

NOTICE OF
CANCELLATION

INCH-POUND
MIL-P-52327C
NOTICE 1
7 December 1998

MILITARY SPECIFICATION

PUMPS, CENTRIFUGAL, ELECTRIC-MOTOR-DRIVEN,
POSITIVE PRIME, PETROLEUM PRODUCTS,
AIRFIELD DEFUELING AND RECEIVING

MIL-P-52327C, dated 14 September 1990, is hereby cancelled without replacement.

Custodians:

Army - AT
Navy - YD2

Preparing Activity:

Army - AT

(Project 4320-0037)

Review Activities:

Army - AV, CE, CR
DLA - CC

AMSC N/A

FSC 4320

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INCH-POUND

MIL-P-52327C
 14 ~~September~~ 1990
 SUPERSEDING
 MIL-P-52327B
 4 October 1979

MILITARY SPECIFICATION

PUMPS, CENTRIFUGAL, ELECTRIC-MOTOR-DRIVEN

POSITIVE PRIME, PETROLEUM PRODUCTS,

AIRFIELD DEFUELING AND RECEIVING

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

1. SCOPE

1.1 Scope. This specification covers electric-motor-driven, horizontally mounted, centrifugal pumps with positive prime.

1.2 Classification. Pumps shall be of the following types and classes, as specified (See 6.2):

Type I - Defueling.

class 1 - 200 gallons per minute (gpm) at 100 feet total head.

class 2 - 200 gpm at 140 feet total head.

class 3 - 300 gpm at 80 feet total head.

Type II - Receiving - 250 gpm at 96 feet total head.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks from 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).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA Belvoir Research, Development, and Engineering Center, ATTN: SIRBE-TSE, Fort Belvoir, VA 22060-5606 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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SPECIFICATIONS

FEDERAL

- QQ-S-781 - Strapping, Steel, and Seals.
- PPP-B-601 - Boxes, wood, cleated-Plywood.
- PPP-B-621 - Boxes, Wood, Nailed, and Lock-Comer.

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- MIL-P-116 - Preservation, Methods of.
- MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.
- MIL-V-173 - Varnish, Moisture and Fungus Resistant (For Treatment of Communications, Electornic and Associated Equipment) 1
- MIL-P-514 - Plates, Identification, Instruction and Marking, Blank.
- MIL-T-704 - Treatment and Painting of Materiel.
- MIL-F-3541 - Fittings, Lubrication.
- MIL-L-21260 - Lubricating Oil, Internal Combustion Engine, Preservative and Break-In.
- MIL-T-22085 - Ripe, Pressure-Sensitive Adhesive, Preservation and Sealing.
- MIL-I-45208 - Inspection System Requirement
- MIL-S-52506 - seals , shaft, Mechanical, Low-Pressure Type, self-Lubricating; for General-Purpose Centrifugal Pumps.

STANDARDS**FEDERAL**

- FED-STD-H28 - screwed Standards for Federal Services.
- FED-STD-101 - Test Procedure for Packaging Materials.

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- MIL-STD-105 - Sampling procedures and Tables for Inspection by Attributes .
- MIL-STD-129 - Marking for Shipment and Storage.
- MIL-STD-130 - Identif ication Marking of US Military Property.
- MIL-STD-209 - Slinging and Tiedown Provisions for Lifting and Tying Down Military Equipment.
- MIL-STD-461 - Electromagnetic Interference Characteristics Requirements for Equipment.
- MIL-STD-810 - Environmental Test Methods.
- MIL-STD-838 - Lubrication of Military Equipment.
- MIL-STD-889 - Dissimilar Metals .
- MIL-STD-1186 - Cushioning, Anchoring, Bracing, Blocking, and Waterproof ing; with Appropriate Test Methods.
- MIL-STD-1472 - Human Engineering Design Criteria for Military Systems, Equipment and Facilities.
- MIL-STD-1474 - Noise Limits for Army Material.
- MS35844 - Plug, Machine Thread, Magnetic: Drain.

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MS49006 - Plugs, Pipe, Magnetic-Hedless, Aluminum, Iron, or steel 1

HANDBOOKS

MIL-HDBK-113 - Guide for the Selection of lubricants, Fluids, Preservatives , and Specialty Products for Use in Ground Equipment Systems.

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

2.1.2 other Government documents. The following other Government documents form a part of this document to the extent specified herein. Unless otherwise specif ied the issues are those cited in the solicitation.

MILITARY TRAFFIC MANAGEMENT COMMAND (MIMC/TEA)

Pamphlet 70-1 - Transportability for Better Strategic Mobility.

(Application for copies should be addressed to the Military Traffic Management Command, Transportation Engineering Agency (MIMC/TEA), ATTN: MTT-TR, P.O. Box 6276, Newport News, VA 23606-0276.)

OCCUPATION SAFETY AND HEALTHACT OF 1970 (OSHA)

Title 29, CFR, Chapter XVII, Part 1910

(The Code of Federal Regulations (CFR) and the Federal Register (FR) are for sale on a subscription basis by the Superintendent of Documents, Government Printing Office, Washington, DC 20402. When indicated, reprints of certain regulations may be obtained from the Federal agency responsible for issuance thereof .)

SOUTH COAST AIR QUALITY MANAGEMENTDISTRICT

Rule 442 - Usage of Solvents

(Application for copies should be addressed to the South Coast Air Quality Management District, 9150 E Flare Drive, El Monte, CA 91731.)

2.2 Non-Government publications. The following document(s) 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).

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

B16.5 - Steel Pipe Flanges, Flanged Valves, and Fittings.
B16 .14 - Ferrous Pipe Plugs, Bushings, and Locknuts with Pipe Threads.

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B40.1 - Gauges - Pressure and Vacuum, Indicating Dial Type - Elastic Element .

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

Boiler and Pressure Vessel Code, Section IX, Welding and Brazing Qualifications.

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 36 - Structural steel 1
A 276 - Stainless and Heat-Resisting Steel Bars and Shapes.
A 278 - Gray Iron Castings for Pressure-Containing Parts for Temperatures Up to 650 °F (345 °C).
B 26 - Aluminum-Alloy Sand Castings .
B 148 - Aluminum-Bronze Sand Castings.

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

AMERICAN WELDING SOCIETY (AWS)

D1.1 - Structural Welding Code - Steel.

(Application for copies should be addressed to the American Welding society, 550 N.W. LeJeune Rind, P. O. Box 351040, Miami, FL 33135.)

HYDRAULIC INSTITUTE (HI)

Standards of the Hydraulic Institute.

(Application for copies should be addressed to the Hydraulic Institute, 1.230 Keith Building, Cleveland, OH 44115.)

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

MG-1 - Motors and Generators.

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

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

AMS3275 - Sheet, Acrylonitrile Butadiene (NBR) Rubber.
J429 - Mechanical and Material Requirements for Externally Threaded Fasteners .
J492 - Rivets and Riveting.

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

UNDERWRITERS LABORATORIES , INC. (U-L)

Bulletin No. 674 (B) - Electric Motors and Generators for Use in Hazardous Locations, Class I, **Groups C and D.**

(Application for copies should be addressed to the Underwriters laboratories, Inc., 207 East Ohio Street, Chicago, IL 60611.)

(Non-Government standards and other publications are normally available from the organization 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, (except for related associated detail specifications, specification sheets or MS standards), the text of this document takes precedence. Nothing in this document , however, superseded applicable laws and regulations unless a specific exemption has been obtained.

3. **REQUIREMENTS**

3.1 Description The electric-motor-driven, centrifugal pumps, hereinafter referred to as "pump units " shall consist of an electric motor, a flexible coupling, and a horizontal, positive prime (self-priming) centrifugal pump mounted on a common base.

3.2 First article. Unless otherwise specified (see 6.2) , a sample shall be subjected to first article inspection (see 6.3) in accordance with 4.3.

3.3 Material. Material shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.3.1 Material deterioration Prevention and control. The pump units shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration that maybe encountered in any of the applicable operation and storage environment to which the pump units may be exposed.

3.3.2 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion. Dissimilar metals and methods of protection are defined and detailed in MIL-STD-889.

3.3.3 Identification of materials and finishes. The contractor shall identify the specific material, material finish or treatment for use with components and subcomponents, and shall make the information available, upon request, to the contracting officer or designated representative.

3.3.4 Recovered materials. For the purpose of this requirements recovered materials are those materials which have been collected from solid waste and reprocessed to become a source of raw materials, as distinguish from virgin raw Materials. The components, pieces and parts incorporated in the pump units

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may be newly fabricated from recovered materials to the maximum extent practicable, provided the pump units produced meets all other requirements of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the pump units.

3.3.5 Hydrocarbon compatibility. Those **components, parts, or accessories not specifically described** shall be compatible **with liquid hydrocarbon products** including aviation gasolines, jet aircraft **engine fuels, fuel oils, kerosene,** and diesel oils.

3.4 Design and construction.

3.4.1 Screw threads. Screw threads shall conform to FED-STD-H28.

3.4.2 Base mounting. The pump and motor shall be mounted on a base fabricated of cast iron conforming to ASTM A 278, class 35, or steel conforming to ASTM A 36.

3.4.3 Pump. The pump shall be a single-stage, horizontal, centrifugal type consisting of a centrifugal impeller combined with a vane-type rotary, positive evacuating, volumetric-displacement priming unit, mounted on a common shaft. The pump shall be such that all rotating parts maybe removed without disconnection of the suction or discharge piping. The pump shall operate dry for not less than 1 hour without damage or permanent defamation of moving parts after the pump has been operated by pumping petroleum products.

3.4.4 Pump case. The pump case shall be the vertically split type and shall be cast iron conforming to ASTM A 278, class 35. The pump suction shall be faced, drilled, or tapped for a 125-pound, 4-inch pipe flange in accordance with ANSI B16. 5; the pump discharge shall be flanged and drilled for a 125-pound, 3-inch pipe flange in accordance with ANSI B16. 5. The case shall be fitted with a flanged suction nozzle equipped with 125-pound, 4-inch flanges in accordance with ANSI B16 .5. The pump case shall be drilled and tapped for 1/8-inch NPT threads to connect pressure and vacuum gauges.

3.4.4.1 Drain port and plug The drain port shall be internally threaded NPT and shall be of such size and as located as to completely drain the pump case in not more than 2 minutes. The drain plug shall be a square-head pipe plug conforming to ANSI B16 . 14 . When installed, the plug shall not protrude beyond the inner surface of the pump case.

3.4.4.2 Support bracket. The pump cases shall be provided with a support bracket fabricated of cast iron conforming to ASTM A 278, class 35. The support bracket shall be either integrally cast with or bolted to the pump case.

3.4.5 Pump impeller. The impeller shall be closed type, heat-treated cast aluminum conforming to ASTM B 26. The impeller shall be fitted with a replaceable wear ring fabricated from bronze conforming to ASTM B 148 as-cast, alloy No. 954 (UNS No. C954000).

3.4.6 Pump shaft. The pump shaft shall be corrosion-resistant steel conforming to ASTM A 276, type 316 (UNS No. S316000). The shaft shall be turned, ground, and polished. The shaft shall be hardened to a Brinell hardness of not less than 225.

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3.4.6.1 Pump-shaft seal. The pump shall be provided with a liquid-cooled mechanical-type seal conforming to MIL-S-52506, for closure between the pump case and the pump shaft. The sealing surface shall be self-aligning and removable for repair or replacement without removal of the motor from the common base.

3.4.7 Priming unit. The priming unit shall be a vane-type rotary, positive, volumetric-displacement unit mounted on the same shaft as the centrifugal impeller. The priming unit shall evacuate air from the suction piping and thereby initially priming the centrifugal impeller and restoring lost prim during operation of the pump. A self-cleaning strainer shall be provided in the priming-unit intake line.

3.4.8 Pump cover. The pump shall have a pump cover fabricated of cast iron conforming to ASTM A278, class 35.

3.4.9 Pump-bearing housing. A pump-bearing housing shall be directly connected to the pump. The housing shall contain an arrangement of heavy-duty, anti-friction, grease-lubricated or lubricated-for-life prepacked, sealed bearings which shall support the maximum radial and axial loads which may be imposed by the pump impeller. The housing, when supplied with grease lubricated bearings, shall be provided with a grease reservoir and shall have grease lubrication and pressure-relief fittings and bearing cap to protect the bearings against the entry of water and foreign matter (see 3.5.2) .

3.4.10 Shaft coupling. The pump shaft shall be coupled to the motor shaft by means of a flexible coupling, providing for angular and linear misalignment. The coupling shall have a torsional strength of not less than that of the pump shaft and shall transmit the maximum horsepower developed by the rotor to the pump through an arrangement that will reduce the transmission of torsional vibration. The pump-motor alignment shall fall within the operating tolerance of the coupling used.

3.4.11 Gaskets. Gaskets shall be of material conforming to SAE AMS3275. Flange gaskets shall be not less than 0.0625-inch thick.

3.4.12 Electric motor. The motor shall conform to NEMA MG-1, polyphase, design B, squirrel-cage induction type, rated for continuous duty. The rotor shall be totally enclosed, explosion-proof design, with class A insulation, and shall be suitable for class 1, group C, hazardous locations as defined in UL Bulletin No. 674 (B) . The rotor shall be horizontally mounted, and shall have a rated speed of 1,800 rpm or 3,600 rpm.

3.4.12.1 Power rating The continuous duty rating of the motor shall be not less than the maximum brake horsepower required by the pump at rated conditions.

3.4.12.2 Voltage and frequency Unless otherwise specified (see 6.2) , the motor shall operate on a 208-volt, 3 phase, 60-Hertz (Hz) , 4-wire, electrical power system.

3.4.13 Pump discharge. The discharge of the pump shall be in the horizontal position and shall be equipped with a check valve.

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3.5 Maintainability.

3.5.1 Ease of maintenance. All assemblies, parts, and attachments shall be accessible for maintenance, repair, and replacement without the removal of other major assemblies and installed attachments not normally removed. Drain outlets shall be located for accessibility. Provisions shall be made to permit the use of receptacles for collecting drainage. Design for maintainability shall conform to 3.8.

3.5.2 Lubrication. All surfaces requiring lubrication shall be provided with a means for lubricating.

3.5.2.1 Lubricants. The procedure for the selection of lubricants shall be in accordance with MIL-STD-838, section 5. Lubricants selected shall be in accordance with MIL-HDBK-113, chapter 2. When the specification of the lubricant selected includes a requirements for a Qualified Products List (QPL), the lubricant supplied shall be from a source that is listed on the applicable QPL.

3.5.2.2 Lubrication fittings. Lubrication fittings shall conform to MIL-F-3541, types I, II, or III. Fittings shall be located in a protected position and shall be accessible to a grease gun with a 10-inch flexible extension. Accessibility to fittings shall be provided without the removal or adjustment of accessories or parts. Panels and plates equipped with hand operable, quick-disconnect fasteners may be removed to provide accessibility.

3.5.2.2.1 Pressure-release device. A pressure release device shall be provided where the use of pressure lubricating equipment could damage grease seals or other parts.

3.5.2.3 Filling, draining, and checking provisions. Enclosures Such as gear cases and transmission housings that contain a reservoir of lubricants for the lubrication of the parts enclosed shall be equipped with dipsticks, check plugs not less than 1/2-inch pipe size, or sight gauges to determine the level of the lubricant. Each enclosure shall be equipped for filling the enclosure with a lubricant and for draining. The drain outlet shall be fitted with a magnetic drainplug, size conforming to MS35844 or MS49006. The drain outlet shall be located so that removal of the plug will result in complete drainage of the lubricant from the enclosure. Drainage shall be into a suitable receptacle when the pump unit is in its normal position. Integral tubes or troughs may be used to convey the lubricant from the drain outlet to the receptacle. The drainplug, the filling means, and the lubricant level dipstick or holes shall be accessible without disturbance of accessories or parts.

3.6 Transportability.

3.6.1 Lifting provisions. The tiedown provisions shall conform to MIL-STD-209. The tiedown provisions shall satisfactorily complete the pull testing as specified in 4.5.2.10 without weld failure, permanent deformation, cracking, loosening, or breaking of the provision or its connecting structural **components.**

3.6.2 Tiedown provisions. The slinging provisions shall conform to MIL-STD-209. The provisions shall enable the complete pump unit to be lifted in

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the normal operating position. The provisions shall be located so that not less than 1-inch clearance is maintained between slings and all exterior parts and shall be fastened to members which will withstand **stresses in the amount and direction** of pull specified for the provisions without weld failure, permanent deformation, cracking, loosening or breaking of the provision or its connecting structural components. Slings may also be used as tie-down provisions when such provisions meet the requirements specified in 3.6.1. All slinging/tie-down provisions shall be labeled "LIFT" "TIEDOWN" or "LIFT/TIEDOWN", as appropriate, in 1-inch (2.54 cm) high letters.

3.6.3 Rail transportability. The pump unit shall be rail transportable in CONUS and NATO countries without restrictions. The pump shall have a dimensional profile within the international de Chargement (GIC) in accordance with MIMC/TEA pamphlet 70-1, outline diagram when loaded on a 50-inch (127 cm) high rail car. The pump shall be capable of withstanding shock loads resulting from rail impact testing in accordance with 4.5.2.7 without failure, damage, or permanent deformation. A transportability test is required (see 6.7).

3.7 Performance.

3.7.1 Dry operation. The pump shall operate dry for not less than 1 hour without damage or permanent deformation of moving parts after the pump has been operated by pumping petroleum products.

3.7.2 Hydrostatic pressure. The pump shall withstand a hydrostatic pressure of not less than 125 pounds per square inch (psi) for not less than 2 minutes without leakage, failure or permanent deformation.

3.7.3 Impeller balancing. The impeller shall be dynamically balanced. The out-of-balance condition shall be not more than 0.50 ounce-inch at the rated operating speed of the pump.

3.7.4 Priming. The pump shall prime in not more than 30 seconds while operating at a synchronous speed of 1,800 revolutions per minute (rpm) or 3,600 rpm at static suction lift conditions equivalent to 10 feet of fuel with a specific gravity of 0.80, at standard sea level conditions (atmospheric conditions of 29.92 inches of mercury and +68 °F (+ 20 °C)).

3.7.5 Type I, performance 1 The pump unit shall deliver rated capacity when operating at a synchronous speed of 1800 rpm or 3600 rpm and when operating at each of the following conditions:

- a. With a static suction lift of 10 feet.
- b. With a dynamic suction lift of 17 feet.

The pump unit shall require a net positive suction head (NPSH) of not more than 5.5 feet at 200 gpm. The pump shall have an efficiency of not less than 50 percent at rated conditions and a maximum efficiency of not less than 62 percent.

3.7.5.1 Class 1. The pump unit shall deliver 200 gpm at 100 feet total head.

3.7.5.2 Class 2. The pump unit shall deliver 200 gpm at 140 feet total head.

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3*7.5.3 class 3. The pump unit shall deliver 300 gpm at 80 feet total head.

3.7.5.4 Check valve performance. The check valve shall be capable of withstanding a test ppressure of not less than the maximum discharge head of the pump without any leakage.

3.7.6 Type II, performance. The pump unit shall deliver not less than 250 gpm against a total head of 96 feet when operated at a synchronous speed of 1800 rpm or 3600 rpm and when operating at each of the following conditions:

- a. With a static suction lift of 10 feet.
- b. With a dynamic suction lift of 14 feet.

The pump shall require an NPSH of not more than 6 feet at 250 gpm. The pump shall have an efficiency of not less than 50 percent when operating at rated capacity and a maximum efficiency of not less than 62 percent.

3.7.6.1 Air release. The air release shall enable the pump to prime at any discharge head pressure from 0 feet to maximum discharge head and shall release drip-free air to the atmosphere and drain any liquid back into the centrifugal pump.

3.8 Human factors. The pump unit shall conform to human factors engineering design criteria as specified in MIL-STD-1472. Special design emphasis shall be given, but not limited to, the following: 4.1; 4.2; 4.3; 4.4.b, c, f, h, m, and p; 4.5; 4.6; 4.7; 4.8; 4.9; 4.11; 5.1; 5.2; all of 5.4 except for 5.4.1.1.2, 5.4.1.2.4, 5.4.1.8.5, 5.4.1.8.6, 5.4.2.2.2.6, 5.4.2.2.4, 5.4.2.2.5, 5.4.3.1.2, 5.4.3.1.3, 5.4.3.2.2, 5.4.3.2.3, 5.4.3.2.4, 5.4.3.2.5, 5.4.3.2.6, 5.4.3.2.7, 5.4.3.2.8, 5.4.5, and 5.4.6; 5.5; 5.6; 5.9; and all of 5.13 except for 5.13.2.3, 5.13.2.4, 5.13.2.5, 5.13.4.1, 5.13.4.2, 5.13.4.3, 5.13.7.1.8, 5.13.7.2.2, 5.13.7.4.2, and 5.13.7.5.

3.9 Safety. All rotating components that are of such nature or located so as to become a hazard to operating personnel shall be enclosed or guarded in accordance with OSHA 29 CFR 1910.212 and 1910.219. Electrically energized equipment, switches, wiring, and relays shall meet **requirements of OSHA 29 CFR 19100309.** Protective devices shall not impair the operating functions of the pump unit.

3.9.1 Noise limits. The noise produced by the pump units shall conform to MIL-STD-1474 requirement with the exception of MIL-STD-1474, 5.2., 5.3, and 5.4, when tested in accordance with 4.5.2.1. The provisions of MIL-STD-1474, 4.3 and 4.4 shall be provided if, and only if, MIL-STD-1474, 5.1.1.2 procedures have been pursued and documented to the satisfaction of the procuring activity and written permission to exceed the 85 dB(A) limit is obtained from the procuring activity. Hazard signs shall conform to MIL-STD-1474, 4.3, except the sign shall state 'WEARING PROTECTION REQUIRED WITHIN (specify) FEET.' The sign shall be readable at the distance indicated on the sign.

3.9.2 Wiring. Wiring shall be secured in compact harnesses and attached to frame members with insulated clamps at close intervals to insure a neat and orderly cable run. cables and wires shall not be spliced at any point throughout the length of their runs. Wiring shall not be attached to panels or other components that require removal during maintenance, except for actual.

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electrical connections to components. Electrical isolators shall be used between all wiring and metal components to prevent abrasive action to wire insulation. Wiring shall be color coded or numbered for easy identification and shall be consistent throughout the system.

3.9.3 Fire and casualty hazards. The rotor shall be approved under UL Bulletin No. 674 (B) for class 1, group C, hazardous location. Approval shall be evidenced by the attachment of the UL seal or label indicating that the rotor was approved under the UL Bulletin No. 674 (B) , class 1, group C, hazardous location requirement of 3.4.10.

3.10 Environmental requirements.

3.10.1 Operating temperature. The pump unit shall perform as specified herein at any ambient temperature from +120 to -25 *F (+49 to -32 *C) .

3.10.2 Storage temperature. The pump unit shall not be damaged by storage in any ambient temperature from +155 to -65 *F (+68 to -54 l C) for 24 hours. Solar radiation shall not be present.

3.10.3 Fungus and moisture-resistance. The electrical circuitry, including all components and connections, except as specified here, shall be protected from the effects of fungus growth and moisture by an overall treatment with a **varnish** conforming to MIL-V-173, composition I or II, as applicable (see 3.10.4) , with 1 percent copper 8-quinolinolate (by weight) based on the nonvolatile content of the varnish.

- a. Components or circuit elements that are inherently fungus and moisture-resistant or which are heretically sealed need not be treated.
- b. Components or circuit elements whose functions will be adversely affected by the varnish coating shall not be treated.

When used, the varnish shall be applied by spray, brush, or a combination of both to give a dry-film thickness of not less than 1 mil to component or element surfaces previously cleaned and prepared so that the surfaces are free from all foreign matter which would interfere with the adherence or function of the **varnish**.

3.10.3.1 Composition. MIL-V-173 composition II shall be used only in the case when local air pollution regulations governing the application of varnish precludes the use of composition I. When composition II is used, the contractor shall provide evidence to the Government that the use of composition II is **required**, and shall certify that the composition II material complies with the South Coast Air Quality Management District Rule 442.

3.11 Detailed requirements.

3.11.1 Type I pumps.

3.11.1.1 Gauge group The pump unit shall be provided with a gauge group consisting of the following :

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- a. A vacuum gauge having a range of 0 to 30 inches of with a piston-type gauge saver.
- b. A pressure gauge having a range of 0 to 200 psi with pin-type snubber.
.. Necessary fittings and tubing.
- d. Bronze stock needle valve.
- e. Gauge mounting bracket provided with means to securely fasten the gauge group to the pump unit.

All gauges shall conform to ANSI B40.1, grade A, 4-1/2 nominal size.

3.11.1.2 Check valve. The discharge of the pump shall be in the horizontal position and shall be equipped with a check valve.

3.11.2 Type II pumps.

3.11.2.1 Air release. The pump unit shall be provided with an automatic air release mounted on the pump base. All piping necessary to accommodate the air release shall be provided. The operation of the air release shall bypass not more than 2 percent of the flow of the pump.

3.12 Electromagnetic interference. When specified (see 6.2), the electromagnetic interference mission and susceptibility characteristics of the pump unit shall conform to MIL-STD-461, class IIB.

3.13 Color and finish. The portion of the pump unit normally painted shall be cleaned, treated, and painted in accordance with MIL-T-704, type A.

3.14 Identification marking.

3.14.1 Plates. The pump unit shall be identified in accordance with MIL-STD-130. The marking shall be applied to the pump unit on identification plates conforming to MIL-P-514, type I, style 1, composition C, of type I, grade A, class 1 material. Each plate shall be attached by screws, bolts, or rivets in a conspicuous protected location.

3.14.2 Part number marking. Definitive specification part numbers for items described in this specification shall be formatted as shown in 6.6 and shall be used in product identification.

3.15 Workmanship. The pump unit shall be free from defects such as misaligned components, incomplete welds, cracks, and any other defects that could impair the operating and serviceability characteristics of the pump assembly. All piping, fittings, hoses, and cables shall be supported to prevent damage caused by vibration, chafing, or sharp bends.

3.15.1 Castings and forgings. All parts, components, and assemblies of the pump unit which include castings and forgings shall be clean of harmful extraneous material such as sand, dirt, sprues, scale, flux, and free from holes. Rework shall be limited to procedures which do not reduce mechanical properties or effect function.

3.15.2 Metal fabrication. Metal used in fabrication shall be free from kinks and sharp bends. The straightening of material shall be done by methods that will not cause damage to the material. Corners shall be square and true.

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Flame-cutting using tips suitable for the thickness of the steel, may be employed instead of shearing and sawing. All bends shall be made with controlled means to insure uniformity of size and shape. Precaution shall be taken to avoid overheating. Heated steel shall be allowed to cool slowly. External surfaces shall be free of burrs, sharp edges, and corners, except when sharp edges or corners are required or where they are not detrimental to safety.

3.15.3 Welders and welding.

3.15.3.1 Welders. Before assigning any welder to manual welding work covered by this specification, the contractor shall provide the contracting officer with certification that the welder has passed qualification tests as prescribed by either of the following listed codes for the type of welding operations to be performed and that such qualification is effective as defined by the particular code:

- ASME - Boiler and Pressure Vessel Code, Section IX, Welding and Brazing Qualifications
- AWS D1.1 - Structural welding code - steel.

Contractors who make only horizontal welds need not qualify welders for "all position welding. Subject to approval by the Government, the contractor's standard welder qualification may be substituted in lieu of the above codes provided that the contractor's procedure is equivalent to the above codes. The contractor shall be responsible for determining that automatic welding equipment operators are capable of producing quality welds in accordance with ASME or AWS codes.

3.15.3.2 Welding. The surfaces of parts to be welded shall be free from rust, scale, paint, grease, mill scale that can be removed by chipping and wire brushing, and other foreign matter. Welds shall transmit stress without permanent deformation or failure when the parts connected by the welds are subjected to proof and service loading. Parent materials, weld filler metals, and fabrication techniques shall be as required to enable the pump unit to conform to the examination and test specified in section 4. Parts to be joined by fillet welds shall be brought into as close contact as possible and in no event shall be separated by more than 0.1875 inch unless appropriate bridging techniques are used. Unless otherwise specified (see 6.2), the welding process used in fabrication of the pump unit shall be at the option of the contractor.

3.15.4 Bolted connections. Boltholes shall be accurately formed and shall have the burrs removed. Washers or lockwashers shall be provided where necessary. Matching thread areas securing bolts conforming to SAE J429 or capscrews shall be of sufficient strength to withstand the tensile strength of the bolt. All fasteners shall be correctly torqued and shall have full thread engagement. Bolts shall protrude not more than 2 full threads.

3.15.5 Riveted connections. Rivets shall fill the holes completely. The upset rivet heads shall be full, neatly made, concentric with the rivet holes, in full contact with the surface of the member, and shall be in accordance with SAE J492.

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4. QUALITY ASSURANCE PREVISIONS

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 the 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 acceptance of defective material.

4.1.2 Component and material inspection. The contractor is responsible for assuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards, as applicable.

4.1.3 Inspection system. The contractor shall maintain an inspection system in accordance with MIL-I-4 5208.

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

- a. First article inspection (see 4.3) .
- b. Quality conformance inspection (see 4.4).
- c. Inspection of packaging (see 4.6).

4.3 First article inspection.

4.3.1 Examination. The first article pump unit shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.3.2 Tests. The first article pump unit shall be subjected to tests marked "X" in column 1 of table 1. Failure of any test shall be cause for rejection.

4.4 Quality conformance inspection.

4.4.1 Sampling. Sampling for examination and tests shall be in accordance with MIL-STD-105.

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4.4.2 Examination.

4.4.2.1 Individual. Each pump unit shall be examined for the critical defect specified in 4.5.1. Presence of a critical defect shall be cause for rejection.

4.4.2.2 Samples. Samples selected in accordance with 4.4.1 shall be examined for the major defects specified in 4.5.1.

4.4.3 Test.

4.4.3.1 Individual. Each pump unit shall be subjected to tests marked "X" in column 2 of table I. Failure of a test shall be cause for rejection.

4.4.3.2 Samples. Samples selected in accordance with 4.4.1 shall be subjected to tests marked "X" in column 3 of table I.

4.5 Inspection procedure.

4.5.1 Examination. The pump unit shall be examined as specified herein for the following defects:

Number**Defects**

Critical

1. Holes in castings (see 3.15.1) .

Major

101. Materials not as specified (see 3.3).
102. Materials are not resistant to corrosion or deterioration or treated to be made resistant to corrosion or deterioration for the applicable storage and operating environments (see 3.3.1).
103. Dissimilar metals as defined in MIL-STD-889 are not effectively insulated from each other (see 3.3.2).
104. Contractor does not have documentation available for identification of material finishes or treatment (see 3.3.3).
105. Used rebuilt or remanufactured components, pieces or parts incorporated in the pump unit (see 3.3.4).
106. Hydrocarbon compatibility not as specified (see 3.3.5) .
107. Screw threads not as specified (see 3.4.1).
108. Base mounting not as specified (see 3.4.2).
109. Pump not as specified (see 3.4.3).
- 110.1 Pump case not as specified (see 3.4.4).
111. Drain port and plug not as specified (see 3.4.4.1).
112. Support bracket not as specified (see 3.4.4.2).
113. Pump impeller not as specified (see 3.4.5).
- 114.1 Pump shaft not as specified (see 3.4.6).
115. Pump shaft seal not as specified (see 3.4.6.1).
116. Priming unit not as specified (see 3.4.7).
117. Pump cover not as specified (see 3.4.8).
118. Pump bearing housing not as specified (see 3.4.9).
119. Shaft coupling not as specified (see 3.4.10).
120. Gaskets not as specified (see 3.4.11) .

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121. Electric motor not as specified (see 3.4.12).
122. Power rating not as specified (see 3.4.12.1).
123. Voltage and frequency not as specified (see 3.4.12.2).
124. Pump discharge not as specified (see 3.4.13).
125. Ease of maintenance not as specified (see 3.5.1).
126. Lubrication not as specified (see 3.5.2).
127. Lubricants not as specified (see 3.5.2.1).
128. Lubrication fittings not as specified (see 3.5.2.2).
129. Pressure-release device not as specified (see 3.5.2.2.1).
130. Filling, draining, and checking provisions not as specified (see 3.5.2.3).
131. Tiedown provisions not as specified (see 3.6.1) .
132. Slings provisions not as specified (see 3.6.2) .
133. Rail transportability requirements not as specified (see 3.6.3).
134. Dry operation not as specified (see 3.7.1).
135. Hydrostatic pressure not as specified (see 3.7.2).
136. Impeller balancing not as specified (see 3.7.3) .
137. Priming not as specified (see 3.7.4).
138. Type I, performance not as specified (see 3.7.5) .
139. Class 1 pump unit not as specified (see 3.7.5.1).
140. Class 2 pump unit not as specified (see 3.7.5.2).
141. Class 3 pump unit not as specified (see 3.7.5.3).
142. Check valve performance not as specified (see 3.7.5.4).
143. Type II, performance not as specified (see 3.7.6).
144. Air release not as specified (see 3.7.6.1).
145. Human factors not as specified (see 3.8) .
146. Safety not as specified (see 3.9) .
147. Noise, limits not as specified (see 3.9.1) .
148. Wiring not as specified (see 3.9.2).
149. Fire and casualty hazards not as specified (see 3.9.3) .
150. Operating temperature not as specified (see 3.10.1) .
151. Storage temperature not as specified (see 3.10.2) .
152. Fungus- and moisture-resistance not as specified (see 3.10.3).
153. Composition not as specified (see 3.10.4).
154. Type I pumps gauge group not as specified (see 3.11.1.1).
155. Check valve not as specified (see 3.11.1.2).
156. Type II pumps air release not as specified (see 3.11.2.1).
157. Electromagnetic interference not as specified (see 3.12).
158. Workmanship not as specified (see 3.15).
159. Castings and forgings not as specified (see 3.15.1).
160. Metal fabrication not as specified (see 3.15.2).
161. Welders and welding not as specified (see 3.15.3).
162. Bolted connections not as specified (see 3.15.4).
163. Riveted connection not as specified (see 3.15.5).

Minor

201. Color and finish not as specified (see 3.13) .
202. Identification marking not as specified (see 3.14 thru 3.14.2).

4.5.2 Tests.

4.5.2.1 Test conditions. Unless otherwise specified in a test, tests shall be performed in accordance with the applicable provisions of the test code for

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centrifugal pumps of the standards of the Hydraulic Institute. Prior to test, the pump unit shall be lubricated with greases and oils specified. Test the pump units using a petroleum product with a specific gravity of not less than 0.80. All performance data shall be corrected to standard sea level conditions of barometric pressure of 29.92 inches of mercury and liquid fuel at +68 °F (+20 °C) having a specific gravity of 0.80 and a vapor pressure of 4.0 psi.

4.5.2.2 Test schedule.

TABLE I. Test schedule.

First Article	Quality Conformance		Test	Test Paragraph	Requirement Paragraph
	Individual	Sample			
1	2	3	4	5	6
X	X		Preassembly:		
X	-	-	Impeller balance	4.5.2.3.1	3.7.3
			Pump unit performance	4.5.2.3.2	3.7.5, 3.7.6
X			Environmental	4.5.2.4	3.10
X			Safety	4.5.2.5	3.9
X			Human factors	4.5.2.6	3.8
			Noise level measurement	4.5.2.7	3.9.1
X	X		Hydrostatic	4.5.2.8	3.7.2
X			Electromagnetic interference	4.5.2.9	3.12
X			Lifting provisions	4.5.2.10	3.6.1
X			Tiedown provisions	4.5.2.11	3.6.2
X			Rail impact	4.5.2.12	3.6.3
X		X	Dry operation	4.5.2.12	3.7.1
X	X		Dry prime	4.5.2.13	3.4.6
X		X	Reprime	4.5.2.14	3.7.4
X		X	Head-capacity	4.5.2.15	3.7.5.1, 3.7.5.2, 3.7.5.3, 3.7.6
X		X	Check-valve (type I)	4.5.2.16	3.11.1.2
X		X	Air release bypass (type II)	4.5.2.17	3.7.6.1
X		X	Dry prime against discharge (type II)	4.5.2.18	3.7.6

4.5.2.3 Preassembly.

4.5.2.3.1 Impeller balance. Determine the dynamic balance of the impeller. An out-of-balance condition of more than 0.50 ounce-inch shall constitute failure of this test.

4.5.2.3.2 Pump performance. Prior to assembly of the **electric motor to the pump**, operate the pump (including bearing housing) using **a dynamometer or**

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calibrated electric motor at the design operating speed and at a static suction lift equivalent to 10 feet of liquid fuel at standard sea level renditions as specified in 4.5.2.1. Test the pump for the requirements specified in 3.7.5 for the type I pump unit and 3.7.6 for the type II pump unit, in accordance with the rating standards and test code standards for centrifugal pumps of the Hydraulic Institute. Data relative to head capacity shall be taken at a minimum of six points and shall include the specified rating point (see 3.7.5 and 3.7.6), point of maximum horsepower, wide open discharge, and shut-off. Nonconformance to 3.7.5 for the type I pump unit and 3.7.6 for the type II pump unit shall constitute failure of this test.

4.5.2.4 Environmental.

4.5.2.4.1 High temperature. Test the pump unit in accordance with MIL-STD-810 , method 501, procedure II, except that the storage temperature shall be at +155 °F (+68 °C) for 4 hours and the operating temperature shall be +120 °F (+49 °C) Operation of the pump unit in the test chamber shall consist of filling the pump case with water or liquid petroleum, sealing all openings, and running the pump for not less than 3 minutes. Nonconformance to 3.10 shall constitute failure of this test.

4.5.2.4.2 Low temperature. Test the pump unit in accordance with MIL-STD-810 , method 502, procedure I, except that the storage temperature shall be at -65 °F (-54 °C) for 24 hours and the operating temperature at -25 °F (-32 °C) Operation of the pump unit in the test chamber shall consist of filling the pump case with liquid petroleum, sealing all openings, and running the pump for 3 minutes. Nonconformance to 3.10 shall constitute failure of this test.

4.5.2.5 Safety. The pump unit shall be evaluated for safety requirements throughout testing as specified in 4.5.2. Nonconformance to 3.9 shall constitute failure of this test.

4.5.2.6 Human factors. The pump unit shall be evaluated by a qualified human factors engineer. Nonconformance to 3.8 shall constitute failure of this evaluation.

4.5.2.7 Noise level test. Noise levels shall be measured in accordance with MIL-STD-1474 requirements and reported in the format indicated by MIL-STD-1474, figure 7. As a minimum, noise levels shall be measured when equipment is operating under full load. MIL-STD-1474, 5.1.2.1.4 contours shall be taken at not fewer than 12 equal (horizontal) arc increments, one increment shall include data from the noisiest position. Additionally, the noise level at the typical operating position shall be provided as dB (A) level. Failure to comply with MIL-STD-1474 provisions shall constitute failure of this test.

4.5.2.8 Hydrostatic. Subject the pump unit to a hydrostatic pressure of not less than 125 psi for a period of not less than 2 minutes. Evidence of leakage, failure, or permanent deformation shall constitute failure of this test.

4.5.2.9 Electromagnetic interference. The first article shall be tested to determine conformance to 3.12. The contractor shall furnish the contracting officer the report of tests required by MIL-STD-461. Disapproval of the report shall constitute failure of this test.

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4.5.2.10 Tiedown Prevision test. The tiedown provisions shall be tested in accordance with MIL-STD-209 to prove conformance to 3.6.1. Inability to meet the requirements of 3.6.1 shall constitute failure of this test.

4.5.2.11 Lifting provision test. The slinging provisions shall be tested in accordance with MIL-STD-209 to prove conformance to 3.6.2. Inability to meet the requirements of 3"6"2 shall constitute failure of this test.

4.5.2.12 Rail impact test. The first article pump unit shall be tested in accordance with MIL-STD-810 to prove conformance to 3.6.3. Inability to meet the **requirements** of 3.6.3 shall constitute failure of this test.

4.5.2.13 Dry operation. Operate the pump dry continuous for not less than 1 hour at a synchronous speed of 1,800 rpm or 3,600 rpm. Inability of the pump to operate continuously for not less than 1 hour without damage or permanent deformation to any part of the pump unit shall constitute failure of this test.

4.5.2.14 Dry prime. Operate the pump at a static suction lift equivalent to 10 feet, with the discharge open to the atmosphere and without the benefit of priming liquid in the pump or in the suction pipe. Inability of the pump to prime itself and deliver the capacity specified in 3.7.5.1, 3.7.5.2, 3.7.5.3, and 3.7.6, as applicable, shall constitute failure of this test.

4.5.2.15 Reprime. After the pump is initially primed, operate the pump unit as specified in 3.7.5 and 3.7.6. Introduce air or vapor into the suction piping in such quantity as to cause the pump to lose suction. Inability of the pump to reprime itself in not more than 30 seconds shall constitute failure of this test.

4.5.2.16 Head capacity. After the pump has been completely primed, operate the pump unit to determine conformance to 3.7.5.1, 3.7.5.2, 3.7.5.3, and 3.7.6. The operating time shall be that required to obtain the performance characteristics of the pump. Nonconformance to 3.7.5, 3.7.5.2, 3.7.5.3, and 3.7.6, as applicable shall constitute failure of this test.

4.5.2.17 Check-valve (type I only). After the type I pump has been completely primed, subject the check-valve to a maximum test pressure of not less than the maximum discharge head of the pump. Allow the pump to set for a period of not less than 30 minutes. leakage of liquid into the pump case shall constitute failure of this test.

4.5.2.18 Air release bypass (type II only). Operate the pump as specified in 4.5.2.14 to determine conformance to 3.7.6.1. Liquid bypass of more than 2 percent of the rated capacity of the pump shall constitute failure of this test.

4.5.2.19 Dry prime against discharge head (type II only). Operate the type II pump as specified in 4.5.2.14 except that the pump discharge shall be set at a pressure setting of 35 psi. Inability of the pump to prime itself and deliver the capacity specified in 3.7.6 in not more than 30 seconds shall constitute failure of this test.

4.6 Inspection of packaging.

4.6.1 First article packaging inspection. The first article pack shall be inspected as follows:

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4.6.1.1 Examination. The first article pack shall be examined for the defects specified in 4.6.2.3. Presence of one or more defects shall be cause for rejection.

4.6.1.2 Tests. The first article pack shall be subjected to the pendulum impact test in accordance with FED-S7D-101, test method 5012, except the vertical height of drop shall be 18 inches.

4.6.1.2.1 Failure criteria. At the conclusion of the test or at any time during the test as deemed necessary by the Government, the pack shall be examined. Any shifting of the contents, loosening or breaking of hold-downs, blocking or bracing, any visible damage to the contents or any other discernible damage which would render the pack useless for its intended use, shall constitute failure of the test. In addition, the pump shall be subjected to the operational tests specified herein; any malfunction attributed to the first article pack test shall be cause for rejection.

4.6.2 Quality conformance inspection of packaging.

4.6.2.1 Unit of product. For the purpose of inspection, a **completed** pack prepared for shipment shall be considered a unit of product.

4.6.2.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105

4.6.2.3 Examination. Samples selected in accordance with 4.6.2.2 shall be examined for the following defects.

No.	Def ect	Level		
		A	B	c
164.	Unprotected surfaces not preserved as specified.	5.2.1.1		
165.	Interior surfaces or pump not preserved as specified.	5.2.1.2		
166.	Air release on the type II pump not preserved as specified.	5.2.1.2		
167.	Excess preservative not drained as specified.	5.2.1.2		
168-	Pump openings not sealed as specified	5.2.1.3		
169.	Opening into electric motors and electric components not sealed as specified.	5.2.1.4		
170.	Shipping container not as specified.	5.3.1	5.3.2	
171.	Contents not blocked, braced and anchored to prevent movement as specified.	5.3.1	5.3.2	
172.	Strapping not as specified.	5.3.1	5.3.2	
173 l	Marking not as specified.	5.4	5.4.	5.4

5. PACKAGING

5.1 First article pack. The contractor shall furnish a first article pack for examination and test within the the frame specified (see 6.2), to prove, prior to starting production packaging, that the applied preservation, packing and marking amply with the requirements of this specification. Examination and test shall be as specified in section 4 and shall be subject to surveillance and approval by the Government (see 6.5). The first article pack may be accomplished

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utilizing either the first article model or a production model. If the first article model is utilized and the Government requests a comparison between the first article model and a production model, any preservation and packing shall be removed by the contractor at no expense to the Government.

5.2 Preservation. Preservation shall be level A or C, as specified (see 6.2).

5.2.1 Level A.

5.2.1.1 Unprotected surfaces. Unprotected exterior metal surfaces of the pump unit requiring the application of a contact preservative in accordance with MIL-P-116, shall be coated with type P-1 preservative. The preservative shall conform to the applicable specification listed in and shall be applied in accordance with MIL-P-116.

5.2.1.2 Pumps. Interior surfaces of each pump, and the air release on the type II pump, shall be mated with lubricating oil conforming to MIL-L-21260, type I, grade 30. The pump shall be actuated during application of the oil to assure complete coverage of all interior parts of the pump. Excess preservative shall be drained.

5.2.1.3 Pump openings. Openings shall be sealed with plastic or metal caps or plugs as applicable or with barrier material conforming to MIL-B-121, type 1, grade and class optional, and secured in place with tape conforming to MIL-T-22085, type II.

5.2.1.4 Electrical components. Openings into electrical components shall be sealed with tape conforming to MIL-T-22085, type II.

5.2.2 Level C. Each complete pump unit including any repair parts, tools and technical publications shall be preserved in a manner to prevent damage and deterioration during shipment from the contractor to the initial destination.

5.3 Packing. Packing shall be level A, B, or C, as specified (see 6.2) .

5.3.1 Level A. Each complete pump unit, preserved as specified in 5.2, shall be packed in a close-fitting box conforming to PPP-B-601, overseas type, style A with an unnailed type closure, or PPP-B-621, class 2, style A with an unnailed type closure. The contents shall be blocked, braced, and anchored within the box in a manner to prevent movement or damage in accordance with MIL-STD-1186. Closure and strapping shall be in accordance with the appendix to the applicable box specification. Strapping shall conform to QQ-S-781, class 1, type I or IV, finish B, size as applicable.

5.3.2 Level B. Each complete pump unit; preserved as specified in 5.2, shall be packed as specified in 5.3.1 except the box shall be Domestic type or class 1 as applicable. Closure and strapping shall be in accordance with the appendix to the applicable box specification.

5.3.3 Level C. Each complete pump unit, preserved as specified in 5.2, shall be packed in a manner to prevent damage and deterioration during shipment from the contractor to the initial destination at the lowest carrier rates.

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5.4 Marking. In addition to any special or identification marking required by the contract or purchase order, marking shall be in accordance with MIL-STD-129 .

6. NOTES

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

6.1 Intended use. The pump units are intended for use in multiple-outlet hydrant fueling system for defueling aircraft, for dispensing petroleum products to truck-fill stands, and for transferring fuels from tanks, cars, or trucks, to bulk storage tanks.

6.2 Acquisition requirements. Acquisition documents should 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 and 2.2).
- c. Type and class of pump required (see 1.2).
- d. When a first article is required for inspection and approval, and the number of units required (see 3.2).
- e. Electrical power system required if other than that specified (see 3.4.12.2).
- f. When electromagnetic interference characteristics are required (see 3.12).
- g. when welding process is not at the contractors option (see 3.15.3.2).
- h. Time frame required for submission of the first article pack (see 5.1).
- i. Level of preservation and of packing required (see 5.2 and 5.3).
- j. Any special marking required (see 5.4).
- k. Specification part number (see 6.6).
- l. When a transportability report is required (see 6.7).

6.3 First article. When a first article inspection is required, the item(s) should be a first production item. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of the first article test results and disposition of the first articles. Invitation for bids should provide that the Government reserves the right to waive the requirements 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. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

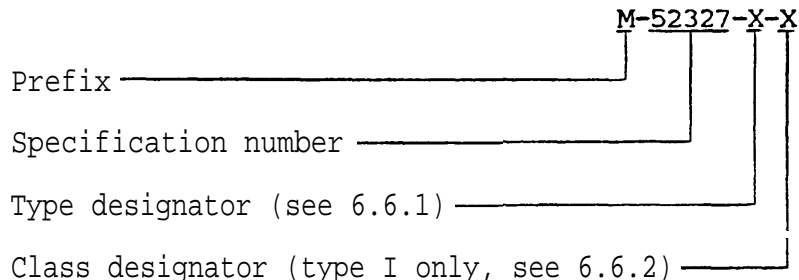
6.4 Lubricants. MIL-STD-838 lubrication of Military Equipment, prescribes the policy for using specification-type products wherever possible and provides specific requirements for potential use of non-standard proprietary products. MIL-STD-838 is implemented by MIL-HDBK-113 Guide for the Selection of Lubricants, Fluids, Preservatives and Specialty Products for Use in Ground Equipments Systems. The contracting officer should note that unless otherwise authorized by the USA Belvoir Research, Development and Engineering Center

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(ATTN: STRBE-VF), Fort Belvoir, VA 22060-5606, lubricants, fluids, and greases for ground equipment system must be restricted to those listed under MIL-HDBK-113, chapter 2.

6.5 First article pack. Any changes or deviations of production packs from the approved first article pack will be subject to the approval of the contracting officer. Approval of the first article pack will not relieve the contractor of his obligation to preserve, pack and mark the pumps in accordance with this specification.

6.6 Part or identifying number (PIN). The PIN to be used for pump units acquired to this specification are created as follows:



6.6.1 Type of pump designator. A one position field used to designate the required type (see table II).

TABLE II. Type.

Letter designator	Type designation	Description
A	I	Defueling
B	II	Receiving

6.6.2 Class of pump designator. A one position field used to designate the class of pump required (see table III).

TABLE III. class (type I only).

Letter designator	Class designation	Description
A	1	200 gallons per minute (gpm) 100 feet total head.
B	2	200 gpm at 140 feet total head.
C	3	300 gpm at 80 feet total head.

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6.7 Transportability report. When specified (see 6.2) , the contracting officer should arrange for the contractor to furnish a transportability report in accordance with AR 70-47 and SOP 70-38 for the pump unit, 95 days prior to delivery of the first article pump unit.

6.8 Subject term (key word) listing.

Dispensing

Fuel

Horizontally-mounted

Self -priming

Single-stage

Transferring

6.9 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.

custodians :
Army-ME
Navy - YD

Preparing activity:
Army - ME

Review activities:
Army - AV
DIA - CS

Project 4320-0302

User activities:
Army - CE, ER

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

RECOMMEND A CHANGE		1. DOCUMENT NUMBER MIL-P-52327C	2. DOCUMENT DATE (YYMMDD) 900914
3. DOCUMENT TITLE Pumps, Centrifugal, Electric-Motor-Driven, Positive Prime, Petroleum Products, Airfield Defueling and Receiving			
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)			
5. REASON FOR RECOMMENDATION			
6. SUBMITTER			
7. NAME (Last, First, Middle Initial)		8. ORGANIZATION	
9. ADDRESS (Include Zip Code)		10. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (If applicable)	11. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY			
a. NAME		b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON	
c. ADDRESS (Include Zip Code) US Army Belvoir RDE Center ATTN: STRBE-TSE Ft. Belvoir, VA 22060-5606		(703) 664-5717 354-5717	
		IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Derense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	