SOUTHWEST GAS CORPORATION
ENGINEERING STAFF
MATERIAL SPECIFICATION

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PIPE AND TUBING
Pipe, Steel, ASTM A-53 (Black)

1. SCOPE

This specification covers ASTM A-53, Grade B, seamless and electric-resistance welded carbon steel pipe in nominal pipe sizes (NPS) of 3/8-inch through 3 1/2-inch. This steel pipe is used for various uses including the manufacture of pipe nipples in Southwest Gas Material Specification B-4.

2. APPLICABLE DOCUMENTS

2.1 ASTM International (ASTM) A-53M-10 (Oct. 2010), "Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated, Welded and Seamless."

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

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

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

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

2.6 SWG Corporation Material Specification (MS) B-4, "Pipe Nipples, Threaded and Plain End."

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 document incorporated in whole or part by 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 "approve," "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. MATERIAL AND MANUFACTURING

4.1 Pipe purchased under specification will be manufactured, as a minimum, in accordance with ASTM A-53 and additional requirements as defined in this specification.

4.2 Pipe manufactured to this specification will be furnished in the following types and grades:

- Type E, Grade B, Electric-resistance welded (ERW) or,
- Type S, Grade B, Seamless.

4.3 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.

4.4 Jointers are not permitted.

4.5 Pipe end specifications are given in Southwest Gas' MS B-4 and will be specified in the purchase order.

4. MATERIAL AND MANUFACTURE (Cont'd)

4.6 The pipe will be visually examined and will be determined to be free of defects as defined by Section 12 of ASTM A-53. 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.

4.7 Defects in the pipe may be repaired in accordance with ASTM A-530 with written consent from Southwest Gas. Repair welding of the weld seam of Type E is prohibited.

5. PERFORMANCE REQUIREMENTS

5.1 The material will conform to the tensile requirements of ASTM A-53; 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-53 for both seamless and ERW. 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 ASTM A-53 and are shown in Table X2.2 of that document. The test pressure need not exceed 2500 psig.

5.4 Tests required by ASTM A-53 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 analysis according to ASTM A-751, will conform to ASTM A-53, Table 1, for Grade B.

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6. DIMENSIONS AND TOLERANCES

6.1 Pipe diameter and wall thickness dimensions and tolerances will conform to Table X2.2 in ASTM A-53.

6.2 Individual lengths may be requested per SWG MS B-4

6.3 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

TABLE A-4.1

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 referenced in this specification that are sold to SWG.

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's facility; the supplier's warehouse or any subsequent delivery location, before or after SWG assumes possession. Notice of rejection will be made promptly thereafter 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 materials, products or systems 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. When requested or specified in the purchase order or contract, a report of test results will be provided. The supplier will provide the results of all tests outlined in Section 5 and 6 in tabular form according to grade and heat number.

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-530
P.O. Box 98510
Las Vegas, NV 89193-8510

10. PRODUCT MARKING

The pipe manufactured to this specification will be marked in accordance with ASTM A-53. This will include ASTM designation, grade, type, 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, BLACK, ASTM A-53, GRADE B,_____ (TYPE S OR TYPE E); ____ INCH OD X WT; ____ (SRL, DRL, TRL OR FEET); ____ ENDS (PLAIN OR ACCORDING TO MS B-4; MAX LENGTH ___ FT, MIN LENGTH ___ FT. (OPTIONAL); FOR USE IN MS B-4 ONLY.