
* INCH-POUND *

XX-C-2866
January 5, 1995

SUPERSEDING
MIL-C-29222A
31 July 1989

FEDERAL SPECIFICATION

CLEANER, PRESSURE, HOT-WATER, SKID-MOUNTED

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

1. SCOPE

1.1 Scope. This specification covers a portable, skid-mounted, electric, oil fired, hot water pressure cleaner, with a minimum output capacity of 200 gallons per hour (gph) or 760 liters per hour (Lph) at a minimum 1,000 pounds per square inch gage (psig) or 6895 kilopascals (kPa) operating pressure.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

Federal Specifications

- VV-F-800 - Fuel Oil, Diesel.
- ZZ-H-601 - Hose and Hose Assemblies, Rubber (Yarn or Fabric Reinforced) Water Service.

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, *
 *1000 23rd Avenue, Port Hueneme, CA 93043-4301, by using the Standardization *
 *Document Improvement Proposal (DD Form 1426) appearing at the end of this *
 *document or by letter. *

AMSC N/A

FSC 4940

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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Federal Standards

- FED-STD-H28 - Screw Thread Standards for Federal Services.
- FED-STD-595 - Color Used in Government Procurement.

Military Specifications

- MIL-V-173 - Varnish, Moisture and Fungus Resistance (For Treatment of Communications, Electronics and Associated Equipment).
- MIL-T-5624 - Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-8.
- MIL-C-87936 - Cleaning Compounds, Aircraft Exterior Surfaces, Water Dilutable.

Military Standard

- MIL-STD-209 - Slings and Tiedown Provisions for Lifting and Tying Down Military Equipment.

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

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

Occupational Safety and Health Administration (OSHA):

- OSHA 29 CFR 1910.95 - Occupational Noise Exposure.

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

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents which is current on the date of the solicitation (see 6.2).

ASTM:

- ASTM A 53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- ASTM A 106 - Seamless Carbon Steel Pipe for High-Temperature Service.
- ASTM D 396 - Fuel Oils.
- ASTM D 2156 - Smoke Density in Flue Gases from Burning Distillate Fuels, Test Method for.
- ASTM D 3951 - Commercial Packaging.

(Application for copies should be addressed to ASTM, 1916 Race Street, Philadelphia, PA 19103.)

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National Electrical Manufacturers Association (NEMA):

- NEMA ICS 1 - General Standards for Industrial Controls and Systems.
- NEMA WD 1 - General purpose Wiring Devices.
- NEMA 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.)

National Fire Protection Association (NFPA):

- NFPA 70 - National Electrical Code.

(Application for copies should be addressed to the National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101.)

Underwriters Laboratories Inc. (UL):

- UL 296 - Oil Burners.
- UL 1776 - High Pressure Cleaning Machines.

(Application for copies should be addressed to the Underwriters Laboratories Inc., 333 Pfingsten Road, Northbrook, IL 60062.)

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

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification takes precedence. Nothing in this specification, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The cleaners shall consist essentially of an oil fired, continuous coil, spark ignited heating unit; electric motor driven positive displacement water pump; a concentrated cleaning solution storage and dispensing system; operational and safety controls; a skid mounting; a spray gun with nozzles; and hoses specified herein.

3.2 First article. When specified in the contract or purchase order (see 6.2), a sample shall be subjected to first article inspection (see 4.2.1 and 6.4).

3.3 Standard commercial product. The cleaner shall, as a minimum, be in accordance with the requirements of this specification. 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

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in the cleaner 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. Unless otherwise specified, none of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification.

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 Performance.

3.6.1 Capacity. The cleaner shall be capable of continuous delivery of not less than 200 gph (760 Lph) of hot water at 180 degrees Fahrenheit (oF) or 83 degrees Celsius (oC) at a minimum pressure of 1,000 psig (6895 kPa).

3.6.2 Vibration. The cleaner shall operate without excessive or undesirable vibration or pulsations. Valves shall close without causing water hammer.

3.7 Design. The cleaner shall be designed in accordance with UL 1776 (as applicable) and the requirements as specified herein. The cleaner shall be designed and constructed to be capable of withstanding the normal shocks and stresses incident to transport by truck, air, sea, and rail. The design shall permit accessibility for maintenance and service of cleaners in the field. The cleaner shall be designed and equipped with purge air connection to permit complete drainage of the water from the heating coil, pump(s) and piping. Water and solution container shall be so designed and located as to prevent spillage or drainage on electrical equipment. All screw threads shall conform to FED-STD-H28.

3.8 Safety. All mechanical or electrical parts that are of such nature or so located as to become a hazard to operating or maintenance personnel shall be enclosed or properly guarded. The cleaner noise level (dBA) shall not exceed the value for an 8-hour exposure as defined in OSHA 29 CFR 1910.95.

3.8.1 Safety device. The cleaner shall be equipped with all mechanical and electrical controls and devices necessary for safe and efficient operation. Such controls shall, as a minimum, include the following:

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- a. Temperature control device to shut down the burner in the event the temperature of the heating coil exceeds a predetermined safe limit due to partial or total interruption of the water flow to the coil.
- b. Pressure control device to maintain the rated pressure in the heating coil and delivery hose.
- c. Automatic fuel shutdown device in the event of ignition interruption.
- d. A safety relief valve suitable for relieving overpressure before reaching a predetermined safe limit.

3.9 Heater section. The heater section shall consist essentially of a heating coil, a combustion chamber, and an oil burner. The burner shall be capable of continuous operation at full rated capacity with a density reading not to exceed ASTM D 2156 (Shell Bacharach Scale) No. 2 spot for No. 2 fuel oil.

3.9.1 Heating coil. The heating coil shall be continuous coiled seamless or welded carbon steel conforming to ASTM A 53 or ASTM A 106, or alloy steel pipe or tubing having sufficient ductility for close coiling. The coil shall be capable of withstanding a hydrostatic test pressure of 2,000 psig (13 790 kPa). The nominal diameter of the tubing shall be not less than 1/2-inch or 12.7 millimeters (mm). The cleaner shall be equipped with accessible connections, fittings, and valves, as required, to permit coil blowdown for the removal of scale deposits and sludge. The coil shall be designed and installed to allow for unequal expansion and contraction and to facilitate removal for soot cleaning, repair, or replacement.

3.9.2 Combustion chamber. The combustion chamber shall be of preformed castable refractory; of a double, concentrically coiled, tangent tube water wall; of a preformed, ceramic fiber refractory; or of a tangent tube water wall with metal liner. Both the castable and ceramic fiber refractories shall be rated to withstand exposure of the hot face to temperatures up to 2,500oF (1370 oC).

3.9.3 Burner. The oil burner shall be of the high pressure mechanical atomizing type or the low pressure air atomizing type. The fuel system for mechanical atomizing burners shall include a positive displacement, electric motor driven fuel pump. Low pressure burners shall include a fuel metering device. Both type burners shall be equipped with high voltage electrode type spark ignition and a forced draft blower. The burner firing cycle shall be thermostatically controlled in accordance with the manufacturer's standard practice to prevent excessive heating coil temperatures at reduced flow rates. Burner shall conform to UL 296 or UL 1776. The burner shall be suitable for firing any of the following fuel:

- a. Fuel oil, grade No. 2 or ASTM D 396 (API gravity: 30.0 minimum).
- b. Diesel fuel, grades DF-1 and DF-2 of VV-F-800 (API gravity: 38.0 to 45.0).
- c. Jet fuel (kerosene type), grade JP-5 of MIL-T-5624 (API gravity: 36.0 to 48.0).

The cleaner shall be equipped with a fuel tank having a minimum capacity for 2 hours continuous operation.

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3.10 Water pump. The pump shall be a positive displacement, electric motor driven packed plunger type. Pump check valves, including disk or balls, springs, seats, and any other associated metallic parts, shall be resistant to the corrosive effects of the cleaning compound and coil descaling acid solutions. Pump bearings shall be of the sealed, permanently lubricated type or shall run in an oil bath.

3.10.1 Pulsation damper. The pump or piping connected thereto shall be equipped with a damping device to absorb pressure pulsations caused by the reciprocating action of the pump.

3.10.2 Water float tank. A water tank with a constant level float valve shall be provided to act as a reservoir for the incoming water supply. The tank shall be fabricated of corrosion resistant metal or metal treated to resist corrosion, and shall be equipped with inlet piping consisting of a manual shutoff valve, and a standard threaded connection for a 3/4-inch (19 mm) garden hose coupling. The inlet float valve shall be designed to operate against supply pressures up to 80 psig (551 kPa). The tank shall be equipped with an overflow pipe and an air gap or other means to prevent back-siphonage of the tank water into the water supply line.

3.10.3 Water supply hose. A 50-foot or 15 meter (m) length of hose for feeding water to the water float tank shall be furnished. The hose shall be yarn reinforced, rubber construction conforming to grade 3, class 1, size 3/4-inch (19 mm) of ZZ-H-601. The hose shall be equipped with commercial brass fittings with male and female end hose connections.

3.11 Cleaning solution system. The cleaning solution system shall be designed to introduce concentrated or mixed cleaning compound (conforming to MIL-C-87936) at the pump suction or at the coil outlet through a metering valve. The metering valve shall be manually adjustable from zero to 10 percent by volume and located at the control panel. The cleaning compound supply to the system shall come from a solution container or from a solution tank as specified (see 6.2).

3.11.1 Solution container. When a solution container is required, the cleaner shall be provided with a rack to secure a 5-gallon (19 L) liquid solution container.

3.11.2 Solution tank. When a solution tank is required, the tank shall be fabricated from stainless steel or high density polyethylene, designed in accordance with manufacturer's standard practice. The tank shall have a capacity of not less than 10 gallons (38 L). Means shall be provided to determine the liquid level inside the tank. The tank shall be so located that any spilled solution shall not drip or splash onto the electrical and other cleaner components.

3.12 Delivery equipment. Each cleaner shall be furnished with a cleaning gun, a set of nozzles, and high pressure hose. The cleaner shall be equipped with a hanger, rack, or other appurtenance for stowing the guns and hose in transit, and when not in use.

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3.12.1 Cleaning gun. The gun shall be furnished as a single unit with interchangeable nozzles. The gun shall be equipped with an insulated or air-cooled, trigger shutoff, pistol grip handle. The wand shall be a tube not less than 2 feet (0.61 m) in length. The handle shall be capable of withstanding a 2,000 psig (13 790 kPa) hydrostatic test. The handle and wand shall be capable of withstanding the drop test specified in 4.4.5.

3.12.2 Spray nozzle. Three corrosion-resistant steel nozzles shall be furnished with each cleaner to provide 0, 15, and 40 degrees spray patterns. When specified (see 6.2), spare spray nozzles shall be provided with the unit. The nozzles shall be equipped with quick disconnect couplers and shall not leak during cleaner operation. The nozzles shall be prominently marked so as to assist the cleaner operator in selecting a particular spray pattern.

3.12.3 Hose. The hose shall be suitable for hot water service with a pressure rating of not less than 2,250 psig (15 510 kPa). Hose shall be 3/8-inch (9.5 mm) inside diameter (nominal) with a length of not less than 40 feet (12 m). The hose shall consist of a wire braid reinforced, natural or synthetic rubber, multi-ply inner carcass, heat, oil, and weather resistant, with neoprene or equivalent outer cover.

3.13 Electrical system. Unless otherwise specified (see 6.2) the electrical system shall operate from a power source of 208-volt, 3-phase, 60 Hertz.

3.13.1 Motor. The motor shall be designed and rated in accordance with NEMA MG 1. Motors shall be furnished in dripproof enclosures and sealed windings. Motor overload protection, load capacity, feeder circuit protection, controller selection, and associated wiring practices shall conform to and installed in accordance with NFPA 70. Motor controller shall meet the design and operational requirements of NEMA ICS 1.

3.13.2 Wiring. Wiring on the cleaner shall be complete up to the point of the plug connection for the power supply cord. All wiring and circuit devices shall conform to and be installed in accordance with NFPA 70.

3.13.3 Power cord. A 75-foot (23 m) hard service, four conductor, oil resistant, flexible, power cord shall be furnished with each cleaner. The cord shall be NEMA type S, SO, or ST and shall be equipped with 3-phase, 3-pole, 4-wire grounding type connectors conforming to figures 15-20 of NEMA WD 1. One end shall be male, the other female. The cleaner shall be equipped with a matching, weatherproof male connector suitable for exterior applications.

3.14 Enclosure. Components of the cleaner requiring protection from the weather, such as the pumps, motors, switches, and other controls, shall be enclosed in a weather resistant, 20-gauge (0.91 mm) or heavier, sheet metal housing with access doors or panels and a stock cover. All switches, operating handwheels for the manually adjusted metering valve, and control valves, shall be centrally located in the control panel. The control panel shall be recessed or otherwise guarded to prevent damage to protruding elements. Access doors or panels shall be equipped with suitable latching devices.

3.15 Skid mounting. The cleaner shall be mounted on a welded, structural steel skid base. The skid base shall include two longitudinal structural steel skid runners and a base plate or welded cross members to support the cleaner.

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When the cleaner is supported on cross members, open areas between the skids shall be covered by a sheet steel splash pan not less than 0.0598-inch (1.52 mm) thick. The skid runners shall be suitable I-beams, channels, or equivalent shapes. The runners shall be of sufficient height to provide ready access to any connections located under the units and of sufficient width to provide adequate bearing surface on a smooth gravel base when the cleaner is full-serviced for operation. In no case shall the clearance from the ground to the lowest projection of the cleaner be less than 4 inches (100 mm). Both ends of each skid shall be shaped to facilitate skidding and shall be provided with attachments for towing and lifting slings. The skid runners shall be provided with pockets to permit lifting of the cleaner by a forklift truck. The pockets shall be a minimum of 24 inches (610 mm) on centers and shall be shaped to accommodate forks in sizes up to 2 inches (50 mm) in thickness by 8 inches (203 mm) in width.

3.16 Lifting and tiedown attachments. When specified (see 6.2), the cleaner shall be equipped with lifting and tiedown attachments. Lifting and tiedown attachments shall conform to type II or type III of MIL-STD-209. A nonferrous transportation plate shall be provided and mechanically attached to the cleaner. Transportation plates shall be inscribed with a diagram showing the lifting attachments and lifting slings, the capacity of each attachment, and the required length and size of each sling cable. A silhouette of the item furnished showing the center of gravity shall be provided on the transportation plate. Tiedown attachments may be identified by stenciling or other suitable marking. Tiedown marking shall clearly indicate that the attachments are intended for the tiedown of the cleaner on the carrier when shipped.

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 conforming to FED-STD-595 shall be as specified (see 6.2). Surfaces to be painted shall be cleaned and dried to insure that they are free from contaminants such as soil, 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 of acrylic-based enamel. 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 (0.0635 mm) over the entire surface. The paint shall be free from runs, sags, orange peel, or other defects. The end item, allied equipment, and attachments shall be the same color.

3.18 Instruction plates. The cleaner 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 shall 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 (3 mm) diameter. The instructions shall include, but not be limited to the following:

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- a. Safety precautions.
- b. Preparation of the cleaning solution.
- c. Descaling procedures and schedule for the heating coil.
- d. Blowdown procedures.
- e. Wiring diagram.

The following shall also be permanently and legibly stenciled on the equipment in letters at least 3/4 inch (19 mm) high in conspicuous locations:

Use only No. 2 fuel oil, diesel fuel, or JP-5.

All switches, and control valves shall be identified by permanent plates marked in a manner specified herein for the metallic instruction plates.

3.19 Identification plate. An identification plate shall be furnished by the contracting officer for each cleaner. 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 cleaner in a conspicuous place with nonferrous screws, rivets, or bolts not less than 1/8-inch (3 mm) in diameter. The applicable nomenclature contained in the contract item description shall be placed in the top blank.

3.20 Fungus resistance. When specified (see 6.2), electrical components and circuit elements, including terminals 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.

3.21 Workmanship.

3.21.1 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.

3.21.2 Bolted connections. Bolt holes 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.

3.21.3 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.

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3.21.4 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.

3.21.5 Castings. All castings shall be sound and free from patching, misplaced coring, warping, or any other defect which reduces the casting's ability to perform its intended function.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in 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 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

4.1.2 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 complete cleaner 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 techniques applicable to the remaining items to be furnished under the contract.

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4.2.2 Quality conformance inspection. The quality conformance inspection shall include the examination of 4.3, the tests of 4.4.1 and 4.4.2, and the packaging inspection of 4.5.

4.3 Examination. Each cleaner shall be examined for compliance with the requirements specified in section 3 of this specification. 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. Failure to pass any of the following test shall constitute cause for rejection.

4.4.1 Hydrostatic test. Each heating coil and cleaning gun shall be hydrostatically tested at 2,000 psig (13 790 kPa) for a period of at least 2 minutes. Any leakage or rupture shall constitute failure of this test.

4.4.2 Functional test. Each cleaner shall be operated for at least 1 hour on a high pressure, hot water wash cycle to verify the functional adequacy of operational components and controls. Any cleaner which requires frequent adjustment, suffers flame failure or erratic combustion, fails to maintain the specified operational pressures, or otherwise exhibits shutdowns or repeated malfunctions shall constitute failure of this test.

4.4.3 Performance test. The first article sample shall be tested to verify compliance with the requirements of 3.6 and 3.9. The duration of test shall be 2 hours at high pressure hot water wash cycle. The following data shall be recorded at 20 minute intervals during the test:

- a. Liquid flow rate in pounds per minute (recorded as a meter reading or scale reading for calculation of flow rate after test).
- b. Temperature of water leaving coil.
- c. Water pressure at coil outlet.

The solution feed system shall be checked during the test for compliance with 3.11. Failure to meet the requirements at any test time intervals shall constitute failure of this test.

4.4.4 Safety control tests. After the test of 4.4.3, the first article sample shall be tested to verify compliance with 3.8.1. The conditions which activate the safety controls shall be simulated by interruption of water and fuel flows, as applicable, and for the pressure control test, by throttling the discharge.

4.4.5 Drop tests. The cleaning gun with the delivery hose assembly attached shall be dropped two times from a height not less than 6 feet (1.8 m) to a concrete floor. One drop shall impact on the handle and one drop shall impact on the wand. Upon completion of the two drops, the handles and wand shall show no evidence of breaks and fractures. Permanent deformation of the handle and wand shall not be cause for rejection. The cleaner shall then be operated, and the handles and wand inspected for leaks. Leaks that cannot be corrected by tightening of threaded connections and failure to operate satisfactorily shall constitute failure of this test.

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

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, packing and marking. Preservation, packaging, packing and marking shall be in accordance with the requirements of ASTM D 3951 or as specified (see 6.2).

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 cleaner is intended to be used for removing dirt, mud, grease, and oil from automotive equipment, heavy construction equipment, ground support equipment, and miscellaneous parts for maintenance and overhaul.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this 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. When first article is required for inspection and approval (see 3.2).
- d. When a solution container or solution tank is required (see 3.11).
- e. When spare nozzles are required (see 3.12.2).
- f. When the electrical characteristic is other than as specified (see 3.13).
- g. When lifting and tiedown attachment is required (see 3.16).
- h. Color of finish coat required (see 3.17).
- i. When fungus resistance treatment is required (see 3.20).
- j. Level of preservation and level of packing required, if other than in accordance with ASTM D 3951 (see 5.1).

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 (DD Form 1423) incorporated into the contract. When the provisions of DoD Federal Acquisition Regulations (FAR) Supplement, Part 27, Sub-Part 227.405-70 are invoked and the DD Form 1423 is not used, the data should be delivered by the contractor in accordance with the contract or purchase order requirements.

6.4 First article. When a first article inspection is required, the item should 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.

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6.5 Subject term (key word) listing.

Electric
Oil-fired
Pressure jet
Washer

6.6 Supersession data. This specification replaces military specification MIL-C-29222A, dated 31 July 1989.

MILITARY INTERESTS:

Custodian

Navy - YD1

Review Activity

DLA - CS

CIVIL AGENCY COORDINATING ACTIVITY:

GSA - FSS

PREPARING ACTIVITY:

Navy - YD1

(Project 4940-0666)