SOUTHWEST GAS CORPORATION

ENGINEERING STAFF

MATERIAL SPECIFICATION

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Couplings

Couplings For Use On Polyethylene Pipe

1. SCOPE

This specification covers 3-inch, 4-inch, 4" x 2" and 6-inch IPS mechanical couplings for use in connecting polyethylene pipe. Couplings covered in this specification may be installed as single components without pressure testing.

2. APPLICABLE DOCUMENTS

2.1 ASTM International (ASTM) A563, "Specification for Carbon and Alloy Steel Nuts."

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

2.3 American Iron and Steel Institute (AISI) C-1008, C-1010 and C-1020 Steel Products Manual Alloy, Carbon and High Strength Low Alloy Steel: Semi-Finished for Forging; "Hot Rolled Bars," "Cold Finished Bars," "Hot Rolled Deformed" and "Plain Concrete Reinforcing Bars."

2.4 ASTM International (ASTM) F1924, "Standard Specification for Plastic Mechanical Fittings for Use on Outside Diameter Controlled Polyethylene Gas Distribution Pipe and Tubing."

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

2.6 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 in whole or in part by 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 if 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 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 Steel components such as the body, grip rings and stiffeners must be of carbon steel AISI C-1008, C-1010, C-1020 or equivalent quality grade steel.

4.2 Nuts and bolts must be ASTM A563 Grade A carbon steel or approved equivalent.

4.3 If elastomeric seals are used, they must be of material compatible with natural gas and its constituents.

4.4 A factory applied fusion bonded epoxy coating (or approved equivalent) must be applied to all external steel components in accordance with Southwest Gas Design Standard C-3.

4.5 The body shall include a terminal for the connection of an anode or lead wire.

4.6 The steel stiffener shall be plated (or approved equivalent such as stainless steel).

4.7 All PE components will be made from virgin material.

4.8 Plastic molded components must be uniform in physical and chemical properties, free of cracks, voids, holes, foreign inclusions, areas of unpigmented polymer, or other injurious defects.

4. MATERIALS AND MANUFACTURING (Cont'd)

4.9 Plastic molded materials must be listed in the most current edition of the Plastics Pipe Institute (PPI) Technical Report (TR)-4.

4.10 Plastic fittings must contain suitable antioxidants.

5. PERFORMANCE REQUIREMENTS

5.1 The 3-inch coupling shall be able to sustain a 13,000 lb. tensile load, the 4-inch coupling shall be able to sustain a 14,000 lb. tensile load and the 6-inch shall be able to sustain a 26,000 lb. tensile load.

5.2 Each fitting and joint assembly shall be stronger than the PE pipe itself and shall remain leak-free while sustaining a tensile load which produces a 100 percent elongation as measured on a 2-inch segment.

5.3 Mechanical joints must conform to 49 CFR §192.281(e), "Plastic pipe: Mechanical joints."

5.4 Fittings and elastomeric seals must be designed so that water, condensate, rust, sand, and other debris that may be found in natural gas systems do not affect the gas seal, or integrity of the fitting.

5.5 Gaskets, o-rings, and other non-metallic internal components must be compatible with PE and PA pipe, tubing, and natural gas.

5.6 All exposed metallic components must be resistant to corrosion.

5.7 The Company shall have the option of performing or requiring additional qualification testing at its discretion.

6. DIMENSIONS AND TOLERANCES

6.1 Dimensions and tolerances shall be in accordance with the table below:

Nominal Pipe Size (Inches)	O.D. Average (Inches)	Tolerance (Inches)	Minimum (Inches)	Wall Thickness Tolerance (Inches)	Nominal SDR
2 IPS	2.375	±0.006	0.216	±0.026	11
3 IPS	3.500	±0.008	0.318	±0.038	11
4 IPS	4.500	±0.009	0.409	±0.049	11
6 IPS	6.625	±0.011	0.602	±0.072	11

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 all materials, products or systems supplied to SWG under this specification at the manufacturer's facility.

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 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. This 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 SWG's approval may be cause for rejection and disqualification as an approved supplier.**

8. CERTIFICATION

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

10. PRODUCT MARKING

All materials, products or systems referenced in this specification that are sold to Southwest will be marked in accordance with ASTM F1924.

All polyethylene pipe extensions (pips) 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 materials, products or systems covered in this specification will be packaged in a manner to prevent damage during transportation and storage.

12. STOCK CLASSIFICATION DESCRIPTION

COUPLING, STEEL, FOR USE ON POLYETHYLENE SYSTEMS, _____ SIZE.

COUPLING, PE, FOR USE ON POLYETHYLENE SYSTEMS, _____ SIZE, _____ MANUFACTURER.