

INCH-POUND

A-A-59008

22 July 1997

COMMERCIAL ITEM DESCRIPTION

STRAINERS, SELF-CLEANING, BACKFLUSH TYPE  
(MANUAL OR AUTOMATED)

The General Service Administration has authorized the use of this commercial item description, for all federal agencies.

1. SCOPE

1.1 Scope. This commercial item description covers both manual and automated backflush type self-cleaning strainers.

1.2 Intended use. The strainers specified are intended for installation in sea water piping systems on the discharge side of the pump.

2. CLASSIFICATION

2.1 Classification. Backflush type self-cleaning strainers shall be of the following types, classes, styles, and sizes as specified (see 7.1):

Type I - Manual.

Type II - Automated.

Class 150 - 150 pounds per square inch gage (psig) pressure rating.

Class 250 - 250 psig pressure rating.

Style 1 - Rotational divider, sizes 2, 3, 4, 6, 8, 10, 12, 14, 16, 20 and 24 inch.

Style 2 - Rotational backwash arm, sizes 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20 and 24 inch.

Beneficial comments, recommendations, additions, deletions, clarifications etc. and any other data which may improve this document should be sent to: Commander, SEA 03R42, Naval Sea Systems Command, 2531 Jefferson Davis Hwy, Arlington, VA 22242-5160.

AMSC N/A

FSC 4730

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### 3. SALIENT CHARACTERISTICS

3.1 Codes and standards. Strainer shall comply with the applicable requirements of Table I.

3.2 Design and construction. Each strainer shall be of the type, class, style, and size as specified (see 2.1). The self cleaning action shall remove particulate contaminants from the sea water system without interrupting the operation of that system. The straining element shall be cleaned in segments such that the particulate contaminants are flushed free of the strainer.

3.3 Material. The material requirements for all strainer components shall be in accordance with Table II.

TABLE I. Reference data.

Equipment/Characteristic	Description
Fuel type	Sea water
Operating pressure	150, 250 psi
Temperature range	70 to 150°F
Piping connections	
Inlet, outlet, and screen compartment	MIL-F-20042 raised face flanges
Vent, drain and gage	SAE J 1926
Screen	Table VII
Pressure resistance	FCI 78-1
Flow capacity	Table III per ISA-S75.02
Shock resistance	MIL-S-901, grade A
Type II strainer only	
Motor	MIL-M-17059
Control panel	MIL-M-38510 and MIL-STD-1686

3.4 Straining element. The straining element shall be made of one unit. The element shall be of the perforated plate or plate type construction. All seam welds shall be continuous.

3.4.1 Straining element compression strength test. The straining element shall be tested by applying a differential pressure (outside-inside) across the straining element equal to 100 percent of the specified strainer design pressure for the applicable type and class, using water for a duration of 5 minutes. Differential pressure shall be applied in a rapid manner, one minute or less.

3.4.2 Straining element expansion strength test. The straining element shall be tested by applying a differential pressure (inside-outside) across the straining element equal to 100 percent of the specified strainer design pressure for the applicable type and class, using water for a duration of 20 minutes. Differential pressure shall be applied in a rapid manner, one minute or less.

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3.5 Actuation. Each strainer shall be fitted with a shaft along its rotational axis, which penetrates the compartment cover through a watertight seal. Outside the housing, the shaft shall be capable of being fitted with either a handle (Type I) or an electric motor actuator (Type II). Each type I strainer shall be sized and configured so that maximum required operating force is less than 50 pounds. For certain hazard areas, such as installation in a JP-5 pump room, type II strainer motors shall be explosion proof.

TABLE II. Materials required for strainers.

Part	Material	Applicable documents	Remarks
Bodies, covers	Copper-nickel	ASTM B 369	C96400
	NiAl bronze	ASTM B 148	C95800
Collar, handle	Cast tin bronze	ASTM B 61	C92200
	CRES	ASTM A 276	C31600
Self cleaning mechanism	NiCu alloy	ASTM B 127	N04400
	NiAl bronze	ASTM B 148	C95800
Threaded fasteners	NiCu alloy	ASTM F 467	N04400, N04405
		ASTM F 468	
"O"-ring	Fluorocarbon	MIL-R-83248/1	For all except threaded bosses
		MIL-R-83248/2	Threaded bosses
Straining element	CuNi plate	ASTM B 122	C71500
	NiCu plate	ASTM B 127	N04400, N04405

3.6 Self cleaning mechanism.

3.6.1 Style 1. The straining element is divided by a vertical partition which yields 2 - halves of a cylindrical element. At the bottom of each half, there is a drain connection which will be used to connect backflush valves at installation. Backflushing is accomplished by rotating the divider handle 180°, diverting flow to the clean half of the element, and then opening the drain valve of the dirty half. A portion of the fluid, flows back through the dirty element freeing the contaminant and allowing the debris to be flushed from the strainer. Fluid use to flush the debris out of the strainer shall not exceed 15% percent of the total flow through the strainer assembly. Strainer shall be fitted with two flushing connections one for each partitioned straining compartment.

3.6.2 Style 2. The straining element is cleaned by a hollow backwash arm which rotates inside the element. Backflushing is accomplished by opening the drain valve, diverting fluid flow back through a portion of the element. The debris flows into hollow backwash arm and out of the strainer. The backwash arm then rotates to the next portion of the element. Fluid used to flush the debris out of the strainer shall not exceed 15% percent of the total flow through the strainer assembly.

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3.7 Covers. Covers shall be flanged and attached to the body by bolts. Each cover shall effect a positive seal on an O-ring.

3.8 Functional performance. Unless otherwise specified (see 7.1), design flow capacity, design temperature, and clean pressure drop shall be as specified in Table III.

3.8.1 Operational cycling tests. The strainer shall be tested for a total of 600 hours at design pressure and flow rates. Strainer shall be backflushing once every hour during testing period. At the completion of the 600 hours, compliance with the required operating force of 50 pounds or less and zero leakage shall be demonstrated. Upon satisfactory completion of this test the unit shall be refurbished to new condition before being offered for delivery.

3.9 Envelope dimensions. Envelope dimensions shall be in accordance with Table IV.

3.10 Workmanship. The strainer body and covers shall be of uniform quality and condition, free from blow holes, porosity, hard spots, shrinkage defects, cracks, and other defects. All surfaces shall be smooth and well cleaned. The inside surfaces of strainers shall be well cleaned and free from sharp edges.

TABLE III. Functional performance.

Size	Clean pressure drop at flow rate		Temperature F degrees
	(psi)	(gpm)	
2	2	80	150
3	2	175	150
4	2	325	150
6	2	750	150
8	2	1400	150
10	2	2000	150
12	2	3000	150
14	2	4000	150
16	2	5000	150
18	2	7000	150
20	2	9000	150
24	2	13,000	150

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TABLE IV. Envelope dimensions.

Size	Style 1				Style 2			
	Flange to Flange	Width	Height	Screen removal	Flange to Flange	Width	Height	Screen removal
2	14.00	11.00	20.25	24.50	18.25	12.00	28.00	37.00
3	15.00	12.00	20.25	24.50	18.25	12.00	28.00	37.00
4	19.00	14.00	23.50	28.00	18.25	12.00	28.00	37.00
6	24.00	18.00	28.50	34.25	29.00	21.25	39.00	50.00
8	29.50	22.75	25.50	42.50	27.00	21.25	39.00	50.00
10	35.50	29.00	35.25	53.25	39.50	31.00	54.00	74.00
12	42.50	33.50	51.25	61.25	37.75	31.00	54.00	74.00
14	47.50	37.00	58.25	73.50	45.50	37.00	55.50	82.00
16	54.25	40.25	64.25	82.75	45.50	37.00	55.50	82.00
18	----	----	----	-----	55.00	44.25	71.50	85.00
20	55.50	51.75	76.25	99.25	52.00	44.25	71.50	85.00
24	76.00	60.00	90.00	107.00	65.00	65.00	90.00	113.00

#### 4. REGULATORY REQUIREMENTS

4.1 Recovered materials. The offeror/contractor is encouraged to use recovered materials to maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

4.2 Prohibited material. Zinc or cadmium plating shall not be used on any part of the strainer.

4.3 Mercury exclusion. The strainer shall be free of mercury contamination. During the manufacturing process, tests, and examination, the product to be offered for acceptance shall not come in direct contact with mercury or any of its components, nor with any mercury containing device employing a single boundary of containment.

#### 5. QUALITY ASSURANCE PROVISIONS

5.1 Product conformance. The products provided shall meet the salient characteristics of this commercial item description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same production offered for sale in the commercial market. The government reserves the right to require proof of such conformance.

5.2 Additional inspection. Where other specifications form a part of this specification, sampling, examination, and tests shall be conducted as required by the pertinent specification, unless otherwise specified in the contract or order (see 7.1).

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## 6. PACKAGING

6.1 General requirement. Commercial packaging shall be in accordance with the requirements of ASTM D 3951.

6.1.1 Container modification. Shipping containers exceeding 200 pounds gross weight shall be provided with a minimum of two, 3- by 4-inch nominal wood skids laid flat, or a skid- or sill-type base which will support the material and facilitate handling by mechanical handling equipment during shipment, stowage, and storage.

## 7. NOTES

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

7.1 Acquisition requirements. Acquisition documents must specify the following.

- (a) Title, number, and date of this commercial item description.
- (b) Type, class, and style required (see 2.1).
- (c) Straining element design and characteristics (see 3.4).
- (d) Whether alternate motor design is required (see 3.5).
- (e) Whether gage connections are required at inlet and outlet (see Table I).
- (f) The required design flow capacity, design pressure, design temperature, and clean pressure drop (see Table III).
- (g) Quantity of technical manuals and drawings required (see 7.3).
- (h) Whether repair parts are required (see 7.5.1).
- (i) Issue of DODISS to be cited in the solicitation, and if required, the specified issue of individual documents referenced (see 7.2.1.1).

7.2 Sources of documents.

7.2.1 Government documents. The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified.

7.2.1.1 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 listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 7.1).

## SPECIFICATIONS

## DEPARTMENT OF DEFENSE

- MIL-S-901 - Shock Tests, H.I. (High-Impact); Shipboard Machinery, Equipment, & Systems, Requirements for.
- MIL-M-17059 - Motors, 60-Cycle, Alternating Current, Fractional H.P., Shipboard Use.
- MIL-F-20042 - Flanges, Pipe, Bronze (Silver Brazing).

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## DEPARTMENT OF DEFENSE (Continued)

- MIL-M-38510 - Microcircuits, General Specification for.
- MIL-R-83248 - Rubber, Fluorocarbon Elastomer, High Performance Fluid and Compression Set Resistant.
- MIL-R-83248/1 - Rubber, Fluorocarbon Elastomer, High Temperature Fluid and Compression Set Resistant (O-Rings, Class 1, 75 Hardness).
- MIL-R-83248/2 - Rubber, Fluorocarbon Elastomer, High Pressure Fluid (O-Rings, Class 2, 60 Hardness).

## STANDARDS

## DEPARTMENT OF DEFENSE

- MIL-STD-1686 - Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies, and Equipment (Excluding Electrically Initiated Explosive Devices), Metric.

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

7.2.2 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 7.1).

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- A 276 - Standard Specification for Stainless and Heat Resisting Steel Bars and Shapes.
- B 61 - Standard Specification for Steam or Valve Bronze Castings.
- B 122 - Standard Specification for Copper-Nickel-Tin Alloy, Copper Nickel-Zinc Alloy (Nickel Silver), and Copper-Nickel Alloy Plate, Sheet, Strip and Rolled Bar.
- B 127 - Standard Specification for Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip.
- B 148 - Standard Specification for Nickel Aluminum Alloy.
- B 369 - Copper Nickel Alloy Castings.
- D 3951 - Commercial Packaging, Practice for.
- F 467 - Standard Specification for Nonferrous Nuts for General Use.
- F 468 - Standard Specification for Nonferrous Bolts, Hex Cap Screws, and Studs.

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2859.)

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FLUID CONTROL INSTITUTE (FCI)

78-1 - Pressure Rating Standard For Pipeline Strainers Other Than "Y" Type.

(Application for copies should be addressed to the Fluid Control Institute, Inc., P.O. Box 3854, Tequesta, FL 33458.)

INSTRUMENT SOCIETY OF AMERICA (ISA)

S75.02 - Control Valve Capacity Test Procedure.

(Application for copies should be addressed to the Instrument Society of America, 67 Alexander Dr., P.O. Box 12277, Research Triangle Park, NC 27709.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

J 1926 - Specification for Straight Thread O-Ring Boss Port.

(Application for copies should be addressed to the Society of Automotive Engineers Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

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

7.2.3 Order of precedence. In the event of a conflict between the text of this commercial item description and the references cited herein, the text of this commercial item description takes precedence. Nothing in this commercial item description, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

7.3 Technical manuals. The requirement for technical manuals should be considered when this commercial item description is applied to a contract. If technical manuals are required, military specifications and standards which have been cleared and listed in DoD 5010.12-L (AMSDL) must be listed on a separate CDRL (DD Form 1423), included as an exhibit to the contract. The technical manuals must be acquired under a separate contract line item in the contract.

7.4 Sub-contracted material and parts. The packaging or delivery preparation requirements of referenced documents listed in section 7.2 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.

7.5 Ordering spare or repair parts. When ordering spare parts or repair parts for the equipment covered by this commercial item description, the contract should state that such spare parts and repair parts should meet the same requirements as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified.

7.5.1 Repair parts and repair parts boxes. Complete sets of repair screens for each type and class shall be furnished as follows:

- (a) One set for each of the ten initial strainers required.
- (b) One set for each two additional strainers required.



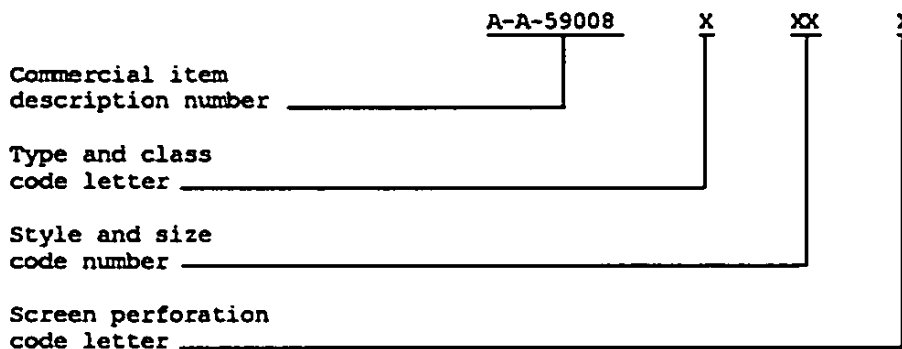
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- (c) Cover O-rings - four for every strainer supplied.  
 (d) Other O-rings, and seals - one set for every ten strainers supplied.

When specified (see 7.1) items (c) and (d) shall be furnished in repair boxes.

**7.6 Preinstallation instruction.** A set of instructions covering preinstallation 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 greaseproof barrier and the location of detached components. Instructions should be packaged in a transparent waterproof plastic bag. Closure should be by heat sealing. The shipping container in which the instructions are packed should be so marked.

**7.7 Part number.** The part number is a definitive number which corresponds to the type, class, style and size of strainers covered by this commercial item description. The commercial item description number, the type and class code letter, the style and size code numbers and screen perforation code letter are combined to form a definitive part number. Part numbers for the strainers are assigned as follows:



**7.7.1 Type and class.** The type and class of strainer (see 2.1) are identified by a single letter (see Table V).

TABLE V. Code letter to type and class.

Class	Type	
	I	II
150	A	B
250	C	D

**7.7.2 Style and size.** The style and size of strainer (see 2.1) are identified by a double digit number (see Table VI).

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TABLE VI. Code number to size and style.

Size	Style	
	1	2
2	01	02
3	03	04
4	05	06
6	07	08
8	09	10
10	11	12
12	13	14
14	15	16
16	17	18
18	--	20
20	21	22
24	23	24

7.7.3 Screen perforation. The screen perforation of strainer (see 2.1) are identified by a single letter (see Table VII).

TABLE VII. Code letter for screen perforation.

PERFORATED SCREENS		
Hole size	System particle size tolerance range	Code
1/4"	.47 to .62	A
3/16"	.31 to .47	B
1/8"	.24 to .31	C
3/32"	.15 to .24	D
1/16"	.09 to .15	E
1/32"	.06 to .09	F

7.8 Subject term (key word) listing.

Automated  
Screen  
Cleaning  
Filtration  
Manual  
Motor

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CIVIL AGENCY COORDINATING ACTIVITY:  
GSA-PSS

MILITARY INTERESTS:

Custodians:

Army - MR  
Navy - SH  
Air Force - 99

Preparing activity:

Navy - SH  
(Project 4730-0444)

Review activities:

Navy - SA  
Air Force - 82  
DLA - CS

## STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

**INSTRUCTIONS**

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

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

**I RECOMMEND A CHANGE:**

1. DOCUMENT NUMBER

A-A-59008

2. DOCUMENT DATE (YYMMDD)

970722

3. DOCUMENT TITLE

STRAINERS, SELF-CLEANING, BACKFLUSH TYPE (MANUAL OR AUTOMATED)

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 (*Exclude Zip Code*)d. TELEPHONE (*Exclude Area Code*)

(1) Commercial

(2) AUTOVON

*(If applicable)*

7. DATE SUBMITTED

*(YYMMDD)*

8. PREPARING ACTIVITY

a. NAME

POC CHRIS GALECKI

b. TELEPHONE (*Exclude Area Code*)

(1) Commercial

(215) 897-7239

(2) AUTOVON

443-7239

c. ADDRESS (*Exclude Zip Code*)

COMMANDER, SEA 03R42  
 NAVAL SEA SYSTEMS COMMAND  
 2531 JEFFERSON DAVIS HWY  
 ARLINGTON, VA 22242-5160

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Defense Quality and Standardization Office  
 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3468  
 Telephone (703) 758-2340 AUTOVON 289-2340