

INCH-POUND

MIL-PRF-13789E
 01 February 1999
 SUPERSEDING
 MIL-S-13789D
 11 October 1990

PERFORMANCE SPECIFICATION

STRAINERS, SEDIMENT: PIPELINE, BASKET TYPE

This specification is approved for use by all departments and agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers single element basket-type sediment strainers from 0.75 to 12.00-inch nominal pipe size, for the removal of foreign material from fuel and oil service lines.

1.2 Classification. The strainers are classified by type, class, material, perforation, and size.

1.2.1 Type. Strainer type by inlet and outlet connection configuration will be as follows:

T	=	Threaded.
F	=	Flanged.
G	=	Grooved end.

1.2.2 Class. Strainer class by flange class number will be as follows:

1	–	Class 125.
2	–	Class 150.
3	–	Class 250.
4	–	Class 300.
5	–	Class 600.

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

Beneficial comments, recommendations, additions, deletions, and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-D/210, Warren, MI 48397-5000 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.
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AMSC N/A

FSC 4730

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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 requirement documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents that 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 SOCIETY OF MECHANICAL ENGINEERS (ASME)

- ASME B1.20.1 – Pipe Threads, General Purpose (Inch) (DoD adopted)
- ASME B16.1 – Cast Iron Pipe Flanges and Flanged Fittings (DoD adopted)
- ASME B16.5 – Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 (DoD adopted)
- ASME B16.21 – Nonmetallic Flat Gaskets for Pipe Flanges (DoD adopted)
- ASME B18.2.1 – Square and Hex Bolts and Screws (Inch Series) (DoD adopted)
- ASME B18.2.2 – Square and Hex Nuts (Inch Series) (DoD adopted)

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

AMERICAN WATER WORKS ASSOCIATION (AWWA)

- AWWA C606 – Grooved and Shouldered Joints (DoD adopted)

(Application for copies should be addressed American Water Works Association, 6666 West Quincy Avenue, Denver, Colorado 80235.)

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 Description. The basket-type sediment strainer shall contain the items necessary to remove foreign material from fuel and oil service lines.

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.3 Physical characteristics.

3.3.1 Strainer body. The strainer body configuration shall provide for fluid flow through the strainer basket from the inside out.

3.3.1.1 Perforation diameter. Plate perforation diameter will be in accordance with table I.

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TABLE I. Plate perforation size code.

Plate perforation size in inches (mesh)	Code for plate perforation
0.0045 (130 mesh)	A
0.0070 (80 mesh)	B
0.0157 (40 mesh)	C
0.031 (20 mesh)	D
0.062 (10 mesh)	E
0.125	F
0.187	G
0.250	H
0.375	J

3.3.1.2 Size. The nominal inside diameter strainer size will be expressed in four significant figures, XX.XX (100ths of an inch) increments. For example 0125 is 1.25-inch nominal inside diameter; 1200 is 12.00-inch nominal inside diameter.

3.3.1.3 Drain port. A port, with plug, shall be required at the strainer body low point to provide for draining of residual fluid.

3.3.1.4 Threads. All screw-type threads shall conform to ASME B1.20.1.

3.3.1.5 Thread compound. Port and plug threads shall be coated with a gasket-forming compound capable of resisting fuel or water degradation.

3.3.2 Strainer basket. The strainer basket shall be single-or double-walled and shall be removable from the strainer body without the use of special tools.

3.3.2.1 Screen. The strainer basket screen shall be made from bronze, brass, corrosion resistant steel, monel wire, or other suitable corrosion resistant, fuel and oil compatible, material.

3.3.2.2 Open area. The open area of the strainer basket screen shall be greater than 30 percent of the screen total area. The net open area shall be greater than 300 percent of the cross-sectional area of the inlet opening.

3.3.3 Inlet and outlet connections. Inlet and outlet connections shall be on a common axis passing through the strainer body.

3.3.3.1 Threaded. All screw-type threaded connections shall be internal National Pipe Thread (NPT) in accordance with ASME B1.20.1.

3.3.3.2 Flanged. All flanged connections, gaskets, bolts, and nuts shall be in accordance with ASME B16.1 or ASME B16.5, ASME B16.21, ASME B18.2.1, and ASME B18.2.2, respectfully.

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3.3.3.3 Grooved. All grooved connections shall be in accordance with AWWA C606-97, table 4 (Cut grooving dimensions - Steel, aluminum, brass, and other metallic pipe of IPS dimensions)

3.3.4 Dimensions. The strainer shall not exceed 36.00 ± 0.25 -inches in overall length for 6.00-inch and smaller connections, or 48.00 ± 0.25 -inches for connections over 6.00-inches.

3.4 Performance.

3.4.1 Working and hydrostatic pressures. The strainer shall conform to the working and hydrostatic pressures listed in table II.

- a. The strainer shall not leak or sweat, when subjected to the maximum working or hydrostatic pressure.
- b. The strainer basket shall be easily removed and not collapsed or bulged when subjected to the maximum hydrostatic pressure and the surging action during operating conditions.

TABLE II. Working and hydrostatic pressure requirements

Requirement	Class				
	125/ ¹	150/ ²	250/ ¹	300/ ²	600/ ²
Working pressure for water, oil, or gas at 100 °F (psi)-	175	275	400	720	1440
Hydrostatic pressure (psi)-	270	410	600	1080	2160

¹ – Pressures in accordance with ASME B16.1

² – Pressures in accordance with ASME B16.5

3.4.2 Environmental.

3.4.2.1 Storage temperature. The strainer shall perform as specified after storage at any ambient temperature from -60 to 160 degrees Fahrenheit (°F).

3.4.2.2 Operating temperatures. The strainer shall perform as specified at ambient temperatures from -40 to 125 °F.

3.5 Support and ownership requirements.

3.5.1 Identification marking. Identification markings shall be permanent, legible, and shall include as a minimum the manufacturer's identification code, the manufacturer's part number, and the national stock number (NSN) as provided.

3.5.2 Materials. The materials selected for construction are the responsibility of the contractor. The materials shall be of sufficient durability to meet all the performance requirements as specified herein. The material shall have no adverse effect on the health of personnel when used for its intended purpose.

3.5.2.1 Deterioration prevention and control. The strainers shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration to which the material is susceptible.

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3.5.2.2 Dissimilar metals. Dissimilar metals shall not be used in intimate contact with each other unless protected against galvanic corrosion (see 6.4.4).

3.5.2.3 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable 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 (see 6.4.5).

3.5.3 Cleaning, treatment, and painting. All surfaces of the strainers, normally painted internally and externally shall be cleaned, treated, and painted in accordance with the manufacturer's standard commercial practice. The top coat color shall be as specified in the contract or order (6.2).

4. VERIFICATION

4.1 Classification of inspections. Inspections shall be classified as follows:

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First article inspection. The first article inspection shall be performed on a minimum of one strainer (see 3.2 and 6.2). This inspection shall include the examinations of table III and first article tests in table IV. Nonconformance to any specified requirement, the failure of any test, or the presence of one or more defects shall be cause for rejection.

4.3 Conformance inspection. The conformance inspection of table III shall be performed on all strainer production units. Nonconformance to any specified requirement, the failure of any test, or the presence of one or more defects shall be cause for rejection.

4.4 Examination. The examination shall be in accordance with table III.

TABLE III. Examination schedule.

Exam	Examination description	Requirement paragraph	Method of examination
E-1	Components missing or not specified.	3.1	Visual / Doc.
E-2	Strainer body not as specified.	3.3.1	Visual / Doc.
E-3	Strainer basket not as specified.	3.3.2	Visual
E-4	Inlet and outlet connections not as specified.	3.3.3	Visual
E-5	Dimensions not as specified.	3.3.4	SIE

Table III. Examination schedule - Continued

E-6	Identification and markings not as specified.	3.5.1	Visual
E-7	Materials not as specified.	3.5.2	Visual / Doc.
E-8	Color not as specified.	3.5.3	Visual

Doc. = Document, SIE = Standard Inspection Equipment

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4.5 Tests. Testing shall be in accordance with table IV and performed in the sequence. Unless stated, the tests shall be performed at ambient temperatures.

TABLE IV. Test schedule

Test	Test description	Requirement paragraph	Test paragraph
T-1	Working pressure.	3.4.1	4.5.2
T-2	Hydrostatic pressure.	3.4.1	4.5.3
T-3	Strainer removal and deformation.	3.4.1	4.5.4
T-4	Environmental.	3.4.2	4.5.5

4.5.1 Test medium. Water shall be used as the test medium.

4.5.2 Working pressure. The strainer shall be subjected to the working pressure as specified by class for a continuous period of 15 minutes. Leakage or sweating, when subjected to the maximum working pressure, shall constitute failure of this test.

4.5.3 Hydrostatic pressure. The strainer shall be subjected to the hydrostatic pressure as specified by class for a continuous period of 15 minutes. Leakage or sweating, when subjected to the maximum hydrostatic pressure, shall constitute failure of this test.

4.5.4 Basket removal and deformation. With the hydrostatic pressure maintained as specified by class, the downstream closure of the strainer shall be opened suddenly. Drain all fluid from the strainer by opening the drain port. Remove the strainer basket and examine. Deformation, collapse or bulging of the basket, when subjected to the maximum hydrostatic pressure and the surging action during operating conditions, shall constitute failure of this test. The strainer basket not being easily removed shall also constitute failure of this test.

4.5.5 Environmental. The environmental test shall consist of a 72 hour cycle performed on a strainer. The strainer shall be placed in a temperature chamber and the temperature gradually raised over a six hour period to 160 ± 3 °F. The temperature shall be maintained for a period of 24 hours. At the completion of the 24 hour period, the temperature shall be lowered to 73 ± 3 °F, and maintained for six additional hours. Over the next six hour period, gradually lower the temperature to -60 ± 3 °F and maintain for 24 hours. At the completion of the 24 hour period at -60 °F, the temperature shall be raised to 73 ± 3 °F and maintained for six hours. Remove the strainer for testing and repeat the functional tests 4.5.2, 4.5.3, and 4.5.4. Nonconformance to 3.4.2 shall constitute failure of this test.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military

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Department 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 strainers will be used in an integrated military petroleum pipeline. The strainer must interface between meters, pumps, and other pipeline equipment to remove material damaging to the equipment if it were allowed to enter. The vagaries of the battlefield require the petroleum equipment specification to exceed commercially available products in the range of performance. The expected operating terrain, climate, and conditions are unique and beyond the design of similar commercial items

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this publication.
- b. Type, class, material, perforation diameter, and size, as 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 2.2).
- d. When first article testing is required (see 3.2).
- e. Color of top coat required (see 3.5.3).
- f. Packaging requirements (see 5.1).

6.3 Data Requirements. The contracting officer will include requirements for such data as technical publications, instructional materials, illustrated parts lists, and contractor's maintenance and operation manuals to be furnished with each clamp assembly.

6.4 Definitions.

6.4.1 Basket. Refers to screen shape and fluid flow into the basket and out through the sides.

6.4.2 Screen. Component of the strainer that performs the filtering action.

6.4.3 Strainer. A unit placed either in a pipeline or as a branch off of a pipeline, that removes foreign material prior to entering pumps, valves, or other equipment that may be damaged if the foreign material is ingested.

6.4.4 Dissimilar metals. For its purpose, this document considers metals dissimilar when two specimens in contact with each other promote accelerated galvanic corrosion (see 3.5.2.2).

6.4.5 Recovered materials. For the purpose of this document, recovered materials are those materials that have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials (see 3.5.2.3).

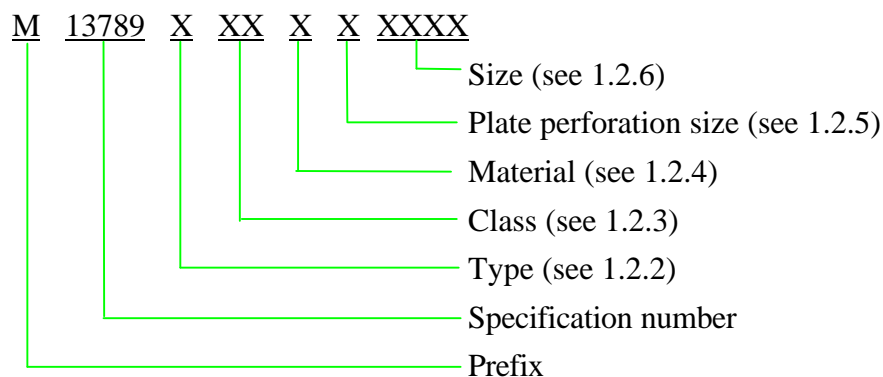
6.5 Subject term (key word) listing.

Filter

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Mesh
Perforation
Screen

6.6 Part Identification Number (PIN). The following part identification numbering procedure is for government purposes and does not constitute a requirement for the contractor. This example describes a part numbering system for specification MIL-PRF-13789E.



6.7 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.

Custodians:

Army – AT
Navy – YD2
Air Force – 99

Preparing activity:

Army – AT

(Project 4730-1034)

Review activities:

Army – CE
Navy – CG and SH
DLA – CC

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I RECOMMEND A CHANGE:

 1. DOCUMENT NUMBER
MIL-PRF-13789E

 2. DOCUMENT DATE (YYMMDD)
990201

3. DOCUMENT TITLE

STRAINERS, SEDIMENT: PIPELINE, BASKET TYPE

 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

 USA TARDEC, AMSTA-TR-D/210
(Fuel and Water Handling)

b. TELEPHONE (Including Area Code)

 (1) Commercial
(810)574-7744

(2) DSN

786-7744

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