

MIL-P-11087F(ME)
 22 November 1985
 SUPERSEDING
 MIL-P-11087E(ME)
 8 August 1980

MILITARY SPECIFICATION

PIPE, STEEL: GROOVED, THREADED, OR PLAIN ENDS

This specification is approved for use within the USA Belvoir Research and Development Center, 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 and electric welded steel pipe.

1.2 Classification. Pipe shall be the following types, as specified and shall be designated by the applicable definitive military specification part number (see 6.2, 6.4, and 6.5).

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

1.2.1 Definitive military specification part number. Tubing covered by this specification shall be designated in the following form (see 6.2 and 6.5):

	M11087	-	X	-	X	-	XXXX
Military specification code number							
Type symbol (see 1.2.2)							
Size symbol (see 1.2.3)							
Length symbol - last digit in 1/4 of inch (see 3.4)							
(Not applicable for pipe furnished in random lengths.)							

1.2.2 Types. The pipe type is identified by the symbols shown in table I.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: USA Belvoir Research and Development Center, ATTN: STRBE-TSE, Fort Belvoir, VA 22060-5606 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4710

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

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TABLE I. Pipe type symbols.

Symbol	Type
A	Type I - Grooved ends.
B	Type II - Plain ends.
C	Type III - Threaded ends.

1.2.3 Size. The pipe size is identified by the symbols shown in table II.

TABLE II. Pipe size symbol.

Size Symbol	Nominal Size (inches)
2	2
3	3
4	4.50 (.219 wall)
4A	4.50 (.237 wall)
6	6.625 (.219 wall)
6A	6.625 (.280 wall)
8	8.625 (.250 wall)
8A	8.625 (.322 wall)
8B	8.625 (.375 wall)
10	10.750
12	12.750 (.250 wall)
12A	12.750 (.281 wall)
12B	12.750 (.312 wall)
12C	12.750 (.330 wall)
14	14.00
16	16.00
18	18.00

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part 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.

SPECIFICATIONS

FEDERAL

QQ-S-781
PPP-T-60

- Strapping, Steel, and Seals.
- Tape: Packaging, Waterproof.

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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

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.

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

AMERICAN PETROLEUM INSTITUTE (API)

STD 5B - Threading, Gaging, and Thread Inspection.

SPEC 5L - Line Pipe.

(Application for copies should be addressed to the American Petroleum Institute, 2101 L Street, N.W., Washington, DC 20037.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

Boiler and Pressure Vessel Code, Section IX, Welding Qualifications.

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

D 3951 - Standard Practice for Commercial Packaging.

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

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AMERICAN WELDING SOCIETY (AWS)

D1.1 Structural Welding Code, Section 5, Qualification.

(Application for copies should be addressed to the American Welding Society, 2501 Northwest Seventh Street, Miami, FL 33125.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which 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 specification and the references cited herein, (except for associated detail specifications, specifications 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 pipe shall conform to API SPEC 5L and as specified herein.

3.2 First article. When specified (see 6.2), a sample shall be subjected to first article inspection (see 4.3 and 6.3).

3.3 Material. Material shall be grade B steel as specified in API SPEC 5L.

3.3.1 Material deterioration and control. The pipe shall be fabricated from compatible materials, inherently corrosion and deterioration resistant or treated to provide protection against the various forms of corrosion and deterioration that may be encountered in any of the applicable storage and operating environment to which the item may be exposed.

3.3.2 Physical requirements. Physical requirements shall be in accordance with table III.

3.3.3 Recovered materials. For the purpose of this requirement, recovered materials are those materials which have been collected from solid waste and reprocessed to become a source of raw materials, as distinguished from virgin raw materials. The components, pieces and parts incorporated in the pipe may be newly fabricated from recovered materials to the maximum extent practicable, provided the pipe produced meets all other requirements of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the pipe.

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TABLE III. Physical requirements.

Nom. size	Outside diameter ^{1/2/}	Wall thickness ^{1/}	Plain end weight ^{1/}	Hydrostatic press., min.	
				Plain and grooved ends	Threaded ends
Inches	Inches	Inches	Pounds per foot	Psi	Psi
2	2.375	0.154	3.65	2500	1100
3	3.50	0.216	7.58	2500	1100
4	4.50	0.219	10.01	2040	-
	4.50	0.237	10.79	2210	1300
6	6.625	0.219	14.98	1390	-
	6.625	0.280	18.97	1780	1300
8	8.625	0.250	22.36	1220	-
	8.625	0.322	28.55	1570	1570
	8.625	0.375	33.04	1830	-
10	10.750	0.307	34.24	1200	1200
12	12.750	0.250	33.38	820	-
	12.750	0.281	37.42	930	-
	12.750	0.312	41.45	1030	-
	12.750	0.330	43.77	1090	1090
14	14.00	0.312	45.61	940	-
16	16.00	0.312	52.27	820	-
18	18.00	0.312	58.94	730	-

1/ Tolerances in outside diameter, wall thickness, and weight shall be as specified in API SPEC 5L.

2/ Diameter for a distance of 4 inches, minimum, from each end of types I and II pipe only, shall be as specified in API SPEC 5L.

3.4 Dimensions. Nominal pipe size and wall thickness shall be as specified (see 6.2), and shall be as shown in table III. Type I and type III pipe shall be furnished in lengths of 20 feet $\pm 1/4$ inch. Unless otherwise specified (see 6.2), type II pipe shall be furnished in random lengths between 17-1/2 and 25 feet.

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

3.6 Coating. Unless otherwise specified (see 6.2), the interior surfaces of the pipe shall be given a mill coating of oil for protection against rusting in transit.

3.6.1 Treatment and painting. Unless otherwise specified (see 6.2), all exterior surfaces of the pipe shall be treated and painted in accordance with MIL-T-704, type and color of paint in accordance with one of the following (see 6.2). Interior surfaces of each pipeline section shall be thoroughly cleaned of all dirt, rust, scale, and foreign matter.

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3.6.1.1 For noncamouflage. Painted in accordance with MIL-T-704, type A, color forest green.

3.6.1.2 For camouflage. Painted in accordance with MIL-T-704, top coat camouflage paint systems as specified in table II A, color Army forest green.

3.6.1.3 For chemical agent resistant coating. The portions of the pipe normally painted internally and externally shall be cleaned, treated, and painted in accordance with MIL-T-704, type F. Unless otherwise specified (see 6.2) top coat color shall be camouflage green 383 conforming to MIL-C-46168.

3.7 Type I, grooved 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 make-up with clamp connector.

3.7.1 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 and the groove diameter, ± 0.0125 inch.

3.8 Type II, plain ends. The type II pipe shall have beveled ends in accordance with API SPEC 5L.

3.9 Type III, threaded ends. Type III pipe shall be threaded on each end. A pipe coupling shall be placed on one end, and the threads on the other end shall be protected with an end protector. Threads shall conform to API STD 5B. Coupling and end protectors shall conform to API SPEC 5L.

3.10 Welders and welding. Before assigning any welder to manual welding work covered by this specification, the contractor shall obtain certification that the welder has passed qualification tests as prescribed by either of the following listed codes for the type of welding operations to be performed and that such qualification is effective as defined by the particular code:

AWS D1.1, Structural Welding Code, Section 5, Qualification.

ASME Boiler and Pressure Vessel Code, Section IX, Welding Qualifications.

Contractors who make only horizontal welds need not qualify welders for "all position welding". The contractor shall be responsible for determining that automatic welding equipment operators are capable of producing quality welds in accordance with AWS or ASME codes. The certification shall be made available for review by the contracting officer or the contracting officer's representative.

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

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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, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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 assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

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

- a. First article inspection (see 4.3).
- b. Quality conformance inspection (see 4.4).
- c. Inspection of packaging (see 4.6).

4.3 First article inspection.

4.3.1 Tests. The first article shall be tested as specified in 4.5.2.1 through 4.5.2.3. Failure of any test shall be cause for rejection. In lieu of the actual testing required, certification by the steel-producing mill that pipe meets the physical, chemical, and hydrostatic test requirements of API SPEC 5L on line pipe will be acceptable.

4.4 Quality conformance inspection.

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

4.4.2 Examination. Samples selected in accordance with 4.4.1 shall be examined for the defects specified in 4.5.1. AQL shall be 2.5 percent defective.

4.4.3 Tests. Each pipe shall be tested as specified in 4.5.2.1. Failure of the test shall be cause for rejection.

4.5 Inspection procedure.

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

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- 101. Material not as specified.
- 102. Materials are not resistant to corrosion and deterioration or treated to be resistant to corrosion and deterioration for the applicable and operating environment.
- 103. Used, rebuilt, or remanufactured components, pieces and parts incorporated in the pipe.
- 104. Weight of pipe not as specified.
- 105. Length of pipe not as specified.
- 106. Identification or special marking missing, incomplete, or illegible.
- 107. Protective mill coating of oil not applied to pipe as specified.
- 108. Treatment and painting not as specified.
- 109. Groove and land dimensions not as specified (type I only).
- 110. Land surfaces not free from indentations, projections, or heavy roll marks.
- 111. Pipe threads not as specified (type III only).
- 112. Couplings and end protectors omitted when threaded pipe is furnished (type III only).
- 113. Workmanship not as specified.
- 114. Welding not as specified.
- 115. Welding certification not as specified.
- 116. Paint color not as specified.

4.5.2 Tests.

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

4.5.2.2 Chemical properties. The pipe shall be subjected to the tests specified in API SPEC 5L. Inability to pass these tests shall constitute failure. When specified (see 6.2), ladle analyses or check analyses shall be provided.

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

4.6 Inspection of packaging.

4.6.1 Quality conformance inspection of pack.

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

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

4.6.1.3 Examination. Samples selected in accordance with 4.6.1.2 shall be examined for the following defects. AQL shall be 2.5 percent defective.

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- 117. Land-sealing surface of type I pipe not completely covered with barrier material and tape as specified.
- 118. Improper application of the barrier material or the tape on type I pipe.
- 119. Tape not rolled in place on pipe and on each end face for type I pipe.
- 120. Bundling of 2-, 3-, 4-, and 6-inch pipe not as specified for level A or level B.
- 121. Strapping not zinc coated for level A.
- 122. Marking illegible, incomplete, or incorrect for level A or level B.

5. PACKAGING

5.1 Preservation. 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 (see figure 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 (see figure 2).

5.2 Packing. Packing shall be level A, level B or commercial 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 QQ-S-781, class 1, type I or IV, finish B, grade 1, with a minimum size and thickness of 3/4 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.

5.2.1.2 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 QQ-S-781, class 1, type I or IV, finish B, grade 1, 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 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 B. Unless otherwise specified (see 6.2), the pipe shall be shipped loose. When specified (see 6.2), 2-, 3-, 4-, and 6-inch nominal size pipe shall be bundled as specified for level A, except flat steel straps shall not be required to be zinc coated.

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5.2.3 Commercial. Commercial packing shall be in accordance with ASTM D 3951.

5.3 Marking.

5.3.1 Military. Marking for military levels of protection shall be in accordance with MIL-STD-129.

5.3.2 Commercial. Marking for commercial packaging shall be in accordance with ASTM D 3951. In addition to the marking required, the cube and weight shall also be indicated.

6. NOTES

6.1 Intended use. This pipe is intended for use in overland transportation of refined petroleum products but may also be used in water supply systems.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. Definitive military specification part number required (see 1.2).
- c. Time frame required for submission of the first article and number of pipes required (see 3.2).
- d. Pipe size and wall thickness required (see 3.4).
- e. Length of type II pipe required if other than as specified (see 3.4).
- f. When oil coating is not required (see 3.6).
- g. Color and type of paint required (see 3.6.1).
- h. Treatment, painting or color if other than as specified (see 3.6.1).
- i. When ladle analyses are required (see 4.5.2.2).
- j. When check analyses are required (see 4.5.2.2).
- k. Degree of packing required (see 5.2).
- l. When bundling for 2-, 3-, 4-, and 6-inch pipe is required for level B (see 5.2.2).

6.3 First article. When a first article inspection is required, the items should be a preproduction model. The first article should consist of one or more units. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, tests, and approval of the first article results and disposition of the documents' first articles.

6.4 International standardization. Certain provisions of this specification (including figure 1, dimensions for grooved ends) are the subject of International Standardization Agreements NATO STANAG 2761 and QSTAG 240. When an amendment, revision or cancellation of this specification is proposed which affects or violates the international agreement concerned, the preparing activity will take appropriate reconciliation action through international standardization channels, including departmental standardization offices, if required.

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6.5 Definitive military specification part number. The military specification part number corresponds to the type, class, and condition of the tubing covered by this specification and defines the requirements of the options presented under this specification. The military specification is a definitive part number which is formed by combining the military specification symbol (M11087 for MIL-P-11087) with a dash after it; the type symbol; the class and condition symbol; the size symbol; and the wall thickness symbol; the carbon steel composition symbol; and the tubing length in whole feet combination as shown in 1.2.

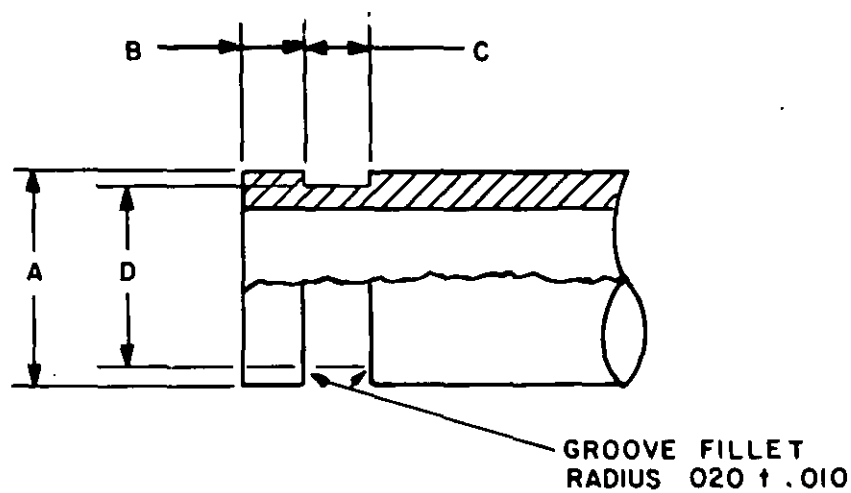
Custodians:
Army - ME

Preparing activity:
Army - ME

Review activity:
DLA - CS

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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 \pm .000 - .020
6	6.625	0.625 \pm .031	0.375 \pm .031	6.455 \pm .000 - .022
8	8.625	0.750 \pm .031	0.437 \pm .031	8.441 \pm .000 - .025
10	10.750	0.750 \pm .031	0.500 \pm .031	10.562 \pm .000 - .027
12	12.750	0.750 \pm .031	0.500 \pm .031	12.531 \pm .000 - .030
14	14.000	0.937 \pm .031	0.500 \pm .031	13.781 \pm .000 - .030

FIGURE 1. Dimensions for grooved ends.

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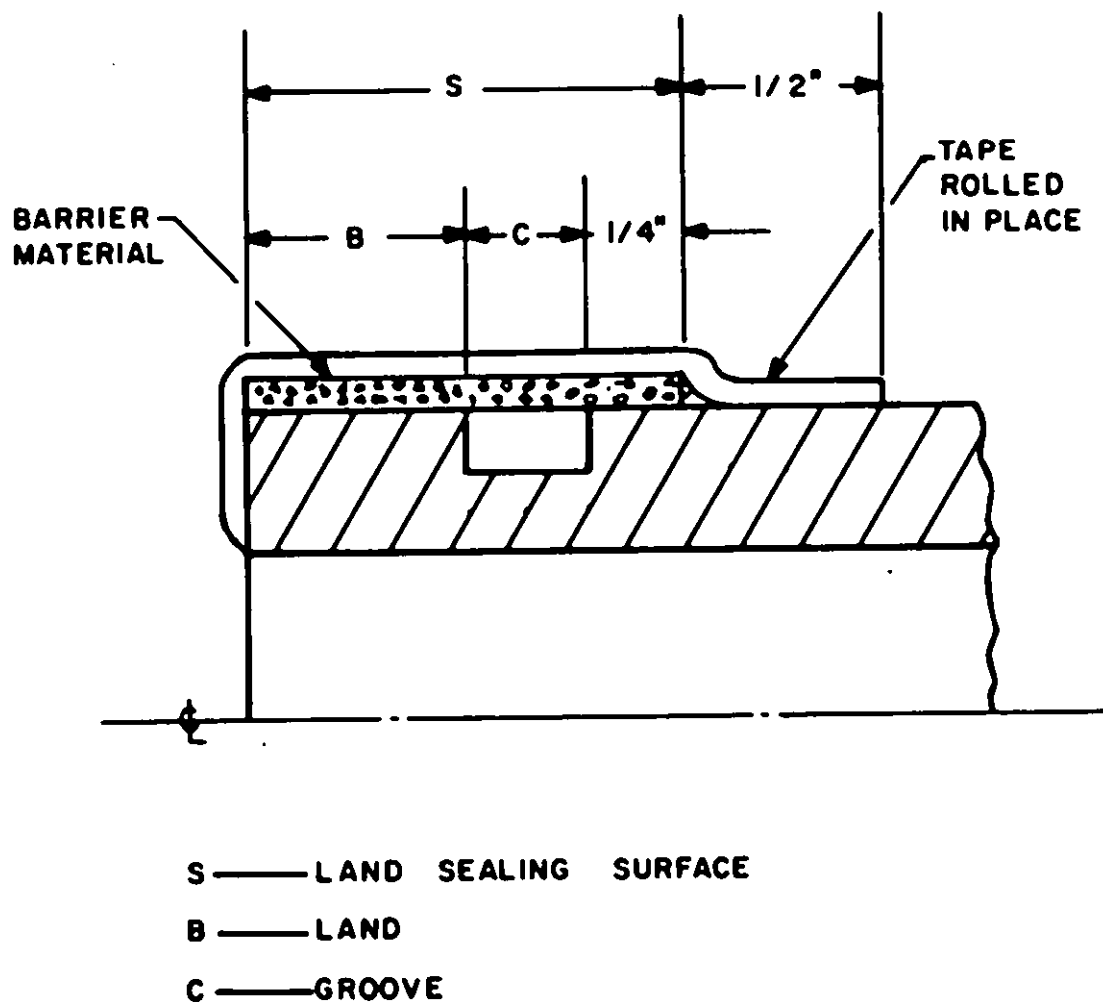


FIGURE 2. Land sealing surface for grooved end pipe, tube end fittings.

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STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL*(See Instructions - Reverse Side)*

1. DOCUMENT NUMBER MIL-P-11087F (ME)		2. DOCUMENT TITLE Pipe, Steel: Grooved, Threaded, or Plain Ends	
3a. NAME OF SUBMITTING ORGANIZATION		4. TYPE OF ORGANIZATION (Mark one)	
b. ADDRESS (Street, City, State, ZIP Code)		<input type="checkbox"/> VENDOR	
		<input type="checkbox"/> USER	
		<input type="checkbox"/> MANUFACTURER	
		<input type="checkbox"/> OTHER (Specify): _____	
5. PROBLEM AREAS			
a. Paragraph Number and Wording:			
b. Recommended Wording:			
c. Reason/Rationale for Recommendation:			
6. REMARKS			
7a. NAME OF SUBMITTER (Last, First, MI) - Optional		b. WORK TELEPHONE NUMBER (Include Area Code) - Optional	
c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional		8. DATE OF SUBMISSION (YYMMDD)	