

**INCH-POUND****MIL-B-2128D(SH)****7 MAY 1991****SUPERSEDING****MIL-B-2128C(SHIPS)****8 March 1966****MILITARY SPECIFICATION****BURNERS, STEAM AND OIL PRESSURE, ATOMIZING**

*This specification is approved for use by the Naval Sea Systems Command, Department of the Navy, and is available for use by all departments and agencies of the Department of Defense.*

**1. SCOPE**

**1.1 Scope.** This specification covers the straight pressure, vented plunger and steam pressure atomizing oil burners for use in fossil fueled propulsion boilers aboard Naval ships. Burner assemblies consist of the atomizer, air register, and safety shutoff devices.

**1.2 Classification.** Burners must be of the following types and classes as specified (see 6.2):

- |         |   |
|---------|---|
| Type A  | Straight pressure atomizing fuel oil burners  |
| Type C  | Steam and oil pressure atomizing burners  |
| Type D  | Vented plunger pressure atomizing fuel oil burners  |
| Class 1 | For normal mounting through boiler furnace double casing  |
| Class 2 | For mounting through boiler furnace double casing with air register hinged to provide for furnace access. |

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 55Z3, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4530

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**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).

**SPECIFICATIONS****FEDERAL**

FF-N-836	Nut: Square, Hexagon, Cap, Slotted, Castle, Knurled, Welding and Single Ball Seat
FF-S-85	Screw, Cap, Slotted and Hexagon Head
FF-S-86	Screw, Cap, Socket-Head
FF-S-92	Screw, Machine: Slotted, Cross-Recessed or Hexagon Head
FF-S-200	Setscrews: Hexagon Socket and Spline Socket, Headless
FF-S-210	Setscrews: Square Head (Inch) and Slotted Headless (Inch and Metric)

**MILITARY**

MIL-S-1222	Studs, Bolts, Hex Cap Screws, Socket Head Cap Screws and Nuts
MIL-T-5624	Turbine Fuel, Aviation, Grades JP-4, JP-5, and JP-5/JP-8 ST
MIL-P-15024	Plates, Tags, and Bands for Identification of Equipment
MIL-P-15024/5	Plates, Identification
MIL-F-16884	Fuel, Naval Distillate

**STANDARDS****MILITARY**

MIL-STD-278	Welding and Casting Standard
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(Unless otherwise indicated, copies of federal and military specifications and standards are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

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

## DRAWING

## NAVAL SEA SYSTEMS COMMAND (NAVSEA)

803-5959293

Typical Arrangement of Fuel Oil Burner Leads for Boiler

(Applications for copies should be addressed to the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

## NAVAL SHIP SYSTEMS ENGINEERING STATION (NAVSES)

4168	Sprayer Plate, Racer-Navjet Stream Atomizer
4171	Sprayer Plate – Standard High Capacity
4173	Sprayer Plate – Standard Straight Mechanical, Dished and Flat
4461	Assembly of Vented Plunger Atomizer for 21 Inch Convergent Throat
4514	V P Atomizer Skirt Diffuser for Use with 21 Inch Convergent Throat
4543	NAVSES 21 Inch Convergent Throat Ring
4787	NAVSES 16-7/8 Inch and 18 Inch Convergent Throat Ring for B and W Boilers
4789	V P Atomizer Skirt Diffuser for B and W Burner and Convergent Throat
4790	Assembly of VP Atomizer for 16-7/8 Inch and 18 Inch Dia. Convergent Throat Registers
11Y1308	Detail of Sprayer Nut
11Y1309	Detail of Nozzle Body

(Application for copies should be addressed to Naval Ships Systems Engineering Station, Code 022C, Philadelphia, PA 19112-5083.)

**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 cited in the solicitation (see 6.2).

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

B 165 Pipe Flanges and Flanged Fittings; (DOD adopted)

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

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## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- A 105      Standard Specification for Forgings, Carbon Steel, for Piping Components
- D 3951      Standard Practice for Commercial Packaging; (DOD adopted)
- E 18      Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials; (DOD adopted)

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

(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 document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

**3.1 First article.** When specified (see 6.2), a sample shall be subjected to first article inspection (see 6.5) in accordance with 4.4.

**3.2 General construction.** Construction shall be light and compact to the greatest extent practicable and consistent with requirements herein. Fabrication welding and inspection shall be in accordance with MIL-STD-278.

**3.2.1 General description.** Each burner specified herein shall consist of an adjustable air register of the swirl nonventuri type, atomizer assembly, and safety shutoff device. Burners shall be constructed to prevent buckling, warping, or jamming of parts that require adjustments. Material shall be of a Navy approved type for the conditions encountered. The material of burner parts subjected to radiant heat (up to 1600 °F) from the furnace shall be of Navy approved heat-resisting alloy. Burners shall burn Naval distillate fuel that conforms to MIL-F-16884 or JP-5 aviation turbine fuel that conforms to MIL-T-5624. Burner registers shall be provided with at least one observation port, having a lens of cobalt blue heat resisting glass. At least one port on the register shall be usable as an insertion port for the lighting off torch for emergency lightoffs. Provision shall be incorporated to permit the atomizer to be removed from the air register and replaced without the use of a tool and to prevent discharge of furnace gases into the fireroom when the atomizer assembly is removed from the burner. The fuel oil and steam (for type C burners) shall be supplied to the burner by means of branch line connections from the fuel oil supply and steam manifolds to the burner.

**3.2.2 Shutoff devices.** The following means for shutting off the fuel oil and steam (if applicable) shall be provided for each burner in addition to the flanged root valves provided between the burner and supply manifolds.

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- a. A safety shutoff device including separate steam and oil (if applicable) valves that must be placed in the closed position before the atomizer assembly can be removed from the burner. The shutoff device shall have zero leakage when pressurized with Navy fuel at maximum system oil pressure with the burner installed or removed with shutoff valves closed.
- b. Spring loaded check valves that open only when the atomizer assembly is installed properly and closes when the atomizer assembly is loosened or removed from the burner.
- c. For type C burners, the safety shutoff device shall incorporate the capability of purging steam through the atomizer with the oil valve shut. The steam and oil valves shall be interlocked so that it is not possible to open the oil valve with the steam valve closed.

**3.2.3 Burner lead connections.** Forged carbon steel 1/2 inch nominal pipe size (nps) 600 pounds per square inch (lb/in<sup>2</sup>) socket welded flanges in accordance with ASTM A 105 and ANSI B 16.5 shall be provided to connect burner leads in accordance with Drawing 803-5959293. Flange holes shall straddle the centerline.

**3.2.4 Atomizer/diffuser assembly setting and adjustments.** Provisions shall be made for adjusting and locking the atomizer assembly in proper position with respect to the diffuser to maintain the optimum atomizer tip setting. The burner shall also include an adjustment for positioning the atomizer/diffuser assembly relative to the throat ring or inner burner front wall (as applicable). The adjustment shall be lockable at either the inner or outer stop setting.

**3.2.5 Allowance for movement and withdrawal.** Oil burners shall be engineered for relative movement between the connections to the inner and outer burner front casing plates, in such a way that the atomizers and air registers cannot be thrown out of alignment by warping or expansion of the casings under high temperature conditions. Provisions shall be made to prevent accumulations of fuel oil drip between inner and outer casings under all conditions of operation. The construction of the burners shall permit convenient removal of the entire burner assembly through the burner front plate.

**3.2.6 Air register.** Air register dimensions shall be as specified (see 6.2). The air doors in the air register shall be moving under all operating conditions. The air doors shall cycle from closed position to fully open position with less than one turn of the air door operating lever or handle.

**3.2.7 Hinged air registers.** The hinged air registers specified for class 2 burners shall be so constructed that the burner can be swung out to provide access to the furnace through the burner opening, and be swung back into position.

**3.2.8 Capacity to weight factor.** Each burner at rated capacity shall deliver at least 8 pounds of fuel oil per hour per pound of burner weight. For calculations, all parts of the burner necessary for satisfactory operation are considered part of the burner weight except the burner throat refractory material, the retaining devices for this refractory material, and the branch fuel oil and steam lines.

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**3.2.9 Capacity to area factor.** Each burner at rated capacity shall deliver not less than 3.4 pounds of oil per hour per square inch of circular area covered by the closed burner (air doors shut) at the burner inner front plate (exclusive of holding ears or points in the case of polygonal base rings). This ratio shall apply to burners of capacity as great as 1,000 pounds per hour but shall be increased 0.1 pound of oil per hour per square inch for each 100 pound per hour increase in burner capacity.

**3.2.10 Low capacity operation.** Type A burners shall maintain a stable flame pattern down to a supply fuel oil pressure of 125 lb/in<sup>2</sup>. For all other burners, a stable flame pattern shall be maintained down to the specified minimum oil pressure. For type C and D atomizers the low capacity at the minimum fuel oil pressure shall be not more than the rated capacity at maximum oil pressure divided by the specified turndown (normally 10 to 1 or 12 to 1). For atomizers specifically designated as lightoff atomizers, the minimum capacity shall be not more than 200 pounds of oil per hour, or as specified (see 6.2).

**3.2.11 Limiting firing distances.** The least permissible distances for a service (multiple burner) installation shall be determined for each type and size of burner (see 4.4.1.7) and shall govern the determination of the position of burners in any boiler. These limiting firing distances shall be not less than those specified in table I.

TABLE I. *Limiting firing distances.*

Centerline of burner to	Burner capacities in pounds of oil per hour			
	Up to and including 2,100	From 2,101 to 3,300	From 3,301 to 6,000	Above 6,000
	Inches	Inches	Inches	Inches
Centerline of adjacent burners	22	25-1/2	30	36-1/2
Furnace floor	25	25	25	25
Nearest tube surface towards which gas is flowing	31	31	31	31
Water-cooled side wall	—	26	28	28
Side wall refractory	25	25	—	—

**3.2.12 Air pressure drop across burner.** The air pressure drop across the burner shall be as low as practical, consistent with the complete burning of the fuel within the available firing depth, and the adequate mixing of the air and fuel oil. If a maximum allowable air pressure across the burner register, at maximum burner capacity is cited in the contract (see 6.2), the contractor shall design to hold pressure drop at or less than this limit.

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**3.2.13 Fuel data.** For construction and evaluation purposes, the following ultimate analysis, heating valves, and furnace heat releases shall be use:

Carbon .....	85.8 percent
Hydrogen .....	13.2 percent
Oxygen .....	0.1 percent
Sulphur .....	0.8 percent
Nitrogen .....	0.1 percent
Heating valve .....	19,500 British thermal units per pound (Btu/lb) of oil
Total furnace heat release at maximum capacity of burners per unit of furnace volume .....	700,000 British thermal units per hour per cubic foot (Btu/hr/ft <sup>3</sup> ) of furnace volume

**3.2.14 Threaded parts.** Unless otherwise specified herein, or approved by the contracting activity, all bolts, nuts, studs, and machine screws shall conform to FF-N-836, FF-S-85, FF-S-86, FF-S-92, FF-S-200, FF-S-210, or MIL-S-1222, as applicable.

**3.2.15 Accessories.** Unless otherwise specified (see 6.2), the following accessories shall be supplied with the burners, in the quantities specified:

- a. Atomizer assemblies less  
sprayer plates ..... 250 percent of number of burners  
purchased
- b. Sprayer plates ..... 300 percent of each size sprayer plate  
intended for use per burner, for sizes and  
capacities (see 6.2)
- c. Adapters, steam to mechanical ..... 200 percent of number of type C burners  
purchased.

**3.2.16 Onboard repair parts.** Each set of onboard repair parts shall consist of the following:

- a. Impeller plates (diffuser plates) – 25 percent of the number installed or ordered
- b. Gaskets or seals of each size and type used for oil or steam tightness – 200 percent of the number installed or ordered
- c. Gaskets of each size and type used for air tightness – 10 percent of the number installed or ordered
- d. One set of wrenches required for sprayer plate assembly/disassembly in the atomizer, for each boiler on order, or as specified (see 6.2)
- e. One set of tools required for safety shutoff device seal replacement, for each fireroom.



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Note: The number of burners per boiler and number of boilers per fireroom shall be as specified (see 6.2). Tools and wrenches required must have national stock numbers and be listed in the Federal Supply Catalog (copies of this catalog may be consulted in the office of the Defense Contract Administration Services Management Area (DCASMA)).

**3.3 Type A - straight pressure atomizing fuel oil burners.** Type A burners shall utilize the fuel oil pressure mechanical atomizing principle exclusively; all oil supplied to these burners is atomized (no return flow). They shall employ Navy standard sprayer plates, atomizer nozzles, and nuts at a normal fuel oil operating range of 300 (600 if specified (see 6.2)) to 150 lb/in<sup>2</sup>. However, emergency operation down to a fuel oil pressure of 125 lb/in<sup>2</sup> shall be permitted, and fires must remain stable at this supply pressure. Details of sprayer plates for type A shall be in accordance with Drawings 4171 or 4173. Standard atomizer nozzles shall be in accordance with Drawing 11-Y-1309, and standard atomizer nuts shall be in accordance with Drawing 11-Y-1308.

**3.4 Type C - steam and oil pressure atomizing burners.** Type C burners shall employ steam as the atomizing medium for normal operation. Atomizers shall operate with steam conditions of 135 to 150 lb/in<sup>2</sup>, 370 to 410 °F, and oil pressures of 350 to 35 lb/in<sup>2</sup> at the supply headers. They shall have a satisfactory turndown operating range of not less than 10 to 1 based on oil flow. The burner atomizer for type C burners shall be of the internal mix type and contain an outer barrel and a central tube. The center tube shall convey steam and the passage between the center tube and outer barrel shall convey oil to the atomizing end. In order to accommodate the two lapped metal to metal seals on the sprayer plate, (see 3.2.15 and Drawing 4168), the outer barrel and its seal at the atomizer head end shall be of a floating design. The atomizer shall also be capable of operating with 70 to 90 lb/in<sup>2</sup> air as the atomizing medium. This mode of operation will be an alternate means for lighting off, and combustion shall be satisfactory with atomizing air up to a capacity of at least 5 percent of the rated full power oil flow.

**3.4.1 Oil/steam ratio.** Atomizers shall atomize oil at the rate of not less than 7.7 pounds of oil for each pound of atomizing steam used when the burner is operated at firing rates in excess of 30 percent of the capacity of the atomizer.

**3.4.2 Sprayer plates.** Sprayer plates shall be designed for turndown ratios of 10 to 1 or 12 to 1, as specified (see 6.2). In the event that 10 to 1 sprayer plates are specified, one plate size shall be provided to operate the boiler from 10 percent to 100 percent of the full power rating, based on oil flow (all burners firing). A second plate will be provided that will fire the boiler from the 100 percent to the 120 percent of full power rates. If 12 to 1 turndown sprayer plates are specified, one plate size shall be sufficient to fire the boiler from 10 percent rate to 120 percent rate. Sprayer plates capable of firing the boiler at overload rate shall be sized to prevent the oil flow from exceeding the 120 percent rate by more than 5 percent. Contractors may, however, exceed the specified turndown by designing for reduced low end capacities, provided that the fires remain stable at minimum oil pressure. If a single burner cannot fire the boiler at rates less than 5 percent of the total full power oil rate, then lightoff sprayer plates shall be as specified (see 6.2), in order to permit lightoff and raising of boiler pressure at the prescribed rate and time, without the need for securing fires.



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**3.4.3 Straight pressure atomizing.** Adapters that shall convert the atomizer to straight pressure atomizing (atomizer type A) shall be provided (see 3.2.15).

**3.4.4 Sprayer plate marking.** Sprayer plates shall be stamped with a size designation indicating the following:

- a. Number of exit holes
- b. Cone angle between the exit holes
- c. Drill size of the exit holes
- d. Drill size of the steam holes
- e. Drill size of the oil holes.

**3.5 Type D - vented plunger pressure atomizing fuel oil burners.** Type D burner assemblies utilize fuel oil pressure mechanical atomizing principle over a wide range of burner operation without changing atomizers. Fuel oil pressure operating range shall be 350 to 65 lb/in<sup>2</sup>. Fuel oil pressure operating range shall be 375 to 50 lb/in<sup>2</sup>. Type D fuel oil burners shall be manufactured in accordance with the assembly Drawings 4461, 4514, 4543, 4787, 4789, or 4790, as applicable, and all drawings referenced on these assembly drawings.

**3.6 Designation and marking.**

**3.6.1 Identification and designation plates.** Identification plates and other designating marking, in accordance with MIL-P-15024 and MIL-P-15024/5, shall be provided. These plates shall be installed on and furnished as a part of the burners. They shall be mounted on the front of the burner so as to be located in a readily accessible position where they can be read at any time without danger to personnel.

**3.6.2 Identification plate markings.** Data marked on identification plates shall include the following:

- a. Manufacturer's name, identification, symbols, and serial number
- b. Contract number and date of manufacture
- c. Type and class of burner
- d. Blank space for Government inspector's official stamping.

**3.6.3 Designation plates.** Each burner shall have a designation plate, bearing a number or letter, mounted on the burner front, to designate the lighting-off sequence. A small brass plate, bearing a number or letter corresponding to the number or letter of the burner that the root valve serves shall be attached to the handwheel of each root valve with no sharp or protruding edges that might cause personal injury when operating the valve.

**3.7 Special tools.** Special tools shall not be required to install or service the burners. Special tools are defined as those tools not listed in the Federal Supply Catalog (copies of this catalog may be consulted in the office of the Defense Contract Administration Services Management Area (DCASMA)).

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**3.8 Workmanship.** Workmanship shall be of acceptable quality. Poor molding fabrication, loose materials, damaged or improperly assembled burners, galling of mating parts, nicks and burrs of metal parts, and post molding warpage will be considered adequate basis for rejection of items being of inferior quality for the purpose intended.

**3.9 Sprayer plate materials and hardness.** Type A and C sprayer plates shall be manufactured from corrosion resisting steel in accordance with QQ-S-763, class 440C, condition A. An acceptable alternate material is T-1 tool steel conforming to QQ-T-590. Type A and C sprayer plates will be hardened to a range of HRC 58 to 62, in accordance with the procedures of MIL-H-6875. Type D Vented Plunger parts (whirl chamber cartridges, pistons, orifice plates, and spring retainers, as identified on Drawings 4461 and 4790) shall be made from corrosion resisting steel, QQ-S-763, class 440C, condition A. An acceptable alternate material is class 440 F-Se of the same specification. These atomizer parts shall be hardened to HRC 58 minimum, in accordance with MIL-H-6875.

#### 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 this specification where such inspections are deemed necessary to ensure that 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 (see 6.3). The absence of any inspection requirements in the specification shall not relieve the contractor of 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 the manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective materials, either indicated or actual, nor does it commit the Government to accept defective material.

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

- a. First article inspection ( see 4.4)
- b. Quality conformance inspection (see 4.5).

**4.3 Inspection conditions.** Unless otherwise specified, all inspections shall be performed in a laboratory with a burner test stand and operating boiler. The environmental conditions shall be the same as those aboard ship except that ship motion is not required.

**4.4 First article inspection.** First article inspection shall consist of the tests specified in 4.4.1 through 4.4.8.1 (see 6.3).

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**4.4.1 Capacities.** The approved overload, low, and rated capacities, in pounds of oil fired per burner per hour shall be demonstrated in a boiler or test facility. Air pressure drop across the burner over its operating range shall be measured to verify conformance to 3.2.12.

**4.4.1.1 Overload capacity.** Overload capacity shall be the amount of fuel oil that can be satisfactorily burned per hour per burner when the volume percent of carbon dioxide (CO<sub>2</sub>) in the combustion gas is one unit less than the maximum as determined by a smooth performance curve based on test data. Loss of ignition, excessive carbon laying, improper flame conditions, or necessity for difficult adjustments will be considered evidence of unsatisfactory firing.

**4.4.1.2 Rated capacity.** Rated capacity of the burners shall be the amount of fuel oil that can be satisfactorily burned per hour per burner in a multiple burner installation (the number of burners to be based on probable number required for service installation) at "trace smoke" condition with a draft loss (pressure drop from fireroom or double front to the furnace) of 8 inches of water. The rated capacity is intended for comparative purposes only.

**4.4.1.3 Low capacity.** Low capacity (see 3.2.10) shall be demonstrated with one burner without difficult special adjustments. Operation at this capacity shall be "trace smokeless" and shall be carbon free or with such small carbon deposits (as built up in at least 4 hours of continuous operation) as not to affect burner performance or result in a light coating on furnace refractories.

**4.4.1.4 Operating range.** The burners shall operate over the full operating range from low to overload capacity in smokeless condition when such smokeless operation is required and shall function under all operating conditions without depositing carbon to such extent as to affect the burner performance or result in a light coating upon furnace refractories.

**4.4.1.5 Disassembly.** After a specified period of boiler operation, an atomizer shall be selected, secured, and removed from the boiler. Removal shall be accomplished without binding. The atomizer shall be permitted to cool at ambient conditions for 15 minutes after which the cap nut and sprayer plate shall be removed with the normal removal tools. There shall be no binding of parts.

**4.4.1.6 Oxygen (O<sub>2</sub>) and CO<sub>2</sub>.** During operational tests, the volume percentages of O<sub>2</sub> and CO<sub>2</sub> in the exit combustion gases shall be measured. At the maximum capacity, O<sub>2</sub> shall be 3.5 percent or less. At a fuel flow rate of 40 percent of full power, the O<sub>2</sub> shall be 7 percent or less. Oxygen readings at other rates shall lay on a smooth curve. Equivalent CO<sub>2</sub> percentages for Naval distillate fuel operation shall be 12.7 percent or greater at maximum capacity, and 10 percent or greater at 40 percent of full power.

**4.4.1.7 Limiting firing distances.** The limiting firing distances for each burner shall be determined at the overload capacity.

**4.5 Quality conformance inspection.** Quality conformance inspection shall consist of the tests specified in 4.5.1 through 4.5.2.2 (see 6.3).

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**4.5.1 Examination.** Each burner shall be examined to determine conformance to the requirements of this specification.

**4.5.2 Tests.** Each burner and all parts shall be tested to determine conformance to the requirements of this specification.

**4.5.2.1 Integrity/leakage tests.** Each safety shutoff device and atomizer assembly shall be hydrostatically tested for integrity to 150 percent of the maximum system operating pressure, and shall be tested for leakage at 100 percent of the maximum system operating pressure.

**4.5.2.2 Safety shutoff device valve operation.** Valves and spring check valves on each safety shutoff device shall be operated in the manner in which they will be used for normal and also emergency boiler operation, to ensure compliance with the requirements of 3.2.2.

**4.5.2.3 Hardness tests.** Test sprayer plates for hardness in accordance with ASTM E-18 to verify conformance to 3.11.

**4.6 Inspection of packing.** Sample packages and packs, and the inspection of the preservation, packing, and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

## 5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging requirements of referenced documents listed in section 2, see 6.7.)

**5.1 Packaging.** Burners and accessories shall be preserved level A or commercial, packed level A, B, or commercial as specified (see 6.2) and marked as follows:

- a. Levels A and B and marking thereof in accordance with ASTM D 3951
- b. Commercial and commercial marking in accordance with ASTM D 3951.

## 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 burners covered by this specification are intended for use on propulsion boilers aboard Naval ships. Type A burners are used on boilers that have lower capacities or with little fluctuation in steaming rates. Type C and type D burners are used in all types of boilers as specified.

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**6.2 Acquisition requirements.** Acquisition documents must specify the following:

- a. Title, number, and date of this specification
- b. Type and class required (see 1.2)
- c. 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)
- d. Whether first article is required (see 3.1)
- e. Dimensions for air registers and maximum allowable register pressure drop (see 3.2.6)
- f. Sizes and capacities of sprayer plated required and the quantity for each if other than as specified (see 3.2.10 and 3.2.16)
- g. Capacity range for lightoff sprayer plates, if they are required
- h. Number of burners per boiler, and number of boilers per fireroom
- i. Accessories to be supplied with the burner, if other than as specified (see 3.2.15)
- j. When fuel oil operating range of 600 lb/in<sup>2</sup> for type A burners is required (see 3.3)
- k. If lightoff sprayer plates are required, and turndown ratio (see 3.4.2)
- l. Level of preservation and packing required (see 5.1).

**6.3 Consideration of data requirements.** The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
4.1.1	DI-E-2121	Certificate of Compliance	—
4.4	DI-MISC-80678	Certification/Data Report	10.3.1 does not apply
4.5	DI-T-2072	Tests, Reports	—

The above DID's were those cleared as of the date of this specification. The current issue of DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

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**6.4 Technical manuals.** The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, military specifications and standards that have been cleared and listed in DOD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDDL) must be listed on a separate Contract Data Requirements List (DD Form 1423), which is included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract.

**6.5 First article.** When first article inspection is required, the contracting officer should provide specific guidance to offerors whether the item(s) should be a preproduction sample, a first article sample, a first production item, a sample selected from the first \_\_\_ production items, a standard production item from the contractor's current inventory (see 3.1), and the number of items to be tested as specified in 4.4. The contracting officer should also include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results, and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement 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.

**6.6 Provisioning.** Provisioning Technical Documentation (PTD), spare parts, and repair parts should be furnished as specified in the contract.

**6.6.1** When ordering spare parts or repair parts for the equipment covered by this specification, the contract should state that such spare parts and repair parts should meet the same requirements and quality assurance provisions as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified.

**6.7 Subcontracted material and parts.** The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

**6.8 Type B.** this revision deletes the type B return flow atomizing fuel oil burner and adds the type D vented plunger pressure atomizing fuel oil burner.

**6.9 Subject term (key word) listing.**

Air register  
Atomizer  
Fuel oil burner  
Oil burner

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**6.10 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.

Preparing activity:  
Navy – SH  
(Project 4530-N001)



# 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.
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### I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER  
MIL-B-2128D(SH)

2. DOCUMENT DATE (YYMMDD)  
7 MAY 1991

### 3. DOCUMENT TITLE

BURNERS, STEAM AND OIL PRESSURE, ATOMIZING

### 4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)

### 5. REASON FOR RECOMMENDATION

### 6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (Include Area Code)  
(1) Commercial  
(2) AUTOVON  
(if applicable)

7. DATE SUBMITTED  
(YYMMDD)

### 8. PREPARING ACTIVITY

a. NAME Technical Point of Contact (TPOC):  
Mr. Paul Kauffman (SEA 56P21)

b. TELEPHONE (Include Area Code)  
(1) Commercial  
(2) AUTOVON

PLEASE ADDRESS ALL CORRESPONDENCE AS FOLLOWS:

TPOC: (703) 602-0085 332-0085

c. ADDRESS (Include Zip Code)  
Commander, Naval Sea Systems Command  
Department of the Navy (SEA 55Z3)  
Washington, DC 20362-5101

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