3 Internal Threads: The internal threads shall be of the Unified form, in accordance with FED-STD-H28/2 and ANSI/ASME B1.1 (Class 3B), modified at the minor diameter (truncated to 5H/16) to the values given in Tables 1 through 6 (see Figures 5 and 6).

3.4.4 Length of Engagement and Tolerances: The length of engagement for UNJC, UNJF, and 8UNJ series threads upon which their specified tolerances are based is equal to the basic major diameter. These tolerances are applicable for lengths of engagement of these threads of 1.0 and 1.5 times the basic major diameter. The length of engagement for UNJEF, 12UNJ, and 16UNJ series threads upon which their specified tolerances are based is equal to 9 pitches. These tolerances are applicable for lengths of engagement of these threads of 5 to 15 pitches.

3.4.5 Variations: The combined effect of variations in the following characteristics shall not exceed the pitch diameter tolerance.

3.4.5.1 Pitch Diameter: No portion of the complete thread shall be permitted to project beyond the envelope defined by the maximum-material limits on the one hand, or beyond that defined by the minimum-material limits on the other, and thus be outside of the tolerance zone specified.

3.4.5.2 Lead and Flank Angle: The lead shall be the number of thread starts divided by the number of threads per inch. The flank angle shall be 30 degrees. The diameter equivalent of variations in lead (including helix variations), or flank angle, shall not exceed 0.4 of the total pitch diameter tolerance for each element individually.

3.4.5.3 Circularity (Roundness) (See 6.2.1): The product screw thread pitch diameter shall be circular within a tolerance zone of one-half the pitch diameter tolerance where pitch diameter tolerance is less than 0.004 inch. Where pitch diameter tolerance is 0.004 inch or larger, the tolerance zone is 0.002 inch. When circularity is checked using pitch diameter indicating gage segments or rolls, the circularity tolerance is equal to one-half the difference between maximum and minimum pitch diameter readings. Threads 1.5000 inches and larger with 16 threads per inch or less may exceed the tolerance by 0.002 inch over a maximum arc of 15 degrees, in the direction of minimum material in this area provided that this overcut does not result in raised material on the thread flanks or roots. The tolerance shall fall within the pitch diameter tolerance except above the 15 degree arc.

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TABLE 8 - Special Diameter-Pitch Computations

Dimensions for threads of special diameter-pitch combinations shall be computed by the following formulas:

External Threads:

Maximum major diameter	=	Basic major diameter.
Minimum major diameter	=	Maximum major diameter minus tolerance specified in Table 7, column 20 herein.
Maximum pitch diameter	=	Basic major diameter minus 0.649519p. See Table 7, column 14 herein.
Minimum pitch diameter	=	Maximum pitch diameter minus tolerance specified in ANSI B1.1.
Maximum minor diameter	=	Maximum pitch diameter minus 0.50518p. See Table 7, column 18 herein.
Minimum minor diameter	=	Minimum pitch diameter minus 0.56580p. See Table 7, column 19 herein.
Maximum root radius	=	0.18042p. See Table 7, column 8 herein.
Minimum root radius	=	0.15011p. See Table 7, column 7 herein.

Internal Threads:

Minimum major diameter	=	Basic major diameter.
Minimum pitch diameter	=	Maximum major diameter minus 0.649519p. See Table 7, column 14 herein.
Maximum pitch diameter	=	Minimum pitch diameter plus tolerance specified in ANSI B1.1, Table 38.
Minimum minor diameter	=	Basic major diameter minus 0.97428p. See Table 7, column 16 herein. Round up to the next larger fourth place decimal, unless the fifth place is zero.
Maximum minor diameter	=	Minimum minor diameter plus the internal thread minor diameter tolerances.
Minor diameter tolerance	=	$[0.05\sqrt[3]{p^2} + 0.03\,p/D] - 0.002$ except that the tolerance shall not be greater than 0.259809p nor less than 0.135315p for threads 13 per inch and finer. For threads 12 per inch and coarser, the tolerance is equal to 0.120p.

where:

p = pitch
D = basic major diameter

NOTE: Dimensions of special threads shall be rounded off to 4 decimal places as required after all computations are made.

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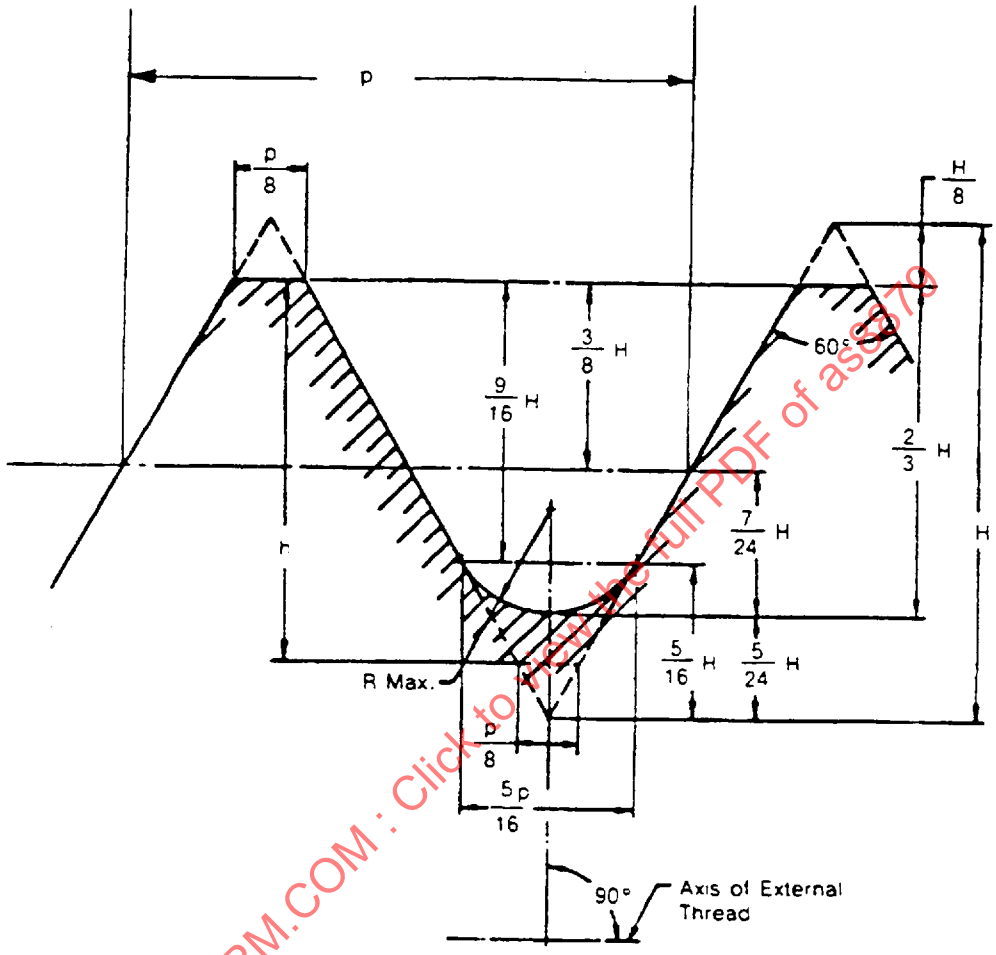

p = Pitch = 1/n
n = number of threads per inch
H = 0.866025p
h = 0.649519p

FIGURE 4 - External Thread Maximum Material Condition

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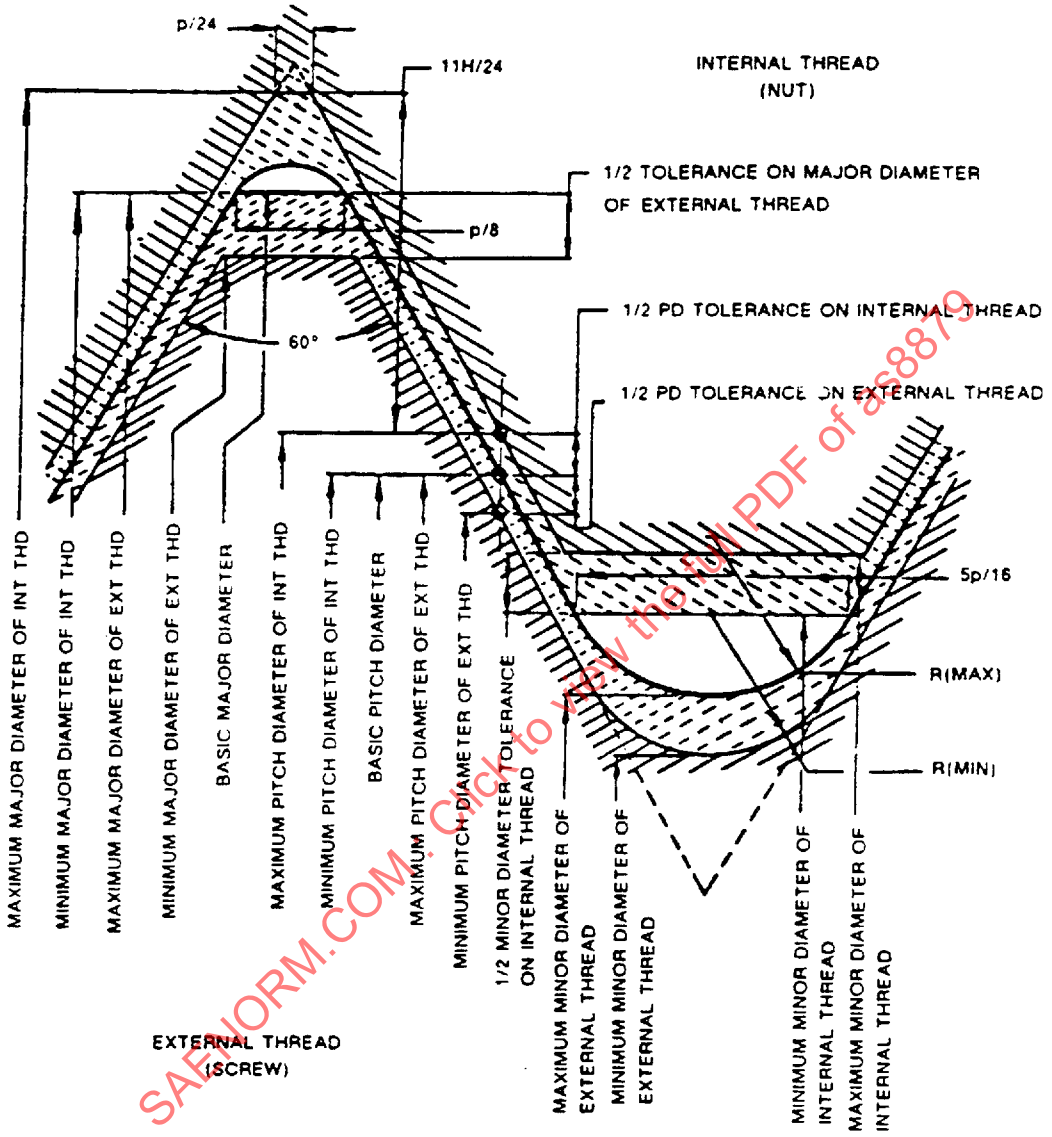

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FIGURE 5 - Disposition of Tolerances and Crest Clearances

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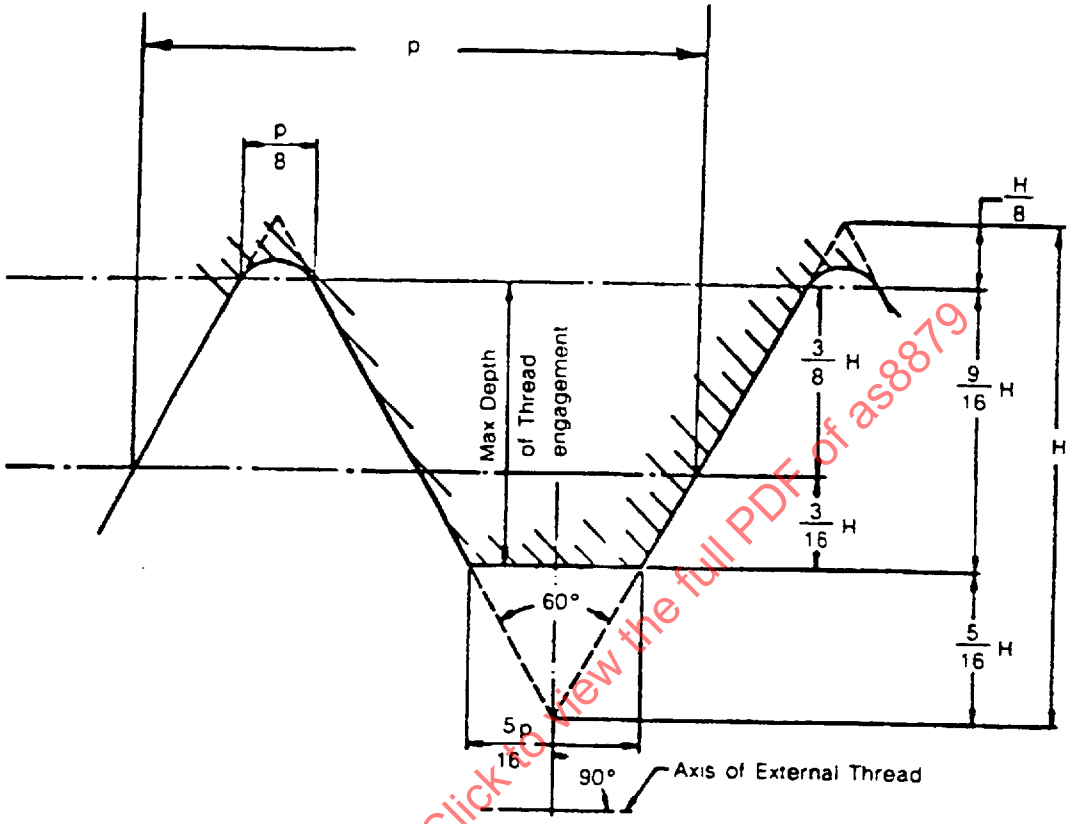

p = Pitch = 1/n
n = number of threads per inch
H = 0.866025p

FIGURE 6 - Internal Thread Maximum Material Condition

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3.4.5.4 Taper: Taper of the pitch diameter based on the length of engagement in 3.4.4 shall be within 0.4 of the pitch diameter tolerance.

3.4.6 Incomplete Threads: Unless otherwise specified, the runout threads on externally threaded parts shall be no less than one nor more than two pitches in length. The threads shall run out onto the shank, eliminating any abrupt change in cross sectional area. The root of the runout threads shall be radiused. The radius, as it approaches the unthreaded portion of the shank, shall be no less than the radius of the full thread portion.

3.4.6.1 Lead Threads: Unless otherwise specified, the entering end of external threads and the entering end of internal threads may be outside the specified limits of size for a length not to exceed two pitches, including chamfer. In no case shall the lead threads exceed the maximum material limit of size specified herein.

3.4.7 Material Limits for Coated/Plated Threads: When externally threaded parts are to be coated/plated, the minimum pitch diameter shall not be reduced by more than 0.001 inch on all threads for which the pitch diameter tolerance specified herein does not exceed 0.0035 inch. For threaded parts for which the pitch diameter tolerance specified herein is greater than 0.0035 inch, the minimum pitch diameter may be reduced by an amount equal to 0.3 times the pitch diameter tolerance but not more than 0.0015 inch. All external thread elements shall be within the adjusted tolerance before coating. Internal thread to be coated/plated may be increased by the same amount permitted for external threads. All internal thread elements shall be within the adjusted tolerance before coating. The material limits for coated/plated threads shall be the same material limits as required in this specification for uncoated/unplated threads.

3.4.7.1 Coating Threads with Solid Film Lubricant: External thread to be coated with solid film lubricant shall not have the minimum pitch diameter reduced by more than 0.001 inch. Internal threads to be coated with solid film lubricant shall not have the maximum pitch diameter increased by more than 0.001 inch. The variation in pitch diameter to accommodate solid film lubricant is not in addition to that specified in 3.4.7 if another coating is applied before the solid film lubricant. The solid film lubricant may be removed for gaging. The parts shall be recoated with a solid film lubricant prior to restocking or usage.

3.4.8 Runout (See 6.2.8): The circular runout of the external thread major diameter cylinder and internal thread minor diameter cylinder with the pitch diameter cylinder shall not exceed twice the pitch diameter tolerance.

3.4.9 Surface Roughness: Certain thread applications may require control of the surface roughness of the thread flanks, roots, or crests. The surface roughness requirement shall be specified, if necessary, on the drawing, product specification, or specification sheet. Due consideration shall be given to the practical method of production and the surface roughness commensurate with that method. Unless otherwise specified on the drawing, product specification, or specification sheet, the surface roughness of the thread flanks and roots shall be no greater than 63 µin Ra for external threads and 100 µin Ra for internal threads in accordance with ANSI/ASME B46.1.

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