PROCUREMENT SPECIFICATION

RIVETS: BLIND, NON-STRUCTURAL

(Cherry TackMax RIVETS)

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1.0 SCOPE

This specification establishes procurement requirements for non-structural blind rivets.

Classification - Rivets are furnished in one type and class as noted below:

Type AA – 5056 Aluminum Alloy Sleeve-7075 Aluminum Alloy Stem

Class 1 – Reduced Footprint Protruding Head

2.0 REFERENCES

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

AMS-QQ-A-225/9	Aluminum Alloy 7075, Bar, Rod, Wire and Special Shapes, Rolled, Drawn or Cold Headed
ANSI/ASQC Z1.4	Sampling Procedures and Tables for Inspection by Attributes
ASTM-D-3951	Standard Practice for Commercial Packaging
MIL-A-8625	Anodic Coating For Aluminum and Aluminum Alloys
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
QQ-A-430	Aluminum Alloy Rod and Wire: For Rivets and Cold Heading

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.

3.2.2 Installation – The rivet shall be installed by mechanical means. The rivet shall be installed by pulling the stem (pin) into the rivet sleeve by mechanical tools in one operation. The pull pin portion of the rivet stem shall be separated from the rivet after the blind-side bulb has formed. A means of visual inspection for proper installation shall be provided (see 4.5.3).

3.2.3 Lubrication – Lubrication as allowed by the product drawing or standard to assure proper function of the rivet is permissible provided it does not change the color of the stem. 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 (Code A in Table II)

b. Acceptance Tests (Code B in Table II)

Table II lists the tests to be performed.

4.1.1 Responsibility of Tests – Cherry Aerospace shall be responsible for accomplishing the required tests. Cherry Aerospace shall maintain a record available to the inspector or customer of the quantitative results of all tests required by the 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 rivets shall consist of assemblies of one combination of component lots.

4.3 Samples shall be selected at random in accordance with standard ANSI/ASQC Z1.4, Inspection Level S-3, Acceptable Quality Level (AQL) 4.0, and shall be subjected to the following tests described under "Test Methods".

a. Examination of Product (4.5.1)

b. Run-Out (4.5.1.1)

4.4 Samples shall be selected at random in accordance with Table II (Level S-3 accepts 0).

a. Tension (4.5.2.1)

b. Shear (4.5.2.2)

c. Preload (4.2.2.3)

d. Uninstalled Spindle Retention (4.2.2.4)

4.5 Test Methods

4.5.1 Examination of Product – All sample rivets from the inspection lot 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.

4.5.1.1 Run-Out – Run-Out of universal head rivets shall be determined by observing the total variation of a dial indicator or other acceptable test device testing the periphery of the head, as the rivet is rotated with its shank as an axis. Total variation shall be no more than 0.010 inches.

4.5.2 Strengths

4.5.2.1 Tension – Tension strength shall meet the requirements of Table I, when tested in maximum grip in accordance with NASM1312-8. 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. Grips less than 2 times the nominal diameter are too short for testing.

4.5.2.2 Shear – Single shear strength shall meet the requirements of Table I, when tested in maximum grip in accordance with NASM1312-20. 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. Grips less than 2 times the nominal diameter are too short for testing.

4.5.2.3 Preload – Preload strength shall meet the requirements of Table I. Tensile preload testing shall be performed in accordance with NASM1312-16 and is required for qualification only. The preload should be the maximum recorded value. Grips less than 2 times the nominal diameter are too short for testing.

4.5.2.4 Uninstalled Spindle Retention – The loads required to push out the spindles of the uninstalled rivets shall meet the requirements of Table I. The load shall be applied at a maximum rate of .05 inch per minute to the spindle from the manufactured head of the rivet. A means for accurately determining the force applied to the spindle shall be provided. The push out load shall be applied directly in line with the axis of the rivet spindle.

4.5.3 Installation – Test rivets shall be installed in test plates as shown in Figure 2. Holes shall be in accordance with Figure 2. The rivets shall be tested at minimum grip and maximum grip. After installation, the fastener shall be inspected for defects such as deformed heads, split sleeves, spindle position and examined for conformance to Table III.

4.5.4 Test Coupon and Test Plate Geometry and Material:

4.5.4.1 Shear and tension coupons shall be .001" over the minimum recommended hole size specified on the drawing with a tolerance of +.001/-.000". Other coupon geometry shall be as required to function with the test fixtures. Coupon material shall be alloy steel having a Rockwell Hardness of Rc 42 minimum.

4.5.4.2 Installation plates shall be of the thickness specified on the drawing for the grip range (minimum or maximum, as specified) with a tolerance of +/-.003". 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 to ensure delivered products are not damaged at one of the following levels:

5.2 Packaging

5.2.1 Preservation – Preservation shall be level A or C as specified in the contract or order.

5.2.1.1 Level A – The rivets shall be preserved and packaged in accordance with the applicable requirements of ASTM-D-3951.

5.2.1.2 Level C – The rivets shall be preserved and packaged in accordance with the supplier's standard practice.

5.2.2 Packing – Packing shall be level A or C as specified in the contract or order.

5.2.2.1 Level A – The rivets shall be packed in accordance with the applicable requirements of ASTM-D-3951.

5.2.2.2 Level C – The rivets shall be packed in a manner which will ensure arrival at destination in satisfactory condition and be acceptable to the carrier at lowest rates. Containers and packing shall comply with Uniform Freight Classification rules, or with National Motor Freight Classification rules.

5.2.3 Marking – 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.

5.3 Special Requirements

5.3.1 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
MINIMUM STRENGTH REQUIREMENTS

RIVET TYPE (Material)	HEAD CLASS	DIAMETER	SHEAR (lbf)	TENSION (lbf)	UNINSTALLED SPINDLE RETENSION (lbf)	PRELOAD (lbf)
AA	1	-5 (5/32)	120	95	7	50

TABLE II
CLASSIFICATION OF TESTS

CHARACTERISTICS (Classification per 4.1)	INSPECTION REQUIREMENTS	
	TEST METHOD	SAMPLING
IDENTIFICATION (A,B)	Visual Examination	ASQ Z 1.4 LEVEL S-3 AQL 1.0
DIMENSIONS (A,B)	Test per Paragraph 4.5.1	ASQ Z 1.4 LEVEL S-3 AQL 4.0
INSTALLATION (A,B)	Test per Paragraph 4.5.3	
SHEAR STRENGTH (A,B)	Test per Paragraph 4.5.2.2	ASQ Z 1.4 LEVEL S-3 Zero (Defective)
TENSILE STRENGTH (A,B)	Test per Paragraph 4.5.2.1	
UNINSTALLED SPINDLE RETENTION (A,B)	Test per Paragraph 4.5.2.4	
PRELOAD STRENGTH (A)	Test per Paragraph 4.5.2.3	

TABLE III
VISUAL INSPECTION TABULATION

Nominal Diameter	Spindle Position "B" Min (inch) (see Fig 1)
-5 (5/32)	0.010

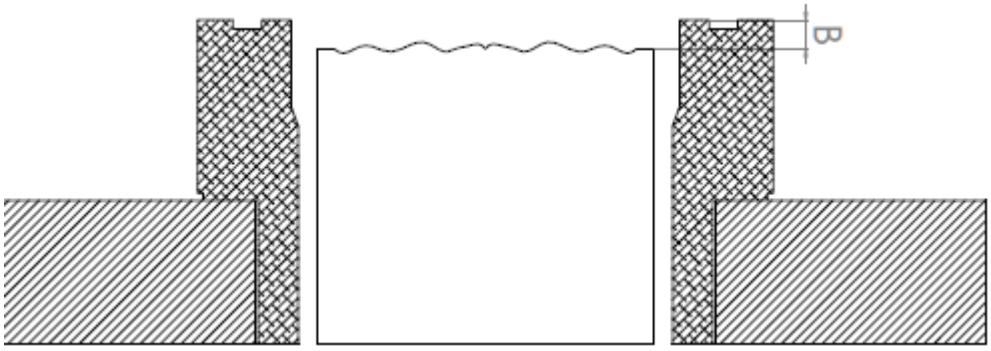

Figure 1
INSTALLED SPINDLE POSITION

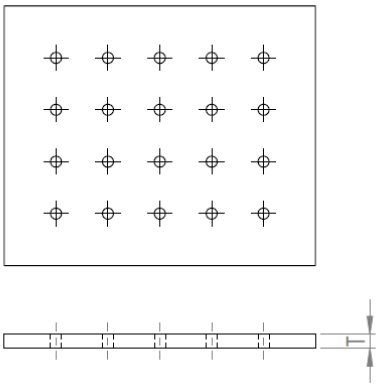

FIGURE 2
Specimen for Installation Test

Notes:

1. "T" – Sheet Thickness. For each specific grip length of appropriate size under evaluation, installation tests shall be conducted at total grip (T) conforming to minimum and maximum grip as indicated in applicable standard. The required tests shall be in min. grip-max. hole, and in max. grip-min. hole, hole size per applicable drawing.
2. Material – Rivet Type AA = Alloy Steel or 7075-T6 Aluminum Alloy or 2024-T3 Aluminum
3. Number of holes, length and width of plate and configuration of holes are all optional