METRIC AEROSPACE STANDARD

MA1370™	REV. A

Issued 1990-01
Reaffirmed 2018-08
Stabilized 2024-04

Superseding MA1370

Screw Threads - MJ Profile, Metric

RATIONALE

This document has been determined to contain basic and stable technology which is not dynamic in nature.

STABILIZED NOTICE

This document has been declared “STABILIZED” by SAE E-25 General Standards for Aerospace and Propulsion Systems Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

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FOREWORD

Change in Document Prefix Letters: This design standard was formerly numbered AS1370A; and with this document, the prefix letters are changed to MA to be consistent with SAE format practice for metric design standards. Because of the change in document prefix letters, MA1370 is issued without a revision letter and treated as a new document. The design requirements in this standard, including dimensions and tolerances, are the same as in the superseded AS1370A.

ISO Equivalent Standards: ISO/TC 20/SC 4 developed MJ profile screw thread documents based on SAE AS1370 which are identical to the threads for fastener sizes. The original issues were identified as:

ISO 5855/1 – Aerospace construction - MJ threads - Part 1: Basic profile
ISO 5855/2 – Aerospace construction - MJ threads - Part 2: Dimensions for bolts and nuts

In addition, ISO/TC 20/SC 4 and SC 10 developed the following document to provide MJ screw threads for fluid system fittings, which are also specified in MA1370:

ISO 5855-3 – Aerospace - MJ threads - Part 3: Dimensions for fittings for fluid systems

ISO 5855/1 and /2 have since been revised and re-identified as ISO 5855-1 and -2, respectively.

In addition to the above ISO screw thread requirements, MA1370 includes standard thread sizes up to 200 mm nominal diameter (see Table 2, standard series).

MJ Profile vs UNJ Profile: The basic profile and design profiles, in proportion to the triangular height H and pitch P, are the same for MA1370 MJ profile and MIL-S-8879 UNJ profile; however, the diameter-pitch combinations and tolerances in MA1370 are metric module values based on ISO/TC 1 metric standards, whereas, MIL-S-8879 UNJ threads are based on the Unified inch standard for these features. Thus, MJ and UNJ threads are not interchangeable.

FOREWORD (Continued):

FED-STD-H28 vs MA1370: FED-STD-H28/21 includes the requirements of ANSI B1.21M-1978, Metric Screw Threads - MJ Profile, and FED-STD-H28/20 includes ANSI/ASME B1.3M-1986, Screw Thread Gaging Systems for Dimensional Acceptability.

The original issue of AS1370, May 1976, was submitted to ANSI for approval as the American National Standard for MJ metric screw threads. AS1370 was used by ASME B1 as the basis for ANSI B1.21M-1978. The dimensional requirements of ANSI B1.21M-1978 are identical to this standard.

ANSI/ASME B1.3M-1986 includes several screw thread gaging systems for acceptability requiring that a system be selected consistent with application requirements which permits the selection of gaging systems that would not inspect certain critical design requirements, such as, root radius and root diameter of the external thread; thus, constant quality practice in aerospace industry could be compromised. MA1566-1980 was issued by SAE for the referee gaging practice of the dimensional requirements specified in AS1370 in order to assure that a constant inspection level would be used for acceptability.

1. SCOPE:

1.1 Purpose:

To establish a metric module version of the UNJ profile, MIL-S-8879 inch screw thread standard, predominantly used in aerospace inch designs.

1.2 Scope:

This standard specifies the characteristics of the MJ profile metric series of screw threads, altered from ISO 68 M Profile, 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. MJ basic profile and design profiles
b. Standard series of diameter-pitch combinations for nominal thread diameters from 1.6 to 200 mm
c. Standard thread classes and form tolerances
d. Formulae for thread dimensions and tolerances
e. Method of designating MJ threads
f. Inspection requirement
g. Tables for selected diameter-pitch combinations for aerospace screws, bolts, nuts, shaft and bearing retaining screw threads, and fluid fittings thread sizes
h. Tables for MJ screw threads limiting dimensions and tolerances
i. Symbols for MJ thread dimensions and tolerances

1.3 Field of Application:

The MJ profile metric screw thread is intended for use in aerospace metric designs requiring metric threaded parts, and for other highly stressed metric applications requiring high fatigue strength.

2. REFERENCES:

2.1 Applicable Documents:

The following publications form a part of this standard to the extent specified herein. The latest issue of Metric Aerospace Standard (MA) and ISO Recommendations shall apply.

2.1.1 SAE Publications: Available from SAE, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

MA1566 Gaging Practice and Gage Requirements for MJ Metric Screw Threads

2.1.2 ISO Publications: Available from American National Standards Institute, 1430 Broadway, New York, NY 10018.

ISO/R 1501 ISO Miniature Screw Threads

2.2 Reference Documents:

The following documents are referred in this standard for reference purposes only.

2.2.1 SAE Publications:

AS1337 Selected Aerospace Diameter-Pitch Combinations of Metric 60° Screw Threads for Nuts and Bolts
AS1338 Aerospace Metric 60° Screw Thread Profile and Tolerance Classes
AS1421 Aerospace Selected Diameter-Pitch Combinations of Metric 60° Screw Threads for Shaft or Bearing Retaining Screw Threads

2.2.2 ISO Publications:

ISO 68 ISO general purpose screw threads - Basic profile
ISO 261 ISO general purpose metric screw threads - General plan
ISO 965/1 ISO general purpose metric screw threads - Tolerances - Part 1: Principles and basic data
ISO 965/3 ISO general purpose metric screw threads - Tolerances - Part 3: Deviations for constructional threads

2.3 Symbols & Terms, MJ Thread Dimensions & Tolerances:

Symbol	Dimension
D	MAJOR DIAMETER, internal thd
D bsc	basic major dia
D min	minimum major (form) dia
D_1	MINOR DIAMETER, internal thd
D_1 bsc	basic minor dia
D_1 max	maximum minor dia
D_1 min	minimum minor dia
D_2	PITCH DIAMETER, internal thd
D_2 bsc	basic pitch dia
D_2 max	maximum pitch dia
D_2 min	minimum pitch dia
D_3	ROOT DIAMETER, internal thd
D_3 max	maximum root dia
T	TOLERANCE
TD_1	minor dia tol, int thd
TD_2	pitch dia tol, int thd
Tf'	cumulative form tol, int thd
Tr'	runout tol, int thd
δ	VARIATION
δα'	flank angle, int thd
δP'	pitch, int thd
H	HEIGHT, sharp vee thd
P	PITCH
α	FLANK HALF-ANGLE
h	BASIC THREAD DEPTH
MJ	THREAD PROFILE SYMBOL

Symbol	Dimension
d	MAJOR DIAMETER, external thd
d bsc	basic major dia
d max	maximum major dia
d min	minimum major dia
d_1	MINOR DIAMETER, external thd
d_1 bsc	basic minor dia
d_1 max	maximum minor (form) dia
d_2	PITCH DIAMETER, external thd
d_2 bsc	basic pitch dia
d_2 max	maximum pitch dia
d_2 min	minimum pitch dia
d_3	ROOT DIAMETER, external thd
d_3 max	maximum root dia
d_3 min	minimum root dia
R	ROOT RADIUS, external thd
R max	maximum root rad
R min	minimum root rad
T	TOLERANCE
Td	major dia tol, ext thd
Td_2	pitch dia tol, ext thd
Td_3	root dia tol, ext thd
Tf	cumulative form tol, ext thd
Tr	runout tol, ext thd
δ	VARIATION
δα	flank angle, ext thd
δP	pitch, ext thd
Le	LENGTH OF THD ENGAGEMENT
Le bsc	basic length, thd engagement
Le max	max length, thd engagement
Le min	min length, thd engagement

3. TECHNICAL REQUIREMENTS:

3.1 Profile of Thread:

Thread profiles in this standard conform with AS1338.

3.1.1 Basic Profile: The basic profile is the theoretical profile corresponding to the basic dimensions (without tolerance) of the thread major diameter, pitch diameter, and minor diameter. The deviations are applied from the basic dimensions. For basic profile, see Figure 1.

3.1.1.1 The symbols used in the basic profile shown in Figure 1 represent the thread dimensions in 2.3.

3.1.2 Design Profiles: The design profile for the internal thread at maximum material condition is the same as the basic profile, except in practice the root is cleared above the basic major (form) diameter, D bsc. See Figure 2. The design profile for the external thread at maximum material condition is the basic profile with a maximum radiused root, tangent to the flanks, as shown in Figure 3 for the maximum limit profile.

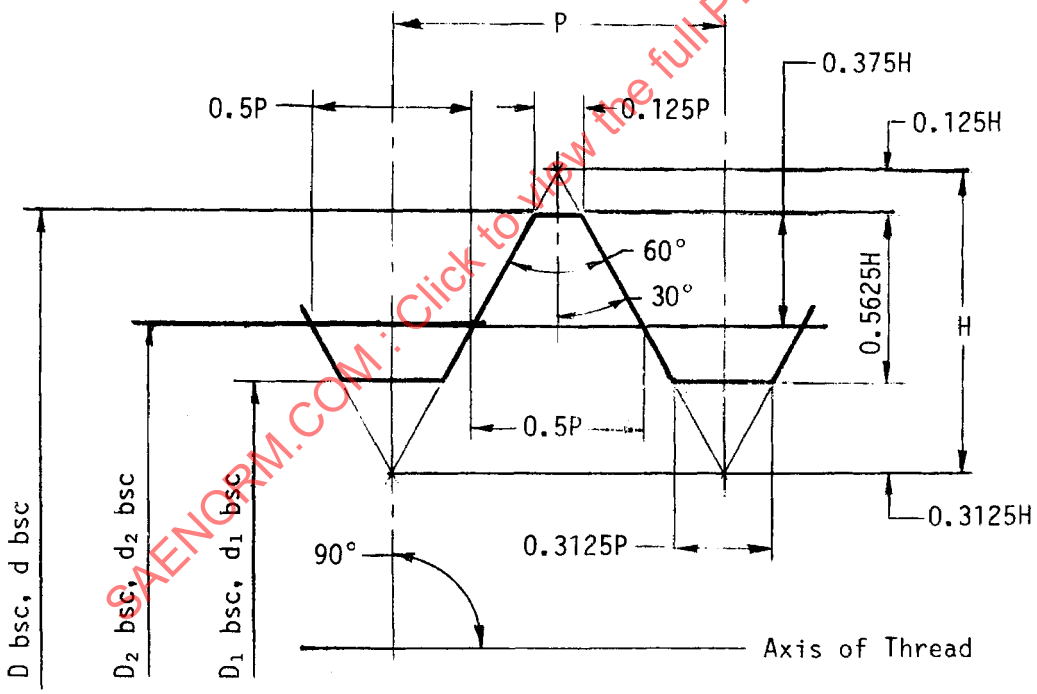


FIGURE 1 - Basic Profile

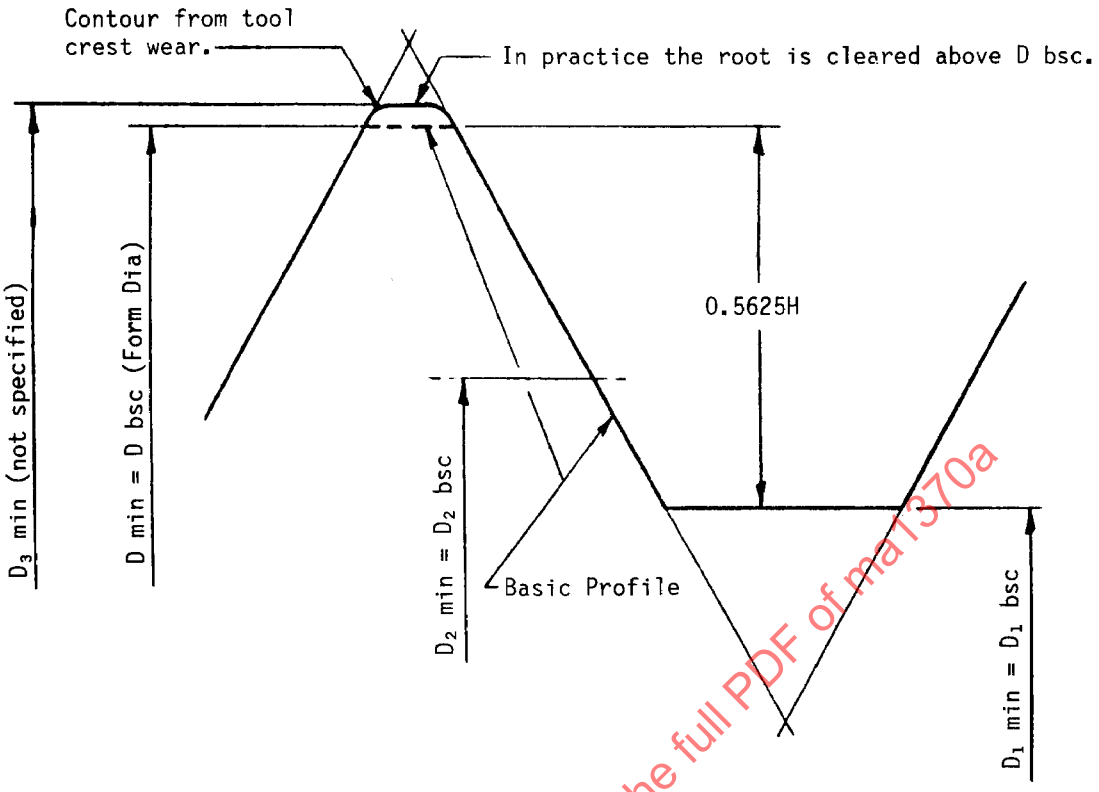


FIGURE 2 - Internal MJ Thread Design Profile

3.2 Series of Threads:

This standard includes a selected series of diameter-pitch combinations of threads extracted from ISO 261 plus additional sizes in the constant pitch series. Also, it includes the standard series of diameter-pitch combinations listed in AS1337 for aerospace screws, bolts and nuts, the standard series of diameter-pitch combinations listed in AS1421 for shaft or bearing retaining screw threads, and the standard series of diameter-pitch combinations for aerospace fluid fittings.

3.3 Thread Classes (Tolerances):

3.3.1 Length of Thread Engagement: The pitch diameter tolerances specified herein are based on a length of thread engagement with the GO gaging member having nine pitches or a length equal to the basic major diameter, whichever is the smaller. The actual thread engagement of the product threads are normally applicable for lengths of engagement up to 1.5 diameters for those thread sizes based on one diameter gaging length, and up to 15 pitches for those thread sizes based on nine pitches of gaging length. Where the length of thread engagement exceeds that for which standard tolerances are applicable, refer to 3.4.4 for pitch diameter tolerance increase.

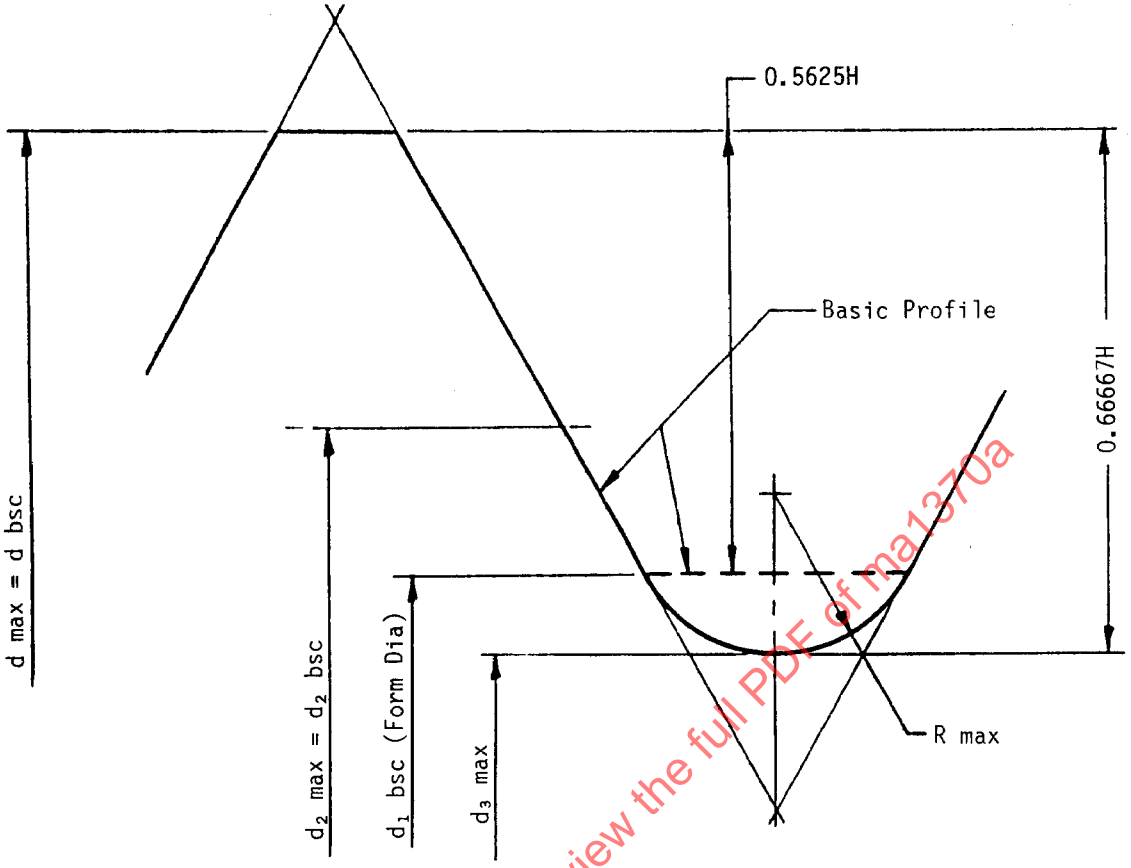


FIGURE 3 - External MJ Thread Design Profile

3.3.2 Tolerance System: The thread tolerance system is based on the International Standard ISO 965/1 metric screw thread system of tolerance positions and grades using, where applicable, tolerances included in ISO 965/3.

3.3.2.1 The tolerance classes selected for this standard conforms with AS1338.

3.3.3 External Thread Class: Except for fluid fittings external threads mating with tube coupling nuts, one class of threads is specified in this standard for all sizes of threads, including fluid fittings external threads mating with port internal threads, as follows after all processing has been completed, including coating or plating:

Tolerance Class 4h6h

The tolerance position h provides zero allowance, the pitch diameter tolerance is grade 4, and the major diameter tolerance is grade 6. The limits of size for tolerance class 4h6h external threads are in Table 6.

3.3.3 (Continued):

Fluid fittings external threads mating with tube coupling nuts have the following thread class after all processing has been completed, including coating or plating:

Tolerance Class 4g6g

The tolerance position g provides an allowance as specified in Table 5, the pitch diameter tolerance is grade 4, and the major diameter tolerance is grade 6.

3.3.3.1 Except for fluid fittings external threads mating with tube coupling nuts, the tolerance class for coated or plated external threads having pitches 3 mm and smaller is as follows before the processing has been applied:

Tolerance Class 4g6g

For these external threads, the tolerance position g provides an allowance for coating or plating only. The amount of this allowance for each thread pitch is specified in Table 5. This allowance is the amount of reduction permitted below the limits of size for diameters d, d_2 and d_3 specified in Table 6. For pitches larger than 3 mm, use the allowances specified in 3.4.2.2.

Fluid fittings external threads mating with tube coupling nuts require the tolerance class 4g6g after all processing has been applied. Where these threads require coating or plating, use the allowance specified in 3.4.2.2 below the g allowance required on the finished thread.

3.3.4 Internal Thread Class: The following classes of threads are specified in this standard for internal threads after all processing has been completed, including coating or plating:

Tolerance Class 4H6H for sizes 1 thru 5 mm
Tolerance Class 4H5H for sizes 6 mm and larger

The tolerance position H provides zero allowance, the pitch diameter tolerance is grade 4 for all sizes, and the minor diameter tolerance is grade 6 for 5 mm size and smaller, grade 5 for 6 mm size and larger. The limits of size for these tolerance class threads are in Table 6.

3.3.4.1 For coated or plated internal threads having pitches 3 mm and smaller, the tolerance class, before the processing has been applied, is as follows:

Tolerance Class 4G6G for sizes 1 thru 5 mm
Tolerance Class 4G5G for sizes 6 mm and larger

The tolerance position G provides an allowance for coating or plating. The amount of this allowance for each thread pitch is specified in Table 5. This allowance is the amount of increase permitted above the limits of size for diameters D, D_1, and D_2 specified in Table 6. For pitches larger than 3 mm, use the allowances in 3.4.2.2.

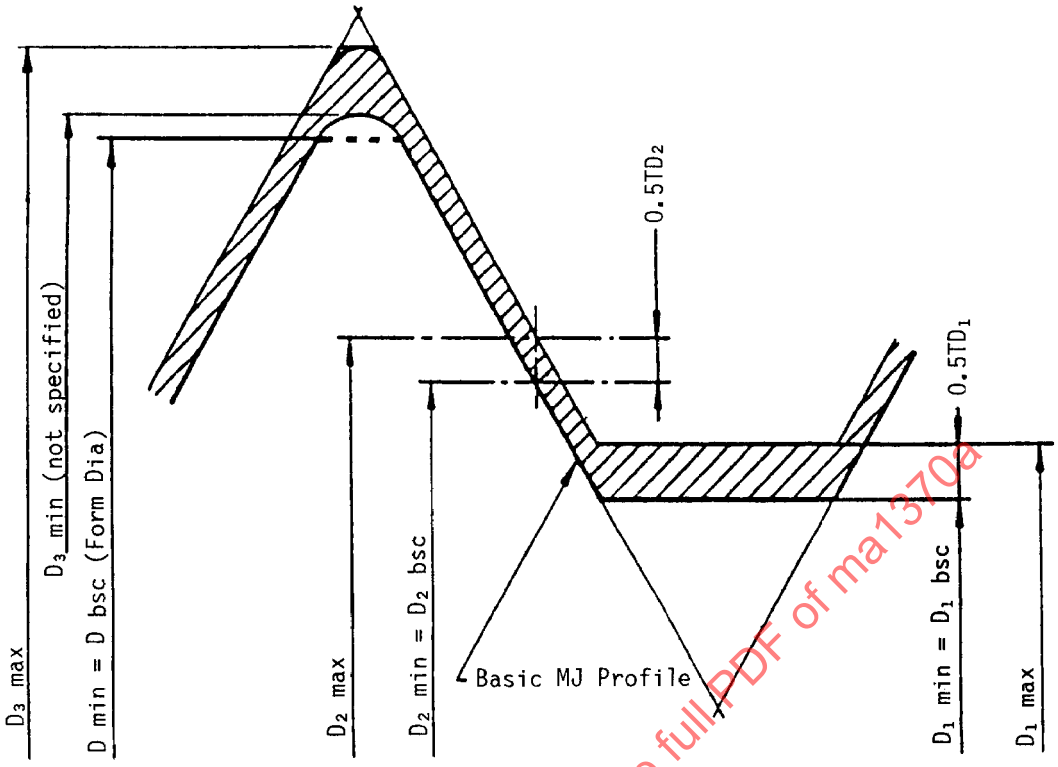


FIGURE 4 - Internal Thread Tolerances

3.3.5 Position of Tolerances: The class tolerances are positive for internal threads and negative for external threads, that is, in the direction of minimum material. See Figures 4 and 5.

3.3.6 Cumulative Form Tolerance: The cumulative form variation is the combined effect on functional size due to individual thread form variations in lead (pitch), helix, flank angle, taper, roundness, and other form variations of the thread. The allowable amount of cumulative form variation shall not exceed 0.5 times the pitch diameter tolerance.

3.3.7 Runout of External Thread Major Diameter and Internal Thread Minor Diameter: The runout of the external thread major diameter and internal thread minor diameter relative to their respective pitch cylinders shall be within the full indicator movement equal to the pitch diameter tolerance.

3.3.8 Profile Dimensions and Tolerances: The thread profile theoretical data is given in Table 1. The profile dimensions and tolerances (T) shown in Figures 4 and 5 and their values are specified in Table 6. For special threads for which there are no calculated values, use the formulae listed in 3.3.8.1 and 3.3.8.2.

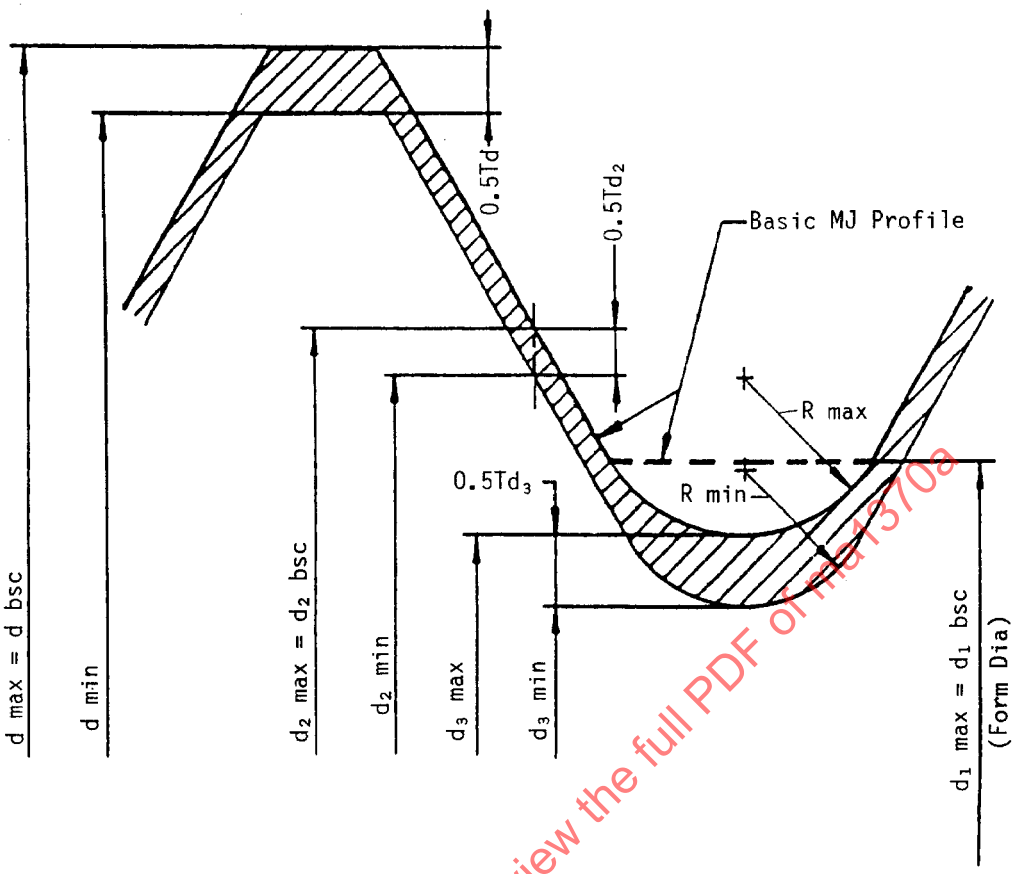


FIGURE 5 - External Thread Tolerances

3.3.8.1 External Thread Formulae:

d max = d bsc – allowance
d min = d max – Td(6), where Td(6) = 0.180 $\sqrt[3]{P^2}$ – 0.00315 x 1/ $\sqrt{P}$ (See Table 8)
d_1 max = D_1 max
d_2 max = d max – 0.649519P (See Table 1)
d_2 min = d_2 max – $Td_2(4)$, where $Td_2(4) = 0.63 \times 0.090P^{0.4}d^{0.1}$ (See Table 10)
d_3 max = d_2 max – 0.5051815P (See Table 1)
d_3 min = d_2 min – 0.565805P (See Table 1)
Td_3 = d_3 – d_3 min
R max = 0.18042P (See Table 4)
R min = 0.15011P (See Table 4)

3.3.8.2 Internal Thread Formulae:

D min = D bsc + allowance
D_3 max = D_2 max + 0.7938566P (See Table 1)
D_2 min = D min – 0.649519P (See Table 1)
D_2 max = D_2 min + $TD_2(4)$, where $TD_2(4) = 0.85 \times 0.090^{0.4} d^{0.1}$ (See Table 10)
D_1 min = D min – 0.9742786P (See Table 1)
D_1 max = D_1 min + $TD_1(6)$ for pitches 0.2 thru 0.8 mm where $TD_1(6) = 0.433P - 0.190P^{1.22}$
D_1 max = D_1 min + $TD_1(5)$ for pitches 1 mm and larger where $TD_1(5) = 0.8 \times 0.230P^{0.7}$ (See Table 9)

3.3.9 Pitch and Flank Angle Variation: For the maximum permissible pitch and flank angle variation, the following formulae and their values in Table 7 are provided for reference only. (The flank half-angle $\alpha = 30°$.)

3.3.9.1 External Thread:

Pitch Variation, $\delta P = \delta d_2 / \text{ctn}\ \alpha = 0.4 T d_2 / 1.7321$
Flank Half-Angle Variation, $\delta \alpha' = \tan^{-1}(0.3 T d_2 / 1.125P)$

3.3.9.2 Internal Thread:

Pitch Variation, $\delta P' = \delta D_2 / \text{ctn}\ \alpha = 0.4 T D_2 / 1.7321$
Flank Half-Angle Variation, $\delta \alpha' = \tan^{-1}(0.3 T D_2 / 1.125P)$

3.3.10 Root Radius of the Thread:

3.3.10.1 Internal Thread: For internal threads, the profile of the actual root of the thread shall at no point be below the basic major (form) diameter or above the maximum root diameter, D_3 max. No root radius is specified.

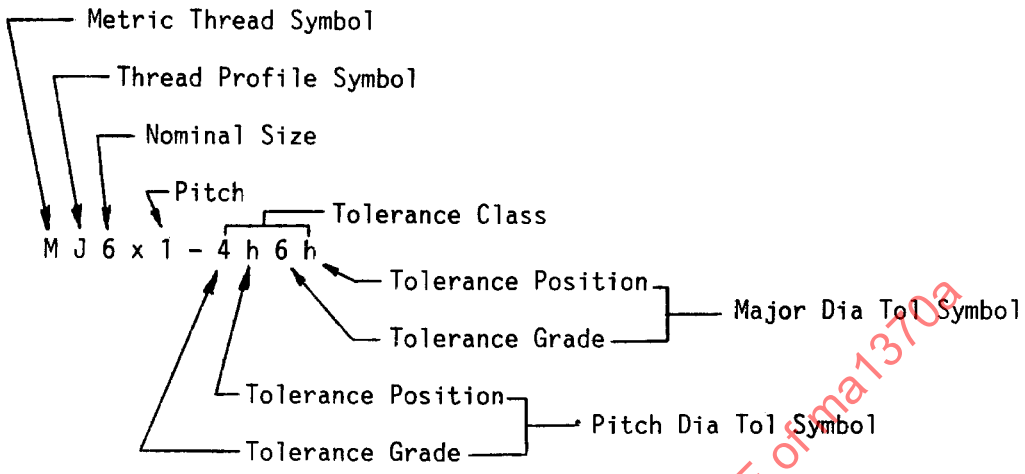
3.3.10.2 External Thread: For external threads, the profile of the actual root of the thread shall lie within the root radius tolerance zone shown in Figures 5 and 6. The limit values of the root radius R are specified in Table 4. The profile shall be a continuous smoothly blended nonreversing curve no part of which shall have a radius of less than 0.15011P and which is tangent to the thread flanks at not less than 0.5625H thread depth. The profile may comprise circular arcs that are tangent to the flanks and a flat at the root provided that the root diameter, d_3, is within the zone established by the formulae in 3.3.8.1.

3.4 Designation of Threads:

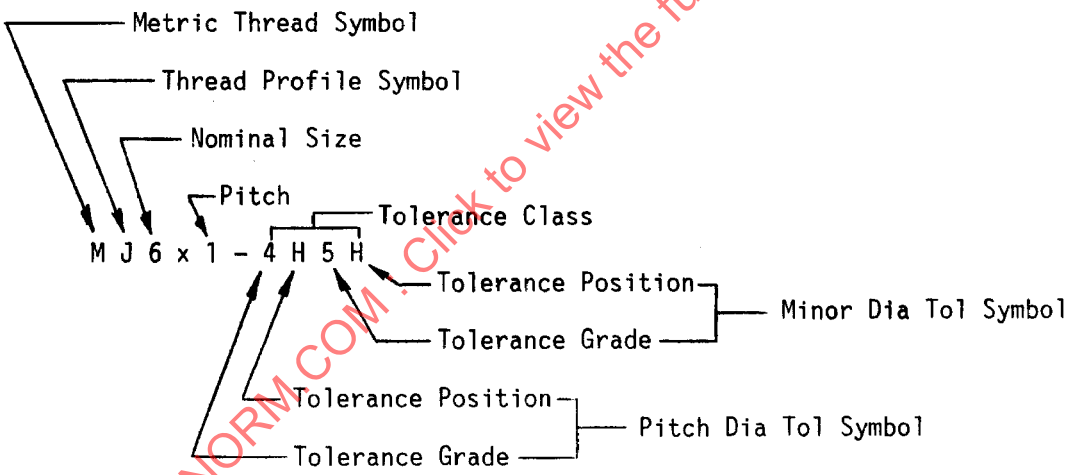
3.4.1 Basic Designation: ISO metric threads are identified by the letter "M" in the thread designation. This aerospace metric screw thread is designated by the letters "MJ" to identify the metric J thread profile, followed by the nominal size and the pitch in millimeters (separated by the sign "x"), and followed by the tolerance class (separated by a dash from the pitch). Unless otherwise specified in the designation, the screw thread helix is right hand.

3.4.1 (Continued):

Example: External Thread, Right Hand:



Internal Thread, Right Hand:



Example: External Thread, Left Hand (LH): MJ6 x 1-4h6h-LH

3.4.2 Designation of Coated Threads: Coated threads shall be designated by only the standard MJ thread designation where the coating allowance g and G are adequate relief for the applied coating. Unless otherwise specified, threaded parts to be coated shall have the standard coating allowance g and G in accordance with 3.3.3.1 for external threads and 3.3.4.1 for internal threads. The thread limits shall be within tolerance, as modified by the coating allowance, before coating. After coating, the material limits in Table 6 for standard MJ threads shall apply.

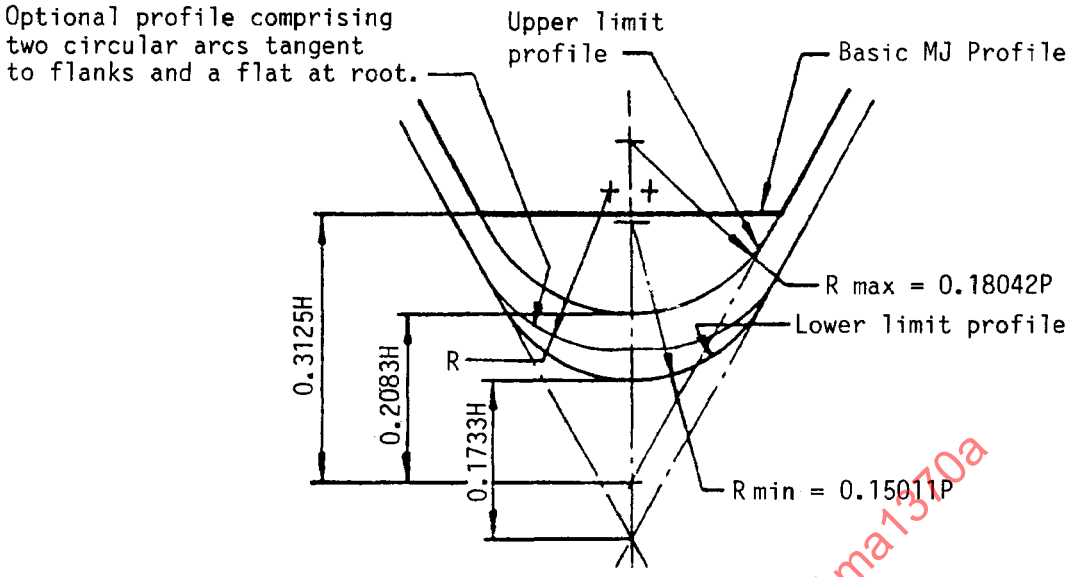


FIGURE 6 - Root Radius of External Thread

3.4.2.1 Coating Threads with Dry FIlm Lubricant: Threads to be coated with dry film lubricant may have the standard g and G coating allowance applied. If another coating is applied before the dry film lubricant, no additional coating allowance shall be allowed to accommodate the dry film lubricant. The dry film lubricant shall be removed for gaging; however, parts shall be recoated with dry film lubricant before returning to stock.

3.4.2.2 Special Coating Allowances: Where the standard coating allowance g and G are insufficient relief for the applied coating, the coating allowance should be established by altering the dimensions of the standard thread as follows:

a. External Threads Before Coating Limits:

Min major dia decreased 2 times min coating thickness
Min pitch dia and min root dia* decreased 4 times min coating thickness

b. Internal Threads Before Coating Limits:

Max minor dia increased 2 times min coating thickness
Max pitch dia increased 4 times min coating thickness

* For small sizes (5 mm and smaller), root dia reduction may require less reduction to maintain adequate tensile strength.

3.4.2.3 Designation of Special Coating Allowance: For special coating allowances, the coated threads shall be designated by the standard MJ thread designation followed by the min before coating major dia, pitch dia, and root dia for external threads, and the max before coating minor dia and pitch dia for internal threads. After coating, the material limits in Table 6 for standard MJ threads shall apply.

Example: Allowance based on 0.010 mm min coating thickness.

MJ6 x 1-4h6h
BEFORE COATING
MAJOR DIA 5.800 MIN
PITCH DIA 5.239 MIN
ROOT DIA 4.674 MIN

MJ6 x 1-4H5H
BEFORE COATING
MINOR DIA 5.236 MAX
PITCH DIA 5.485 MAX

3.4.3 Designation of Threads Having Modified Crests: Where the limits of size of the major diameter of an external thread or the minor diameter of an internal thread are modified, the thread designation is suffixed by the letters "MOD" followed by the modified diameter limits.

Example: External Thread, major dia reduced 0.075 mm

MJ6 x 1-4h6h MOD
MAJOR DIA 5.745 – 5.925 MOD

Example: Internal Thread, minor dia increased 0.075 mm

MJ6 x 1-4H5H MOD
MINOR DIA 5.101 – 5.291 MOD

3.4.4 Special Lengths of Thread Engagement: Where the length of product engagement exceeds that given in 3.3.1, which applies to standard tolerances, the pitch diameter tolerance should be computed from the following formulae:

$$TD_2 = (0.013\sqrt[3]{D} + 0.0076\sqrt{Le} + 0.044\sqrt[3]{P^2}) \times B$$

$$Td_2 = 0.75TD_2$$

where

Le = actual length of thread engagement on the special length GO gaging member
B = 1.25, where Le is over 15 but not over 30 pitches or over 1.5 but not over 3 diameters
B = 1.50, where Le is greater than 30 pitches or greater than 3 diameters.

3.4.4.1 Designating Threads Having Special Lengths of Thread Engagement: Where a standard series thread has a special length of engagement differing from that for which the standard pitch diameter tolerances are applicable, the thread class symbol is suffixed by the letters "SE" (special engagement), followed by the special pitch diameter limits of size and the length of engagement (LE).

Example: Le based on 3 basic major diameters

MJ6 x 1-4h6h SE
PITCH DIA 5.256 – 5.350
LE 18

3.4.5 Designation of Special Threads: Special diameter-pitch threads developed in accordance with this standard shall be identified by the letters "MJS" followed by the basic size, pitch, and tolerance class. Below the designation shall be specified the major diameter, pitch diameter, internal minor diameter, external thread minor (form) diameter, external thread root diameter, and external thread root radius.

Example:	External Thread	Internal Thread
	MJS6.5 x 1-4h6h	MJS6.5 x 1-4H5H
	MAJOR DIA 6.320 – 6.500	MAJOR (FORM) DIA 6.500 MIN
	PITCH DIA 5.779 – 5.850	PITCH DIA 5.850 – 5.945
	MINOR (FORM) DIA 5.526 MAX	MINOR DIA 5.526 – 5.716
	ROOT DIA 5.213 – 5.345	
	ROOT RAD 0.150 – 0.180	

3.4.5.1 Special Diameter-Pitch Combinations: Dimensions for threads of special diameter-pitch combinations shall be computed by using the formulae given in 3.3.8.1 and 3.3.8.2, rounding the dimensions to three decimal places per rules given in 3.6.

3.5 Inspection:

Inspection of the thread dimensional requirements may be performed with gages or measuring instruments (optical, mechanical, etc.) of the type commercially available. Referee inspection shall be as specified in MA1566.

3.6 Rules for Rounding Off Numerical Values:

The computed dimensions for special threads shall be rounded to three decimal places per the following rules:

a. The figure in the last decimal place to be retained should be kept unchanged when

(1) The figure in the next place is less than five
(2) The figure in the next place is five followed by no other figures or only zeros, and the figure in the last decimal place retained is even

b. The figure in the last decimal place to be retained should be increased by one when

(1) The figure in the next place is more than five
(2) The figure in the next place is five followed by no other figures or only zeros, and the figure in the last decimal place retained is odd
(3) The figure in the next place is five, followed by any figure or figures other than zero

TABLE 1 - Theoretical Thread Profile Data
(millimeters)

Pitch P	Height of Sharp Vee Thread	Height of Int Thd and Depth of Thread Engagement	Height of External Thread	Truncation of Int Thd Major Dia & Ext Thd Crest	Flat at Int Thd Major Dia & Ext Thd Crest	Truncation of Int Thd Crest & Ext Thd Minor Dia	Flat at Int Thd Crest & Ext Thd Minor Dia
	H = 0.8660254P	9/16 H = 0.4871393P	2/3 H = 0.5773503P	1/8 H = 0.1082532P	0.125P	5/16 H = 0.2706329P	0.3125P
0.35	0.30311	0.17050	0.20207	0.03789	0.04375	0.09472	0.10938
0.4	0.34641	0.19486	0.23094	0.04330	0.05000	0.10825	0.12500
0.45	0.38971	0.21921	0.25981	0.04871	0.05625	0.12178	0.14062
0.5	0.43301	0.24357	0.28868	0.05413	0.06250	0.13532	0.15625
0.6	0.51962	0.29228	0.34641	0.06495	0.07500	0.16238	0.18750
0.7	0.60622	0.34100	0.40415	0.07578	0.08750	0.18944	0.21875
0.75	0.64952	0.36535	0.43301	0.08119	0.09375	0.20297	0.23438
0.8	0.69282	0.38971	0.46188	0.08660	0.10000	0.21651	0.25000
1	0.86603	0.48714	0.57735	0.10825	0.12500	0.27063	0.31250
1.25	1.08253	0.60892	0.72169	0.13532	0.15625	0.33829	0.39062
1.5	1.29904	0.73071	0.86603	0.16238	0.18750	0.40595	0.46875
1.75	1.51554	0.85249	1.01036	0.18944	0.21875	0.47361	0.54688
2	1.73205	0.97428	1.15470	0.21651	0.25000	0.54127	0.62500
2.5	2.16506	1.21785	1.44338	0.27063	0.31250	0.67658	0.78125
3	2.59808	1.46142	1.73205	0.32476	0.37500	0.81190	0.93750

Pitch P	Addendum of External Thread	Twice External Thread Addendum	Difference Between Max Root Dia & Max Pitch Dia* of Int Thd	Double Height of Internal Thread	Difference Between Max Pitch Dia* and Max Root Dia of Ext Thd	Difference Between Min Pitch Dia* and Min Root Dia of Ext Thd
	3/8 H = 0.3247595P	3/4 H = 0.6495191P	11/12 H = 0.7938566P	1 1/8 H = 0.9742786P	7/12 H = 0.5051815P	0.6533358H= 0.5658054P
0.35	0.11367	0.22733	0.27785	0.34100	0.17681	0.19803
0.4	0.12990	0.25981	0.31754	0.38971	0.20207	0.22632
0.45	0.14614	0.29228	0.35724	0.43843	0.22733	0.25461
0.5	0.16238	0.32476	0.39693	0.48714	0.25259	0.28290
0.6	0.19486	0.38971	0.47631	0.58457	0.30311	0.33948
0.7	0.22733	0.45466	0.55570	0.68200	0.35363	0.39606
0.75	0.24357	0.48714	0.59539	0.73071	0.37889	0.42435
0.8	0.25981	0.51962	0.63509	0.77942	0.40415	0.45264
1	0.32476	0.64952	0.79386	0.97428	0.50518	0.56581
1.25	0.40595	0.81190	0.99232	1.21785	0.63148	0.70726
1.5	0.48714	0.97428	1.19078	1.46142	0.75777	0.84871
1.75	0.56833	1.13666	1.38925	1.70499	0.88407	0.99016
2	0.64952	1.29904	1.58771	1.94856	1.01036	1.13161
2.5	0.81190	1.62380	1.98464	2.43570	1.26295	1.41451
3	0.97428	1.94856	2.38157	2.92284	1.51554	1.69742

* Theoretical pitch diameter rounded to 5 decimal places.

TABLE 2 - Aerospace Metric Screw Thread Standard Series
(millimeters)

Nominal Diameters		Pitches							Nominal Diameters		Pitches		
Col. 1 1st Choice	Col. 2 2nd Choice	Coarse	Fine						Col. 1 1st Choice	Col. 2 2nd Choice	Fine		
			3	2	1.5	1.25	1	0.75			3	2	1.5
1.6		0.35							50		3	2	1.5
	1.8	0.35								52	3	2	1.5
2		0.4							55		3	2	1.5
	2.2	0.45								56	3	2	1.5
2.5		0.45								58	3	2	1.5
3		0.5							60		3	2	1.5
3.5		0.6								62	3	2	1.5
4		0.7								64	3	2	1.5
	4.5	0.75							65		3	2	1.5
5		0.8								68	3	2	1.5
6		1						0.75	70		3	2	1.5
7		1						0.75		72	3	2	1.5
8		1.25					1	0.75	75		3	2	1.5
	9	1.25					1	0.75		76	3	2	1.5
10		1.5				1.25	1	0.75		78	(3)	2	[1.5]
	11	1.5				1.25	1	0.75	80		3	2	1.5
12		1.75			1.5	1.25	1			82	(3)	2	[1.5]
14		2			1.5	1.25*	1		85		3	2	1.5
	15				1.5		1		90		3	2	1.5
16		2			1.5		1		95		3	2	1.5
	17				1.5		1		100		3	2	1.5
18		2.5		2	1.5		1		105		3	2	1.5
20		2.5		2	1.5		1		110		3	2	1.5
22		2.5		2	1.5		1			115	3	2	1.5
24		3		2	1.5		1		120		3	2	1.5
	25			2	1.5		1			125	3	2	1.5
	26				1.5		1		130		3	2	1.5
27		3		2	1.5		1			135	3	2	1.5
	28			2	1.5		1		140		3	2	1.5
30			3	2	1.5		1			145	3	2	1.5
	32			2	1.5				150		3	2	[1.5]
33			3	2	1.5					155	3		
	35				1.5				160		3		
36			3	2	1.5					165	3		
	38				1.5				170		3		
39			3	2	1.5					175	3		
	40		3	2	1.5				180		3		
	42		3	2	1.5					185	3		
45			3	2	1.5				190		3		
	48		3	2	1.5					195	3		
									200		3		

Choose, for preference, diameters in column 1 and, if necessary, in column 2.
Encircled pitches are not listed in ISO 261. *Only for spark plugs for engines.

TABLE 3A - Standard Series for Aerospace
Screws, Bolts & Nuts
Screw Threads

Nominal Size mm	Pitch mm
1.6	0.35
2	0.4
2.5	0.45
3	0.5
3.5	0.6
4	0.7
5	0.8
6	1
7	1
8	1
10	1.25
12	1.25
14	1.5
16	1.5
18	1.5
20	1.5
22	1.5
24	2
27	2
30	2
33	2
36	2
39	2

Note: For threads smaller than 1.6 nominal size, use ISO/R 1501 miniature screw threads

TABLE 3B - Standard Series for Aerospace
Shaft & Bearing Retaining
Screw Threads

Nominal Size mm	Pitch mm
10	0.75
12	1
15	1
17	1
20	1
25	1.5
30	1.5
35	1.5
40	1.5
45	1.5
50	1.5
55	1.5
60	1.5
65	1.5
70	1.5
75	1.5
80	1.5
85	2
90	2
95	2
100	2
105	2
110	2
120	2
130	2
140	2
150	2
160	3
170	3
180	3
190	3
200	3

TABLE 3C - Standard Thread Series for Aerospace Fluid Fittings

Internal Threads Class 4H5H	External Threads Class 4h6h	External Threads Class 4g6g
MJ8 x 1-4H5H	MJ8 x 1-4h6h	MJ8 x 1-4g6g
MJ10 x 1-4H5H	MJ10 x 1-4h6h	MJ10 x 1-4g6g
MJ12 x 1.25-4H5H	MJ12 x 1.25-4h6h	MJ12 x 1.25-4g6g
MJ14 x 1.5-4H5H	MJ14 x 1.5-4h6h	MJ14 x 1.5-4g6g
MJ16 x 1.5-4H5H	MJ16 x 1.5-4h6h	MJ16 x 1.5-4g6g
MJ18 x 1.5-4H5H	MJ18 x 1.5-4h6h	MJ18 x 1.5-4g6g
MJ20 x 1.5-4H5H	MJ20 x 1.5-4h6h	MJ20 x 1.5-4g6g
MJ22 x 1.5-4H5H	MJ22 x 1.5-4h6h	MJ22 x 1.5-4g6g
MJ24 x 1.5-4H5H	MJ24 x 1.5-4h6h	MJ24 x 1.5-4g6g
MJ27 x 1.5-4H5H	MJ27 x 1.5-4h6h	MJ27 x 1.5-4g6g
MJ30 x 1.5-4H5H	MJ30 x 1.5-4h6h	MJ30 x 1.5-4g6g
MJ33 x 1.5-4H5H	MJ33 x 1.5-4h6h	MJ33 x 1.5-4g6g
MJ36 x 1.5-4H5H	MJ36 x 1.5-4h6h	MJ36 x 1.5-4g6g
MJ39 x 1.5-4H5H	MJ39 x 1.5-4h6h	MJ39 x 1.5-4g6g
MJ42 x 2-4H5H	MJ42 x 2-4h6h	MJ42 x 2-4g6g
MJ48 x 2-4H5H	MJ48 x 2-4h6h	MJ48 x 2-4g6g
MJ50 x 2-4H5H	MJ50 x 2-4h6h	MJ50 x 2-4g6g

TABLE 4 - Limit Values, External Thread Root Radius, R
(millimeters)

Pitch P	Root Radius, R min	max
0.35	0.053	0.063
0.4	0.060	0.072
0.45	0.068	0.081
0.5	0.075	0.090
0.6	0.090	0.108
0.7	0.105	0.126
0.75	0.113	0.135
0.8	0.120	0.144
1	0.150	0.180
1.25	0.188	0.226
1.5	0.225	0.271
1.75	0.263	0.316
2	0.300	0.361
2.5	0.375	0.451
3	0.450	0.541

TABLE 5 - Allowance for Coated or Plated Threads
(millimeters)

Pitch P	Internal Thread Allowance, G	External Thread Allowance, g
0.35	+0.019	-0.019
0.4	+0.019	-0.019
0.45	+0.020	-0.020
0.5	+0.020	-0.020
0.6	+0.021	-0.021
0.7	+0.022	-0.022
0.75	+0.022	-0.022
0.8	+0.024	-0.024
1	+0.026	-0.026
1.25	+0.028	-0.028
1.5	+0.032	-0.032
1.75	+0.034	-0.034
2	+0.038	-0.038
2.5	+0.042	-0.042
3	+0.048	-0.048

Note: Allowance G and allowance g conform with the fundamental deviations G and g, respectively, as given in ISO 965/1. For larger pitches, use the allowance specified in paragraph 3.4.2.2.

TABLE 6 - Limiting Dimensions of Aerospace Metric Screw Thread Standard Series
(millimeters)

Basic Thread Designation	Tol Class	External Thread							
		Major Dia, d		Pitch Dia, d_2			Form Dia d_1	Root Dia, d_3	
		Max	Min	Max	Min	Tol	Max	Max	Min
*MJ1.6 x 0.35	4h6h	1.600	1.515	1.373	1.333	0.040	1.259	1.196	1.135
MJ1.8 x 0.35	4h6h	1.800	1.715	1.573	1.533	0.040	1.459	1.396	1.335
*MJ2 x 0.4	4h6h	2.000	1.905	1.740	1.698	0.042	1.610	1.538	1.472
MJ2.2 x 0.45	4h6h	2.300	2.100	1.908	1.863	0.045	1.762	1.681	1.608
*MJ2.5 x 0.45	4h6h	2.500	2.400	2.208	2.163	0.045	2.062	1.980	1.908
*MJ3 x 0.5	4h6h	3.000	2.894	2.675	2.627	0.048	2.513	2.423	2.344
*MJ3.5 x 0.6	4h6h	3.500	3.375	3.110	3.057	0.053	2.915	2.807	2.718
*MJ4 x 0.7	4h6h	4.000	3.860	3.545	3.489	0.056	3.318	3.192	3.093
MJ4.5 x 0.75	4h6h	4.500	4.360	4.013	3.957	0.056	3.769	3.634	3.533
*MJ5 x 0.8	4h6h	5.000	4.850	4.480	4.420	0.060	4.221	4.076	3.968
MJ6 x 0.75	4h6h	6.000	5.860	5.513	5.450	0.063	5.269	5.134	5.026
*MJ6 x 1	4h6h	6.000	5.820	5.350	5.279	0.071	5.026	4.845	4.714
MJ7 x 0.75	4h6h	7.000	6.860	6.513	6.450	0.063	6.269	6.134	6.026
*MJ7 x 1	4h6h	7.000	6.820	6.350	6.279	0.071	6.026	5.845	5.714
MJ8 x 0.75	4h6h	8.000	7.860	7.513	7.450	0.063	7.269	7.134	7.026
* & **MJ8 x 1	4h6h	8.000	7.820	7.350	7.279	0.071	7.026	6.845	6.714
**MJ8 x 1	4g6g	7.974	7.794	7.324	7.253	0.071	7.000	6.819	6.688
MJ8 x 1.25	4h6h	8.000	7.788	7.188	7.113	0.075	6.782	6.557	6.406
MJ9 x 0.75	4h6h	9.000	8.860	8.513	8.450	0.063	8.269	8.134	8.026
MJ9 x 1	4h6h	9.000	8.820	8.350	8.279	0.071	8.026	7.845	7.713
MJ9 x 1.25	4h6h	9.000	8.788	8.188	8.113	0.075	7.782	7.557	7.406
MJ10 x 0.75	4h6h	10.000	9.860	9.513	9.450	0.063	9.269	9.134	9.026
**MJ10 x 1	4h6h	10.000	9.820	9.350	9.279	0.071	9.026	8.845	8.713
**MJ10 x 1	4g6g	9.974	9.794	9.324	9.253	0.071	9.000	8.819	8.687
*MJ10 x 1.25	4h6h	10.000	9.788	9.188	9.113	0.075	8.782	8.557	8.406
MJ10 x 1.5	4h6h	10.000	9.764	9.026	8.941	0.085	8.539	8.268	8.092
MJ11 x 0.75	4h6h	11.000	10.860	10.513	10.450	0.063	10.269	10.134	10.026
MJ11 x 1	4h6h	11.000	10.820	10.350	10.279	0.071	10.026	9.845	9.713
MJ11 x 1.25	4h6h	11.000	10.788	10.188	10.113	0.075	9.782	9.557	9.406
MJ11 x 1.5	4h6h	11.000	10.764	10.026	9.941	0.085	9.539	9.268	9.092
MJ12 x 1	4h6h	12.000	11.820	11.350	11.275	0.075	11.026	10.845	10.710
* & **MJ12 x 1.25	4h6h	12.000	11.788	11.188	11.103	0.085	10.782	10.557	10.396
**MJ12 x 1.25	4g6g	11.972	11.760	11.160	11.075	0.085	10.754	10.529	10.368
MJ12 x 1.5	4h6h	12.000	11.764	11.026	10.936	0.090	10.539	10.268	10.087
MJ12 x 1.75	4h6h	12.000	11.735	10.863	10.768	0.095	10.295	9.979	9.778
MJ14 x 1	4h6h	14.000	13.820	13.350	13.275	0.075	13.026	12.845	12.710
MJ14 x 1.25	4h6h	14.000	13.788	13.188	13.103	0.085	12.782	12.557	12.396
* & **MJ14 x 1.5	4h6h	14.000	13.764	13.026	12.936	0.090	12.539	12.268	12.087
**MJ14 x 1.5	4g6g	13.968	13.732	12.994	12.904	0.090	12.507	12.236	12.055
MJ14 x 2	4h6h	14.000	13.720	12.701	12.601	0.100	12.051	11.691	11.469
MJ15 x 1	4h6h	15.000	14.820	14.350	14.275	0.075	14.026	13.845	13.710
MJ15 x 1.5	4h6h	15.000	14.764	14.026	13.936	0.090	13.539	13.268	13.087
MJ16 x 1	4h6h	16.000	15.820	15.350	15.275	0.075	15.026	14.845	14.710
* & **MJ16 x 1.5	4h6h	16.000	15.764	15.026	14.936	0.090	14.539	14.268	14.087

*Standard series for aerospace screws and bolts.
**Standard series for aerospace fluid fittings.

TABLE 6 (Continued)

Basic Thread Designation	Tol Class	Internal Thread						
		Minor Dia, D_1		Pitch Dia, D_2			Form Dia	Root Dia
		Min	Max	Min	Max	Tol	D Min	D_3 Max
*MJ1.6 x 0.35	4H6H	1.259	1.359	1.373	1.426	0.053	1.600	1.704
MJ1.8 x 0.35	4H6H	1.459	1.559	1.573	1.626	0.053	1.800	1.904
*MJ2 x 0.4	4H6H	1.610	1.722	1.740	1.796	0.056	2.000	2.114
MJ2.2 x 0.45	4H6H	1.762	1.887	1.908	1.968	0.060	2.200	2.325
*MJ2.5 x 0.45	4H6H	2.062	2.187	2.208	2.268	0.060	2.500	2.625
*MJ3 x 0.5	4H6H	2.513	2.653	2.675	2.738	0.063	3.000	3.135
*MJ3.5 x 0.6	4H6H	2.915	3.075	3.110	3.181	0.071	3.500	3.658
*MJ4 x 0.7	4H6H	3.318	3.498	3.545	3.620	0.075	4.000	4.176
MJ4.5 x 0.75	4H6H	3.769	3.959	4.013	4.088	0.075	4.500	4.683
*MJ5 x 0.8	4H6H	4.221	4.421	4.480	4.560	0.080	5.000	5.195
MJ6 x 0.75	4H5H	5.269	5.419	5.513	5.598	0.085	6.000	6.193
*MJ6 x 1	4H5H	5.026	5.216	5.350	5.445	0.095	6.000	6.239
MJ7 x 0.75	4H5H	6.269	6.419	6.513	6.598	0.085	7.000	7.193
*MJ7 x 1	4H5H	6.026	6.216	6.350	6.445	0.095	7.000	7.239
MJ8 x 0.75	4H5H	7.269	7.419	7.513	7.598	0.085	8.000	8.193
* & **MJ8 x 1	4H5H	7.026	7.216	7.350	7.445	0.095	8.000	8.239
MJ8 x 1.25	4H5H	6.782	6.994	7.188	7.288	0.100	8.000	8.280
MJ9 x 0.75	4H5H	8.269	8.419	8.513	8.598	0.085	9.000	9.193
MJ9 x 1	4H5H	8.026	8.216	8.350	8.445	0.095	9.000	9.239
MJ9 x 1.25	4H5H	7.782	7.994	8.188	8.288	0.100	9.000	9.280
MJ10 x 0.75	4H5H	9.269	9.419	9.513	9.598	0.085	10.000	10.193
**MJ10 x 1	4H5H	9.026	9.216	9.350	9.445	0.095	10.000	10.239
*MJ10 x 1.25	4H5H	8.782	8.994	9.188	9.288	0.100	10.000	10.280
MJ10 x 1.5	4H5H	8.539	8.775	9.026	9.138	0.112	10.000	10.328
MJ11 x 0.75	4H5H	10.269	10.419	10.513	10.598	0.085	11.000	11.193
MJ11 x 1	4H5H	10.026	10.216	10.350	10.445	0.095	11.000	11.239
MJ11 x 1.25	4H5H	9.782	9.994	10.188	10.288	0.100	11.000	11.280
MJ11 x 1.5	4H5H	9.539	9.775	10.026	10.138	0.112	11.000	11.328
MJ12 x 1	4H5H	11.026	11.216	11.350	11.450	0.100	12.000	12.244
* & **MJ12 x 1.25	4H5H	10.782	10.994	11.188	11.300	0.112	12.000	12.292
MJ12 x 1.5	4H5H	10.539	10.775	11.026	11.144	0.118	12.000	12.334
MJ12 x 1.75	4H5H	10.295	10.560	10.863	10.988	0.125	12.000	12.378
MJ14 x 1	4H5H	13.026	13.216	13.350	13.450	0.100	14.000	14.244
MJ14 x 1.25	4H5H	12.782	12.994	13.188	13.300	0.112	14.000	14.292
* & **MJ14 x 1.5	4H5H	12.539	12.775	13.026	13.144	0.118	14.000	14.334
MJ14 x 2	4H5H	12.051	12.351	12.701	12.833	0.132	14.000	14.421
MJ15 x 1	4H5H	14.026	14.216	14.350	14.450	0.100	15.000	15.244
MJ15 x 1.5	4H6H	13.539	13.775	14.026	14.144	0.118	15.000	15.334
MJ16 x 1	4H5H	15.026	15.216	15.350	15.450	0.100	16.000	16.244
* & **MJ16 x 1.5	4H5H	14.539	14.775	15.026	15.144	0.118	16.000	16.334

*Standard series for aerospace nuts.
**Standard series for aerospace fluid fittings.

TABLE 6 (Continued)

	Basic Thread Designation	Tol Class	External Thread							
			Major Dia, d		Pitch Dia, d_2			Form Dia d_1	Root Dia, d_3	
			Max	Min	Max	Min	Tol	Max	Max	Min
	**MJ16 x 1.5	4g6g	15.968	15.732	14.994	14.904	0.090	14.507	14.236	14.055
	MJ16 x 2	4h6h	16.000	15.720	14.701	14.601	0.100	14.051	13.691	13.469
	MJ17 x 1	4h6h	17.000	16.820	16.350	16.275	0.075	16.026	15.845	15.710
	MJ17 x 1.5	4h6h	17.000	16.764	16.026	15.936	0.090	15.539	15.268	15.087
	MJ18 x 1	4h6h	18.000	17.820	17.350	17.275	0.075	17.026	16.845	16.710
* &	**MJ18 x 1.5	4h6h	18.000	17.764	17.026	16.936	0.090	16.539	16.268	16.087
	**MJ18 x 1.5	4g6g	17.968	17.732	16.994	16.904	0.090	16.507	16.236	16.055
	MJ18 x 2	4h6h	18.000	17.720	16.701	16.601	0.100	16.051	15.691	15.469
	MJ18 x 2.5	4h6h	18.000	17.665	16.376	16.270	0.106	15.564	15.113	14.856
	MJ20 x 1	4h6h	20.000	19.820	19.350	19.275	0.075	19.026	18.845	18.710
* &	**MJ20 x 1.5	4h6h	20.000	19.764	19.026	18.936	0.090	18.539	18.268	18.087
	**MJ20 x 1.5	4g6g	19.968	19.732	18.994	18.904	0.090	18.507	18.236	18.055
	MJ20 x 2	4h6h	20.000	19.720	18.701	18.601	0.100	18.051	17.691	17.469
	MJ20 x 2.5	4h6h	20.000	19.665	18.376	18.270	0.106	17.564	17.113	16.856
	MJ22 x 1	4h6h	22.000	21.820	21.350	21.275	0.075	21.026	20.845	20.710
* &	**MJ22 x 1.5	4h6h	22.000	21.764	21.026	20.936	0.090	20.539	20.268	20.087
	**MJ22 x 1.5	4g6g	21.968	21.732	20.994	20.904	0.090	20.507	20.236	20.055
	MJ22 x 2	4h6h	22.000	21.720	20.701	20.601	0.100	20.051	19.691	19.469
	MJ22 x 2.5	4h6h	22.000	21.665	20.376	20.270	0.106	19.564	19.113	18.856
	MJ24 x 1	4h6h	24.000	23.820	23.350	23.270	0.080	23.026	22.845	22.704
	**MJ24 x 1.5	4h6h	24.000	23.764	23.026	22.931	0.095	22.539	22.268	22.082
	**MJ24 x 1.5	4g6g	23.968	23.732	22.994	22.899	0.095	22.507	22.236	22.050
	*MJ24 x 2	4h6h	24.000	23.720	22.701	22.595	0.106	22.051	21.691	21.463
	MJ24 x 3	4h6h	24.000	23.625	22.051	21.926	0.125	21.077	20.536	20.229
	MJ25 x 1	4h6h	25.000	24.820	24.350	24.270	0.080	24.026	23.845	23.704
	MJ25 x 1.5	4h6h	25.000	24.764	24.026	23.931	0.095	23.539	23.268	23.082
	MJ25 x 2	4h6h	25.000	24.720	23.701	23.595	0.106	23.051	22.691	22.463
	MJ26 x 15	4h6h	26.000	25.764	25.026	24.931	0.095	24.539	24.268	24.082
	MJ27 x 1	4h6h	27.000	26.820	26.350	26.270	0.080	26.026	25.845	25.704
	**MJ27 x 1.5	4h6h	27.000	26.764	26.026	25.931	0.095	25.539	25.268	25.082
	**MJ27 x 1.5	4g6g	26.968	26.732	25.994	25.899	0.095	25.507	25.236	25.050
	*MJ27 x 2	4h6h	27.000	26.720	25.701	25.595	0.106	25.051	24.691	24.463
	MJ27 x 3	4h6h	27.000	26.625	25.051	24.926	0.125	24.077	23.536	23.229
	MJ28 x 1	4h6h	28.000	27.820	27.350	27.270	0.080	27.026	26.845	26.704
	MJ28 x 1.5	4h6h	28.000	27.764	27.026	26.931	0.095	26.539	26.268	26.082
	MJ28 x 2	4h6h	28.000	27.720	26.701	26.595	0.106	26.051	25.691	25.463
	MJ30 x 1	4h6h	30.000	29.820	29.350	29.270	0.080	29.026	28.845	28.704
	**MJ30 x 1.5	4h6h	30.000	29.764	29.026	28.931	0.095	28.539	28.268	28.082
	**MJ30 x 1.5	4g6g	29.968	29.732	28.994	28.899	0.095	28.507	28.236	28.050
	*MJ30 x 2	4h6h	30.000	29.720	28.701	28.595	0.106	28.051	27.691	27.463
	MJ30 x 3	4h6h	30.000	29.625	28.051	27.926	0.125	27.077	26.536	26.229
	MJ32 x 1.5	4h6h	32.000	31.764	31.026	30.931	0.095	30.539	30.268	30.082
	MJ32 x 2	4h6h	32.000	31.720	30.701	30.595	0.106	30.051	29.691	29.463

*Standard series for aerospace screws and bolts.
**Standard series for aerospace fluid fittings.

TABLE 6 (Continued)

Basic Thread Designation	Tol Class	Internal Thread						
		Minor Dia, D_1		Pitch Dia, D_2			Form Dia	Root Dia
		Min	Max	Min	Max	Tol	D Min	D_3 Max
MJ16 x 2	4H5H	14.051	14.351	14.701	14.833	0.132	16.000	16.421
MJ17 x 1	4H5H	16.026	16.216	16.350	16.450	0.100	17.000	17.244
MJ17 x 1.5	4H5H	15.539	15.775	16.026	16.144	0.118	17.000	17.334
MJ18 x 1	4H5H	17.026	17.216	17.350	17.450	0.100	18.000	18.244
* & **MJ18 x 1.5	4H5H	16.539	16.775	17.026	17.144	0.118	18.000	18.334
MJ18 x 2	4H5H	16.051	16.351	16.701	16.833	0.132	18.000	18.421
MJ18 x 2.5	4H5H	15.564	15.919	16.376	16.516	0.140	18.000	18.501
MJ20 x 1	4H5H	19.026	19.216	19.350	19.450	0.100	20.000	20.244
* & **MJ20 x 1.5	4H5H	18.539	18.775	19.026	19.144	0.118	20.000	20.334
MJ20 x 2	4H5H	18.051	18.351	18.701	18.833	0.132	20.000	20.421
MJ20 x 2.5	4H5H	17.564	17.919	18.376	18.516	0.140	20.000	20.501
MJ22 x 1	4H5H	21.026	21.216	21.350	21.450	0.100	22.000	22.244
* & **MJ22 x 1.5	4H5H	20.539	20.775	21.026	21.144	0.118	22.000	22.334
MJ22 x 2	4H5H	20.051	20.351	20.701	20.833	0.132	22.000	22.421
MJ22 x 2.5	4H5H	19.564	19.919	20.376	20.516	0.140	22.000	22.501
MJ24 x 1	4H5H	23.026	23.216	23.350	23.456	0.106	24.000	24.250
**MJ24 x 1.5	4H5H	22.539	22.775	23.026	23.151	0.125	24.000	24.342
*MJ24 x 2	4H5H	22.051	22.351	22.701	22.841	0.140	24.000	24.429
MJ24 x 3	4H5H	21.077	21.477	22.051	22.221	0.170	24.000	24.603
MJ25 x 1	4H5H	24.026	24.216	24.350	24.456	0.106	25.000	25.250
MJ25 x 1.5	4H5H	23.539	23.775	24.026	24.151	0.125	25.000	25.342
MJ25 x 2	4H5H	23.051	23.351	23.701	23.841	0.140	25.000	25.429
MJ26 x 1.5	4H5H	24.539	24.775	25.026	25.151	0.125	26.000	26.342
MJ27 x 1	4H5H	26.026	26.216	26.350	26.456	0.106	27.000	27.250
**MJ27 x 1.5	4H5H	25.539	25.775	26.026	26.151	0.125	27.000	27.342
*MJ27 x 2	4H5H	25.051	25.351	25.701	25.841	0.140	27.000	27.429
MJ27 x 3	4H5H	24.077	24.477	25.051	25.221	0.170	27.000	27.603
MJ28 x 1	4H5H	27.026	27.216	27.350	27.456	0.106	28.000	28.250
MJ28 x 1.5	4H5H	26.539	26.775	27.026	27.151	0.125	28.000	28.342
MJ28 x 2	4H5H	26.051	26.351	26.701	26.841	0.140	28.000	28.429
MJ30 x 1	4H5H	29.026	29.216	29.350	29.456	0.106	30.000	30.250
**MJ30 x 1.5	4H5H	28.539	28.775	29.026	29.151	0.125	30.000	30.342
*MJ30 x 2	4H5H	28.051	28.351	28.701	28.841	0.140	30.000	30.429
MJ30 x 3	4H5H	27.077	27.477	28.051	28.221	0.170	30.000	30.603
MJ32 x 1.5	4H5H	30.539	30.775	31.026	31.151	0.125	32.000	32.342
MJ32 x 2	4H5H	30.051	30.351	30.701	30.841	0.140	32.000	32.429

*Standard series for aerospace nuts.
**Standard series for aerospace fluid fittings.

TABLE 6 (Continued)

Basic Thread Designation	Tol Class	External Thread							
		Major Dia, d		Pitch Dia, d_2			Form Dia d_1	Root Dia, d_3	
		Max	Min	Max	Min	Tol	Max	Max	Min
**MJ33 x 1.5	4h6h	33.000	32.764	32.026	31.931	0.095	31.539	31.268	31.082
**MJ33 x 1.5	4g6g	32.968	32.732	31.994	31.899	0.095	31.507	31.236	31.050
*MJ33 x 2	4h6h	33.000	32.720	31.701	31.595	0.106	31.051	30.691	30.463
MJ33 x 3	4h6h	33.000	32.625	31.051	30.926	0.125	30.077	29.536	29.229
MJ35 x 1.5	4h6h	35.000	34.764	34.026	33.931	0.095	33.539	33.268	33.082
**MJ36 x 1.5	4h6h	36.000	35.764	35.026	34.931	0.095	34.539	34.268	34.082
**MJ36 x 1.5	4g6g	35.968	35.732	34.994	34.899	0.095	34.507	34.236	34.050
*MJ36 x 2	4h6h	36.000	35.720	34.701	34.595	0.106	34.051	33.691	33.463
MJ36 x 3	4h6h	36.000	35.625	34.051	33.926	0.125	33.077	32.536	32.229
MJ38 x 1.5	4h6h	38.000	37.764	37.026	36.931	0.095	36.539	36.268	36.082
**MJ39 x 1.5	4h6h	39.000	38.764	38.026	37.931	0.095	37.539	37.268	37.082
**MJ39 x 1.5	4g6g	38.968	38.732	37.994	37.899	0.095	37.507	37.236	37.050
*MJ39 x 2	4h6h	39.000	38.720	37.701	37.595	0.106	37.051	36.691	36.463
MJ39 x 3	4h6h	39.000	38.625	37.051	36.926	0.125	36.077	35.536	35.229
MJ40 x 1.5	4h6h	40.000	39.764	39.026	38.931	0.095	38.539	38.268	38.082
MJ40 x 2	4h6h	40.000	39.720	38.701	38.595	0.106	38.051	37.691	37.463
MJ40 x 3	4h6h	40.000	39.625	38.051	37.926	0.125	37.077	36.536	36.229
MJ42 x 1.5	4h6h	42.000	41.764	41.026	40.931	0.095	40.539	40.268	40.082
**MJ42 x 2	4g6g	41.962	41.682	40.663	40.557	0.106	40.013	39.653	39.425
**MJ42 x 2	4h6h	42.000	41.720	40.701	40.595	0.106	40.051	39.691	39.463
MJ42 x 3	4h6h	42.000	41.625	40.051	39.926	0.125	39.077	38.536	38.229
MJ45 x 1.5	4h6h	45.000	44.764	44.026	43.931	0.095	43.539	43.268	43.082
MJ45 x 2	4h6h	45.000	44.720	43.701	43.595	0.106	43.051	42.691	42.463
MJ45 x 3	4h6h	45.000	44.625	43.051	42.926	0.125	42.077	41.536	41.229
MJ48 x 1.5	4h6h	48.000	47.764	47.026	46.926	0.100	46.539	46.268	46.077
**MJ48 x 2	4g6g	47.962	47.682	46.663	46.551	0.112	46.013	45.653	45.419
**MJ48 x 2	4h6h	48.000	47.720	46.701	46.589	0.112	46.051	45.691	45.457
MJ48 x 3	4h6h	48.000	47.625	46.051	45.919	0.132	45.077	44.536	44.222
MJ50 x 1.5	4h6h	50.000	49.764	49.026	48.926	0.100	48.539	48.268	48.077
**MJ50 x 2	4g6g	49.962	49.682	48.663	48.551	0.112	48.013	47.653	47.419
**MJ50 x 2	4h6h	50.000	49.720	48.701	48.589	0.112	48.051	47.691	47.457
MJ50 x 3	4h6h	50.000	49.625	48.051	47.919	0.132	47.077	46.536	46.222
MJ52 x 1.5	4h6h	52.000	51.764	51.026	50.926	0.100	50.539	50.268	50.077
MJ52 x 2	4h6h	52.000	51.720	50.701	50.589	0.112	50.051	49.691	49.457
MJ52 x 3	4h6h	52.000	51.625	50.051	49.919	0.132	49.077	48.536	48.222
MJ55 x 1.5	4h6h	55.000	54.764	54.026	53.926	0.100	53.539	53.268	53.077
MJ55 x 2	4h6h	55.000	54.720	53.701	53.589	0.112	53.051	52.691	52.457
MJ55 x 3	4h6h	55.000	54.625	53.051	52.919	0.132	52.077	51.536	51.222
MJ56 x 1.5	4h6h	56.000	55.764	55.026	54.926	0.100	54.539	54.268	54.077
MJ56 x 2	4h6h	56.000	55.720	54.701	54.589	0.112	54.051	53.691	53.457
MJ56 x 3	4h6h	56.000	55.625	54.051	53.919	0.132	53.077	52.536	52.222

*Standard series for aerospace screws and bolts.
**Standard series for aerospace fluid fittings.

TABLE 6 (Continued)

Basic Thread Designation	Tol Class	Internal Thread						
		Minor Dia, D_1		Pitch Dia, D_2			Form Dia	Root Dia
		Min	Max	Min	Max	Tol	D Min	D_3 Max
**MJ33 x 1.5	4H5H	31.539	31.775	32.026	32.151	0.125	33.000	33.342
*MJ33 x 2	4H5H	31.051	31.351	31.701	31.841	0.140	33.000	33.429
MJ33 x 3	4H5H	30.077	30.477	31.051	31.221	0.170	33.000	33.603
MJ35 x 1.5	4H5H	33.539	33.775	34.026	34.151	0.125	35.000	35.342
**MJ36 x 1.5	4H5H	34.539	34.775	35.026	35.151	0.125	36.000	36.342
*MJ36 x 2	4H5H	34.051	34.351	34.701	34.841	0.140	36.000	36.429
MJ36 x 3	4H5H	33.077	33.477	34.051	34.221	0.170	36.000	36.603
MJ38 x 1.5	4H5H	36.539	36.775	37.026	37.151	0.125	38.000	38.342
**MJ39 x 1.5	4H5H	37.539	37.775	38.026	38.151	0.125	39.000	39.342
*MJ39 x 2	4H5H	37.051	37.351	37.701	37.841	0.140	39.000	39.429
MJ39 x 3	4H5H	36.077	36.477	37.051	37.221	0.170	39.000	39.603
MJ40 x 1.5	4H5H	38.539	38.775	39.026	39.151	0.125	40.000	40.342
MJ40 x 2	4H5H	38.051	38.351	38.701	38.841	0.140	40.000	40.429
MJ40 x 3	4H5H	37.077	37.477	38.051	38.221	0.170	40.000	40.603
MJ42 x 1.5	4H5H	40.539	40.775	41.026	41.151	0.125	42.000	42.342
**MJ42 x 2	4H5H	40.051	40.351	40.701	40.841	0.140	42.000	42.429
MJ42 x 3	4H5H	39.077	39.477	40.051	40.221	0.170	42.000	42.603
MJ45 x 1.5	4H5H	43.539	43.775	44.026	44.151	0.125	45.000	45.342
MJ45 x 2	4H5H	43.051	43.351	43.701	43.841	0.140	45.000	45.429
MJ45 x 3	4H5H	42.077	42.477	43.051	43.221	0.170	45.000	45.603
MJ48 x 1.5	4H5H	46.539	46.775	47.026	47.158	0.132	48.000	48.348
**MJ48 x 2	4H5H	46.051	46.351	46.701	46.851	0.150	48.000	48.439
MJ48 x 3	4H5H	45.077	45.477	46.051	46.231	0.180	48.000	48.613
MJ50 x 1.5	4H5H	48.539	48.775	49.026	49.158	0.132	50.000	50.348
**MJ50 x 2	4H5H	48.051	48.351	48.701	48.851	0.150	50.000	50.439
MJ50 x 3	4H5H	47.077	47.477	48.051	48.231	0.180	50.000	50.613
MJ52 x 1.5	4H5H	50.539	50.775	51.026	51.158	0.132	52.000	52.348
MJ52 x 2	4H5H	50.051	50.351	50.701	50.851	0.150	52.000	52.439
MJ52 x 3	4H5H	49.077	49.477	50.051	50.231	0.180	52.000	52.613
MJ55 x 1.5	4H5H	53.539	53.775	54.026	54.158	0.132	55.000	55.348
MJ55 x 2	4H5H	53.051	53.351	53.701	53.851	0.150	55.000	55.439
MJ55 x 3	4H5H	52.077	52.477	53.051	53.231	0.180	55.000	55.613
MJ56 x 1.5	4H5H	54.539	54.775	55.026	55.158	0.132	56.000	56.348
MJ56 x 2	4H5H	54.051	54.351	54.701	54.851	0.150	56.000	56.439
MJ56 x 3	4H5H	53.077	53.477	54.051	54.231	0.180	56.000	56.613

*Standard series for aerospace nuts.
**Standard series for aerospace fluid fittings.

TABLE 6 (Continued)

Basic Thread Designation	Tol Class	External Thread							
		Major Dia, d		Pitch Dia, d_2			Form Dia d_1	Root Dia, d_3	
		Max	Min	Max	Min	Tol	Max	Max	Min
MJ58 x 1.5	4h6h	58.000	57.764	57.026	56.926	0.100	56.539	56.268	56.077
MJ58 x 2	4h6h	58.000	57.720	56.701	56.589	0.112	56.051	55.691	55.457
MJ58 x 3	4h6h	58.000	57.625	56.051	55.919	0.132	55.077	54.536	54.222
MJ60 x 1.5	4h6h	60.000	59.764	59.026	58.926	0.100	58.539	58.268	58.077
MJ60 x 2	4h6h	60.000	59.720	58.701	58.589	0.112	58.051	57.691	57.457
MJ60 x 3	4h6h	60.000	59.625	58.051	57.919	0.132	57.077	56.536	56.222
MJ62 x 1.5	4h6h	62.000	61.764	61.026	60.926	0.100	60.539	60.268	60.077
MJ62 x 2	4h6h	62.000	61.720	60.701	60.589	0.112	60.051	59.691	59.457
MJ62 x 3	4h6h	62.000	61.625	60.051	59.919	0.132	59.077	58.536	58.222
MJ64 x 1.5	4h6h	64.000	63.764	63.026	62.926	0.100	62.539	62.268	62.077
MJ64 x 2	4h6h	64.000	63.720	62.701	62.589	0.112	62.051	61.691	61.457
MJ64 x 3	4h6h	64.000	63.625	62.051	61.919	0.132	61.077	60.536	60.222
MJ65 x 1.5	4h6h	65.000	64.764	64.026	63.926	0.100	63.539	63.268	63.077
MJ65 x 2	4h6h	65.000	64.720	63.701	63.589	0.112	63.051	62.691	62.457
MJ65 x 3	4h6h	65.000	64.625	63.051	62.919	0.132	62.077	61.536	61.222
MJ68 x 1.5	4h6h	68.000	67.764	67.026	66.926	0.100	66.539	66.268	66.077
MJ68 x 2	4h6h	68.000	67.720	66.701	66.589	0.112	66.051	65.691	65.457
MJ68 x 3	4h6h	68.000	67.625	66.051	65.919	0.132	65.077	64.536	64.222
MJ70 x 1.5	4h6h	70.000	69.764	69.026	68.926	0.100	68.539	68.268	68.077
MJ70 x 2	4h6h	70.000	69.720	68.701	68.589	0.112	68.051	67.691	67.457
MJ70 x 3	4h6h	70.000	69.625	68.051	67.919	0.132	67.077	66.536	66.222
MJ72 x 1.5	4h6h	72.000	71.764	71.026	70.926	0.100	70.539	70.268	70.077
MJ72 x 2	4h6h	72.000	71.720	70.701	70.589	0.112	70.051	69.691	69.457
MJ72 x 3	4h6h	72.000	71.625	70.051	69.919	0.132	69.077	68.536	68.222
MJ75 x 1.5	4h6h	75.000	74.764	74.026	73.926	0.100	73.539	73.268	73.077
MJ75 x 2	4h6h	75.000	74.720	73.701	73.589	0.112	73.051	72.691	72.457
MJ75 x 3	4h6h	75.000	74.625	73.051	72.919	0.132	72.077	71.536	71.222
MJ76 x 1.5	4h6h	76.000	75.764	75.026	74.926	0.100	74.539	74.268	74.077
MJ76 x 2	4h6h	76.000	75.720	74.701	74.589	0.112	74.051	73.691	73.457
MJ76 x 3	4h6h	76.000	75.625	74.051	73.919	0.132	73.077	72.536	72.222
MJ78 x 1.5	4h6h	78.000	77.764	77.026	76.926	0.100	76.539	76.268	76.077
MJ78 x 2	4h6h	78.000	77.720	76.701	76.589	0.112	76.051	75.691	75.457
MJ78 x 3	4h6h	78.000	77.625	76.051	75.919	0.132	75.077	74.536	74.222
MJ80 x 1.5	4h6h	80.000	79.764	79.026	78.926	0.100	78.539	78.268	78.077
MJ80 x 2	4h6h	80.000	79.720	78.701	78.589	0.112	78.051	77.691	77.457
MJ80 x 3	4h6h	80.000	79.625	78.051	77.919	0.132	77.077	76.536	76.222
MJ82 x 1.5	4h6h	82.000	81.764	81.026	80.926	0.100	80.539	80.268	80.077
MJ82 x 2	4h6h	82.000	81.720	80.701	80.589	0.112	80.051	79.691	79.457
MJ82 x 3	4h6h	82.000	81.625	80.051	79.919	0.132	79.077	78.536	78.222
MJ85 x 1.5	4h6h	85.000	84.764	84.026	83.926	0.100	83.539	83.268	83.077
MJ85 x 2	4h6h	85.000	84.720	83.701	83.589	0.112	83.051	82.691	82.457
MJ85 x 3	4h6h	85.000	84.625	83.051	82.919	0.132	82.077	81.536	81.222