

| INCH POUND |

MIL-F-18240E

1 December 1989

SUPERSEDING

MIL-F-18240D

25 February 1972

MILITARY SPECIFICATION

FASTENER ELEMENT, SELF-LOCKING, THREADED FASTENER, 250 °F MAXIMUM

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers the performance requirements for three types of self-locking elements for use in externally and internally threaded fasteners, such as bolts, screws and nuts to be used in fasteners with either UNC, UNJC, UNF, or UNJF threads and where the temperatures will not exceed 250°F.

1.2 Classification. The self-locking elements covered by this specification are of the following types as specified.

Type N Plug/Pellet

Type L Strip

Type P Patch

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards and handbooks. The following specifications, standards, and handbooks form a part of this specification to

Beneficial comments, (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to the Naval Air Engineering Center, Systems Engineering and Standardization Department (Code 53), Lakehurst, NJ 08733-5100, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 53GP

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the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specification and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS FEDERAL

QQ-P-416	Plating, Cadmium (Electrodeposited).
GGG-W-686	Wrench, Torque.
PPP-H-1581	Hardware (Fasteners and Related Items) Packaging of.

MILITARY

MIL-S-8879	Screw Threads, Controlled Radius Root with Increased Minor Diameter, General Specification for.
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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

HANDBOOKS

AIR FORCE - NAVY AERONAUTICAL

AN 3 thru AN 20	Bolt, Machine, Aircraft.
AN 315	Nut, Plain, Airframe.
AN 121501 thru AN 121525	Nut, Plain.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Naval Publications and Forms Center (Attn: NPODS), 5801 Tabor Ave., Philadelphia, PA 19120-5099.)

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be 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 issue of the documents cited in the solicitation (see 6.2).

NATIONAL AEROSPACE STANDARDS (NAS)

NAS 600 thru NAS 602 Screw, Machine, Aircraft, Pan Head, Phillips.
Recess, Full Threaded, Alloy Steel.

(Application for copies should be addressed to the Aerospace Industries Association of America, Inc., 1250 Eye Street, N.W., Washington, DC 20005.)

ASTM D-1535 Specifying Color By The Munsull System

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

(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 (except for related associated detail specifications, specification sheets or MS standards), the text of this document shall take precedence. Nothing in this document, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

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

3.1.1 Extent of qualification. Qualification approval of external self-locking element in UNC or UNJF external thread constitutes approval of external self-locking element in UNC, UNJC, UNF, or UNJF external thread of the same diameter. Qualification approval of internal self-locking element in UNC or UNJF internal thread constitutes approval of internal self-locking element in UNC, UNJC, UNF, or UNJF internal thread of the same diameter.

3.2 Design. The self-locking element design shall conform to the types illustrated on figure 1 and MS15981.

3.2.1 Dimensions. The external and internal self-locking element dimensions shall be as specified in table I and figure 1. In cases of dimensional conflict, the dimensions of figure 1 and table I shall take precedence over those identified in MS15981.

3.2.2 Threads. Threads shall be in accordance with the applicable drawing.

3.3 Performance characteristics.

3.3.1 Torque. The self-locking element shall conform to the installation and removal torque values listed in table II (see 4.5.2).

3.3.2 High temperature torque. The self-locking element shall conform to the high temperature torque test in 4.5.3.

3.3.3 Minimum breakaway torque at maximum temperature. The self-locking element shall meet the minimum breakaway torque values in table II at maximum temperature (see 4.5.4).

3.3.4 Vibration. The nut or bolt shall be subjected to and pass the vibration test for 30,000 cycles (see 4.5.5). For qualification purposes, the activity responsible for qualification may waive the vibration requirement for thread sizes greater than 1/2-inch provided the 1/2-inch thread size having the same type locking element has passed the vibration test. The vibration test is not required for self-locking elements for screw thread sizes below size no. 10.

3.3.5 Tensile strength. The nut, bolt or screw shall conform to the tensile requirements specified in the applicable specification and in 4.5.6.

3.4 Reusability. Nuts shall be capable of 15 unloaded (no preload) installation and removal cycles without damage to either the nut or bolt threads (see 4.5.2 d through h and 4.5.7).

3.5 Identification.

3.5.1 Self-locking element. The self-locking element shall be identified by color code as identified in ASTM D1535 and in table VIII.

3.5.2 Color-company identification. Each manufacturer of the products specified herein shall color code their self-locking elements produced per this specification in accordance with their designated colors identified per QPL-18240. These identification colors shall be implemented in new production lots no later than the date of publication of this revision. All previous color designations are cancelled as of the date of publication of this revision. Existing stock may be used until depleted.

3.6 Workmanship. Workmanship shall be consistent with high-grade commercial practice. 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 II are not exceeded.

4. QUALITY ASSURANCE

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 the specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

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 contractors overall inspection system or quality program. The absence of any inspection requirements in the specifications 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 conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

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 be performed at a laboratory acceptable to the Government on sample units produced with equipment and procedures normally used in production. Qualification inspections shall be as specified in table VII. Qualification inspection shall be limited to the fasteners shown in tables IV and V and shall be authorized only upon presentation of certified test reports to the activity responsible for qualification. The test reports shall include actual results of all the tests and a drawing which shows the location, size, material, method of attachment and protrusion of the self-locking element for each diameter upon which qualification is desired. A manufacturer's designation shall be submitted for the locking element to be used in each diameter of fastener. For qualification of sizes up to and including 1/2" (government designation 80), the manufacturer must submit samples for full testing to be conducted by the qualifying test facility for each individual desired size. For qualification of sizes above 1/2" nominal diameter size, the manufacturer must submit actual torque test data and samples of the specific size to the qualifying testing facility and must be qualified to the 1/2" nominal diameter size.

4.3.1 Retention of qualification. Certification shall be requested by Naval Air Development Center from each manufacturer and forwarded to the preparing activity for those specifications which do not contain a requirement for retention of qualification by testing. Certification shall be at the time of the two year review and shall be signed by a responsible official or management, attesting that the listed product(s) is 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, meets the requirements of the current issue of the specification. Failure to provide the certification will be cause for removal from the QPL.

4.3.2 Sampling instructions. The qualification inspection samples shall consist of 60 fasteners with the self-locking element conforming to the dimensions specified in table IV (for bolts and screws) and table V (for nuts) for each diameter upon which qualification is desired. All supplementary parts necessary for the inspections shall conform to the dimensions specified in tables IV and V and shall be furnished by the manufacturer. 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).

4.4 Quality conformance inspection. Prior to installation of the self-locking element, the quality conformance inspections of the applicable fastener specification shall be met. In addition, after installation of the self-locking element on to the applicable fastener, the quality conformance inspections specified in table VI shall be met. Also, self-locking bolts, screws, and nuts 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. For the inspections specified herein, the sample bolts, screws or nuts shall be selected at random from each lot (as defined below) and in accordance with table VI, and table IX.

4.4.1.1 Lot. A lot shall consist of finished bolts or screws or nuts with the self-locking element incorporated which are of the same diameter and length, fabricated by the same process, heat treated in the same manner, and produced as one continuous run or order or part thereof, whichever is of the smaller quantity.

4.5 Methods of inspection.

4.5.1 Examination of product. The bolts, screws or nuts shall be examined for the following items before any installation (of the fastener containing the self-locking element) into other mating parts (for example, the mating nut to be fastened to the bolt containing the self-locking element) and before any other tests are conducted.

- a. Presence of self-locking element.
- b. Location of self-locking element.
- c. Dimensions of self-locking element.
- d. Presence of burrs and slivers (see 3.6).
- e. Identification of product.

4.5.2 Torque.

a. Ten sample fasteners with self-locking elements shall be used for qualification.

b. For qualification purposes for self-locking externally and internally threaded fasteners, the bolt shall be specified in table IV and the nut as specified in table V. For quality conformance purposes, the bolts/nuts shall be specified in the applicable document which requires a self-locking element per MIL-F-18240 and the mating fastener shall be appropriately matched in terms of tensile strength and thread type to the applicable fastener containing the self-locking element.

c. Carbon and alloy steel nuts shall be used with carbon and alloy steel bolts or screws. Corrosion resistant steel nuts shall be used with corrosion-resistant steel bolts or screws.

d. Install the nut on the bolt or screw until the nut or bolt has traveled completely along the threaded length of the self-locking element, or until 5 complete turns after the threads have engaged the self-locking element, or until a minimum of 2 threads of the bolt or nut is showing through, whichever provides the greatest number of turns.

e. During step (d) above, measure the torque using a calibrated torque wrench per GGG-W-686. Maximum torque shall be the maximum torque required to install the nut onto the bolt during the portion of engagement when the nut or bolt is traveling along the threaded length of the self-locking element. Maximum torque shall be determined at the start of the first, seventh, and fifteenth removals and shall meet the limitations of table II.

f. The test shall be run at a rate slow enough to yield a dependable measure of torque readings. The temperature rise of the fasteners shall be not greater than 75°F above the starting temperature.

g. Disengage each nut or bolt from the self-locking element.

h. Repeat steps (d) through (g) a total of 15 consecutive times.

i. Minimum breakaway torque shall be the minimum torque required to start removal of the nut from the installed position. Minimum breakaway torque shall be determined at the start of the first and fifteenth removals and shall meet the limitations of table II.

j. Any torque value determined for this test to be in excess of the limitations of table II constitutes failure of this test.

4.5.3 High temperature torque.

a. Assemble ten new fasteners as tested in 4.5.2, steps b through d.

b. Bake the assemblies to 250°F ±10° for 3 hours.

c. Air cool the assemblies to room temperature for a minimum of 1 hour.

d. Test the torque values as indicated in 4.5.2, steps e through i, except that the maximum torque values must be not greater than 150 percent of the values listed in table II.

4.5.4 Minimum breakaway torque at maximum temperature.

a. Assemble the same ten fasteners used in paragraph 4.5.3.

b. Bake the assemblies for one hour to 250°F ±10°.

c. While the fastener is still at 250°F, determine the minimum breakaway torque value shall not be less than the minimum breakaway torque value listed in table II.

4.5.5 Vibration. Sample nuts and bolts of the size and quantities specified in table III shall be subjected to the vibration test specified in MIL-STD-1312-7, Vibration. The nuts shall then be removed and reinstalled to this torque four additional times before being vibrated. The fastener assembly shall traverse the entire length of the slots in the test fixture during the test.

4.5.5.1 Vibration failure conditions. The self-locking element shall have failed the vibration test for any of the following conditions:

- a. When any structural failure occurs in the self-locking element area during the vibration test such as a crack intersecting the region of threads containing self-locking element.
- b. When any nut rotates greater than 360° during 30,000 cycles.
- c. When any nut can be turned completely on or off the bolt or screw, with the fingers, during or after completion of 30,000 cycles.
- d. When any nut comes completely off the bolt during the 30,000 cycles.

4.5.6 Tensile strength. The tensile test shall be conducted as specified in the applicable fastener specification. When the tensile test is conducted for qualification purposes, the following shall apply:

- a. For self-locking externally threaded fasteners, the nuts shall meet the dimensions of table V and shall engage the threads of the bolts or screws that have grip portions to a minimum of two thread pitches from the thread runout. The nuts shall be of sufficient strength as to fail the bolts or screws.
- b. For self-locking internally threaded fasteners, the bolt shall meet the length and diameter of bolts of table IV. The bolts shall be of sufficient strength to exceed the minimum specified tensile strength of the nut.
- c. Bolts and screws that do not have grip portions shall be engaged by the nut until the bolt or screw protrudes from the top of the nut a distance of two thread pitches.

4.5.7 Reusability. At the conclusion of the tests specified in 4.5.2 (and 4.5.3 and 4.5.4 for qualification testing), the mating nuts and bolts (or screws) used in this test shall be examined for damage to the threads. Noticeable distortion or scratches deep enough to reduce the efficiency of the threads shall be considered a failure of the self-locking element. The threads shall remain in serviceable condition and permit the installation of a new fastener freely with the fingers up to the self-locking element.

4.5.8 Noncompliance. If a sample fails to pass group B inspection of table VI, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure and take corrective action on the materials or processes, or both, as warranted, and on all units of products which can be corrected and which are manufactured under essentially the same materials and processes, and which are considered subject to the same failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the inspection activity has been taken. After corrective action has been taken, group B inspection shall be repeated on additional sample units (all test and examinations, or the test which the original sample failed, at the option of the qualifying activity). Groups A and B inspections may be reinstituted; however, final acceptance and shipment shall be withheld until the group B inspection has shown that the corrective action was successful. In the event of failure after reinspection, information concerning the failure shall be furnished to the cognizant inspection activity and the qualifying activity.

4.5.9 Inspection of packaging. The sampling and inspection of the preservation, packing and container marking shall be in accordance with PPP-H-1581 to determine conformance to section 5.

5. PACKING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with PPP-H-1581 and the applicable standard.

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 elements while covered by this specification are intended to be incorporated in external or internal screw threads to be used in applications where maximum temperature does not exceed 250°F. When these self-locking elements are incorporated in external threads and are used in compliance with MS15981, all the configurations of Figure 1 are interchangeable. A specific type should be specified only when required by design or application requirements. Lubrication of the fastener containing a self-locking element per this specification is not recommended because the lubricant may reduce the minimum breakaway torque.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DODISS to be cited in the solicitation.
- c. Type (see 1.2, table I and figure 1).
- d. Part number in accordance with the applicable standard.
- e. Levels of preservation and packing (see section 5).

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 qualified products list QPL-18240, 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 Qualified Products List is the Naval Air Systems Command, Attention: AIR-53033G, Washington, DC 20360; however, information pertaining to qualification of products and a letter of authorization may be obtained from the Naval Air Development Center, Code 6013, Warminster, PA 18974.

6.3.1 Qualification evaluation. Qualification inspection and evaluation of type N (see figure 1) locking element designs were based on the protrusion of the element being in accordance with figure 1, dimension "B". Type N designs with protrusion of "B + 0.007" and design that are otherwise the same as listed, also have qualification approval. To identify the element design with greater protrusion of the dimension "B + 0.007", figure 1 of this

specification, the additional +0.007 protrusion must be specified on the standard or drawing for the part, for nonstandard parts that require a specific configuration, add a "P" to the government designation.

6.4 Quality conformance inspection. The quality conformance inspections before installation of the self-locking element shall be conducted by the fastener manufacturer or fastener supplier or the company installing the self-locking element. The company installing the self-locking element is responsible for the documentation proving that the fastener product has met all the quality conformance inspections.

6.5 Definitions.

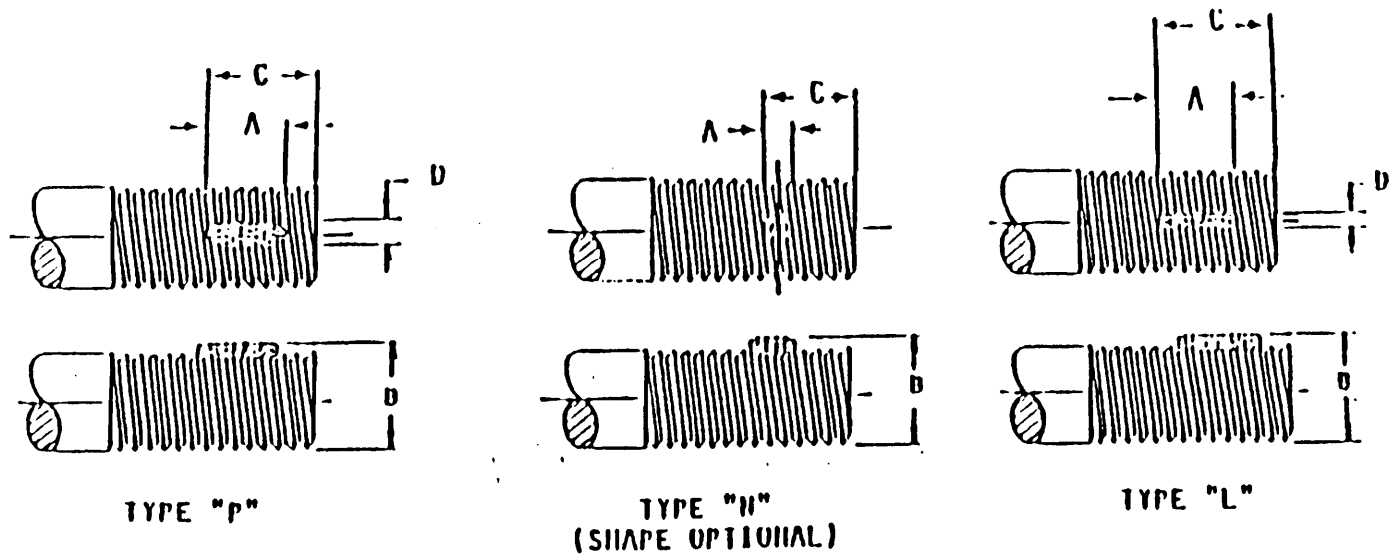
6.5.1 Self-locking externally or internally threaded fastener(s). In this specification a "self-locking externally or internally threaded fastener" refers to bolts, screws, or nuts that incorporate self-locking elements conforming to this specification.

6.6 Subject term (keyword) listing.

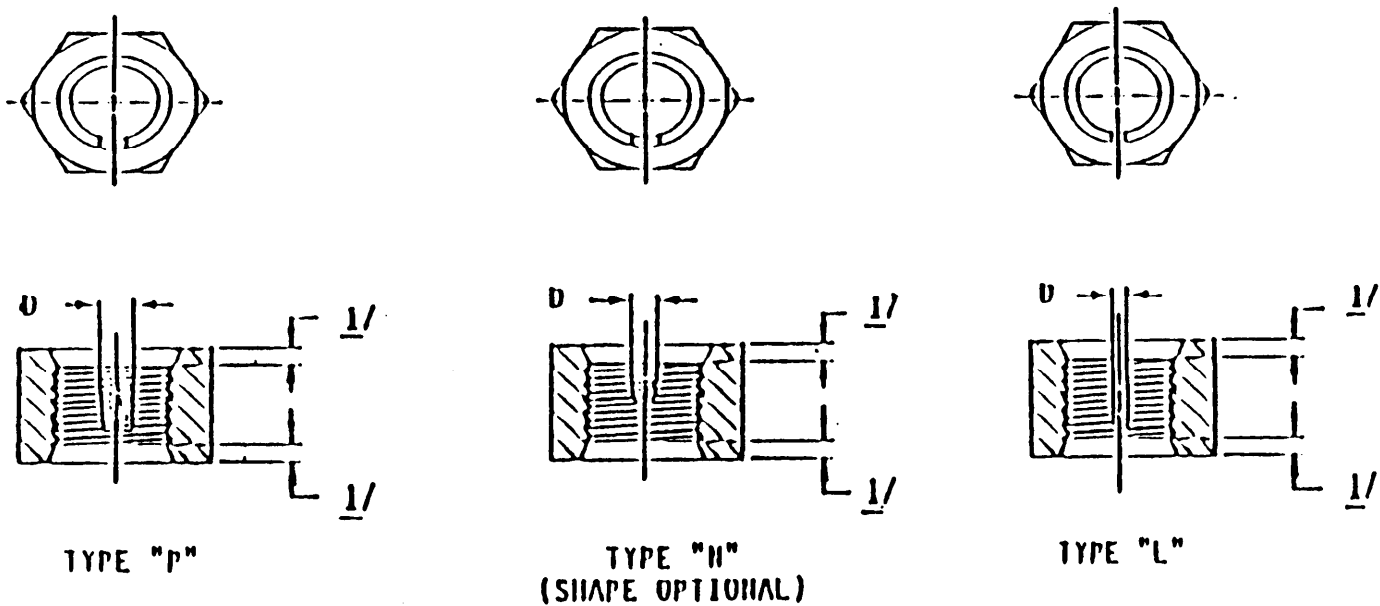
Element, self-locking
Fasteners, threaded

6.7 Usage. Type N element, plug/pellet configuration (previously identified as configuration A in revision D, dated 25 February 1972) is intended to be installed via a hole drilled into the fastener. Type L element, strip configuration (previously identified as configuration B in revision D) is intended to be installed via a strip cut through the threads parallel to the length of the fastener. Type P element, patch configuration (previously also identified as configuration B) is intended to be installed without removal of any material of the fastener.

6.8 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.



250°F SELF-LOCKING ELEMENT FOR EXTERNALLY THREADED FASTENERS



250°F SELF-LOCKING ELEMENT FOR INTERNALLY THREADED FASTENERS 2/

NOTES:

- 1/ LENGTH OF SELF-LOCKING ELEMENT SHALL ALLOW A MINIMUM OF ONE COMPLETE THREAD PITCH ON EACH SIDE OF NUT SELF-LOCKING ELEMENT. (EXCEPT FOR TYPE P (PATCH) WHERE ONE-HALF THREAD FOR SIZES 3/8" DIAMETER IS ACCEPTABLE, PROVIDED THE FASTENER CAN BE ENGAGED WITH THE FINGERS AT LEAST ONE COMPLETE REVOLUTION OR ONE THREAD.)
- 2/ THE LENGTH, WIDTH AND QUANTITY OF SELF-LOCKING ELEMENTS ARE OPTIONAL TO MEET THE TORQUE REQUIREMENTS OF TABLE 11.

FIGURE 1. Self-locking elements for threaded fasteners.

TABLE I. Self-locking element dimensions. (see figure 1)

Gov't Des.	Nom dia	Type	A		B		C		D Min
			Max	Min	Max	Min	Max	Min	
04	.112	L. P	.250	.125	.115	.105	.312	.180	.025
		N	.106	.053			.161	.121	.053
06	.138	L. P	.312	.156	.141	.131	.390	.234	.030
		N	.106	.066			.184	.144	.066
08	.164	L. P	.312	.156	.167	.157	.390	.234	.030
		N	.124	.084			.192	.152	.084
10	.190	L. P	.312	.156	.193	.183	.390	.234	.030
		N	.124	.084			.208	.150	.084
40	.250	L. P	.326	.178	.253	.243	.415	.267	.025
		N	.144	.089			.231	.191	.089
50	.3125	L. P	.364	.208	.315	.305	.468	.312	.025
		N	.188	.130			.278	.222	.130
60	.375	L. P	.474	.208	.378	.368	.578	.312	.035
		N	.166	.146			.284	.230	.146
70	.4375	L. P	.456	.250	.440	.430	.581	.375	.035
		N	.166	.146			.301	.261	.146
80	.500	L. P	.581	.250	.503	.493	.706	.375	.035
		N	.166	.146			.301	.261	.146
90	.5625	L. P	.827	.278	.566	.552	.954	.417	.055
		N	.199	.175			.363	.323	.175
100	.625	L. P	.850	.278	.628	.616	.986	.417	.055
		N	.197	.175			.363	.323	.175
120	.750	L. P	.999	.312	.753	.741	1.150	.469	.055
		N	.235	.209			.411	.321	.209
140	.875	L. P	1.143	.357	.878	.864	1.311	.536	.055
		N	.235	.209			.427	.387	.209
160	1.000	L. P	1.250	.417	1.003	.987	1.437	.625	.055
		N	.235	.209			.427	.387	.209
180	1.125	L. P	1.417	.417	1.128	1.112	1.632	.625	.055
		N	.266	.240			.516	.387	.240
200	1.250	L. P	1.604	.417	1.253	1.237	1.819	.625	.055
		N	.266	.240			.516	.452	.240

NOTES:

- 1/ 1/2 inch size and larger may have two self-locking elements. They shall be not more than 120 degrees of thread diameter apart.
- 2/ Dimensions are in inches.

TABLE II. Torque. 1/

Bolt, screw or nut thread size	Maximum torque (inch pounds)	Minimum breakaway torque (inch pounds)
No. 4-40	3	0.5
No. 6-32	6	1.0
No. 8-32	9	1.5
No. 10-32	13	2.0
1/4-28	30	3.5
5/16-24	60	6.5
3/8-24	80	9.5
7/16-20	100	14.0
1/2-20	150	18.0
9/16-18	200	24.0
5/8-18	300	32.0
3/4-16	400	50.0
7/8-14	600	70.0
1-12	800	92.0
1-1/8-12	900	117.0
1-1/4-12	1000	143.0

1/ These values apply to MIL-S-8879 and MIL-S-7742 threads.

TABLE III. Vibration requirements.

Nut size	Bolt size	MIL-STD-1312, -7, vibration	
		Bolts and nuts required (min. of each)	Max. torque (in.-lb.)
10-32	AN3-15A	5	36
1/4-28	AN4-16A	5	60
5/16-24	AN5-16A	5	120
3/8-24	AN6-17A	5	160
7/16-20	AN7-17A	5	200
1/2-20	AN8-20A	5	300

TABLE IV. Length and diameter of bolts and screws required for qualification inspection.

Basic part no.	Length dash no.	Basic part no.	Length dash no.
NAS600	12P	AN 8	20
NAS601	12P	AN 9	21
NAS602	12P	AN 10	21
AN 3	15	AN 12	21
AN 4	16	AN 14	23
AN 5	16	AN 17	24
AN 6	17	AN 18	25
AN 7	17	AN 20	27

TABLE V. Dimensions of nuts required for qualification tests (inches).

Thread size	Maximum across flats	90-degree csink dia.	
		Nut thickness	+ .010
No. 4-40 UNJC-3B	0.250	0.203	0.132
No. 6-32 UNJC-3B	.312	.250	.168
No. 8-32 UNJC-3B	.344	.250	.194
No. 10-32 UNJF-3B	.375	.250	.220
1/4-28 UNJF-3B	.437	.281	.281
5/16-24 UNJF-3B	.500	.328	.344
3/8-24 UNJF-3B	.562	.328	.406
7/16-20 UNJF-3B	.688	.375	.468
1/2-20 UNJF-3B	.750	.375	.531
9/16-18 UNJF-3B	.875	.422	.593
5/8-18 UNJF-3B	.937	.468	.656
2 3/4-16 UNJF-3B	1.062	.625	.781
7/8-14 UNJF-3B	1.250	.656	.906
1-12 UNJF-3B	1.437	.750	1.031
1-1/8-12 UNJF-3B	1.625	.812	1.156
1-1/4-12 UNJF-3B	1.812	.875	1.281

- Notes: 1/ For thread size 9/16 inch and larger, nuts shown on AN315 may be used except for the countersink, which is to be altered to 90 degrees by 0.030 inch over OD of threads. For thread sizes 3/8 through 1 inch, nuts shown on AN121501 through AN121525 may be used.
- 2/ Material of nuts used to test externally threaded fasteners with self-locking elements - carbon steel or alloy steel with cadmium plate as per QQ-P-416, Class 2, Type 1.

TABLE VI. Quality conformance inspections.

Examination or test	Requirement Paragraph	Test Paragraph	Inspection level per	AQL %
<u>Group A</u>				
Reusability	3.4	4.5.7	MIL-STD-105, level I	2.5
Examination of product:	3.6	4.5.1		
Presence of self-locking element	3.6	4.5.1	MIL-STD-105, level I	2.5
Location of self-locking element	3.2	4.5.1	MIL-STD-105, level I	4.0
Dimensions of self-locking element	3.2.1	4.5.1	MIL-STD-105, level I	4.0
Presence of burrs and slivers	3.6	4.5.1	MIL-STD-105, level I	4.0
Identification of product	3.5	4.5.1	MIL-STD-105, level I	6.5
<u>Group B</u>				
Torque	3.3.1	4.5.2	see table IX	see table IX
Tensile strength	3.3.5	4.5.6	MIL-STD-105, level S-2	0.0

TABLE VII. Qualification tests.

Inspection	Requirement Paragraph #	Test method paragraph #
Torque	3.3.1	4.5.2
High temperature torque	3.3.2	4.5.3
Minimum breakaway torque at maximum temperature	3.3.3	4.5.4
Vibration	3.3.4	4.5.5
Tensile strength	3.3.5	4.5.6
Reusability	3.4	4.5.7
Identification of product	3.5	4.5.1
Examination of product	3.6	4.5.1

TABLE VIII. Basic color limits for the self-locking element

BASIC COLOR	LIMITS Per ASTM D1535
Blue	10.0B min., 8 Chroma min., 6 value min. 7.5PB max., 10 Chroma min., 4 value min. 2.5PB min., 10 Chroma min., 4 value min.
Green	10.0G max., 4 Chroma min., 4 value min. 7.5 G 4 Chroma min., 4 value min. 5.0 G min., 4 Chroma min., 4 value min.
Plum	5.0RP min., 8 Chroma min., 5 value max. 7.5RP 8 Chroma min., 5 value max. 10.0RP max., 8 Chroma min., 5 value max.
Yellow	10.0Y max., 2 Chroma min., 6 value min. 7.5 Y 2 Chroma min., 6 value min. 5.0 Y min., 2 Chroma min., 6 value min.
Red	10.0R max., 8 Chroma min., 5 value min. 7.5 R 8 Chroma min., 5 value min. 5.0 R min., 8 Chroma min., 5 value min.
White	N 9.5 max. / 90.0 % R N 7.25 min / 46.8 % R
Brown	2.5YR min., 4 Chroma min., 4 value max. 5.0YR 4 Chroma min., 4 value max. 7.5YR max., 4 Chroma min., 4 value max.

(See QPL-18240 for current approved sources)

TABLE IX. Attribute plan for quality conformance torque tests

Lot size	Sample size	Acceptance number of failed parts
Under 10,000	5	0
10,000 through 50,000	10	0
50,001 through 100,000	15	0
Over 100,000	27	1

Custodians:

Navy - AS
 Air Force - 11
 Army - AV

Preparing activity

Navy - AS
 (Project No. 53GP-0132)

Review activities:

Navy - OS
 Air Force - 99
 Army - AR, EA, MI
 DLA - IS

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER
MIL-F-18240E2. DOCUMENT TITLE
FASTENER ELEMENT, SELF-LOCKING, THREADED FASTENER, 250 Deg F MAX

3. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

☐ VENDOR☐ USER☐ MANUFACTURER☐ OTHER (Specify): _____

5. ADDRESS (Street, City, State, ZIP Code)

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7. NAME OF SUBMITTER (Last, First, MI) - Optional

8. WORK TELEPHONE NUMBER (Include Area Code) - Optional

9. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

10. DATE OF SUBMISSION (YYMMDD)

(Fold along this line)

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