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MIL-F-46851C

21 September 1993

SUPERSEDING

MIL-E-46S5IB

20 November 1980

## MILITARY SPECIFICATION

FANS, GUIDED MISSILE, GROUND SUPPORT  
EQUIPMENT, 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 general requirements for three types of general purpose, air circulation fans to be used within the ground support equipment of a guided missile system.

1.2 Classification. Fans covered by this specification shall be of the following types as specified (see 6.2):

|          |   |                           |
|----------|---|---------------------------|
| Type I   | - | Centrifugal (blower) fans |
| Type II  | - | Vane axial fans           |
| Type III | - | Propeller fans.           |

|   |
|---|
| <p>Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, U.S. Army Missile Command, ATTN: AMSMI-RD-SE-TD-ST, Redstone Arsenal, AL 35898-5270 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.</p> |
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AMSC N/A

FSC 1450

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## MIL-F-46851C

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 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 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

|           |   |
|-----------|---|
| PPP-T-76  | Tape, Packaging, Paper (For Carton Sealing)                               |
| PPP-B-601 | Boxes, Wood, Cleated-Plywood  |
| PPP-B-636 | Boxes, Shipping, Fiberboard   |
| PPP-C-850 | Cushioning Material, Polystyrene Expanded, Resilient (for Packaging Uses) |

## MILITARY

|             |  |
|-------------|--|
| MIL-P-116   | Preservation, Methods of   |
| MIL-B-121   | Barrier Material, Greaseproofed, Waterproofed, Flexible                  |
| MIL-T-152   | Treatment, Moisture and Fungus-Resistant, of Communications~             |
|             | Electronic, and Associated Electrical Equipment                          |
| MIL-P-514   | Plates Identification, Instruction and Marking, Blank                    |
| MIL-D-3464  | Desiccants, Activated, Bagged, Packaging Use and Static Dehumidification |
| MIL-A-8625  | Anodic Coatings, for Aluminum and Aluminum Alloys                        |
| MIL-C-16173 | Corrosion Preventive Compound, Solvent Cutback, Cold-Application         |

## MIL-F-46851C

## STANDARDS

## MILITARY

|              |  |
|--------------|--|
| MIL-STD-129  | Marking for Shipment and Storage   |
| MIL-STD-130  | Identification Marking of U.S. Military Property   |
| MIL-STD-171  | Finishing of Metal and Wood Surfaces   |
| MIL-STD-202  | Test Methods for Electronic and Electrical Component Parts   |
| MIL-STD-461  | Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference |
| MIL-STD-810  | Environmental Test Methods and Engineering Guidelines  |
| MIL-STD-889  | Dissimilar Metals  |
| MIL-STD-1472 | Human Engineering Design Criteria for Military Systems, Equipment and Facilities                         |
| MS20003      | Indicator, Humidity, Card, Three Spot, Impregnated Areas (Cobaltous Chloride)                            |

(Unless otherwise indicated, copies of the federal and military specifications, standards and handbooks are available from the Standardization Documents Order Desk, Bldg. 4D, 700 Robbins Ave, Philadelphia, PA 19111-5094.)

2.2 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 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).

## AIR CONDITIONING AND REFRIGERATION INSTITUTE

|                  |   |   |
|------------------|---|---|
| ARI Standard 210 | - | Standard for Unitary Air Conditioning Equipment |
|------------------|---|---|

(Application for copies should be addressed to the Air Conditioning and Refrigeration Institute, 1501 Wilson Boulevard, Suite 600, Arlington, VA 22209).

MIL-F-46851C

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR  
CONDITIONING ENGINEERS, INC.

ASHRAE 52 - Method of Testing Air-Cleaning  
Devices Used in General Ventilation  
for Removing Particulate Matter

(Application for copies should be addressed to the American  
Society of Heating, Refrigerating and Air-Conditioning Engineers,  
Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS

ASTM D 3951 - Standard Practice for Commercial  
Packaging

(Application for copies should be addressed to the American  
Society-for Testing and Materials, 1916 Race Street, Philadelphia,  
PA 19103.)

(Non-Government standards and other publications are normally  
available from the organizations that prepare or distribute the  
documents. These documents also may be available in or through  
libraries or other informational services.)

2.3 Order of precedence. 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 First article. When specified (see 6.2), a sample shall  
be subjected to first article inspection (see 6.3) in accordance  
with 4.4.1.

#### 3.2 Design and construction.

3.2.1 Parts, materials and processes. Parts, materials and  
processes shall be as specified in this specification and the  
application detail drawing. Acceptance or approval of any  
constituent materials or parts shall not be construed as acceptance  
of the fan.

## MIL-F-46851C

3.2.1.1 Metals. Metals shall be corrosion-resistant type, or shall be plated or treated to resist corrosion.

3.2.1.1.1 Dissimilar metals. When dissimilar metals contact each other, protection against electrolysis and corrosion shall be provided. Dissimilar metals shall be as defined in MIL-STD-889.

3.2.1.2 Aluminum alloy parts. Where aluminum alloy parts are anodized the anodic treatment shall be as specified in MIL-A-8625.

3.2.2 Weight and dimensions. The weight and dimensions of the fan shall be as specified on the detail drawings.

3.2.3 Finishes. Exterior finishes for the fan shall be as specified on the detail drawings and shall conform to MIL-STD-171.

3.2.4 Marking. Each fan shall be identified by means of a durable nameplate as specified in MIL-P-514, and shall include the supplier's name, trademark, part number (see 6.6), and date manufactured. The nameplate shall be clearly and permanently marked as specified in MIL-STD-130.

3.2.5 Fungus treatment. Parts and materials shall be treated with fungicidal material to the greatest extent possible. With the exception of parts and materials which are in hermetically sealed cases, any parts or material not inert to fungus growth shall be individually treated with fungicidal material. No damage shall result from treatment of fungicidal coating. The application of fungicidal treatment shall be in accordance with type II, MIL-T-152.

3.2.6 Age limitation. The fan shall not be acceptable if manufactured more than 36 months prior to delivery. The date of manufacture shall be stamped on the fan.

3.2.7 Interchangeability. Uniformity of shapes, dimensions, and performance shall permit interchangeability of replaceable parts and the complete fan of the same part number.

### 3.3 Performance characteristics.

3.3.1 Fan and motor characteristics. Fan and motor characteristics for air flow and power requirements shall be as specified on the detail drawings.

## MIL-F-46851C

3.3.2 Dielectric withstanding voltage. Unless otherwise specified on the detail drawing, the fan shall not exhibit arcing or insulation breakdown when subjected to 1000 volts  $\pm$  100 volts alternating current (vat), 60 Hertz (Hz), between the insulated terminals tied together and the motor housing, for 30  $\pm$  15 seconds.

3.3.3 Insulation resistance. The fan motor shall have an insulation resistance not less than that specified on the detail drawing when subjected to 500  $\pm$  50 volts direct current (vdc), between the insulated terminals tied together and the motor housing, for two minutes.

3.3.4 Power factor. The motors shall maintain, or be corrected to maintain, not less than a .80 power factor.

3.4 Environmental and service conditions.

3.4.1 High temperature. The fan shall withstand a temperature of 71°  $\pm$  2° Celsius (C) for not less than six hours without evidence of damage, and shall meet the requirements of 3.3.1.

3.4.2 Low temperature. The fan shall withstand a temperature of -54°  $\pm$  2°C for not less than six hours without evidence of damage and shall meet the requirements of 3.3.1.

3.4.3 Temperature Cycling. The fan shall withstand a temperature of -55° to + 71°C for periods of 10 to 30 minutes, cycled five times without evidence or damage, and shall meet the requirements of 3.3.1.

3.4.4 Humidity. The fan shall withstand exposure to a relative humidity of 90 to 95 percent at 40°  $\pm$  2°C for 240 hours without evidence of damage and shall meet the fan and motor characteristics of 3.3.1 within five seconds. The fan motor shall also meet the insulation resistance requirements as specified in 3.3.3.

3.4.5 Salt spray. The fan shall withstand exposure to five percent salt solution (NaCl) fogging for 48 hours without evidence of damage at a temperature of 35° + 1° or -2°C. The fans shall also meet the requirements of paragraph 3.2.4, 3.3.1 and 3.3.3.

3.4.6 Barometric pressure. The fan shall withstand an atmospheric pressure from 17 pounds force per inch squared (lbf/in<sup>2</sup>) to a pressure equivalent to 10,000 feet altitude without

## MIL-F-46851C

evidence of damage, and shall meet the requirements of 3.3.2 and 3.3.3.

3.4.7 Shock. The fan shall withstand two impact shocks of 15 gravity units (G) along each of two mutually perpendicular axes for a total of eight shocks, with each shock impulse having a time duration of  $11 \pm 1$  milliseconds without evidence of physical damage, and shall meet the requirements of 3.3.1, 3.3.2, and 3.3.3.

3.4.8 Vibration. The fan shall withstand harmonic motion having an amplitude either 0.06 inch double amplitude or 10 G, whichever is less, from 5 to 500 to 5 Hz in 15 minutes, except that the double amplitude shall be 0.125 inch for vibrations below 40 Hz. Fans shall be vibrated six times in each of three mutually perpendicular directions. The fans shall exhibit no damage and shall meet the requirements of 3.3.1, 3.3.2, and 3.3.3.

3.4.9 Fungus. The fan shall meet the requirement of MIL-STD-810, Method 508, without evidence of harmful fungus growth and shall meet the requirements of 3.2.5 and 3.3.1.

3.4.10 Operational life. The fan shall withstand the time and temperature life requirements as specified on the detail drawings, and shall meet the requirements of 3.3.1, 3.3.2 and 3.3.3.

3.4.11 Radio interference reduction. The radio interference of each fan shall comply with requirements of MIL-STD-461.

3.4.12 Noise. The fan developed under this specification shall meet these requirements of MIL-STD-1472 Noise Criteria (NC) curves for speech communication NC 45 to NC 60, when measured at a distance of not more than 24 inches in any direction from the fan, when operating under any design load (pressure, head, etc.) in unconfined free air between sea level and 1500 feet above sea level.

3.5 Workmanship. There shall be no cracks, dents, scratches, burrs, sharp edges, loose solder, loose electrical connections, loose paint, or any other evidence of poor workmanship that will render the fan unsuitable for the purpose intended. The fan shall be clean and free of foreign matter.

## MIL-F-46851C

## 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 Test equipment. Test equipment and inspection facilities shall be of sufficient accuracy and quality to permit performance of the inspections and tests specified herein. The supplier shall establish adequate calibration of test equipment to the satisfaction of the Government. Records of test equipment calibration shall be maintained by the supplier for the duration of the contract or purchase order. The specific test equipment used for first article tests of fans shall also be documented. The accuracy of test instruments shall be verified and traceable to the National Bureau of Standards.

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

- a. First article inspection (see 4.4.1)
- b. Quality conformance inspection (see 4.4.2).

## MIL-F-46851C

4.3 Measurements.

4.3.1 Recalibration errors. If an instrument is scheduled for recalibration during a test period, the recalibration date shall be waived until completion of testing. If upon recalibration, instrument error exceeds specifications, a note shall be added to all test data collected prior to recalibration indicating percentage and direction of error deviation.

4.3.1.1 Measurement accumulative error. Total accumulative error for any one test shall not exceed the specified tolerance.

4.3.1.2 Stability of instrumentation. Stability of instrumentation shall be assured by preconditioning measurement instruments for not less than two hours prior to performing any measurements.

4.3.2 Standard condition. Unless otherwise specified (see 6.2), all tests required by this specification shall be made under the following standard conditions:

- (a) Temperature  $25^{\circ} \pm 2^{\circ}\text{C}$
- (b) Relative humidity - not greater than 70 percent (%)
- (c) Barometric pressure - Local standard

Standard air - rating of the fan shall be based on standard air standard air shall be considered as air at a temperature of  $21^{\circ}\text{C}$ , a barometric pressure of 29.92 inches of mercury, and a density of 0.075 pounds per cubic foot ( $\text{lb}/\text{ft}^3$ ).

4.3.3 Repeatability. When it is necessary to repeat a measurement for comparison purposes the repeated measurement shall be made at within  $2^{\circ}\text{C}$  of the temperature at which the original measurement was made. Instrumentation, measurements, and nondestructive tests shall be conducted in a manner to be repeatable.

4.3.4 Performance measurement tolerances. When a test frequency is specified with no tolerance, the frequency used shall be within 10% of the value specified. Test frequencies shall contain not more than 1% total harmonic distortion.

## MIL-F-46851C

4.3.5 Environmental measurement tolerances. Unless otherwise specified (see 6.2), the greatest allowable tolerance on environmental measurements shall be as follows:

| Environment              | Tolerance               |
|--------------------------|-------------------------|
| (a) Temperature          | $\pm 2^{\circ}\text{c}$ |
| (b) Altitude (feet)      | $\pm 5\%$               |
| (c) Relative humidity    | $\pm 0\%$               |
| (d) Vibration amplitude  | $\pm 10\%$              |
| (e) Vibration frequency  | $\pm 5\%$               |
| (f) Shock amplitude      | $\pm 10\%$              |
| (g) Shock time           | $\pm 1$ millisecond     |
| (h) Static pressure      | $\pm 0.1$ inch of water |
| (i) Additional tolerance | $\pm 10\%$              |

4.3.6 Repetitive measurements. Insofar as it is Practical, measurements which are repetitive shall not be made unless otherwise specified on the detail drawing. The measurements taken after specific tests shall be considered to be the initial measurements for the next test. Elapsed time between tests, insofar as repetition measurements are concerned, shall be not greater than 72 hours.

4.3.7 Temperature stabilization. For the purpose of this specification, a temperature chamber and the specimens contained therein shall be considered to have been stabilized at a specific temperature when two consecutive measurements, taken 15 minutes + 1 minute apart on the largest mass of the part, are within  $\pm 2^{\circ}\text{C}$  of the specific temperature.

4.4 Classification of tests. Testing of the fan shall be classified as follows:

- (a) First article tests (see 4.4.1)
- (b) Quality conformance inspection and tests (see 4.4.2)

## MIL-F-46851C

4.4.1 First article tests. Unless otherwise specified in the procurement document (see 6.2), first article tests shall not be required.

4.4.1.1 First article models. When first article tests are specified (see 6.2), five first article models shall be submitted for first article model approval and shall be representative of the manufacturer's normal production.

4.4.1.2 Procedure. First article models shall be subjected to the first article tests specified in table I in the order shown. All first article models shall be subjected to the examination and tests of group I. The first article models shall then be divided and subjected to the tests as specified in groups II through IV of table I.

TABLE I. First article inspections.

| Inspection                       | Requirement paragraph | Test paragraph |
|----------------------------------|-----------------------|----------------|
| (GROUP I - 5 Specimens)          |                       |                |
| Visual and Mechanical Inspection | 3.2, 3.5              | 4.5            |
| Capacity                         | 3.3.1                 | 4.6.1          |
| Dielectric Withstanding Voltage  | 3.3.2                 | 4.6.2          |
| Insulation Resistance            | 3.3.3                 | 4.6.3          |
| (GROUP II - 2 Specimens)         |                       |                |
| High temperature                 | 3.4.1                 | 4.6.4.1        |
| Low temperature                  | 3.4.2                 | 4.6.4.2        |
| Temperature Cycling              | 3.4.3                 | 4.6.4.3        |
| Humidity                         | 3.4.4                 | 4.6.4.4        |
| Salt Spray                       | 3.4.5                 | 4.6.4.5        |
| (GROUP III - 2 Specimens)        |                       |                |
| Radio frequency interference     | 3.4.11                | 4.6.4.6        |
| Barometric pressure              | 3.4.6                 | 4.6.4.7        |
| Shock                            | 3.4.7                 | 4.6.4.8        |
| Vibration                        | 3.4.8                 | 4.6.4.9        |
| (GROUP IV - 1 Specimen)          |                       |                |
| Fungus                           | 3.4.9                 | 4.6.4.10       |
| Operational life                 | 3.4.10                | 4.6.11         |

## MIL-F-46851C

4.4.1.3 Failure. Any failure of first article samples shall be cause for refusal to grant first article approval. Failure is defined as the inability to meet any of the requirements of this specification.

4.4.2 Quality conformance inspection and tests. Quality conformance inspection and tests shall consist of those tests specified in table II, in the order shown. Unless otherwise specified (see 6.2), all items supplied under this specification shall be subjected to quality conformance inspection and tests as set forth herein.

TABLE II. Quality conformance inspection.

| Test                             | Requirement paragraph | Test paragraph |
|----------------------------------|-----------------------|----------------|
| Visual and Mechanical Inspection | 3.2, 3.5              | 4.5            |
| Capacity                         | 3.3.1                 | 4.6.1          |
| Dielectric Withstanding Voltage  | 3.3.2                 | 4.6.2          |
| Insulation Resistance            | 3.3.3                 | 4.6.3          |

4.4.2.1 Inspection lot. An inspection lot shall consist of a group of like items produced at the same place using the same batches of materials, lots of components, process runs, fabrication techniques, assembly techniques, tools, equipment and facilities, but shall not be greater than one month's production.

4.4.2.1.1 Lot size. Lot size shall not exceed that quantity of items produced in one continuous operation by the same manufacturer in accordance with the same drawing and specification.

4.4.2.1.2 Lot rejection. Failure of any fan to meet the requirements specified in table II shall be cause for rejection of the entire lot.

4.5 Visual and mechanical inspection. Fans shall be inspected to verify that the materials, external design and construction, dimensions, weight, marking, and workmanship are as specified in the applicable requirements of 3.2 and 3.5. A visual and mechanical inspection shall also be conducted on fans prepared for delivery to insure compliance with section 5 requirements.

4.6 Performance testing. The fans shall be subjected to performance testing in accordance with the following.

## MIL-F-46851C

4.6.1 Fan and motor characteristics. The fan shall be tested for air volume and static pressure, as specified in ARI Standard 210 and ASHRAE 52. The test procedure shall be in accordance with fan type and test procedure specified on the detail drawing. All results shall be corrected to standard air as specified in 4.3.2. The motor power requirements shall be tested for conformance to the power requirements specified on the detail drawing.

4.6.2 Dielectric withstanding voltage. The fan shall be tested for dielectric withstanding voltage as specified in Method 301 of MIL-STD-202, with 1000 volts ac, 60 Hz applied between the insulated terminals tied together and the motor housing for a period of  $30 \pm 15$  seconds. Any subsequent test for dielectric withstanding voltage (during environmental testing) shall be at 75 percent of the above test voltage.

4.6.3 Insulation resistance. Insulation resistance shall be measured as specified in Method 302, condition B, MIL-STD-202. Measurements shall be made between the insulated terminals tied together and the motor housing.

4.6.4 Environmental and service condition tests.

4.6.4.1 High temperature. The high temperature test shall be in accordance with MIL-STD-810, Method 501.3, and the following. The fan shall be operated at rated voltage in an ambient temperature of 71°C for not less than six hours after the temperature has stabilized. The fan shall operate for a period of one hour with a voltage variation of 90% to 120% at the above temperature. At the completion of the test, the fan shall be tested in accordance with 4.6.1.

4.6.4.2 Low temperature. The low temperature test shall be in accordance with MIL-STD-810, Method 502.3, and the following. The fan shall be maintained in an ambient temperature of -54° for not less than six hours after the temperature has stabilized. At the end of the six hour period, and before removal from the test chamber, the rated voltage shall be applied. The fan shall attain the rated speed in accordance with 3.3.1 in not greater than five seconds. At the completion of the test and at 25°C the fan shall be tested in accordance with 4.6.1.

4.6.4.3 Temperature cycling. The fan shall be temperature cycled as specified in Method 107G, condition A, of MIL-STD-202,

## MIL-E-46851C

except that in test condition A, the temperature shall be not greater than 71°C. At the completion of the test the fan shall be tested in accordance with 4.6.1.

4.6.4.4 Humidity. The fan shall be tested for humidity as specified in Method 103B, condition A, of MIL-STD-202. Following this test, the fan shall attain rated speed in accordance with 3.3.1 in not greater than five seconds and shall be tested in accordance with 4.6.1 and 4.6.3.

4.6.4.5 Salt spray. The fans shall be tested for salt spray as specified in Method 101D, condition B, of MIL-STD-202, using a five percent salt solution. At the conclusion of the salt spray test, the fan shall be examined for marking and finish requirements of 3.2 and measurements shall be made in accordance with 4.6.1 and 4.6.3, in order specified.

4.6.4.6 Radio frequency interference. The fan shall be tested as specified in MIL-STD-461.

4.6.4.7 Barometric pressure. When mounted by its normal mounting means, the fan shall be tested as specified in Method 105C of MIL-STD-202, except that the pressures shall be from 17 lbf/in<sup>2</sup> to a pressure equivalent to 10,000 feet altitude. While at high pressure and low pressure, the fan shall be tested in accordance with 4.6.2 and 4.6.3.

4.6.4.8 Shock. The shock test shall be in accordance with MIL-STD-810, Method 516.4, and the following. The fan shall be mounted by its normal mounting means and be subjected to two impact shocks of 15 G in each direction along the mutually perpendicular axis (total of eight shocks) one axis to be along the motor armature shaft axis, the other perpendicular to the motor armature shaft axis. The shock impulses shall have a time duration of 11 milliseconds, in a sine waveform. At the conclusion of this test, the fan shall be tested in accordance with 4.6.2, 4.6.3, and 4.6.1, in the order specified.

4.6.4.9 Vibration. When mounted by its normal mounting means, the fan shall be tested as specified in Method 204D, condition A, of MIL-STD-202, except that the frequency shall be 5 to 500 to 5 Hz and the double amplitude shall be 0.125 inch below 40 Hz. The fan shall be vibrated six times in each of three mutually perpendicular directions. At the conclusion of the test, the fan shall be tested in accordance with 4.6.2, 4.6.3, and 4.6.1, in the order specified.

## MIL-F-46851C

4.6.4.10 Fungus. The fan shall be tested as specified in the fungus resistance test of MIL-STD-810, Method 508.4. At the conclusion of the test, the fan shall be tested in accordance with 4.5, 4.6.1, and 4.6.3. The supplier's certification of the use of fungus-inert materials may be accepted in lieu of this test (see 6.2).

4.6.4.11 Operational life. The fan shall be life tested for the length of time and in an ambient temperature as specified on the detail drawing. The fan shall operate at the rated voltage and zero static pressure (free delivery). At the conclusion of the test the fan shall be tested in accordance with 4.6.2, 4.6.3, and 4.6.1, in the order specified.

4.6.4.12 Noise. The fan shall be tested in accordance with MIL-STD-1472 to meet the requirements of 3.4.12.

4.7 Inspection of packaging. Except when commercial packaging is specified, the sampling and inspection of the preservation and interior package marking shall be in accordance with groups A and B quality conformance inspection requirements of MIL-P-116. The sampling and inspection of the packing for shipment and storage shall be in accordance with the quality assurance provisions of the applicable container specification shown in section 5. The inspection of marking for shipment and storage shall be in accordance with MIL-STD-129. The inspection of commercial packaging shall be as specified in the contract (see 6.2).

## 5. PACKAGING

5.1 Preservation. Preservation shall be Level A, B or C, as specified (see 6.2).

### 5.1.1 Level A.

5.1.1.1 Cleaning. Each fan shall be cleaned in accordance with MIL-P-116, process C-1.

5.1.1.2 Drying. Each fan shall be dried in accordance with MIL-P-116, process D-4.

5.1.1.3 Preservative application. Exposed bare surfaces will be preserved by applying preservative conforming to MIL-C-16173,

## MIL-F-46851C

Grade 4. Preserved areas shall be intimately wrapped with barrier material conforming to MIL-B-121, Grade A.

5.1.1.4 Unit packaging. Fans shall be individually packaged in accordance with MIL-P-116, method IIB. Each fan cleaned, dried and preserved as defined herein shall be inserted and immobilized in a container conforming to PPP-B-636, domestic class, style RSC. A quantity of desiccant conforming to MIL-D-3464, computed in accordance with MIL-P-116, shall be secured within the container and insulated from contact with the exposed metal parts of the fan. The container shall be closed with tape in accordance with PPP-T-76. A desiccant indicator conforming to MS20003 shall be secured on the outer top side of the closed container. The fan shall be inserted in a barrier bag conforming to MIL-B-121, Class 1, and heat sealed. The bagged fan shall then be inserted in a container conforming to PPP-B-636, style RSC, Class WR completely lined with material conforming to PPP-C-850 of sufficient thickness to prevent the fan from sustaining more than 15G shock (as the specified limit) when dropped under the conditions specified in 3.4.7 and 4.6.4.8. Closure shall be by using tape conforming to PPP-T-76.

5.1.2 Level B. Level B packaging shall be the same as Level A, except omit desiccant and indicator. Method shall be IA-14.

5.1.3 Level C. Packaging shall be in accordance with ASTM D 3951.

5.2 Packing. Packing shall be Level A, B or C, as specified (see 6.2).

5.2.1 Level A. A specified quantity of fans, pack-aged as prescribed herein, shall be inserted in a snug-fitting container conforming to PPP-B-601, Style A or B, overseas type. Closure shall be in accordance with the requirements set forth in the appendix of the container specification.

5.2.2 Level B. Level B packing shall be the same as A, except that a domestic type container shall be used.

5.2.3 Level C. Packing shall be in accordance with ASTM D 3951.

MIL-F-46851C

5.3 Marking.

5.3.1 Level A or B. Marking shall be in accordance with MIL-STD-129.

5.3.2 Level C. Marking shall be in accordance with ASTM D 3951.

6. NOTES

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

6.1 Intended use. Fans furnished to this specification are intended to be used within the ground support equipment of a guided missile system.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1)
- c. Part number
- d. Type classification (see 1.2)
- e. Whether first article is required (see 3.1)
- f. Disposition of first articles, when required
- g. Disposition of rejected parts
- h. Standard test conditions {see 4.3.2}
- i. Environmental measurement tolerance (see 4.3.5)
- j. Quality conformance inspection and tests (see 4.4.2)

## MIL-F-46851C

k. Whether supplier's certification of the use of fungus-inert materials is acceptable in lieu of testing (see 4.6.4.10)

l. Applicable levels of preservation, packaging and packing (see 4.7, 5.1, 5.2 and 5.3).

6.3 First article. When first article inspection is required, the contracting officer should provide specific guidance to offerers whether the item(s) should be a first article sample, a first production item, or a number of items to be tested as specified in 4.4.1.1. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Metrication. Metric equivalents in accordance with FED-STD-376 are acceptable for use in this specification.

6.5 Subject term (keyword) listing.

Air circulation equipment  
Air conditioning  
Blowers  
Cooling equipment  
Propeller blowers  
Vane axial blowers

6.6 Part or identifying number (PIN). the PIN for fans acquired to this specification is created as follows:

|   |                         |                             |
|---|-------------------------|-----------------------------|
| <u>M</u>  | <u>46851-</u>           | <u>x</u>                    |
| Prefix to indicate<br>military<br>specification | Specification<br>number | Type<br>number<br>(see 1.2) |

MIL-F-46851C

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

Custodian:

Army - MI  
Air Force - 99  
Navy - AS

Preparing activity:

Army - MI

Review activities:

Army - CR  
Air Force - 14

Project no. 1450-0056

User activities:

Navy - MC

