

British Standard Aerospace Series: Specification for

Procurement of self-locking nuts with non-metallic locking element. Metric series

Série aérospatiale : Approvisionnement en écrous autofreinés à élément de freinage non métallique.
Série métrique — Spécifications

Luft- und Raumfahrt-Reihe: Nichtmetallische Klemmelemente an selbstsichernden Schrauben.
Metrische Reihe

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Foreword

This British Standard, which has been prepared under the direction of the Aerospace Standards Committee, is intended primarily for use in conjunction with those 'A' series British Standard aerospace specifications in which conformity to this standard is a specific requirement.

It may also be applicable to other aerospace metric threaded fasteners if required by the relevant specification, drawing, contract or order.

This standard invokes:

- (a) quality assurance approval of the manufacturer; and
- (b) product qualification testing approval.

Appendix A is included in this standard to provide information on the axial loads and torque values for thread sizes M8 × 1.25, M10 × 1.5 and M12 × 1.5. When there is no further requirement for these sizes appendix A will be deleted by amendment.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

1. Scope

This British Standard specifies the requirements for the procurement of self-locking nuts with non-metallic locking element.

This standard invokes product qualification testing requirements and quality assurance approval procedure for manufacture of aerospace standard parts.

This standard is intended primarily for use with 'A' series British Standard aerospace standards for metric self-locking nuts with non-metallic locking element. It is also applicable to other aerospace self-locking nuts if required by the relevant drawing, contract or order.

NOTE 1. Where the requirements of the nut standard or drawing differ from this standard they take precedence over the requirements of this standard.

NOTE 2. The titles of the publications referred to in this standard are listed on the inside back cover.

2. Definitions

For the purposes of this British Standard the following definitions apply.

2.1 self-locking nut with non-metallic locking element.

A self-contained unit which consists of a nut body surmounted by a non-metallic locking element which imposes friction between itself and the male screw thread upon which it is mounted.

2.2 nut body. The portion of the self-locking nut containing the screw thread.

2.3 locking element. The non-metallic portion of the self-locking nut designed to impose friction between itself and the male screw thread with which it is engaged. The locking element does not operate by means of a separate movement as a result of installation and does not depend upon pressure on the bearing surface for the locking action.



Amendment No. 1
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(Aerospace Series)

Specification for procurement of self-locking nuts
with non-metallic locking element.
Metric series

Revised text

AMD 5767
April 1990

Clause 3.2.3

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.2** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.4.2

In the column headed '**Characteristic**', after the words 'Magnetic permeability' insert 'and residual magnetism'.

In the column headed '**Technical requirement**' delete 'nut standard or drawing' and substitute 'material specification of the product. Residual magnetism shall not exceed 0.5 gauss.'

In the column headed '**Inspection and test method**' delete 'Test under consideration' and substitute 'Magnetic field indicator of suitable calibration, used in accordance with the manufacturer's instructions.'

AMD 5767
April 1990

Clause 3.5.1

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.3.2.2** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.5.2

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute the following:

'Two nuts shall be mounted on a stud of a strength class superior to the nuts being tested and torqued as specified in the technical requirement against a hardened block.'

AMD 5767
April 1990

Clause 3.5.3

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.7** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.5.4

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.6** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.5.5

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.10** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.5.6

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.9** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.5.7.1

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.8** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.5.7.2

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.8** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.5.10.1

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.11** of BS A295 : 1985.'.

AMD 5767
April 1990

Clause 3.5.10.2

In the column headed '**Inspection and test method**' delete 'Test under consideration.' and substitute '**3.11** of BS A295 : 1985.'.

AMD 5767
April 1990

Publications referred to

After the entry for BS 6001 insert the following:

'British Standard A295 Methods of test for self-locking nuts with maximum operating temperature less than or equal to 425 °C'

2.4 self-locking fixed anchor nut. A self-locking nut which has at the bearing surface and integral with the nut body, a lug or lugs by which it is attached in position, the nut becoming rigidly located in relation to the supporting structure.

2.5 self-locking floating anchor nut. A self-locking nut in which the nut body integral with a base plate is retained in an attachment plate which has a lug or lugs by which it is attached in position. Provision is made for radial movement of the nut within the attachment plate to allow for alignment on assembly.

2.6 self-locking clinch nut. A self-locking nut, the body of which has a shank co-axial with the screw thread at the bearing surface of the nut capable of being swaged to secure the nut in position and to prevent rotation.

2.7 base plate. That portion of the nut body normal to the axis of the nut, which forms the lugs of a fixed anchor nut or the flange of a floating anchor nut for retaining the nut in the attachment plate. The base plate is always integral with the nut body, either as one piece or joined by an approved process.

2.8 attachment plate. The plate of the floating anchor nut which incorporates the attachment lug or lugs and retains the nut body, allowing a specified movement of the nut body in relation to the structure.

2.9 maximum locking torque. The highest torque to overcome the friction encountered in any assembly or removal cycle with no axial load on the nut.

2.10 minimum breakaway torque. The torque required to start nut or bolt rotation from a fixed position during any removal cycle with no axial load on the nut.

2.11 wrench torque. The minimum torque which the driving configuration of the nut has to withstand without any permanent deformation which would interfere with the appropriate wrench and preclude the reuse of the nut.

2.12 permanent set test. A measure of the performance of a nut on a minimum mandrel after having been subjected to a single assembly and removal cycle on a maximum stud.

2.13 reusability test. A test to measure the torque required to remove a self-locking nut from a standard test bolt after a specified number of assembly and removal cycles.

2.14 push out test. A test to confirm that the anchorage of anchor or clinch nuts will withstand 'push out' load requirements of this standard.

2.15 torque out test. A test to confirm that the anchorage of anchor or clinch nuts will withstand the torque out requirements of this standard.

2.16 production lot. Finished nuts which have the basic part number and diameter, the individual elements of which

have been fabricated by the same process from a single material batch, and which have been heat treated together to the same specified condition and produced as one continuous run.

2.17 inspection lot. Nuts from a single production lot, of the same part number which completely defines the nut.

2.18 Discontinuities

2.18.1 crack. A rupture in the material which may extend in any direction and which may be intercrystalline or transcrystalline in character.

2.18.2 seam. A longitudinal surface defect in the form of an unwelded open fold in the material.

2.18.3 lap. A surface defect caused by folding over metal fins or sharp corners and then rolling or forging them into the surface.

2.19 random sample. A sample taken in such a manner that each unit in the inspection lot has the same chance of being the first unit in the random sample; after the first unit in the sample is taken, each of the remaining units in the inspection lot has the same chance of being the second unit in the sample, etc.

2.20 acceptable quality level (AQL). The maximum percentage defective (or maximum number of defects per hundred units) that, for purposes of sampling inspection, can be considered acceptable as a process average.

2.21 limiting quality (LQ). A magnitude of percentage defective, greater than the AQL, which, in accordance with the operating characteristic of the sampling/inspection plan, the purchaser runs a specified risk of accepting. (In this standard the LQ corresponds to a purchaser's risk of 10 %.)

3. Requirements and test methods

3.0 Introduction. The technical requirements and test methods given in 3.1 to 3.6 complement the requirements of the self-locking nut standard or drawing but may supplement the requirements of the material specification.

Table 1 gives the testing required for each characteristic of the self-locking nut sample necessary for qualification approval. Table 2 summarizes the testing required for both qualification and production acceptance testing.

All tests shall be carried out at ambient temperature unless otherwise specified in a particular test method.

NOTE 1. A nut is considered to be assembled when a minimum of two full male threads plus the chamfer extend beyond the friction element of the nut.

NOTE 2. The removal cycle is considered complete when the friction element is disengaged.