Aeroquip®
Sure-Mate™ Couplings

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- Positive locking fingers
- Blunt start ACME threads for easy connection
- Lighter weight compared to previous thread-together couplings
- Low pressure drop across the connector
- Minimal air inclusion during connection
- Small envelope design
- Minimal fluid loss during disconnection

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Sure-Mate® Couplings

Introduction

Eaton's Aeroquip Sure-Mate quick disconnect couplings are the newest generation of self-sealing, thread-together couplings. They allow for quick, easy, reliable connection and disconnection of lube oil, coolant and hydraulic lines for civil and military aircraft as well as ground vehicle applications.

Eaton's innovative new Sure-Mate incorporates a new locking finger design to replace the aging ratchet teeth interface of many thread-together couplings. These couplings utilize blunt start ACME threads to allow easier connection and prevent galling and cross threading. The Sure-Mate is also lighter in weight and has a lower pressure drop than previous generation thread-together couplings.

The Sure-Mate coupling incorp-orates tubular valve and sleeve technology and a flush face design that minimizes fluid loss and air inclusion during connection and disconnection. Bonded elastomeric seals are used between the tubular valve and valve sleeve to prevent any leakage or wetting from the female half when in the disconnected position.

Sure-Mate couplings are available in titanium and aluminum with operating pressures up to 5000 psi (345 bar).

Sure-Mate features include:

- Positive locking fingers
- Blunt start ACME threads for easy connection
- Lighter weight compared to previous thread-together couplings
- Low pressure drop across the connector
- Minimal air inclusion during connection and minimal fluid loss during disconnection
- Small envelope design

Every Sure-Mate coupling design has undergone rigorous quality and performance testing.

This dedication to detail and excellence is what has made Eaton's Aeroquip brand a leader in the aerospace industry.

Applications

The Sure-Mate coupling has a zero-leakage, ultra low profile design for use in hydraulic, lube oil and coolant systems on variety of civil aircraft, military aircraft and ground defense vehicles. The design of the coupling is essentially the same for all fluid applications; however, the O-ring material varies to accommodate the different fluids and their respective properties. For low-pressure applications, aluminum components are typically selected over titanium due to their lower cost and weight.

Design Features

The Sure-Mate coupling is a self-sealing thread-together coupling that allows for quick, reliable connection and disconnection of fluid lines. The improved design features fingers for positive lock indication and blunt start ACME threads for easy connection.

The Sure-Mate coupling has a zero-leakage, low air-inclusion and fluid loss design, which features a flat-faced valve that eliminates air trapped between the two halves during connection.

The unique one-piece male half design also eliminates a seal and a potential leak path found in older, two-piece designs. The use of a bonded, elastomeric seal on the female half valve provides a more reliable, leak-free seal when compared to both metal-to-metal or PTFE seals.

The flush face, self-sealing design of the Sure-Mate makes the coupling the most contamination resistant coupling on the market. Furthermore, the design contains no exposed O-rings. This reduces the possibility of damage to the seals and eliminates the potential for O-rings to fall out of the coupling. Exposed O-ring designs can be susceptible to the intro-duction of FOD (Foreign Object Debris) into the hydraulic or coolant system. FOD is one of the leading causes of failure in hydraulic and coolant systems.

The design of the Sure-Mate coupling incorporates timed threads and locking fingers to ensure a precise and secure connection every time. Sure-Mate's locking fingers provide unmistakable visual and tactile indication that the coupling is fully engaged. When the coupling is not fully engaged, visual and tangible gaps are present between the fingers and mating slots. Additionally, the locking fingers create an audible click, signaling the user that the coupling is secure.

The robust design has been tested in field applications and in Eaton test facilities to simulate a broad range of working environ-ments. All sizes are qualified to SAE AS1709 requirements for fluid conveyance applications. Eaton's Sure-Mate couplings can operate at pressures ranging from vacuum to 5000 psi (345 bar) and temperatures ranging from -65°F to +275°F (-54°C to +135°C), giving it unsurpassed versatility for a thread-together coupling.

Sure-Mate couplings are available in many different end-fitting configurations, and each coupling is 100% leak-tested after assembly to ensure quality.

Sure-Mate couplings have been selected for the Boeing 787 liquid cooling system.

Key Components

Valve

The valve is a flush face design engineered to minimize air inclusion during connection and minimize fluid loss during disconnection. A bonded seal provides additional leak protection. The valve sleeve first forms a primary seal with the molded seal before ending in a secondary metal-to-metal seal.

Fingers

Each Sure-Mate coupling has locking fingers that are linked and timed with the threads ensuring full flow and secure connections each and every time. The locking fingers and matching thread-start design can be used to poke-yoke or polarize different systems, thus preventing cross-connection. There are a total of 6 polarized designs ranging from 1 to 6 locking fingers and matching thread starts.

Blunt Start Acme Threads

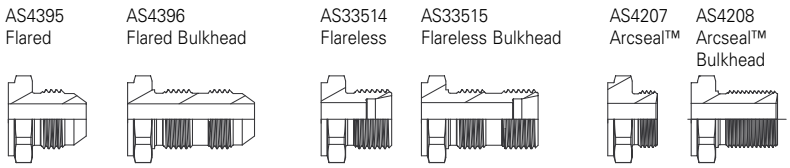
Stub Acme blunt start threads result in easier connection of the coupling halves when compared to couplings utilizing traditional V threads. Stub Acme blunt start threads are also more durable and more resistant to galling and cross threading than traditional V-threads.

Adapter

There are several possible end-fitting configurations based on application and customer specification.

Table: Letter Code & Tube Size

Dash Size	-4	-6	-8	-10	-12	-16
Tube Size (in)	1/4	3/8	1/2	5/8	3/4	1
Letter Code	E	G	H	J	K	M



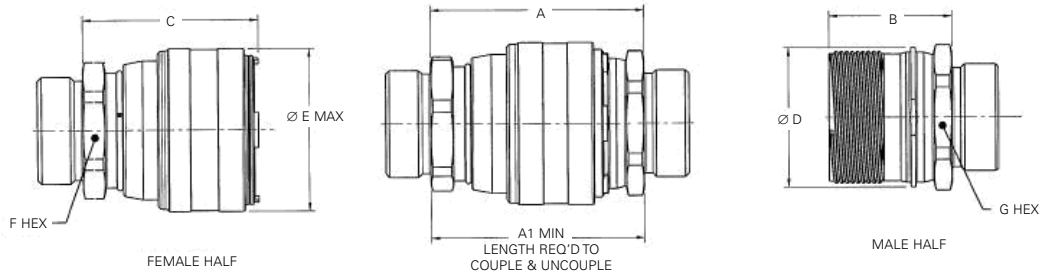


Table: Coupling Dimensions

Dash Size	"A" DIM (IN)	"A1"MIN (IN)	"B" DIM (IN)	"C" DIM (IN)	Ø"D" DIM (IN)	Ø"E" MAX (IN)	"F" HEX (IN)	"G" HEX (IN)
-4	1.695	2.44	1.015	1.400	0.562	.870	0.625	0.688
-6	1.770	2.49	1.030	1.440	0.750	1.030	0.750	0.812
-8	2.000	2.87	1.100	1.740	0.938	1.210	0.938	1.000
-10	2.280	3.31	1.310	1.940	1.125	1.450	1.062	1.250
-12	2.600	3.78	1.490	2.270	1.312	1.680	1.312	1.438
-16	3.000	4.20	1.765	2.390	1.625	2.031	1.562	1.562
-20	3.250	4.60	1.875	2.690	2.182	2.490	1.875	2.000
-24	3.750	5.33	2.185	3.100	2.480	2.900	2.000	2.250

Operation

The Sure-Mate coupling, when connected, allows fluid to flow freely from one half to the other. It can provide power or can transfer resources such as coolant or hydraulic oil safely and efficiently throughout the system.

The design of the Sure-Mate coupling allows for easy connection and disconnection using only one hand. To connect, simply thread the two mating halves together until the locking fingers have seated in the male half. You will hear a click when the coupling connects. Both the clicking sound as well as the visual seating of the locking fingers, signal that the coupling is fully connected and secure.

To disconnect the Sure-Mate coupling halves, pull back on the outer knurled sleeve and rotate. The locking fingers disengage allowing rotation of the female coupling half sleeve until the two halves are completely disconnected.

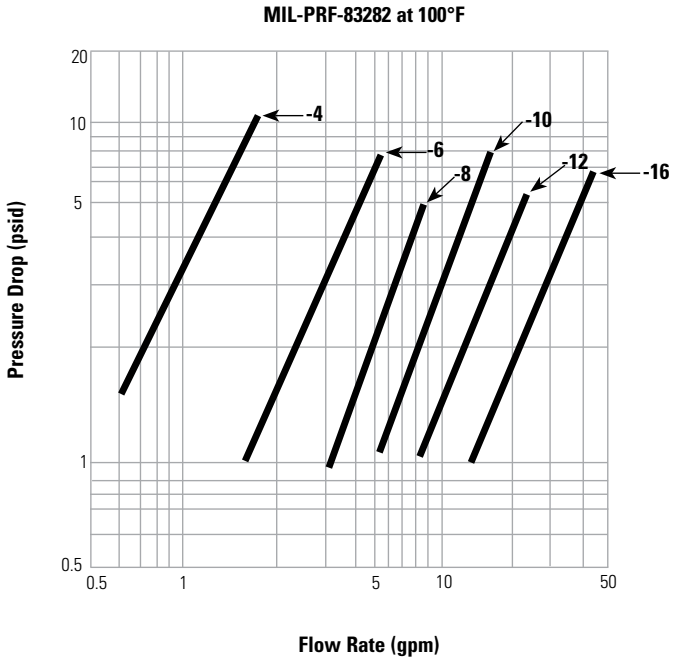
Reliability

Each coupling has been tested at Eaton's state-of-the-art facility. These tests have been designed to simulate all possible working conditions to certify the superior performance of the couplings. All Sure-Mate couplings have been tested to meet or exceed SAE AS1709 specifications for hydraulic thread-together couplings. These requirements include:

- Ability to operate within a temperature range of -65°F (-54°C) to +275°F (135°C).
- Capable of enduring 200 connect/disconnect cycles without evidence of malfunction, leakage or damage
- Ability to tolerate a one-minute proof pressure test equal to 150% of the operating pressure and a burst test equal to 250% of the rated operating pressure without rupture or loss of fluid.
- Ability to withstand a 20g impact test without inadvertent disconnection or malfunction

Weight and Performance Characteristics

Sure-Mate Pressure Drop Curves



Flow Coefficient (C_V Factor)
(Flow Rate in GPM of Water 60°F with 1 psig Pressure Drop)

Dash Size	-4	-6	-8	-10	-12	-16
C_V	0.53	1.6	4.1	6.2	10.3	15.9

Sure-Mate Bulletin Weights

Aluminum (1500 psig) AS4395 Ends			Titanium (5000 psig) AS4207B Arcseal® Ends	
Dash Size	**Bulkhead Half (lbs)**	**Hose Half (lbs)**	**Bulkhead Half (lbs)**	**Hose Half (lbs)**
-4	.027	.054	.041	.070
-6	.041	.070	.065	.103
-8	.065	.117	.103	.169
-10	.113	.179	.180	.270
-12	.165	.271	.244	.410
-16	.247	.414	.374	.628
-20	.395	.667	-	-
-24	.586	.939	-	-

Materials

High Pressure Series	
Primary Component Material	Titanium (Consult Eaton for CRES)
Media	MIL-PRF-83282 Oil and Phosphate Ester Base Fluids (Skydrol)
Packings	Nitrile, EPR
Temperature Range	-65F (-54C) to +275F (135C)
Operating Pressure	5000 psi (345 bar)
Proof Pressure	7500 psi (517 bar)
Minimum Burst Pressure	12500 psi (862 bar)

Low Pressure Series	
Primary Component Material	Aluminum
Media	MIL-PRF-83280 Oil, Phosphate Ester Base Fluids (Skydrol)
Packings	Nitirle, EPR, Fluorosilicone, Fluorocarbon
Temperature Range	-65F (-54C) to +275F (135C)
Operating Pressure	1500 psig (-4 through -16 sizes) and 1000 psig for -20 and -24
Proof Pressure	2250 psig (-4 through -16 sizes) and 1500 psig for -20 and -24
Minimum Burst Pressure	3750 psig (-4 through -16 sizes) and 2500 psig for -20 and -24

With an appropriate change in materials and packings, couplings may be adapted to a wide range of fluids and temperatures.

Part Numbers

Eaton is dedicated to helping you choose the correct coupling and correct materials for the correct application. Our technical service representatives can assist you in part selection. This catalog features standard coupling models; however Eaton will provide custom designed couplings upon request.

High Pressure 5000 psi Series Titanium Coupling Part Numbers
Coupling Half, Male

AS33514 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76033E	AE76034E
-6	AE76033G	AE76034G
-8	AE76033H	AE76034H
-10	AE76033J	AE76034J
-12	AE76033K	AE76034K
-16	AE76033M	AE76034M

AS4395 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76035E	AE76036E
-6	AE76035G	AE76036G
-8	AE76035H	AE76036H
-10	AE76035J	AE76036J
-12	AE76035K	AE76036K
-16	AE76035M	AE76036M

AS4207B Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76037E	AE76038E
-6	AE76037G	AE76038G
-8	AE76037H	AE76038H
-10	AE76037J	AE76038J
-12	AE76037K	AE76038K
-16	AE76037M	AE76038M

High Pressure 5000 psi Series Titanium Coupling Part Numbers
Coupling Half, Male for Bulkhead Mounting

AS33515 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76022E	AE76024E
-6	AE76022G	AE76024G
-8	AE76022H	AE76024H
-10	AE76022J	AE76024J
-12	AE76022K	AE76024K
-16	AE76022M	AE76024M

AS4396 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76026E	AE76028E
-6	AE76026G	AE76028G
-8	AE76026H	AE76028H
-10	AE76026J	AE76028J
-12	AE76026K	AE76028K
-16	AE76026M	AE76028M

AS4208B Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76030E	AE76032E
-6	AE76030G	AE76032G
-8	AE76030H	AE76032H
-10	AE76030J	AE76032J
-12	AE76030K	AE76032K
-16	AE76030M	AE76032M

High Pressure 5000 psi Series Titanium Coupling Part Numbers
Coupling Half, Female for Hose Attaching

AS33514 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76021E	AE76023E
-6	AE76021G	AE76023G
-8	AE76021H	AE76023H
-10	AE76021J	AE76023J
-12	AE76021K	AE76023K
-16	AE76021M	AE76023M

AS4395 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76025E	AE76027E
-6	AE76025G	AE76027G
-8	AE76025H	AE76027H
-10	AE76025J	AE76027J
-12	AE76025K	AE76027K
-16	AE76025M	AE76027M

AS4207B Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76029E	AE76031E
-6	AE76029G	AE76031G
-8	AE76029H	AE76031H
-10	AE76029J	AE76031J
-12	AE76029K	AE76031K
-16	AE76029M	AE76031M

Low Pressure 1500 psi Series Aluminum Coupling Part Numbers
Coupling Half, Male

AS33514 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE77290E	AE76048E
-6	AE77290G	AE76048G
-8	AE77290H	AE76048H
-10	AE77290J	AE76048J
-12	AE77290K	AE76048K
-16	AE77290M	AE76048M
-20	AE77290N	AE76048N
-24	AE77290P	AE76048P

AS4395 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76809E	AE76050E
-6	AE76809G	AE76050G
-8	AE76809H	AE76050H
-10	AE76809J	AE76050J
-12	AE76809K	AE76050K
-16	AE76809M	AE76050M
-20	AE76809N	AE76050N
-24	AE76809P	AE76050P

Low Pressure 1500 psi Series Aluminum Coupling Part Numbers
Coupling Half, Male for Bulkhead Mounting

AS33515 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76040E	AE770001E
-6	AE76040G	AE770001G
-8	AE76040H	AE770001H
-10	AE76040J	AE770001J
-12	AE76040K	AE770001K
-16	AE76040M	AE770001M
-20	AE76040N	AE770001N
-24	AE76040P	AE770001P

AS4396 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76044E	AE76046E
-6	AE76044G	AE76046G
-8	AE76044H	AE76046H
-10	AE76044J	AE76046J
-12	AE76044K	AE76046K
-16	AE76044M	AE76046M
-20	AE76044N	AE76046N
-24	AE76044P	AE76046P

Low Pressure 1500 psi Series Aluminum Coupling Part Numbers
Coupling Half, Female for Hose Attaching

AS33514 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE77289E	AE77000E
-6	AE77289G	AE77000G
-8	AE77289H	AE77000H
-10	AE77289J	AE77000J
-12	AE77289K	AE77000K
-16	AE77289M	AE77000M
-20	AE77289N	AE77000N
-24	AE77289P	AE77000P

AS4395 Ends Fluid		
Size	**Mil-PRF-83282 Oil**	**Phosphate Ester**
-4	AE76808E	AE76045E
-6	AE76808G	AE76045G
-8	AE76808H	AE76045H
-10	AE76808J	AE76045J
-12	AE76808K	AE76045K
-16	AE76808M	AE76045M
-20	AE76808N	AE76045N
-24	AE76808P	AE76045P

The user should carefully observe the precautions listed in this catalog or brochure, including the recommendations on the selection of couplings on the relevant pages and the pages on fluid compatibility. Maximum application operating pressure should not exceed operating pressure listed.

⚠ WARNING:

Application considerations must be observed in selecting appropriate components for the application of these products contained herein. The failure to follow the recommendations set forth in this catalog may result in an unstable application, which may result in serious personal injury or property damage.

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Caps & Plugs

Metal Dust Cap

Metal Dust Plug

Pressure Caps

Size	Material	MIL-PRF-83282	"Phosphate-Ester (Skydrol)"
-4	Aluminum Titanium	NA AE77864E	AE77295E AE77296E
-6	Aluminum Titanium	NA AE77864G	AE77295G AE77296G
-8	Aluminum Titanium	NA AE77864H	AE77295H AE77296H
-10	Aluminum Titanium	NA AE77864J	AE77295J AE77296J
-12	Aluminum Titanium	AE77867K AE77864K	AE77295K AE77296K
-16	Aluminum Titanium	AE77867M AE77864M	AE77295M AE77296M

Pressure Plugs

Size	Material	MIL-PRF-83282	"Phosphate-Ester (Skydrol)"
-4	Aluminum Titanium	NA AE77865E	NA AE77866E
-6	Aluminum Titanium	NA AE77865G	NA AE77866G
-8	Aluminum Titanium	NA AE77865H	NA AE77866H
-10	Aluminum Titanium	NA AE77865J	NA AE77866J
-12	Aluminum Titanium	AE77868K AE77865K	AE77869K AE77866K
-16	Aluminum Titanium	AE77868M AE77865M	AE77869M AE77866M

Rubber Dust Cap (Male QD)

Rubber Dust Cap (Female QD)

Rubber Caps (Male QD's)

Size	MIL-PRF-83282	"Phosphate-Ester (Skydrol)"
-4	NA	AE76549E
-6	NA	AE76549G
-8	NA	AE76549H
-10	NA	AE76549J
-12	NA	AE76549K
-16	NA	AE76549M

Rubber Caps (Female QD's)

Size	MIL-PRF-83282	"Phosphate-Ester (Skydrol)"
-4	NA	AE76550E
-6	NA	AE76550G
-8	NA	AE76550H
-10	NA	AE76550J
-12	NA	AE76550K
-16	NA	AE76550M

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