

## DETAIL SPECIFICATION

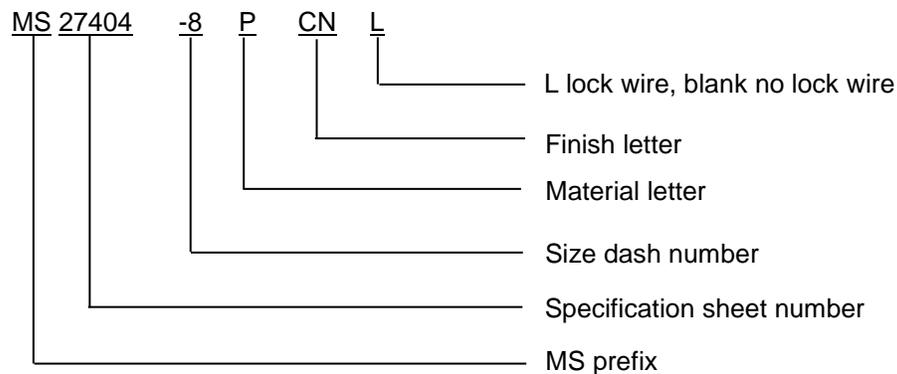
## ADAPTER ASSEMBLY, REUSABLE, FLEXIBLE HOSE, LOW PRESSURE

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 Part or Identifying Number (PIN). The PIN consists of the letter "MS" the specification sheet number, a dash number for tube and port size, a letter designator for material type, material finish letter, and a blank (no lockwire) or L for lockwire.



## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 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, 4, or 5 of this specification, whether or not they are listed.

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, Columbus, Attn: VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to [Fluidflow@dla.mil](mailto:Fluidflow@dla.mil). Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.daps.dla.mil>.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

DEPARTMENT OF DEFENSE SPECIFICATIONS

AN6270	-	Hose Assembly - Detachable Swivel Fitting, Low Pressure
MIL-A-8625	-	Anodic Coatings for Aluminum and Aluminum Alloys
MIL-DTL-5593	-	Hose, Aircraft, Low Pressure, Flexible
MIL-DTL-16232	-	Phosphate Coating, Heavy, Manganese or Zinc Base
MIL-DTL-81706	-	Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys
MIL-PRF-5606	-	Hydraulic Fluid, Petroleum Base; Aircraft, Missile, and Ordnance
MIL-PRF-6083	-	Hydraulic Fluid, Petroleum Base, For Preservation and Operation.
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

DEPARTMENT OF DEFENSE STANDARDS

FED-STD-595/36076-	Gray, Flat or Lusterless
FED-STD-595/36081-	Gray, Flat or Lusterless
FED-STD-595/36099-	Gray, Flat or Lusterless
FED-STD-595/36118-	Gray, Flat or Lusterless
FED-STD-595/36134-	Gray, Flat or Lusterless
FED-STD-595/36152-	Gray, Flat or Lusterless
FED-STD-595/36170-	Gray, Flat
FED-STD-595/36173-	Gray, Flat or Lusterless
FED-STD-595/36176-	Gray, Flat or Lusterless

(Copies of these documents are available online at <https://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, 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 these documents are those cited in the solicitation or contract.

ASME INTERNATIONAL

ASME B46.1	-	Surface Texture (Surface Roughness, Waviness, and Lay)
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(Copies of these documents are available online at <http://www.asme.org> or from the ASME International, Three Park Avenue, New York, NY 10016-5990.)

ASTM INTERNATIONAL

ASTM B117	-	Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM B487	-	Standard Test Method for Measurement of Metal and Oxide Coating Thickness by Microscopical Examination of Cross Section

## MIL-DTL-38726B

- ASTM B499 - Standard Test Method for Measurement of Coating Thicknesses by the Magnetic Method: Nonmagnetic Coatings on Magnetic Basis Metals
- ASTM B567 - Standard Test Method for Measurement of Coating Thickness by the Beta Backscatter Method
- ASMT B568 - Standard Test Method for Measurement of Coating Thickness by X-Ray Spectrometry
- ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
- ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel
- ASTM B748 -
- ASTM D380 - Rubber Hose, Standard Test Methods for
- ASTM F1136/F116M - Standard Specification for Zinc/Aluminum Corrosion Protective Coatings for Fasteners

(Copies of these documents are available online at <http://www.astm.org> or from the ASTM International, P.O. Box C700, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

## INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

- ISO 17025 - General requirements for the competence of testing and calibration laboratories

(Copies of these documents are available online at [www.ansi.org](http://www.ansi.org) or from the ANSI Customer Service Department, 25 W. 43<sup>rd</sup> Street, 4<sup>th</sup> Floor, New York, NY 10036.)

## NATIONAL CONFERENCE OF STANDARDS LABORATORIES (NCSL)

- NCSL Z540.3 - Requirements for the Calibration of Measuring and Test Equipment

(Copies of these documents are available online at <http://www.ncsli.org> or from NCSL International 2995 Wilderness Place, Suite 107 Boulder, Colorado 80301-5404.)

## SAE INTERNATIONAL

- SAE-AMS2417 - Plating, Zinc-Nickel Alloy
- SAE-AMS2488 - Anodic Treatment - Titanium and Titanium Alloys Solution pH 13 or Higher
- SAE-AMS2451/5 - Plating, Brush, Chromium Hard Deposit, Trivalent
- SAEAMS-2451/9 - Plating, Brush, Zinc-Nickel Low Hydrogen Embrittlement
- SAE-AMS2700 - Passivation of Corrosion Resistant Steels
- SAE-AMS2770 - Heat Treatment of Wrought Aluminum Alloy Parts
- SAE-AMS4141 - Aluminum Alloy Die Forgings, 5.6Zn - 2.5Mg - 1.6Cu - 0.23Cr (7075-T73), Solution and Precipitation Heat Treated
- SAE-AMS4928 - Titanium Alloy Bars, Wire, Forgings, Rings, and Drawn Shapes 6Al - 4V Annealed - UNS R56400
- SAE-AMS5639 - Steel, Corrosion-Resistant, Bars, Wire, Forgings, Tubing, and Rings 19Cr - 10Ni Solution Heat Treated - UNS S30400
- SAE-AMS5648 - Steel, Corrosion and Heat-Resistant, Bars, Wire, Forgings, Tubing, and Rings, 17Cr - 12Ni - 2.5Mo (316) Solution Heat Treated - UNS S31600

## MIL-DTL-38726B

SAE-AMS6348	-	Steel, Bars 0.95Cr - 0.20Mo (0.28 to 0.33C) (SAE 4130) Normalized - UNS G41300
SAE-AMS6349	-	Steel Bars, 0.95Cr - 0.20Mo (0.38 to 0.43C) (SAE 4140), Normalized
SAE-AMS6370	-	Steel, Bars, Forgings, and Rings 0.95Cr - 0.20Mo (0.28 - 0.33C) (SAE 4130) - UNS G41300
SAE-AMS6382	-	Steel, Bars, Forgings, and Rings, 0.95Cr - 0.20Mo (0.38 - 0.43C) (SAE 4140), Annealed
SAE-AMS-C-81562	-	Coatings, Cadmium, Tin-Cadmium and Zinc (Mechanically Deposited)
SAE-AMS-QQ-A-225/9	-	Aluminum Alloy 7075, Bar, Rod, Wire, and Special Shapes; Rolled, Drawn, or Cold Finished
SAE-AMS-QQ-P-416	-	Plating, Cadmium (Electrodeposited)
SAE-ARP908	-	Torque Requirements Installation and Qualification Test, Hose and Tube Fittings
SAE-AS8879	-	Screw Threads - UNJ Profile, Inch

(Copies of these documents are available from <http://www.sae.org/> or from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein 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 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 cost

3.4 Materials. Component parts of the adapter assembly shall be fabricated from the materials listed in [table I](#), as specified in MS27404.

3.4.1 Heat treatment. Aluminum alloy parts shall be heat treated in accordance with SAE-AMS2770 to the temper specified in [table I](#).

TABLE I. Material.

Material	Alloy requirements
Corrosion resistant steel (CRES), type 304	SAE-AMS5639
Corrosion resistant steel (CRES), type 316	SAE-AMS5648
Chrome-molybdenum steel 4130	SAE-AMS6348 or SAE-AMS6370
Steel 4140	SAE-AMS6349 or SAE-AMS6382
Titanium <sup>1/</sup>	SAE-AMS4928 (6Al-355 annealed)
Aluminum alloy 7075-T73	SAE-AMS-QQ-A-225/9 or SAE-AMS4141

<sup>1/</sup> Not to be used on oxygen systems.

### 3.5 Finish.

#### 3.5.1 Steel fitting finish (except CRES).

- a. Cadmium plating. Cadmium plating in accordance with SAE-AMS-C-81562, type II, class 3 or SAE-AMS-QQ-P-416, type II, class 2. Fluid passages, other openings and internal threads shall not be subject to the plating thickness requirement and may have bare areas provided they are protected with a light film of oil.
- b. Zinc platings.
  - (1) Zinc plating shall be in accordance with ASTM B633; type II or III, Fe/Zn 5, or ASTM B695, type II, class 5. Both zinc platings specified in ASTM B633 type III and ASTM B695 type II shall meet the same 96-hour salt spray test endurance as ASTM B633 type II zinc plating. Not for use in aircraft.
  - (2) Zinc plating in shall be in accordance with ASTM B633, type VI, Fe/Zn 5 and shall be hexavalent chromium free.
  - (3) Aluminum-nickel in accordance with ASTM F1136/F1136M, grade 3, NC.
  - (4) Zinc phosphate. Zinc phosphate shall be in accordance with MIL-DTL-16232, type Z.
  - (5) Zinc nickel shall be in accordance with SAE-AMS2417, type 2, grade B.

Note: For new design it is recommended that phosphate coating be specified when electrodeposited zinc or mechanically-deposited cadmium plating is not required.

- c. Chemical film. NAVAIR trivalent chromate pretreatment (TCP) in accordance with MIL-DTL-81706, class 1A, material form (1 through 6), application method A, B, or C. Example of a PIN: M817061A3C.

3.5.2 Corrosion resistant steel. Corrosion resistant steel shall be passivated in accordance with SAE-AMS2700, type 6 or 7.

3.5.3 Titanium. Titanium shall be anodized in accordance with SAE-AMS2488, type 2.

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

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

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3.5.5 Finish. All platings shall be capable of meeting the 96 hour salt spray test in accordance with 4.6.5. Fluid passages, other openings, and internal threads shall not be subject to the plating thickness requirement and may have bare areas provided they are protected with a light film of oil. The following exceptions shall apply:

- a. Phosphate coated adapters shall be subjected to all tests as specified in MIL-DTL-16232, class 1, except for the salt spray test. The salt spray test is required only to verify the phosphating process or changes thereto.
- b. Passivated fittings shall be subjected only to the copper sulfate tests as specified in SAE-AMS2700. Fittings passing this test shall be returned to stock for usage after each fitting is thoroughly rinsed in deionized water and thoroughly dried.

3.5.5.1 Color coding. The adapter assembly shall be color-coded in accordance with [table II](#).

TABLE II. Color coding.

Color	Material/plating
Brown	Aluminum 7075
Black	4140 steel cadmium
Olive drab	4130 steel cadmium plated
Gray in accordance with FED-STD-595/36076, /36081, /36099, /36118, /36134, /36152, /36170, /36173, or /36176	Titanium
Natural color	CRES
Yellow	ASTM B633 type II
Yellow	ASTM B633, type III
Flat black	Zinc phosphate
Clear	Zinc-nickel

3.5.6 Trivalent wenchability. When the finish has been damaged due to poor wrenchability, the surface of the connector shall be touched up using the brush plating process below. The term “trivalent wrenchability” is used to evaluate the ability of the finish to withstand abrasion from an excessive amount of wrenching.

- a. Brush plating of hard chromium by electrodeposition shall be in accordance with SAE-AMS2451/5.
- b. Brush plating of medium-hardness, low stress nickel by electrodeposition shall be in accordance with SAE-AMS2451/9.
- c. Brush plating of NAVAIR TCP shall be in accordance with MIL-DTL-81706, type 2, class A, material form 1 through 6, application method B. Example of a PIN: M817062A6B.

3.5.7 Cadmium plating is not recommended. Carbon steel material with cadmium plating shall only be used when other materials and finishes specified in this document cannot meet performance requirements (see 6.5).

3.5.8 Plating thickness verification (aluminum-nickel cadmium and zinc plating's). Plating thickness shall be measured in accordance with 4.7.7 and shall meet the requirements of 3.5.1.

3.6 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.

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

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

3.6.3 Screw threads. Screw threads shall be in accordance with SAE-AS8879.

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

3.6.5 Interchangeability. All parts having the same manufacturer's PIN shall be functionally and dimensionally interchangeable.

3.7 Performance.

3.7.1 Proof pressure. When tested as specified in 4.7.2 with the applicable proof pressure specified in table II, there shall be no evidence of leakage from the adapter assembly.

3.7.2 Leakage. When tested as specified in 4.7.3, there shall be no evidence of leakage from the adapter assembly.

3.7.3 Burst pressure. When tested as specified in 4.7.4, the adapter assembly shall not leak or blow off the hose at any pressure that is less than the burst pressure specified in table III.

TABLE III. Performance characteristics.

Adapter assembly size	Operating pressure, max psi (MPa)	Proof pressure, min psi (MPa)	Burst pressure, min psi (MPa)	Bend radius (inside of bend), min inch (mm)
-2	300 (2.07)	600 (4.14)	2000 (13.79)	2 (50.80)
-3	250 (1.72)	500 (3.45)	1700 (11.72)	2 (50.80)
-4	200 (1.38)	400 (2.76)	1250 (8.62)	4 (101.60)
-6	150 (1.03)	300 (2.07)	1000 (6.89)	4 (101.60)
-8	150 (1.03)	250 (1.72)	750 (5.17)	6 (152.40)
-10	150 (1.03)	250 (1.72)	700 (4.83)	6 (152.40)

3.7.4 Low temperature flexibility. When tested as specified in 4.7.5, there shall be no evidence of leakage from the adapter assembly.

3.7.5 Over-tightening torque. When tested as specified in 4.7.6, there shall be no evidence of failure of the adapter assembly or difficulty in turning the swivel nut on the nipple by hand.

3.7.6 Plating thickness verification (cadmium and zinc plating's). Plating thickness shall be measured in accordance with 4.7.7 and shall meet the requirements of 3.5.1.

3.7.7 Salt spray (4130 and 4140 steel fittings only). When tested in accordance with 4.7.8 the fittings shall show no evidence of corrosion after 96 hours of salt spray.

3.8 Identification of product. The adapter assembly shall be marked with the PIN, manufacturer's name or trademark, and CAGE code.

3.9 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  $\mu\text{in } R_a$ , as defined in ASME B46.1, shall be acceptable. All other machined surfaces shall not exceed 125  $\mu\text{in } R_a$ .

#### 4. VERIFICATION

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

- a. Qualification inspection (see 4.4).
- b. Conformance inspection (see 4.5).

4.2 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 established and maintained or identified by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment shall be in accordance with ISO 17025 and NCSL Z540.3 as applicable.

4.3 Inspection conditions. Unless otherwise specified, all required inspections shall be performed in accordance with the test conditions specified in 4.7.

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 14 adapter assemblies conforming to MS27404 of each size, shall be subjected to qualification testing. Six adapter assemblies conforming to MS27404 of each size and material, 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 (457.2 mm) in length.

4.4.2 Qualification inspection routine. All samples shall be subjected to qualification testing in accordance with [table IV](#) and in the sequence specified in [table V](#).

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 IV. Qualification inspection.

Requirement	Requirement paragraph	Test method paragraph
Examination of product	3.4, 3.6.2, 3.8, 3.9	4.7.1
Plating verification (cadmium or zinc) <u>1/</u>	3.7.6	4.7.7
Salt spray <u>2/</u>	3.7.7	4.7.8
Proof pressure	3.7.1	4.7.2
Leakage	3.7.2	4.7.3
Burst pressure	3.7.3	4.7.4
Low temperature flexibility	3.7.4	4.7.5
Over-tightening torque	3.7.5	4.7.6

1/ May be supplied by the plating manufacturer.

2/ Applicable to cadmium, zinc and phosphate coated adapters.

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

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 V. Qualification inspection sequence.

Required qualification inspection	Test method paragraph	Sample number				
		Adapter assemblies	Hose assemblies			
			1	2	3	4
Examination of product	4.7.1	1 through 6	X	X	X	X
Plating verification	4.7.7	1 and 2				
Salt spray	4.7.8	3 and 4 <u>1/</u>				
Proof pressure	4.7.2		X	X	X	X
Leakage	4.7.3		X	X		
Burst pressure	4.7.4		X	X		
Low temperature flexibility	4.7.5				X	X
Over-tightening torque	4.7.6	5 and 6				
Proof pressure	4.7.2				X	X

1/ Applicable to steel adapters with cadmium, zinc and phosphate coated finish.

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 Period inspection 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.

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

4.4.7 Test plans. Test plans shall be prepared and submitted in accordance with the requirements of the qualification activity. The method of qualification proposed by the contractor is subject to the approval of the qualification activity. Manufacturers shall discuss with the qualifying activity the test specimens and test plans. These plans shall state specifically the component requirement to be verified during the test, such as test fixtures, setup, conditions, and identification of the successor failure criteria shall be included as appropriate.

4.5 Conformance inspection.

4.5.1 Inspection of product for delivery. Inspection of product for delivery shall consist of individual inspection.

4.5.2 Individual inspection. Individual inspection shall consist of the inspections specified in [table VI](#) in the order shown. The visual and mechanical inspection will be 100% unless another sampling plan is approved in writing by the qualifying activity.

TABLE VI. Individual inspections.

Requirements	Requirement paragraph	Test method paragraph
Examination of product	<a href="#">3.4</a> , <a href="#">3.6.2</a> , <a href="#">3.8</a> , <a href="#">3.9</a>	<a href="#">4.7.1</a>

4.5.3 Nonconformance of individual inspections. 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.

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

4.5.3.2 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 VII](#).

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TABLE VII. 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

4.5.4 Periodic inspection. Periodic inspection shall consist of the tests specified in [table VIII](#), in the order shown.

4.5.4.1 Acceptance of periodic 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.

4.5.4.2 Periodic inspection (1). Periodic inspection (1) as specified in [table VIII](#) shall be performed on six adapter assemblies, conforming to MS27404 of each size and material 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 inspection (1) is not required for that size.

4.5.4.3 Periodic inspection (2). Periodic inspection (2) as specified in [table VIII](#) shall be performed on two adapter assemblies, conforming to MS27404 of any size and material, 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 inspection (2) is not required.

TABLE VIII. Periodic inspections.

Requirement	Requirement paragraph	Test method paragraph	Periodic inspection	
			1	2
Examination of product	3.4, 3.6.2, 3.8, 3.9	4.7.1	X	X
Proof pressure	3.7.1	4.7.2	X	
Leakage	3.7.2	4.7.3	X	
Burst pressure	3.7.3	4.7.4	X	
Over-tightening torque	3.7.5	4.7.6		X
Plating verification (cadmium or zinc) <u>1/</u>	3.7.6	4.7.7		X
Salt spray <u>2/</u>	3.7.7	4.7.8		X

1/ May be supplied by the plating manufacturer. Two adapter assemblies minimum.

2/ Applicable to steel adapters plated with cadmium and zinc. Applicable to phosphate coated adapters only if a process change has been made, see 3.5.5.a.

4.5.4.4 Nonconformance of periodic inspection. If a sample fails a periodic inspection, 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.

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

#### 4.6 Additional QPL test and reporting requirements.

4.6.1 Retention of qualification. To retain qualification, the contractor shall submit a test report to the qualifying activity at 12 month intervals. The qualifying activity shall establish the initial reporting date. Each report shall consist of a summary of test and inspection results required by this specification that were performed during the 12 month reporting interval. As a minimum, the report shall include the following:

- a. Number of lots produced and tested, including lot and sample sizes for each lot.
- b. Identify which tests were performed.
- c. Quantities passed.
- d. Quantities failed.
- e. All reworked sampling lots shall be accounted for and identified. A summary of corrective action taken shall be included.

4.6.2 Loss of product qualification.

4.6.3 Failure to meet test requirements. The manufacturer shall immediately notify the qualifying activity at any time during the 12-month reporting period when the qualified product fails to meet the test and inspection requirements of this specification. The manufacturer shall identify and indicate what corrective action will be taken to correct the problem. Failure to take corrective action acceptable to the qualifying activity may result in removal of the product from the QPL.

4.6.4 Failure to submit summary test data report. Failure to submit a report within 30 days after the end of the 12 month reporting period may result in loss of qualification for the product.

4.6.5 Change to manufacturing process, materials or equipment. The manufacturer shall notify the qualifying activity, in writing, of any changes in the manufacturing process, materials, or equipment used to manufacture a QPL product. Subsequently, the qualifying activity will notify the manufacturer, in writing, if a full re-qualification, partial re-qualification, or no additional testing is required as a result of these changes.

4.6.6 No production during reporting period (12 months). When no production occurs during the reporting period, a report shall be submitted to the qualifying activity certifying that the manufacturer still has the capability and facilities necessary to produce the QPL product.

4.7 Test methods.

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

- a. Materials (see 3.4).
- b. Dimensions (see 3.6.2).
- c. Marking (see 3.8).
- d. Workmanship (see 3.9).

4.7.2 Proof pressure. Proof pressure testing shall be conducted in accordance with ASTM D380, hydrostatic pressure test (using either hydraulic fluid, conforming to MIL-PRF-5606, MIL-PRF-6083 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](#).

4.7.3 Leakage. Hose assemblies when subjected to the leakage test shall meet the requirements of [3.6.2](#). Hydraulic fluid conforming to MIL-PRF-5606, MIL-PRF-6083, MIL-PRF-83282, or water shall be used as the test fluid. The following details shall apply:

- a. A pair of unaged hose assemblies shall be subjected to 70 percent of the burst pressure specified in [table III](#) for 5 minutes.
- b. The pressure shall then be reduced to zero, after which the pressure shall again be raised to 70 percent of the specified burst pressure and held for an additional 5 minutes.
- c. There shall be no evidence of adapter leakage, burst, deformation, movement relative to the hose, or separation from the hose.

4.7.4 Burst pressure. Burst pressure testing shall be conducted in accordance with ASTM D380 on the test samples that were subjected to the leakage test (see [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](#).

4.7.5 Low temperature flexibility. The low temperature flexibility test shall be determined in accordance with the low temperature test described in ASTM D380 (see 4.7.2). Requirements shall be as specified in 3.6.4.

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

4.7.7 Verification of fitting plating thickness for aluminum-nickel, cadmium, or zinc (see 3.5.1). Verification of under plating and finish plating shall be measured in accordance with ASTM B499, ASTM B567, or ASTM B568. A cross-sectioning method, such as that specified by ASTM B487 or ASTM B748, can also be used as a referee method to confirm the precision when thicknesses of 30 microinches (0.76  $\mu\text{m}$ ) or above are used. The zinc plating thickness may also be measured in accordance with ASTM B633 or ASTM B695 as applicable. The plating requirements shall meet the requirements of 3.5.1. The following details shall apply:

- a. When applicable a minimum of three points shall be measured on the fitting surface. The fitting may be rotated, but measurement points shall be progressively further from the last point.
- b. Readings shall not be averaged. Measurements shall be as follows:
  - (1) One measurement shall be taken at a point on the front and rear.
  - (2) Three measurements shall be taken in the middle areas.

4.7.8 Salt spray test (see 3.7.7). Fittings when subjected to salt spray testing shall meet the requirements of 3.7.7. Expose test specimens 96 hours in accordance with ASTM B117, see 3.5.5.

## 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 or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point packaging activities within the Military Service or Defense Agency, or within the military service's system command. Packaging data retrieval is available from the managing Military Service 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 (-95°C to +320°C).

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. PIN (see 1.2).
- c. Packaging requirements (see 5.1).

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 in Qualified Products List QPL No.38726 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, 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 contracts or orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from DLA Land and Maritime, P.O. Box 3990, ATTN: VQ, Columbus, Ohio 43218-3990 or emailed to [vqp.chief@dla.mil](mailto:vqp.chief@dla.mil). An online listing of products qualified to this specification may be found in the Qualified Products Database (QPD) at <https://assist.daps.dla.mil>.

6.3.1 Provisions governing qualification (SD-6). Copies of "Provisions Governing Qualification" are available online at <https://assist.daps.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

6.4 Environmentally preferable material. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. As of the dating of this document, the U.S. Environmental Protection Agency (EPA) is focusing efforts on reducing 31 priority chemicals. The list of chemicals is available on their website at <http://www.epa.gov/epawaste/hazard/wastemin/index.htm>. Included in the EPA list of 31 priority chemicals are cadmium, lead, and mercury. Use of the materials on the list should be minimized or eliminated unless needed to meet the requirements specified herein (see section 3).

6.5 Guidance on use of alternative parts. Guidance on use of alternative parts with less hazardous or non-hazardous materials. This specification provides for a number of alternative plating materials via the PIN. Users should select the PIN with the least hazardous material that meets the form, fit, and function requirements of their application.

6.6 Subject term (key word) listing.

- Air systems
- Cadmium
- Nickel
- Swivel nut
- Vacuum systems

6.7 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.

MIL-DTL-38726B

CONCLUDING MATERIAL

Custodians:

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

Preparing activity:

DLA - CC

(Project 4730-2012-021)

Review activities:

Navy - MC, SA  
Air Force - 71

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.daps.dla.mil>.