

MILITARY SPECIFICATION

SWEEPER, MAGNETIC, ROAD, WHEEL MOUNTED, TOWED, PERMANENT MAGNET, 96 INCH

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 towed type, magnetic road sweeper, two-wheel mounted, permanent magnet type, 96 inches wide.

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

FEDERAL

PPP-B-601 - Boxes, Wood, Cleated-Plywood.
PPP-B-621 - Boxes, Nailed and Lock-Corner.

MILITARY

MIL-C-104 - Crates, Wood: Lumber and plywood sheathed, nailed and bolted.
MIL-P-116 - Preservation, Methods of.
MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.
MIL-B-22191 - Barrier Material, Transparent, Flexible, Heat Sealable.

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, 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 3830

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STANDARD

MILITARY

MIL-STD-129 - Marking for Shipment and Storage.

(Copies of specifications and standards and other Government documents 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 documents 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.

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.)

TIRE AND RIM ASSOCIATION, INC. (TRA)

TRA Yearbook

(Applications for copies should be addressed to the Tire and Rim Association, Inc., 3200 West Market Street, Akron, OH 44313.)

(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 sweeper shall be a self-contained unit complete with magnet assembly, retainer pans, tow bar, wheels, and tires.

3.2 First article. When specified in the contract or purchase order a sample shall be subjected to first article inspection (see 4.2.1 and 6.2).

3.3 Standard commercial product. The sweeper 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 sweeper 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.

3.4 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 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.

3.5 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 Construction. Construction of the sweeper shall be such that it will withstand abnormal usage encountered in military service and in operation under severe weather conditions. Construction of the equipment shall be in accordance with the current state-of-the-art practice. The equipment design and accessory installations shall permit accessibility for maintenance and service in the field. The design shall be such as to prevent conditions which may be hazardous to personnel or deleterious to equipment. Suitable lifting eyes shall be installed that are capable of carrying the complete sweeper without undue structural strain.

3.6.1 Dissimilar metals. The use of dissimilar metals in an intimate contact with each other shall be avoided wherever possible in order to minimize galvanic corrosion between these metals.

3.6.2 Wheels, rims, and tires. The sweeper shall be mounted on two pneumatic-tired wheels. Wheels shall have ball or roller bearings and shall be demountable at the hub or rim. Rim and tire ratings shall conform to TRA

recommendations for the type and size tires furnished. Tires shall be of the tubeless type, with highway tread. When specified, (See 6.2), tires shall be filled with urethane foam.

3.7 Magnet assembly. The magnet assembly shall consist of one or more permanent magnets rigidly fastened within an enclosed metal housing with a stainless steel cover plate used as the sweeping face. The magnet assembly shall have an effective sweeping face width of 96 inches, a depth from front to back of not less than 9 inches, and a height of not less than 2 inches. The magnet assembly shall be capable of rotating about its longitudinal axis to facilitate removal of the metal debris from the cover plate into retainer pans (see 3.9), mounted on the sweeper. The sweeping face cover plate shall be capable of emptying of the ferrous metal debris from the surface of the cover plate into the retainer pans.

3.7.1 Shock and vibration. The magnet assembly shall be of rugged construction, suitable for its intended use. It shall not be damaged or show degraded performance from mechanical shock or vibration of the type encountered over rough, unpaved ground containing rocks, bumps, potholes, debris, and other obstructions.

3.7.2 Waterproof and dustproof. The magnet assembly shall be so designed to prevent the entrance of water and dust into the assembly.

3.7.3 Magnetic characteristics. The magnets used in the magnet assembly shall be suitable for their intended use, and shall be permanent magnetic material of a type having a residual induction greater than 3,800 Gauss and a coercive force greater than 600 Oersteds.

3.7.4 Magnet stabilization. The magnets shall be stabilized as to preserve and maintain the original magnet field strength. After stabilization and throughout the life of the sweeper, the magnets shall not show evidence of loss of field strength due to natural or stray magnetic fields, mechanical shock and vibration, or operating temperatures from -25 degrees Fahrenheit (°F) to +125°F.

3.7.5 Sweeping clearance. In operation, the magnet assembly sweeping clearance measured in a vertical plane from level flat ground to the level horizontal plane of the magnet assemblies sweeping face cover plate shall be not less than 2 inches and not greater than 3 inches.

3.7.6 Traveling road clearance. The minimum road clearance of the magnet assembly in a traveling, nonoperating condition shall be not less than 5 inches, measured from level flat ground to the lowest portion of the magnet assembly in traveling position.

3.7.7 Static measurement capability. Over any portion of the magnet assembly pickup area, the magnet assembly shall be capable of producing a minimum flux density of 150 Gauss at a distance of 3 inches perpendicular from the surface of the magnet assembly sweeping face.

3.8 Sweeper pickup capability. At any speed less than 5 miles per hour (mph) or when traveling at a speed of 5 mph and having a sweeping clearance of 3 inches from the ground as specified in 3.7.5, the sweeper shall be capable of picking up 99 percent of 39 pounds (lbs) of miscellaneous small steel items such as washers, nuts, wire, and flattened cans that have been uniformly spread on the ground beneath the magnet assembly pickup area. At the manufacturer's option, 30 lbs of size 4d common steel nails may be used instead of the miscellaneous small steel items.

3.9 Retainer pans. Two or more rectangular pans with carrying handles shall be installed in line parallel to the longitudinal axis of the magnet assembly. The retainer pans shall be capable of being easily removed and lifted by one person from their mountings for emptying purposes. The pans shall be mounted such that when the magnet assembly is rotated about its longitudinal axis to an upward position, the magnet assembly cover plate(s) may be easily positioned or removed, and the metal debris collected on the plate emptied into the retainer pans. The retainer pans shall be provided with drain holes or some other method to drain accumulated rain water when the sweeper is stored outside.

3.10 Environmental and storage conditions. The sweeper shall be capable of satisfactory performance and storage in any ambient temperature from -25°F to 125°F while exposed to maximum solar radiation.

3.11 Dimensions. The overall dimensions shall not exceed 84 inches in length, 130 inches in width, and 46 inches in height.

3.12 Tow bar. The tow bar shall have a lunette type towing ring with a 3-inch inside diameter eye and be fabricated from 1-5/8-inch diameter round steel bar stock. The tow bar shall be constructed from material structurally adequate for the weight drawn. The sweeper shall be designed with its center of gravity forward of the wheel axle center line placing a weight load on the towing ring. The weight on the towing ring shall be not more than 100 lbs or less than 50 lbs. Provisions shall be made for adjusting the height of the tow bar from 20 to 30 inches to match the height of the towing vehicle hitch or at manufacturer's standard fixed height of approximately 27 inches. Such adjustments shall not disturb the horizontal plane of the magnet assembly.

3.13 Safety chain(s). The sweeper shall be coupled with a safety chain(s) to the towing vehicle. The length of the chain(s) shall be not less than 30 inches long, fitted with grabhooks and connected so that no excess slack will be in the chain(s) other than necessary to permit proper turning. The safety chain(s) shall be so arranged and connected that they will prevent the tow bar from dropping to the ground in the event of hitch failure. Each chain shall have an ultimate strength at least equal to the gross weight of the load being towed. S-hooks or anchor shackles are acceptable in lieu of grabhooks.

3.14 Tracking. The coupling devices shall be so designed and installed that the sweeper being towed will follow in the path of the towing vehicle without shifting or swerving more than 3 inches from side to side. The sweeper shall trail when prime mover is turning at its minimum radius without cramping.

3.15 Travel speed. The sweeper shall have a safe travel speed up to 55 mph and follow the towing vehicle as required in 3.14.

3.16 Safety reflectors. A red colored SAE Class A circular light reflector having a reflecting surface not less than 3 inches in diameter shall be mounted on each side of the sweeper and on each side of the rear portion of the sweeper. The reflectors shall be visible at night between 100 and 600 feet to the rear of the sweeper when illuminated by the low beam of an oncoming motor vehicle headlight. The reflectors shall be securely fastened to the sweeper by screws, rivets, or bolts.

3.17 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 ensure that they are free 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.

3.18 Instruction plates. The sweeper 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.

3.19 Identification plate. An identification plate will be furnished by the contracting officer for each sweeper. The contractor shall stamp all necessary data in the blank spaces of the plate provided for that purpose, and securely affix a plate to each sweeper in a conspicuous place with nonferrous screws, rivets, or bolts not less than 1/8-inch in diameter. The applicable nomenclature contained in the contract item description shall be placed in the top blank.

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 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 each sweeper when a first article is required (see 3.2 and 6.2). This inspection shall include the examination of 4.3 and the tests of 4.4. 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 4.3 and the tests of 4.4.

4.3 Examination. Each sweeper shall be examined for compliance with the requirements specified in section 3 of this specification. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet specified requirements shall receive particular attention for adequacy and suitability. This element of inspection shall encompass all visual examinations and dimensional measurements. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.4 Tests. The first article sample shall be tested in accordance with all the tests specified in 4.3. Each sweeper shall be tested in accordance with the test specified in 4.4.2. Failure of the sweeper to meet the requirements of the tests shall be cause for rejection.

4.4.1 Magnetic characteristics test. The magnets used in the sweepers shall be in conformance with 3.7.3. If magnet stabilization is necessary, the testing shall be done after stabilization by using a magnet or magnets from the same manufacturing lot for testing as those used in the sweepers.

4.4.2 Flux density test. The magnet assembly shall be tested to determine conformance to 3.7.7.

4.4.3 Sweeper pickup capability test. The sweeper shall be tested to determine conformance to 3.8.

4.4.4. Road test. The sweeper shall be road tested by the contractor for not less than one mile over straight roads or paved surfaces and around curves of varying radii of curvature to determine conformance to 3.14 and 3.15.

4.5 Packaging inspection. The preservation, packing, and marking of the item shall be inspected to verify conformance to the requirements of section 5.

5. PACKAGING

5.1 Preservation. Preservation shall be level A or commercial as specified (see 6.2).

5.1.1 Level A.

5.1.1.1 Methods of preservation. Cleaning processes, drying procedures, preservatives, and methods of preservation are listed in MIL-P-116 and shall conform to the requirements of MIL-P-116 and any applicable specifications.

5.1.1.2 Disassembly. Disassembly shall be the minimum necessity to protect parts subject to damage or loss, and to accomplish reduction in cube. Removed bolts, nuts, pins, screws, and washers shall be reinstalled in mating parts and secured to prevent their loss.

5.1.1.3 Matchmarking. Parts removed and mating parts on the equipment and attachments shall be matchmarked to facilitate reassembly. Parts and accessories removed, and mating parts on the equipment, shall be identified with weatherproof tags attached to mating parts and locations. Marking shall be applied to the tags with a waterproof material.

5.1.1.4 Cleaning and drying. Prior to the application of preservative compounds or paints, surfaces shall be cleaned by process C-1 and dried by any applicable procedure of MIL-P-116.

5.1.1.5 Unprotected surfaces. Unprotected exterior surfaces requiring the application of a contact preservative in accordance with MIL-P-116 and not specifically provided for herein shall be preserved as follows:

5.1.1.5.1 Unfinished (not machined) surfaces. Unfinished exterior metal surfaces shall be coated with type P-1 preservative.

5.1.1.5.2 Machined surfaces. Exposed machined surfaces shall be coated with type P-6 or P-11 preservative and wrapped or covered, as applicable, with barrier material conforming to MIL-B-121, type I, grade A, class 2 or MIL-B-22191, type II. The material shall be secured in place with waterproof tape.

5.1.2 Commercial. The equipment shall be preserved in accordance with the contractor's standard practice in a manner to prevent deterioration and damage.

5.2 Packing. Packing shall be level A, B, or commercial as specified (see 6.2).

5.2.1 Level A. The sweeper shall be shipped in a crate conforming to MIL-C-104. Disassembled components and tools for each sweeper shall be packed in containers conforming to PPP-B-601, overseas type or PPP-B-621, class 2. The contents shall be cushioned, blocked, and braced to prevent movement within the boxes. Boxes shall be secured to the equipment with appropriate strapping. Arrangement and location on the equipment shall be such so as not to interfere with lifting or mobility of the equipment.

5.2.2 Level B. The sweeper shall be the same as level A except containers conforming to PPP-B-601, domestic type or PPP-B-621, class 1 shall be used.

5.2.3 Commercial. The equipment shall be prepared for shipment in a manner which will ensure arrival at destination in a satisfactory condition. Preparation for delivery shall comply with applicable carrier rules and regulations.

5.3 Marking. Marking shall be in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use. Permanent magnet road sweepers are used for picking up ferrous metal objects from runways, roads, and maintenance areas.

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. When tires shall be filled with urethane foam (see 3.6.2).
- d. Color of paint finish coat (see 3.17)
- e. Level of preservation and level of packing required (see 5.1 and 5.2).

6.3 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements shall be developed as specified by an approved Data Item Description (DD Form 1664) and

delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DOD FAR Supplement, Part 27, Sub-Part 27.410-6 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data shall be delivered by the contract or in accordance with the contract or purchase order requirements.

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 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.

Magnet
Magnet fields
Materials
Towing
Wheels

6.6 Changes from previous issue. The margins of this specification are marked with an asterisk to indicate where changes (additions, modifications, corrections, deletions) 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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Air Force - 99

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(Project 3830-0160)

Review activities:
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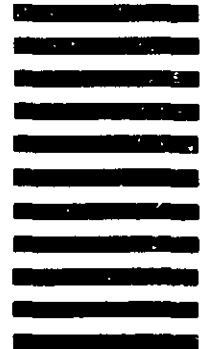
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