

MIL-J-26870C
 25 March 1974
 SUPERSEDING
 MIL-J-26870B
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MILITARY SPECIFICATION

JOINT, SWIVEL, AIRCRAFT FUEL

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

1. SCOPE

1.1 Scope. This specification covers aircraft fuel swivel joints.

1.2 Classification. Swivel joints shall be of the following classes, as specified (see 6.2).

Class 1 - Swivel joint with two 90° elbows with swivel between elbows.

Class 2 - Swivel joint with one 90° elbow with straight outlet swivel.

2. APPLICABLE DOCUMENTS.

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of the specification to the extent specified herein.

SPECIFICATIONS

Federal

QQ-A-601	Aluminum Alloy Sand Castings
TT-E-489	Enamel, Alkyed, Gloss, (For Exterior And Interior Surfaces)
PPP-B-576	Boxes, Wood, Cleated, Veneer, Paper Overlaid
PPP-B-585	Boxes, Wood, Wirebound
PPP-B-591	Boxes, Fiberboard, Woodcleated
PPP-B-621	Boxes, Wood, Nailed And Lock Corner
PPP-B-636	Boxes, Shipping, Fiberboard
PPP-B-640	Boxes, Corrugated, Triple Wall

Military

MIL-P-116	Preservation, Methods Of
MIL-T-5624	Turbine Fuel, Aviation Grades JP-4 And JP-5
MIL-C-8585	Primer Coating, Zinc Chromate, Low Moisture Sensitivity
MIL-A-8625	Anodic Coatings, For Aluminum And Aluminum Alloys
MIL-P-10388	Pipe Fittings: One Or More Ends Grooved

FSC 4730

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MIL-G-25013

Grease, Aircraft, Ball And Roller Bearings

STANDARDS

Federal

FED-STD-102	Preservation, Packaging, And Packing Levels
FED-STD-123	Marking For Domestic Shipment (Civilian Agencies)

Military

MIL-STD-100	Engineering Drawing Practices
MIL-STD-105	Sampling Procedures And Tables For Inspection By Attributes
MIL-STD-129	Marking For Shipment And Storage
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-810	Environmental Test Methods
MIL-STD-831	Test Reports, Preparation Of
MIL-STD-889	Dissimilar Metals

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

American Standards Association Standard

B16.9	Steel Butt-Welding Fittings
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(Applications for copies of the ASA standard should be addressed to the American Standards Association, 70 East 45th Street, New York NY 10017.)

National Bureau of Standards

Handbook H28	Screw Thread Standards for Federal Services
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(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington D.C. 20402.)

3. REQUIREMENTS

3.1 Preproduction. This specification makes provisions for preproduction testing.

3.2 Materials. Materials shall be as specified herein. Materials not definitely specified shall be of good commercial quality entirely suitable for the purpose. Materials shall be free from all defects and imperfections that might affect the serviceability of the finished joint.

3.2.1 Protective treatment. When materials are used in the construction of the joint that are subject to deterioration when exposed to climatic and environmental conditions likely to occur during service usage, they shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements of this specification. The use of any protective coating that will crack, chip, or scale with age or extremes of climatic and environmental conditions shall be avoided.

3.2.2 Fungus-proof materials. Materials that are nutrients for fungi shall not be used where it is practical to avoid them. Where used and not hermetically sealed, they shall be treated with a fungicidal agent acceptable to the procuring activity. If they will be used in a hermetically sealed inclosure fungicidal treatment will not be necessary.

3.2.3 Metals. Metals shall be of the corrosion-resistant type or suitably treated to resist corrosion due to salt spray or atmospheric conditions likely to be met in storage or normal service.

*3.2.3.1 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals shall not be used in intimate contact with each other. Dissimilar metals are defined in MIL-STD-889.

3.3 Design and construction. The joint shall be designed to permit 3.0 degree rotation at each swivel connection. The joint shall be 4 inch nominal pipe size. Swivel connections shall rotate on two or more rows of ball bearings, isolated from the fuel by a packing and packing retainer, and provided with a lubrication fitting and grease retainer.

3.3.1 Bodies. Bodies shall be of cast aluminum-alloy conforming to QQ-A-601 and of a composition and temper to suit the use.

3.3.2 Breakaway torque. With no internal pressure, the joint shall rotate freely with the application of a breakaway torque of 5 pounds feet, or less at room temperature.

*3.3.3 Lubrication. The joint shall be capable of giving the required performance when properly lubricated with grease conforming to MIL-G-25013. Grease seals shall be provided to isolate the lubricant from the fuel.

3.3.4 End connections. End connections shall be 4 inch nominal pipe size and shall be threaded, grooved, or beveled for welding, as specified (see 6.2).

3.3.4.1 Threads. Threads shall be American-National Taper pipe threads in accordance with National Bureau of Standards Handbook H28.

3.3.4.2 Grooved ends. Grooved ends shall be in accordance with MIL-P-10388.

3.3.4.3 Beveled ends. When specified (see 6.2), ends shall be beveled in accordance with Standard B16.9.

3.3.5 Ball bearings. Ball bearings shall be of corrosion-resistant steel.

*3.3.6 Ring seals or packings. Ring seals or packings shall be of synthetic rubber suitable for use with jet fuels conforming to MIL-T-5624.

3.3.7 Packing retainers. Packing retainers shall be of brass or bronze.

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3.4 Environmental conditions. The joint shall be capable of satisfactory operation when subjected to the following conditions:

- a. Temperature of -65° Fahrenheit (F) to $+125^{\circ}$ F.
- b. A relative humidity of 95 percent \pm 5 percent at a temperature of 160° \pm 2 $^{\circ}$ F.
- c. Airborne sand and dust particles as encountered in normal and desert operations.
- d. Atmosphere containing salt-laden moisture.
- e. Fungus as encountered in tropical climates.

3.5 Storage temperatures. The joint shall be capable of withstanding storage temperature ranging from 80° F to $+160^{\circ}$ F.

3.6 Working pressure. The joint shall be capable of withstanding a hydrostatic pressure of 125 pounds per square inch (psi).

3.7 Hydrostatic pressure. The joint shall be capable of withstanding a hydrostatic pressure of 350 psi without damage.

*3.8 Interchangeability. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The item identification and part number requirements of MIL-STD-100 shall govern the manufacturer's part numbers and changes thereto.

3.9 Weight. The weight of the joint shall not exceed the following:

	<u>Pounds</u>
a. Class 1	12
b. Class 2	10

3.10 Finish. The joint shall be finished in accordance with TT-E-489, MIL-C-8585 and MIL-C-8625.

3.11 Identification of product. Equipment, assemblies and parts shall be marked for identification in accordance with MIL-STD-130.

3.12 Workmanship. Workmanship shall be of the highest grade and in accordance with good commercial practice for this type of equipment.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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 assure supplies and services conform to prescribed requirements.

4.2 Classification of tests. The inspection and testing of the joints shall be classified as follows:

- a. Preproduction tests See 4.3
- b. Acceptance tests See 4.4

4.3 Preproduction tests. The preproduction test samples shall consist of one joint of each class representative of the preproduction equipment. They shall be tested at the contractor's plant under the supervision of the procuring activity, unless the contract shall specify the laboratory at which the tests are to be conducted. If performed by the contractor he shall prepare a test report in accordance with MIL-STD-831. The preproduction tests shall consist of the following individual tests.

4.3.1 Examination of product. The joint shall be inspected to determine compliance with the requirements specified herein with respect to materials, design, weight, finish, workmanship and marking.

4.3.2 Hydrostatic test. The joint shall be hydrostatically tested to 350 psi for a period of 5 minutes. Upon completion of the test there shall be no evidence of leakage. Test fluid shall conform to MIL-T-5624.

4.3.3 Torque test. The 350 psi hydrostatic pressure shall be released and the breakaway torque measured for rotating the joint. The torque shall not exceed 20 pounds feet.

4.3.4 Environmental tests. The following tests shall be conducted in accordance with specified procedures in MIL-STD-810.

4.3.4.1 Low Temperature. The joint shall be installed in a low temperature chamber and subjected to low temperature in accordance with procedure II. At the end of the exposure period, the temperature shall be raised to -65°F and at this temperature the joint shall pass the hydrostatic and torque tests specified in 4.3.2 and 4.3.3.

4.3.4.2 High temperature. The joint shall be subjected to high temperature in accordance with procedure II. At the end of the exposure the temperature shall be lowered to 125°F and the joint shall pass the hydrostatic and torque tests specified in 4.3.2 and 4.3.3.

4.3.4.3 Humidity. The joint shall be subjected to humidity in accordance with procedure I. Following this test the joint shall be visually examined for deterioration, separation of components and related types of failure.

4.3.4.4 Fungus. The joint shall be subjected to fungus in accordance with procedure I. The joint shall resist the effects of fungi.

4.3.4.5 Sand and dust test. The joint shall be subjected to sand and dust in accordance with procedure II. At the conclusion of the test the breakaway torque required to rotate the joint shall be measured. This torque shall not exceed 20 pounds feet.

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4.3.4.6 Salt spray test. The joint shall be subjected to salt spray in accordance with procedure I for a period of 50 hours. At the conclusion of the test the breakaway torque required to rotate the joint shall be measured. This torque shall not exceed 20 pounds feet.

4.4 Acceptance tests. Before being accepted, every joint shall be subjected to the tests prescribed under 4.3.1 and 4.3.2. Inspection shall be at the contractor's plant unless otherwise specified.

4.5 Examination of preparation for delivery requirements. An examination shall be made to determine that packaging, packing and marking requirements of the applicable specification are complied with. Defects shall be scored in accordance with the list below. The sample unit shall be one shipping container fully prepared for delivery. The inspection level shall be S-2 and the acceptable quality level shall be 4 defects per 100 units. Sampling shall be in accordance with MIL-STD-105.

<u>Examine</u>	<u>Defects</u>
Marking (exterior and interior)	Omitted, incorrect, illegible, improper size, location, sequence, or method of application
Materials	Any component damaged affecting serviceability.
Workmanship	Inadequate application of components such as incomplete closure of case liners, container flaps, loose strapping, inadequate stapling, bulging or distortion of containers.
Weight of content exterior	Number of intermediate packages is more or less than required. Gross net weight exceeds requirements.
Preservation	Preservation improper, improperly applied, or missing.

5. PREPARATION FOR DELIVERY

5.1 General. Packaging and packing shall be in accordance with FED-STD-102.

5.2 Preservation and packaging. Preservation and packaging shall be level A or C (see 6.2).

5.2.1 Level A. Joint assemblies shall be packaged in accordance with method III of MIL-P-116.

*5.2.2 Level C. Joint assemblies shall be packaged to afford the minimum degree of protection to prevent damage during shipment from the supply source to the first receiving activity. The supplier may use his standard practice provided it meets the requirement of this level.

*5.3 Packing. Packing shall be level A, B, or C, as specified (see 6.2).

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5.3.1 Level A. Joint assemblies packaged as specified in 5.2.1 shall be packed in overseas class or type shipping containers conforming to PPP-B-576, PPP-B-585, PPP-B-591, PPP-B-621, PPP-B-636, or PPP-P-640. As far as practical containers shall be of minimum cube and tare consistent with the protection required and shall contain identical quantities. The gross weight of each pack shall be limited to approximately 200 pounds. Containers shall be closed and strapped in accordance with the applicable container specification or appendix thereto.

5.3.2 Level B. Joint assemblies packaged as specified in 5.2.1 shall be packed in domestic type or class shipping containers conforming to PPP-B-576, PPP-B-585, PPP-B-591, PPP-B-621, PPP-B-636, or PPP-B-640. As far as practical containers shall be of a minimum cube and tare consistent with the protection required and shall contain identical quantities. Containers shall be closed and strapped in accordance with the applicable specification or appendix thereto.

*5.3.3 Level C. Joint assemblies shall be packed in a manner to insure safe delivery to destination at the lowest transportation rate for such supplies. Containers shall be in accordance with rules of carriers or regulations applicable to the mode of transportation.

5.4 Marking.

5.4.1 Military marking. In addition to any special marking required packaging and shipping containers shall be marked in accordance with MIL-STD-129.

5.4.2 Civilian agency marking. Shipments shall be marked in accordance with FED-STD-123.

6. NOTES

6.1 Intended use. The joints covered by this specification are intended for use as integral parts of a gasoline or jet-fuel dispensing system.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Class joint required. (See 1.2)
- c. End connections required. (See 3.3.4)
- d. Point of inspection. (See 4.2 and 4.3)
- e. Level of packaging and packing. (See Section 5)

6.3 The margins of this specification are marked with an asterisk 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.

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