

INCH-POUNDS

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DETAIL SPECIFICATION

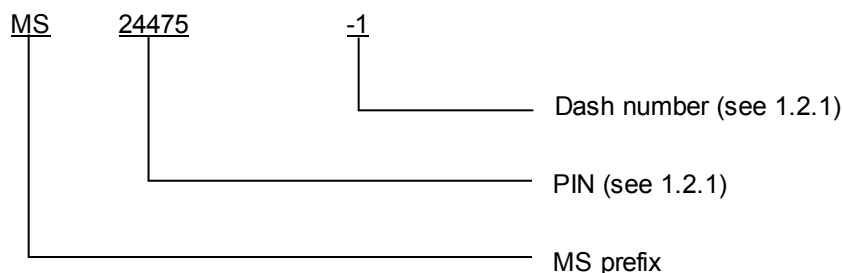
ADAPTER, CAP, AND NOZZLE, PRESSURE LUBRICATING OIL
 SERVICING, AIRCRAFT, GENERAL SPECIFICATION FOR

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

1. SCOPE

1.1 Scope. This specification covers the requirements for an adapter, cap, and nozzle, pressure lubricating oil servicing, aircraft, for ground servicing of aircraft turbine engines.

1.2 Part or Identifying Number (PIN). The PIN consists of the letters MS, the PIN and dash number from the respective slash sheet (see 1.2.1) shown in the following example:

1.2.1 Military Specification sheet number and dash numbers from:

MIL-DTL-25677/1 (MS24476-1 or MS24476-2)
 MIL-DTL-25677/2 (MS24480-1 or MS24480-2)
 MIL-DTL-25677/3 (MS24475-1 or MS24475-2)
 MIL-DTL-25677/4 (M25677/4-1, M25677/4-2, M25677/4-3 or M25677/4-4)

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.

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, Attn: VAI, P.O. Box 3990, Columbus, OH 43218-3990, or emailed to 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.dla.mil>.

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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

MIL-PRF-7808	-	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-PRF-8188	-	Corrosion Preventive Oil, Gas Turbine Engine, Aircraft, Synthetic Base
MIL-PRF-23699	-	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base, NATO Code Number 0-156
MIL-DTL-25677/1	-	Adapter, Pressure Lubricating Oil Servicing, Aircraft
MIL-DTL-25677/2	-	Dust Cap, Lubrication Fitting, Protective
MIL-DTL-25677/3	-	Nozzle, Pressure Lubricating Oil Servicing, Locking
MIL-DTL-25677/4	-	Cap, Lubricating Fitting, Protective, Pressure
MIL-DTL-83420	-	Wire Rope, Flexible, Type I, Composition B
MS51844	-	Sleeve, Swaging-Wire Rope

DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-130	-	Identification Marking of U.S. Military Property
MIL-STD-810	-	Environmental Test Methods and Engineering Guidelines
MIL-STD-889	-	Dissimilar Metals

(Copies of these documents are available online at <http://quicksearch.dla.mil> 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-Y-14.5M	-	Dimensioning and Tolerancing
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(Copies of these documents are available from www.asme.org or ASME International, Three Park Avenue, New York, NY 10016-5990.)

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO/IEC17025	-	General Requirements for the Competence of Testing and Calibration Laboratories
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(Copies of these documents are available online at www.ansi.org or from the ANSI Customer Service Department, 25 W. 43rd Street, 4th Floor, New York, NY 10036.)

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SAE INTERNATIONAL

SAE-AMS-2472	-	Anodic Treatment of Aluminum Alloys Sulfuric Acid Process, Dyed Coating
SAE-AS3209	-	Packing, Preformed - AMS7276, 'O' Ring
SAE-AS4273	-	Fire Testing of Fluid Handling Components for Aircraft Engines and Aircraft Engine Installations
SAE-AS4396	-	Fitting End-Bulkhead Flared Tube, Connection, Design, Standard (DoD adopted)
SAE-AS8879	-	Screw Threads-UNJ Profile, Inch
SAE-AS29523	-	Hook, Filler Cap Chain
SAE-AS29561	-	Packing, Preformed, "O" Ring, Synthetic Lubricant Resistant
SAE-AMS-QQ-P-416	-	Plating, Cadmium Electrodeposited
SAE-AMS2700	-	Passivation of Corrosion Resistant Steels

(Copies of these documents are available from www.sae.org or 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 specification sheets), 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. Adapters, nozzles, pressure caps, and dust caps furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list (QPL) before contract award (see 4.3 and 6.3).

3.2.1 Quality.

3.2.1.1 Statistical process control (SPC). The contractor shall implement and use statistical process control (SPC) techniques, when possible, in the manufacturing of parts covered by this specification. Where SPC cannot be utilized because of non-continuous production, a lot sampling plan for inspection with C = 0 (accept on zero defects) may be utilized. The SPC and C = 0 programs shall be documented and maintained as part of the overall reliability assurance program. Evidence of such compliance shall be verified by the qualifying activity as a prerequisite for qualification, effective 24 months after the date of this document. Dimensioning and tolerancing shall be in accordance with ASME Y-14.5M.

3.3 Materials. Materials shall be as identified herein or as approved by the qualifying activity. However, when a definite material is not specified, a material shall be used which will enable the adapters, nozzles, pressure caps, and dust caps to meet the requirements of this specification. Acceptance or approval of any constituent material shall not be construed as a guarantee of acceptance of the finished product.

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

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3.3.2 Metals. The use of materials which minimize the weight of adapters, nozzles, pressure caps, and dust caps is encouraged. Items made of passivated stainless steel and anodized aluminum are acceptable if they meet the requirements of this specification.

3.3.2.1 Aluminum alloy. Aluminum alloy capable of meeting them flame test requirement specified in 3.7.11.

3.3.2.2 Stainless steel. Stainless steel alloy capable of meeting the flame test requirement specified in 3.7.11.

3.3.3 O-rings. O-rings shall be in accordance with SAE-AS3209 or SAE-AS29561 and shall be compatible with oil in accordance with MIL-PRF-7808, MIL-PRF-8188, and MIL-PRF-23699.

3.3.4 Seals. Seals shall be compatible with oil in accordance with MIL-PRF-7808, MIL-PRF-8188, and MIL-PRF-23699.

3.3.5 Wire rope. Wire rope shall be in accordance with MIL-DTL-83420/2, 1/16 diameter, type 1, composition B.

3.3.6 Hook. Hook shall be in accordance with SAE-AS29523-1.

3.3.7 Dissimilar metals. When dissimilar metals are used in intimate contact with each other, protection against electrolysis and corrosion shall be provided. Dissimilar metals such as brass, copper, or steel (except corrosion-resisting steel passivated in accordance with SAE-AMS2700) shall not be used in intimate contact with aluminum or aluminum alloy. Protective measures for dissimilar metals shall be in accordance with MIL-STD-889. Magnesium shall not be used.

3.4 Design. The oil servicing components shall consist of:

- a. Adapter incorporating a self-sealing shut-off device in accordance with MIL-DTL-25677/1.
- b. Dust cap in accordance with MIL-DTL-25677/2.
- c. Nozzle in accordance with MIL-DTL-25677/3.
- d. Pressure cap in accordance with MIL-DTL-25677/4.

3.4.1 Adapter. The adapter shall be designed to mount on a section of aircraft structure or engine to connect to, and provide for a quick separation from, a pressure servicing lubricating oil nozzle. A positive locking means shall be provided when the adapter is connected to the nozzle. The adapter and nozzle, when uncoupled, each shall automatically seal its respective uncoupled end against spillage of fluid.

3.4.2 Pressure cap. The pressure cap shall mount on the adapter and provide seal redundancy as a secondary seal. The pressure cap shall be capable of being securely mounted or tethered to the adapter.

3.4.3 Dust cap. The dust cover shall mount on the adapter and provide a seal. The dust cap shall be capable of being securely mounted or tethered to the adapter.

3.4.4 Pressure and dust cap. The pressure cap and dust caps shall be a female type that covers the entire open end of the adapter to minimize entry of dust, dirt, and water. The pressure and dust caps shall have a wire rope which can be attached to the adapter by using a sleeve or surrounding aircraft structure with a hook as specified in MIL-DTL-25677/2 and MIL-DTL-25677/4.

3.4.5 Adapter, pressure cap and dust cap. The adapter, pressure cap and dust cap shall function over a temperature range of -65°F to +275°F (-54°C to +135°C).

3.4.6. Nozzle. The nozzle shall function over a temperature range of -65°F to +160°F (-54°C to +71°C).

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3.4.7 Interchangeability. Parts having the same manufacturer's PIN shall be functionally and physically interchangeable. All parts manufactured to the same military PIN shall be functionally interchangeable.

3.4.8 Interoperability. Parts manufactured in accordance with MIL-DTL-25677/2, MIL-DTL-25677/3, and MIL-DTL-25677/4 shall operate on any adapter manufactured in accordance with MIL-DTL-25677/1.

3.4.9 Connections. The adapter fitting end shall be in accordance with SAE-AS4396.

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

3.4.11 Anti-seize compound. An anti-seize compound shall be used on threaded aluminum or aluminum alloy parts.

3.5 Construction. The adapter shall be constructed to withstand the normal strains of jars, vibration, and such other conditions incident to shipping, storage, installation, and service. All loose parts such as gaskets and seals shall be securely attached to the adapter so that they will not become detached or damaged due to rough or inept handling while connecting and disconnecting the adapter to the nozzle. Connecting and disconnecting the adapter shall have no adverse effect on its leakage characteristics.

3.6 Finish.

3.6.1 Non-corrosion resistant metals. All metals used in the construction of the nozzle that are not corrosion-resistant shall be protected to resist corrosion from salt spray, atmospheric conditions, storage, and normal service life, see 3.6.2 and 3.6.3. It is recommended to use grade 3 or 4 oil in accordance with MIL-PRF-7808 for internal parts.

3.6.2 Aluminum alloy parts. Aluminum alloy parts shall be anodized in accordance with SAE-AMS-2472.

3.6.3 Steel parts. Steel parts using cadmium plating corrosion protection shall be plated externally in accordance with SAE-AMS-QQ-P-416, type II, class 2.

3.7 Performance. The adapter shall operate without failure under the following conditions. There shall be no leakage except for entrapped fluid within the adapter which would be lost at disconnection.

3.7.1 Adapter connect and disconnect. Adapters when tested in accordance with 4.7.2 connecting and disconnecting the nozzle to the adapter shall be accomplished manually throughout the operating temperature range. Each connection and disconnection shall be accomplished with relative ease and rapidity and without the use of tools. There shall be no binding, sticking, or scoring of parts.

3.7.2 Pressure test. When subjected to the pressure test specified in 4.7.3 the adapter when connected to the nozzle shall show no visible signs of leakage.

3.7.3 Operation and leakage. The adapter shall have no visible signs of leakage when tested in accordance with 4.7.4. The adapter shall operate when subjected to the operating pressures encountered in turbine engine oil systems. The nozzle self-sealing shutoff device shall be capable of sealing against a 2 foot (61.0 cm) head of grade 3 or 4 oil in accordance with MIL-PRF-7808 when not engaged.

3.7.4 Low temperature leakage. There shall be no visible signs of leakage during the low temperature leakage tests in accordance with 4.7.5. The adapter shall not crack nor show other imperfections when subjected to an ambient temperature of -65°F (-54°C) for 24 hours. Following this cold soak, connection and disconnection of the adapter and nozzle shall be accomplished with relative ease and rapidity.

3.7.5 High temperature leakage. The adapter shall show no imperfections as a result of the high temperature test specified in 4.7.6. There shall be no leakage during this test.

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3.7.6 Pressure drop. The pressure drop of the adapter and nozzle assembly, when tested in accordance with 4.7.7, shall not exceed that specified on MIL-DTL-25677/1.

3.7.7 Corrosion. The adapter, nozzle, pressure cap, dust cap shall show no evidence of corrosion or impairment of operation of the components which will affect the performance of any part, when tested in accordance with 4.7.8. Material discoloration which does not affect performance is acceptable.

3.7.8 Side load. The adapter and nozzle assembly shall not leak nor be distorted or damaged in any way when subjected to the side load test in accordance with 4.7.9.

3.7.9 Poppet spring. The poppet spring force shall not exceed 15 pounds (6.8 kg) when tested in accordance with 4.7.10. The poppet spring force of the adapter shall be such as to permit relatively easy coupling or uncoupling of the nozzle and to provide adequate pressure on the poppet while uncoupled.

3.7.10 Vibration and leakage. The adapter shall remain firmly fixed to the mounting structure, the pressure cap or dust cap shall not become loosened or unattached during that portion of the test in which it is installed on the adapter, and there shall be no leakage during the vibration test specified in 4.7.11.

3.7.11 Fire proof. Two adapters, one with a pressure cap the other adapter with a dust cap installed, shall be capable of withstanding the flame test in accordance with 4.7.12, and shall show no leakage during and 5 minutes after the flame test. Pressure or dust caps shall not become loosened or unattached during or after the flame test.

3.7.12 Disassembly and inspection. When tested in accordance with 4.7.13 the adapter shall show no corrosion, deterioration, or undue wear, which exists to a degree that could adversely affect performance, the adapter shall be rejected.

3.8 Marking. The military PIN (see 1.2), manufacturer's name, and cage code shall be legibly and permanently marked on the adapter, nozzle, pressure cap, and dust cap in accordance with MIL-STD-130.

3.9 Workmanship. Fittings shall be free from burrs and tool marks. All sealing surfaces shall be smooth.

4. VERIFICATION

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

- a. Qualification inspection (see 4.3).
- b. Conformance inspection (see 4.4).

4.2 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in 4.7.1, 4.7.2, 4.7.3, 4.7.4, 4.7.5, 4.7.6, 4.7.7, 4.7.8, 4.7.9, 4.7.10, 4.7.11, 4.7.12, and 4.7.13.

4.2.1 Testing conditions. Unless otherwise specified, all testing shall be conducted at $+70^{\circ}\text{F} \pm 10^{\circ}\text{F}$ ($21.11^{\circ}\text{C} \pm 5.55^{\circ}\text{C}$). Before testing, all oil and grease or other corrosion-resistant compounds shall be removed from the interior and exterior parts of the adapter, nozzle, pressure cap and dust cap.

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4.3 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government (see 6.3) on sample units produced with equipment and procedures normally used in production. Use of alternate materials, plating, and processes shall be identified in the product test documentation.

4.3.1 Test plans and qualification reports.

4.3.1.1 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.

4.3.1.2 Qualification reports. Qualification reports shall be submitted in accordance with requirements of the qualifying activity. As a minimum manufacturers shall submit a report identifying test specimens, and test results.

4.3.2 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, qualify and quality to permit performance of the required inspection shall be established and maintained by the contractor. The establishment and maintenance of a calibration system to control the accuracy of the measuring and test equipment in accordance with ISO/IEC17025 shall be required.

4.3.3 Samples for qualification. Samples for qualification shall be representative of the products proposed to be furnished to the Government. Test samples, see table I, of each item to be qualified shall be examined and tested by the contractor in accordance with this specification, and if request samples shall be submitted to the qualifying activity. Each component shall be tested for qualification individually. Tests requiring a test adapter, nozzle, pressure cap, or dust cap shall be conducted with an adapter, dust cap, nozzle, or pressure cap that has been qualified in accordance with MIL-DTL-25677/1, MIL-DTL-25677/2, MIL-DTL-25677/3, and MIL-DTL-25677/4, respectively and herein.

TABLE I. Sampling table. 1/

Adapter	Pressure cap	Dust cap	Nozzle	Test	paragraph
11	5	5	5	Examination of product 2/	4.7.1
5			5	Connect disconnect 2/	4.7.2
5			5	Pressure 2/	4.7.3
1			1 Test nozzle	Operation and leakage	4.7.4
1			1	Low temperature and leakage	4.7.5
1				High temperature and leakage	4.7.6
1			1	Pressure drop	4.7.7
1	1	1	1	Corrosion	4.7.8
1			1	Side load	4.7.9
1				Poppet spring	4.7.10
2	1	1		Vibration and leakage	4.7.11
2	1	1		Fire proof	4.7.12
All	All	All	All	Disassembly and inspection 3/	4.7.13

1/ Manufacturers may at their discretion may subject some components to multiple testing.

2/ Samples that under go examination of product, connect disconnect and pressure testing shall be the samples subjected to the remaining qualification tests of table II.

3/ Number of samples applies only to components subjected to qualification testing.

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4.3.4 Inspection routine. Qualification inspection shall consist of the tests listed in table II, in the order shown. The tests that apply to each of the four components, adapter, nozzle, pressure cap, and dust cap shall be as indicated in table II.

TABLE II. Qualification inspection.

Inspection	Requirement Paragraph	Test method paragraph
Examination of product	3.1, 3.4, 3.5, 3.8, and 3.9	4.7.1
Connect and disconnect	3.7.1	4.7.2
Pressure	3.7.2	4.7.3
Operation and leakage	3.7.3	4.7.4
Low temp leakage	3.7.4	4.7.5
High temp leakage	3.7.5	4.7.6
Pressure drop	3.7.6	4.7.7
Corrosion	3.7.7	4.7.8
Side load	3.7.8	4.7.9
Poppet spring	3.7.9	4.7.10
Vibration and leakage	3.7.10	4.7.11
Fire proof	3.7.11	4.7.12
Disassembly and inspection	3.7.12	4.7.13

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

4.4 Conformance inspection. Conformance inspection shall be performed on sample units produced with equipment and procedures normally used in production. Manufacturers shall keep lot records for 3 years minimum, monitor for compliance to the prescribed procedure, and observe that satisfactory manufacturing conditions and records on lots are maintained for those connectors. The records shall be available for review by customers at all times.

4.4.1 Inspection lot. An inspection lot shall consist of all adapters, nozzles, pressure caps or dust caps produced under essentially the same conditions, and offered for inspection at one time.

4.4.2 Inspection of product for delivery. Group A inspection shall consist of the inspections specified in table III, in the order shown.

TABLE III. Group A inspection.

Inspection	Requirement paragraph	Test method paragraph
Examination of product	3.1, 3.4, 3.5, 3.8, and 3.9	4.7.1
Connect and disconnect ^{1/}	3.7.1	4.7.2
Pressure test ^{1/}	3.7.2	4.7.3

^{1/} Adapter and nozzle only.

4.4.2.1 Sampling plan (group A). Group A inspections (table III) shall be performed on a production lot basis. Samples shall be selected as specified in table IV. If one or more defects are found, the lot shall be screened for that particular defect and defective parts removed. A new sample of parts shall be selected as specified in table IV and all group A tests again performed. If one or more defects are found in the second sample, the lot shall be rejected and shall not be supplied to this specification.

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TABLE IV. Lot and sample size.

Lot size	Sample size
2 to 5	All
6 to 150	5
151 to 1,200	20
1,201 to 10,000	32
10,001 to 35,000	50
35,001 to 500,000	80
500,001 and over	125

4.5 Nonconformance. If a sample fails to pass group A inspection, the manufacturer shall notify the qualifying activity and the cognizant inspection activity of such failure, and take corrective action on the materials, processes, and all units of product, which can be corrected and were manufactured under essentially the same conditions, and are considered subject to the same failure. Acceptance of the product shall be discontinued until corrective action acceptable to the qualifying activity has been taken. After the corrective action has been taken, group B inspection shall be repeated on additional sample units (all inspections, or the inspection which the original sample failed, at the option of the qualifying activity). Group A inspections may be reinstated. However, final acceptance and shipment shall be withheld until the group B inspection shows that the corrective action was successful. In the event of failure after reinspection, information concerning the failure and corrective action shall be made available to the cognizant inspection activity and the qualifying activity.

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.

4.6.2.1 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.

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

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4.6.2.3 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.

4.6.2.4 No production during reporting period. 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. If during two consecutive 12 month reporting periods there has been no production, the manufacturer may be required, at the discretion of the qualifying activity, to submit QPL products to a full qualification inspection in accordance with this specification.

4.7 Methods of inspection. The following identified tests and test methods assure integrity within typical operating conditions and applications. Alternate commercial industry standard test methods are allowed; however when an alternate method is used, documented approval must be obtained from the qualifying activity prior to the performance of the test. The test methods described herein are proven methods and shall be the referee method in case of dispute.

4.7.1 Visual and mechanical inspection. Each adapter, nozzle, pressure cap and dust cap shall be examined to ensure conformance with this specification and associated specification sheets. Where feasible, in-process controls may be used in lieu of specific inspections required by this paragraph provided such controls assure conformance to all requirements. Continuous examination shall be performed to assure compliance with the following requirements:

- a. Specification sheets (see 3.1).
- b. Design and construction (see 3.4 and 3.5).
- c. Marking (see 3.8).
- d. Workmanship (see 3.9).

4.7.2 Connect and disconnect test (see 3.7.1). When an adapter and nozzle are connected and disconnected by they shall meet the requirements of 3.7.1. The following details shall apply:

- a. Each sample adapter or nozzle shall be connected to and disconnected from a test adapter or nozzle, as applicable, 10 times while dry.
- b. The force required to engage the adapter assembly shall not exceed 20 pounds (9 kg).
- c. After the adapter and nozzle have been connected, positive flow of fluid shall be assured, and no possibility of fluid shut-off shall occur.

4.7.3 Pressure test (see 3.7.2). Each sample adapter or nozzle shall be connected to an adapter or nozzle as applicable and shall be hydrostatically tested at 500 pounds per square inch (psi) (34.47 bar) minimum, with grade 3 or 4 oil in accordance with MIL-PRF-7808 for 1 minute. The adapter or nozzle shall meet the requirements of 3.7.2.

4.7.4 Operation and leakage test (see 3.7.3). The adapter shall meet the operation and leakage requirements of 3.7.3. The following details shall apply.

- a. This test shall be conducted on the adapter while connected to a test nozzle.
- b. An adapter and nozzle shall be connected and disconnected 2,000 times consecutively while dry.
 - (1) The assembly shall then be pressure checked with grade 3 or 4 oil in accordance with MIL-PRF-7808 oil for 1 minute at a hydrostatic pressure of 500 psi (34.47 bar) minimum.
 - (2) There shall be no visible signs of leakage from the adapter portion.
- c. The adapter and nozzle shall be disconnected and the following pressure tests conducted on the adapter.
- d. Using MIL-PRF-7808 oil, a hydraulic pressure of 500 psi (34.47bar) minimum, shall be applied to

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the outlet end of the adapter for 5 minutes minimum.

- e. A hydraulic back pressure of a 2-foot (609.6 mm) head minimum, of oil in accordance with MIL-PRF-7808 shall be applied to the adapter for 1/2 hour minimum.
- f. A hydraulic back pressure of oil equivalent to 5 psi (0.34 bar) minimum, shall be applied to the adapter for 1/2 hour minimum.
- g. The adapter shall be drained and an air back pressure of 4.5 psi (0.31 bar) minimum, shall be applied to the adapter for 1/2 hour minimum.

4.7.5 Low temperature and leakage test (see 3.7.4). An adapter and nozzle when subjected to low temperatures shall meet the requirements of 3.7.4. The following details shall apply:

- a. An adapter and nozzle, while disconnected, shall be filled with grade 3 or 4 oil in accordance with MIL-PRF-7808 and cold-soaked at a temperature of -65 °F (-53.9°C) for 24 hours minimum.
- b. The following tests shall then be conducted at an ambient temperature of -65°F (-53.9°C).
 - (1) The adapter and nozzle shall be connected and disconnected. This shall be accomplished with relative ease and rapidity. Any binding, locking, or scoring of parts shall be cause for rejection.
 - (2) The adapter and nozzle shall then be connected, and a hydrostatic pressure of 500 psi (34.47 bar) minimum, of oil in accordance with MIL-PRF-7808 shall be applied at the adapter inlet for 1 minute minimum.
 - (3) The adapter shall be subjected to the operation and leakage tests of 4.7.4d, e, f, and g.

4.7.6 High temperature leakage test (see 3.7.5). An adapter when subjected to high temperatures shall meet the requirements of 3.7.5. The following details shall apply:

- a. A high temperature test shall be conducted at an ambient temperature of 250°F (121°C) minimum.
- b. The adapter shall be heat-soaked for 2 hours minimum, and while maintained at 250°F (121°C), the pressure tests of 4.7.4d, e, f, and g shall be repeated.
- c. There shall be no visible signs of leakage.

4.7.7 Pressure drop test (see 3.7.6). An adapter and nozzle shall meet the pressure drop requirements of 3.7.6. With the adapter connected to a nozzle, the assembly shall be filled with oil and cold-soaked at -65°F (-53.9°C) for 24 hours. While maintained at this temperature, the following procedure shall be conducted:

- a. Grade 3 or 4 oil in accordance with MIL-PRF-7808 at -65 °F shall be flowed through the assembly at the rate of 1 gallon per minute (gpm) (3.78 liter per minute (lpm)).
- b. The maximum pressure drop across the assembly required to establish rated flow shall be determined.
- c. Pressure measurements shall be taken at least 10 diameters upstream and 10 diameters downstream from the assembly.
- d. Temperature measurements shall be taken 10 diameters upstream of the assembly.
- e. The maximum pressure drop shall then be determined with the oil entering the assembly at -45°F (-42.8°C) and at a flow rate of 1 gpm (3.78 lpm). The pressure drop with -45°F (-42.8°C) oil shall not exceed the pressure drop shown for the applicable nozzle dash number in accordance with MIL-DTL-25677/3.
- f. Pressure measurements shall be taken at least 10 diameters upstream and 10 diameters downstream from the assembly.
- g. Temperature measurements shall be taken 10 diameters upstream of the assembly.

4.7.8 Corrosion test (see 3.7.7). The adapter, nozzle, pressure cap, dust cap shall meet the corrosion requirements of 3.7.7. The following details shall apply:

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- a. The adapter, nozzle, pressure cap, dust cap shall be immersed in a solution consisting of 2.5%, by weight, of sodium chloride in distilled water.
- b. After immersion, the solution shall be drained and the components heated in an oven to a temperature of $130^{\circ}\text{F} \pm 5^{\circ}\text{F}$ ($54.44^{\circ}\text{C} \pm 9^{\circ}\text{C}$) for a period of not less than 1 hour.
- c. The immersion and heating cycle shall be repeated 50 times.
- d. The components shall not be operated at any time during these cycles.
- e. Immediately after completing the immersion and heating cycles, the components shall be thoroughly washed with warm water to remove all salt accumulations.
- f. The adapter shall then be dried, wetted with oil, and connected and disconnected with each accessory (nozzle, pressure cap, dust cap) for three complete cycles.

4.7.9 Side load test (see 3.7.8).

- a. The adapter shall be mounted to a test fixture simulating a typical installation.
- b. The adapter shall be connected to the nozzle and a 2-pound (907 g) weight simulating the weight of the hose shall be applied to the hose end of the assembly perpendicular to the center axis, for a period of 10 minutes minimum.
- c. During this time, grade 3 or 4 oil in accordance with MIL-PRF-7808 shall be flowed through the assembly at the rate of 2 gpm (8.81 lpm) with a back pressure of 25 psi (1.72 bar) minimum.
- d. At the completion of this test, the adapter shall be visually inspected for cracks, distortion, or failure, and subjected to the tests of 4.7.2, 4.7.4b, c, and e.

4.7.10 Poppet spring test (see 3.7.9). The force required to open the adapter poppet valve its full travel shall be measured and shall meet the requirement of 3.7.9.

4.7.11 Vibration and leakage test (see 3.7.10). The adapter, pressure cap, and dust cap when subjected to vibration testing shall meet the requirements of 3.7.10. The following details shall apply:

- a. The two adapters shall be mounted to a representative section of aircraft structure and tested in accordance with MIL-STD-810, procedure XII.
- b. Using grade 3 or 4 oil in accordance with MIL-PRF-7808, hydraulic back pressure equivalent to a 2-foot (609.6 mm) head of oil shall be maintained in the adapter during the test period.
- c. The one adapter shall have a pressure cap the other adapter shall have a dust cap installed during one-half of the total test period.
- d. Following the vibration period, the low temperature leakage test of 4.7.5 shall be repeated.
- e. At no time during the test shall the pressure or dust cap become loosened or unattached, nor shall there be any visible signs of leakage.

4.7.12 Fire proof test (see 3.7.11). Adapters one with a pressure cap and one with a dust cap installed shall meet the fire proof testing in accordance with SAE-AS4273. The following details shall apply:

- a. Samples:
 - (1) Adapter with pressure cap.
 - (2) Adapter with dust cap.
- b. Component orientation shall simulate realistic engine compartment fire conditions.
- c. Samples shall be directly exposed to the flame.
- d. A visual inspection for leakage shall be made during and after the test.
- e. Sufficient instrumentation shall be included so continuously record critical parameters.
- f. Remotely controlled color video and stop-action photographic test facility equipment shall be provided. Voice input on video tape shall be provided for clarification of test times and conditions.
- g. Thermocouples shall be provided at the interface between flame pattern and surface to monitor and record flame temperature during testing to verify that flame temperature does not fall below pre-test burner calibration limits.
- h. Thermocouple(s) shall be mounted directly within the flame pattern.

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- j. 15 minute duration.
- k. Shall meet the requirements of [3.7.11](#).

4.7.13 Disassembly and inspection (see [3.7.12](#)). After completion of the tests, the adapter shall be disassembled and inspected and shall meet the requirements of [3.7.12](#).

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 material 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 System Commands. 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 which may be helpful, but is not mandatory.)

6.1 Intended use. These items are used in ground servicing of aircraft turbine engine lubricating oil systems. The adapter provides a connection for ground servicing equipment, using pressure synthetic lubricating and preservative oil. The nozzle is coupled to the adapter during servicing. The pressure cap acts as a secondary pressure seal and protects against foreign matter entering the adapter when not undergoing servicing. These military unique parts are critical to the servicing of aircraft turbine engines. The adapter is an integral part of the engine and must withstand a 2000°F (1093.33°C) fire proof requirement. The qualification process ensures these adapters meet this fire proof and operational requirements. The adapter, nozzle, pressure cap and dust cap have to withstand temperature changes from -65°F to + 250°F (-54 to +121°C). Commercial adapters, nozzles, and caps are not designed to withstand these extreme conditions or sudden environmental changes, and would experience catastrophic failure.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Title, number, and date of the applicable specification sheet and the complete PIN (see [1.2](#)).
- c. Level of preservation, packaging, and marking required (see [5](#)).

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.25677 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 Defense Supply Center Columbus, P.O. Box 3990, ATTN: DSCC-VQ, Columbus, Ohio 43218-3990 or emailed to vqp.chief@dla.mil.

6.3.1 Provisions Governing Qualification. Application procedures should be in accordance with the "Provisions Governing Qualification" (SD-6). Copies of "Provisions Governing Qualification" are available online at <http://assist.dla.mil> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.

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6.4 Supersession data. The former military standard (MS) document numbers cross referenced to MIL-DTL-25677 specification sheet numbers are as follows:

MIL-DTL-25677/1	-	MS24476
MIL-DTL-25677/2	-	MS24480
MIL-DTL-25677/3	-	MS24475

Note: The military standard (MS) PIN's have been retained in the specification sheets.

6.5 References to superseded specifications. All the requirements of MIL-DTL-25677D are interchangeable with those of MIL-N-25677C and MIL-PRF-25676E, therefore, previously existing documents (OEM drawings, etc.) referencing MIL-N-25677C and MIL-PRF-25676E need not be changed.

6.6 International standardization. This specification implements AIR STD 25/1B(2) "PRESSURE REPLENISHMENT CONNECTIONS FOR ENGINE LUBRICATING OIL" and STANAG 3595 ED.4(2), "AIRCRAFT FITTING FOR PRESSURE REPLENISHMENT OF GAS TURBINE ENGINES WITH OI8L". When amendment, revision, or cancellation of this specification is proposed, the preparing activity must coordinate the action with the U.S. National Point of Contact for the international standardization agreement, as identified in the ASSIST data base at <http://assist.dla.mil>.

6.7 Environmentally preferable materials. Environmentally preferable materials should be used to the maximum extent possible to meet the requirements of this specification. Table V lists the Environmental Protection Agency (EPA) top seventeen hazardous materials targeted for major usage reduction. Use of these materials should be minimized or eliminated unless needed to meet the requirements specified herein (see section 3).

TABLE V. EPA top seventeen hazardous materials.

Benzene	Dichloromethane	Tetrachloroethylene
Cadmium and Compounds	Lead and Compounds	Toulene
Carbon Tetrachloride	Mercury and Compounds	1,1,1 Trichoroethane
Chloroform	Methyl Ethyl Ketone	Trichloroethylene
Chromium and Compounds	Methyl Isobutyl Ketone	Xylenes
Cyanide and Compounds	Nickel and Compounds	

6.8 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.

6.9 Subject term (key word) listing.

Cadmium
 Connector ground
 Connector turbine engine
 Poppet spring
 Self-sealing shut-off

6.10 Changes from the previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

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CONCLUDING MATERIAL

Custodians:

Navy - AS
Air Force - 99
DLA - CC

Preparing activity:

DLA - CC

(Project 4730-2014-071)

Review activities:

Navy - CG, MC, SA
Air Force - 06, 70, 71

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