SOUTHWEST GAS CORPORATION
ENGINEERING STAFF

MATERIAL SPECIFICATION

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VALVES AND STOPS
Stopcocks

1. SCOPE

This specification covers both lubricated and non-lubricated cast iron stopcocks in sizes 1/2" to 2" NPS. Stopcocks covered by this specification will have pressure ratings of 175 psig or 500 psig.

All stopcocks covered by this specification when installed as a single component, may be installed without an installation pressure test. When a pressure test is required during installation, the test pressure will not exceed the manufacturer's test pressure.

2. APPLICABLE DOCUMENTS

2.1 American National Standards Institute (ANSI) B-1.20.1, "Pipe Threads (Except Dry Seal)."

2.2 American National Standards Institute (ANSI) B-16.33, "Manually Operated Metallic Gas Valves for Use in Gas Piping Systems Up To 125 psig."

2.3 American National Standards Institute (ANSI) Z-55.1 "Finishes for Industrial Apparatus and Equipment."

2.4 ASTM International (ASTM) A-47, "Specification for Ferritic Malleable Iron Castings."

2.5 ASTM international (ASTM) A-48, "Standard Specification for Gray Iron Castings."

2.6 ASTM International (ASTM) A-126, "Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings."

2.7 ASTM International (ASTM) A-197, "Specification for Cupola Malleable Iron."

2.8 ASTM International (ASTM) A-395, "Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperature."

2.9 ASTM International (ASTM) A-536, "Specification for Ductile Iron Castings."

2.10 ASTM International (ASTM) B-283, "Standard Specification for Copper and Copper Alloy Die Forgings (Hot Pressed)."

2. APPLICABLE DOCUMENTS (Cont'd)

2.11 ASTM International (ASTM) D-2000, "Classification System for Rubber Products in Automotive Applications."

2.12 American Petroleum Institute (API) Specification 6-A, "Specification for Wellhead Equipment."

2.13 American Petroleum Institute (API) Specification 6-D, "Specification for Pipeline Valves."

2.14 Southwest Gas Material Specification (MS) H-7, "Valve Lubricant."

2.15 Southwest Gas Material Specification (MS) B-12, "Unions, Malleable Iron."

2.16 United States Department of Transportation (DOT), Code of Federal Regulations, Title 49, Part 192, "Transportation of Natural and Other Gas by Pipeline; Minimum Safety Standards."

NOTE: Unless otherwise specified, the editions of the above documents incorporated by DOT 49 CFR 192 are applicable. Documents not incorporated by DOT 49 CFR 192 will be the most recent edition.

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 technical product information that a manufacturer must submit to SWG to determine if the product is suitable for use by SWG, unless specifically stated otherwise.

3.2 CWP will mean "Cold Working Pressure" and is the maximum service pressure permitted in the ambient temperature range of -20°F to 150°F. CWP is expressed in psig (pounds per square inch gage).

3. TERMINOLOGY (Cont'd)

3.3 WOG will mean "Water, Oil and Gas" and is equivalent to CWP in Paragraph 3.2.

3.4 The terms "stop" or "stopcock" will mean manually operated gas valve.

4. MATERIALS AND MANUFACTURING

4.1 Stopcocks purchased under this specification will meet the minimum requirements of DOT 49 CFR 192 and the applicable standards of API Specification 6-A, API Specification 6-D or ANSI B-16.33 in addition to the requirements defined in this specification.

4.2 The body of the stops will be made from one of the following materials and manufactured according to the applicable standard:

ASTM A-47
ASTM A-48, Class 30
ASTM A-126, Grade B
ASTM A-197
A-395
A-536
ASTM B-283

4.3 The stopcocks' stem, plug and/or ball will be made from materials approved by Southwest Gas and referenced in Section 2, Applicable Documents, of this specification.

4.4 The stopcocks will be tamper-proof. They will be designed and constructed to minimize the possibility of the removal of the core of the valve with anything other than specialized tools. The designation "T" will be stamped on any valve where the tamper-proof features are not easily identifiable.

4.5 All components of the valve will be designed for natural gas use and will be compatible with natural gas and other elements commonly found in natural gas pipelines.

4.6 All O-rings will meet the requirements of ASTM D-2000 and will have a minimum Shore "A" durometer of 70.

4. MATERIALS AND MANUFACTURING (Cont'd)

4.7 All cast iron stopcocks, as a part of manufacture, will be tested in accordance with DOT 49 CFR 192.145 as follows:

- A shell test with a minimum test pressure equal to 1.5 times the maximum rated working pressure for a minimum duration of 30 seconds. The test fixture will allow ejection of the plug in case of improper assembly.
- After the shell test, a seat test not less than 1.5 times the maximum rated working pressure will be applied to both sides of the closed valve.
- After the last pressure test, the valve will then be operated through its entire travel to demonstrate freedom of interference.
- The valve must not leak past the seat in the closed position and past the plug into the atmosphere in either the open or the closed position.

4.8 The stop will have a flat rectangular head to provide a method for operating with a wrench. The position of the operating head will indicate the position of the valve plug. The head parallel to the piping will indicate open, perpendicular will indicate closed.

4.9 The operating head will have a lockwing to lock the valve in the closed position with the valve body using a standard 1/2-inch barrel lock.

4.10 Non-Lubricated/Permanently Lubricated Stops

- Non-lubricated (permanently lubricated) stopcocks will have a soft seat and not require a lubricant to provide a bubble tight shut-off.
- Seals of non-lubricated stops will not be affected by grease or other petroleum products.

4. MATERIALS AND MANUFACTURING (Cont'd)

4.11 Lubricated Stopcocks

- The stops will be capable of being lubricated while subjected to the maximum rated operating pressure in both the fully open and the fully closed position.
- The stops will be compatible with lubricant specified by Southwest Gas Material Specification MS H-7.
- The plug will be designed with lubrication ports and be designed to minimize entry of lubricant into the gas stream.

4.12 The stopcock ends will be NPT and conform to ANSI B-1.20.1.

4.13 Unless otherwise specified, all stopcocks shall be coated with an Industrial Gray Coating No. 49 per ANSI Z-55.1. The paint system used shall be one of the systems listed in Tables D-2.1 and D-2.2 or a pre-approved equivalent.

4.14 Southwest Gas may request the stopcock to be furnished with an insulating union. This union will meet the requirements of Southwest Gas Material Specification MS B-12. If the union is supplied on a unidirectional valve, it will be installed on the downstream side of the valve.

4. MATERIALS AND MANUFACTURING (Cont'd)

APPROVED PAINT SYSTEMS				
SYSTEM NUMBER	**SURFACE PREPARATION**	**PRIMER COAT**	**INTERMEDIATE COAT**	**FINISH COAT**
1	Solvent Cleaning (SSPC-SP 1) THEN Power Tool Cleaning (SSPC-SP 3) Rusted Spots	High-Build Polyamide Epoxy, DFT 4.0 to 5.0 Mils.	None	Aliphatic Polyurethane DFT 2.0 to 3.0 Mils.
2	Solvent Cleaning (SSPC-SP 1) THEN Power Tool Cleaning (SSPC-SP 3) Rusted Spots	Modified Alkyd, Inhibited, Chromate and Lead-Free, DFT 2.0 Mils.	Alkyd Enamel, DFT 1.5 to 2.0 Mils.	Alkyd Enamel, DFT 1.5 to 2.0 Mils.
3	Solvent Cleaning (SSPC-SP 1) THEN Power Tool Cleaning (SSPC-SP 3) Rusted Spots	Aluminum Flake Epoxy Mastic, DFT 4.0 to 5.0 Mils.	None	Aliphatic Polyurethane DFT 2.0 to 3.0 Mils.

TABLE D-2.1

4. MATERIALS AND MANUFACTURING (Cont'd)

APPROVED PAINT SYSTEMS MANUFACTURER'S PART NUMBERS				
SYSTEM NUMBER	**CARBOLINE**	**SHERWIN WILLIAMS**	**RUST-OLEUM**	**KRYLON**
1[1]	801834	B58 T 104 B65 W 300 Series	9100 Series 9400 Series	
2[1]	GP-818 Subsil B	B50 HZ 1 B56 Series	76697686	69100871
3[1]	Carbomastic 15 834	B62 S 100 B65 W 300 Series		

NOTE: [1]For each paint system, the top part number is for the primer and the bottom part number is for the top coat.

TABLE D-2.2

5. PERFORMANCE REQUIREMENTS

5.1 The valve will provide a bubble tight shut-off with pressure from 0 psig to 1.5 times the rated working pressure. This may be verified in accordance with Section 3.2 of ANSI B-16.33.

5.2 Stopcocks will be rated for an operating temperature range of -20 degrees F to 150 degrees F at the rated working pressure.

5.3 The stopcocks will be capable of being easily replaced in operating pressures up to 60 psig with the use of Mueller's H-17010 NO-BLO Valve Changer.

5.4 The stops will meet the structural provisions set forth in ANSI B-16.33, Section 3.4.

5.5 The torque required to either operate or break loose the valve's set (breaking torque) will not exceed the values below.

Nominal Valve Size (Inches)	Maximum Break & Operating Torque (Foot Pounds)
½	17
¾	20
1	27
1 ¼	42
1 ½	58
2	100

TABLE D-2.3

5.6 The minimum torque required to operate the valve will be 4 foot-pounds (ft-lbs) for all valve sizes.

5.7 The valves will meet the flow requirements of ANSI B-16.33.

6. DIMENSIONS AND TOLERANCES

6.1 All NPT threads will meet the dimensions and tolerances of ANSI B-1.20.1.

6.2 The maximum end-to-end dimensions of the stops will be as follows:

NOMINAL VALVE SIZE (Inches)	MAXIMUM LENGTH (Inches)
¾	3 ½
1	4
1 ¼	4 ½
1 ½	5
2	5 5/8

TABLE D-2.4

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 any and all materials, products or systems referenced in this specification that are sold to SWG.

7.3 Southwest will make appropriate inspections and tests of any and 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 Southwest 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 materials, products or systems described in this material specification for sale to Southwest Gas 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 sample 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.

Upon the request of Southwest, the certification of an independent third party indicating conformance to the 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
Staff Safety
Mail Station LVA-120
P.O. Box 98510
Las Vegas, NV 89193-8510

10. PRODUCT MARKING

All stopcocks sold to Southwest will be marked with the following:

- Manufacturers name or trademark
- The stopcocks rated working pressure
- The designation "T" to indicate tamper resistance where applicable
- Unidirectional valves will be marked with a permanent arrow showing the direction of flow.

11. PACKAGING AND PACKAGE MARKING

All stopcocks will be packaged with suitable protectors to prevent damage to the valve or the threads during transportation and storage.

12. STOCK CLASSIFICATION DESCRIPTION

STOPCOCK, ___-INCH___ (INSULATED, OPTIONAL, LEAVE BLANK IF NOT) WITH ____MAX WORKING PRESSURE; ___ (NON-LUBRICATED OR LUBRICATED); _____ (UNIDIRECTIONAL OR BIDIRECTIONAL); TAMPER-PROOF WITH LOCKWING; BLACK FINISH.