



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS C-21
Page No.:	1 of 16
Issue Date:	03/01/16
Superseded Date	01/22/15

PIPE COATINGS

Viscous Elastic Polyolefin Pipe Coating System, Sealant Paste & Patch

1. SCOPE

This specification defines the minimum requirements for materials and inspection for viscous elastic polyolefin coating systems, sealant (filler) paste and patch which is used for coating repair, sealing pipe/casing sleeves, cracks in concrete vaults and for coating repair or wrapping steel risers at the soil-to-atmosphere transition/interface.

2. APPLICABLE DOCUMENTS

- 2.1 ASTM International D-570 (98), "Standard Test Method for Water Absorption of Plastics."
- 2.2 ASTM International D-1356 (08), "Standard Test Method for Assignment of the Glass Transition Temperatures by Differential Scanning Calorimetry."
- 2.3 ASTM International D-4541, "Standard Test Method for Pull-Off Strengths of Coatings Using Portable Adhesion Testers."
- 2.4 ASTM International G-1, "Standard Practice for Preparing, Cleaning and Evaluating Corrosion Test Specimens."
- 2.5 ASTM International G-3, "Standard Practice for Conventions Applicable to Electrochemical Measurements in Corrosion Testing."
- 2.6 ASTM International G-5, "Standard Reference Test Method for Making Potentiodynamic Anodic Polarization Measurements."
- 2.7 ASTM International G-8, "Standard Test Methods for Cathodic Disbonding Pipeline Coatings."
- 2.8 ASTM International G-10, "Standard Test Methods for Specific Bendability of Pipeline Coatings."
- 2.9 ASTM International G-23 (96), "Practice for Operating Light-Exposure Apparatus (Carbon-Arc Type) With and Without Water for Exposure of Non-metallic Materials (Withdrawn 2000 replaced by G-152 & G-153).
- 2.10 ASTM International G-152 (06), "Standard Practice for Operating Open Flame Carbon Arc Light Apparatus for Exposure of Non-metallic Materials."



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS C-21
Page No.:	2 of 16
Issue Date:	03/01/16
Superseded Date	01/22/15

PIPE COATINGS

Viscous Elastic Polyolefin Pipe Coating System, Sealant Paste & Patch

2. APPLICABLE DOCUMENTS (Cont'd)

- 2.11 ASTM International G-153 (04, 2010), "Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Non-metallic Materials."
- 2.12 NACE (National Association of Corrosion Engineers) International, "Standard Practice (SP-0188), "Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates."
- 2.13 "United States Department of Transportation (DOT), Code of Federal Regulations, Title 49, Part 192, "Transportation of Natural and Other Gas by Pipelines 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 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 Southwest to determine if the product is suitable for use by Southwest, unless specifically stated otherwise.



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS C-21
Page No.:	3 of 16
Issue Date:	03/01/16
Superseded Date	01/22/15

PIPE COATINGS

Viscous Elastic Polyolefin Pipe Coating System, Sealant Paste & Patch

4. MATERIALS AND MANUFACTURING

4.1 Inner or Base Coat

The inner or base coat shall be viscous-elastic amorphous A-polar polyolefin, anti-corrosion compound. It is blue in color, 70 mils thick with an operating temperature range of -43°F up to 160°F. It adheres to the substrate without primer, has permanent wetting characteristics, and not sensitive to salts or osmosis and it's formulation is 100% inert: no reactive groups and no deterioration over the course of time. It is available in the sizes listed below:

- 2 Inch x 33 Feet/Roll
- 4 Inch x 33 Feet/Roll
- 6 Inch x 33 Feet/Roll
- 8 Inch x 33 Feet/Roll
- 12 Inch x 33 Feet/Roll

4.2 Outer or Top Coat

The outer or top coat shall be a polyethylene (PE), UV0inhibited protective wrap. At a minimum it shall be 15 mils thick and provides mechanical protection from backfilling of the pipe or other operations that could damage the base coat. It is available in the sizes listed below:

- 2 Inch x 100 Feet/Roll
- 4 Inch x 100 Feet/Roll



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS C-21
Page No.:	4 of 16
Issue Date:	03/01/16
Superseded Date	01/22/15

PIPE COATINGS

Viscous Elastic Polyolefin Pipe Coating System, Sealant Paste & Patch

4. MATERIALS AND MANUFACTURING (Cont'd)

4.3 Polyolefin Sealant Paste

The paste shall be viscous-elastic amorphous A-polar polyolefin, anti-corrosion compound and sealant. It is blue in color with an operating temperature range of -43°F up to 160°F. It adheres to the substrate without primer, has permanent wetting characteristics, and not sensitive to salts or osmosis and its formulation is 100% inert: no reactive groups and no deterioration over the course of time. It is available in the sizes listed below:

- 1 ¼ Inch x 1 ½ Inch x 9 Feet/Coil

4.4 Polyolefin Patch

The paste shall be viscous-elastic amorphous A-polar polyolefin, anti-corrosion compound and sealant. It is gray in color, 141 mils thick and has an operating temperature range of -43°F up to 160° F. It adheres to the substrate without primer, has permanent wetting characteristics and is not sensitive to salts or osmosis and its formulation is 100% inert: no reactive groups and no deterioration over the course of time and is paintable. It is available in the size of patches listed below:

- 6 Inch x 8 Inch (Patch)



SOUTHWEST GAS CORPORATION

® **ENGINEERING STAFF**

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS C-21
Page No.:	5 of 16
Issue Date:	03/01/16
Superseded Date	01/22/15

PIPE COATINGS

Viscous Elastic Polyolefin Pipe Coating System, Sealant Paste & Patch

5. PERFORMANCE REQUIREMENTS

- 5.1 The inner or base coat layer of viscous elastic polyolefin later provides protection against corrosion of both above and below grade steel piping systems. The PE outer wrap is a heavy duty polyethylene tape with an adhesive backing. The outer wrap provides protection from soil stresses, back filling procedures and other forms of mechanical impact. This pipe coating system can be used for girth welds, coating repair, bends, and elbows and as a line pipe coating for rehabilitation of long sections of poor coating.
- 5.2 The sealant (filler) paste is used to seal pipe/casing-sleeves end seals, annuluses of piping entering or leaving vaults, cracks in concrete vaults, etc.
- 5.3 The patch can be used for coating repair or for wrapping steel risers at the soil-to-atmosphere transition/interface.
- 5.4 The properties and performance of the Viscous Elastic Polyolefin coating products shall be in accordance with requirements outlined in the following referenced table.

**SOUTHWEST GAS CORPORATION**

ENGINEERING STAFF

MATERIAL SPECIFICATION*Prepared By:* Engineering Staff *Approved By:* Jerome T. Schmitz

Section No:	MS C-21
Page No.:	6 of 16
Issue Date:	03/01/16
Superseded Date	01/22/15

PIPE COATINGS

Viscous Elastic Polyolefin Pipe Coating System, Sealant Paste & Patch

5. PERFORMANCE REQUIREMENTS (Cont'd)

Measurement	Value	Method
Glass Transition	-42.92°C/-45.3°F	ASTM E-1356 (2003)
Material State	Solid	N/A
Density	1.1-1.4	DIN 53479
Thickness	>1.8mm/>70 mils	ISO 4593:1993(E)
Melting Point	152.09°C/>70 mils	ASTM E-1356 (2003)
Yield Point	Yes	ISO 3219
Water Vapor Permeability	>4*10-4g/daym ² /Pa	ASTM E96/96M (2010)
Water Absorption	3.7g/m ² or 0.0013g/g	ASTM D-570
Water Penetration	<0.14% (1800 hrs., 6V, 3% NaCl)	ASTM G9 (1987)
Cathodic Disbondment	0-3 mm (Self-Healing)	ASTM G8 (1996)
Dissipation Factor	<0.15 (1500hrs., 20KHz)	ASTM G9 (1998)
Pore Resistance	Rp0/Rp1<1.5	EIS Spectroscopy
Volume Resistivity	>2.2* 10 ¹³ ohm*cm	ASTM D257 (2007)
Surface Resistivity	>5.6* 10 ¹⁵ ohm*m ²	ASTM D257 (2007)
Dielectric Strength	>17.5 kV/mm	ASTM D149 (2009)
Tensile Strength	222 N/cm	ASTM D-638
Impact Strength	>15J (Immediate) >18J (Self-Healing, 96 hrs.)	EN 12068:Annex H
Indention	No Holidays	EN 12068:1998 Annex G
Peel Adhesion (Total System)	0.06 Ken (Cohesive Fracture)	ASTM D-1000
Soil Stress Test 23°	No Movement	Alyssa Shear modified to full ring, 18.6 kg load, 6.8 kg force
UV/Weather Cycle Test	Excellent, Rating 10	ASTM D-4587
Wet Adhesion Test	Excellent	CSA Z245-20-06 Sec. 12.14
Flexibility	No Cracking	CSA Z245-20-06 Sec. 12.11
Simulated Aggressive Soil	No Sign of Deterioration, 72 hrs., 70°C	Sol.1) H2SO4:30% Sol.2) HNO3:10% Sol.3) H3PO4:20% Sol.4) HCl:10%
Smoke and Flame Spread	Class A Flame Spread 0, Smoke 25 (System Includes Stainless Steel Foil)	ASTM E-84



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS C-21
Page No.:	7 of 16
Issue Date:	03/01/16
Superseded Date	01/22/15

PIPE COATINGS

Viscous Elastic Polyolefin Pipe Coating System, Sealant Paste & Patch

6. INSPECTION

- 6.1 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.
- 6.2 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.
- 6.3 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.
- 6.4 Any changes in the manufacturing of preciously 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.**



SOUTHWEST GAS CORPORATION

® ENGINEERING STAFF

MATERIAL SPECIFICATION

Prepared By: Engineering Staff 

Approved By: Jerome T. Schmitz 

Section No:	MS C-21
Page No.:	8 of 16
Issue Date:	03/01/16
Superseded Date	01/22/15

PIPE COATINGS

Viscous Elastic Polyolefin Pipe Coating System, Sealant Paste & Patch

7. CERTIFICATION

The manufacturer's or supplier's certification will be furnished to SWG. 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 specified in the purchase order or contract, a report of 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.

8. 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

9. PACKAGING AND PACKAGE MARKING

9.1 Each coating product shall be packaged in suitable shipping containers to protect the product during transport. Packaging material shall be suitable for the material being shipped so the individual units do not stick to each other; or the shipping material does not stick to the product being shipped.

9.2 A shipping document shall accompany the product and have the following information included:

- Manufacturer's Name
- Complete Shipping Address
- Purchase Order Number and Date
- List of Materials Being Shipped
Manufacturer Part Number (MPN)