

INCH-POUND
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SUPERSEDING
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MILITARY SPECIFICATION

FASTENER ELEMENT, SELF-LOCKING, EXTERNALLY THREADED, 450° F AND 1,200° F

This specification has been approved by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the requirements for self-locking elements for externally threaded fasteners to be used where temperatures will not exceed 450°F and 1,200°F.

1.2 Classification. The self-locking element of the fastener shall be classified as follows (see 6.2):

<u>Class</u>	<u>Maximum temperature use</u>
I	450°F
II	1,200°F

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer, Naval Air Warfare Center Aircraft Division Lakehurst, Systems Requirements Department Code SR3, Lakehurst, NJ 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of document or letter.

AMSC N/A

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SPECIFICATIONS

FEDERAL

- QQ-P-35 - Passivation Treatments for Corrosion Resistant Steel.
- QQ-P-416 - Plating, Cadmium (Electrodeposited).
- TT-E-751 - Ethyl Acetate, Technical.
- TT-I-735 - Isopropyl Alcohol.
- TT-N-97 - Naphtha, Aromatic.
- PPP-H-1581 - Hardware (Fasteners and Related Items), Packaging of.

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- MIL-S-8879 - Screw Threads Controlled Radius Root with Increased Minor Diameter, General Specification for.
- MIL-L-46010 - Lubricant, Solid Film, Heat Cured, Corrosion Inhibiting.

STANDARDS

MILITARY

- MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
- MIL-STD-1312 - Fastener Test Methods.
- MS15981 - Fasteners, Externally Threaded, Self-Locking, Design and Usage Limitations for.
- MS21134 - Bolt, Tension, Steel, 180 KSI F_{tu} , 450°F External Wrenching, Spline Drive, Flanged.
- MS21250 - Bolt, Tension, Steel, External Wrenching, Flanged, 12-Point, 180 KSI F_{tu} , 450°F.

(Unless otherwise indicated, copies of federal and military specifications, standards and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Bldg. 4D, Philadelphia, PA 19111-5094.)

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

SAE Aerospace Materials Specification - AMS

AMS 2411 Silver Plating for High Temperature Applications.

(Application for copies should be addressed to SAE, 400 Commonwealth Drive, Warrendale, PA 15096.)

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Aerospace Industries Association of America, Inc. (AIA)

NAS 1348	Fasteners-Recommended Tensile Stress Areas for External Threaded.
NAS 6704 thru 6720	Bolt, Hex Head, Close Tolerance, A286 CRES, Long Threads, Self-Locking and Non-Locking.

(Application for copies should be addressed to Aerospace Industries Association of America, 1250 Eye Street, NW, Washington, D.C. 20005.)

American Society for Testing and Materials (ASTM)

ASTM D740 Standard Specification for Methyl Ethyl Ketone.

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1137.)

(Non-government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the 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.

3. REQUIREMENTS

3.1 Qualification. The fastener elements furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.3 and 6.3).

3.2 Materials.

3.2.1 Class I. The 450°F elements shall be fabricated from alloy steel or high temperature plastic. The sulphur content or the phosphorous content of the non-corrosion resistant steel shall not exceed 0.050 percent by weight.

3.2.2 Class II. The 1200°F elements shall be fabricated from corrosion and heat resistant steel.

3.3 Construction. The self-locking element feature shall be a one-piece prevailing torque type, self-contained.

3.3.1 Lubrication. The fastener shall be provided with a coating to prevent nut-bolt seizure. Any dry film lubricant coating shall have been previously qualified to MIL-L-46010, Type I. The Qualified Products List (QPL) will identify the lubricant used, which shall not be changed without requalification of the design.

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3.3.2 Dimensions. Dimensions shall be as specified on the associated detail specifications, specification sheets or MS standards. Dimensions are after plating but before lubrication. The fasteners must also meet the other requirements of the associated detail specifications, specification sheets or MS standards and acquisition documents. The self-locking element shall be within the dimensional limitations of MS15981.

3.3.3 Threads. Thread dimensions shall be in accordance with MIL-S-8879. Threads used in the Class II locking element may be displaced in any single rolling process which will provide self-locking fasteners conforming to this specification. Thread gaging shall be performed after plating in accordance with MIL-S-8879, except that the fastener with locking device incorporated, but without lubricant, shall enter the go gage member 1 to 1-1/2 turns before engagement of the locking element. When the lubricant prevents the use of standard gages, the free rotation (finger torque) of the nut shall produce bolt engagement of at least one turn.

3.3.4 Plating or surface treatment. Fasteners fabricated from alloy steel shall be cadmium plated in accordance with QQ-P-416 Type II, Class 2. For dry lubricated fasteners, the type and class are optional if the fasteners conform to the salt spray requirements for of QQ-P-416 Type II plating.

3.3.4.1 1200°F corrosion resistant steel (CRES). The threads of fasteners fabricated from 1200°F CRES shall be silver plated in accordance with AMS 2411. CRES fasteners shall be passivated per QQ-P-35.

3.4 Performance.

3.4.1 Torque. The fastener incorporating the self-locking element shall meet the torque requirements specified in table I and 4.5.4.

3.4.2 Vibration. The self-locking fasteners shall withstand the applicable vibration tests specified in 4.5.7.

3.5 Workmanship. Parts are required to be free of burrs and slivers except slight burrs are permissible in the area of the self-locking element provided maximum locking torque values specified in table I are not exceeded.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements; however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

TABLE I. Torque (at room temperature in inch-pounds).

Bolt or Screw Size	Maximum Torque (installation or removal)		Minimum Breakaway		Tensile Preload (lbs) (fourth, ninth, and 14th installation cycles)	
	Class I	Class II	Class I	Class II	Class I	Class II
0.2500-28-UNJF-3A	30	60	3.5	7	4,400	2,300
0.3125-24-UNJF-3A	60	120	6.5	13	7,000	3,650
0.3750-24-UNJF-3A	80	160	9.5	19	10,800	5,650
0.4375-20-UNJF-3A	100	200	14	28	14,600	7,660
0.5000-20-UNJF-3A	150	300	18	36	19,500	10,200
0.5625-18-UNJF-3A	200	400	24	48	24,800	12,950
0.6250-18-UNJF-3A	300	600	32	64	31,000	16,200
0.7500-16-UNJF-3A	400	800	50	100	45,000	23,500
0.8750-14-UNJF-3A	600	1,200	70	140	61,000	32,000
1.0000-12-UNJF-3A	800	1,600	92	184	80,000	41,800
1.1250-12-UNJF-3A	900	1,800	117	234	102,000	53,600
1.2500-12-UNJF-3A	1,000	2,000	143	286	128,000	66,800

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4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.3)
- b. Quality conformance inspection (see 4.4)

4.3 Qualification inspection. Qualification inspection shall consist of the inspections listed in table II with self-locking feature incorporated. Qualification approval for the locking design is based on testing and evaluation of the design incorporated in 3A coarse threads for sizes smaller than No. 10 and 3A fine threads for size No. 10 and larger. Locking designs shall pass the quality conformance inspection (4.4) and conform to the dimensional limitations of MS15981.

4.3.1 Sampling instructions. The qualification test samples shall consist of 70 fasteners and 70 nuts for each diameter upon which qualification is desired. These fasteners shall incorporate the self-locking design and conform to the configuration listed in table III, but shall be of the material as specified in 3.2.1 and 3.2.2, and the nuts shall conform to the dimensions in table IV. Samples shall be identified as required and forwarded to the activity designated in the letter of authorization from the activity responsible for qualification (see 6.3).

4.3.2 Certified test report. The manufacturer shall make available to the activity responsible for qualification a certified test report showing that the manufacturer's product conforms to this specification. The test report shall include as a minimum, actual numerical results of each of the tests or examinations specified herein and listed in the order of their appearance in table II, including photographs of macro- and micro-examinations. When this report is made available, it shall be accompanied by a detail drawing which completely describes the manufacturer's product by specifying all dimensions and tolerances, composition of material, selected coating or plating applied, and the heat treatment. The manufacturer's part number for each size and length shall be included on the above drawing. Failure of a manufacturer to make available a satisfactory certified test report with the qualification samples shall be sufficient cause for rejection of the qualification request.

TABLE II. Qualification test and samples required.

Qualification	Test Paragraph	Class I	Class II
Tensile strength	4.5.1	5	5
Stress rupture	4.5.2	-	5
Examination of product	4.5.3	5	5
Torque	4.5.4	10	10
High temperature torque	4.5.5	10	10

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TABLE II. Qualification test and samples required - Continued.

Qualification	Test Paragraph	Class I	Class II
Minimum breakaway at maximum temperature	4.5.5.2	10	10
Reusability	4.5.6	10	10
Vibration	4.5.7	10	10

4.3.3 Retention of qualification. To maintain qualification on a QPL, certification shall be requested to indicate continued compliance with the requirements of this specification. Certification shall be requested from each manufacturer by the Naval Air Warfare Center Aircraft Division Warminster (NAWCADWAR), Code 6013, Warminster, PA 18974. NAWCADWAR will forward certification to the Naval Air Warfare Center Aircraft Division Lakehurst. Certification shall be at the time of the two-year review and shall be signed by a responsible official of management, attesting that the listed product(s) is (are) still available from the listed plant; can be produced under the same conditions as originally qualified; i.e., same process, materials, construction, design, manufacturer's part number or designation, and meets the requirements of the current issue of the specification. Failure to provide the certification will be cause for removal from the QPL.

4.4 Quality conformance inspection. Prior to installation of the self-locking element, the quality conformance inspections of the applicable fastener specification shall be met. After installation of the self-locking element onto the applicable fastener, the quality conformance inspections specified in table V shall be met. In addition, self-locking bolts and screws shall meet any other tests which are considered necessary by the procuring activity to determine conformance with the requirements of this specification.

4.4.1 Sampling. The sample shall be selected at random from each lot as specified below.

4.4.1.1 Random sample. A random sample is a specific number of items so selected that each item of the lot from which the sample is drawn has the same chance of being the first item in the sample. After the first item in the sample is drawn, each of the remaining items has the same chance of being the second item in the sample, and so on.

4.4.1.2 Lot. A "lot" shall consist of fasteners with the same diameter and of the same length; fabricated by the same process; heat treated in the same manner; and produced as one continuous run or order. These finished fasteners will then have the self-locking element incorporated, and this "lot" will be used in the Qualification/Quality Conformance Testing of the applicable fastener(s).

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TABLE III. Configuration of fasteners required for qualification tests.

Class I		Class II	
Part No.	Length Dash No.	Part No.	Length Dash No.
MS21134 or MS21250-04	022	NAS 6704	24
-05	022	6705	24
-06	022	6706	24
-07	022	6707	24
-08	022	6708	24
-09	022	6709	24
-10	022	6710	24
-12	022	6712	24
-14	022	6714	24
-16	022	6716	24
-18	022	6718	24
-20	022	6720	24

TABLE IV. Dimensions of nuts used for qualification tests (inches).

Thread size	Maximum across flats	Nut thickness ± 0.010	90 degree C-sink ± 0.010 dia.
0.2500-28-UNJF-3B	0.437	0.281	0.281
0.3125-24-UNJF-3B	.500	.328	.344
0.3750-24-UNJF-3B	.562	.328	.406
0.4375-24-UNJF-3B	.688	.375	.468
0.5000-20-UNJF-3B	.750	.375	.531
0.5625-18-UNJF-3B	.875	.422	.593
0.6250-16-UNJF-3B	.937	.468	.656
0.7500-16-UNJF-3B	1.062	.625	.781
0.8750-14-UNJF-3B	1.250	.656	.906
1.0000-12-UNJF-3B	1.437	.750	1.031
1.1250-12-UNJF-3B	1.625	.812	1.156
1.2500-12-UNJF-3B	1.812	.875	1.281

NOTE: Nuts shall be fabricated from the same material as the fasteners. Nuts for Class I shall be unplated or cadmium plated per QQ-P-416, Type I, Class 2. Nuts for Class II shall be unplated or threads silver plated per AMS 2411.

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4.4.1.3 Sampling plan. Sample sizes for examination of product shall be in accordance with MIL-STD-105 Inspection Level I. The acceptance and rejection criteria shall be applied for the following Acceptable Quality Levels (AQL's) applying to the corresponding class of characteristics:

Major 2.5 percent
 Minor A 4.0 percent
 Minor B 6.5 percent

4.4.1.3.1 Classification of defects. All dimensional characteristics are considered defective when out of tolerance. The classification of defects for self-locking fasteners shall be as follows:

Major:

101. Locking element missing (see applicable fastener standard).

Minor A:

201. Locking element location (see applicable fastener standard).

TABLE V. Quality conformance inspections.

Examination or Test	Test Paragraph	Inspection Level MIL-STD-105	AQL %
Tensile Strength	4.5.1	Level S-2	0.0
Examination of product	4.5.3		
- Presence of element	4.5.3	Level I	2.5
- Location of element	4.5.3	Level I	4.0
- Dimensions of element	4.5.3	Level I	4.0
- Presence of burrs and slivers	4.5.3	Level I	4.0
- Identification of product	4.5.3	Level I	6.5
Torque	4.5.4	See Table VI	Table VI
Reusability	4.5.6	Level I	2.5

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Minor B:

- 301. Burrs and slivers (see applicable standard).
- 302. Identification of product (see applicable standard).

4.4.1.4 Maximum torque, minimum breakaway torque and reusability. Sampling for these tests shall be in accordance with the attribute plan shown in table VI. The same sample shall be used throughout for these tests. The acceptance and rejection numbers shall apply to these tests taken separately. A fastener may be classified as defective for maximum torque, minimum breakaway torque or reusability.

TABLE VI. Attribute plan.

Lot size	Sample size	Acceptance number
Under 10,000	5	0
10,000 through 50,000	10	0
50,000 through 100,000	15	0
Over 100,000	27	1

4.4.2 Non-dry film lubricant removability. Non-dry film lubricant coated panels made of the same material and containing the same finish as the fastener product, excluding non-metals (plastics) shall be submerged for 10 ± 1 minutes in the cleaner specified in table VII. The panel shall then be wiped dry with a clean non-oily cloth or tissue. Failure of all lubricant to be removed from the panel by the above process shall be cause for rejection of the fastener product.

TABLE VII. Formulation of cleaner.

Ingredient	Specification	Percent by volume
Aromatic naphtha	TT-N-97, type I, grade B	50
Ethyl acetate	TT-E-751	20
Methyl ethyl ketone	ASTM-D740	20
Isopropyl alcohol	TT-I-735	10

4.5 Test methods.

4.5.1 Tensile strength. The tensile test shall be performed using nuts which meet the materials and dimensional requirements of table IV. The nuts shall engage the threads of fasteners which have grip portions, to within one to three thread pitches of the thread runout. Fasteners that do not have grip portions shall be engaged by the nut until the fastener protrudes from the top of the nut a distance of two thread pitches including chamfer, if any. The

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nuts shall be of sufficient strength to fail the fastener. At least two samples in assembly with nuts shall be baked at the temperature applicable to the class for six hours, then cooled at room temperature for not less than one hour. The baked assemblies and at least two others in the unbaked condition shall subsequently be tested in tension in accordance with the loads specified in table VIII.

4.5.2 Stress rupture (Class II only). The sample in assembly as specified in 4.5.1.1 with a nut which meets the material and dimensional requirements of table IV shall be maintained at $1200^{\circ} \pm 10^{\circ}\text{F}$. While at this temperature, an axial tensile load as specified in table VIII shall be applied continuously for 23 hours. Rupture of the sample within the specified time shall be cause for rejection.

4.5.3 Examination of product. The fasteners shall be examined for conformance to the applicable fastener standard relative to:

Presence of locking element.
Location of locking element.
Dimensions of locking element.
Presence of burrs or slivers.
Identification of product.

TABLE VIII. Qualification test bolt strength requirements.

Size	Tensile area, A (sq. in)	Minimum tensile breaking strength (lbs) 1/				
		Class I (450°F)		Class II (1200°F)		
		At Room temp.	At Room temp. after bake 2/	At Room temp.	At Room temp. after bake 2/	23 hrs @ 1200°F Rupture 3/ strength
0.2500-28	0.0404	7,200	5,000	5,600	3,900	2,600
0.3125-24	.0640	11,500	8,000	8,900	6,200	4,100
0.3750-24	.0951	17,000	11,900	13,300	9,300	6,100
0.4375-20	.1288	23,100	16,200	18,000	12,600	8,300
0.5000-20	.1717	30,900	21,600	24,000	16,800	11,100
0.5625-18	.2176	39,100	27,400	30,400	21,300	14,100
0.6250-18	.2724	49,000	34,300	38,100	26,600	17,700
0.7500-16	.3953	71,100	49,800	55,300	38,700	25,600
0.8750-14	.5392	97,000	67,900	75,400	52,800	35,000
1.0000-12	.7027	126,400	88,500	98,300	68,800	45,600
1.1250-12	.9007	162,100	113,400	126,000	88,200	58,500
1.2500-12	1.1233	202,100	141,500	157,200	110,000	73,000

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- 1/ Ultimate tensile strength = F_{tu} times "A" where F_{tu} = 180,000 psi for Class I and 140,000 psi for Class II. "A" is in square inches as defined in NAS 1348.
- 2/ Tensile loads after baking are 70 percent of the tensile loads at room temperature.
- 3/ Rupture strength based on F_{tu} = 65,000 psi.

4.5.4 Torque. The nuts used for this test shall be as specified in table IV, and shall assemble freely on the fastener up to the self-locking device. Each nut shall be screwed on and off the fastener a total of 15 consecutive installations and removals (see 6.4.1 and 6.4.4). Each installation shall consist of either turning the fastener until the nut's bearing surface has traveled completely along the thread length of the effective area of the specific element design or at least five complete turns of the nut after the threads of the nut have initially engaged the locking device, whichever provides the greater number of turns. For quality conformance inspection on fasteners without sufficient thread length for "X min" of MS15981, only a positive indication of torque is required for 15 installations and removals. Each removal shall consist of the same number of complete turns, in the opposite direction, as was required for the installation. The torque test shall run at a rate slow enough to yield a dependable measure of torque, and the temperature rise of the nut being tested shall not exceed 75°F. At every fourth, ninth, and 14th installation cycle, the test bolt shall be seated against a hardened steel bushing and torqued to develop the tensile preload specified in table I. On the seventh and 15th removal cycle, the minimum breakaway torque shall not be less than the applicable value specified in table I. A new nut and fastener shall be used for each test. For qualification, ten of the sample fasteners supplied shall be used for this test.

4.5.4.1 Maximum torque. Maximum torque shall be the maximum value indicated by the torque device during the 15 installations and removals (see 6.4.2). This torque value shall not exceed the applicable value shown in table I.

4.5.4.2 Minimum breakaway torque. Minimum breakaway torque shall be the minimum torque required to start removal of the nut from the installed position (see 6.4.3). It shall be determined at the start of the first and 15th removal. This torque value shall not be less than the applicable values shown on table I.

4.5.5. High temperature torque. The nuts used in this test shall be as specified in table IV. The nuts shall be screwed on the fastener until the bearing surface of the nut has traveled completely along the thread length of the effective area of the specific locking design feature or at least five complete turns after the threads of the nuts have initially engaged the locking design feature, which ever provides the greatest number of turns. Ten new fasteners shall be subjected to this test. These assemblies shall be conditioned at the high temperature of 450°F/1200°F (Class II) for six hours, as applicable. The assemblies shall be conditioned in air to room temperature for not less than one hour. The assemblies shall then be tested as specified in 4.5.4. Maximum locking torque readings shall be taken at each installation and removal of the nut. Exposed threads may be mechanically cleaned prior to nut removal.

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4.5.5.1 Maximum torque at temperature. Maximum torque shall be the maximum value indicated by the torque device during the installation and removal (see 6.4.2). This value shall not exceed 150 percent of the applicable value shown in table I.

4.5.5.2 Minimum breakaway torque at temperature. Using the same assemblies tested in 4.5.4.2, minimum breakaway torque shall be determined on the first removal cycle at temperature while the fastener engagement with the nut is made in accordance with 4.5.3. The fastener assembly shall have been preheated six hours at 450°F and 1200°F, as applicable, and held at this temperature during test. This torque value shall not be less than the applicable requirement listed in table I.

4.5.6 Reusability. The threads of the fasteners and nuts in the torque tests shall show no distortion or scratches deep enough to reduce the efficiency of the threads. The threads of the fasteners and nuts shall remain in a serviceable condition and shall freely permit installation with the fingers of a new nut up to the self-locking element.

4.5.7 Vibration. The fasteners shall be assembled in accordance with MIL-STD-1312-7, Vibration Test, with nuts specified in table IV, to the assembly torque values specified in table IX. The nuts shall then be removed and reinstalled to this torque four additional times. The assembled specimens shall be vibrated at room temperature for six hours. The above procedure will be repeated, and the assembled specimens baked at 450°F or 1200°F, as applicable for six hours. These fasteners will then be vibrated at room temperature for six hours. A new nut/fastener assembly will be used for the Class II (room temperature/1200°F) vibration tests. Vibration tests on bolts larger than 0.50-inch size are waived, providing that 0.50-inch bolts and smaller of the same type and design of locking device have satisfactorily passed the vibration test. The fixture shall then be vibrated with an essentially sinusoidal waveform at frequency of 1,750 to 1,800 cycles per minute and an amplitude of 0.45 inch, +0.015, -0.000. Determinations shall be made throughout the test to guarantee that the assembly is traversing the entire length of the slots in the test fixture. The test shall be run for 30,000 cycles except that it may be stopped prior to the completion of the 30,000 cycles in the event a nut becomes disassembled from the fastener. Upon completion of the test, the relative rotation between each nut and fastener shall be measured. The relative rotation between any nut and fastener shall not exceed 360 degrees. The fastener samples shall be examined under 10X magnification for cracks. The samples shall not have developed any cracks.

TABLE IX. Vibration torque values.

Bolt or screw size	Max. assembly torque after bake (inch - pounds)
0.2500	60
.3125	120
.3750	160
.4375	200
.5000	300

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4.5.8 Inspection of packaging. The sampling and inspection of the preservation, packing and container marking shall be in accordance with PPP-H-1581.

5. PACKAGING

5.1 Packaging. Packaging shall be in accordance with PPP-H-1581.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The self-locking fasteners are intended for use in tapped holes in place of lock-wire bolts and screws.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number and date of the specification.
- b. Part number in accordance with applicable fastener standard.
- c. Class (see 1.2).
- d. Levels of packaging (see 5.1).
- e. Issue of DODISS to be cited in the solicitation (see 2.1.1).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in QPL-8961 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the QPL is the Naval Air Systems Command (Attention: Commanding Officer, Naval Air Warfare Center Aircraft Division Lakehurst, Systems Requirements Department, Code SR3, Lakehurst, NJ 08733-5100.); however, information pertaining to qualification of products and a letter of authorization may be obtained from the NAWCADWAR, Code 6013, Warminster, PA 18974-5000.

6.3.1 Qualification tests will be authorized only upon presentation of certified test reports indicating that the fasteners have met or will meet the requirements of this specification.

6.4 Definitions.

6.4.1 Installed. A nut is considered installed when the minimum of two threads plus the chamfer of the external thread extends beyond the top of the nut.

6.4.2 Maximum locking torque. Maximum locking torque is the highest self-locking torque encountered in any installation or removal cycle with no load on the base of the nut.

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6.4.3 Minimum breakaway torque. The minimum breakaway torque is that torque required to start nut rotation from a fixed position during removal cycle with no load on the base of the nut.

6.4.4 Removal cycle. The removal cycle shall be considered complete when the self-locking device is disengaged.

6.5 Subject term (keyword) listing:

All-Metal
Patch
Plug
Strip

6.6 Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

Custodians:
Army - AV
Navy - AS
Air Force - 99

Preparing activity:
Navy - AS
(Project 53GP-0241)

Reviewer activities:
Army - AR, EA, MI
Navy - OS
Air Force - 82
DLA - IS

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
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I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER
MIL-F-8961A

2. DOCUMENT DATE (YYMMDD)
9/28/92

3. DOCUMENT TITLE

FASTENER ELEMENT, SELF-LOCKING, EXTERNALLY THREADED, 450°F and 1,200°F

4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)

7. DATE SUBMITTED (YYMMDD)

(1) Commercial

(2) AUTOVON

(If applicable)

8. PREPARING ACTIVITY

COMMANDEERING OFFICER, NAVAL AIR
WARFARE CENTER AIRCRAFT DIVISION LAKEHURST
SYSTEMS REQUIREMENTS DEPARTMENT

b. TELEPHONE (Include Area Code)

(1) Commercial

(2) AUTOVON

(908) 323-7488

624-7488

c. ADDRESS (Include Zip Code)

CODE SR3
LAKEHURST, NJ 08733-5100

IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:

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