



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

| | |
|-------------------------|----------|
| Section No: | MS M-7 |
| Page No.: | 1 of 10 |
| Issue Date: | 03/01/16 |
| Superseded Date: | 02/25/15 |

METERS

Meter Connections: Welded Steel Case, Iron Case and Aluminum Case Meters

1. SCOPE

This specification covers meter connections, regular and insulated, for diaphragm-type gas displacement meters per ANSI B-109.1 and ANSI B-109.2. The parts covered include ring nuts, swivels, washers and caps.

2. APPLICABLE DOCUMENTS

- 2.1 American National Standards Institute (ANSI) B-1.20.1, "Pipe Threads, General Purpose (INCH)."
- 2.2 American National Standards Institute (ANSI) B-16.3, "Malleable-Iron Screwed Fittings, 150 and 300 Lb."
- 2.3 American National Standards Institute (ANSI) B-109.1, "Gas Displacement Meters (500 cubic feet per hour capacity and under)."
- 2.4 American National Standards Institute (ANSI) B-109.2, "Gas Displacement Meters (over 500 cubic feet per hour capacity)."
- 2.5 American National Standards Institute (ANSI) Z-55.1 "Finishes for Industrial Apparatus and Equipment."
- 2.6 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.



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3. TERMINOLOGY (Cont'd)

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.

4. MATERIALS AND MANUFACTURING

- 4.1 All meter connections shall be coated malleable-iron or steel and shall conform to ANSI B-16.3.
- 4.2 Galvanized connections can be supplied as a suitable alternative only when bare connections are not available for coating, but they must be coated per this specification.
- 4.3 The finish coating shall be an Industrial Gray No. 49 per ANSI Z-55.1. The paint system used shall be one of the systems listed in Tables M-7.1 and M-7.2 or a pre-approved equivalent.
- 4.4 Pipe threads shall conform to ANSI B-1.20.1.
- 4.5 Threads on the nut shall conform to ANSI B-1.20.1.
- 4.6 All threads shall be chamfered or countersunk. Threads on items which are coated galvanized or electroplated shall meet these requirements after coating.
- 4.7 Internal parts and surfaces of the meter connections shall be resistant to corrosion or chemical attack from the affects of gas.
- 4.8 The meter connections shall be constructed to provide adequate strength in connecting the meter to related piping systems.
- 4.9 Insulated swivels shall use Zytel nylon or equal as the insulating material. Minimum thickness shall be 35 mil (0.035 inch) and have minimum dielectric voltage strength of 600 Volts Direct Current (DC) per mil.

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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 M-7.1



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4. MATERIALS AND MANUFACTURING (Cont'd)

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

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

TABLE M-7.2

5. PERFORMANCE REQUIREMENTS

- 5.1 All meter connections shall be free from porosity and capable of holding 100 psi air pressure without leaking.
- 5.2 The meter connections shall be capable of operating within ambient temperature and flowing gas temperature range of -30°F (-34°C) through 120°F (49°C).
- 5.3 All meter connections shall be able to withstand a minimum of 3,820 pounds of compressive force against edge of component.
- 5.4 All insulating swivels shall have a breakdown voltage exceeding 5,000 Volts Direct Current (DC).

6. DIMENSIONS AND TOLERANCES

All meter connections manufactured to this specification will meet the dimensions and tolerances of Appendix A.



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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 meter connections sold to SWG.
- 7.3 SWG 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 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 will be made 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 shall 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.

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



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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

10. PRODUCT MARKING

All meter connections will be marked with the manufacturer's name or trademark, material designation, and size.

11. PACKAGING

Meter connections will be packaged to prevent damage during transportation and storage. Installation instructions will be packaged with each shipment.

12. STOCK CLASSIFICATION DESCRIPTION

NUT, GRAY COATED, METER SWIVEL, _____ INCH MPT.

SWIVEL, GRAY COATED, STRAIGHT OR _____ INCH OFFSET _____ INCH MPT X _____ LONG.

WASHER, NEOPRENE 70 DURO, FOR _____ LT SWIVEL, _____ INCH X _____ INCH X _____ INCH TK.

CAP, SPUD, 20 LITE FOR ALL DOMESTIC METERS.



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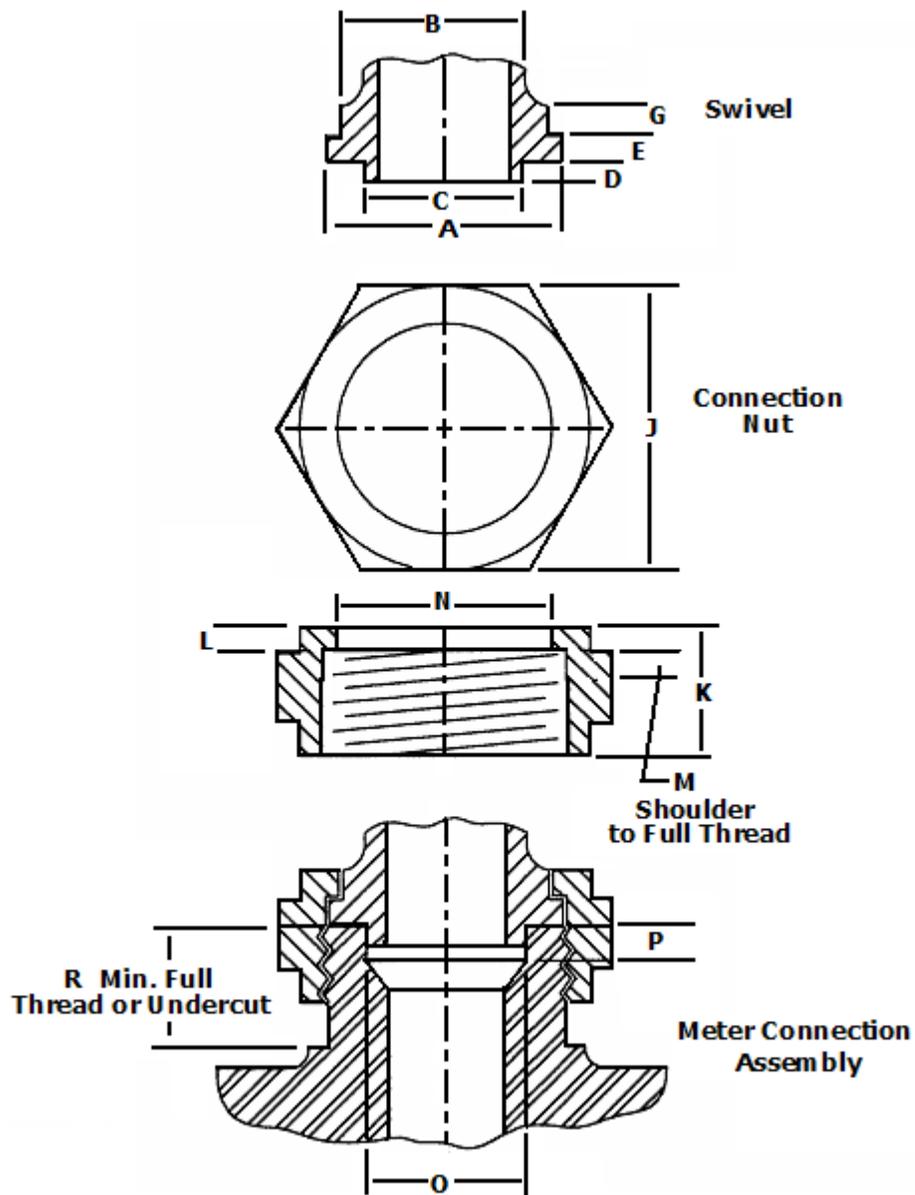
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APPENDIX A

CONNECTION DIMENSIONS NOMINAL FOR SWIVEL, NUT AND CAP



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APPENDIX A

(Cont'd)

| THREAD SPECIFICATIONS | | | | | | | | | | | |
|---|-------------------------|-------------------------|-------------------------|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| (NOTE: Unified thread form throughout, except as noted.) | | | | | | | | | | | |
| Connection Designation | 5 Lt. | 10 Lt. | #1 Sprague | 1" Pittsburgh | 20 Lt. | #2 Sprague | 30 Lt. | 45 Lt. | #4 Sprague | 60 Lt. | #5 Sprague |
| Thread/Inch | 12 | 11 1/2 | 12 | 1 1/4 – 1 1/2 NPT | 11 1/2 | 11 1/2 | 11 1/2 | 11 1/2 | 11 1/2 | 11 1/2 | 8 |
| External Major Dia. | <u>1.1138</u> 1.1310 | <u>1.4234</u> 1.4411 | <u>1.5759</u> 1.5931 | — | <u>1.8164</u> 1.8341 | <u>1.8578</u> 1.8755 | <u>2.0348</u> 2.0525 | <u>2.2543</u> 2.2720 | <u>2.3208</u> 2.3385 | <u>2.4253</u> 2.4430 | <u>3.4407</u> 3.4632 |
| External Pitch Dia. | <u>1.0669</u> 1.0769 | <u>1.3746</u> 1.3846 | <u>1.5290</u> 1.5390 | — | <u>1.7676</u> 1.7776 | <u>1.8090</u> 1.8190 | <u>1.9860</u> 1.9960 | <u>2.2055</u> 2.2155 | <u>2.2720</u> 2.2820 | <u>2.3765</u> 2.3865 | <u>3.3706</u> 3.3820 |
| External Minor Dia. | 1.0288 | 1.3344 | 1.4909 | — | 1.7274 | 1.7688 | 1.9458 | 2.1653 | 2.2318 | 2.3363 | 3.3098 |
| Internal Major Dia. | 1.1390 Min. | 1.4491 Min. | 1.6011 Min. | 1 1/4 – 1 1/2 NPS <u>1.650</u> 1.656 | 1.8421 Min. | 1.8835 Min. | 2.0605 Min. | 2.2800 Min. | 2.3465 Min. | 2.4510 Min. | 3.4712 Min. |
| Internal Pitch Dia. | <u>1.0849</u> 1.0962 | <u>1.3926</u> 1.4043 | <u>1.5470</u> 1.5585 | <u>1.588</u> 1.591 | <u>1.7856</u> 1.7974 | <u>1.8270</u> 1.8390 | <u>2.0040</u> 2.0160 | <u>2.2235</u> 2.2358 | <u>2.2900</u> 2.3023 | <u>2.3945</u> 2.4068 | <u>3.3900</u> 3.4049 |
| Internal Minor Dia. | <u>1.049</u> 1.060 | <u>1.355</u> 1.367 | <u>1.511</u> 1.522 | <u>1.543</u> 1.550 | <u>1.748</u> 1.760 | <u>1.789</u> 1.801 | <u>1.966</u> 1.978 | <u>2.186</u> 2.198 | <u>2.252</u> 2.265 | <u>2.357</u> 2.369 | <u>3.336</u> 3.351 |
| Pipe Size Normally Used | 1/2" | 3/4" | 1" | 1" | 1" | 1 1/4" | 1 1/2" | 1 1/2" | 1 1/2" | 1 1/2" | 2" |

TABLE M-7.3

**SOUTHWEST GAS CORPORATION**

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| CONNECTION DIMENSIONS NOMINAL FOR SWIVEL, NUT AND CAP | | | | | | | | | | | | |
|--|--------------|--------------|------------|---------------|---------|------------|-------------|------------|--------------|--------------|-------------|-------------|
| Connection Designation | 5 Lt. | 10 Lt. | #1 Sprague | 1" Pittsburgh | 20 Lt. | #2 Sprague | 30 Lt. | 45 Lt. | #4 Sprague | 60 Lt. | 100 Lt. | #5 Sprague |
| A | 1 | 1 5/16 | 1 15/32 | 1 15/32 | 1 11/16 | 1 3/4 | 1 29/32 | 2 1/8 | 2 7/32 | 2 5/16 | 2 27/32 | 3 1/4 |
| B | 27/32 | 1 3/32 | 1 5/16 | 1 5/16 | 1 3/8 | 1 5/8 | 1 21/32 | 1 29/32 | 1 61/64 | 1 29/32 | 2 13/32 | 2 27/32 |
| C | 3/4 | 1 | 1 | 1 | 1 5/16 | 1 15/64 | 1 1/2 | 1 45/64 | 1 1/2 | 1 29/32 | 2 7/32 | 2 5/16 |
| D | 5/32 | 5/32 | 3/16 | 3/16 | 3/16 | 3/16 | 1/4 | 1/4 | 3/16 | 1/4 | 1/4 | 1/4 |
| E | 1/8 | 1/8 | 5/32 | 5/32 | 5/32 | 7/32 | 5/32 | 5/32 | 3/16 | 5/32 | 3/16 | 1/4 |
| G | 7/64 | 1/8 | 3/16 | 3/16 | 5/32 | 7/32 | 11/64 | 3/16 | 3/8 | 3/16 | 1/4 | 1/4 |
| J Flats | 1 19/64 Oct. | 1 39/64 Oct. | 1 7/8 Hex | 1 7/8 Hex | 2 Oct. | 2 7/32 Hex | 2 7/32 Oct. | 2 1/2 Oct. | 2 13/16 Oct. | 2 41/64 Oct. | 3 7/16 Oct. | 3 55/64 Hex |
| K | 11/16 | 11/16 | 27/32 | 7/8 | 13/16 | 31/32 | 29/32 | 31/32 | 1 1/16 | 31/32 | 13/16 | 1 7/16 |
| L | 1/8 | 9/64 | 5/32 | 3/16 | 5/32 | 5/32 | 11/64 | 3/16 | 1/4 | 3/16 | 1/4 | 19/64 |
| M (Max.) | 5/32 | 5/32 | 7/32 | 3/16 | 3/16 | 1/4 | 3/16 | 3/16 | 7/32 | 3/16 | 3/16 | 7/32 |
| N | 7/8 | 1 5/32 | 1 11/32 | 1 11/32 | 1 13/32 | 1 43/64 | 1 11/16 | 1 15/16 | 2 | 1 15/16 | 2 7/16 | 2 31/32 |
| O | 13/16 | 1 1/16 | 1 1/16 | 1 1/8 | 1 11/32 | 1 5/16 | 1 35/64 | 1 3/4 | 1 19/32 | | 2 9/32 | 2 3/8 |
| P (Min.) | 7/32 | 7/32 | 1/4 | 1/4 | 1/4 | 1/4 | 5/16 | 5/16 | 1/4 | 5/16 | 7/16 | 5/16 |
| R (Min.) Full Thread or Undercut | 7/16 | 7/16 | 17/32 | 17/32 | 1/2 | 19/32 | 19/32 | 5/8 | 5/8 | 5/8 | 3/4 | 7/8 |

TABLE M-7.4