INCH-POUND
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SUPERSEDING
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DETAIL SPECIFICATION

STRAINERS, SEDIMENT, PIPELINE, DUPLEX (WITH AND WITHOUT MAGNET)

This specification is approved for use by the Naval Sea Systems Command and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers duplex strainers for the purpose of removing sediment from the piping of lubricating-oil, diesel, fuel-oil, and sea-water-cooling systems. This specification covers strainers with and without magnets.

1.2 Classification. Duplex strainers are of the following types, classes, and sizes as specified (see 6.2):

1.2.1 Types.

a. Type I – With magnet.

(1) Class 1 – Steel body, 30 mesh basket; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 pounds per square inch (psi).

(2) Class 2 – Non-ferrous body, 80 mesh basket; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(3) Class 3 – Non-ferrous body, 30 mesh basket; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(4) Class 4 – Steel body, 80 mesh basket; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(5) Class 5 – Non-ferrous body, 40 micrometer absolute filtration; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(6) Class 6 – Steel body, 40 micrometer absolute filtration; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(7) Class 7 – Non-ferrous body, 25 micrometer absolute filtration; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(8) Class 8 – Steel body, 25 micrometer absolute filtration; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

b. Type II – Without magnet.

(1) Class 1 – Steel body, 30 mesh basket, diesel oil, marine transfer service, maximum temperature 120 °F, maximum design pressure 100 psi.

(2) Class 2 – Non-ferrous, ⅛ inch perforated plate basket, sea water cooling service, design pressure 50 to 220 psi, maximum temperature 120 °F.

Comments, suggestions, or questions on this document should be addressed to Commander, Naval Sea Systems Command, ATTN: SEA 05S, 1333 Isaac Hull Avenue, SE, Stop 5160, Washington Navy Yard DC 20376-5160 or emailed to CommandStandards@navy.mil, with the subject line “Document Comment”. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.dla.mil.

AMSC N/A FSC 4730

(3) Class 3 – Steel body, 24 mesh basket, fuel oil service, maximum design pressure 350 psi, maximum temperature 120 °F.

(4) Class 4 – Steel body, 80 mesh basket, fuel oil service, maximum design pressure 600 psi, maximum temperature 120 °F.

(5) Class 5 – Non-ferrous body, 40 micrometer absolute filtration; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(6) Class 6 – Steel body, 40 micrometer absolute filtration; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(7) Class 7 – Non-ferrous body, 25 micrometer absolute filtration; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

(8) Class 8 – Steel body, 25 micrometer absolute filtration; lubricating oil service, maximum temperature 220 °F, maximum design pressure 250 psi.

1.2.2 Sizes. The sizes of strainers are identified by nominal pipe size (NPS) of inlet/outlet piping as specified (see 6.2).

1.3 Part or identifying number (PIN). PINs to be used for duplex strainers acquired to this specification are created as follows:

M	**17849**	**-**	**X**	**X**	**X**
Prefix for Military Specification	Specification Number		Type (see 1.3.1)	Class (1.3.1)	Size (see 1.3.2)

1.3.1 Type and class. Codes for types and classes are as follows:

Type	Class 1	Class 2	Class 3	Class 4	Class 5	Class 6	Class 7	Class 8
I	A	B	C	D	E	F	G	H
II	I	J	K	L	M	N	O	P

1.3.2 Sizes. The sizes of strainers are as specified (see 6.2).

1.3.3 Example. An example PIN created for a 6-inch, type I (with magnet), class 1 (steel body, 30 mesh basket; lubricating oil service, maximum temperature 220 °F) strainer is M17849-IA6.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

FEDERAL SPECIFICATIONS

QQ-N-281 - Nickel-Copper Alloy Bar, Rod, Plate, Sheet, Strip, Wire, Forgings, and Structural and Special Shaped Sections

DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-901 - Shock Tests, H.I. (High-Impact) Shipboard Machinery, Equipment, and Systems, Requirements for

MIL-PRF-1149 - Gasket Materials, Synthetic Rubber, 50 and 65 Durometer Hardness

MIL-DTL-1222 - Studs, Bolts, Screws and Nuts for Applications Where a High Degree of Reliability is Required; General Specification for

MIL-DTL-8815 - Filter and Filter Elements, Fluid Pressure, Hydraulic Line, 15 Micron Absolute and 5 Micron Absolute, Type II Systems, General Specification for

MIL-DTL-15024 - Plates, Tags, and Bands for Identification of Equipment, General Specification for

MIL-P-15024/5 - Plate, Identification

MIL-C-15726 - Copper-Nickel Alloy, Sheet, Plate, Strip, Bar, Rod and Wire

MIL-PRF-20042 - Flanges, Pipe, Bronze (Silver Brazing)

MIL-P-24396 - Packing Material, Braided PTFE (Polytetrafluoroethylene)

MIL-B-24480 - Bronze, Nickel-Aluminum (UNS No. C95800) Castings for Seawater Service

MIL-V-24586 - Valve, Needle, Size 1/4-Inch and 1/2-Inch, Union Bonnet Construction

NOTE: MIL-V-24586 is inactive for new design and intended only for guidance. It will eventually be replaced.

MIL-C-24707 - Castings, Ferrous, General Specification for

MIL-C-24707/1 - Castings, Ferrous, for Machinery and Structural Applications

MIL-C-24707/3 - Castings, Ferrous, Corrosion-Resistant, Austenitic, Chromium-Nickel

MIL-C-24723 - Castings, Nickel-Copper Alloy

(Copies of these documents are available online at http://quicksearch.dla.mil.)

2.2.2 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 of these documents are those cited in the solicitation or contract.

MILITARY SPECIFICATION SHEETS

MS18229 - Plug for O-Ring Gasket

(Copies of this document are available online at http://quicksearch.dla.mil.)

NAVAL SEA SYSTEMS COMMAND (NAVSEA) DRAWINGS

803-2177525 - 1/4-2 BW & SW 900 Lb ASME Valve

803-4384536 - Valves; Bronze; ¼"-2" Union End Globe; In-Line & Angle; Stop, Stop Check, and Needle

803-5001048 - Strainer, Duplex, Fuel Oil, Firesafe, 3 inch

803-6397291 - Strainer Assembly, Duplex, Lube Oil, 6 inch

803-6397390 - Strainer Assembly, Duplex, Lube Oil, 2 NPS

803-6397396 - Strainer Assembly, Duplex, Lube Oil, 4 NPS

(Copies of these documents are available from the applicable repositories listed in S0005-AE-PRO-010/EDM, which can be obtained online via Technical Data Management Information System (TDMIS) at https://mercury.tdmis navy mil/. Copies of these documents may also be obtained from the Naval Ships Engineering Drawing Repository (NSEDR) online at https://199.208.213.105/webjedmics/index.jsp. To request an NSEDR account for drawing access, send an email to NNSY_JEDMICS_NSEDR_HELP_DESK@navy mil.)

NAVAL SEA SYSTEMS COMMAND (NAVSEA) PUBLICATIONS

S9074-AR-GIB-010/278 - Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

T9070-AL-DPC-020/077-2 - NAVSEA Hazardous Material Avoidance Process

(Copies of these documents are available online via Technical Data Management Information System (TDMIS) at https://mercury.tdmis navy mil/ by searching for the document number without the suffix. Refer questions, inquiries, or problems to: DSN 296-0669, Commercial (805) 228-0669. This document is available for ordering (hard copy) via the Naval Logistics Library at https://nll.navsup.navy.mil. For questions regarding the NLL, contact the NLL Customer Service at nllhelpdesk@navy.mil, (866) 817-3130, or (215) 697-2626/DSN 442-2626.)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI/ASQ Z1.4 - Sampling Procedures and Tables for Inspection by Attributes

(Copies of this document are available online at http://webstore.ansi.org/.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B16.5 - Pipe Flanges and Flanged Fittings: NPS 1/2 through NPS 24 Metric/Inch Standard

(Copies of these documents are available online at www.asme.org.)

ASTM INTERNATIONAL

ASTM A105/A105M - Standard Specification for Carbon Steel Forgings, for Piping Applications

ASTM A106/A106M - Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service

ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished

ASTM A216/A216M - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High Temperature Service

ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications

ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes

ASTM A285/A285M - Standard Specification for Pressure Vessel Plates, Carbon Steel, Low- and Intermediate-Tensile Strength

ASTM A312/A312M	-	Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM A513/A513M	-	Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing
ASTM A516/A516M	-	Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service
ASTM A519/A519M	-	Standard Specification for Seamless Carbon and Alloy Steel Mechanical Tubing
ASTM A595/A595M	-	Standard Specification for Steel Tubes, Low-Carbon or High-Strength Low-Alloy, Tapered for Structural Use
ASTM A1070	-	Standard Specification for Cast and Sintered Alnico Permanent Magnets
ASTM B30	-	Standard Specification for Copper Alloys in Ingot Form
ASTM B124/B124M	-	Standard Specification for Copper and Copper Alloy Forging Rod, Bar, and Shapes
ASTM B138/B138M	-	Standard Specification for Manganese Bronze Rod, Bar, and Shapes
ASTM B139/B139M	-	Standard Specification for Phosphor Bronze Rod, Bar, and Shapes
ASTM B369	-	Standard Specification for Copper-Nickel Alloy Castings
ASTM E2016	-	Standard Specification for Industrial Woven Wire Cloth

(Copies of these documents are available online at www.astm.org.)

SAE INTERNATIONAL

SAE AS3209	-	Packing, Preformed – AMS7276, 'O' Ring
SAE AS3581	-	Packing, Preformed – O-Ring Seal, AMS7259
SAE J1926/2	-	Connections for General Use and Fluid Power – Ports and Stud Ends with ASME B1.1 Threads and O-Ring Sealing – Part 2: Heavy-Duty (S Series) Stud Ends

(Copies of these documents are available online at www.sae.org.)

2.4 Order of precedence. Unless otherwise noted herein or in the contract, 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 in accordance with 4.3.

3.2 Recycled, recovered, environmentally preferable, or biobased materials. Recycled, recovered, environmentally preferable, or biobased materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.3 Design. (See 6.2.)

3.3.1 General construction. Each strainer shall be of the duplex basket type with three-way valves (inlet and outlet valving) and constructed to be readily opened for examination, removal, and cleaning of the baskets. The cross sectional area of the path of flow through the strainer shall be equal to or greater than the cross sectional area of the piping to which the strainer is connected. Each strainer shall be provided with shifting means to permit changeover (the act of shifting flow from one strainer basket to the other) without damage to any parts. Each strainer compartment shall have a set of vent and drain valves.

3.3.1.1 Changeover mechanism. This mechanism shall consist of an actuator and three-way valves (inlet and outlet valving). The three-way valving shall be arranged so that one basket is fully open and the other is fully shut off at the same time and so that no contaminated fluid can pass from the inlet to outlet side of the strainer during changeover. The arrangement of the strainer shall be such that changeover shall be accomplished without interruption, even momentarily, of the full flow through the strainer. A visual indicator shall be included to identify the basket in service.

3.3.1.1.1 Equalizing feature. Except for type II, class 2, strainers shall have an equalizing feature that slowly pressurizes the off-duty strainer basket compartment at a flow rate not exceeding 10 gallons per minute (gpm) at design pressure.

3.3.1.1.2 Changeover actuator. Unless otherwise specified (see 6.2), shifting for all strainers, except type II, class 2, shall require a minimum of four complete rotations of a handwheel to require slow changeover and to enable return to the original basket in the event of a leak in the oncoming basket compartment. The connection of the changeover valve operator to the valve stem shall prevent improper attachment causing incorrect orientation of the operator to the valve. Thus, square changeover valve stem ends are not acceptable. Internal stops shall prevent inadvertent disruption of fluid flow due to improper positioning of changeover valve part.

3.3.1.1.2.1 Safety interlock. Positive interlocks shall be provided to prevent the following operator actions (not applicable to type II, class 2):

a. Changeover: Change over to an off-duty compartment when the off-duty compartment cover is off or when the drain and equalizing valves are open.

b. Remove or loosen the cover when the compartment is pressurized.

c. Open the drain valve on the compartment in service.

3.3.1.1.3 Operating torque. The maximum required force for any operation associated with shifting from one strainer basket to the other shall be less than 40 pounds (see 4.6.2.2).

3.3.1.1.4 Type of changeover valves. Plug, ball, and disc changeover valves in accordance with 3.3.1.1.4.1, 3.3.1.1.4.2, and 3.3.1.1.4.3 are approved for use in these strainers.

3.3.1.1.4.1 Plug changeover valves. Plug valves shall be of the non-lubricated, straight-cartridge type, capable of tight seating in both directions. The valve operating arrangement shall not utilize a lift arrangement to unseat the plug before rotating, in order to reduce operating torque. Low friction fluorocarbon or similar resin material shall be employed at rubbing surfaces to prevent sticking, and to provide low operating torque for ease of actuation. The plug ports shall be properly aligned with the housing ports in all flow positions, and the plug shall not be raised or lowered by the line pressure. The valve shall be operable by one person. The valve shall be fully ported. The valve housing shall withstand the applied stresses developed during operation of the valve. The valve shall be compatible with the fluid in the system.

3.3.1.1.4.2 Ball changeover valves. Ball valves shall tightly seat in both directions. The ball valve seats shall be nonmetallic, renewable, compatible with the fluid media, and shall minimize erosive effects due to fluid flow. The ball ports shall be properly aligned with the housing ports in all flow positions. The valve shall be operable by one person. The valve shall be fully ported. The valve housing shall withstand the applied stresses developed during operation of the valve. The valve shall be compatible with the fluid in the system.

3.3.1.1.4.3 Disc changeover valves. Disc valves shall tightly seat in both directions. The disc valve seats shall be nonmetallic, renewable, compatible with the fluid media, and shall minimize erosive effects due to fluid flow. The disc ports shall be properly aligned with the housing ports in all flow positions. The valve shall be operable by one person. The valve shall be fully ported. The valve housing shall withstand the applied stresses developed during operation of the valve. The valve shall be compatible with the fluid in the system.

3.3.1.1.5 Changeover valve leakage.

a. For strainers tested in accordance with 4.6.2, there shall be zero leakage.

b. Strainers tested in accordance with 4.6.12 shall then be tested in accordance with 4.6.2; a leakage rate that fills the off-duty basket compartment in less than 1 hour shall be cause for rejection.

3.3.2 Piping connections. Piping connections for 3.3.2.1, 3.3.2.2, 3.3.2.3, and 3.3.2.4 shall be either welded, silver brazed, flanged, straight threaded unions, or boss connections to the strainer housing, as specified (see 6.2). Straight threaded unions and boss connections shall be in accordance with SAE J1926/2. Open ended valves with a union or boss connection shall be secured to prevent accidental rotation of the threaded joint.

3.3.2.1 Inlet and outlet connections. Inlet and outlet connections of each strainer shall be of the same type and size as specified (see 6.2). Unless otherwise specified (see 6.2), both inlet and outlet connections shall be flanged. Flange faces shall have a concentric or phonographic/spiral finish. Flange face finish shall be as specified (see 6.2).

3.3.2.2 Valved gage connections. When specified (see 6.2), valved gage connections shall be included at both the inlet and outlet.

3.3.2.3 Equalizing valve arrangement. When the changeover mechanism is not equipped with an equalizing position (see 6.2), a means shall be included to equalize pressure from the duty side to the off-duty side. This arrangement shall contain a self-actuating shut-off valve in the equalizing line or port. Equalizing valves that are integral to the strainer housing shall be soft seated.

3.3.2.4 Vent and drain (globe) valves. Vent and drain (globe) valves shall be installed with the underside of the seat subject to system pressure. Valves that are integral to the strainer housing shall be soft seated.

3.3.3 Operating conditions. The design flow capacity, design pressure (see 4.6.1), range of liquid temperature and viscosity, and maximum allowable pressure drop (see 4.6.4) shall be as specified (see 6.2).

3.3.4 Compartment covers. Covers shall be flanged and attached to the body by bolts and nuts, hinged bolts, clamps, or a yoke. The cover shall effect a positive seal on a gasket recessed in the body. Hinged-type covers shall be equipped with a latch to prevent accidental closing under dynamic shipboard conditions.

3.3.4.1 Anti-spray feature. Compartment covers (except for type II, class 2 strainers) shall, in the event of gasket/O-ring failure, deflect fluid spray downward away from the operator. The spray deflector shall remain in position at all times when the compartment is pressurized.

3.3.5 Identification plates. Identification plates shall be provided in accordance with MIL-DTL-15024 and MIL-P-15024/5 and shall include the following:

a. Type and class.

b. Manufacturer.

c. Contract number.

d. Nominal pipe size of the inlet and outlet connections.

e. Design pressure.

f. Basket mesh size/filtration rating.

g. The necessary operating instructions (see 3.4.1).

h. National Stock Number (NSN) (see 6.2).

i. Component Identification Number (Designation) (CID).

j. Fastener industry part number identifying size and material.

3.3.6 Type I – with magnets.

3.3.6.1 Class 1 and 4 strainers. Class 1 and 4 strainers (2-inch, 4-inch, and 6-inch sizes) shall be in accordance with 803-6397390, 803-6397396, and 803-6397291 (see table I). Materials for all other class 1 and 4 strainers shall be in accordance with table II.

TABLE I. Lubricating oil strainer navy standard drawings.

Navy standard drawing number	Nominal pipe size (inches)	Capacity (gpm)	Maximum clean differential pressure (PSID) 1/	Operating pressure range (psi)	Maximum operating temperature (°F)	Type I, class 1 basket mesh/wire OD 2/ (inches)	Type I, class 4 basket mesh/wire OD (inches)
803-6397390	2	300	5	50 – 250	220	30 x 30/ 0.016	80 x 80/ 0.007
803-6397396	4	500	5	50 – 250	220	30 x 30/ 0.016	80 x 80/ 0.007
803-6397291	6	850	5	50 – 250	220	30 x 30/ 0.016	80 x 80/ 0.007

NOTES:

1/ Pounds per square inch differential

2/ Outside diameter

3.3.6.2 Class 6 and 8 strainers. Class 6 and 8 strainers (2-inch, 4-inch, and 6-inch sizes) should use standard drawing designs listed in table I with an altered strainer basket design in accordance with 3.3.6.6. Materials for all other class 6 and 8 strainers shall be in accordance with table II.

TABLE II. Materials for type I, steel body strainers.

Part	Material	Applicable document	Remarks
Bodies, bonnets, and cover	Steel castings	MIL-C-24707/1	
		ASTM A216/A216M	Grade 70-30
	Steel pipe and tubing	ASTM A519/A519M	Grade 1030 Condition A (annealed) or N (normalized)
		ASTM A106/A106M	Grade B
		ASTM A513/A513M	Type 5, grade 1020 or 1026
		ASTM A516/A516M	Grade 70
	Carbon steel	ASTM A285/A285M	Grade C
		ASTM A105/A105M	
		ASTM A595/A595M	
Clamps, yokes, and valve operators	Steel	ASTM A108	
		ASTM A516/A516M	Grade 70
		ASTM A36/A36M	Grade 1010-1025
	Carbon steel	ASTM B138/B138M	
	Manganese bronze	MIL-C-24707/1	
Glands	Steel or cast steel	MIL-C-24707/3	
	Corrosion-resisting steel	ASTM B138/B138M	
Changeover valves	Manganese bronze cast	ASTM B30	Copper Alloy UNS No. C96400
	Copper alloy	MIL-V-24586	Class 1, style A, type II
Vent, gage, and equalizing valves	Steel	803-2177525	
Drain valves	Forged steel	MIL-DTL-1222	Grade 400 or 405
Threaded fasteners	Nickel Alloy	SAE AS3209	For all except threaded bosses
O-rings	Fluorocarbon rubber	SAE AS3581	For threaded bosses
		MIL-P-24396	
Packing for valve stems and rods		ASTM A240/A240M	UNS Designation S30400
Basket frames, top rings, and handle	CRES plate	ASTM E2016	UNS Designation S30400 or S31600
	CRES wire	ASTM A108	MS18229
Threaded plugs	Steel	ASTM E2016	UNS Designation S30400 or S31600
Basket wire mesh	CRES wire	ASTM A312/A312M	S30400
Magnet rods	CRES pipe	ASTM A1070	AL-CA-65/115
Magnets (see 6.2)	Co-Ni	ASTM A1070	AL-SA-29/128
	Co-Ni		

3.3.6.3 Class 2, 3, 5, and 7 strainers. Material shall be in accordance with table III.

TABLE III. Materials for type I, non-ferrous body strainers.

Part	Material	Applicable document	Remarks
Bodies, bonnets, and covers	Copper-nickel	ASTM B369	C96400
	Aluminum bronze	MIL-B-24480	C95800
Clamps, yokes, and valve operators	Cast tin bronze	ASTM B30	Tin bronze Copper Alloy UNS No. C90300
	Bronze phosphor	ASTM B139/B139M	C51000
	Aluminum bronze	MIL-B-24480	C95800
	CRES casting	MIL-C-24707/3	
Glands	Cast tin bronze	ASTM B30	Tin Bronze Copper Alloy UNS No. C90300
Changeover valves	Manganese bronze cast	ASTM B138/B138M	
	Copper alloy	ASTM B30	Copper Alloy UNS C96400
Vent valves	Bronze angle	803-4384536	
Drain, gage, and equalizing valves	Bronze, globe	803-4384536	
Threaded fasteners	Nickel Alloy	MIL-DTL-1222	Grade 400 or 405
O-rings	Fluorocarbon rubber	SAE AS3209	For all except threaded bosses
		SAE AS3581	For threaded bosses
Packing for valve stems and rods		MIL-P-24396	
Top ring and handle	Brass	ASTM B124/B124M	
Basket frames	CRES Plate	ASTM A240/A240M	UNS Designation S30400 or S31600
	CRES wire	ASTM E2016	
Threaded plugs	Manganese bronze	ASTM B138/B138M	MS18229
	Nickel-copper	QQ-N-281	
Basket wire mesh	Copper-nickel	ASTM E2016	UNS Designation C70600 or C71500
	Nickel-copper	ASTM E2016	UNS Designation N04400 or N04405
Magnet rods	CRES pipe	ASTM A312/A312M	S30400
Magnets (see 6.2)	Co-Ni	ASTM A1070	AL-CA-65/115
	Co-Ni		AL-SA-29/128

3.3.6.4 Flanges.

3.3.6.4.1 Class 1, 4, 6, and 8. Flanges shall be integrally cast with the body and shall be dimensionally in accordance with ASME B16.5, class 150, with flange face finish requirements as specified (see 6.2).

3.3.6.4.2 Class 2, 3, 5, and 7. Flanges shall be integrally cast with the body and shall be dimensionally in accordance with MIL-PRF-20042, class 100, with flange face finish requirements as specified (see 6.2).

3.3.6.5 Basket assembly for classes 1, 2, 3, and 4.

3.3.6.5.1 Mechanical construction. Baskets shall be screen type construction, consisting of a supporting framework (strength member) with a wire mesh as the screening medium. Wire mesh edge and seams shall be folded back upon themselves and welded or brazed to preclude fraying. Wire mesh shall be attached to the interior as opposed to the exterior of the support basket. The supporting framework (strength member) shall be either plate or wire construction, with a flange for supporting the frames on a machined surface in the strainer body. A seal shall be provided between the strainer element lands to prevent bypassing of contaminants. The seal shall be retained by the element (e.g., by a groove) to preclude gasket/O-ring loss during strainer changeover and element removal. The basket elements shall be held securely in place when the strainer is assembled. Baskets shall not rupture when totally clogged and subjected to a differential pressure equal to 125 percent of the maximum design pressure for a duration of 10 minutes.

3.3.6.5.2 Strainer basket. Flow through the basket shall be inside out. The strainer basket shall be made of inner and outer elements as specified in 3.3.6.5.2.1 through 3.3.6.5.2.2. The total clear area through the assembled strainer basket shall equal or exceed 2½ times the cross-sectional area of the strainer discharge connection. The total clear area of an assembled basket of two-element construction is the area of those mesh openings of the inner element that are visible through the opening in the outer element, when assembled.

3.3.6.5.2.1 Inner elements.

3.3.6.5.2.1.1 Class 1 and 3 strainers. The inner element shall be wire mesh comprising 0.016-inch diameter wire, 0.0173-inch square openings, and 30 mesh per linear inch. Sufficient clearance shall be allowed to permit withdrawal.

3.3.6.5.2.1.2 Class 2 and 4 strainers. The inner element shall be wire mesh, 0.007-inch diameter wire fabric with 0.0055-inch square openings, 80 mesh per lineal inch. Sufficient clearance shall be allowed to permit withdrawal.

3.3.6.5.2.2 Outer elements. Wire outer elements shall have square openings at least 0.253 inch long using 0.08-inch diameter wire. Plate outer elements shall be at least 3/32-inch thick. Plate outer element sides and bottom shall have perforated 0.250-inch diameter holes spaced a minimum 0.325 inch center-to-center. All welds shall be continuous.

3.3.6.6 Basket assembly for classes 5, 6, 7, and 8.

3.3.6.6.1 Mechanical construction. For class 5, 6, 7, and 8 strainers, baskets shall be of pleated or similar construction that will result in a large surface area per unit of volume. Strainer baskets shall prevent passage of particulate matter larger than the size specified in 1.2 (smallest cross section). The supporting framework (strength member) shall be either plate or wire construction, with a flange for supporting the frames on a machined surface in the strainer body. Wire mesh edges and seams shall be folded back upon themselves and welded or brazed to preclude fraying. A seal shall be provided between the strainer element lands to prevent bypassing of contaminants. The seal shall be retained by the element (e.g., by a groove) to preclude gasket/O-ring loss during strainer changeover and element removal. The basket elements shall be held securely in place when the strainer is assembled. Baskets shall not rupture when totally clogged and subjected to a differential pressure equal to 125 percent of the maximum design pressure for a duration of 10 minutes. Materials shall be corrosion resistant and shall meet the performance requirements of this specification. Flow through the basket may be inside out or outside in, with the provision that construction and operating instructions (see 3.3.5) for outside in shall include measures to prevent accumulation of dirt in the strainer body.

3.3.6.6.1.1 Multi-straining elements. Each straining element shall be equipped with a separate seal between the straining element lands. Each straining element shall be individually secured, top and bottom, in the basket support frame.

3.3.6.6.1.2 Disposable straining elements. Disposable straining elements shall be in accordance with 3.3.6.6, except for 3.3.6.6.3. The basket compartment shall accommodate a muslin/nylon bag in a basket support frame. If the basket support frame design cannot support either a muslin/nylon or a polypropylene bag, a separate basket shall be provided. Muslin or nylon bags shall be fabricated from cloth having at least 70 yarns-per-inch in warp and fill direction. Muslin/nylon bag particle removal shall be equivalent to that of the strainer. The basket support frame shall be in accordance with 3.3.6.5.1 except that a wire mesh screening medium is not required.

3.3.6.6.2 Dirt holding capacity. Strainer basket assemblies shall retain 1 gram of test dust in accordance with 4.6.8.3.1 per gpm of rated flow without exceeding a differential pressure of 10 psi, or as specified (see 6.2), through the strainer when tested in accordance with 4.6.8.3.

3.3.6.6.3 Cleaning procedures. An effective secondary means of cleaning without special equipment shall be provided. The cleaning procedure shall result in an average clean basket pressure differential not greater than 6.6 psi, and the final minimum dirt holding capacity shall be 0.8 gram per gpm of rated flow when tested in accordance with 4.6.8.4.

3.3.6.6.4 Filtration ratio (beta ratio, B_X). When tested as specified in 4.6.8.2, the filter element shall have a minimum beta ratio of 75.

3.3.6.7 Magnet. Inside-out flow strainer baskets shall be equipped with magnets, which shall be secured to a tube with a guide rod in the center of each basket. The magnet element shall be withdrawn with the basket and shall be readily detachable for cleaning or replacement without damage to the wire mesh screens. The magnets shall have rounded ends. The magnets and magnet assembly shall be installed to prevent the magnets or magnet assembly from coming into contact with the strainer basket, should any unlocked screwed connection become unscrewed in service. For outside-in flow, magnets shall be placed in the center of the inlet flow path.

3.3.7 Type II – without magnets.

3.3.7.1 Class 1 strainers. Class 1 strainers shall be as specified in 3.3.6.1, except that magnets are not applicable.

3.3.7.2 Class 2 strainers.

3.3.7.2.1 Material. The material shall be in accordance with table IV.

TABLE IV. Materials for type II, class 2 strainers.

Part	Material	Applicable document	Remarks
Bodies, covers, bonnets, glands, and changeover valves (parts in contact with seawater)	Copper-nickel alloy	ASTM B369	Alloy C96400
	Bronze	MIL-B-24480	C95800
Clamps, yokes, and valve operators (parts not in contact with seawater)	Cast bronze	ASTM B30	Tin bronze Copper Alloy UNS No. C90300 or Copper Alloy UNS No. C92200
	Nickel-copper	MIL-C-24723	
	CRES	ASTM A276/A276M	
	CRES casting	MIL-C-24707/3	
Vent, drain, gage, and equalizing valves	Bronze, globe	803-4384536	1/
Threaded fasteners	Nickel-copper	MIL-DTL-1222	Grade R 400 or 405
Gaskets	O-ring	SAE AS3581	For all except threaded bosses
	Synthetic rubber	MIL-PRF-1149	
Packing for valve stems and rods		MIL-P-24396	
	O-ring	SAE AS3209	For threaded bosses
Basket	Copper-nickel plate	MIL-C-15726	Alloy C71500
	Nickel-copper plate	QQ-N-281	N04400 or N04405
Threaded plugs	Nickel-copper	QQ-N-281	MS18229
	Copper-nickel	MIL-C-15726	

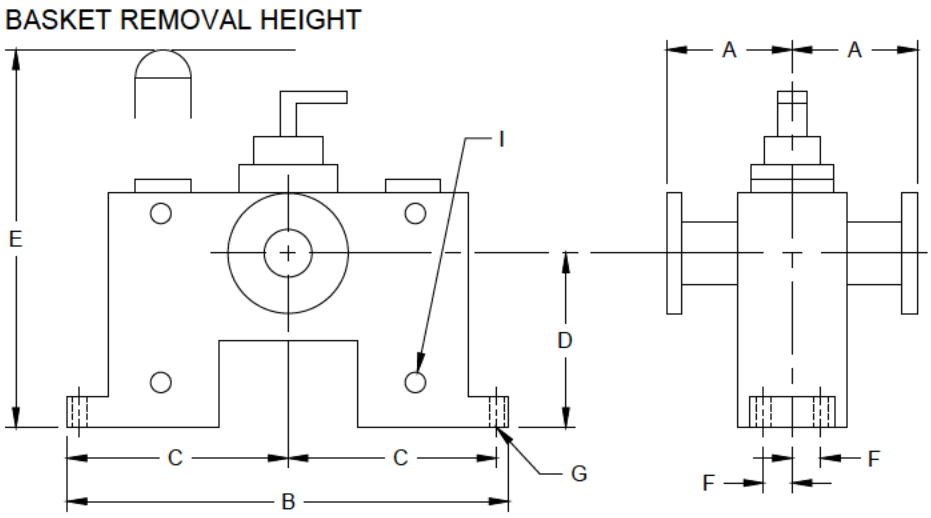
NOTE:

1/ Connections shall be either straight threaded unions or boss connections fitted with O-rings. Open ended valves with a union or boss connection must be secured to prevent accidental rotation of the threaded joint.

3.3.7.2.2 Flanges. Flanges shall be integrally cast with the body and shall be dimensionally in accordance with MIL-PRF-20042 as applicable to the design pressure.

3.3.7.2.3 Strainer basket and handle. The strainer basket and handle assembly shall be an integral unit. Baskets shall be perforated plate with a flange for securing the baskets in the strainer body. Strainer baskets and handles shall be at least 3/32-inch thick. The total clear area of the perforations shall be not less than three times the cross-sectional area of the strainer discharge connection. Unless otherwise specified (see 6.2), the basket sides and bottom shall have 1/8-inch diameter holes, spaced a minimum of 3/16 inch center to center. All welds shall be continuous. When finer straining is required, an inner liner shall be added to the basket. Baskets shall not rupture when totally clogged and subjected to a differential pressure equal to 125 percent of the maximum design pressure for a duration of 10 minutes.

3.3.7.2.4 Class 2 envelope dimensions. Dimensions shall be as specified on figure 1.



Nominal pipe size	2	3	4	5	6	8
A	7	9	10	14	14	16
B	22¼	25¼	32	40	45	58
C	10¼	11⅝	14⅞	18⅞	21¼	27⅞
D	9	12	15	22	22	30
E	28 MAX	38 MAX	48 MAX	55 MAX	55 MAX	72 MAX
F	2¼	3	3¾	4¾	5½	7¼
G	⅝	⅝	¾	1	1	1
I	½	½	½	1	1	1

NOTES:

1. All dimensions are in inches.
2. Flange drilling, straddles center line (see 3.3.7.2.2).
3. Vent valves ¼inch on inlet side of each compartment or on the basket compartment covers.
4. Drain valves on inlet side of each compartment.
5. Unless otherwise noted, all dimensions ±1/16 inch.
6. Half sizes shall use the next largest envelope dimension.
7. 6-inch and 8-inch strainer basket compartments are to be flanged to the changeover valve(s).
8. Foundation base shall be designed to accommodate a minimum of four mounting bolts.

FIGURE 1. Type II, class 2 envelope dimensions.

3.3.7.3 Classes 3 and 4. Class 3 and 4 strainers shall be in accordance with 803-5001048 (see table V).

TABLE V. Fuel oil strainer navy standard drawings.

Type and class	Navy standard drawing number	Nominal pipe size (inches)	Capacity (gpm)	Maximum clean differential pressure (PSID)	Maximum operating pressure (psi)	Maximum operating temperature (°F)	Basket mesh/wire OD (inches)
Type II, class 3	803-5001048	3	80	5	300 – 350	120	24 x 24/ 0.023
Type II, class 4	803-5001048	3	80	5	300 – 600	120	80 x 80/ 0.007

3.3.7.4 Class 5, 6, 7, and 8 strainers. Type II, class 5, 6, 7, and 8 strainers shall be in accordance with the requirements for the same class of type I strainer except magnets shall not be furnished.

3.3.8 Mechanical shock. The complete strainer assembly shall withstand the high-impact shock test specified in 4.6.5.

3.4 Workmanship. The strainer and its components shall be free from blow holes, porosity, hard spots, shrinkage defects, and cracks. All surfaces shall be smooth and clean. The inside surfaces of strainers shall be clean and free from sharp edges.

3.5 Welding and allied processes. Fabrication welding and inspection, and casting inspection and repair, shall be in accordance with S9074-AR-GIB-010/278 (see 4.6.11).

3.6 Prohibited materials. The strainer shall not contain any chemicals categorized as “prohibited” in accordance with T9070-AL-DPC-020/077-2. Zinc or cadmium plating shall not be used on any internal part of the strainer. Parts containing asbestos shall not be used.

3.7 Spares. Requirements for spare parts shall be as specified (see 6.2 and 6.5).

4. VERIFICATION

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

a. First article inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 First article inspection. First article inspection shall be performed on duplex strainers when a first article sample is required (see 3.1). This inspection shall include the examination of 4.5 and the tests of 4.6.

TABLE VI. First article and conformance inspection.

Examination and tests	First article	Conformance
Post-Foundry Production:		
Pilot Pressure Boundary Casting	4.6.11	---
Post-Production Tests:		
Examination	4.5	4.5
Shock	4.6.5	---
Hydrostatic	4.6.1	4.6.1
Tightness (leakage)	4.6.2	4.6.2
Torque	4.6.2.2	4.6.2.2
Operating Capacity	4.6.3	---
Pressure Drop	4.6.4	---
Spray Deflector	4.6.7	---
Safety Interlock	4.6.9	4.6.9
Equalizing Flow Rate	4.6.13	4.6.13
Operational Cycling	4.6.12	---
Basket Tests:		
Element Strength	4.6.6	---
Bubble Point	4.6.8.1.1	4.6.8.1.2
Retention Test	4.6.8.3	---
Cleaning Procedures	4.6.8.4	---
Non Destructive Test	4.6.10	4.6.10
Prohibited Materials	4.7	4.7

4.3 Conformance inspection. Conformance inspection shall include the examination of 4.4 and the tests of 4.5.

4.4 Sampling for visual and dimensional examination. A random sample of strainers shall be selected from each lot offered to the Government in accordance with ANSI/ASQ Z1.4 at inspection level II and Acceptance Quality Limit (AQL) as specified (see 6.2).

4.5 Visual and dimensional examination. The strainers shall be examined to verify conformance to the requirements of table VIII. Strainers having one or more defects shall be rejected.

TABLE VIII. Visual and dimensional examinations.

Inspection	Paragraph
General construction	3.3.1
Changeover mechanism	3.3.1.1
Changeover actuator	3.3.1.1.2
Safety interlock	3.3.1.1.2.1
Piping connection	3.3.2, 3.3.2.1, 3.3.2.2, and 3.3.2.3
Vent and drain valves	3.3.2.4
Cover	3.3.4
Anti-spray (except type II, class 2)	3.3.4.1
Identification plate	3.3.5
Material	3.3.6.1, 3.3.6.2, and 3.3.6.3
Flange (classes 1, 6, and 8)	3.3.6.4.1
(classes 2, 3, 5, and 7)	3.3.6.4.2
(type II, class 2)	3.3.7.2.2
Magnets (type I only)	3.3.6.7
Basket construction (classes 1, 2, 3, and 4)	3.3.6.5.1 – 3.3.6.5.2.2
(classes 5, 6, 7 and 8)	3.3.6.6.1, 3.3.6.6.1.1, and 3.3.6.6.1.2
(type II, class 2)	3.3.7.2.3
Type II class 1 material	3.3.7.1
Class 2 strainers material	3.3.7.2.1
Class 2 envelope dimensions	3.3.7.2.4
Type II classes 3 and 4 material	3.3.7.3
Type II classes 5, 6, 7, and 8 material	3.3.7.4
Quality of workmanship	3.6
Spare parts	3.7

4.6 Tests.

4.6.1 Hydrostatic pressure test for strength and porosity. The test shall be an internal pressure test with water or system fluid at a viscosity equivalent to water. Where water is detrimental to the unit being tested, corrosion inhibitors shall be added. Each completely assembled strainer shall be tested to a pressure equal to 150 percent of the design pressure for a duration of 60 minutes. During this test, the changeover valve shall be positioned to allow flow to both basket compartments. Any evidence of leakage shall be cause for rejection.

4.6.2 Tightness tests (leakage). Each strainer shall be tested for a duration of 30 minutes to verify the seal tightness for each valve seat of the three-way changeover valve at 100 percent of design pressure using test fluid as specified in 4.6.3. Any evidence of leakage shall be cause for rejection. The observation of wetting at the fluid boundary formed by the seal does not constitute leakage. Fluid-forming drops that become large enough to drop or flow away from the point of formation and into the basket compartment constitutes leakage.

4.6.2.1 Changeover operational sequence. The changeover operational sequence shall be as follows:

a. Ensure drain valve is shut.

b. Open vent valve on off-duty basket compartment.

c. Admit fluid slowly to off-duty compartment by means of equalizing valve.

d. When fluid flows from vent valve, close vent valve.

e. Examine off-duty compartment for leaks. If there is no evidence of leakage, proceed with step (f).

f. If leakage occurs, close equalizing valve, vent and drain compartment, remove cover, correct cause of leakage, replace cover, and repeat steps (a) through (d).

g. Shift flow slowly to off-duty side while watching for leaks. Fluctuations in differential pressure across the strainer may occur during shift. If leaks occur, shift quickly back to original flow pattern, and repeat step (f). If there is no leakage during shifting, proceed with step (g).

h. Shut equalizing valve.

i. Open vent valve (drain valve for type II, class 2) on new off-duty compartment.

j. Open drain valve (vent valve for type II, class 2) on new off-duty compartment and allow fluid to drain while removing cover.

k. When fluid level is below top of strainer basket, close drain valve.

l. Remove strainer basket, if installed, and slowly allow fluid to drip into strainer body. Remove magnets, if installed in baskets.

m. Clean basket and examine for damage. Repair or replace as necessary.

n. Replace magnets, if installed in basket.

o. Replace basket.

p. Examine cover gasket. Replace if damaged.

q. Replace and secure cover.

r. Open equalizing valve.

s. When fluid flows from vent valve, close vent.

t. Examine for leaks. If there is no evidence of leakage, close equalizing valve and proceed with other duties.

u. If leakage occurs, repeat step (f).

4.6.2.2 Torque test. While conducting the leakage test in 4.6.2, the force required to change over from one compartment to another, including valve unseating and reseating, shall be determined in both directions by (a) or (b) as follows:

a. The operating force applied at the radius of the handwheel.

b. The force applied at the end of the shifting lever (type II, class 2 only).

NOTE: Strainers whose operating force exceeds 40 pounds shall be rejected (see 3.3.1.1.3).

4.6.3 Operating test. The strainer shall be tested for pressure drop across the strainer at the specified design flow capacity and pressure under the conditions specified below. When specified (see 6.2), a range of pressure drops at specified operating conditions (see 6.2) shall be developed. For strainers intended for use with oil, the test shall be conducted with oil of the lowest viscosity specified (see 3.3.3) and repeated with oil of the highest viscosity specified (see 3.3.3) or as follows if not specified:

a. Type I, all classes, and type II, classes 5, 6, 7, and 8: test with oil having viscosity of 175 Standard Saybolt Universal (SSU) maximum.

b. Type II, class 1, 3, and 4: test with oil having viscosity of 95 SSU maximum.

c. Type II, class 2: test with water.

4.6.4 Pressure drop test. The strainer shall be tested for pressure drop across the strainer at the specified design flow capacity and pressure, under the conditions specified below. The clean pressure drop shall not exceed that specified (see 3.3.3) or, if not specified, 6 psi.

a. Type I, all classes, and type II, classes 5, 6, 7, and 8: test with oil having viscosity of 600 SSU minimum.

b. Type II, class 1, 3, and 4: test with oil having viscosity of 450 SSU minimum.

c. Type II, class 2: test with water.

NOTE: Strainers exceeding the specified clean pressure drop shall be rejected.

4.6.5 Mechanical shock test. The strainer shall be tested for compliance with high-impact shock resistance in accordance with MIL-DTL-901, grade A, at a laboratory acceptable to NAVSEA. After shock testing, the baskets shall be subjected to and pass the strength test in accordance with 4.6.6.

4.6.6 Basket strength test. The strainer basket assembly shall be tested by applying a differential pressure across the basket assembly equal to 125 percent of the specified strainer design pressure for the applicable type and class, using water for a duration of 10 minutes. Differential pressure shall be applied in a rapid manner, 1 minute or less. Alternate methods of obtaining differential pressure across the straining element such as those obtained when starting up with cold oil or having a strippable film on the element interior will be considered by NAVSEA. Straining elements which distort, stretch, or exhibit other weaknesses shall be rejected. Minor swelling of the pleated filter media does not constitute failure.

4.6.7 Spray deflector effectiveness test. One strainer of each type, class, size, and specific design shall be subjected to this test. The strainer shall be centered in a drip pan 3 inches deep and of a size and shape to allow a 4-inch clearance around the periphery. The strainer cover shall be installed with an O-ring which has been notched to cause leakage. The strainer shall be pressurized to maximum design pressure. Leakage shall be deflected into the drip pan. This test shall be conducted eight times with the O-ring notch moved clockwise 45 degrees between tests. Failure to pass this test in any leakage position shall require redesign of the deflector and retest.

4.6.8 Basket straining element tests for classes 5, 6, 7, and 8.

4.6.8.1 Bubble point tests.

4.6.8.1.1 Bubble point (first article inspection). Four basket assemblies shall be tested to determine the initial bubble point. The basket, containing no fluid, shall be installed in a test loop in accordance with the typical schematic diagram for air bubble test figure of MIL-DTL-8815. The fluid level shall be maintained at approximately ½ inch above the top of the basket. The air pressure, as indicated in inches of water on the manometer, shall be slowly raised by small increments. The basket assembly shall be rotated 360 degrees about its longitudinal axis for each increment of air pressure so that the entire area can be observed for the appearance of the first bubble. The area of greatest porosity is determined by observing the first bubble on the surface of the basket assembly and the manometer reading in inches of water at which this bubble emits from the basket assembly shall be recorded. This test shall be accomplished within a period of 10 minutes after immersion in the fixture. The fluid used shall be Proprietary Solvent Number 3, or equal, at 70±5 °F filtered through a 0.45-micrometer membrane Millipore filter, or equal.

4.6.8.1.2 Bubble point (conformance). The basket assembly, containing no fluid, shall be installed in a test loop in accordance with the typical schematic diagram for air bubble test figure of MIL-DTL-8815. The fluid level shall be maintained at approximately ½ inch above the top of the basket assembly. The air pressure shall be preset to 0.1 inch of water less than the minimum initial bubble point. The basket assembly shall be rotated 360 degrees about its longitudinal axis and the entire area scanned for the appearance of any bubbles. No bubble shall emerge from the basket assembly. The fluid used shall be Proprietary Solvent Number 3, or equal, at 70+5 °F filtered through a 0.45-micrometer membrane Millipore filter, or equal.

4.6.8.2 Filtration ratio (filter element efficiency). After completion of testing in accordance with 4.6.8.1.1, the elements shall be subjected to a filter element efficiency test using the specified test dust (see 6.2).

4.6.8.2.1 Test point values. The minimum allowable initial bubble point value shall be the lowest initial bubble point of the first article inspection baskets and shall be determined prior to further testing.

4.6.8.3 Retention test. The strainer basket assembly and its straining elements shall be tested for effectiveness of filtration using clean oil of the viscosity specified in 4.6.3.a. Oil shall be pumped through the strainer at rated flow. At the rate of 10 grams per 4 minutes, 1 gram per gpm of specified in 4.6.8.3.1 shall be added. After all dust has circulated, the pressure differential through the strainer and total weight of test dust retained by the basket assembly shall comply with 3.3.6.6.2.

4.6.8.3.1 Test contaminant. Unless otherwise specified (see 6.2), the test dust contaminant shall be of the proposed International Standards Organization (ISO) test dust grade identified in table IX.

TABLE IX. ISO test dust grades.

Size (micrometers)	Volume percent content of test dust larger than	
	Coarse	Medium
5	88 – 89	79 – 82
10	77 – 79	54 – 58
20	61 – 64	29 – 33
40	38 – 41	11 – 13
80	10 – 12	0 – 1
Filter rating (micrometers)	**Test dust grade**	
10–30	Medium	
25–80	Coarse	

4.6.8.4 Test of cleaning procedures. After completion of 4.6.8.3 the strainer basket assembly and its straining elements shall be cleaned in accordance with 3.3.6.3 and the clean basket assembly pressure differential shall be recorded. The test of 4.6.8.3 shall then be repeated nine times with dirt holding capacity and differential pressure after cleaning recorded for each test. The final dirt holding capacity and the average clean basket differential pressure increase shall be as specified in 3.3.6.3.

4.6.9 Verification of safety interlock effectiveness. Except type II, class 2, it shall be demonstrated that actions prohibited by 3.3.1.1.2.1 are positively prevented by the interlocks. Strainers permitting the actions in 3.3.1.1.2.1 shall be rejected.

4.6.10 Non-destructive test. The strainer and its components shall have welds and casting surfaces inspected in accordance with S9074-AR-GIB-010/278. Welds or castings not in accordance with S9074-AR-GIB-010/278 shall be rejected.

4.6.11 Pilot pressure boundary casting test. Prior to production of casting lots, each foundry shall establish foundry methods and techniques, produce one casting, and subject it to radiographic and dye penetrant testing in accordance with S9074-AR-GIB-010/278.

4.6.12 Operational cycling tests. The strainer shall be tested for a total of 600 cycles at design pressure and flow rates. One complete cycle is defined by the operation of the changeover valve switching one basket on-line to the other and back again. At the completion of the 600 cycles, compliance with the requirements of 3.3.1.1.3 and 3.3.1.1.5 shall be demonstrated, as specified by 4.6.2.

4.6.13 Verification of equalizing flow rate. Each assembled strainer shall be tested in the equalizing positions to verify that the strainer is in accordance with 3.3.1.1.1. Strainers exceeding 10 gpm equalizing flow shall be rejected.

4.7 Prohibited materials. Prohibited materials shall be verified as specified (see 3.8 and 6.2).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

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 high-reliability strainers specified are intended for installation on the discharge side of pumps aboard naval ships and are expected to last the life of the ship. Current stock of strainers may be used until depleted; future requisitions for strainers should refer to the current version of this specification.

6.2 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number, and date of this specification.

b. Type, class, and size required (see 1.2, 1.2.2, and 1.3.2).

c. Specific issue of individual documents referenced (see 2.2.1, 2.2.2, and 2.3).

d. When first article is required (see 3.1).

e. Alternate or additional design characteristics (see 3.3).

f. Alternate shifting mechanisms (see 3.3.1.1.2).

g. Piping connections (see 3.3.2).

h. Inlet and outlet connection type, size, and flange face finish (see 3.3.2.1, 3.3.6.4.1, and 3.3.6.4.2).

i. Whether gauge connections are required at inlet and outlet (see 3.3.2.2).

j. Whether equalizing connections are required (see 3.3.2.3).

k. The required design flow capacity, design pressure, range of fluid temperature and viscosity, and maximum allowable pressure drop (see 3.3.3).

l. National Stock Number (see 3.3.5).

m. Alternate magnet characteristics (see table II).

n. Terminal differential pressure drop (see 3.3.6.6.2 and 4.6.8.3).

o. Alternate strainer basket design and characteristics (see 3.3.7.2.3).

p. Requirements for spare parts (see 3.7 and 6.5).

q. AQL of 1.0 (see 4.4).

r. Whether a range of differential pressure drops must be reported for various operating conditions (see 4.6.3).

s. Alternate filtration ratio (filter element efficiency) (see 4.6.8.2).

t. Test dust (see 4.6.8.3.1).

u. Requirement for prohibited material verification (see 3.6 and 4.7).

v. Packaging requirements (see 5.1).

w. When special lifting equipment is required (see 6.6)

x. Pre-installation instructions (see 6.7)

6.3 First article. When a first article inspection is required, the items should be a first article sample. The first article should consist of the units specified. The contracting officer should 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.

6.4 Sub-contracted material and parts. The packaging or delivery preparation 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.

6.5 Ordering spare or repair parts. 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 first article inspection provisions as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified.

6.5.1 Repair parts and repair parts boxes. Complete sets of repair parts should be furnished for each type and class as follows:

a. One set of repair baskets for each of the ten initial strainers supplied.

b. One set of repair baskets for each two additional strainers supplied.

c. Cover gaskets – four for every strainer supplied.

d. Other gaskets, seals and springs –·one set for every ten strainers supplied.

When specified (see 6.2), items (c) and (d) should be furnished in repair boxes.

6.6 Special lifting equipment. Strainer components requiring lifting equipment should be kept to a minimum. When lifting equipment is required, the weight of the component and the method of lifting used should be identified.

6.7 Pre-installation instruction. When specified (see 6.2), a set of instructions covering the pre-installation of the equipment should be furnished. Instructions should include all information necessary to return the unit to active status, such as, but not limited to: the addition of lubricants prior to operation, flushing of lines, removal of grease-proof barrier, and the location of detached components. Instructions should be packaged in a transparent waterproof plastic bag, minimum 4 mil thick. Closure should be by heat sealing. The shipping container in which the instructions are packed should be so marked.

6.8 Subject term (key word) listing.

Basket

Filtration

Fuel

Lube oil

Seawater

Valves

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 extent of the changes.

CONCLUDING MATERIAL

Preparing activity:
Navy – SH
(Project 4730-2017-075)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at https://assist.dla.mil.