




## **SOUTHWEST GAS CORPORATION**

® ENGINEERING STAFF

### ***MATERIAL SPECIFICATION***

*Prepared By:* Engineering Staff 

*Approved By:* Jerome T. Schmitz 

|                         |          |
|-------------------------|----------|
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## **FILTERS & STRAINERS**

### Filters

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#### **1. SCOPE**

This specification covers threaded, flanged weld end and pilot filters in sizes ¼-inch NPS and larger. The filters covered in this specification will be used upstream of meters and regulators to remove pipe scale, dust, dirt and condensate traveling through the mains and services.

All filters covered by this specification, when installed as a single component, may be installed without a pressure test.

#### **2. APPLICABLE DOCUMENTS**


- 2.1 American National Standards Institute (ANSI) B-1.20.1, "Pipe Threads, General Purpose."
- 2.2 American National Standards Institute (ANSI) B-16.25, "Butt Welding Ends."
- 2.3 American National Standards Institute (ANSI) B-16.5, "Pipe Flanges and Flanged Fittings."
- 2.4 American National Standards Institute (ANSI) B-31.8, "Gas Transmission and Distribution Piping Systems."
- 2.5 American National Standards Institute (ANSI) Z-55.1 "Finishes for Industrial Apparatus and Equipment."
- 2.6 American Petroleum Institute (API) Specification 6D, "Specification for Pipeline Valves."
- 2.7 American Petroleum Institute (API) Specification 1104, "Standard for Welding Pipelines and Related Facilities."
- 2.8 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section 8, Division 1, "Pressure Vessels."
- 2.9 ASTM International (ASTM) A-126, "Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings."
- 2.10 ASTM International (ASTM) B-16, "Free-Cutting Brass Rod, Bar and Shapes."
- 2.11 ASTM International (ASTM) B-211, "Standard Specification for Aluminum-Alloy Bar, Rod and Wire."



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**2. APPLICABLE DOCUMENTS** (Cont'd)

2.12 United States Department of Transportation (DOT), Code of Federal Regulations (CFR), 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 The following are ANSI class ratings which correspond to CWP's as recognized by Southwest Gas:

| ANSI Class | CWP (psig) |
|------------|------------|
| 150        | 275        |
| 300        | 720        |
| 600        | 1440       |


**TABLE G-2.1**



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#### **4. MATERIALS AND MANUFACTURING**

- 4.1 Filters covered by this specification will be manufactured in accordance with ANSI B-31.8, ASME Boiler and Pressure Vessel Code (Section 8, Division 1) and any additional requirements as defined in this specification.
- 4.2 The welding of fabricated filters will be performed in accordance with ASTM Boiler and Pressure Vessel Code or API 1104.
  - 4.2.1 Filter bodies made from brass will meet the requirements of ASTM B-16.
  - 4.2.2 Filter bodies made from aluminum will meet the requirements of ASTM B-211.
- 4.3 Filter bodies made from cast iron will meet the requirements of ASTM A-126, Grade B or C.
- 4.4 Filter bodies made from steel will be made with material listed in API 6D.
- 4.5 Filter Ends:
  - 4.5.1 Flanged filters will have steel flanges which conform to ANSI B-16.5.
  - 4.5.2 Threaded and pilot filters will have tapered threads and will be threaded in accordance with ANSI B-1.20.1.
  - 4.5.3 Weld ends will conform to ANSI B-16.25.
- 4.6 Tee type filters will have openings located at the top to facilitate removal of the filter elements.
- 4.7 Tee type filters will have openings located at the top to facilitate removal of the filter elements.
- 4.8 Tee type filters will have differential taps which can be used to determine the pressure differential across the filters.
- 4.9 All filter elements will be rated between 5 to 50 microns inclusive and capable of removing debris from the gas flow in accordance with their rating.

**EXAMPLE:** A filter element with a 10 micron rating will be capable of removing debris that is 10 microns and larger.



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**4. MATERIALS AND MANUFACTURING (Cont'd)**

4.10 All components and sealing elements will be compatible with natural gas and other agents and debris commonly found in natural gas pipelines.

4.11 Each filter will be subjected to a hydrostatic shell test at 1.5 times the rated design pressure. The required durations for the hydrostatic tests are listed below:

| <b>DURATION OF HYDROSTATIC TEST</b>     |                              |
|---|------------------------------|
| <b>FILTER CONNECTION SIZE</b><br>Inches | <b>SHELL TEST</b><br>Minutes |
| ¼ through 1 ½                           | 1                            |
| 2 through 4                             | 2                            |
| 6 through 10                            | 5                            |
| 12 through 18                           | 15                           |

**TABLE G-2.2**

4.12 SWG reserves the right to require higher hydrostatic test pressures and/or longer testing durations.

4.13 The end-to end dimension tolerance will not exceed 1/16-inch from the dimensions specified by the manufacturer, measured from any point on the sealing face on one flange or weld face to the corresponding location on the other flange or weld face.

4.14 Flanges will be installed so that they are parallel. To check, level the face of one flange. A level placed on the face of the other flange will require a shim no more than 1/16-inch thick placed on the outer edge of the face to achieve a level condition.

4.15 Flanges will be oriented to match standard “two-hole” leveled flange connections.

4.16 Flanges will be installed so that they are parallel. To check, level the face of one flange. A level placed on the face of the other flange will require a shim no more than 1/16-inch thick placed on the outer edge of the face to achieve a level condition.

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**4. MATERIALS AND MANUFACTURING (Cont'd)**

4.17 Unless otherwise specified, all threaded unions 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 Table G-2.1 and G-2.2 or a pre-approved equivalent.

| APPROVED PAINT SYSTEMS |   |  |                                   |   |
|------------------------|---|--|-----------------------------------|---|
| SYSTEM NUMBER          | SURFACE PREPARATION   | PRIMER COAT  | INTERMEDIATE COAT                 | FINISH COAT                                 |
| 1                      | Solvent Cleaning (SSPC-SP1)<br>THEN<br>Power Tool Cleaning (SSPC-SP3)<br>Rusted Spots | High-Build Polyamide Epoxy, DFT 4.0 to 5.0                       | None                              | Aliphatic Polyurethane DFT 2.0 to 3.0 Mils. |
| 2                      | Solvent Cleaning (SSPC-SP1)<br>THEN<br>Power Tool Cleaning (SSPC-SP3) 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-SP1)<br>THEN<br>Power Tool Cleaning (SSPC-SP3)<br>Rusted Spots | Aluminum Flake Epoxy Mastic, DFT 4.0 to 5.0 Mils.                | None                              | Aliphatic Polyurethane DFT 2.0 to 3.0 Mils. |

**TABLE G-2.3**



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**4. MATERIALS AND MANUFACTURING (Cont'd)**

| APPROVED PAINT SYSTEMS      |                |                  |             |        |
|-----------------------------|----------------|------------------|-------------|--------|
| MANUFACTURER'S PART NUMBERS |                |                  |             |        |
| SYSTEM NUMBER               | CARBOLINE      | SHERWIN WILLIAMS | RUST-OLEUM  | KRYLON |
| 1 <sup>1</sup>              | 801            | B58 T 104        | 9100 Series |        |
|                             | 834            | B65 W 300 Series | 9400 Series |        |
| 2 <sup>1</sup>              | GP-818         | B50 HZ 1         | 7669        | 00691  |
|                             | Subsil B       | B56 Series       | 7686        | 00871  |
| 3 <sup>1</sup>              | Carbomastic 15 | B62 S 100        |             |        |
|                             | 834            | B65 W 300 Series |             |        |

<sup>1</sup> For each paint system, the top part number is for the primer and the bottom part number is for the top coat.

**TABLE G-2.4**

**5. PERFORMANCE REQUIREMENTS**


- 5.1 All tee type filters will be designed so that the filter element can be changed without removing the filter body from the piping.
- 5.2 A differential pressure test performed on flanged and screwed filters will be sufficient to determine when the filter elements require changing. The manufacturer will provide recommended maximum allowable differentials.
- 5.3 All filters will be capable of withstanding hydrostatic test pressures required in Paragraph 4.13 for at least 8 hours without any detrimental effects to the filters.
- 5.4 All filters will be capable of withstanding a pressure test of 1.5 times the rated pressure with air or nitrogen.



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#### **6. DIMENSIONS AND TOLERANCES**

- 6.1 Flange dimensions and tolerances will conform to ANSI B-16.5.
- 6.2 Threaded end dimensions and tolerances will conform to ANSI B-1.20.1
- 6.3 Weld end dimensions and tolerances will conform to ANSI B-16.25.
- 6.4 Dimensions are shown in Appendixes A, B and C of this specification.
- 6.5 Tolerances will be 1/16-inch (1.59 mm) for end-to-end dimensions.

#### **7. INSPECTION**


- 7.1 Successful review of the 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 filters sold to SWG.
- 7.3 SWG will make appropriate inspections and test 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 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.
- 7.4 Any changes in the manufacture 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.**



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**8. CERTIFICATION**

The manufacturer's or supplier's certification shall be furnished to Southwest. This certification shall state that samples representing each lot have been manufactured, tested and inspected in accordance with this specification and that 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  
Corporate Safety  
Mail Station LVA-581  
P.O. Box 98510  
Las Vegas, NV 89193-8510

**10. PRODUCT MARKING**

10.1 The direction of flow will be either cast or stamped into all filters.

10.2 All filters sold to SWG will be marked with the manufacturer's name or trademark, the manufacturer's part number, date of manufacture, material identification, the maximum operating pressure or appropriate ANSI class rating and the nominal pipe size.






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**11. PACKAGING AND PACKAGE MARKING**

The threads of screwed and pilot filters will be free of paint and plugged with thread protectors. Flanged filters will have a suitable protector to prevent damage to contact surfaces and prevent contamination of the filter. All filters will be packaged in a manner to prevent damage during transportation and storage.

**12. STOCK CLASSIFICATION DESCRIPTION**

FILTER; \_\_\_\_\_ INCH; \_\_\_\_\_ (SCREWED, FLANGED, PILOT); \_\_\_\_\_ (PRESSURE RATING) PSIG; \_\_\_\_\_ MICRON CARTRIDGE.