

FED. SUPPLY CLASS

5306

1. SCOPE

- 1.1 This specification establishes the requirements for self-retaining, impedance type bolts procured under part numbers listed on drawings which refer to this specification. These drawings may carry notes which modify the requirements, in which case, only the non-modified portion of this specification applies.
- 1.2 Recommendations for improvements or corrections of this specification should be directed to: National Aerospace Standards Committee, Aerospace Industries Association, 1000 Wilson Boulevard, Suite 1700, Arlington, VA 22209.

2. APPLICABLE DOCUMENTS

- 2.1 Documents listed herein of the issue in effect on date of solicitation or price inquiry form a part of this specification. In the event of conflict between the requirements of this specification and the listed documents, the requirements herein shall govern.

2.1.1 Federal Standards

FED-STD-H28/21 Screw-thread Standards for Federal Services Section 21 Metric Screw-threads

2.1.2 Federal Specifications

QQ-P-35 Passivation Treatments for Corrosion Resistant Steels
 PPP-B-566 Boxes, Folding, Paperboard
~~PPP-B-601 Boxes, Wood, Cleated Plywood~~
~~PPP-B-636 Boxes, Shipping, Fiberboard~~
 PPP-B-676 Boxes, Setup

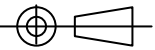
2.1.3 Military Specification

~~MIL-H-6875 Heat Treatment of Steel, (Process for)~~
 MIL-PRF-121 Barrier Materials, Greaseproof, Waterproof, Flexible, Heat-sealable

2.1.4 Military Standards

~~MIL-STD-105 Sampling Procedures and Tables for Inspection by Attributes~~
 MIL-STD-129 Military Marking for Shipment and Storage
~~MIL-STD-1312 Test Methods for Fasteners~~
~~MIL-STD-1949 Inspection, Magnetic Particle~~
~~MIL-6866 Penetrant Method of Inspection~~

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THIRD ANGLE PROJECTION 	CUSTODIAN NATIONAL AEROSPACE STANDARDS COMMITTEE	REVISION 1
PROCUREMENT SPECIFICATION NONE	TITLE PROCUREMENT SPECIFICATION, BOLT, METRIC, SELF-RETAINED, IMPEDANCE TYPE, 660 MPa SHEAR ①	CLASSIFICATION SPECIFICATION NA0258 SHEET 1 OF 18

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC.
1000 WILSON BLVD.
ARLINGTON, VA 22209

THIS DRAWING SUPERSEDES ALL ANTECEDENT STANDARD DRAWINGS FOR THE SAME PRODUCT AND SHALL BECOME EFFECTIVE NO LATER THAN SIX MONTHS FROM THE LAST REVISION DATE.

FORM 12-01

REVISION DATE: JUNE 30, 2015
ISSUE DATE: AUGUST 1995

2.1.5 ASTM International

ASTM D6251/D6251M	Standard Specification for Wood-Cleated Panelboard Shipping Boxes
ASTM D5118/D5118M	Standard Practice for Fabrication of Fiberboard Shipping Boxes
ASTM D1974/D1974M	Standard Practice for Methods of Closing, Sealing, and Reinforcing Fiberboard Boxes
ASTM E1444/E1444M	Standard Practice for Magnetic Particle Testing
ASTM E1417/E1417M	Standard Practice for Liquid Penetrant Testing
ASTM E112	Standard Test Methods for Determining Average Grain Size
ASTM A313/A313M	Standard Specification for Stainless Steel Spring Wire

Copies can be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.
www.astm.org

2.1.6 American Society for Quality

ASQ Z1.4	Sampling Procedures and Tables for Inspection by Attributes
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Copies can be obtained from American Society for Quality, 600 North Plankinton, Milwaukee, Wisconsin 53203.
www.asq.org

2.1.7 American Society of Mechanical Engineers

ASME B46.1	Surface Texture (Surface Roughness, Waviness, and Lay)
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Copies can be obtained from American Society of Mechanical Engineers, Two Park Ave, New York, NY 10016-5990.
www.asme.org

2.1.8 Aerospace Industries Association

NASM1312	Fastener Test Methods
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Copies can be obtained from Aerospace Industries Association, 1000 Wilson Blvd., Arlington, VA 22209.
www.aia-aerospace.org

3. REQUIREMENTS

3.1 General

Fasteners supplied to this specification shall comply with all of the requirements of this specification and shall have passed all of the applicable tests herein.

3.2 Materials

3.2.1 Bolt Body

Bolt body shall be made of corrosion-resistant material in accordance with AMS5643 (UNS S17400) or AMS5732 (UNS S66286).

3.2.2 Retaining Elements

The retaining elements shall be made of material in accordance with AMS5643 (UNS S17400), AMS5678 (UNS S17700) or QQ-S-763, Class 440C.

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3.2.3 Springs

Springs (if required by design), shall be made of material in accordance with AMS5678 (UNS S17700), ASTM A313/A313M Type 302 (UNS S30200) Class 1, AMS5833 (UNS R30003), or AMS5834 (UNS R30003).

3.2.4 Heat Treat

Bolt body and impedance device components shall be heat treated to develop the mechanical properties specified herein, without adverse effects on metallurgical properties as defined herein (see 4.5.7).

3.2.5 Hardness

Bolt body and impedance device components shall have the hardness necessary to develop the mechanical properties specified herein; however, the bolt body hardness shall never exceed 42 HRC.

3.2.6 Protective Finish

Bolts shall be plated, coated, or treated as specified on the applicable drawings.

3.2.7 Passivation

Corrosion-resistant steel parts shall be passivated in accordance with AMS2700, Method 1, Class 4.

3.3 Design and Construction

The design and construction of the bolt shall be as specified herein and on the applicable drawings.

3.3.1 Dimensions

Dimensions shall be in accordance with the applicable detail drawing. Dimensions shall include the finishes designated on the detailed drawing. Dimensions shall exclude dry film lubricants. Measurements shall be made per 4.5.1.

3.3.2 Surface Texture

Surface texture shall be in accordance with the requirements of the detail drawing.

3.3.3 Thread Form

Thread form and dimensions shall conform to FED-STD-H28/21 or as required by the applicable detail drawing.

3.3.3.1 Thread Forming

Threads shall be fully formed after final heat treatment. Threads shall be formed by a single rolling process.

3.3.3.2 Incomplete Threads

Incomplete thread pitches are permissible at the chamfered end and at the juncture of the unthreaded portion of the shank, per AS3062. The incomplete thread pitch next to the shank shall include a thread run-out at least one pitch and not more than two pitches.

3.3.3.3 Chamfer

The entering point of the thread shall be chamfered as specified in the applicable detail drawing.

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3.3.3.4 Irregular Flank

The flank of the incomplete thread closest to the grip, or head, may be irregular due to natural flow of material that is not controlled by thread rolling dies. Folds or laps in excess of those permitted by Figure 4 and paragraph 3.4.5.2.3 shall not be considered "Natural Flow." The roots and flanks of threads in the run-out area shall be filleted, smooth and devoid of abrupt tool marks.

3.3.3.5 Grain Flow

The grain flow in the threads shall be continuous and shall flow the general contour with the maximum density at the bottom of the root radius as illustrated in Figure 2.

3.3.3.5.1 Grain Size

Grain size in the vicinity of head or threads shall not differ from grain size in shank by more than one size (as defined in ASTM E112).

3.3.4 Heads

Fastener heads shall be formed by forging before heat treatment. Recesses may be forged or machined. Flash or chip clearance in machined recesses shall not cause recess dimensions to exceed the specified limits.

3.3.4.1 Bearing Surfaces

The bearing surface of fastener heads shall be oriented relative to the shank within the limits shown in Figure 1. The angular variations of the underside of the head shall be uniform around the shank within a tolerance of +20', -0.0', as measured between the bearing surface of the head and shank, at a length along the shank from the head equal to the diameter of the bolt (see 4.5.1).

3.3.4.2 Head Structure and Grain Flow

A metallographic cross section of the head shall show no detrimental defects (see Figure 2 and 3.4.5), and shall exhibit grain flow lines as illustrated in Figure 2 (size larger than 5 mm thread). Grain lines shall be continuous and shall not terminate in the head to shank fillet, but may show minor interruption resulting from finish machining operation. Grain size in vicinity of head or threads shall not differ from grain size in shank by more than one size (as defined by ASTM E112). Evaluation to be conducted at 50X to 60X.

3.3.5 Head-shank Fillet

The juncture of the fastener head and shank shall be cold worked by a rolling process in thread size 5 mm and larger in grips greater than nominal diameter after completion of all machining, grinding and thermal treatments. Fillet radius shall conform to the requirements of the detail drawing and shall show no evidence of seams or inclusions. Distortion from the smooth contour resulting from cold working shall not extend beyond the limits in Figure 3. A short tapered lead into the fillet area is permissible providing the dimensions do not exceed the limits of the detail drawing.

3.3.6 Straightness

The straightness of the fastener shank shall be within the limits of Table I and 4.5.3.

TABLE I – SHANK STRAIGHTNESS

NOMINAL SHANK DIAMETER	MAXIMUM DEVIATION (mm PER 10 mm OF GRIP LENGTH)
8 mm AND UNDER	0,02
10 mm AND LARGER	0,015

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3.3.7 Coaxiality

The coaxiality tolerance between the thread and the shank of bolts, which is the coaxiality of the shank with respect to the pitch diameter as the datum, shall be as specified on the detailed drawing. The position of measurement shall be at a distance of 1D from the point where the thread runout meets the shank. When the shank length is less than 2D, coaxiality shall be measured at a distance midway between the head and the thread runout.

3.3.8 Impedance Device

All bolts shall be of such design as to be retained in position by the impedance element. Retaining elements shall cause no damage to joints upon insertion or removal, and shall perform with the dimensional limitations of applicable NA drawings.

3.3.9 Concentricity

For flush-head bolts, the conical surface of the head and shank diameter D shall be within 0,13 mm full indicator movement (FIM). Head driving recess to shank shall be within 0,40 mm FIM. Concentricity of the head and shank of the protruding-head bolts shall be with C values FIM (see Figure 1). Measurement shall be measured within approximately a distance L from the head of bolt which is equal to 1 diameter D.

TABLE II – CONCENTRICITY

THREAD SIZE NOMINAL		C mm
DIA mm	PITCH mm	
5	0,8	0,10
6	1,0	0,15
8	1,0	0,20
10	1,25	0,25
12	1,25	0,30
14	1,5	0,30
16	1,5	0,30
18	1,5	0,35
20	1,5	0,35
22	1,5	0,40
24	2,0	0,40

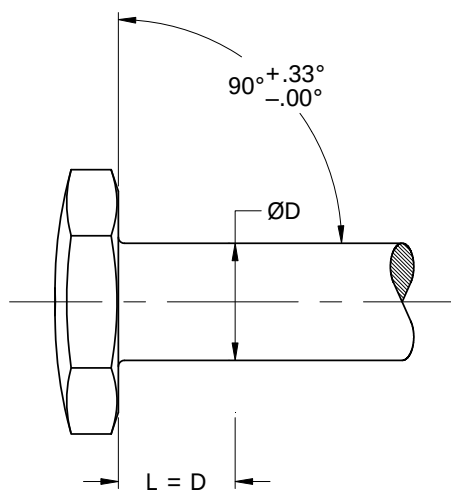


FIGURE 1 – HEAD ANGULARITY

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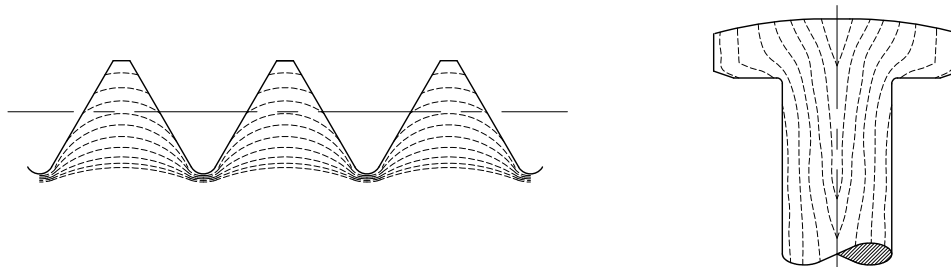


FIGURE 2 – GRAIN FLOW IN THREAD AND HEAD

TABLE III – LIMITS OF DISTORTION DUE TO FILLET ROLLING

NOMINAL SIZE	5, 6, and 7 mm	8 and 10 mm	12, 14 and 16 mm	18 mm and larger
C MAX	1,5 mm	2,5 mm	3,2 mm	4,0 mm

Cold working of head to shank fillet may cause distortion of fillet area. Distortion shall not exceed 0,05 mm above A or below B contour shown on fastener drawing. Distorted area shall not extend beyond C as illustrated above.

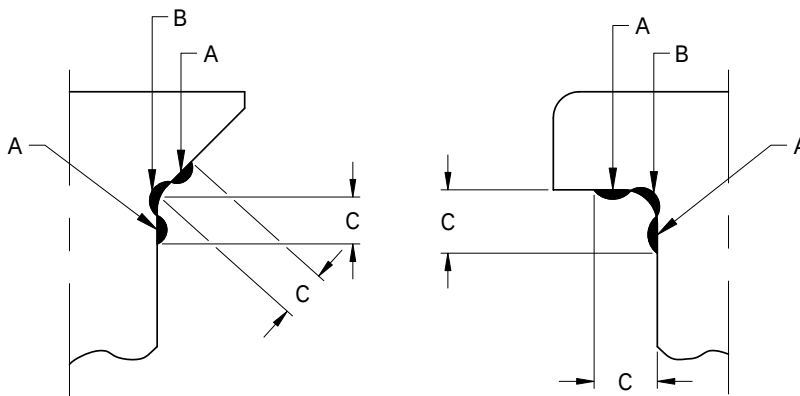


FIGURE 3 – DISTORTION DUE TO FILLET ROLLING