

POLYKEN®



Polyken 980-955 Field Coating System Application Specifications

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POLYKEN FIELD COATING APPLICATION SPECIFICATION 980, 955

SCOPE

1.0 Materials to be covered:

Polyken N° 1027 Primer
Polyken N° 980 (anti-corrosion protection innerwrap)
Polyken N° 955 white (mechanical protection outerwrap)
Polyken N° 934 (holiday patch and repair coating)
Polyken N° 933 (longitudinal or girth weld stripping tape)
Polyken N° 931 (longitudinal or girth weld stripping tape)

2.0 Storage Conditions

3.0 Project Site Conditions

4.0 Pipe Surface Preparations

5.0 Coating Applications Conditions (directly prior to and during application)

6.0 Inspection and Patch Repair

7.0 Special Conditions

1.0 MATERIALS

- 1.1 Polyken 1027 Primer is a synthetic rubber/resin blend in a solvent solution. Polyken 1027 serves to rapidly wet out the pipe's surface with synthetic rubber solids, preparing it for proper bond of the 980, anticorrosion protection innerwrap, as well as Polyken 933 or Polyken 931.
- 1.2 Polyken 980 (anti-corrosion protection innerwrap) total thickness of a laminated butyl rubber adhesive with stabilized, specially blended polyethylene backing.
- 1.3 Polyken 955 white (adhesive mechanical protection outerwrap) total thickness of laminated butyl rubber adhesive with stabilized, specially blended polyethylene backing. Polyken 955 serves as the mechanical protection layer bonded to and protecting the 980 anti-corrosion protection innerwrap.
- 1.4 Polyken 933 or 931 (weld stripping tape) and 934 (patch and repair tape) total thickness, is a specialized butyl rubber adhesive with stabilized, specially blended polyethylene backing. Polyken 933 or 931 is to be used as the coating to strip the raised welds (where applicable).
- 1.5 Polyken 934 is to be used as the holiday patch and repair coating.

2.0 STORAGE CONDITIONS

- 2.1 Polyken primers and tapes should not be stored at temperatures above 105° F (40.56° C).
- 2.2 Polyken products should be stored in a secure, dry location.
- 2.3 Polyken products packaged in cases can be stacked to a limit of 6 feet (182.9 cm) high. All packages should be stacked right side up at all times.
- 2.4 Inventoried Polyken products should be used on a first-in, first-out basis.

3.0 PROJECT SITE CONDITIONS

- Ambient temperature conditions
- Pipeline temperature conditions

Project site conditions should be routinely monitored. Project site temperature issues should be used to determine the optimum roll-body application temperature for Polyken's System. Polyken recommends that the minimum roll body temperature of (980/955) be approximately 70° F (21° C) during application.

Particular site conditions may require that the system application temperature be higher than the minimum requirement of approximately 70° F (21° C). Please refer to data below for guidance of when higher than minimum roll body temperature of approximately 70° F (21° C) would be required. Polyken 933, 931 and/or 934 can be suitably applied at a minimum roll body temperature of 50° F (10° C).

3.1 Cold conditions/Cold pipe:

- Ambient temperature: below 40° F (4.5° C)
- Pipeline temperature: below 40° F (4.5° C)

The Polyken (980, 955) system roll body temperature should be 80°F to 90°F (27° C to 32.2° C). When conditions as noted above are in the 28°F (2.2°C) and below range, it is recommended that this system be applied at approximately a 90°F (32.2°C) roll body temperature. The system should be applied in a prompt manner to ensure that the heated roll body temperature does not decrease by more than 20°F (7°C) by roll end.

3.2 Cold Conditions/ Warm pipe:

- Ambient temperature: below 40° F (4.5° C)
- Pipeline temperature: 70°F to 150°F (21°C to 65.5°C)

The Polyken system roll body temperature should approximate that of the pipeline temperature 85°F to 115°F (29.4° C to 46.1°C) roll body maximum of 120°F (49°C). Decrease in roll body temperature during application process should not be more than 20°F (7°C). If decrease in roll body temperature is expected to be more than 20°F (7°C) by roll end then initial roll body temperature should be increased accordingly up to 120°F (49° C).

3.3 Warm Conditions / Warm pipe:

- Ambient temperature: above 40°F to 100°F (4° C to 38° C)
- Pipeline temperature: Identical to ambient

The Polyken system roll body temperature should be minimum of 70°F (21°C). Application should be prompt enough so that roll body temperature would not decrease by more than 20°F (7°C). If decrease in roll body temperature is expected to be more than 20°F (7°C) by roll end then initial roll body temperature should be slightly higher than minimum 70°F (21°C).

3.4 Warm Temperature Conditions:

- Ambient temperature: above 40°F to 100°F (4.5° C - 38° C)
- Pipeline temperature: 90°F to 150°F (32.2° C to / 65.5° C)

The Polyken system roll body temperature should approximate that of the pipeline temperature 85°F to 115°F (29.4°C to 46.1° C) roll body to maximum of 120°F (49°C). Decrease in roll body temperature during application process should not be more than 20°F (7°C). If drop in roll body temperature is expected to be more than 20°F (7°C) by roll end then initial roll body temperature should be increased accordingly, but never above 120°F (49° C).

4.0 PIPE SURFACE PREPARATION

The pipe's surface should be sand, grit or shot blasted to a commercial blast finish SSPC-SP6 NACE No. 3, or power wire brush per SSPC-SP3. The steel surface blast pattern should have a profile of 1 to 3 mils (25 to 76 microns). The steel pipe surface should be free of all blast material, dirt, or foreign debris and should be free of any grease or oils. Proper solvents should be used to thoroughly remove any surface oil or grease. A Polyken representative should be contacted for further information regarding use of solvents for surface cleaning.

5.0 POLYKEN COATING APPLICATION CONDITIONS

(Directly prior to and during application)

- 5.1 Primer is applied to the pipe steel surface with a brush or paint roller to a wet thickness of no less than 2 mils (50 microns) and no greater than 4 mils (100 microns). The primer shall be thoroughly mixed prior to application on pipe. Primer container shall remain covered when not in use. Primer coverage should be between approximately 200 and 400 square feet per gallon.

Metric 18.5 to 37 square meters per gallon (1 gallon = 3.785 liters = 9.8 m² per liter).

- 5.2 Under special conditions, more than one coat of primer can be applied (see Section 7.0, Special Conditions.)
- 5.3 The Polyken 933 or 931 (longitudinal and girth weld stripping tape) 4 or 6 inches (10, 1 cm or 15.2cm) wide should be applied over the primed longitudinal weld (where present) in a length-wise fashion. A splice (roll end) of 933 or 931 should overlap the previously coated longitudinal weld by approximately 1 inch (2.54 cm) and continue its application in length-wise fashion over the longitudinal weld at mid-width such that the weld is coated 2 inches (5 cm) on each side along its length.
- 5.4 Application of Polyken 980 (anti-corrosion protection inner wrap) to the 1027 primed pipe.
Important application issues:
- Roll body temperature
 - Proper application tension of the 980 during application as determined through routine tape “neck down” measurements.

The application tension of the Polyken tape systems is directly related to and should be monitored by measuring the “neck down” or reduction of the product’s width. Polyken 980 6 inches x 200 feet (15.24 cm X 60.69 m) rolls, should “neck down” approximately 1/8” or 3.2mm during application to achieve the specified tension 12-18 lb. per inch of width (21 to 32 N/10 mm width).

The 980 roll body temperature is important for two application reasons (also see Section 3.0 for reference):

- 1) The minimum roll body temperature of 70° F (21° C) allows “neck down” to occur within the 12-18lb. per inch width (21 to 32 N/10 mm width) application range. This corresponds to a 1/8 inch / 3.2 mm neckdown. If the tape is colder than 70° F (21° C), it will take more than 12-18lb. per inch width (21 to 32 N/10 mm width) width to achieve the 1/8” or 3.2 mm “neck down” specification.
- 2) The 70° F (21° C) and above roll body temperature reduces the effect of thermal expansion of the cold applied tape system on warmer operating temperature pipelines, thus maintaining the proper amount of tangential force on the wrapped tape system.

- 5.41 The 980 should be applied by a Polyken approved power wrapping machine incorporating a Polyken approved brake tensioning device in a spiral fashion with a ¾” (1.9 cm) to 1” (2.54 cm) overlap. Application tension on 980 should begin only after the first third of the pipe’s circumference is wrapped. This prevents crawl back of the tape, which could otherwise be induced, from high tension at the very beginning of the wrapping process.
- Once the application of 980 is completed, it can be holiday tested using a holiday detector and NACE standard RP-02-74 (square root of coating thickness in mils x 1250 +/- 20%). Using this industry standard, the voltage for 980 would range between 5,000 and 7,500 volts. If holidays are detected, they should be patch/repared using the practice described in the Patch/Repair section (Section 6.0).

- 5.5 Application of Polyken 955 White (mechanical protection outerwrap) over the 980 (anti-corrosion protection inner wrap).
Important Application Issues:
- Roll body temperature
 - Tension applied to the 955 during application as determined through product “neck down” measurements.

- 5.51 Polyken 955 should be applied with a Polyken approved power wrapping machine in a spiral fashion with a $\frac{3}{4}$ " (1.9 cm) to 1" (2.54 cm) overlap. The beginning wrap of 955 should start so its mid-width is placed directly over the overlap of the 980. Application practice should be identical to 980. The Polyken 955 should be applied at a tension of 12-18 lb. per inch width (21 to 32 N/10 mm width). The application tension of 955 should be monitored by the "neck down" of the tape's width. Polyken 955-5 6 inch x 200 feet (15.24 cm x 60.96 m) should "neck down" approximately 1/8" (3.2 mm) during application to achieve the 12-18 lb. per inch of width (21 to 32 N/10 mm width) specification. The 955 roll body temperature is important for the same reasons as for 980. The wrap of the 955 should begin with the beginning lap facing in a down side position on the pipe (8 to 10 o'clock or 2 and 4 o'clock position). The wrapping process should proceed from that point (clockwise or counter-clockwise respectively) around the pipe. This process prevents back fill from potentially working against or pulling away the 955, which could occur if the beginning lap was facing upward.

Special Note: The overlap of 955 can be increased to a 50% overlap to achieve thicker outerwrap for rocky back fill areas (refer to Special Conditions, 7.0)
The entire 50 mil (1.27mm) system can be holiday tested at a voltage of 8,000 minimum and 11,000 maximum.

6.0 INSPECTION AND REPAIR

- 6.1 Holiday inspection is covered in Section 5.41 and 5.51. Usual practice involves holiday detection of the 980 innerwrap prior to the application of the 955 outerwrap.
- 6.2 Repair can be accomplished with the use of Polyken 934 or 980.
- 6.3 Polyken 934 or PERP 60 may be used as a patch repair or mislap repair. The holiday area should be primed and the 934 should be applied in postage stamp or strip fashion over the holiday area, overlapping it in all directions by 4 inches (10.16 mm). 955 should then be wrapped over the 934 in a cigarette wrap around the pipe. However, if the 955 outerwrap procedure has yet to occur, then it can simply be spiral wrapped over the 934 patch in accordance with Section 5.5.
- 6.4 980 as a patch or mislap repair. The holiday area should be primed and the 980-25 should be cigarette wrapped under tension over the holiday or mislap. 955 should then be wrapped over the 980 as the usual mechanical protection.

7.0 SPECIAL CONDITIONS

- 7.1 Multiple Application of Polyken's 1027 Primer, Complete Application of Polyken's system may not always be possible due to weather or other construction conditions.

Example: Sand or shot/grit blasted sections of the pipe's surface have been completed, but for various reasons, coating of the line with the full Polyken systems must be delayed. The newly sand or shot/grit blasted surface can be temporarily protected by coating with Polyken 1027 Primer. The area temporarily protected in this manner can be re-primed at a later time (not exceeding 48 hours) and coated with the Polyken system in accordance with Section 4.0.

However, if the temporarily primed surface is contaminated with dirt, grease or other contaminants, prior to the subsequent primer application, the original primed surface must be removed by blasting, use of appropriate solvents or wire brush until the contaminated primed area is thoroughly cleaned. The re-cleaned area must be dry and surface profile acceptable prior to application of the Polyken 1027 primer.

- 7.2 On-Site Coating Thickness for Rocky Backfill Conditions
 The overlap of either the 980 or 955 (or both) can be increased from the standard $\frac{3}{4}$ " or 1.9 cm to 1" or 2.54 cm overlap to a $\frac{1}{2}$ lap (50% overlap) to achieve an extra thickness coating for increased protection from rocky back fill areas. This system could also receive multiple spiral wraps of the 955 applied in accordance with Section 5.5.

APPENDIX I
RECOMMENDED APPLICATION TENSION

Original Roll Body width	* Neckdown tape width (inch)			
	4"	6"	9"	12"
1% neckdown tension	3 $\frac{31}{32}$ "	5 $\frac{15}{16}$ "	8 $\frac{29}{32}$ "	11 $\frac{7}{8}$ "
2% neckdown tension	3 $\frac{15}{16}$ "	5 $\frac{7}{8}$ "	8 $\frac{13}{16}$ "	11 $\frac{3}{4}$ "

Original Roll Body width	* Neckdown tape width (cm)			
	10.16 cm	15.25 cm	22.9cm"	30.48 cm
1% neckdown tension	10.05 cm	15.09 cm	22.67 cm	30.18 cm
2% neckdown tension	39.95 cm	14.94 cm	22.44 cm	29.87 cm