SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

SAE MA1508

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Superseding AS1508

Undercuts for Straight Screw Threads - Metric

RATIONALE

MA1508 has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Purpose:

This SAE Aerospace Standard (MA) provides recommended dimensional data for screw thread undercuts for straight "MJ" metric screw threads in accordance with MA1370.

1.2 Application:

The thread undercut data included in this document are primarily designed to provide a clearance for threading tool runout either where the thread is in a blind hole or where the thread is close to an adjacent shoulder. These thread undercuts are not recommended for bolts, screws, or studs which are required to be necked; e.g., reduced shank contiguous to the thread, to improve their tensile, impact, and cyclic load performance.

2. APPLICABLE DOCUMENTS:

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 SAE Publications:

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

MA1370 Screw Threads - MJ Profile, Metric

2.2 ISO Publications:

Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO/R286 System of Limits and Fits

3. DIMENSIONS:

3.1 External Threads:

Table 1 and Figure 1 provides data for external screw thread undercuts. The basic width (A) of the undercut is based on 1.6 x P, where P = Pitch rounded to nearest 0.1 mm. Tolerance applied is H14[1].

The undercut diameter (ϕG) is equal to nominal thread size (T) less value shown in column 3, Table 1; recommended tolerance is h12[1].

Example: Required ϕG for T = MJ6 x 1 - 4h6h
ϕG_{max} = 6.0 - 1.5 = 4.5
Tolerance h12 = 0.12
Therefore ϕG = 4.38 - 4.50

3.2 Internal Threads:

Table 2 and Figure 2 provides data for internal screw thread undercuts. The basic width (A) of the undercut is based on 1.6 x P for nominal thread sizes (T) less than 20 mm; for nominal thread sizes equal to or greater than 20 mm the basic width is based on 2.5 x P. Basic widths (A) in columns 2 and 3 have been rounded to nearest 0.1 mm. The specific value for "A" selected from Table 2 will therefore depend on thread pitch and size. When an increase in "A" is desired either to provide additional tool clearance, save weight, or accommodate tolerance accumulations, the value for "A" should be increased by multiples of 1.5 x P. Tolerance applied is H14[1].

The undercut diameter (ϕH) is equal to nominal thread size (T) plus value shown in column 4, Table 2; recommended tolerance is H13[1]. The value in column 4 is based on 0.25 x P, except the minimum value is 0.3 mm.

Example: Required ϕH for T = MJ6 x 1 - 4H5H
ϕH_{min} = 6.0 + 0.3 = 6.3
Tolerance H13 = 0.22
Therefore ϕH = 6.3 - 6.52

3.3 Fillet Radii:

The values for the fillet radii (R) in the undercut for both external and internal threads shall be selected from the appropriate table and will depend on the thread pitch.

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1 Selected from ISO/R286 - System of Limits and Fits.

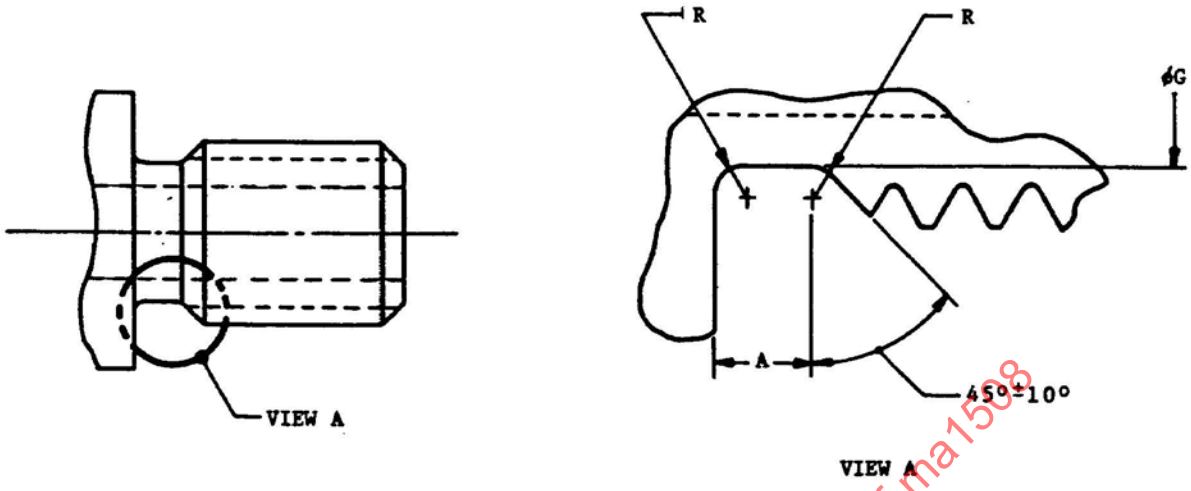

FIGURE 1 - External Thread

TABLE 1 - External Threads
Dimensions in Millimeters

Thread Pitch P 1	A Undercut Width Tol. H14 2	Undercut Diameter ϕG = T Less Values Below See Note 3	Fillet Radii R 4
0.5	0.80-1.05	0.8	0.2-0.6
0.6	1.00-1.25	0.9	0.2-0.6
0.7	1.10-1.35	1.0	0.2-0.6
0.75	1.20-1.45	1.1	0.4-0.8
0.8	1.30-1.55	1.2	0.4-0.8
1	1.60-1.85	1.5	0.4-0.8
1.25	2.00-2.25	1.9	1.1-1.5
1.5	2.40-2.65	2.2	1.1-1.5
1.75	2.80-3.05	2.6	1.1-1.5
2	3.20-3.50	3.0	2.1-2.5
2.5	4.00-4.30	3.8	2.1-2.5
3	4.80-5.10	4.5	2.1-2.5

NOTE: (a) See 3.1 for recommended tolerance.
(b) T = Nominal thread size