SOUTHWEST GAS CORPORATION
ENGINEERING STAFF
MATERIAL SPECIFICATION

Section No:	MS A-9
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Issue Date:	02/26/20
Superseded Date:	02/06/19

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PIPE AND TUBING
Pipe, Steel, ASTM A-106, Grade B

1. SCOPE

This specification covers ASTM A-106, Grade B, seamless carbon steel pipe in nominal pipe sizes (NPS) of 3/8-inch through 16-inch. This steel pipe is used for natural gas mains, services and compressor station piping.

2. APPLICABLE DOCUMENTS

2.1 American National Standards Institute (ANSI) B36.10M, "Welded and Seamless Wrought Steel Pipe."

2.2 ASTM International (ASTM) A-106M-10 (Oct. 2010), "Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service."

2.3 ASTM International (ASTM) A-370, "Mechanical Testing of Steel Products, Annex II, Steel Tubular Products."

2.4 ASTM International (ASTM) A-530, "Standard Specification for General Requirements for Specialized Carbon and Alloy Steel Pipe."

2.5 ASTM International (ASTM) A-700, "Standard Practices for Packaging, Marking, and Loading Methods for Steel Products for Domestic Shipment."

2.6 ASTM International (ASTM) A-751 "Standard Methods, Practices and Terminology for Chemical Analysis of Steel Products."

2.7 Title 49, Code of Federal Regulations, Part 192, "Transportation of Natural and Other Gas by Pipeline; Minimum Safety Standards" (49 CFR 192).

NOTE: Unless otherwise specified, the editions of the documents incorporated in whole or in part by DOT 49 CFR 192 are applicable. The above documents, and parts of documents (including annexes), not incorporated by 49 CFR 192 are incorporated by this Material Specification and will be the most recent edition. If a conflict exists between the applicable documents and/or this Material Specification, the requirements of 49 CFR 192 shall govern, and in the event of all other conflicts, the more stringent requirement shall govern.

3. TERMINOLOGY

3.1 General

3.1.1 "Southwest Gas," "Southwest" or "SWG" wherever used in this specification and other related documents will refer exclusively to Southwest Gas Corporation.

3.1.2 The terms "approved," "as approved," "satisfactory," "as directed," "or equal," or other similar terms wherever used in this specification and other related documents, will mean "as determined by Southwest Gas," unless specifically stated otherwise.

3.1.3 “Product Information Package” or “PIP” wherever used in this specification and other related documents will mean the required information that a manufacturer must submit to SWG to determine if the product is suitable for use by SWG, unless specifically stated otherwise.

4. MATERIALS AND MANUFACTURE

4.1 Pipe purchased under specification will be manufactured, as a minimum, in accordance with ASTM A-106 and additional requirements as defined in this specification.

4.2 Killed steel, made by one or more of the following processes: electric furnace, open hearth or basic oxygen, will be used exclusively in the manufacturing of pipe covered in this specification.

4.3 Jointers are not permitted.

4.4 Pipe Ends

4.4.1 The ends on NPS of 2 and larger will be beveled to an angle of 30° with a tolerance of +5°, -0°. The bevel will be measured from a line drawn perpendicular to the axis of the pipe with a root face of 1/16-inch ±1/32-inch.

4.4.2 The ends on pipe smaller than NPS 2-inch will be plain-end square cut.

4. MATERIALS AND MANUFACTURE (Cont'd)

4.5 The pipe will be visually examined and will be determined to be free of defects as defined by Section 18 of ASTM A-106. Surface imperfections that penetrate more that 12.5% of the nominal wall thickness will be considered defects. The pipe surface will be free from scale, dents and injurious defects.

4.6 Defects in the pipe may be repaired in accordance with ASTM A-530 with written consent from Southwest Gas.

5. PERFORMANCE REQUIREMENTS

5.1 The material will conform to the tensile requirements of ASTM A-106, Grade B. Testing procedures will conform to the requirements of ASTM A-370. All pipe tests must include yield strength, ultimate tensile strength and elongation determinations at room temperature.

5.2 A flattening test will be performed on all pipe larger than 2-inch in accordance with ASTM A-530. Southwest retains the right to require flattening tests on pipe smaller than 2-inch.

5.3 All pipe will be subjected to a hydrostatic pressure test. The test pressure will be in accordance with Section 20, Hydrostatic Test Requirements, of ASTM A-530. The test pressure need not exceed 2500 psig for pipe 3 1/2-inch outside diameter and smaller and 2800 psig for pipe larger than 3 1/2-inch in outside diameter.

5.4 Tests required by ASTM A-106 and A-530 not contained in this specification will be performed per ASTM requirements. Southwest Gas may, at their discretion, request the results of such tests if specified on the purchase order.

5.5 The composition of pipe furnished to this specification, as determined by heat analyses according to ASTM A-751, will conform to ASTM A-106, Table 1, for Grade B.

6. DIMENSIONS AND TOLERANCES

6.1 Pipe diameter and wall thickness dimensions and tolerances will conform to ANSI 36.10. Appendix A of this specification shows common sizes and design pressures.

6.2 Unless a minimum or maximum length is specified on the materials requisition and purchase order, the following tolerances in length shall apply:

Nominal Length	Minimum Length	Minimum Average Lengths of Each Order Item	Maximum Length
20 ft (SRL)	9.0 ft	17.5 ft	22.5 ft
40 ft (DRL)	14.0 ft	35.0 ft	45.0 ft
60 ft (TRL)	21.0 ft	52.5 ft	65.0 ft
80 ft	28.0 ft	70.0 ft	85.0 ft

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7. INSPECTION

7.1 Successful review of the Product Information Package (PIP), as well as any future reference by SWG to the Seller's part number or internal code number in any future contract or purchase, will mean only that no conflict with the specification was found and will not relieve the Seller from meeting all the requirements of this specification.

7.2 SWG retains the option to inspect the manufacture and testing of all materials, products or systems supplied to SWG under this specification at the manufacturer's facility.

7.3 SWG will make appropriate inspections and tests of all materials, products or systems supplied to this specification. SWG will have the right, at their option, to reject any material which fails to conform to this specification. Any such rejection may take place at the manufacturer facility; the supplier's warehouse or any subsequent delivery location, before or after SWG assumes possession. Notice of the rejection will be made promptly to the supplier by SWG. The defective product will be replaced or returned for credit at the manufacturer's expense.

7. INSPECTION (CONT'D)

7.4 Any changes in the manufacturing of previously approved products described in this material specification for sale to SWG, must be approved by SWG's Engineering Staff. **Failure to obtain SWG's approval may be cause for rejection and disqualification as an approved supplier**.

8. CERTIFICATION

The manufacturer's or supplier's certification will be furnished to Southwest. This certification will state that samples representing each lot have been manufactured, tested and inspected in accordance with this specification and that all requirements have been met. The supplier will provide the results of all tests outlined in Section 5 and 6 in tabular form according to grade and heat number.

Testing documentation demonstrating the physical characteristics of the pipe which includes, at a minimum, diameter, yield strength, ultimate tensile strength, wall thickness, seam type and chemical composition shall be provided to Southwest in accordance with 49 CFR 192.

Upon the request of Southwest, the certification of an independent third-party indicating conformance to this specification may be considered at Southwest's expense.

9. SAFETY DATA SHEETS

In accordance with law, the Seller will supply Safety Data Sheets for all applicable items supplied under this specification to the following:

1) The Receiving Location
2) Engineering Staff
3) Southwest Gas Corporation
   Corporate Safety
   Mail Station LVA-120
   P.O. Box 98510
   Las Vegas, NV 89193-8510

PIPE AND TUBING
Pipe, Steel, ASTM A-106, Grade B

10. PRODUCT MARKING

The pipe manufactured to this specification will be marked in accordance with ASTM A-700. This will include ASTM designation and grade, manufacturers name or trademark, size, weight and heat number.

Pipe sold to Southwest Gas will have SWG's purchase order number marked on each length.

11. PACKAGING AND PACKAGE MARKING

Packaging and package marking will conform to ASTM A-700 unless otherwise specified by Southwest Gas. All products covered in this specification will be packaged in a manner to prevent damage during transportation and storage.

12. STOCK CLASSIFICATION DESCRIPTION

PIPE, ASTM A-106, GRADE B, SEAMLESS; ___ INCH OD X ___ WT; ___ (SRL, DRL, TRL); ____ (ENDS BEVELED FOR WELDING 30°, +5°, -0° OR PLAIN ENDS; MAX LENGTH ___ FT,_____ MIN LENGTH _____ FT. (OPTIONAL); COATED (OPTIONAL).

Tex Tube

USX Corp.