



METRIC AEROSPACE STANDARD

MA4070™**REV. A**

Issued 1988-04
Reaffirmed 2013-10
Revised 2021-12

Superseding MA4070

(R) Pins, Procurement Specification for, Metric

RATIONALE

Delete MIL-STD-105, revise sampling requirements and acceptance testing based on zero defectives, revise packaging requirements to MIL-STD-2073-1, extensive revision to Section 4, update references, extensive editorial updates.

1. SCOPE AND FIELD OF APPLICATION

1.1 Type

This specification covers aircraft quality metric pins, such as straight, headless, headed, shouldered, and dowel, in metric sizes.

1.2 Application

Primarily for use in aerospace propulsion systems requiring metric size pins for use as locks, positioners, guides, plugs, and other similar uses.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification 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: 877606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

MA4018 Pin, Straight, Headless, AMS5688, Metric

MA4019 Pin Straight, Headless, AMS5732, Metric

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Documents

Document Sharing Hub

2.1.2 ASTM Publications

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

ASTM E1417/E1417M Standard Practice for Liquid Penetrant Testing

ASTM E1444/E1444M Standard Practice for Magnetic Particle Testing

2.1.3 ASME Publications

Available from ASME, P.O. Box 2900, 22 Law Drive, Fairfield, NJ 07007-2900, Tel: 800-843-2763 (U.S./Canada), 001-800-843-2763 (Mexico), 973-882-1170 (outside North America), www.asme.org.

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

2.1.4 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-STD-2073-1 Standard Practice for Military Packaging

2.1.5 AIA/NAS Publications

Available from Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209-3928, Tel: 703-358-1000, www.aia-aerospace.org.

NAM1312-113 Fastener Test Methods, Metric Method 113 Double Shear Test

NASM1312-6 Fastener Test Methods, Method 6, Hardness

NASM1312-12 Fastener Test Methods, Method 12, Thickness of Metallic Coatings

2.2 Definitions

DEFECTIVE: A unit of product which contains one or more defects.

PRODUCTION INSPECTION LOT: Shall be all finished parts of the same part number, made from a single heat of alloy, heat treated at the same time to the same specified condition, produced as one continuous run, and submitted for vendor's inspection at the same time.

2.3 Unit Symbols

mm millimeter

kN kilonewton

3. TECHNICAL REQUIREMENTS

3.1 Material

Material shall be as specified on the part drawing.

3.2 Dimensions

The dimensions and geometric tolerances of completed parts, after all processing including plating when required, shall conform to the requirements on the part drawing.

3.3 Surface Texture

Surface texture of completed parts, prior to plating or coating when required, shall conform to the requirements on the drawing, determined in accordance with ASME B46.1.

3.4 Hardness

When specified on the part drawing, the hardness shall be uniform and tested in accordance with MIL-STD-1312-6 in accordance with NASM1312-6.

3.5 Shear Strength

In lieu of hardness test as in 3.4, parts made from spring temper, cold drawn material shall withstand the minimum double shear load specified in Table 1, tested in accordance with NAM1312-113.

Table 1 - Double shear loads, room temperature

Nom Dia mm	Area at Nom Dia mm ²	Double Shear Load kN Min /1/
1.5	1.77	2.2
2	3.14	3.9
2.5	4.91	6.1
3	7.07	8.8
4	12.57	15.7
5	19.64	24.5
6	28.27	35.3
8	50.27	62.8
10	78.54	98.2

/1/ Double shear load is based on two times area at nominal diameter times 625 MPa min shear strength divided by 1000 for load in kN.

3.6 Plating or Coating

When required, plating or coating shall be as specified on the part drawing and thickness in accordance with NASM1312-12.

3.7 Product Marking

Parts shall be identification marked as specified on the part drawing.

3.8 Quality

Parts shall be uniform in quality and condition, clean, sound, smooth, and free from burrs and foreign material and external imperfections detrimental to their performance.

3.9 Non-Destructive Inspection

Parts shall be fluorescent penetrant inspected or magnetic particle inspected as specified on the part drawing. Parts shall show no indication of cracks, cold shuts, seams, machining tears, pipes, grinding checks, or nonmetallic inclusions.

3.9.1 Indications in pins shall not exceed the following limitations:

- 3.9.1.1 There shall be no indications of discontinuities transverse to the grain flow (that is, at an angle of more than 10 degrees to the longitudinal axis).