SOUTHWEST GAS CORPORATION
ENGINEERING STAFF
MATERIAL SPECIFICATION

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METERS
Positive Displacement Diaphragm- 500 CFH or Less

1. SCOPE

This specification covers diaphragm-type displacements meters, 500 cubic feet per hour capacity and less. The meters may be regular or temperature compensating.

2. APPLICABLE DOCUMENTS

2.1 American National Standards Institute, ANSI B109.1 – 1973, "Gas Displacement Meters (500 cubic feet per hour capacity and under)."

2.2 American National Standards Institute, ANSI Z55.1 – 1967, "Gray Finishes for Industrial Apparatus and Equipment."

2.3 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", whenever 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.

METERS
Positive Displacement Diaphragm- 500 CFH or Less

4. MATERIALS AND MANUFACTURING

The meters shall conform to the American National Standard for Gas Displacement Meters (500 cubic feet per hour capacity and under), ANSI B109.1 – 1973 and to the specifications listed herein.

4.1 Connections

4.1.1 Class 175, threaded for #1A Sprague, 6-inch c/c.

4.1.2 Class 250, threaded for #1A Sprague, 6-inch c/c.

4.1.3 Class 400, threaded for 30 lt., 8 ¼-inch c/c.

Connection sets, if any, as specified on the purchase order.

4.2 Indexes

2.3.1 All meters shall be equipped with pointer-type circular dial reading indexes; the first reading 1,000 cubic feel per revolution.

2.3.2 Non-reading circles (test hands) shall be either two (2) cubic feet, one-half (1/2) cubic foot or one (1) cubic foot as specified on the purchase order.

4.3 Exterior Finish

The prime coat shall be epoxy. The finish coat shall be acrylic, industrial gray enamel, per ANSI Z55.1 – 1967, No. 49.

4.4 Performance Tests and Specifications

4.41 Pressure Tests shall be made on each meter to confirm that it does not leak when subjected to an internal pressure of 150 percent of its badged case pressure or 10 psig, whichever is greater.

4.4.2 Proof Tests shall be made on each meter to confirm that it has been adjusted to have a preferred setting of 0.00 percent error with a tolerance of +/- 0.20 percent at both the check and capacity rates, using air values

4. MATERIALS AND MANUFACTURING (Cont'd)

METER	CHECK RATE	CAPACITY RATE
Class 175	50 CFH	175 CFH
Class 250 & 275	60 CFH	250 CFH
Class 400	85 CFH	415 CFH

4.4.3 Differential Tests shall be made on each meter at the check rates shown above to confirm that the differential pressure between the inlet and outlet of the meter does not exceed the following:

.30 inches water column for Class 175;

.32 inches water column for class 250; and

.40 inches water column for Class 400.

4.4.4 Pilot Flow (Slow Fire) Tests shall be made on each meter to confirm that the meter will register 90 percent of a flow of 0.2 cubic feet per hour at 1.5-inch water column pressure.

4.4.5 Security Sealing shall be made on each meter in the following manner:

4.4.5.1 Meters manufactured by Equimeter shall be sealed with a wire and lead seal properly crimped or with a red posi-cap security system. As a minimum one screw on the hand hole plate and the two top screws on the index cover shall be sealed.

4.4.5.2 Meters manufactured by American shall be sealed with a wire and lead seal properly crimped or with a red posi-cap security system. As a minimum one screw on the hand hole plate, one screw on the top cover place and two screws on the index cover shall be sealed.

4.4.5.3 Meters manufactured by Schlumberger/Sprague shall be sealed with a wire and lead seal properly crimped or with a red posi-cap security system. As a minimum two screws on the index cover shall be sealed.

5. PRODUCT MARKING

The manufacturer shall prepare a list showing the proof settings, expressed as percent error, at the capacity and check rates for each meter. Meters shall be identified by either the manufacturer's number or Southwest Gas Corporation's assigned number (if specified on the purchase order). The list shall show the Southwest Gas Corporation's purchase order number, the test location and the test date. One (1) copy of the list shall be attached to the packing slip and a duplicate copy of the list shall be sent to the shipping address shown on the Southwest Gas Corporation's purchase order.

6. DIMENSIONS AND TOLERANCES

6.1 Any Quality Acceptance Sampling done by Southwest Gas Corporation will be done to conform with Military Standard MIL-STD-105D, 29 April 1963, (ANSI Z1.4 – 1971), using General Inspection Level II in Table I and using the following Acceptance Quality Levels (AQL's):

ATTRIBUTE	AQL
Proof, Open Rate	2.5
Proof, Check Rate	2.5
Differential, Max.	2.5
Pilot Flow (Slow Fire)	2.5
Leaks	1.0
Exterior Finish	4.0

6.2 When inspection or test results indicate that meters do not meet these specifications, the manufacturer will be notified. Defective meters will be returned to the manufacturer for rework at the manufacturer's expense. Defective lots of meters will be returned to the manufacturer for rework at the manufacturer's expense.

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 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 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 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.

7.4 Any changes in the manufacturing of previously approved 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. MATERIAL SAFETY DATA SHEETS

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.

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. MATERIAL SAFETY DATA SHEETS

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

1) The Receiving Location

2) Southwest Gas Engineering Staff

3) Southwest Gas Corporation
Corporate Safety
Mail Station LVA-120
P.O. Box 98510
Las Vegas, NV 89193-8510

10. PACKAGING AND PACKAGE MARKING

All diaphragm-type displacement meters will be packaged to prevent scratching, bending, denting or any other damage that may occur during transportation and storage.

11. ORDERING

The purchase order shall include the following:

- Meter Manufacturer and Model.
- Southwest Gas Corporation's assigned numbering sequence, if required.
- Connection Sets (Caps, Swivels, etc.).
- Proving Dials Required.
- Temperature Compensating, if required.
- Delivery Location.