

MIL-C-25162B (ASG)

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Superseding
MIL-C-25162A(USAF)
11 June 1956

MILITARY SPECIFICATION

COUPLING, RECEPTION, FLIGHT PRESSURE REFUELING, TYPE MA-2

This specification has been approved by the Department of the Air Force and by the Navy Bureau of Aeronautics.

1. SCOPE

1.1 This specification covers a flight pressure refueling coupling for use with probe- and drogue-type refueling systems.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, standards, drawings, and publications, of the issue in effect on date of invitation for bids, form a part of this specification to the extent specified herein:

SPECIFICATIONS

Federal

QQ-P-416 Plating, Cadmium (Electrodeposited)

Military

MIL-S-3136	Standard Test Fluids Hydrocarbon and Iso-Octane
MIL-D-5028	Drawings and Data Lists: Preparation of Manufacturers' (for Production Aeronautical and Associated Equipment)
MIL-E-5272	Environmental Testing, Aeronautical and Associated Equipment, General Specification for
MIL-P-5315	Packing, "O" Ring, Hydrocarbon Fuel Resistant
MIL-G-5572	Gasoline, Aviation: Grades 80/87, 91/96, 100/130, 115/145
MIL-J-5624	Jet Fuel, Grades JP-3, JP-4, and JP-5
MIL-P-6064	Packaging of Lightweight Aircraft Accessories
MIL-F-7024	Fluids, Calibrating, for Aircraft Fuel System Components
MIL-P-7105	Pipe Threads, Taper, Aeronautical National Form, Symbol ANPT
MIL-S-7742	Screw Threads, Standard, Aeronautical
MIL-F-8615	Fuel System Components; General Specification for
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-N-25027	Nut, Self-Locking, 250°F, 550°F, and 800°F
MIL-N-25161	Nozzle, Flight Pressure Refueling Type MA-2

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STANDARDSMilitary

MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U. S. Military Property
MS24354	Drogue Cone, Nozzle and Reception Coupling, MA-2
MS24355	Flight Pressure Refueling System, Assembly of
MS24356	Coupling, Reception, Flight Pressure Refueling,
MS24358	Type MA-2, Assembly of
MS24358	Nozzle, Flight Pressure Refueling, Type MA-2,
MS24361	Outline of
MS24362	Fitting, Hose End, Flight Pressure Refueling, Type
MS29513	MA-2, Outline of
MS33540	Ring, Split, Reception Flight Pressure Refueling
MS33586	Coupling
MS33588	Sleeve, Reception Flight Pressure Refueling Coupling
	Packing "O" Ring Hydrocarbon Fuel Resistant
	Safety Wiring, General Practices for
	Metals, Definition of Dissimilar
	Nuts and Plate Nuts, Self-Locking, Functional
	Limitations of

DRAWINGSAir Force-Navy Aeronautical Standard Drawings

AN995	Wire, Lock
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PUBLICATIONSAir Force-Navy Aeronautical Bulletins

No. 143	Specifications and Standards; Use of
No. 438	Age Controls for Synthetic Rubber Parts

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

3. REQUIREMENTS

3.1 Qualification.- The coupling furnished under this specification shall be a product which has been tested and has passed the Qualification tests specified herein.

3.2 Components.- The type MA-2 coupling shall consist of an assembled unit as shown on Standard MS24355. Attachment parts as shown on Standards MS24356, MS24358, MS24361, and MS24362 and, in addition, a commercial snap ring, utilized with this coupling, are not considered as a portion of the MA-2 unit. Installation features are defined on Standard MS24354.

3.3 Selection of specifications and standards.- Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with ANA Bulletin No. 143.

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3.4 Materials.- All materials used in the construction of the coupling shall be fuel resistant when tested in any sequence with fluids conforming to the following specifications:

- (a) MIL-S-3136, type I
- (b) MIL-S-3136, type III
- (c) MIL-G-5572
- (d) MIL-J-5624
- (e) MIL-F-7024, type II

3.4.1 Corrosion-resistant materials.- Metals and nonmetals shall be of the corrosion-resistant type or suitably treated to resist corrosion caused by fuels, salt spray, or atmospheric conditions likely to be met in storage or normal service. Magnesium shall not be used.

3.4.2 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 Standard MS33586.

3.5 Design.- The type MA-2 coupling shall conform to Standard MS24355 and shall be for use with a type MA-2 nozzle in accordance with Specification MIL-N-25161, to accomplish fuel transfer in flight. The coupling shall be suitable for working pressures of 120 psi alone and for working pressures of 60 psi in conjunction with a nozzle.

3.5.1 Alignment.- The reception coupling shall incorporate a universal joint having a movement within a 45-degree or greater included angle cone, the centerline of which coincides with the centerline of the coupling. The universal action shall facilitate alignment of a nozzle and minimize the force applied to the equipment by "hose oscillations."

3.5.2 Maintenance.- The coupling shall have a minimum number of parts consistent with reliability. It shall, where practicable, permit easy assembly, disassembly, location of trouble sources, and maintenance with tools and equipment normally available commercially by service maintenance personnel with a minimum of training.

3.6 Construction.- The coupling shall be constructed to withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, installation, and service use.

3.6.1 "O" ring packing.- The "O" ring packing shall conform dimensionally to Standard MS29513 and physically to Specification MIL-P-5315.

3.6.2 Threads.-

3.6.2.1 Screw threads.- Machine screw threads shall conform to Specification MIL-S-7742.

3.6.2.2 Pipe threads.- Pipe threads shall not be used except for permanent closures, in which case the pipe threads shall conform to Specification MIL-P-7105.

3.6.2.3 Locking of threaded parts.- All threaded parts shall be positively locked by safety wiring, self-locking nuts conforming to Specification MIL-N-25027, cotter pins, or other approved methods. Self-locking nuts shall be used in accordance with Standard MS33588. Safety wire shall conform to Drawing AN995, and shall be installed in accordance with Standard MS33540. Staking and the use of lockwashers are prohibited.

3.6.3 Dimensions.- The dimensions of the coupling shall be as shown on Standard MS24355.

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3.6.4 Weight.- The total weight of the coupling shall not exceed 18 lb.

3.7 Interchangeability.- All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable. The drawing number requirements of Specification MIL-D-5028 shall govern changes in the manufacturer's part numbers.

3.8 Finishes and protective coatings.-

3.8.1 Finishes.- The coupling shall not have any painted surface.

3.8.2 Protective coatings.- The coupling shall be adequately protected against corrosion by the use of materials or protective finishes acceptable to the procuring activity. All aluminum-alloy parts shall be anodized in accordance with Specification MIL-A-8625. Cadmium plating, when used, shall conform to Specification QQ-P-416, type II.

3.9 Performance.- The coupling shall satisfy the performance requirements as specified in section 4, when subjected to the following tests:

(a) Inspection	(4.5.1)
(b) Functional	(4.5.2)
(c) Pressure drop	(4.5.3)
(d) Leakage and spillage	(4.5.4)
(e) Fuel resistance and extreme temperature	(4.5.5)
(f) Contaminated fuel	(4.5.6)
(g) Strength	(4.5.7)
(h) Impact and endurance	(4.5.8)
(i) Vibration	(4.5.9)
(j) Accelerated corrosion	(4.5.10)
(k) Proof pressure	(4.5.11)
(l) Burst pressure	(4.5.12)
(m) Latching mechanism	(4.5.13)
(n) Disassembly and inspection	(4.5.14)

3.9.1 Operation.- The coupling shall allow the passage of fuel when fully engaged with a nozzle conforming to Specification MIL-N-25161 with the master seal of the coupling seated. The master seal shall remain seated upon disengagement until fuel flow has been shut off in the nozzle and coupling. This operation shall be effected without the use of any external source of power, such as high-pressure hydraulic fluid, pneumatic, or electrically actuated mechanisms.

3.9.2 Lubrication.- The coupling shall operate satisfactorily without requiring lubrication other than by the fluid being transferred.

3.9.3 Latching mechanisms.-

3.9.3.1 Engagement.- The force required to engage the coupling with a nozzle having a 50-lb sleeve force shall not exceed 140 lb with 0- to 10-psi static fuel pressure in the coupling.

3.9.3.2 Disengagement.- The latching mechanism shall be such that the force required to disengage the nozzle from the coupling is adjustable between 300 and 800 lb with 0-psi fuel pressure in the coupling, with a linear slope between these points. The force required to disengage the nozzle from the coupling shall increase at the rate of 4 ± 0.5 lb for each psi increase in fuel pressure at any fixed adjustment. The coupling shall not disengage when subjected to a surge pressure of 120 psi. Unless otherwise specified by the procuring activity, the setting of the latching mechanism shall be 320 ± 20 lb.

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

3.10.1 Synthetic rubber parts.- Equipment and assemblies containing synthetic rubber parts shall be marked in accordance with ANA Bulletin No. 438.

3.10.2 Use of MS or MIL designations.- MS or MIL designations shall not be applied to a product, except for Qualification test samples, nor referred to in correspondence, until notice of approval has been received from the activity responsible for qualification.

3.11 Workmanship.- The coupling shall be uniform in quality, clean, sound, and free from injurious defects.

4. QUALITY ASSURANCE PROVISIONS

4.1 Classification of tests.- The inspection and testing of the coupling shall be classified as follows:

- (a) Qualification tests (see 4.2)
- (b) Acceptance tests (see 4.3)

4.2 Qualification tests.-

4.2.1 Sampling instructions.- The Qualification test samples shall consist of two complete couplings identified with the manufacturer's own part number. Two complete sets of detail and assembly drawings and a complete test report showing the results of the manufacturer's tests shall be submitted with the samples. (See 6.4.)

4.2.1.1 Drawings.- The contractor's drawing submitted with the Qualification test samples shall show a cutaway section of all parts in their normal assembled position, and shall specify part numbers of all parts and subassemblies. The following data shall be furnished on or together with the assembly drawings (see 6.2):

- (a) Over-all dimensions.
- (b) Materials and construction, treatment and finish.
- (c) Performance requirements and limitations.

4.2.1.2 Test reports.- The test report submitted with the Qualification test samples shall include the following:

- (a) Report of all tests, graphically presented where practicable, together with a detailed statement indicating conformance or extent of non-conformance with all the requirements of this specification, referring to specific paragraph numbers. Wherever a requirement is considered to be not applicable, the report shall so state, along with the reason therefor.
- (b) Summary of Impact and endurance test.
- (c) Diagrams of all test setups.
- (d) Outline and descriptions of tests and test conditions.
- (e) Copies of test log sheets.
- (f) Photograph when available.

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4.2.2 Tests.— The Qualification tests shall consist of all the tests of this specification, as described under "Test methods," and shall be performed in the order listed below:

Coupling No. 1

- | | |
|---|----------|
| (a) Inspection | (4.5.1) |
| (b) Functional | (4.5.2) |
| (c) Pressure drop | (4.5.3) |
| (d) Fuel resistance and extreme temperature | (4.5.5) |
| (e) Leakage and spillage | (4.5.4) |
| (f) Latching mechanism | (4.5.13) |
| (g) Strength | (4.5.7) |
| (h) Disassembly and inspection | (4.5.14) |

Coupling No. 2

- | | |
|--------------------------------|----------|
| (a) Inspection | (4.5.1) |
| (b) Functional | (4.5.2) |
| (c) Impact and endurance | (4.5.8) |
| (d) Vibration | (4.5.9) |
| (e) Contaminated fuel | (4.5.6) |
| (f) Accelerated corrosion | (4.5.10) |
| (g) Proof pressure | (4.5.11) |
| (h) Leakage and spillage | (4.5.4) |
| (i) Burst pressure | (4.5.12) |
| (j) Disassembly and inspection | (4.5.14) |

4.3 Acceptance tests.— The Acceptance tests shall consist of Individual tests and Sampling tests.

4.3.1 Individual tests.— Each coupling shall be subjected to the following tests, as described under "Test methods" of this specification:

- | | |
|----------------|---------|
| (a) Inspection | (4.5.1) |
| (b) Functional | (4.5.2) |

4.3.2 Sampling tests.— One coupling selected by the Inspector from each lot of 200 or fraction thereof that has passed the Individual tests, shall be subjected to the following tests as described under "Test methods" of this specification:

- | | |
|--------------------------------|----------|
| (a) Leakage and spillage | (4.5.4) |
| (b) Burst pressure | (4.5.12) |
| (c) Disassembly and inspection | (4.5.14) |

4.3.2.1 Rejection and retest.— When a sample fails to meet the requirements of a specified test, the lot represented shall be rejected. Before resubmitting the lot, the contractor shall fully explain to the Inspector both the corrections made and the cause of previous rejections.

4.4 Test conditions.—

4.4.1 Cleaning.— All oil and grease or other corrosion-resistant material shall be removed.

4.4.2 Test fluid.— Unless otherwise specified type II fluid conforming to Specification MIL-F-7024 shall be used for all tests. (See 6.3.)

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4.4.3 Temperature and pressure.- Unless otherwise specified, the ambient temperature shall be within the range from 60° to 90°F, and the ambient pressure shall be atmospheric.

4.4.4 Test nozzle.- A nozzle conforming to the requirements of Specification MIL-N-25161 shall be used. The unit for test purposes shall have a sleeve whose full open position load is equal to 50 lb.

4.5 Test methods.-

4.5.1 Inspection.- Each coupling shall be carefully examined to determine conformance to the applicable drawing and all requirements of this specification that are not covered by specific tests.

4.5.2 Functional.- The coupling shall be checked at a static pressure of 2 psi and 60 psi for 1 minute each. There shall be no evidence of external leakage. The coupling shall then be engaged with a nozzle with the coupling latching mechanism adjusted to produce a nominal disengaging force of 320 lb at 0-psi fuel pressure, unless otherwise specified by the procuring activity. (See 6.3.) A testing and production tolerance of ± 20 lb will be allowed. The following tests shall then be conducted.

4.5.2.1 The pressure shall be increased to 50 psi at the coupling, and the latching mechanism shall be checked. The disengagement force shall increase 200 ± 45 lb from the nominal setting at zero fuel pressure.

4.5.2.2 A pressure of 10 psi shall be applied to the coupling. A test nozzle shall be engaged with the coupling. The engagement force shall be measured and shall not exceed 140 lb. A dead-weight test using a test setup similar to 4.5.8 shall be accomplished. Light tapping of the nozzle mast will be allowed.

4.5.2.3 The coupling, prior to engagement with the nozzle, shall be checked at a static pressure of 2 psi and 60 psi for 1 minute each. No external leakage shall be evident.

4.5.2.3.1 The conditions of 4.5.2.2 shall be maintained, and the coupling shall be engaged and disengaged with the nozzle at least five times. No evidence of binding, chattering, or excessive forces shall occur.

4.5.3 Pressure drop.- Using a test setup similar to that shown in figure 1, the pressure-drop test shall be conducted with a flow of 0 to 1,200 gpm of fluid with an inlet static pressure of 50 ± 2 psi. Sufficient data shall be acquired to define accurately a "pressure-drop versus flow" curve. The total pressure drop through the engaged nozzle and coupling shall not exceed 3 psi at a fuel flow of 600 gpm or 12 psi at a fuel flow of 1,200 gpm. Pressure-drop data shall be obtained and corrected in accordance with Specification MIL-F-8615.

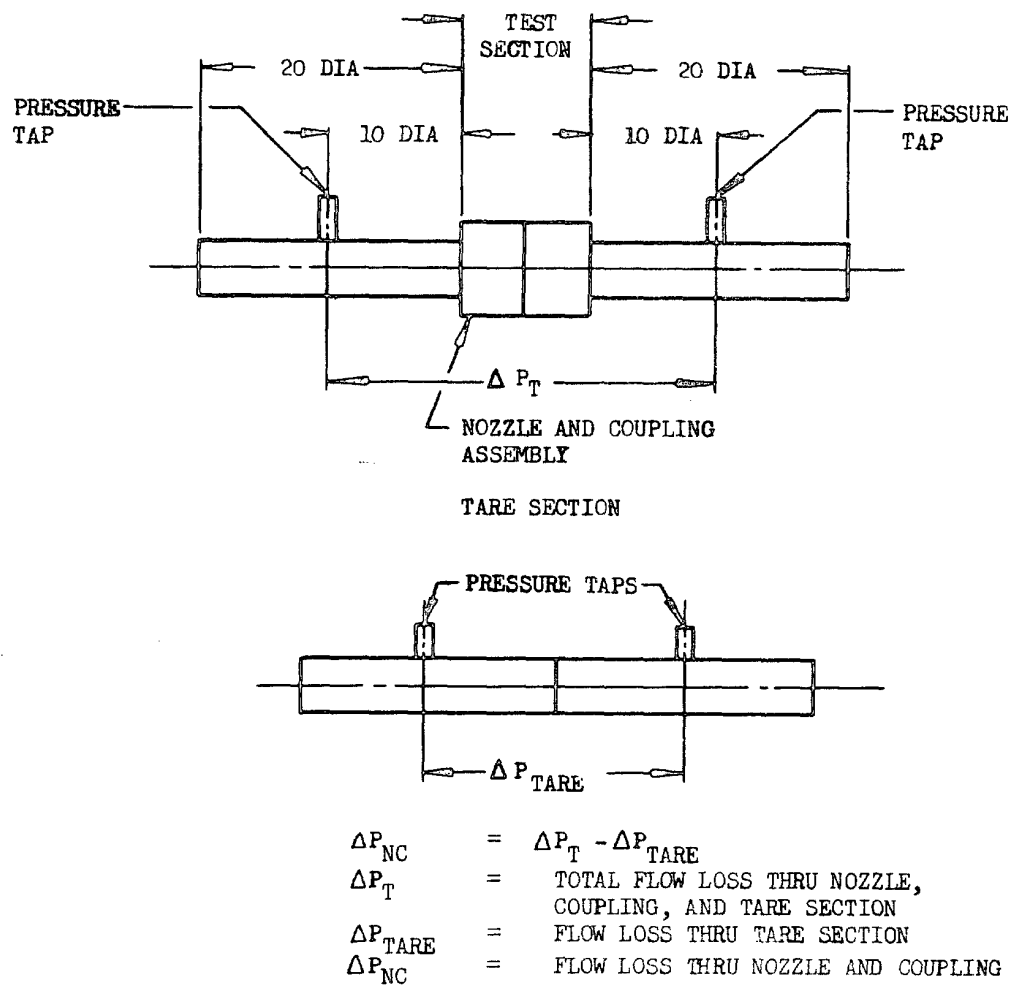
4.5.4 Leakage and spillage.- This test shall be conducted in accordance with the following subparagraphs.

4.5.4.1 The coupling engaged with the test nozzle, shall be subjected to a fluid flow up to 1,200 gpm in 100-gpm increments at an inlet pressure of 60 ± 2 psi. There shall be no evidence of external leakage.

4.5.4.2 The coupling shall be engaged with a nozzle that is subjected to a fuel pressure of 10 psi. With this condition existing, the coupling shall be disengaged a minimum of five times, and the fluid spillage shall not exceed 25 cc per disengagement.

4.5.4.3 The coupling shall be subjected to 10-psi fluid pressure, and the nozzle shall be engaged a minimum of five times. Spillage shall not exceed 25 cc per engagement.

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MATERIAL: 3.25 OD, .120 WALL THICKNESS STEEL TUBING

DIMENSIONS IN INCHES

FIGURE 1. Pressure-drop test diagram

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4.5.4.4 The coupling, engaged with the nozzle, shall be subjected to an inlet fluid pressure of 50 psi and a fluid flow of 100 to 600 gpm in increments of 100 gpm. The nozzle shall be disengaged at every increment, and the spillage shall not exceed 30 cc per disengagement.

4.5.5 Fuel resistance and extreme temperature.— The fuel resistance and extreme temperature test shall be conducted in accordance with table I.

4.5.6 Contaminated fuel.— Test fluid containing the type and concentration of contamination specified in table II shall be pumped through the engaged nozzle and coupling when placed in a recirculating system circulating the test fluid at no less than 50 gpm. The nozzle and coupling shall be operated for 1,000 cycles. A cycle shall consist of engaging and disengaging the nozzle and coupling. The test fluid shall be agitated to maintain a uniform dispersion of the contaminant throughout the test. Upon completion of the test, the nozzle and coupling shall be flushed and drained. At the completion of this test, the coupling shall be subjected to the tests specified in 4.5.2.

4.5.7 Strength.— The coupling shall be subjected to a 1,000-lb tensile load and a 1,000-lb radial load, simultaneously. The tensile load shall be applied between the toggle latches and the hose attachment point by inserting a nozzle and locking the toggles in place. The radial load shall be applied on the coupling body 4.25 inches from the drogue cone attachment flange. After this test, a 2,000-lb compression load shall be applied, using a test setup similar to that of the tensile test. No malfunction or deformation shall be evident after this test.

4.5.8 Impact and endurance.— The impact and endurance test shall be conducted in accordance with table III. The test setup for this test shall be as shown in figure 2 or equivalent. Fuel pressure of 10 ± 2 psi shall be so applied to the reception coupling that this pressure is sustained in the coupling during the engagement and disengagement sequences. As noted in table III, 250 cycles shall be accomplished with 50-psi fuel pressure applied to the coupling during the disengagement sequence only. Leakage at any time during the test shall not exceed the applicable allowable leakage specified in 4.5.4. At the completion of this test, the coupling shall be subjected to the tests specified in 4.5.2.

4.5.9 Vibration.— The vibration test shall be conducted in accordance with Procedure I of Specification MIL-E-5272. This test shall be accomplished with the coupling in a dry condition. For the purpose of this test, the coupling abutment shoulder shall be snubbed-up to a simulated fair-lead by applying 500 ± 25 lb to the hose attachment end of the coupling. At the conclusion of this test, the coupling shall be subjected to the tests specified in 4.5.2.

4.5.10 Accelerated corrosion.— The coupling shall be immersed in a solution consisting of 2-1/2 percent by weight of sodium chloride in distilled water. After immersion, the solution shall be drained, and the coupling shall be heated in an oven to a temperature of $130^\circ \pm 5^\circ\text{F}$ for a period of not less than 1 hour. The immersion and heating cycles shall be repeated 50 times. Immediately after completing the above cycles, the coupling shall be flushed with warm water to remove all salt accumulation. The coupling shall be dried, wetted with test fluid, and engaged with a nozzle three times. Corrosion of any coupling part affecting performance shall be cause for rejection.

4.5.11 Proof pressure.— With the coupling engaged with the nozzle and the nozzle outlet blanked off, the coupling shall be subjected to a hydrostatic proof pressure of 120 psi for a minimum period of 1 minute. The nozzle shall then be disengaged from the coupling, and the coupling shall be pressurized to 240 psi. There shall be no evidence of leakage, distortion, or other injury to any part of the coupling.

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TABLE I
Fuel resistance and extreme temperature tests

Test	Fuel resistance					Extreme temperature	
	Initial drying	Phase I soak	Phase I dry	Phase II soak	Phase II dry	Low temperature	High temperature
Period 1/ Configuration	Reception coupling only	Disengaged coupling during the first 144 hours and engaged with the nozzle the last 24 hours. 2/	Reception coupling only	Disengaged coupling during the first 432 hours and engaged with the nozzle the last 72 hours. 2/	Reception coupling only	Test nozzle and reception coupling disengaged	Test nozzle and reception coupling disengaged
Test fluid	None	Specification MIL-S-3136, type III	None	Specification MIL-S-3136, type I	None	Specification MIL-S-3136, type I	Specification MIL-S-3136, type III
Period duration	168 hours (7 days)	168 hours (7 days)	4 hours	504 hours (21 days)	4 hours	72 hours (3 days)	72 hours (3 days)
Temperature	158° ±2°F	Room	158° ±2°F	Room	158° ±2°F	-67° ±2°F	130° ±5°F
Operation and tests during period	None	Engage nozzle with the reception coupling a minimum of five times a day. At no time during the test shall the force required to engage the nozzle be in excess of 140 lb.	None	Engage nozzle with the reception coupling a minimum of five times a day. At no time during the test shall the force required to engage the nozzle be in excess of 140 lb.	None	None	None

1/ 2/ Footnotes follow at end of table I.

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Table I (continued)
Fuel resistance and extreme temperature tests

Test Period 1/	Fuel resistance				Extreme temperature	
	Initial drying	Phase I soak	Phase I dry	Phase II soak	Phase II dry	Low temperature
Operation and tests immediately after period	Engage nozzle with the reception coupling and check for leakage using fluid conforming to Specification MIL-S-3136, type I. There shall be no leakage after 15 min at 60-psi pressure.	Engage nozzle with the reception coupling and check for leakage, using fluid conforming to Specification MIL-S-3136, type I. There shall be no leakage at 60-psi pressure.	Engage nozzle with the reception coupling and check for leakage, using fluid conforming to Specification MIL-S-3136, type I. There shall be no leakage after 15 min at 60-psi pressure.	Engage nozzle with the reception coupling and check for leakage, using fluid conforming to Specification MIL-S-3136, type I. There shall be no leakage at 60-psi pressure.	Engage nozzle with the reception coupling and check for leakage, using fluid conforming to Specification MIL-S-3136, type I. There shall be no leakage after 15 min at 60-psi pressure.	With ambient temperature at $-67^{\circ} \pm 2^{\circ}\text{F}$, engage nozzle with the reception coupling and check for leakage, using fluid conforming to Specification MIL-S-3136, type I. There shall be no leakage after 15 min at 2-psi and 60-psi pressure. With the ambient temperature and test fluid at $-40^{\circ} \pm 5^{\circ}\text{F}$, engage and disengage the nozzle with the reception coupling 50 times. During this test, maintain 10-psi fluid-pressure on the nozzle and coupling. Upon completion, there shall be no leakage after 15 min at 2-psi and 60-psi pressure in engaged and disengaged condition.

1/ Each period shall follow immediately after the preceding one in the order noted.

2/ During periods of soaking in the test fluid, the coupling shall be filled with the test fluid in such a manner as to insure complete contact of all parts with the fluid as would be expected under service conditions.

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TABLE II

Contaminated fuel test dust

Contamination description	Particle size	Quantity per 20 gal of test fluid (grams)
Sharp silica sand	Smaller than 30-mesh, larger than 50-mesh	0.2
Sharp silica sand	Smaller than 50-mesh, larger than 100-mesh	0.2
Prepared dust AC	0 to 5 microns 12 \pm 2 percent 5 to 10 microns 12 \pm 3 percent 10 to 20 microns 22 \pm 3 percent 20 to 40 microns 23 \pm 3 percent 40 to 80 microns 30 \pm 3 percent 80 to 200 microns 9 \pm 3 percent	1.6

4.5.12 Burst pressure.- With the coupling engaged with a nozzle and the nozzle outlet blanked off, the coupling shall be subjected to a hydrostatic burst pressure of 180 psi for a minimum period of 1 minute. The nozzle shall then be disengaged from the coupling, and the coupling shall be pressurized to 360 psi. There shall be no evidence of leakage, distortion, or injury to any part of the coupling. When the pressure is lowered to 60 psi, there shall be no evidence of leakage.

4.5.13 Latching mechanism.- The coupling shall be engaged with the test nozzle and the latching mechanism adjusted to produce a disengagement force of 320 \pm 20 lb at 0-psi fuel pressure. With the pressure increased to 50 psi (no flow), the latching mechanism shall be checked. The disengaging force shall increase 200 \pm 25 lb from the 0-pressure setting. Then, with the pressure in the coupling of 50 psi and a flow of 600 \pm 25 gpm, the disengaging force shall be rechecked. The force shall change no more than 25 lb from that obtained in the "no flow" test.

4.5.14 Disassembly and inspection.- After completion of all tests, the coupling shall be completely disassembled for inspection of all parts and measurements taken, as necessary, to disclose excessively worn, distorted, or weakened parts which shall constitute failure. The measurements shall be compared with the contractor's drawing dimensions or with similar measurements made prior to the test. The findings of this inspection, together with photographs, where necessary, shall be included in the test report.

5. PREPARATION FOR DELIVERY

5.1 Application.- The requirements of section 5 apply only to direct purchases by or direct shipments to the Government.

5.2 Preservation, packaging, and packing.- The coupling shall be preserved, packaged, and packed in accordance with Specification MIL-P-6064, group VI, and as specified herein.

TABLE III

Impact and endurance test

Condition	ENGAGEMENT 1/			DISENGAGEMENT		
	Displacement of coupling centerline from nozzle centerline (inches)	Drop distance nozzle poppet to coupling poppet (inches)	Wt. of coupling and drogue in as-dropped condition (lb)	Angle of disconnect (degrees)	Latching mechanism setting (lb \pm 20)	Cycles 2/
Impact	0	18	40	0	500	100
	2	18	40	0	500	400
	4	20	40	0	500	500
Endurance	0	3/ 9	--	15	500	1,000
	0	3/ 9	--	15	4/800	250
	0	3/ 9	--	0	5/500	2,750

1/ During the impact test, engagement shall be complete. If the impact does not cause engagement, additional force, as required, may be added to cause engagement.

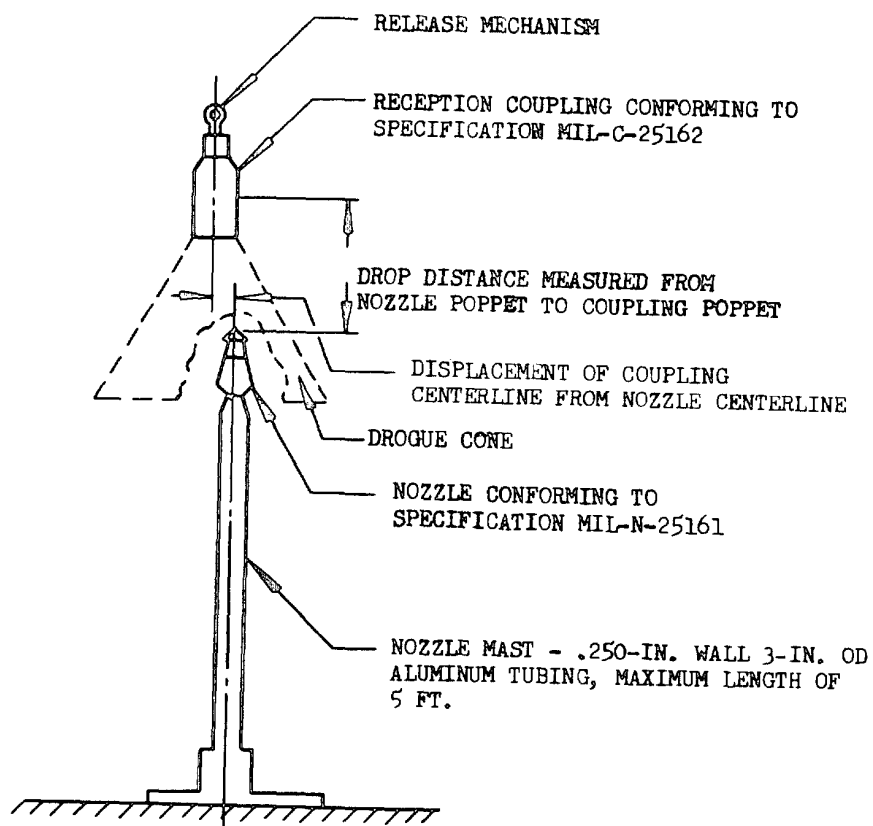
2/ A cycle is defined as 1 engagement and 1 disengagement.

3/ Drop test not required. Mechanical engagement permissible provided engaging velocity is not less than 5 fps just prior to seating the sleeve upon the master coupling seal.

4/ Disengagement shall be accomplished with 50 \pm 2 psi fuel pressure applied to the reception coupling.

5/ The 1,000 cycles called out for the Contaminated fuel test (4.5.6) may be considered as part of this test provided the engaging velocity during the Contaminated fuel test is not less than 5 fps.

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FOR THE PURPOSE OF THIS TEST THE COMBINED WEIGHT OF DROGUE AND RECEPTION COUPLING MUST BE AT LEAST 40 LB. BALLAST WILL BE ADDED IF NECESSARY.

FIGURE 2. Impact and endurance test setup

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5.3 Marking of shipments.~ Interior packages and exterior shipping containers shall be marked in accordance with Standard MIL-STD-129. The identification shall be composed of the following information listed in the order shown:

Stock No. or other identification number as specified
 in the purchase document *
 COUPLING, RECEPTION, FLIGHT PRESSURE REFUELING TYPE MA-2
 Specification MIL-C-25162B
 Manufacturer's Part No.

* NOTE: The contractor shall enter the Federal Stock No. specified in the purchase document or as furnished by the procuring activity. When the Federal Stock No. is not provided or available from the procuring activity, leave space therefor and enter the Stock No. or other identification when provided by the procuring activity.

5.3.1 The following instructions shall be marked on the unit and intermediate packages and shipping containers:

IF IN STORAGE AFTER (DATE) *, THE COUPLING SHALL BE
 TESTED AND INSPECTED BEFORE USE.

* Insert date 18 months after curing date of oldest
 synthetic rubber part used in the nozzle.

6. NOTES

6.1 Intended use.~ The in-flight pressure refueling couplings covered by this specification are intended for use in aircraft being fuel serviced in flight from tanker aircraft. The coupling is extended by a hose or pipe from the "tanker aircraft" which is engaged by a nozzle installed on the front of the "aircraft being serviced," thereby facilitating the transfer of fuel.

6.2 Drawing requirements.~ The attention of contractors is invited to the fact that Government contracts for equipment, whether procured directly by the Government or through another contractor, require that all drawings submitted must conform to the requirements of Specification MIL-D-5028.

6.3 Ordering data.~ Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) The disengaging force required, if other than 320 lb. (See 4.5.2.)
- (c) Type of test fluid to be used if other than type II of Specification MIL-F-7024. (See 4.4.2.)
- (d) Whether overseas packing is required.

6.4 Provisions for qualification.~ With respect to products requiring qualification, awards will be made only for such products as have, prior to the bid opening date, been tested and approved for inclusion in the applicable Qualified Products List whether or not such products have actually been so listed by that date.

6.4.1 The attention of suppliers is called to this requirement, 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

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contracts or orders for the products covered by this specification. Requests for information pertaining to qualification of products covered by this specification should be addressed to the Commander, Wright Air Development Center, Wright-Patterson Air Force Base, Ohio, the activity responsible for qualification, with a copy to the Bureau of Aeronautics, Navy Department, Washington 25, D. C.

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodians:

Navy - Bureau of Aeronautics
Air Force

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
<p style="text-align: center;"><u>INSTRUCTIONS</u></p> <p>This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).</p>		
SPECIFICATION		
ORGANIZATION (Of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEM PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?		
A. GIVE PARAGRAPH NUMBER AND WORDING.		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE?		
<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE

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