SOUTHWEST GAS CORPORATION
ENGINEERING STAFF
MATERIAL SPECIFICATION

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VALVES AND STOPS
Excess Flow Valves

1. SCOPE

This specification covers polyethylene excess flow valves (EFV). The EFV shall be designed to provide automatic reset or bleed-by in the event of a shutoff. All EFV's covered by this specification, when installed as a single component, may be installed without an installation pressure test.

2. APPLICABLE DOCUMENTS

2.1 ASTM International (ASTM) D2513, "Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing and Fittings."

2.2 ASTM International (ASTM) F1802, "Standard Test Method for Performance Testing of Excess Flow Valves."

2.3 ASTM International (ASTM) D3350, "Standard Specification for Polyethylene Plastics Pipe and Fittings Materials"

2.4 ASTM International (ASTM) D6779, "Standard Classification System for and Basis of Specification for Polyamide Molding and Extrusion Materials (PA)"

2.5 ASTM International (ASTM) F2138, "Standard Specification for Excess Flow Valves for Natural Gas Service"

2.6 ASTM International (ASTM) F2897, "Standard Specification for Tracking and Traceability Encoding System of Natural Gas Distribution Components (Pipe, Tubing, Fittings, Valves, and Appurtenances)"

2.7 Plastic Pipe Institute (PPI) TR-4, "PPI Listing of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB) and Minimum Required Strength (MRS) Ratings for Thermoplastic Piping Materials or Pipe"

2.8 Manufacturers Standardization Society (MSS) Standard Practice (SP) 115, "Excess Flow Valves for Natural Gas Service."

2. APPLICABLE DOCUMENTS (Cont'd)

2.9 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 above document incorporated by DOT 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 "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 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 Unless otherwise indicated, this specification covers EFV's sized for use on 2-inch IPS, 1¼ inch IPS, 1-inch CTS and ½ inch CTS residential and commercial service line sizes meeting SWG material specifications.

4. MATERIALS AND MANUFACTURING (Cont'd)

4.2 SWG must approve the plastic materials that house the EFV's (HDPE, PA, etc…). The manufacturer will provide SWG with a complete specification of the materials and/or a Plastic Pipe Institute (PPI) listing number for each resin used in the manufacture of said components.

4.3 All EFV's will be made from virgin material, no rework shall be accepted. The EFV's produced must meet all the requirements of this specification.

4.4 All material that is made of PE will be of pipe extruded from HP516 resin (PE 8100 and PE 8300) and come from virgin material; no rework material will be accepted.

4.5 All materials used must be compatible with the components found in natural gas.

4.6 All polyethylene pipe extensions (pups) must have the pipe manufactured date visibly indicated on the pipe by print line, label or another acceptable method that is clearly and completely readable.

4.7 Manufacturer shall maintain records of qualification and routine production testing performed to confirm that an EFV meets the requirements of ASTM F2138 or MSS SP115. Manufacturer to retain EFV qualification and inspection test records for the service life of the product.

4.8 The EFVs components and carrier must be free of visible cracks, holes, foreign inclusion, blisters, and dents, or other injurious defects.

4.9 The steel housing material shall be minimum schedule 40 pipe conforming to the requirements of ASTM A53, A106 and API 5L. Pipe grade to be A or B, unless specified.

4.10 Polyethylene (PE) resins from which the fitting and pipe are manufactured must conform to the requirements of ASTM D3350.

4.11 Polyamide (PA) resins from which the fitting and pipe are manufactured must conform to the requirements of ASTM D6779.

4.12 Upon delivery, the manufacture date of any PE components will not have exceeded 12 months.

4. MATERIALS AND MANUFACTURING (Cont'd)

4.13 The sample size shall be no less than 25 valves unless agreed otherwise by purchaser and manufacturer. Each rated minimum closure flow rate model must be design qualified under this section.

4.14 If applicable, fusion operations shall be controlled. Temperatures and interfacial pressures shall be monitored at minimum twice a shift and results recorded.

5. PERFORMANCE REQUIREMENTS

5.1 The fittings will be designed for use in gas distribution systems in all class locations, at pressures up to 100 psig, and at temperatures up to 140° F (60° C) simultaneously. All product features must be acceptable to SWG.

5.2 The EFV will be designed so that no harmful or hazardous substances will be released from the EFV into the gas and/or ground.

5.3 In accordance with ASTM F1802, the fittings will be designed so that oils and other agents and debris commonly found in natural gas pipelines will not adversely affect the product serviceability.

5.4 Manufacturer specifications must be provided for each size EFV in the following categories:

- Maximum bleed-by flow rates.
- Bleed-by reset rate.
- Average pressure drop at flow rate prior to shutoff.
- Maximum recommended length of service lines based upon inlet pressures.
- Minimum trip flow rates with respect to inlet pressure.
- A graph indicating minimum flow rates relative to inlet pressure.

5.5 The EFV will be mono-directional and will be of the bleed-by reset type.

5.6 100% visual inspection of beads, if applicable.

5.7 100% visual inspection of EFVs including marking. Barcode shall be scanned if possible.

6. DIMENSIONS AND TOLERANCES

6.1 EFV's installed as an in-line fitting will be integrated into an approved coupling or tapping-tee meeting SWG specifications.

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 options 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 Southwest assumes possession. Notice of 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 materials, products or systems described in this material specification for sale to SWG, must be approved by SWG's Engineering Staff. **Failure to obtain Southwest's approval may be cause for rejection and disqualification as an approved supplier.**

8. CERTIFICATION

The manufacturers 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 speciation 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-120
P.O. Box 98510
Las Vegas, NV 89193-8510

10. PRODUCT MARKING

10.1 The EFVs must be marked in accordance with ASTM F2138 with the following: ASTM F2138, manufacturer's name or trademark, coding that will enable the manufacturer to determine the EFV model as well as the date and location of manufacture.

10.2 If the EFV manufacturer inserts the EFV into pipe or a piping component prior to shipment to the BUYER, the marking shown below must be placed on the outer surface of the pipe or piping component:

10.2.1 ASTM F2138

10.2.2 Manufacturer's name or trademark

10.2.3 Type of EFV: Bypass (EFVB) or Non By-Pass (EFVNB)

10.2.4 Flow direction arrow

10.2.5 Nominal pipe size

10.2.6 Coding that will enable the manufacturer to determine the EFV model, resin formula as well as the date and location of manufacture

10. PRODUCT MARKING (Cont'd)

10.3 Marking on the excess flow valve housing will comply with the marking requirements of ASTM D2513. The marking method will provide permanent identification of the excess flow valve, enabling access to the quality and manufacturing records at any time and will include manufacturer's name or trademark (or both), size, the ASTM standard designation "D2513," material classification, serial number, manufacture date and temperature rating.

10.4 The temperature rating marking will be in accordance with ASTM D2513, which consists of at minimum, a two-letter coding (i.e., "CE"). The first code letter is to identify the high temperature rating and the second code letter is to identify the HDB rating at that high temperature rating. A third code letter may be included which signifies the melt index. The first code letter must have a minimum of a "C" rating which signifies a temperature rating of 140° F (60°C). The second code letter pertaining to the HDB rating must be sufficient to meet the performance requirements of this specification which requires a design pressure rating of 60 psig at 140°F (60C). If the second code letter is a "D," the fitting must be marked, "Rated for 60 psig at 140°F."

10.5 All polyethylene pipe extensions (pups) must have the pipe manufactured date visibly indicated on the pipe by print line, label or another acceptable method that is clearly and completely readable.

11. PACKAGING AND PACKAGE MARKING

All products covered in this specification will be packaged to prevent damage during shipping.

12. STOCK CLASSIFICATION DESCRIPTION

EXCESS FLOW VALVE, _____-INCH CTS, _____ (EFV MANUFACTURER STYLE NUMBER), INSIDE_____-INCH CTS COMPRESSION X _____-INCH WALL THICKNESS, _____(COUPLING MANUFACTURER), FITTING TO BE MARKED IN ACCORDANCE WITH ASTM D2513. AT A MINIMUM, MARKINGS MUST STATE “D2513” AND THE TEMPERATURE/PRESSURE INITIALS “CD” OR “CE” AND IF “CD” IS USED, MUST ALSO BE MARKED “RATED FOR 60 PSIG AT 140°F,”.