MIL-F-50057(CmlC)
30 June 1959
(See section 6)

MILITARY SPECIFICATION

FILTER UNIT, GAS AND PARTICULATE, EMD, 2500 CFM, M11

1. SCOPE

1.1 Scope. This specification covers one type of filter unit for use in protecting permanent installations against toxic gases and aerosols.

2. APPLICABLE DOCUMENTS

2.1 Government documents. The following documents, of the issue in effect on date of invitation for bids, form a part of this specification:

SPECIFICATIONS

FEDERAL

QQ-S-781	-	Strapping, Flat; Steel.

MILITARY

MIL-C-104	-	Crates, Wood, Lumber and Plywood Sheathed, Nailed and Bolted.
MIL-P-116	-	Preservation, Methods of.
MIL-P-16298	-	Preservation, Packaging, Packing, and Marking of Electric Machines Having Rotating Parts and Associated Repair Parts.

STANDARDS

MILITARY

MIL-STD-105	-	Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	-	Marking for Shipment and Storage.

DRAWINGS

CHEMICAL CORPS

D5-19-2198	-	Filter Unit, Gas and Particulate, EMD, 2500 CFM, M11 - Bill of Material.

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following publication of the issue in effect on date of invitation for bids forms a part of this specification.

NATIONAL ASSOCIATION OF FAN MANUFACTURES

NAFM Bulletin No. 110.

(Copies of this bulletin may be obtained from the National Association of Fan Manufacturers, Inc., 2159 Guardian Building, Detroit 26, Michigan.)

3. REQUIREMENTS

3.1 Materials and components.

3.1.1 Materials. All materials cited on Drawing D5-19-2198 or on the subsidiary drawings, shall conform to the specifications thereon, and the specific characteristics set forth on the drawings.

3.1.2 Components. All components of the item shall conform to the specifications and drawings listed on Drawing D5-19-2198 and subsidiary drawings.

3.2 Manufacture and assembly. The filter unit shall be manufactured and assembled as specified on Drawing D5-19-2199 and subsidiary drawings listed on Drawing D5-19-2198.

3.3 Flexibility of air inlet and flexible tubing transitions. After being tested as specified in 4.6.2, the transitions shall be free of external checks, breaks, cracks and tears.

3.4 Preproduction sample. One motor-blower assembly shall be manufactured and assembled as specified on Drawing D5-19-2205 which is listed on Drawing D5-19-2198.

3.5 Performance.

3.5.1 Filter unit. When tested as specified in 4.6.1.1, the filter unit shall satisfy the following requirement:

In the absence of throttling at the effluent end of the test apparatus, the filter unit shall deliver an air flow whose instantaneous value remains within the range equivalent to 2500 ± 125 cubic feet per minute (c.f.m.) of standard air as defined in NAFM Bulletin No. 110 for a period of not less than 3 minutes.

3.5.2 Motor-blower assembly. The blower shall deliver 2500 ± 125 c.f.m. of standard air as defined in NAFM Bulletin No. 110, when tested as specified in 4.6.1.2. The blower shall not stall at air flows less than rated flow. The motor-blower assembly supplier shall furnish certified blower performance curves of static pressure versus air flow as described in NAFM Bulletin No. 110 with preproduction sample.

3.6 Noise. The noise of the preproduction motor-blower assembly shall not be greater than 100 decibels when tested as specified in 4.6.1.2.

3.7 Workmanship. The filter unit, after final assembly, shall be free of contamination and any damage, such as tears or punctures of the filter, flexible tubing, and transition, which might affect its serviceability.

4. QUALITY ASSURANCE PROVISIONS

4.1 Supplier's responsibility. Unless otherwise specified herein, the supplier is responsible for the performance of all inspection requirements prior to submission for Government inspection and acceptance. Except as otherwise specified, the supplier may utilize his own facilities or any commercial laboratory acceptable to the Government. Inspection records of the examination and tests shall be kept complete and available to the Government as specified in the contract or order.

4.2 Objective evidence. The supplier shall present objective evidence as required by the Government representative that all materials and components are in accordance with 3.1 and section 5 (see 6.2).

4.3 Alternate inspection (including testing) procedures. The supplier may utilize any alternate inspection procedure which will assure equal or better quality by submitting a written proposal with justification and obtaining written approval from the Government prior to its institution. In case of dispute, the procedure of this specification will govern.

4.4 Preproduction sample inspection.

4.4.1 Nondestructive examination and tests. The preproduction sample specified in 3.4 shall be submitted for design approval and test as specified in 4.6.1.2.

4.4.2 Acceptance/rejection criteria. If when inspected as specified in 4.6.1.2, the motor-blower assembly fails to comply with the requirements for which it has been inspected, the preproduction sample shall be rejected. The cause of failure shall be ascertained by the contractor and corrective action determined. The decision to require a new preproduction sample will be at the discretion of the contracting officer.

4.5 Inspection provisions.

4.5.1 Lotting. A lot shall consist of the filter units produced by one manufacturer, from the same materials, and under essentially the same manufacturing conditions. However, not more than one lot of M16 2500 c.f.m. gas and particulate filters shall be represented in any one lot of finished filter units.

4.5.1.1 Flexible tubing and air inlet transitions. A lot shall consist of the flexible tubing transitions of air inlet transitions produced by one manufacturer from the same materials and under essentially the same manufacturing conditions and offered for acceptance at one time.

4.5.2 Sampling.

4.5.2.1 Flexible tubing and air inlet transitions. Three flexible tubing transition assemblies and three air inlet transition assemblies shall be taken for test as specified in 4.6.2.

4.5.3 Examination and testing.

4.5.3.1 Filter unit. Each filter unit shall be inspected in accordance with the classification of defects (4.5.4.1).

4.5.3.2 Motor-blower assembly. Each motor-blower assembly shall be tested as specified in paragraph 4.6.1.2 except that subparagraph (c) will be omitted.

4.5.3.3 Preparation for delivery. The filter units shall be inspected in accordance with the classification of defects (4.5.4.2) and Standard MIL-STD-105.

4.5.4 Classification of defects.

4.5.4.1 Filter unit, gas and particulate, EMD, 2500 CFM, M19 - assembly. (Dwg. D5-19-2199).

Defects	Acceptance standards
1. Performance	4.6.1
2. Component missing or incorrect	
3. Component incorrectly assembled or located	
4. Damage	
5. Coating missing, inadequate, or incorrect	
6. Marking missing, illegible, or incorrect	
7. Contamination	

4.5.4.2 Preparation for delivery. (section 5)

Categories and defects

Major — AQL 2.5 percent defective

1. Contamination
2. Components missing, incorrect, or incorrectly assembled
3. Contents missing, or inadequately anchored to crate base
4. Damaged crate
5. Preservative missing where required
6. Instruction manual missing
7. Marking missing, illegible, or incorrect

4.6 Tests.

4.6.1 Performance.

4.6.1.1 Filter unit. Each filter unit, assembled as specified on Drawing D5-19-2199 and resting on a level surface, shall be tested as follows:

(a) Release the strap (Drawing B5-19-2146) and flexible tubing holder (Drawing D5-19-2201) and extend the flexible tubing transition (Drawing C5-19-2204) to its extreme length, keeping the tube coaxial with the filter.

(b) Treating the free end of the flexible tubing as a fan outlet, connect it to the test apparatus used for determining static pressure and air flow in accordance with NAFM Bulletin No. 110.

(c) Connect the motor-blower assembly (Drawing C5-19-2205) to a 220-volt, 3 phase, 60-cycle alternating current source and start the motor.

(d) With the throttling device of the test apparatus fully open, allow the motor-blower to run for a minimum of 10 minutes, and then determine the highest and lowest instantaneous air flow rate during a period of not less than 3 minutes, using the procedure specified in NAFM Bulletin No. 110.

4.6.1.2 Motor-blower assembly. The motor-blower assembly, assembled as specified on Drawing C5-19-2205, and fastened to a level surface, shall be tested as follows:

(a) Connect the fan outlet to the test apparatus used for determining static pressure and air flow in accordance with the procedure specified in NAFM Bulletin No. 110.

(b) Start the motor and adjust the throttling device of the test apparatus to obtain a static pressure of 5.0 inches of water. Allow the motor to run for a minimum of 10 minutes after the test apparatus is adjusted for the proper static pressure. Determine the air flow delivered by the motor-blower assembly, using the procedures in NAFM Bulletin No. 110.

(c) The motor-blower assembly shall be operated at the correct air flow for a total of 100 hours while in a chamber with a minimum relative humidity of 85 percent and a temperature of 40° ± 2°C. The motor-blower assembly shall then be removed from the tropical conditions and inspected to determine that no components have been adversely affected because of heat, vibration, or lack of balance, that corrosion or fungus growth has not endangered or impaired the functionability of any component, and that the assembly can meet the air flow requirements when tested as specified in paragraph (b) above. The noise of the motor-blower assembly shall be determined after 100 hours operation in accordance with NAFM Bulletin No. 110 under the conditions specified in paragraph (b) above.

4.6.2 Flexibility of flexible tubing. Each flexible tubing transition assembly (Drawing C5-19-2204) and each air inlet transition assembly (Drawing C5-19-2203) which is tested shall be stored in the compressed position at a temperature of -65°F. for a period of not less than 24 hours. While still in the cold storage chamber, it shall then be tested for flexibility as follows: Extend the flexible tubing along its long axis to its full length, and then compress the tubing along the same axis to its fully compressed position. Repeat this procedure not less than five times and then extend the flexible tubing to its full length prior to inspection.

4.7 Acceptance/rejection criteria.

4.7.1 Motor-blower assembly. Any motor-blower assembly examined as specified in 4.5.3.2 which fails to meet the requirements of 3.5.2 shall be rejected.

4.7.2 Filter unit. Any filter unit that fails to meet the requirements of 3.2, 3.5.1, and 3.7 or when examined in accordance with 4.5.4.1 shall be rejected.

5. PREPARATION FOR DELIVERY

5.1 Preservation and packaging.

5.1.1 Level A. The motor-blower assembly of the filter unit shall be cleaned and preserved in accordance with Specification MIL-P-16398. The instruction manual shall be packaged as specified in Method IC-3, Specification MIL-P-116.

5.1.2 Level B. Not applicable.

5.1.3 Level C. Not applicable

5.2 Packing.

5.2.1 Level A. The filter unit (Drawing D5-19-2199) with the motor-blower assembly preserved as specified in 5.1.1 shall be packed in a demountable lumber sheathed crate conforming to type II, class 1, style a of Specification MIL-C-104. The skid base shown on Drawing D5-19-2200 shall serve as the bottom of the crate. The outside dimensions of the crate shall be approximately 158 by 32 by 40 inches. The instruction manual packaged as specified in 5.1.1 shall be strapped to the motor end of the skid with a 3/8 inch type I, class or grade optional steel strap conforming to Specification QQ-S-781. Assembly and fastening of the crate shall be as specified in Specification MIL-C-104.

5.2.2 Level B. Not applicable.

5.2.3 Level C. Not applicable.

5.3 Marking. In addition to any special marking required by the contract or order, all shipping containers shall be marked in accordance with Standard MIL-STD-129.

6. NOTES

6.1 Ordering data. Procurement documents should specify the title, number and date of this specification.

6.2 Objective evidence. Provisions for objective evidence and inspection records, and maintenance of inspection records will be specified by the procuring activity.

6.3 Pilot lot. A pilot lot may be required to evaluate the supplier's production and quality control systems. The contracting officer will specify whether a pilot lot is required and applicable pilot lot acceptance criteria.

6.4 Supersession data. This specification supersedes Chemical Corps Purchase Description 197-54-689, dated 21 August 1958.

Notice. When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

Custodian:

Army - Chemical Corps

Preparing activity:

Army - Chemical Corps