

INCH-POUND

MIL-T-425J

16 December 1994

SUPERSEDING

MIL-T-425H

22 December 1986

MILITARY SPECIFICATION

TUBE, STEEL: PIPELINE SECTION; WITH GROOVED

NIPPLE WELDED ON EACH END

This specification is approved for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers thin wall steel pipe with a grooved pipe nipple welded on each end.

1.2 Classification. Pipeline sections shall be of the following sizes, as specified (see 6.2):

<u>Nominal pipe size</u>	<u>Outside diameter</u>
2-inch	2.375-inch
4-inch	4.500-inch
6-inch	6.625-inch
8-inch	8.625-inch
12-inch	12.750-inch

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards 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 (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US ARMY MOBILITY TECHNOLOGY CENTER BELVOIR, 10115 GRIDLEY RD STE 128, FT BELVOIR VA 22060-5843 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

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SPECIFICATIONS

FEDERAL

- TT-V-51 - Varnish; Asphalt.
- PPP-T-60 - Tape: Packaging, Waterproof.

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- 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.
- MIL-STD-889 - Dissimilar Metals.

(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 officer.)

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 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 non-Government documents which is current on the date of the in the solicitation (see 6.2).

AMERICAN NATIONAL STANDARDS INSTITUTE, INC. (ANSI)

- B46.1 - Surface Texture.

(Application for copies should be addressed to: AMERCN NATL STANDS INST, 1430 BROADWAY, NEW YORK NY 10018.)

AMERICAN PETROLEUM INSTITUTE (API)

- SPEC 5L - Specification for Line Pipe.

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(Application for copies should be addressed to: AMERCN PETRO INST, DIV OF PRODN, 300 CORRIGAN TOWER BLDG, DALLAS TX 75201.)

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

Boiler and Pressure Vessel Code Section IX, - Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators.

(Application for copies should be addressed to: AMERCN SCTY OF MECHL ENGRS, 345 E 47TH STRET, NEW YORK NY 10017.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- D 3951 - Standard Practice for Commercial Packaging.
- D 3953 - Strapping, Flat Steel and Seals.

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

AMERICAN WELDING SOCIETY (AWS)

- A5. 1 - Carbon Electrodes for Shielded Metal Arc Welding.
- DI. 1 - Structural Welding Code, Steel, Section 5, Qualifications.

(Application for copies should be addressed to: AMERCN WELD SCTY, 550 NW LEJEUNE RD, PO BOX 351040, MIAMI FL 33135.)

NATIONAL MOTOR FREIGHT TRAFFIC ASSOCIATION, INC., AGENT (NMFTA)

National Motor Freight Classification Rules.

(Application for copies should be addressed to: AMERCN TRKG ASSOC INC, ATTN TRFC DEPT, 1616 P STRET NW, WASHINGTON DC 20036.)

UNIFORM CLASSIFICATION COMMITTEE AGENT (UCC)

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 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, the text of this specification shall take precedence. Nothing in this

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specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Description. The steel pipeline section (hereinafter called "pipeline section") shall consist of a thin wall pipe with a grooved nipple welded at each end as shown in figure 1.

3.2 First article. Unless otherwise specified (see 6.2), a sample shall be subjected to first article inspection (see 4.3 and 6.3). Any changes or deviations of pipeline sections from the approved first article during production will be subject to the approval of the contracting officer. Approval of the first article will not relieve the contractor's obligation to furnish pipeline sections conforming to this specification.

3.3 Material. Material shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

3.3.1 Thin wall pipe. Steel used for pipeline section shall be as specified in API-SPEC 5L, grade B, except that the wall thickness shall be as shown in figure 1.

3.3.2 Nipples. Steel used for fabricating nipples shall be standard weight, plain end line pipe as specified in API-SPEC 5L, grade B. The wall thickness the nipple shall be as shown in figure 1.

3.3.3 Welding electrodes. Welding electrode shall be as specified in AWS A5.1, type, class, and size to suit the application.

3.3.4 Material deterioration prevention and control. The pipeline sections shall be fabricated from compatible materials, inherently corrosion resistant or treated to provide protection against the various forms of corrosion and deterioration that may be encountered in any of the applicable operation and storage environments to which the item may be exposed.

3.3.5 Dissimilar metals. Dissimilar metals in contact with each other shall be protected against galvanic corrosion. Dissimilar metals and methods of protection are defined and detailed in MIL-STD-889.

3.3.6 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 pipeline section may be newly fabricated from recovered materials to the maximum extent practicable, provided the pipeline section produced meets all other requirements

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of this specification. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the pipeline section.

3.4 Performance requirements.

3.4 Hydrostatic pressure. The pipeline section shall withstand the applicable hydrostatic test pressure specified in table I, without evidence of leakage, sweating, or yielding.

TABLE I. Hydrostatic test pressure ratings.

Nominal tube size (inches)	Minimum test pressure (psi)
2	900
4	900
6	900
8	750
12	600

3.4.2 Tensile requirements. The tensile requirements for the pipeline sections shall be as specified in API-SPEC 5L, section 4 for grade B steel pipe.

3.4.3 Straightness. Straightness of the pipeline sections shall conform to API-SPEC 5L.

3.5 Fabrication. The thin wall pipes shall be seamless or electric resistance welded steel pipes. The electric-resistance-welded pipe shall be heat treated after welding to a minimum temperature of 1000 °F or processed in such a manner that no untempered martensite remains. The nipples shall be fabricated to conform to the tolerances shown in figures 1 in inches. The nipples shall be inserted into the pipe ends and joined by a circumferential electric weld. The pipe and the nipples shall have the same outside diameter.

3.5.1 Welders and welding. Before assigning any welder or welding operator to manual welding work covered by this specification, the contractor shall obtain certification that the welder or welding operator 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, Steel, ASME Boiler and Pressure Vessel Code, Section IX, Qualification Standard for Welding procedures, Welders and Welding Operators.

No welding shall be undertaken until after the welding procedure specifications and welders or welding operators have been qualified. The contractor is responsible for obtaining certification.

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Contractors who only make horizontal welds need not qualify welders or welding operators 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 and ASME codes. The certification shall be made available for review by the contracting officer or contracting officer's representative.

3.6 Dimensions. The dimensions of the pipeline sections shall be as shown in figure 1.

3.7 Identification marking. Each pipeline section shall be identified and marked in accordance with MIL-STD-130 and shall include the part or identifying number (see 6.4).

3.8 Treatment and exterior coating. All exterior surfaces of pipeline sections shall be cleaned, treated and painted in accordance with MIL-T-704, type F. Unless otherwise specified (see 6.2) the top coat color shall be camouflage green 383 conforming to MIL-C-46168.

3.8.1 Asphalt varnish. If asphalt varnish coating is specified (see 6.2), the exterior surfaces of pipeline sections shall then be coated with black asphalt varnish conforming to TT-V-51.

3.9 Coating, interior surface. The interior surfaces of each pipeline section shall be thoroughly cleaned of all harmful dirt, rust, scale and foreign matter. Unless otherwise specified (see 6.2), the inside surfaces of all pipeline sections shall be given mill coating with a film of oil for protection against rusting in transit.

3.10 Workmanship. The land-sealing surface of the nipples shall have all indentations, projections, and imperfections removed to the extent that the resulting surface shall have a roughness height rating of not more than 500 microinches as specified in ANSI B46.1. The nipples shall not be out of round by more than 1 percent of the outside diameter. The pipeline sections shall have no circumferential welds other than those required for joining the nipples to the tube.

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 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.

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

4.2 Classification of inspections. The 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 First article examination. The first article pipeline section(s) shall be examined as specified in 4.5.1, as applicable. Presence of one or more defects shall be cause for rejection.

4.3.2 First article tests. The first article pipeline section(s) shall be tested as specified in 4.5.2.1 and 4.5.2.2, as applicable. Failure of either test shall be cause for rejection.

4.4 Quality conformance inspection.

4.4.1 Sampling. Sampling for examination and tests 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 one or more defects are found.

4.4.2 Examination. Samples selected in accordance with 4.4.1 shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.4.3 Tests.

4.4.3.1 Individual. Each pipeline section shall be tested as specified in 4.5.2.1. Failure of this test shall be cause for rejection.

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4.4.3.2 Samples. Samples selected in accordance with 4.4.1 shall be tested as specified in 4.5.2.2. Failure of any test shall be cause for rejection.

4.5 Inspection procedure.

4.5.1 Examination. The pipeline section(s) shall be examined as specified herein for the following defects:

101. Nominal size pipe not as specified (see 1.2).
102. Material of thin-wall pipe not as specified (see 3.3.1).
103. Nipples not as specified (see 3.3.2).
104. Welding electrodes not as specified (see 3.3.3).
105. Materials are not resistant to corrosion or deterioration or treated to be made resistant to corrosion or deterioration for the applicable storage and operating environment (see 3.3.4).
106. Dissimilar metals as defined in MIL-STD-889 are not effectively insulated from each other (see 3.3.5).
107. Used, rebuilt, or remanufactured components, pieces or parts incorporated in the pipeline section (see 3.3.6).
108. Straightness of pipeline sections not as specified (see 3.4.3)
109. Fabrication not as specified (see 3.5).
110. Qualification of welders and welding operators not as specified (see 3.5.1).
111. Dimensions and tolerances not as specified (see 3.6).
112. Identification marking not as specified (see 3.7).
113. Treatment and painting not as specified (see 3.8).
114. Protective mill coating of oil not applied to pipe as specified (see 3.9).
115. Workmanship not as specified (see 3.10).

4.5.2 Tests.

4.5.2.1 Hydrostatic test. The pipeline sections shall be tested as specified in API-SPEC 5L (Specification for Line Pipe), section 5, at the applicable test pressures specified in 3.4.1. Any evidence of leaking, sweating, or yielding shall constitute failure of this test.

4.5.2.2 Tensile test. Tensile strength of the pipeline section(s) shall be tested as specified in API-SPEC 5L, section 4. Nonconformance to 3.4.2 shall constitute failure of this test.

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 pipeline sections prepared for shipment shall be considered a unit of product.

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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. Presence of one or more defects shall be cause for rejection.

- 116. Pipeline sections not preserved as specified (see 5.1).
- 117. Packing of 2-, 4-, 6-, and 8-inch pipeline sections not as specified for level A, level B, or commercial (see 5.2).
- 118. Marking missing, illegible, incorrect, or incomplete for level A, level B, or commercial (see 5.3).

5. PACKAGING

5.1 Preservation. The land-sealing surface shall be completely covered with a single wrap of barrier-material conforming to MIL-B-121, type II, grade A, class 2. The wrap for the land-sealing surface shall be flush with the end of the pipeline section and shall extend back beyond the groove not less than 0.250 inch. The wrap of barrier-material, and shall extend not less than 0.125 inch beyond the end of the pipeline section and extend back beyond the barrier material not less than 0.500 inch. The end of the tape extending beyond the end of the pipeline section and the tape extending back beyond the wrap shall be rolled in place against the pipeline section and against the end face of the pipeline section.

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 Sizes 2-, 4-, 6-, and 8-inch pipeline sections. The 2-, 4-, 6-, and 8-inch pipeline sections shall be secured, like sizes together, in bundles of seven sections each. The bundles shall be secured with strapping conforming to, ASTM D3953, type I, finish B. The end straps shall be placed not more than 18 inches from the ends of the bundle; intermediate straps shall be equally spaced between the end straps. Size of strapping and total number of straps per bundle shall be as follows:

Pipe size (inches)	Strap size (inches)	No. of straps per bundle
2	0.500 x 0.023	3
4	0.750 x 0.028	3
6	0.750 x 0.035 ^{1/}	4
8	0.750 x 0.035 ^{1/}	6

^{1/} 0.750 inch x 0.031 inch high tensile strapping may be used in lieu of 0.750 inch x 0.035 inch.

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5.2.1.2 Size 12-inch pipeline sections. The 12-inch pipeline sections shall be shipped loose.

5.2.2 Level B. Unless otherwise specified (see 6.2), the pipeline sections shall be shipped loose. When specified, 2-, 4-, 6-, and 8-inch nominal size pipeline sections shall be bundled as specified for level A, except flat steel straps shall not be required to be finish B.

5.2.3 Commercial. Pipeline sections shall be bundled or shipped loose, as specified (see 6.2), in a manner to assure carrier acceptance and safe delivery to the destination at lowest ratings in compliance with Uniform Freight Classification rules or National Motor Freight Classification rules.

5.3 Marking.

5.3.1 Military. Marking for shipment and storage shall be in accordance with MIL-STD-129.

5.3.2 Commercial. Marking for commercial packaging shall be in accordance with ASTM D 3951.

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 pipeline sections are primarily intended for use as military pipelines for conveying liquid petroleum products.

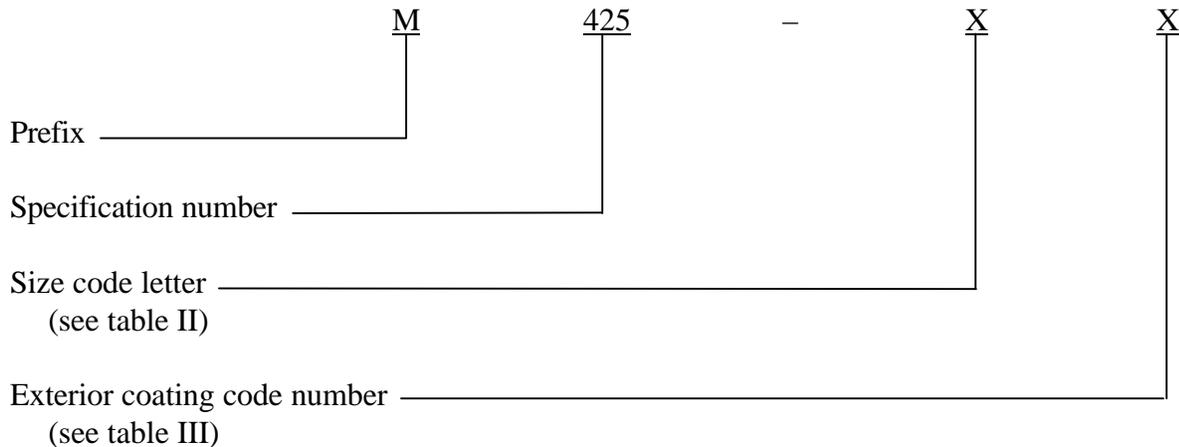
6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification.
- b. Issue of DoDISS to be cited in the in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1)
- c. Size of pipeline sections required (see 1.2).
- d. Time frame required for submission of first article and number of pipeline sections to be furnished (see 3.2).
- e. Treatment, painting, type of paint or color if other than as specified (see 3.8).
- f. When exterior coating of asphalt varnish is required (see 3.8.1).
- g. When oil coating of interior surface is not required (see 3.9).
- h. Level of packing required (see 5.2).
- i. When bundling of 2-, 4-, 6-, and 8-inch pipeline sections is required for level B (see 5.2.2).
- j. Whether pipeline sections are to be shipped loose or bundled for commercial (see 5.2.3).

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6.3 First article. When a first article inspection is required, the item(s) 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, approval of the first article test results and disposition of the first articles. Invitation 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. Bidders should not submit alternate bids unless specifically requested to do so in the solicitation.

6.4 Part or identifying number (PIN). The part or identifying number of pipeline section covered by this specification shall be as follows:



6.4.1 Size. The nominal pipe size of the pipeline sections shall be designated by the following symbols (see table II):

TABLE II. Size code letter.

Code letter	Nominal pipe size (inches)
A	2
B	4
C	6
D	8
E	12

6.4.2 Exterior coating. Coating of the outside surfaces of pipeline sections shall be designated by the following code numbers (see 3.8 and table II):

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TABLE III. Exterior coating code number.

Code number	Type of exterior coating
1	Camouflage green 383, MIL-C-46168
2	Black asphalt varnish
3	Tan 686A, (color chip # 33446)

6.5 International standardization agreement. Certain provisions of this specification (see 3.3.2) are the subject of International Standardization Agreement NATO, STANAG No. 2761 and QSTAG No. 240. When amendment, revision, or cancellation of this specification is proposed which will modify the international standardization agreement concerned the preparing activity will take appropriate action through international standardization channels, including departmental standardization offices to change the agreement or make other appropriate accommodations.

6.6 Couplings. The pipeline sections are connected with couplings conforming to MIL-C-10387.

6.7 Subject term (key word) listing.

Pipe, grooved ends
 Pipe, steel, thin wall
 Pipeline sections, petroleum
 Tube, grooved ends
 Tube, steel

6.8 Changes from previous issue. Asterisks are used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

Army - ME
 Navy - YD1
 Air Force - 99

Preparing activity:

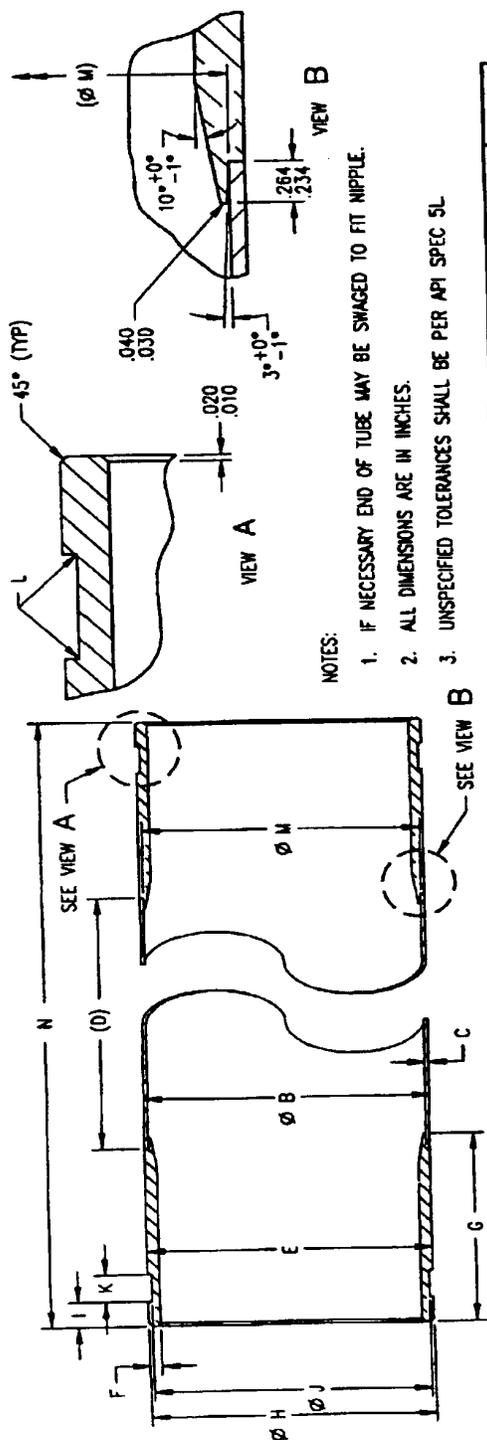
Army - ME

Project 4710-0145

Review activities:

Navy - MC
 Air Force - 82
 DLA - CS

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- NOTES:
1. IF NECESSARY END OF TUBE MAY BE SWAGED TO FIT NIPPLE.
 2. ALL DIMENSIONS ARE IN INCHES.
 3. UNSPECIFIED TOLERANCES SHALL BE PER API SPEC 5L

NOMINAL TUBE (PIPE) SIZE	ACTUAL TUBE (PIPE) OD	TUBING WALL THICK	TUBING LENGTH (REF)	NIPPLE OD	NIPPLE WALL THICK	NIPPLE LENGTH	NIPPLE SEALING LAND OD	SEALING LAND WIDTH	GROOVE BOTTOM OD	GROOVE WIDTH	GROOVE FILLET RADIUS	NIPPLE TANG ROOT OD	TOTAL SECTION LENGTH
A	B	C	D	E	F	G	H	I	J	K	L	M	N
2	2.375	0.109	235.000	2.375 ±0.023	0.154 +0.023 -0.019	2.750 ±0.062	2.375 +0.031 -0.016	0.625 ±0.031	2.250 +0.000 -0.015	0.312 ±0.031	0.020 ±0.010	2.225 +0.000 -0.020	240.000 ±0.250
4	4.500	0.125	233.000	4.500 ±0.045	0.237 +0.035 -0.029	3.750 ±0.062	4.500 +0.031 -0.016	0.625 ±0.031	4.334 +0.000 -0.020	0.375 ±0.031	0.020 ±0.010	4.375 +0.000 -0.020	240.000 ±0.250
6	6.625	0.141	231.000	6.625 ±0.066	0.280 +0.042 -0.035	4.750 ±0.062	6.625 +0.031 -0.016	0.625 ±0.031	6.455 +0.000 -0.022	0.375 ±0.031	0.020 ±0.010	6.440 +0.000 -0.020	240.000 ±0.250
8	8.625	0.156	229.000	8.625 ±0.086	0.322 +0.050 -0.042	5.750 ±0.062	8.625 +0.031 -0.016	0.750 ±0.031	8.441 +0.000 -0.025	0.437 ±0.031	0.020 ±0.010	8.454 +0.000 -0.020	240.000 ±0.250
12	12.750	0.172	229.000	12.750 ±0.128	0.330 +0.050 -0.042	5.750 ±0.062	12.750 +0.047 -0.031	0.750 ±0.031	12.531 +0.000 -0.030	0.500 ±0.031	0.020 ±0.010	12.505 +0.000 -0.020	240.000 ±0.250

FIGURE 1. Steel pipeline section.

X-974B