PROCUREMENT SPECIFICATION

RIVETS, BLIND, SELF PLUGGING

(NUT PLATE RIVETS)

Authorizing Signature is on FILE

APPROVED: ________________________________

DIRECTOR OF PRODUCT ENGINEERING
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1.0 SCOPE

1.1 This specification establishes procurement requirements for self plugging blind rivets.

1.2 Classification - Rivets are furnished in Aluminum sleeve, stainless steel stem with 100° Flush Head.

2.0 APPLICABLE DOCUMENTS

2.1 The following documents form a part of this specification to the extent specified herein:

- ASTM A-493 Specification for Stainless and Heat resisting Steel for Cold Heading and Cold Forging – Bar and Wire
- QQ-A-430 Aluminum Alloy Rod and Wire; for Rivets and Heading
- MIL-F-3803 Polyethylene Bags
- MIL-H-3982 Hardware Fasteners & Related Items, Packaging and Packing for Shipment and Storage of
- MIL-STD-129 Marking for Shipment and Storage
- NASM1312 Test Methods Fasteners
- PPP-B-566 Boxes, Corrugated or Solid Fiberboard
- PPP-B-636 Boxes, Corrugated or Solid Fiberboard
- NASM25027 Nut, Self-Locking 250°F, 450°F and 800°F.
- ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes
- NAS 680 Nut, Self-Locking

3.0 REQUIREMENTS

3.1 Materials - The material used for rivets manufactured for this specification shall be in accordance with the applicable drawing requirements.

3.2 Design and Construction

3.2.1 Construction: The fastener shall be a two component assembly consisting of a tubular rivet sleeve and a stem (mandrel or spindle).

3.2.2 Installation: The rivet shall be installed by mechanical means. Installation is to be accomplished by pulling the stem into the rivet shank. The lock between the sleeve and the stem is created by a combination of friction and the formation of sleeve material into a recessed groove in the stem. The stem breaks off at the break-off point, thereby forming a self-plugging rivet. The pin tail portion of the stem is discarded.

3.2.3 Lubrication: Lubrication as allowed by the product drawing or standard to assure proper function of the rivet is permissible. Lubricants used shall be stable and not subject to deterioration under recommended handling and storage conditions.

3.2.4 Workmanship: Rivets shall be of uniform quality and shall be finished in accordance with high grade manufacturing practice. Discontinuities such as seams and clinch or die marks are permitted, provided they do not affect other requirements of this specification.

3.3 Finish - All rivets shall be finished in accordance with the applicable drawing.
4.0 QUALITY ASSURANCE

4.1 Classification of Tests - Inspection and testing of blind rivets shall be classified as follows:
   a. Qualification Tests
   b. Acceptance Tests

Table II lists the tests to be performed
4.1.1 These tests may be performed in total, or in part, at the discretion of the procuring activity to assure conformance to this specification.

4.2 Lot Definition

4.2.1 A lot of component members (sleeves or stems) shall consist of parts which are of the same type and size, fabricated by the same process and procedure as one continuous run or part thereof.

4.2.2 An inspection lot of finished, assembled rivets shall consist of a single lot of rivet sleeves and a single lot of rivet stems.

4.2.3 Dimensional inspections already performed on components need not be repeated after assembly, as long as they are not changed during subsequent operations.

4.3 Sampling Plan A Tests: Samples shall be selected at random in accordance with standard ANSI/ASQC Z1.4, Inspection Level I, Acceptable Quality Level (AQL) 6.5, and shall be subjected to the following tests described under "Test Methods".

4.3.1 Examination of product (4.6.1)
4.3.2 Concentricity of Head (4.6.1.1)

4.4 Sampling Plan B Tests: Samples shall be selected at random in accordance with standard ANSI/ASQC Z1.4 Inspection Level S-3. Sample size shall be the smallest quantity shown under "Multiple Sampling", Table IV. Acceptance number shall be zero; rejection number shall be one.

4.4.1 Shear (4.6.2.2)
4.4.2 Tension (4.6.2.1)
4.4.3 Spindle Retention (4.6.2.5)
4.4.4 Disassembly (4.6.2.6)

4.5 Sampling Plan C Test: Samples shall be selected at random in accordance with standard ANSI/ASQC Z1.4, Inspection Level S-3, AQL 4.0, and shall be subjected to the following test described under “Test Methods”.

4.5.1 Installation Test (4.6.3)

4.6 Test Methods

4.6.1 Examination of Product - All rivets shall be examined to determine conformance to the requirements of this specification and the drawing with respect to material, workmanship, identification color, instructions, finish and dimensions. Finish and dimensions shall be checked visually and by means of applicable gages. Rivet manufacturer shall maintain “Material Review Board” authority for minor defects (do not affect fit, form or function) for parts procured under this specification.

4.6.1.1 Concentricity of Head

4.6.1.1.1 100° Flush Head Rivets - Concentricity of flush head rivets shall be determined by observing the total variation of a dial indicator testing the conical part of the head (adjacent to the top of the rivet), as the rivet is rotated with its shank as an axis. Total variation shall be no more than 0.010-inch.
4.6.2 Strengths

4.6.2.1 Tension strength shall be no lower than listed in Table I, when tested in maximum grip in accordance with NASM1312, Test 8. Failure is defined as the maximum load attained by the fastener. Load rate shall not exceed 110,000 pounds per minute per square inch of fastener cross sectional area up to the approximate yield load after which it may be increased. Coupon shall be per 4.6.4.

4.6.2.2 Single shear strength shall be no lower than listed in Table I, when tested in maximum grip in accordance with NASM1312, Test 20. Failure is defined as the maximum load attained by the fastener. Load rate shall not exceed 110,000 pounds per minute per square inch of fastener cross sectional area up to the approximate yield load after which it may be increased. Coupon shall be per 4.6.4.

4.6.2.3 Torque out strength shall be tested in accordance with NASM25027. Nut plates used for the test shall be NAS680A4 for the 3/32” diameter rivets. Rivets shall not fail below the loads listed in Table I.

4.6.2.4 Push out strength shall be tested in accordance with NASM25027. Nut plates used for the test shall be NAS680A4 for the 3/32” diameter. Rivets shall not fail below the loads listed in Table I.

4.6.2.5 Spindle retention shall be checked as installed in minimum and maximum grips condition by pushing on the installed stem with a hardened steel pin having a diameter at least 0.007-inch smaller than the stem. Spindle retention shall not be less than the values in Table I. Load rate shall not exceed 2.0-inch per minute. Rivets having passed the installation test plates may be used for this test. Test plates shall be per 4.6.4.

4.6.2.6 Disassembly load shall not be less than the values in Table I. Load rate shall not exceed 2.0-inch per minute. Load shall be applied in line with stem while rivet sleeve is restrained in a suitable fixture.

4.6.3 Installation Test - A sample of each lot of finished rivets shall be tested for installation. One full sample shall be tested in maximum grip / minimum hole application; another full sample shall be tested in minimum grip / maximum hole application.

4.6.3.1 Installed rivets shall be examined for the following:

4.6.3.1.1 Proper expansion of the blind head
4.6.3.1.2 Splitting of the rivet sleeve on the blind side
4.6.3.1.3 Failure of the stem prior to being pulled into the sleeve

4.6.3.1.3.1 Stem position - Measure in the as-installed position. Dimension shall be as specified on the drawing. Stem break off location shall be measured to the highest point on the fracture surface with a 0.050-inch diameter stylus.

4.6.3.2 Splits and/or cracks, shall be cause for rejection during qualification if observed in more than five percent of the installed parts.

4.6.4 Test Coupon and Test Plate Geometry and Material:

4.6.4.1 Shear and tension coupons shall have the minimum recommended hole size as specified on the drawing with a tolerance of +/- 0.0005-inch. For flush fasteners, the countersink diameter shall be equal to the theoretical sharp diameter of the rivet head +/- 0.004-inch. Other coupon geometry shall be as required to function with the test fixtures. Coupon material shall be alloy steel having a Rockwell Harness of RC 42 min.
4.6.4.2 Installation and spindle retention plates shall be of the thickness specified on the drawing for the grip range (minimum or maximum, as specified) with a tolerance of +/- 0.005-inch. Hole diameter (minimum or maximum, as specified) shall be as specified on the drawing with a tolerance of +/- 0.0005-inch. For flush fasteners, the countersink diameter shall be equal to the theoretical sharp diameter of the rivet head +/- 0.004-inch. Other plate geometry shall be as required to function with the test fixtures. Plate material shall be 2024-T3 or 7075-T6 aluminum alloy.

5.0 PREPARATION FOR DELIVERY

5.1 All rivets shall be packaged in accordance with good commercial practice at one of the following levels:

5.2 Level A - Military Packaging - Unless otherwise specified, parts shall be packaged 100 pieces per box. Boxes shall be solid fiberboard conforming to PPP-B-566. These boxes will be further packaged in Corrugated Fiberboard Boxes conforming to PPP-B-636 or PPP-B-566.

5.3 Level B - Parts shall be bulk packed approximately 5000 pieces per box in boxes conforming to PPP-B-636 or PPP-B-566.

5.4 Level C - Parts shall be packaged 100 pieces per bag in plastic bags conforming to MIL-F-3803. Bags shall be marked with the part number and manufacturer’s lot number. Bags will be further packaged 50 bags per box in boxes conforming to PPP-B-636 or PPP-B-566.

5.5 Marking for Shipment

5.5.1 Package: Each package shall be durably marked with the following information in such a manner that the markings will not become damaged when the packages are opened:

5.5.1.1 Lot Number
5.5.1.2 Part Number
5.5.1.3 Customer part number, Stock Number or Other Identification Number as specified in the Purchase Document

5.5.2 In addition to any special marking required by the contract or order, unit and intermediate packages and shipping containers shall be marked in accordance with MIL-STD-129.

5.6 Special Requirements

5.6.1 Preservation: When specified by the procuring activity, preservation of blind rivets shall be accomplished in accordance with the applicable requirements of MIL-H-3982.
### TABLE I
**STRENGTH REQUIREMENTS**

<table>
<thead>
<tr>
<th>FASTENER SHEAR (lbf min.)</th>
<th>FASTENER TENSILE (lbf min.)</th>
<th>ANCHOR NUT TORQUE OUT (in-lbf min.)</th>
<th>ANCHOR NUT PUSH OUT (lbf min.)</th>
<th>FASTENER SPINDLE RETENTION (lbf min.)</th>
<th>FASTENER DISASSEMBLY (UNINSTALLED) (lbf min.)</th>
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<tr>
<td>255</td>
<td>125</td>
<td>60</td>
<td>100</td>
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1. PER NASM25027
2. Shear required for -03 grip and above.

### TABLE II
**CLASSIFICATION OF TESTS**

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