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MIL-C-16703E(YD)
30 September 1987
SUPERSEDING
MIL-C-16703D(YD)
16 May 1980

MILITARY SPECIFICATION

COLLECTOR UNIT, DUST, WITH FAN

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

1. SCOPE

1.1 Scope. This specification covers a dust collector unit capable of separating and collecting wood shavings, sawdust, chips, and similar material.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

MILITARY

MIL-V-173 - Varnish, Moisture-and-Fungus-Resistant (for Treatment of Communications, Electronic, and Associated Equipment).
MIL-S-12514 - Starters, Motor; Across-the-Line and Reduced Voltage Types, A-C Induction, 3/4 to 100 HP, Manual and Electric.
MIL-M-18058 - Machinery, Metal and Woodworking, Packaging of.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commanding Officer (Code 156), Naval Construction Battalion Center, Port Hueneme, CA 93043-5000, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4460

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STANDARDS

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-461 - Electromagnetic Emission and Susceptability Requirements for the Control of Electromagnetic Interference.
MIL-STD-462 - Electromagnetic Interference Characteristics, Measurements of.

2.1.2 Other Government document. The following other Government document forms a part of this specification to the extent specified herein. Unless otherwise specified, the issues shall be those in effect on the date of the solicitation.

CODE OF FEDERAL REGULATIONS (CFR)

Title 40, Protection of Environment.
Determination of particulate emissions from stationary sources
Part 60, Appendix A, Method 5

(Application for copies should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.)

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following document(s) form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. Unless otherwise specified, the issues of the documents not listed in the DODISS shall be the issue of the non-Government documents which is current on the date of the solicitation.

AIR MOVEMENT AND CONTROL ASSOCIATION, INC. (AMCA)

Standard 99-2404 - Drive Arrangements for Centrifugal Fans.
Standard 210 - Laboratory Methods of Testing Fans for Rating.

(Application for copies shoud be addressed to the Air Movement and Control Association, Inc., 30 West University Drive, Arlington Heights, IL 60004.)

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AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

B15.1 - Safety Standard for Mechanical Power Transmission Apparatus.

(Application for copies should be addressed to the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017.)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ICS 6 - Enclosures for Industrial Controls and Systems.
MG 1 - Motors and Generators.

(Application for copies should be addressed to the National Electrical Manufacturers Association, 2101 L Street, N.W., Washington, DC 20037.)

SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE)

SAE Handbook.

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.)

(Non-Government standards and other publications are normally available from the organizations which prepare or which 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 specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The dust collector unit shall be self-contained consisting of a fan, a cyclone or centrifugal type collector with a supporting framework; and shall be electric-motor-driven. The equipment shall not include the interconnecting duct work and exhaust hoods.

3.2 First article. When specified (see 6.2), the contractor shall furnish one dust collector unit for first article inspection (see 4.2.1 and 6.4).

3.3 Materials. Materials used shall be free from defects which would adversely affect the performance or maintainability of individual components or of the overall assembly. Materials not specified herein shall be of the same quality used for the intended purpose in commercial practice. Unless otherwise specified herein, all equipment, material, and articles incorporated

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in the work covered by this specification are to be new and fabricated using materials produced from recovered materials to the maximum extent possible without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products are allowed under this specification unless otherwise specified.

3.3.1 Dissimilar metals. Joints between dissimilar metals, including bolts, nuts, rivets and other fastenings and fittings, shall be protected against galvanic corrosion by the proper selection of materials, plating isolation, insulation, area relationships or other means, providing equivalent protection.

3.3.2 Abrasion and corrosion protection. Materials used in fabricating component parts of the dust collector unit shall resist deterioration as a result of the abrasive action of moist atmosphere or shall be suitably treated to resist corrosion. All weld areas and deposited weld metal shall be equally corrosion-resistant as the parent material.

3.4 Standard commercial product. The collector unit shall, as a minimum, be in accordance with the requirements of this specification and shall be the manufacturer's standard commercial product. Additional or better features which are not specifically prohibited by this specification but which are a part of the manufacturer's standard commercial product, shall be included in the collector unit being furnished. A standard commercial product is a product which has been sold or is being currently offered for sale on the commercial market through advertisements or manufacturer's catalogs, or brochures, and represents the latest production model.

3.5 Interchangeability. All units of the same classification furnished with similar options under a specific contract shall be identical to the extent necessary to insure interchangeability of component parts, assemblies, accessories, and spare parts.

3.6 Design and construction. The equipment shall be designed and constructed to facilitate field maintenance. All adjustments and replaceable accessories shall be readily accessible. Conditions which can be hazardous to personnel or deleterious to equipment shall not be permitted.

3.7 Performance. Unless otherwise specified (see 6.2), the dust collector unit shall move 4,200 standard cubic feet per minute at an external static pressure of not less than 6 inches, water gage. The dust collector unit shall have an overall collection efficiency of not less than 95 percent, when tested in accordance with 4.6.2.

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3.8 Collector. The collector shall be of the cyclone or centrifugal type. The collector shall consist of a cylindrical body and tapered cone arrangement which is designed to centrifically separate the conveyed material from the entering air. An airtight dust receptacle, either as an integral part of the unit or a separately furnished unit, shall be provided. Suitable means for emptying the collected dust particles from the receptacle shall be provided. The collector shell and all sheet metal parts shall be constructed of zinc-coated steel of not less than 0.0478-inch nominal thickness. All joints and seams shall be made airtight, and lap joints shall be in the direction favoring the flow of air. The inlet shall be connected tangentially to the upper cylinder and shall be rectangular in shape and of a size as specified (see 6.2). Unless otherwise specified (see 6.2), the inlet shall be left-handed for counterclockwise air rotation when one looks down into the collector. The air exhaust vent shall be capped or other suitable means shall be provided for protection against weather.

3.8.1 Collector framework. A zinc-coated structural steel framework of bolted construction shall support the collector at an elevation so that the dust outlet shall be approximately 36 inches above the framework base. The framework shall be sufficiently braced to support the collector unit against a wind resistance equivalent to 80 miles per hour. The bottom of the framework shall provide for a secure anchorage to a foundation. Framework may be dismantled for shipping purposes. All necessary bolts, nuts, and lockwashers for field assembly shall be included.

3.9 Fan. The fan shall be integrally mounted on top of the collector and shall be located on the clean air side of the air flow. The fan shall be of suitable size for use with the collector and the motor. The fan drive shall shall be an adjustable speed, multi V-belt or direct drive. The drive arrangement shall conform to the AMCA Standard 99-2404, Arrangement Number 4 for belt driven fan, or Arrangement Number 9 for direct driven.

3.10 Motor. The motor shall be a polyphase, squirrel cage, induction motor conforming to NEMA MG 1, and shall be totally-enclosed fan-cooled. Unless otherwise specified (see 6.2), the motor shall be suitable for continuous fan operation and designed for operation on 208 volt, 60 Hertz, 3-phase, alternating current.

3.11 Starter. An across-the-line, magnetically operated starter conforming to MIL-S-12514, type I, class 2, of the size and capacity suitable for the fan motor, shall be furnished. The starter shall include a thermal overload protective element rated for full load current of the motor. The enclosure shall conform to NEMA ICS 6, type 3, dust-tight enclosure. "Start" and "stop" buttons or switches shall be mounted on the cover of the enclosure.

3.12 Standard air. All references made in this specification to air volumes, velocities, and pressures shall be considered as referring to standard air. Standard air shall be interpreted as air at a temperature of 69° Fahrenheit, a barometric pressure of 29.92 inches, and a density of 0.07488 pounds per cubic foot.

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3.13 Fungus resistance. When specified (see 6.2), electrical components and circuit elements, including terminal and circuit connections, shall be coated with varnish conforming to MIL-V-173, except that:

a. Components and elements inherently inert to fungi or in hermetically sealed enclosures need not be coated.
b. Current-carrying contact surfaces, such as relay contact points, shall not be coated.

3.14 Electromagnetic interference suppression. When specified (see 6.2), the equipment shall conform to the electromagnetic interference suppression requirements and test limits for class C3, group III equipment as specified in MIL-STD-461.

3.15 Instruction plates. The collector unit shall be equipped with instruction plates suitably located, describing any special or important procedures to be followed in operating and servicing the equipment. Plates shall be of a material which will last and remain legible for the life of the equipment. Plates shall be securely affixed to the equipment with nonferrous screws or bolts of not less than 1/8-inch diameter.

3.16 Identification plate. The contracting officer will furnish to the Government inspector the required identification plates. The contractor will be required to stamp the necessary data in the blank spaces thereon and securely affix said plates in a conspicuous place on each unit, assembly or subassembly, and parts as directed by the Government inspector. Nonferrous screws, rivets, or bolts of not less than 1/8-inch in diameter shall be used to affix the plates. Nomenclature shall be "COLLECTOR UNIT, DUST."

3.17 Prime equipment accessories. Repair parts, maintenance tools, and accessories as specified (see 6.2), shall be included with the shipment of the dust collector unit unless written deviation is received from the contracting officer.

3.18 Lubrication. Unless otherwise specified (see 6.2), means for lubrication shall be in accordance with the manufacturer's standard practice. The lubricating points shall be easily visible and accessible. Hydraulic lubrication fittings shall be in accordance with SAE J534. Where use of high-pressure lubricating equipment, 1,000 pound-force per square inch or higher, will damage grease seals or other parts, a suitable warning shall be affixed to the equipment in a conspicuous location. The unit shall be lubricated prior to delivery with type of lubricant specified in the operator's manual and grade of lubricant recommended for ambient temperature at the delivery point. The unit shall be conspicuously tagged to identify the lubricants and their temperature range.

3.19 Cleaning, treatment, and painting. Surfaces normally painted in good commercial practice shall be cleaned, treated, and painted as specified herein. The color of the finish coat shall be as specified (see 6.2). Surfaces to be painted shall be cleaned and dried to insure that they are free

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from contaminants such as oil, grease, welding slag and spatter, loose mill scale, water, dirt, corrosion product, or any other contaminating substances. As soon as practicable after cleaning, and before any corrosion product or other contamination can result, the surfaces shall be prepared or treated to insure the adhesion of the coating system. The painting shall consist of at least one coat of primer and one finish coat. The primer shall be applied to a clean, dry surface as soon as practicable after cleaning and treating. Painting shall be with manufacturer's current materials according to manufacturer's current processes and the total dry film thickness shall be not less than 2.5 mils over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects.

3.20 Workmanship.

3.20.1 Steel fabrication. The steel used in fabrication shall be free from kinks, sharp bends, and other conditions which would be deleterious to the finished product. Manufacturing processes shall not reduce the strength of the steel to a value less than intended by the design. Manufacturing processes shall be done neatly and accurately. All bends shall be made by controlled means to insure uniformity of size and shape.

3.20.2 Bolted connections. Boltholes shall be accurately punched or drilled and shall have the burrs removed. Washers or lockwashers shall be provided in accordance with good commercial practice, and all bolts, nuts, and screws shall be tight.

3.20.3 Riveted connections. Rivet holes shall be accurately punched or drilled and shall have the burrs removed. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads, when not countersunk or flattened, shall be of approved shape and of uniform size for the same diameter of rivet. Rivet heads shall be full, neatly made, concentric with the rivet holes, and in full contact with the surface of the member.

3.20.4 Welding. Welding procedures shall be in accordance with a nationally recognized welding code. The surface of parts to be welded shall be free from rust, scale, paint, grease, or other foreign matter. Welds shall be of sufficient size and shape to develop the full strength of the parts connected by the welds. Welds shall transmit stress without permanent deformation or failure when the parts connected by the weld are subjected to proof and service loadings.

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 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

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Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must 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 assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Component and material inspection. Components and materials shall be inspected in accordance with all the requirements specified herein and in applicable referenced documents.

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

a. First article inspection (see 4.2.1).
b. Quality conformance inspection (see 4.2.2).

4.2.1 First article inspection. The first article inspection shall be performed on one dust collector unit when a first article is required (see 3.2 and 6.2). This inspection shall include the examination of 4.5 and the test of 4.6. The first article may be either a first production item or a standard production item from the supplier's current inventory provided the item meets the requirements of the specification and is representative of the design, construction, and manufacturing technique applicable to the remaining items to be furnished under the contract.

4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.5, the tests of 4.6, and the packaging inspection of 4.7. This inspection shall be performed on the samples selected in accordance with 4.4.

4.3 Inspection lot. All units offered to the Government at one time, shall be considered a lot for purpose of inspection. The sample unit shall be one complete dust collector unit.

4.4 Sampling. Sampling and inspection procedures shall be in accordance with MIL-STD-105. The unit of product shall be one complete dust collector unit. All dust collector units offered for delivery at one time shall be considered a lot for the purpose of inspection. The inspection level shall be level II and the Acceptable Quality Level shall be 1.5 percent defective. If an inspection lot is rejected, the contractor may rework it to correct the defects, or screen out the defective units, and resubmit for a complete reinspection. Resubmitted lots shall be reinspected using tightened

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inspection. If the rejected lot was screened, reinspection shall be limited to the defect causing rejection. If the lot was reprocessed, reinspection shall be performed for all defects. Rejected lots shall be separated frcm new lots, and shall be clearly identified as reinspected lots.

4.5 Examination. The first article sample, when a first article is required, and each sample selected in accordance with 4.4 shall be examined to verify compliance with this specification. Examination shall be conducted as specified in table I. Any dust collector units in the sample containing one or more defects shall be rejected, and if the number of defective units in any sample exceed the acceptance number for that sample, the lot represented by the sample shall be rejected.

TABLE I. Classification of defects.

Classification	Defect
Major:	
101	Material not as specified.
102	Design not as specified.
103	Parts not interchangeable for like equipment.
104	Components missing or not as specified.
105	Dimensions not as specified.
106	Workmanship not as specified.
Minor:	
201	Treatment and painting not as specified.
202	Identification plates or marking missing, illegible, or incorrect.
203	Spare parts, maintenance tools, and accessories missing.

4.6 Tests. Each first article sample dust collector unit and each sample selected in accordance with 4.4 shall be tested and any unit failing to pass the following tests, as applicable, shall be rejected. Tests shall be conducted as outlined in the referenced documents as herein specified.

4.6.1 Dust collector unit performance. The dust collector unit shall be tested for air volume, external static pressure and hp input in accordance with AMCA Standard 210 or shall be licensed to bear the AMCA Certified Ratings Seal. Failure of the fan to meet the requirements of 3.7 shall be cause for rejection.

4.6.2 Collector performance. Overall efficiency and external static pressure of the collector shall conform to the requirements of 3.7. Separation efficiency test shall be performed in accordance with CFR Title 40, Part 60, Appendix A, Method 5. The conveying velocity for the test shall be between 3,800 and 4,000 feet per minute. Static pressure shall be obtained by means of pitot tubes. Nonconformance to 3.7 shall constitute failure of the test.

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4.6.3 Electromagnetic interference suppression. When conformance with electromagnetic interference limits is required, the equipment shall be tested in accordance with MIL-STD-462 to determine conformance to electromagnetic interference suppression requirements of 3.14. Nonconformance of 3.14 shall constitute failure of this test.

4.7 Packaging inspection. The preservation-packaging, packing, and marking of the dust collectors shall be inspected to verify conformance to section 5.

5. PACKAGING

5.1 Preservation-packaging, packing, and marking. The preservation-packaging, packing, and marking shall be in accordance with MIL-M-18058. The level of preservation-packaging and level of packing shall be as specified (see 6.2).

6. NOTES

6.1 Intended use. This equipment is intended for separating and collecting, material such as sawdust, chips, wood shavings, and abrasive dust.

6.2 Ordering data. Acquisition documents should specify the following:

a. Title, number, and date of this specification.
b. When a first article is required for inspection and approval (see 3.2, 4.2.1, and 6.4).
c. Fan capacity and static pressure, if other than that specified (see 3.7).
d. Size of inlet in square feet of area required, and whether inlet shall be other than left-handed (see 3.8).
e. Electrical characteristics, if other than specified (see 3.10).
f. When fungus resistance is required (see 3.12).
g. When electromagnetic interference suppression is required (see 3.13).
h. Type of lubrication, if other than as specified (see 3.17).
i. Color of the finish coat required (see 3.18).
j. Level of preservation-packaging and level of packing required (see 5.1).

6.3 Data requirements. When this specification is used in an acquisition which incorporates a DD Form 1423, Contract Data Requirements List (CDRL) and invokes the provisions of DoD Federal Acquisition Regulations (FAR) Supplement 27.410-6, the data requirements will be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved CDRL (DD Form 1423) incorporated into the contract. When the provisions of DoD FAR 27.410-6 are not invoked, the data shall be delivered in accordance with the contract requirements.

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6.4 First article. When a first article inspection is required, the item will be tested and should be a first production item or it may be a standard production item from the contractor's current inventory as specified in 4.2.1. The first article should consist of one complete dust collector unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examination, test, and approval of the first article.

6.5 Subject term (key word) listing.

Collector unit
Cyclone
Fan

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

Custodian:
Navy - YD

Preparing Activity:
Navy - YD

(Project 4460-N038)

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions – Reverse Side)

1. DOCUMENT NUMBER
MIL-C-16703E (YD)

2. DOCUMENT TITLE
COLLECTOR UNIT, DUST, WITH FAN

3a. NAME OF SUBMITTING ORGANIZATION

b. ADDRESS *(Street, City, State, ZIP Code)*

4. TYPE OF ORGANIZATION *(Mark one)*

- [ ] VENDOR
- [ ] USER
- [ ] MANUFACTURER
- [ ] OTHER *(Specify)*: _____

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional

b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional

c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional

8. DATE OF SUBMISSION *(YYMMDD)*

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