

INCH-POUND

MIL-P-11087G(ME)

17 October 1994

SUPERSEDING

MIL-P-11087F(ME)

22 November 1985

MILITARY SPECIFICATION

PIPE, STEEL: GROOVED OR PLAIN ENDS

This specification is approved for use within the USA Mobility Technology Center Belvoir, Department of the Army, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers seamless welded steel pipe, plain or grooved ends. The pipes will be used for conveying refined petroleum products.

1.2 Classification. Pipe shall be the following types and sizes as specified (see 6.2).

Types:

- Type I - Grooved ends.
- Type II - Plain ends.

Sizes:

- Size 02 - 2-inch nominal
- Size 03 - 3-inch nominal
- Size 04 - 4-inch nominal
- Size 06 - 6-inch nominal
- Size 08 - 8-inch nominal
- Size 10 - 10-inch nominal
- Size 12 - 12-inch nominal
- Size 14 - 14-inch
- Size 16 - 16-inch
- Size 18 - 18-inch

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA MOBILITY TECH CTR BELVOIR, ATTN AMSTA RBE, FT BELVOIR VA 22060-5818 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4710

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

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS

FEDERAL

PPP-T-60 - Tape: Packaging, Waterproof.

MILITARY

MIL-B-121 - Barrier Material, Greaseproofed, Waterproofed, Flexible.
 MIL-T-704 - Treatment and Painting of Materiel.
 MIL-C-46168 - Coating, Aliphatic Polyurethane, Chemical Agent Resistant.

STANDARDS

FEDERAL

FED-STD-595 - Colors Used in Government Procurement.

MILITARY

MIL-STD-105 - Sampling Procedures and Tables for Inspection by Attributes.
 MIL-STD-129 - Marking for Shipment and Storage.
 MIL-STD-130 - Identification Marking of US Military Property.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from: STDZN DCMNT ORDER DESK, BLDG 4D, 700 ROBBINS AVE, PHILADELPHIA PA 19111-5094.)

2.2 Non-Government publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the following documents shall be those listed in the issue of the DoDISS specified in the solicitation.

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AMERICAN PETROLEUM INSTITUTE (API)

SPEC 5L - Line Pipe.

(Application for copies should be addressed to: AMERCN PETRO INST,
1220 L STRET NW, WASHINGTON DC 20005.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- | | |
|-------|--|
| A370 | - Mechanical Testing of Steel Products, Annex II, Steel Tubular Products. |
| A751 | - Standard Methods, Practices and Definitions for Chemical Analysis of Steel Products. |
| D3953 | - Strapping, Flat Steel and Seals. |
| D4675 | - Selection and Use of Flat Strapping Materials. |

(Application for copies should be addressed to: AMERCN SCTY FOR TEST &
MTRLs, 1916 RACE STRET, PHILADELPHIA PA 19103.)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION INC. AGENT

National Motor Freight Classification Rules.

(Application for copies should be addressed to: AMERCN TRCKNG ASS, ATTN
TRFC ORDR SECT, 2200 MILL RD, ALEXANDRIA VA 22314.)

UNIFORM CLASSIFICATION COMMITTEE AGENT

Uniform Freight Classification Rules.

(Application for copies should be addressed to: UNFRM FRGHT CLASS CMMTE,
ATTN TARIFF PBLSHNG OFCR, ROOM 1106, 222 S RIVERSIDE PLZ, CHICAGO
IL 60606.)

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

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

3. REQUIREMENTS

3.1 Description. Pipe shall be made by the seamless, electric-welded, or submerged-arc weld process. The coated pipe shall conform to API SPEC 5L.

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3.2 Material. Material shall be grade B (35,000 psi yield) steel as specified in API SPEC 5L for the plain and grooved end pipes.

3.3 Design and performance. Physical requirements of the pipes and hydrostatic test pressure shall be in accordance with the following table. Maximum allowable operating pressure (MAOP) shall not exceed 0.72 times the hydrostatic test pressure.

TABLE I. Physical and Test requirements.

Nominal Pipe Size (Inches)	Outside Diameter (Inches)	Wall Thickness (Inches)	Minimum Hydrostatic Test Pressure	
			Grooved ends (Psig)	Plain ends (Psig)
2	2.375	0.154	1500	2500
3	3.500	0.216	1600	2500
4	4.500	0.219	1250	2040
	4.500	0.237	1500	2210
6	6.625	0.219	900	1390
	6.625	0.280	1250	1780
8	8.625	0.250	800	1220
	8.625	0.322	1200	1570
	8.625	0.375	1400	1830
10	10.75	0.307	900	1200
12	12.75	0.250	500	820
	12.75	0.281	600	930
	12.75	0.312	750	1030
	12.75	0.375	1000	1240
14	14.00	0.312	600	940
16	16.00	0.312	550	820
18	18.00	0.312	500	730

Tolerances in outside diameter, wall thickness, and weight per foot of pipe shall be as specified in API SPEC 5L.

3.3.1 Dimensions. Nominal pipe size and wall thickness shall be as specified (see 6.2) and as shown in table I. Unless otherwise specified (see 6.2), pipes shall be furnished in twenty-foot lengths.

3.3.2 Chemical properties. The chemical composition of the pipe shall be as specified in table 3.1 of API Specification 5L. Methods for chemical analysis shall be performed in accordance with ASTM A751.

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3.3.3 Physical properties. The mechanical properties for the steel pipes shall be as specified in table 4.1 of API Specification 5L, and the method for testing shall be in accordance with ASTM A370.

3.4 Treatment and painting. All exterior surfaces of the pipe shall be treated and painted in accordance with MIL-T-704, type as applicable. Unless otherwise specified (see 6.2), the top coat shall be in accordance with MIL-C-46168, and the color shall be color chip number 34094 (Green 383) conforming FED-STD-595. Interior surfaces of each pipeline section shall be thoroughly cleaned of all dirt, rust, scale, and foreign matter. When specified (see 6.2), interior surfaces of the pipe shall be given a coating of oil for protection against rusting in transit and storage. The coating applied to the land and groove surface (B & C in figure 2) of the pipe ends shall not exceed 10 mil.

3.5 Type I, groove ends. Type I pipe shall consist of sizes from 4 inches through 14 inches and shall have grooved ends as shown in figure 1. The land surface shall be free from indentations, projections, or heavy roll marks to provide a positive, leakproof seal when coupled with snap-joint couplings. The surface finish of the land and groove area (B & C in figure 1) shall not exceed 125 microinches.

3.5.1 Measurement of groove. The depth of the groove at all points of the periphery shall be one-half of the difference between the land diameter (dimension A in figure 1) and the groove diameter (dimension C in figure 1). Tolerances for 2, 3, 4, and 6-inch pipes shall not exceed ± 0.010 -inch and for 8, 12, and 14-inch shall be ± 0.013 -inch.

3.6 Type II, plain ends. The type II pipe shall have beveled ends in accordance with paragraph 7.3 of API SPEC 5L.

3.7 Identification marking. The pipe shall be identified by rolling, stamping, or stenciling in accordance with MIL-STD-130.

3.8 Workmanship. All parts of the pipe, including the grooves, shall be clean and free from sand, dirt, fins, pits, scale, and other extraneous material. All edges shall be rounded smooth or beveled.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, and unless disapproved by the Government, the contractor's own or any other facilities suitable for the performance of the inspection requirements specified herein may be used. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, indicated or actual, nor does it commit the Government to acceptance of defective material.

4.1.2 Component and material inspection. The contractor is responsible for ensuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards, as applicable.

4.2 Classification of inspection. Inspection requirements specified herein are classified as follows:

- a. Quality conformance inspection (see 4.3).
- b. Inspection of packaging (see 4.5).

4.3 Quality conformance inspection.

4.3.1 Sampling. Sampling for examination shall be in accordance with MIL-STD-105. Sample size shall be determined by using MIL-STD-105, table I and table IIa. A lot shall be accepted when zero defects are found and rejected when 1 or more defects are found.

4.3.2 Examination. Samples selected in accordance with 4.3.1 shall be examined for the defects specified in 4.4.1. Presence of one or more defects shall be cause for rejection.

4.3.3 Tests. Pipes selected as specified in 4.3.1 shall be tested as specified in 4.4.2.1 thru 4.4.2.3. Failure of any test shall be cause for rejection.

4.4 Inspection procedure.

4.4.1 Examination. Pipe shall be examined as specified herein for the following defects:

- 101. Pipe not as specified (see 3.1).
- 102. Material not as specified (see 3.2).
- 103. Dimension of pipe not as specified (see 3.3.1).
- 104. Treated and painting to pipe not as specified (see 3.4).

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- 105. Groove dimensions not as specified for type I pipe (see 3.5 and 3.5.1).
- 106. Type II pipe not beveled as specified (see 3.6).
- 107. Identification markings missing or illegible (see 3.7).
- 108. Workmanship not as specified (see 3.8).

4.4.2 Tests.

4.4.2.1 Proof. The pipe shall be subjected to the applicable hydrostatic pressure specified in table I in accordance with procedure specified in API SPEC 5L. Inability to withstand the pressure without leakage, permanent deformation, or breakage shall constitute failure.

4.4.2.2 Chemical properties. The pipe shall be subjected to the tests specified in API SPEC 5L. The results of the chemical analysis shall be available to the Government in order to determine that chemical properties are met.

4.4.2.3 Physical properties. The pipe shall be subjected to the tests specified in API SPEC 5L. Inability to pass these tests shall constitute failure.

4.5 Inspection of packaging.4.5.1 Quality conformance inspection of pack.

4.5.1.1 Unit of product. For the purpose of inspection a completed bundle of pipe prepared for shipment shall be considered a unit of product.

4.5.1.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105.

4.5.1.3 Examination. Samples selected in accordance with 4.5.1.2 shall be examined for the following defects. One or more defects shall be cause for rejection.

- 109. Land-sealing surface of type I pipe not completely covered with barrier material and tape as specified for level A (see 5.1.1).
- 110. Improper application of the barrier material or the tape on type I pipe as specified for level A (see 5.1.1).
- 111. Tape not rolled in place on pipe and on each end face for type I pipe as specified for level A (see 5.1.1).
- 112. Bundling of 2-, 3-, 4-, and 6-inch pipe not as specified for level A (see 5.2.1.1).
- 113. Strapping not zinc coated for level A (see 5.2.1.1 and 5.2.1.2).
- 114. Marking illegible, incomplete, or incorrect for level A or C (see 5.3).

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5. PACKAGING

5.1 Preservation. Preservation shall be level A.

5.1.1 Level A. The land-sealing surface of type I pipe shall be completely covered with a single wrap of barrier material conforming to MIL-B-121, type II, class 2. The wrap for the land-sealing surface shall be flush with the end of the pipe and shall extend back beyond the groove not less than 1/4 inch. The wrap of barrier material shall be covered with a single wrap of tape conforming to PPP-T-60, type IV, class 1. The tape shall be of a width that will completely cover the barrier material and shall extend not less than 1/8 inch beyond the end of the pipe and extend back beyond the barrier material not less than 1/2 inch. The end of the tape extending beyond the end of the pipe and the tape extending back beyond the wrap shall be rolled in place against the pipe and against the end face of the pipe.

5.2 Packing. Packing shall be level A or C as specified (see 6.2).5.2.1 Level A.

5.2.1.1 Pipe (2- and 3-inch nominal size). The pipe shall be bundled seven pieces to the bundle. Each bundle shall be secured with not less than four flat steel straps conforming to ASTM D3953, type 1, finish B, with a minimum size and thickness of 3/4 inch by 0.035 inch and ASTM D4675. Straps shall be properly tensioned and sealed. The two end straps shall be placed approximately 18 inches from the ends and the two intermediate straps shall be placed equidistantly between the end straps.

5.2.1.2 Pipe (4- and 6-inch nominal size). The pipe shall be bundled seven pieces to the bundle. Each bundle shall be secured with not less than four flat steel straps conforming to ASTM D3953, type 1, finish B with a minimum size and thickness of 1-1/4 inch by 0.035 inch. Straps shall be properly tensioned and sealed. The two end straps shall be placed approximately 18 inches from the ends and the two intermediate straps shall be placed equidistantly between the end straps.

5.2.1.3 Pipe (8-, 10-, 12-, 14-, 16-, and 18-inch nominal size). The pipe shall be shipped loose.

5.2.2 Level C. The pipe shall be packed to assure carrier acceptance and safe delivery to destination at lowest ratings in compliance with Uniform Freight Classification Rules or National Motor Freight Classification Rules.

5.3 Marking. In addition to any special marking specified in the contract or purchase order (see 6.2), marking shall be in accordance with MIL-STD-129.

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6. NOTES

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

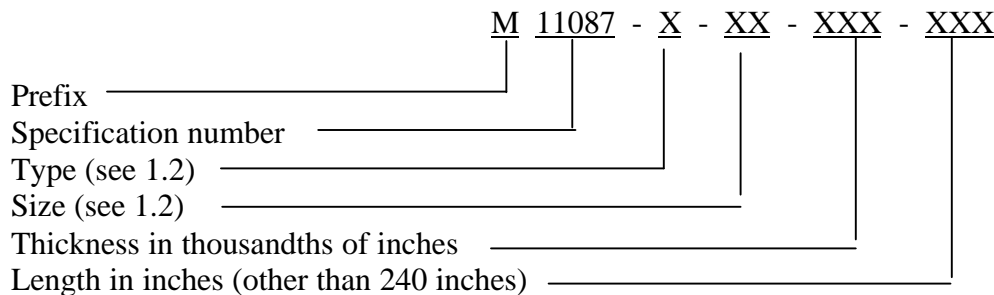
6.1 Intended use. This pipe is intended for use in conveying refined petroleum products.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Type and size of pipe required (see 1.2).
- c. Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- d. Pipe size and wall thickness required (see 3.3.1).
- e. Length of pipe required if other than as specified (see 3.3.1)
- f. Top coat color if other than as specified (see 3.4).
- g. When oil coating is required (see 3.4).
- h. Level of packing required (see 5.2).
- i. Any special marking required (see 5.3).

6.3 International standardization. Certain provisions of this specification (including figure 1, dimensions for grooved ends) are the subject of International Standardization Agreements NATO STANAG 3756. When an amendment, revision or cancellation of this specification is proposed which affects or violates the international agreement concerned, the preparing activity shall take appropriate reconciliation action through international standardization channels, including departmental standardization offices, if required.

6.4 Part or identifying number (PIN). Pipes covered by this specification shall have the part numbering system as follows:



Example of part number M11087I06280228 (i.e., 19 feet long 6.625 O.D. x .280 in. wall pipe with both ends grooved.)

6.5 Subject term (key word) listing.

Grooved, pipe
 Pipeline sections, steel
 Pipeline

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6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:
Army - ME

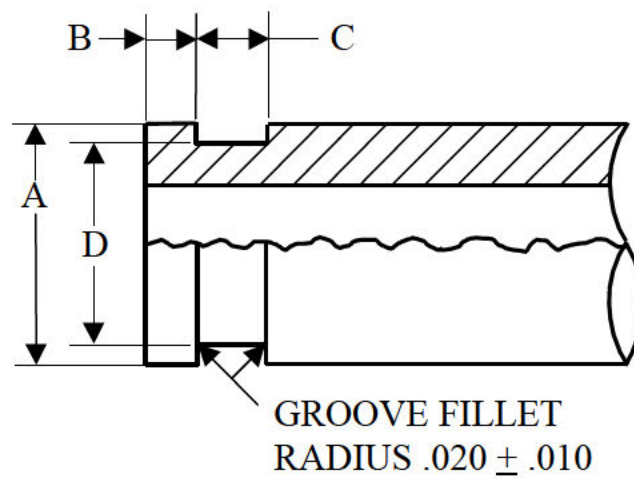
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Review Activity:

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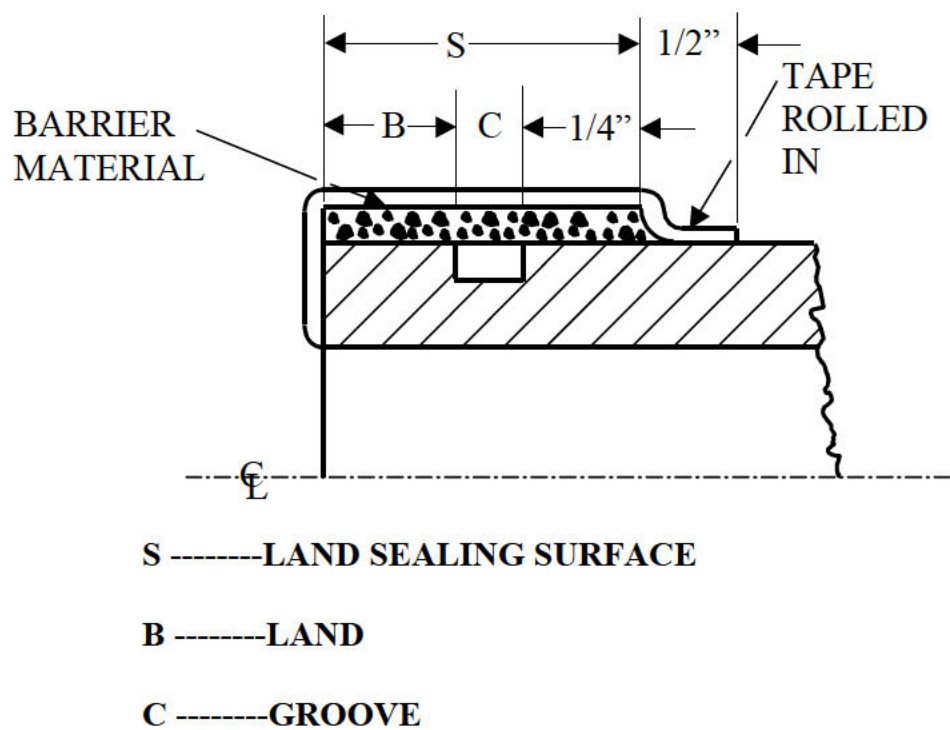
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Nom. pipe size	Groove dimensions (inches)			
	A	B	C	D
4	4.500	$0.625 \pm .031$	$0.375 \pm .031$	$4.334 + .000$ $- .020$
6	6.625	$0.625 \pm .031$	$0.375 \pm .031$	$6.455 + .000$ $- .022$
8	8.625	$0.750 \pm .031$	$0.437 \pm .031$	$8.441 + .000$ $- .025$
10	10.750	$0.750 \pm .031$	$0.500 \pm .031$	$10.562 + .000$ $- .027$
12	12.750	$0.750 \pm .031$	$0.500 \pm .031$	$12.531 + .000$ $- .030$
14	14.000	$0.937 \pm .031$	$0.500 \pm .031$	$13.781 + .000$ $- .030$

FIGURE 1. Dimensions for grooved ends.**X-2126A**

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FIGURE 2. Land sealing surface for grooved end pipe, tube end fittings.

X-449A