SAE Aerospace
An SAE International Group

AEROSPACE STANDARD

SAE AS71051B

Issued 1999-06
Reaffirmed 2004-07
Revised 2008-03

Superseding AS71051A

Pipe Threads, Taper, Aeronautical National Form, Symbol ANPT - Design and Inspection Standard

RATIONALE

Dimensional values in Table 4 are being corrected to reflect calculated values from the provided formulas. Column headings of Figures 5 and 6 are being corrected to reflect formulas for outside diameter of pipe.

1. SCOPE

This document establishes the requirements for Aeronautical National Form (ANPT) pipe threads, gages, and gaging methods for determining conformity of aeronautical taper pipe threads to this standard.

1.1 Purpose

Threads and gages covered by this standard are intended for use on pipe, plugs, fittings, and similar devices in aeronautical components and equipment requiring a sealed thread joint, and where straight threads and gaskets or O-rings are inadequate.

2. REFERENCES

2.1 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.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AS5200 Port or Fitting End, Internal Taper Pipe Thread, Design Standard

AS5201 Fitting End, External Taper Pipe Thread, Design Standard

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
http://www.sae.org

2.1.2 ASME Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASME B46.1 Surface Texture (Surface Roughness, Waviness, and Lay)

2.1.3 U.S. Government Publications

Available from Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, http://assist.daps.dla.mil/quicksearch.

MIL-G-10944 Gages, Dimensional Control

3. REQUIREMENTS

3.1 Form of Thread

The Aeronautical National Taper Pipe Thread Form, Symbol ANPT, as shown on Figure 1, shall be used for taper pipe threads covered by this standard.

3.2 Dimensions

Taper pipe threads shall conform to dimensions as shown on Figure 2 and given in Tables 1 and 2, and shall be full profile within the L_2 and $L_1 + L_3$ lengths. The crest and root of the thread shall be truncated within the limits specified in Table 1, and as shown on Figure 3. This applies to fully machined fittings and bosses and not to fittings made from nominal size pipe stock.

3.2.1 Tolerance

The tolerance for all taper pipe threads shall be plus or minus one turn (length of one pitch --- hereafter “pitch”) on the inspection gage checked over the basic effective length of thread. External threads that are one turn under basic and internal threads that are one turn over basic shall be of correct form for not less than one pitch in excess of the respective L_2 and $L_1 + L_3$ lengths.

3.2.2 Thread Angle

The thread angle, when measured in the axial plane, shall be such that its bisector will be perpendicular to the axis of the thread. Half of the thread angle shall be 30° ± 1° for all pitches with the exception of the 11-1/2 and 8 pitch threads, which shall be within ±45 minutes.

3.2.3 Lead of Thread

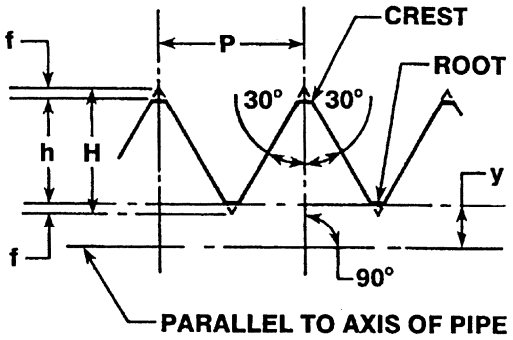
The tolerance on lead (pitch and helix) between any two pitches within the effective thread lengths L_2 and $L_1 + L_3$ shall be the basic pitch within .002 inch.

3.2.4 Taper of Thread

The taper of the thread shall be 3/4 inch per foot, ±1/16 inch, when measured on the diameter and along the axis.

3.2.5 Internal Threads

The entrance end of internal threads shall be countersunk 90° to the diameter given in Table 1.



n = Number of threads per inch.

p = Pitch of thread (measured parallel to axis) = 1/n

H = Height of sharp V thread = 0.866025 p.

h = Basic depth of thread on product = 0.8 p.

f = Depth of truncation.

y = Angle of taper (1°47' approx.) = 3/4 inch per foot on diameter.

FIGURE 1 - AERONAUTICAL NATIONAL TAPER PIPE THREAD FORM AND NOTATION

TABLE 1 - COUNTERSINKING, CHAMFERING, AND LIMITS ON CREST AND ROOT TRUNCATION [1)]

TABLE 1A - DIMENSIONS 1-6

Nominal Pipe Size Inch	Threads per Inch	Truncation			
		Minimum		Maximum	
		Formula	Inch	Formula	Inch
1	2	3	4	5	6
1/16	27	.033P	.0012	.096P	.0036
1/8	27	.033P	.0012	.096P	.0036
1/4	18	.033P	.0018	.088P	.0049
3/8	18	.033P	.0018	.088P	.0049
1/2	14	.033P	.0024	.078P	.0056
3/4	14	.033P	.0024	.078P	.0056
1	11-1/2	.033P	.0029	.073P	.0063
1 1/4	11-1/2	.033P	.0029	.073P	.0063
1 1/2	11-1/2	.033P	.0029	.073P	.0063
2	11-1/2	.033P	.0029	.073P	.0063
2 1/2	8	.033P	.0041	.062P	.0078
3	8	.033P	.0041	.062P	.0078