

INCH-POUND

MIL-DTL-38726A
 8 January 2002
 SUPERSEDING
 MIL-A-38726
 18 June 1965

DETAIL SPECIFICATION

ADAPTER ASSEMBLY, REUSABLE, FLEXIBLE HOSE, LOW PRESSURE

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

1. SCOPE

1.1 Scope. This specification covers a reusable, swivel nut type adapter assembly for use with low-pressure hose assemblies.

1.2 Classification. The adapter assembly is furnished in the sizes specified on the applicable specification sheet.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

QQ-P-416 - Plating, Cadmium (Electrodeposited)

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center, Columbus, DSCC-VAI, 3990 East Broad Street, Columbus, OH 43216-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4730

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DEPARTMENT OF DEFENSE

AN6270	-	Hose Assembly - Detachable Swivel Fitting, Low Pressure
MIL-DTL-5593	-	Hose, Aircraft, Low Pressure, Flexible
MIL-H-5606	-	Hydraulic Fluid, Petroleum Base; Aircraft, Missile, and Ordnance
MIL-A-8625	-	Anodic Coatings for Aluminum and Aluminum Alloys
MIL-PRF-83282	-	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric, NATO Code Number H-537
MS27404	-	Adapter, Straight, Reusable, Tube to Hose, Low Pressure

(Unless otherwise indicated, copies of the above specifications and standards are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4/D, Philadelphia, PA 19111-5094.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are Department of Defense (DoD) adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B46.1	-	Surface Texture (Surface Roughness, Waviness, and Lay) (DoD adopted)
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(Application for copies should be addressed to the American Society of Mechanical Engineers, P.O. Box 2300, Fairfield, NJ 07007-2300.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D380	-	Rubber Hose, Standard Test Methods for (DoD adopted)
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(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

NATIONAL CONFERENCE OF STANDARDS LABORATORIES (NCSL)

ANSI/NCSL Z540-1	-	Calibration Laboratories and Measuring and Test Equipment, General Requirements (DoD adopted)
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(Application for copies should be addressed to the National Conference of Standards Laboratories, 1800 30th Street, Suite 305B, Boulder, CO 80301.)

SAE INTERNATIONAL

SAE AMS4133	-	Aluminum Alloy Forgings and Rolled Rings, 4.4Cu - 0.85Si - 0.80Mn - 0.50Mg (2014-T6), Solution and Precipitation Heat Treated (DoD adopted)
SAE AMS4141	-	Aluminum Alloy Die Forgings, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075-T73), Solution and Precipitation Heat Treated (DoD adopted)

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SAE AMS6349	-	Steel Bars, 0.95Cr - 0.20Mo (0.38 to 0.43C) (SAE 4140), Normalized
SAE AMS6382	-	Steel, Bars, Forgings, and Rings, 0.95Cr - 0.20Mo (0.38 - 0.43C) (SAE 4140), Annealed (DoD adopted)
SAE AMS-H-6088	-	Heat Treatment of Aluminum Alloys (DoD adopted)
SAE AMS-S-6758	-	Steel, Chrome-Molybdenum (4130) Bars and Reforging Stock (Aircraft Quality) (DoD adopted)
SAE AMS-QQ-A-225/6	-	Aluminum Alloy, 2024, Bar, Rod, and Wire; Rolled, Drawn, or Cold Finished (DoD adopted)
SAE AMS-QQ-A-225/9	-	Aluminum Alloy 7075, Bar, Rod, Wire, and Special Shapes; Rolled, Drawn, or Cold Finished (DoD adopted)
SAE ARP908	-	Torque Requirements Installation and Qualification Test, Hose and Tube Fittings (DoD adopted)
SAE AS8879	-	Screw Threads - UNJ Profile, Inch

(Application for copies should be addressed to SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications, specification sheets, or MS standards), the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 Qualification. The adapter assembly furnished under this specification shall be a product that is authorized by the qualifying activity for listing on the applicable qualified products list (QPL) before contract award (see 4.4 and 6.3).

3.3 Materials. Component parts of the adapter assembly shall be fabricated from the materials listed in table I, as specified in MS27404. To allow a phase in period and deplete existing stock, component parts made of material from previous issues may be supplied for one year from date of this document.

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3.3.1 Heat treatment. Aluminum alloy parts shall be heat treated in accordance with SAE AMS-H-6088 to the tempers specified in table I.

TABLE I. Material.

Type	Material	Form	Specification
Straight	Aluminum Alloy	Bars, Rods, Shapes	SAE AMS-QQ-A-225/6 (2024, T851 Temper) SAE AMS-QQ-A-225/9 (7075, T73 Temper)
		Forgings	SAE AMS4133 (2014, T6 Temper) SAE AMS4141 (7075, T73 Temper)
Straight and Shapes	Steel	Bars, Rods, and Forgings	SAE AMS-S-6758 (4130) SAE AMS6382 and AMS6349 (4140)

3.3.2 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3.3 Hazardous substances. The use of hazardous substances, toxic chemicals, or ozone depleting chemicals (ODCs) shall be avoided whenever feasible.

3.4 Finish.

3.4.1 Aluminum parts. Aluminum parts shall be anodized in accordance with MIL-A-8625, type II, for a period of 30 ±5 minutes.

3.4.1.1 Current density. Anodic current density shall be within 12 to 16 amperes per square foot, measured on a flat sheet.

3.4.2 Steel parts. Steel parts shall be cadmium plated in accordance with QQ-P-416, type II, class 2. To the users of this document, it is recommended that the use of steel parts with cadmium plating be used only when other materials and finishes specified in the document cannot meet performance requirements.

3.5 Design and construction. The design of the adapter assembly shall be in accordance with MS27404 and this specification, as applicable. The adapter assembly shall be suitable for use with hose conforming to MIL-DTL-5593.

3.5.1 Hose. The adapter assembly specified herein shall be compatible with hose conforming to MIL-DTL-5593 to form flexible hose assemblies per AN6270 for use in low-pressure systems.

3.5.2 Dimensions. Dimensions and tolerances shall be as specified in MS27404.

3.5.3 Screw threads. Screw threads shall be in accordance with SAE AS8879.

3.5.4 Surface roughness. Surface roughness shall be in accordance with ASME B46.1.

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3.5.5 Interchangeability. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable.

3.6 Performance.

3.6.1 Proof pressure. When tested as specified in 4.6.2 with the applicable proof pressure specified in table II, there shall be no evidence of leakage from the adapter assembly.

3.6.2 Leakage. When tested as specified in 4.6.3, there shall be no evidence of leakage from the adapter assembly.

3.6.3 Burst pressure. When tested as specified in 4.6.4, the adapter assembly shall not leak or blow off the hose at any pressure that is less than the burst pressure specified in table II.

3.6.4 Low temperature flexibility. When tested as specified in 4.6.5, there shall be no evidence of leakage from the adapter assembly.

3.6.5 Over-tightening torque. When tested as specified in 4.6.6, there shall be no evidence of failure of the adapter assembly or difficulty in turning the swivel nut on the nipple by hand.

TABLE II. Performance characteristics.

Adapter assembly size	Operating pressure, max (psi)	Proof pressure, min (psi)	Burst pressure, min (psi)	Bend radius (inside of bend), min (inch)
-2	300	600	2000	2
-3	250	500	1700	2
-4	200	400	1250	4
-6	150	300	1000	4
-8	150	250	750	6
-10	150	250	700	6

3.7 Identification of product. The adapter assembly shall be marked with the Part or Identifying Number (PIN), manufacturer's name or trademark, and CAGE code. In addition, the adapter assembly shall be color-coded blue for aluminum and black for steel.

3.8 Workmanship. The adapter assembly shall be free from cracks, laps, seams, burrs, longitudinal and spiral tool marks, or any other defects that would adversely affect its service performance. The sealing surface shall be smooth except that annular tool marks of 100 μin R_a , as defined in ASME B46.1, shall be acceptable. All other machined surfaces shall not exceed 125 μin R_a .

4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality, and quantity to permit performance of the required inspection shall be used. The establishment and maintenance of a calibration system to control the accuracy of the test and measuring equipment shall be in accordance with ANSI/NCSL Z540-1 or equivalent.

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4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- a. Qualification inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).
 1. Sampling tests (see 4.5.2).
 2. Periodic control tests (see 4.5.3).

4.3 Inspection conditions. Unless otherwise specified, all required inspections shall be performed in accordance with the test conditions specified in 4.6.

4.4 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the qualifying activity on sample units produced with equipment and procedures used in production.

4.4.1 Samples for qualification. Qualification samples shall be representative of the products proposed to be furnished to this specification. Samples, consisting of ten adapter assemblies conforming to MS27404 of each size, shall be subjected to qualification testing. Two adapter assemblies shall be tested as is; the remaining eight adapter assemblies shall be used with hose conforming to MIL-DTL-5593 to construct four hose assemblies that are 18 inches in length. Adapters shall be qualified with hose from a minimum of two specific qualified manufacturers.

4.4.2 Qualification inspection routine. All samples shall be subjected to qualification testing in accordance with table III and in the sequence specified in table IV.

4.4.3 Acceptance of qualification data. For identical requirements and test procedures, using an identical fitting, qualification test data from MIL-DTL-5593 may be accepted as qualification test data for MIL-DTL-38726 providing that documented approval has been obtained from the qualifying activity. Unless otherwise approved by the qualifying activity, qualification test data from one manufacturer shall not be accepted for another.

TABLE III. Inspection requirements.

Requirement	Requirement paragraph	Test method paragraph	Qualification inspection	Conformance inspection		
				Sampling tests	Periodic control tests	
					1	2
Examination of product	3.3, 3.5.2, 3.7, 3.8	4.6.1	X	X		
Proof pressure	3.6.1	4.6.2	X		X	
Leakage	3.6.2	4.6.3	X		X	
Burst pressure	3.6.3	4.6.4	X		X	
Low temperature flexibility	3.6.4	4.6.5	X			
Over-tightening torque	3.6.5	4.6.6	X			X

4.4.4 Failures. One or more failures shall be cause for refusal to grant qualification approval.

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4.4.5 Retention of qualification. To retain qualification, the manufacturer shall submit a report at 12-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. Each report shall contain a summary of the results obtained from both the sampling tests and the periodic control tests performed during the 12-month period. The number of lots and quantities of adapter assemblies that have passed and failed shall be included. All reworked sampling lots shall be accounted for and identified.

Table IV. Qualification inspection sequence.

Required qualification test	Test method paragraph	Sample number				
		Adapter assemblies	Hose assemblies			
		1 and 2	3	4	5	6
Examination of product	4.6.1	X	X	X	X	X
Proof pressure	4.6.2		X	X	X	X
Leakage	4.6.3		X	X		
Burst pressure	4.6.4		X	X		
Low temperature flexibility	4.6.5				X	X
Over-tightening torque	4.6.6	X				
Proof pressure	4.6.2				X	X

4.4.5.1 Non-conformance of qualification. If the summary of test results indicates nonconformance with the requirements specified herein, but corrective measures acceptable to the qualifying activity have not been taken, action may be taken to remove the failing product from the QPL.

4.4.5.2 Periodic qualification report. Failure to submit the report within 30 days after the end of each 12-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the manufacturer shall immediately notify the qualifying activity at any time during the 12-month period that the inspection data indicates failure of the qualified product to meet the requirements of this specification. If there has been no production during the reporting period, a report shall be submitted certifying that the manufacturer still has the capability and facilities necessary to produce the qualified product. If there has been no production during two consecutive reporting periods, the manufacturer may be required, at the discretion of the qualifying activity, to submit his qualified product for testing in accordance with the qualification inspection requirements.

4.5 Quality conformance inspection.

4.5.1 Inspection of product for delivery. Inspection of product for delivery shall consist of sampling tests.

4.5.2 Sampling tests. Adapter assemblies, randomly selected from a production lot (see 4.5.2.1) to form an inspection sample (see 4.5.2.2), shall be subjected to the sampling tests specified in table III.

4.5.2.1 Production lot. A production lot shall consist of adapter assemblies of one size manufactured on the same production line(s) by means of the same production techniques, materials, controls, and design during the same continuous production run.

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4.5.2.2 Inspection sample. An inspection sample shall be product randomly selected from the production lot without regard to quality. The sample size shall be as specified in table V.

Table V. Inspection sample.

Production lot size	Accept on zero sample size
1 to 8	All
9 to 90	8
91 to 150	12
151 to 280	19
281 to 500	21
501 to 1,200	27
1,201 to 3,200	35
3,201 to 10,000	38
10,001 to 35,000	46

4.5.2.3 Nonconformance of sampling tests. If one or more defects are found in the inspection sample, both the qualifying and inspection activities shall be immediately notified and the production lot shall be rejected and not be supplied to this specification. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity, has been taken. The corrective measures shall be performed on the materials or processes, or both, as warranted, and on all products considered subjected to the same failure. Once the corrective action has been completed, either the specific sampling test in which the original sample failed or all sampling tests may be required to be repeated on additional samples, at the option of the qualifying activity. However, final acceptance shall be withheld until testing has shown that the corrective action was successful. In the event of a failure after re-inspection, information concerning the failure and the corrective action taken shall be furnished to both the qualifying and inspection activities.

4.5.3 Periodic control tests. Required periodic control tests at the adapter assembly level that were already performed at the bulk hose level may be eliminated if documented approval has been obtained from the qualifying activity.

4.5.3.1 Periodic tests (1). Periodic tests (1) as specified in table III shall be performed on six adapter assemblies, conforming to MS27404 of each size used with hose conforming to MIL-DTL-5593 to construct three hose assemblies, at least once per year regardless of the total number of adapter assemblies produced. The adapter assemblies selected shall be representative of those produced during the period with respect to materials and joint configurations. If there has been no production of a specific size during the past year, periodic testing (1) is not required for that size.

4.5.3.2 Periodic tests (2). Periodic tests (2) as specified in table III shall be performed on two adapter assemblies, conforming to MS27404 of any size, at least once per year regardless of the total number of adapter assemblies produced. The adapter assemblies selected shall be representative of those produced during the period with respect to the metals used for the threaded parts if the parts have been produced from more than one type of metal. If there has been no production during the past year, periodic testing (2) is not required.

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4.5.3.3 Nonconformance of periodic control tests. If a sample fails a periodic control test, both the qualifying and inspection activities shall be immediately notified of such failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity, has been taken. The corrective measures shall be performed on the materials or processes, or both, as warranted, and on all products considered subjected to the same failure. Once the corrective action has been completed, either the specific periodic control test in which the original sample failed or all periodic control tests may be required to be repeated on additional samples, at the option of the qualifying activity. Furthermore, the sampling tests may be reinstated in addition to the periodic control tests if deemed applicable by the qualifying activity. However, final acceptance shall be withheld until testing has shown that the corrective action was successful. In the event of a failure after re-inspection, information concerning the failure and the corrective action taken shall be furnished to both the qualifying and inspection activities.

4.5.4 Disposition of test samples. Samples that have been subjected to any periodic control tests are considered damaged and shall not be delivered as part of a contract or purchase order.

4.5.5 Acceptance of conformance inspection data. For identical requirements and test procedures, using an identical fitting, conformance inspection data from MIL-DTL-5593 may be accepted as conformance inspection data for MIL-DTL-38726 provided that documental approval has been obtained from the qualifying activity.

4.6 Test methods.

4.6.1 Examination of product. The adapter assembly shall be visually and physically examined for conformance to the following requirements:

- a. Materials (see 3.3).
- b. Dimensions (see 3.5.2).
- c. Marking (see 3.7).
- d. Workmanship (see 3.8).

4.6.2 Proof pressure. Proof pressure testing shall be conducted in accordance with ASTM D380, hydrostatic pressure test (using either hydraulic fluid, conforming to MIL-H-5606 or MIL-PRF-83282, or water as the test fluid). All test samples shall be subjected to the applicable proof pressure specified in table II for not less than 3 minutes and not more than 5 minutes and observed for evidence of leakage. Requirements shall be as specified in 3.6.1.

4.6.3 Leakage. Two unaged (as manufactured) test samples shall be tested in accordance with ASTM D380. Test samples shall be subjected to the applicable proof pressure specified in table II maintained for not less than 1 hour. Hydraulic fluid conforming to MIL-H-5606 or MIL-PRF-83282, or water shall be used as the test fluid. The test samples shall be observed throughout the test for evidence of leakage. Requirements shall be as specified in 3.6.2.

4.6.4 Burst pressure. Burst pressure testing shall be conducted in accordance with ASTM D380 on the test samples that were subjected to the leakage test (4.6.3). The test samples shall be observed throughout the test for evidence of leakage or failure. Requirements shall be as specified in 3.6.3.

4.6.5 Low temperature flexibility. The low temperature flexibility test shall be determined in accordance with the low temperature test described in ASTM D380 (see 4.6.2). Requirements shall be as specified in 3.6.4.

4.6.6 Over-tightening torque. Two adapter assemblies of each size shall be tested in accordance with SAE ARP908.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful but is not mandatory.)

6.1 Intended use. The adapter assembly covered by this specification is intended for use with low-pressure hose assemblies used on air and vacuum systems for instruments, gages, and automatic pilots. The adapter assembly is a military-unique item because it is compatible with associated components and equipment in military aircraft and is capable of operating at temperatures ranging from -65 °F to +160 °F.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, date of this specification (including any amendments), and applicable specification sheet.
- b. Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.2 and 2.3).
- c. Packaging requirements (see 5.1).
- d. Size and part number of adapter assembly (see 6.4).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion on Qualified Products List QPL-38726 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements. Manufacturers are urged to have products they propose to offer to the Federal Government tested for qualification so that they may be eligible for contract awards or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Commander, Defense Supply Center, Columbus, DSCC-VQP, 3990 East Broad Street, Columbus, OH 43216-5000.

6.4 Part or Identifying Number (PIN). The PIN for the adapter assembly acquired under this specification is given in MS27404.

6.5 Subject term (key word) listing.

Air systems
Low temperature
Swivel nut
Vacuum systems

6.6 Changes from the previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

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Custodians:

Air Force - 99
Army - AT
Navy - AS
DLA -CC

Preparing activity:

DLA - CC

(Project 4730-0677)

Review activities:

Air Force - 71
Navy - MC, SA

