



AEROSPACE STANDARD	AS1969™	REV. A
	Issued 1990-03 Reaffirmed 2013-01 Stabilized 2025-01 Superseding AS1969	
Coupling Assembly, Self-Sealing, Quick Disconnect Fuel and Oil System Components		

RATIONALE

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Documents

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1. SCOPE:

This specification covers the requirements for self-sealing, quick-disconnect couplings for fuel and oil system components.

1.1 Classification:

Couplings shall be of the following types and classes:

TABLE 1 - Type I Fuel Line Coupling

CLASS	HIGH TEMPERATURE		LOW TEMPERATURE	
	T (Operating)	T _t (Test)	T _a (Ambient)	FUEL AND AIR (Operating, Test, and Ambient)
A	140°F ± 5	167°F ± 9	167°F ± 9	-65.0°F ± 7
B	203°F ± 9	239°F ± 9	347°F ± 9	-65.0°F ± 7
C	302°F ± 9	356°F ± 13	599°F ± 18	-65.0°F ± 7

Test Fluid per MIL-T-5624, unless otherwise specified.

T = High operational fuel temperature

T_t = High fuel test temperature

T_a = High ambient temperature

TABLE 2 - Type II Oil Line Coupling

CLASS	HIGH TEMPERATURE		LOW TEMPERATURE	
	T (Operating)	T _t (Test)	T _a (Ambient)	OIL AND AIR (Operating, Test, and Ambient)
A Petroleum Oil (MIL-L-6082)	250°F ± 5	250°F ± 5	160°F ± 5	-65°F ± 2
B Synthetic Oil (MIL-L-7808)	350°F ± 5	350°F ± 5	350°F ± 5	-65°F ± 2
C Synthetic Oil (MIL-L-23699)	400°F ± 5	400°F ± 5	400°F ± 5	-40°F ± 2

T = High operational oil temperature

T_t = High oil test temperature

T_a = High ambient temperature

1.2 Nonstandard Environment:

Wherever the temperature environment exceeds the classes of Table 1 or Table 2, or where unusual circumstances exist, the lowest and highest fluid, vapor, and ambient temperatures shall be identified. A component may still belong to one of the above classes if the exposure to a higher ambient temperature (T_a) is transitory and does not result in heating the component more than 86 °F above the test temperature (T_t) for more than 15 min total during 10 h of operation.

1.3 Sizes:

Types I and II couplings shall mate with hose and tubing of the following nominal sizes: 1/8, 1/4, 3/8, 1/2, 5/8, 3/4, 1, 1-1/4, 1-1/2, and 2 inch.

2. APPLICABLE DOCUMENTS:

2.1 Issues of Documents:

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

2.1.1 Federal:

QQ-P-35	Passivation Treatments for Corrosion-Resisting Steel
QQ-C-320	Chromium Plating (Electrodeposited)
P-D-680	Dry Cleaning Solvent
TT-S-735	Standard Test Fluid Hydrocarbon

2.1.2 Military Specifications:

MIL-P-5315	Packing, Preformed, Hydrocarbon Fuel Resistant
MIL-T-5624	Turbine Fuel, Aviation, Grade JP-4 and JP-5
MIL-L-6082	Lubricating Oil, Aircraft Reciprocating Engine (Piston)
MIL-C-7024	Calibrating Fluid, Aircraft Fuel System Components
MIL-R-7362	Rubber, Synthetic, Solid, Sheet, Strip, and Fabricated Parts, Synthetic Oil Resistant
MIL-L-7808	Lubricating Oil, Gas Turbine, Aircraft Engine, Synthetic Base
MIL-F-8615	General Specification for Fuel System Components
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-H-8795	Hose Assemblies, Rubber, Hydraulic, Fuel and Oil Resistant
MIL-L-23699	Lubricating Oil, Aircraft Turbine Engines, Synthetic Base
MIL-H-25579	Hose Assembly, Tetrafluoroethylene, High Temperature, Medium Pressure
MIL-R-25988	Rubber, Fluorosilicone Elastomer, Oil and Fuel Resistant
MIL-R-83248	Rubber, Fluorocarbon Elastomer, High Temperature, Fluid, and Compression Set Resistant

2.1.3 Military Standards:

MIL-STD-129	Marking For Shipment and Storage
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-810	Environmental Test Methods
MS8000	Hose Assembly, Detachable Fittings, Tetrafluoroethylene, High Temperature, Medium Pressure, Flare to Flare
MS8001	Hose Assembly, Detachable Fittings, Tetrafluoroethylene, High Temperature, Medium Pressure, Flareless to Flareless
MS8005	Hose Assembly, Permanently Attached Fittings, Tetrafluoroethylene, High Temperature, Medium Pressure, Flare to Flare
MS8006	Hose Assembly, Permanently Attached Fittings, Tetrafluoroethylene, High Temperature, Medium Pressure, Flareless to Flareless
MS28741	Hose Assembly, Detachable End Fitting, Medium Pressure

2.1.4 Society of Automotive Engineers (SAE):

AIR1047	A Guide for the Selection of Quick-Disconnect Couplings for Aerospace Fluid Systems
ARP24B	Determination of Hydraulic Pressure Drop
ARP868A	Method-Pressure Drop Tests for Fuel System Components

3. REQUIREMENTS:

3.1 Qualification:

The couplings furnished under this specification shall be a product which has been tested, has passed the qualification tests specified herein, and has been approved by the procuring agency or prime contractor.

3.2 General Specification:

The requirements of MIL-F-8615 apply as requirements of this specification for fuel couplings with the exceptions and additions as specified herein. When the two specifications conflict, this specification shall govern. Additional requirements may be added in the detail specification.

3.3 Materials:

Materials used shall be of high quality and suitable for the environment expected for aircraft. The couplings shall be constructed of materials that will not change the composition of or be adversely affected by the applicable fluids specified in MIL-F-8615 and this specification. Other materials and fluids can be utilized for similar applications based on procuring agency requirements.

3.3.1 Magnesium, Copper, and Cadmium: Magnesium, copper, and cadmium plating shall not be used for parts that are normally in contact with fuel and synthetic oil.

3.3.2 Protective Treatment: When materials are used in the construction of the couplings that are subject to deterioration when exposed to climatic or environmental conditions likely to occur during storage or 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 chip, crack, abrade, peel, or scale during service life or extreme environmental conditions shall be unacceptable.

3.4 Design and Construction:

The configuration, dimensions, and other details of design of the couplings shall conform to applicable specification control drawings. The design objective shall be to obtain the smallest size and lightest weight commensurate with meeting performance requirements herein. When coupled, the coupling shall be such that it will permit fluid flow in either direction in accordance with the rated flow and pressure drop as specified in Table 3 and at the rated pressures specified in Table 4. Flow shall not be blocked under surge conditions.

- 3.4.1 Temperature Range: The couplings shall be designed to operate throughout the applicable temperature range for type and class of coupling.
- 3.4.2 Sealing and Fluid Loss: The couplings shall, when uncoupled, seal the ends of the disconnected lines at the point of disconnection and shall not permit external leakage during any phase of coupling or uncoupling. Fluid loss (spillage) as specified in Table 3 is not considered to be external leakage. Both halves of the coupling shall seal fluid under both low and high pressures.
- 3.4.3 Seals: Seals shall be in accordance with MIL-P-5315, MIL-R-7362, MIL-R-25988, MIL-R-83248 or other material compatible with the fluid used.

TABLE 3 - Rated Flow, Pressure Drop, and Fluid Loss

DASH NO.	EQUIVALENT TUBE SIZE IN INCHES	RATED FLOW GPM	SURGE FLOW GPM	PRESSURE DROP WITH WATER PSI (MAX)	AVERAGE FLUID LOSS (SPILLAGE) PER OPERATING CYCLE (in ³) (MAX)
-02	1/8	0.4	2.0	4.0	0.122
-04	1/4	1.2	6.0	4.5	0.153
-06	3/8	3.5	17.5	5.0	0.183
-08	1/2	6.0	30.0	5.5	0.244
-10	5/8	10.5	52.5	6.0	0.549
-12	3/4	16.0	80.0	7.0	0.915
-16	1	29.0	87.0	8.0	2.136
-20	1 1/4	45.0	90.0	10.0	2.746
-24	1 1/2	70.0	140.0	15.0	3.661
-32	2	125.0	250.0	15.0	5.492

TABLE 4 - Pressure Rating

TYPE	CLASS	FLUID	PRESSURE - PSI		
			OPERATING	PROOF	BURST
I	A, B, C	Fuel	60	120	240
II	A, B, C	Oil	120	240	360