

Procedure Name: <i>Coating Systems for Buried or Submerged Piping</i>	Procedure Number: 2-2160	
	Date: <u>1004/2230/2014</u>	Page: 1 of 14

<p><b>Description</b></p>	<p>This procedure describes the application and maintenance of coatings for buried or submerged piping.</p> <p>All buried or submerged pipe must have an approved coating applied over a properly prepared surface. All coatings must be properly inspected and deficiencies repaired prior to lowering in and backfilling.</p> <p>The Coating Specifications and References should be referenced for all buried or submerged piping. These series of documents are a guide for new or rehabilitation coating work by contract personnel and for maintenance coating by Company personnel. The requirements of this procedure override any differences presented in any other handbook or document. Buried and submerged coatings application shall be conducted in accordance with the general workmanship requirements established in the Coating Specifications and References.</p> <p>The specifications and references ensure the following properties for each coating and its application: Each coating is applied on a properly prepared surface (including environmental conditions, ambient temperature, steel temperature, humidity, etc.).</p> <ul style="list-style-type: none"> <li>• Application techniques and controls.</li> <li>• The coating has sufficient adhesion to the metal surface to effectively resist the migration of moisture.</li> <li>• Shall be sufficiently ductile so as to resist cracking</li> <li>• Shall have sufficient strength to resist damage to handling and soil stress, and</li> <li>• Shall be compatible with the existing cathodic protection systems</li> <li>• Shall have low moisture absorption and high electrical resistance where the external coating used is an electrically insulating type.</li> </ul> <p>The Coating Specifications and References also provide information regarding the following:</p> <ul style="list-style-type: none"> <li>• Finished coating inspection, as applicable</li> <li>• Repair techniques, as applicable</li> <li>• Record keeping</li> </ul> <p>All coating selections and applications must be limited to manufacturer's recommended operating parameters (unless</p>
---------------------------	--

Procedure Name: *Coating Systems for Buried or Submerged Piping*

Procedure Number: 2-2160

Date:  
1004/2230/2014

Page: 2 of 14

	<p>otherwise specified). No new coating systems, applications or operational parameters are allowed without specific approval from the Coating Task Group.</p> <p>This SOP contains the following sections:</p> <p>1.0 Testing/Approval of New Systems and References</p> <p>2.0 Operating, Inspection and Application Parameters</p>
<b>Frequency</b>	As required.
<b>Responsibility</b>	Area Management, unless otherwise noted.
<b>Safety Warnings</b>	None
<b>Life Safety Rules</b>	None
<b>Documentation</b>	Reporting information is included in the Coating Specifications and References.
<b>Related Procedures</b>	None
<b>Related OQ Tasks</b>	OP403 - Apply Approved Coatings to Below Ground Piping

Procedure Name: <i>Coating Systems for Buried or Submerged Piping</i>	Procedure Number: 2-2160	
	Date: <u>1004/2230/2014</u>	Page: 4 of 14

2.0 Operating, Inspection and Application Parameters

2.1 When coatings systems are damaged, an increased load on the cathodic protection systems, coating repair expenses, and possible corrosion damage by exposure to excessive operating temperatures is likely to occur.

2.1.1 The high temperature situations will most likely occur immediately downstream of compressor stations



2.4 Refer to the following tables for compressor station and restrictions on sustained operating temperatures.

2.4.1 This will reduce the chance for damage to the corrosion coatings.

Table 1 <u>Texas Eastern Transmission, LP</u> Recommended Maximum Gas Temperatures for Compressor Station Discharges					
Station Name ( <del>Texas Eastern</del> )	Line No.	Coating Code	Temp. °F > 7 days (1)	Temp. °F 2-7 days (2)	Temp. °F <2 days (2)
Accident					
Accident					
Accident					
Accident					
Armagh					
Armagh					
Armagh					
Athens (ATHE-BERN)					
Athens (WHEE-ATHE)					
Athens (ATHE-BERN)					
Athens (WHEE-ATHE)					

Procedure Name: <i>Coating Systems for Buried or Submerged Piping</i>	Procedure Number: 2-2160	
	Date: <u>1004/2230/2014</u>	Page: 5 of 14

Table 1 <u>Texas Eastern Transmission, LP</u> Recommended Maximum Gas Temperatures for Compressor Station Discharges					
Station Name ( <del>Texas Eastern</del> )	Line No.	Coating Code	Temp. °F > 7 days (1)	Temp. °F 2-7 days (2)	Temp. °F <2 days (2)
Athens ( <u>ATHE-BERN</u> )					
Athens ( <u>WHEE-ATHE</u> )					
Atlanta					
Bald Knob					
Barton ( <u>BART-MTPL</u> )					
<u>Barton (EGYP-BART)</u>					
Barton ( <u>BART-MTPL</u> )					
<u>Barton (EGYP-BART)</u>					
Barton ( <u>BART-MTPL</u> )					
<u>Barton (EGYP-BART)</u>					
Batesville					
Bechtelsville					
Bechtelsville					
Bechtelsville					
Bedford					
Bedford					
Berne ( <u>BERN-HOLB</u> )					
<u>Berne (ATHE-BERN)</u>					
Berne ( <u>BERN-HOLB</u> )					
<u>Berne (ATHE-BERN)</u>					
Berne ( <u>BERN-HOLB</u> )					
<u>Berne (ATHE-BERN)</u>					
Bernville					
Bernville					
Bernville					
Bernville					
Blessing					
Blessing					
Chambersburg					
Chambersburg					
Charco					
Clinton ( <u>CLIN-KOSC</u> )					
<u>Clinton (UCHC-CLIN)</u>					
Clinton ( <u>CLIN-KOSC</u> )					
<u>Clinton (UCHC-CLIN)</u>					
<u>Clinton (UCHC-CLIN)</u>					
Danville ( <u>DANV-OWSV</u> )	10	CMPD	130	140	150
<u>Danville (TOMP-DANV)</u>	<u>10</u>	<u>CMPD</u>	<u>130</u>	<u>140</u>	<u>150</u>
Danville ( <u>DANV-OWSV</u> )	15	CHPD	150	160	170
<u>Danville (TOMP-DANV)</u>	<u>15</u>	<u>CHPD</u>	<u>150</u>	<u>160</u>	<u>170</u>
Danville ( <u>DANV-OWSV</u> )	25	CHRE	160	170	180

Procedure Name: <i>Coating Systems for Buried or Submerged Piping</i>	Procedure Number: 2-2160	
	Date: <u>1004/2230/2014</u>	Page: 6 of 14

Table 1 <u>Texas Eastern Transmission, LP</u> Recommended Maximum Gas Temperatures for Compressor Station Discharges					
Station Name ( <del>Texas Eastern</del> )	Line No.	Coating Code	Temp. °F > 7 days (1)	Temp. °F 2-7 days (2)	Temp. °F <2 days (2)
<u>Danville (TOMP-DANV)</u>	<u>25</u>	<u>CHAE</u>	<u>160</u>	<u>170</u>	<u>180</u>
Delmont					
Delmont					
Delmont					
Delmont					
Donaldson					
Eagle					
Eagle					
Eagle					
<del>Egypt</del>					
<u>Egypt (EGYP-BART)</u>					
<u>Egypt (KOSC-EGYP)</u>					
<u>Egypt (EGYP-BART)</u>					
<u>Egypt (KOSC-EGYP)</u>					
<u>Egypt (EGYP-BART)</u>					
<u>Egypt (KOSC-EGYP)</u>					
<u>Egypt (KOSC-EGYP)</u>					
Enriken					
Enriken					
Enriken					
<u>Five Points (FIVE-SOME)</u>					
<u>Five Points (LEBA-FIVE)</u>					
<u>Five Points (FIVE-SOME)</u>					
<u>Five Points (LEBA-FIVE)</u>					
<u>Five Points (FIVE-SOME)</u>					
<u>Five Points (LEBA-FIVE)</u>					
Franklin					
Franklin					
French Lick					
Gas City					
Gillis East					
Gillis West					
Gillis					
<u>Gladeville (GLAD-TOMP)</u>					
<u>Gladeville (MTPL-GLAD)</u>					
<u>Gladeville (GLAD-TOMP)</u>					
<u>Gladeville (MTPL-GLAD)</u>					
<u>Gladeville (GLAD-TOMP)</u>					
<u>Gladeville (MTPL-GLAD)</u>					
Glen Karn					
Grand Chenier					

Procedure Name: *Coating Systems for Buried or Submerged Piping*

Procedure Number: 2-2160

Date:  
1004/2230/2014

Page: 14 of 14

(2) Elevated temperatures are only allowed during upsets in normal operations. It is not acceptable to lower the temperature and then immediately return to the upset condition. Refer to the Coatings Committee for further guidance.

**Table 9  
Coating Codes**

	Type		Grade		Manufacturer
C	Coal Tar Enamel	S	Standard	P	Pittsburgh
A	Asphalt Enamel	M	Modified	B	Barretts
M	Asphalt Mastic	P	Plasticized	K	Koppers
T	Tape	H	Hot Line	R	Reilly
P	Thin Film Epoxy	E	E-120	L	Lion-Monsanto
W	Wax	A	E-120A	H	H.C. Price
		D)	Mastic	W	Wailes-Dove
		II)	Mastic	SR	Seamless Rubber
		III)	Mastic	PF	Plicoflex
		IV)	Mastic	A	Allied
		--	Not Designated	M	M.M.M.
				U	USS Chemical
				N	NAPKO

**COATING CODE SHALL ALWAYS BE SHOWN IN THE FOLLOWING ORDER:**

**TYPE - GRADE - MFGR – CLASS**

**C - M - P - D**

**Coal Tar Enamel – Modified – Pittsburgh – Primer, Enamel No. 1, Fiberglass Wrap No. 1, Asbestos Felt Wrap**

CLASS	C	D	E	F	K	L	O	R	S	U	V	W	X	Y
PRIMER	x	x	x	x	x	x	x	x	x	x	x	x		x
ENAMEL NO. 1	x	x	x	x	x	x	x	x	x	x				
FIBERGLASS WRAP NO. 1		x	x	x	x	x	x	x	x	x				
ENAMEL NO.2				x			x		x	x				
ASBESTOS FELT WRAP	x		x	x		x				x				
KRAFT WRAP		x			x		x							
ROCK SHIELD					x	x	x							
CONCRETE COATING								x	x	x		x		
ASPHALT MASTIC											x	x		
THIN FILM													x	
TAPE														x



Procedure Name: *Coating Systems for Buried or Submerged Piping*

Procedure Number: 2-2160

Date: 11/11/2014

Page: 4 of 14

2.0 Operating, Inspection and Application Parameters

2.1 When coatings systems are damaged, an increased load on the cathodic protection systems, coating repair expenses, and possible corrosion damage by exposure to excessive operating temperatures is likely to occur.

2.1.1 The high temperature situations will most likely occur immediately downstream of compressor stations.



2.4 Refer to the following tables for compressor station and restrictions on sustained operating temperatures.

2.4.1 This will reduce the chance for damage to the corrosion coatings.

<b>Table 1</b> <b>Texas Eastern Transmission, LP</b> <b>Recommended Maximum Gas Temperatures for Compressor Station Discharges</b>					
Station Name	Line No.	Coating Code	Temp. °F > 7 days (1)	Temp. °F 2-7 days (2)	Temp. °F <2 days (2)
Accident					
Accident					
Accident					
Accident					
Armagh					
Armagh					
Armagh					
Athens (ATHE-BERN)					
Athens (WHEE-ATHE)					
Athens (ATHE-BERN)					
Athens (WHEE-ATHE)					
Athens (ATHE-BERN)					



Procedure Name: <i>Coating Systems for Buried or Submerged Piping</i>	Procedure Number: 2-2160	
	Date: 11/11/2014	Page: 5 of 14

Table 1 Texas Eastern Transmission, LP Recommended Maximum Gas Temperatures for Compressor Station Discharges					
Station Name	Line No.	Coating Code	Temp. °F > 7 days (1)	Temp. °F 2-7 days (2)	Temp. °F <2 days (2)
Athens (WHEE-ATHE)					
Atlanta					
Bald Knob					
Barton (BART-MTPL)					
Barton (EGYP-BART)					
Barton (BART-MTPL)					
Barton (EGYP-BART)					
Barton (BART-MTPL)					
Barton (EGYP-BART)					
Batesville					
Bechtelsville					
Bechtelsville					
Bechtelsville					
Bedford					
Bedford					
Berne (BERN-HOLB)					
Berne (ATHE-BERN)					
Berne (BERN-HOLB)					
Berne (ATHE-BERN)					
Berne (BERN-HOLB)					
Berne (ATHE-BERN)					
Bernville					
Bernville					
Bernville					
Bernville					
Blessing					
Blessing					
Chambersburg					
Chambersburg					
Charco					
Clinton (CLIN-KOSC)					
Clinton (UCHC-CLIN)					
Clinton (CLIN-KOSC)					
Clinton (UCHC-CLIN)					
Clinton (UCHC-CLIN)					
Danville (DANV-OWSV)	10	CMPD	130	140	150
Danville (TOMP-DANV)	10	CMPD	130	140	150
Danville (DANV-OWSV)	15	CHPD	150	160	170
Danville (TOMP-DANV)	15	CHPD	150	160	170
Danville (DANV-OWSV)	25	CHRE	160	170	180
Danville (TOMP-DANV)	25	CHAE	160	170	180





Procedure Name: *Coating Systems for Buried or Submerged Piping*

Procedure Number: 2-2160

Date: 11/11/2014

Page: 14 of 14

Table 9 Coating Codes					
	Type		Grade		Manufacturer
C	Coal Tar Enamel	S	Standard	P	Pittsburgh
A	Asphalt Enamel	M	Modified	B	Barretts
M	Asphalt Mastic	P	Plasticized	K	Koppers
T	Tape	H	Hot Line	R	Reilly
P	Thin Film Epoxy	E	E-120	L	Lion-Monsanto
W	Wax	A	E-120A	H	H.C. Price
		I)	Mastic	W	Wailes-Dove
		II)	Mastic	SR	Seamless Rubber
		III)	Mastic	PF	Plicoflex
		IV)	Mastic	A	Allied
		--	Not Designated	M	M.M.M.
				U	USS Chemical
				N	NAPKO

**COATING CODE SHALL ALWAYS BE SHOWN IN THE FOLLOWING ORDER:**

**TYPE - GRADE - MFGR – CLASS**

**C - M - P - D**

**Coal Tar Enamel – Modified – Pittsburgh – Primer, Enamel No. 1, Fiberglass Wrap No. 1, Asbestos Felt Wrap**

CLASS	C	D	E	F	K	L	O	R	S	U	V	W	X	Y
PRIMER	X	X	X	X	X	X	X	X	X	X	X	X		X
ENAMEL NO. 1	X	X	X	X	X	X	X	X	X	X				
FIBERGLASS WRAP NO. 1		X	X	X	X	X	X	X	X	X				
ENAMEL NO.2				X			X		X	X				
ASBESTOS FELT WRAP	X		X	X		X				X				
KRAFT WRAP		X			X		X							
ROCK SHIELD					X	X	X							
CONCRETE COATING								X	X	X		X		
ASPHALT MASTIC											X	X		
THIN FILM													X	
TAPE														X

Procedure Name: *Coating Systems for Buried or Submerged Piping*

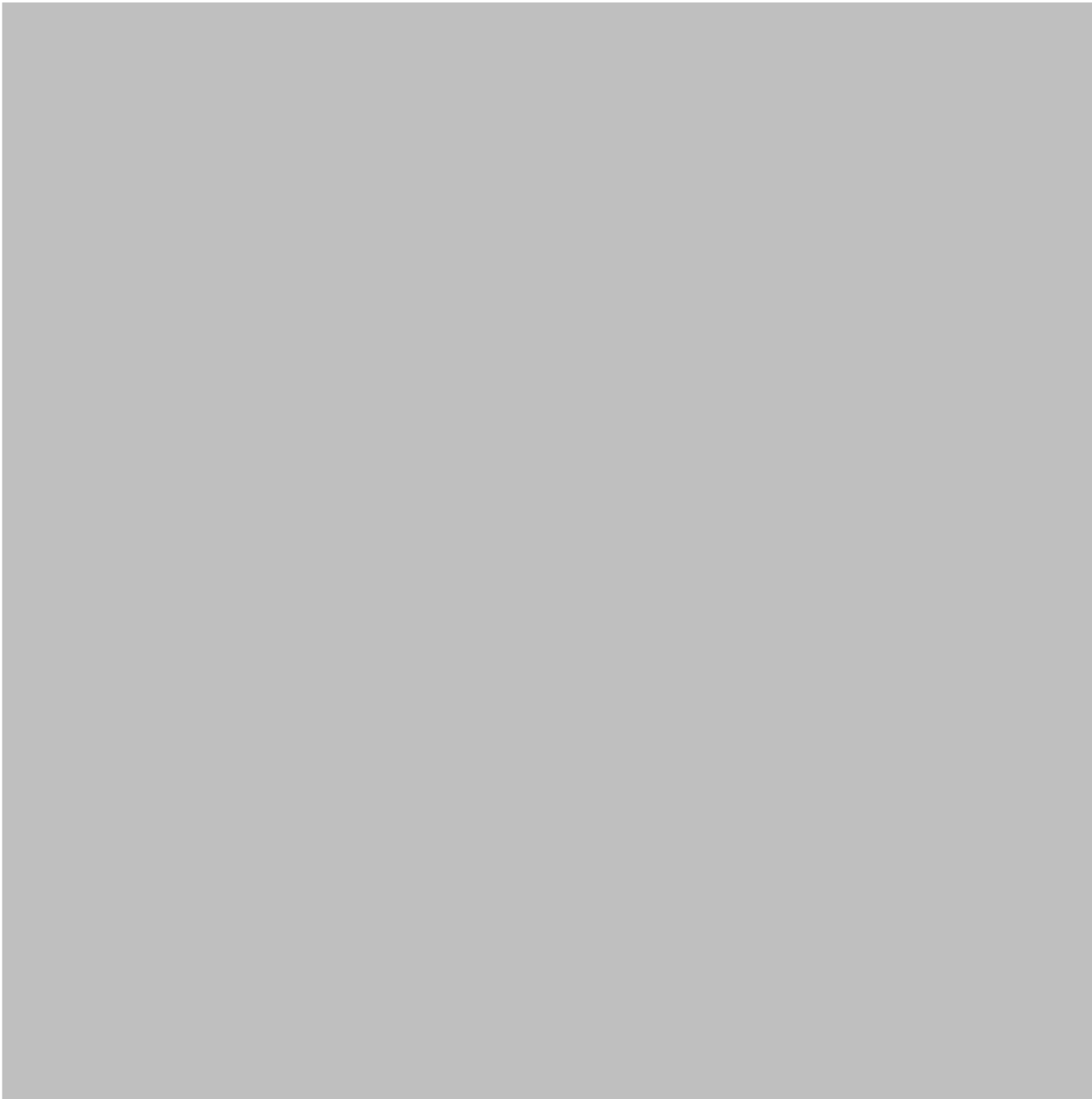
Procedure Number: 2-2160

Date: 03/25/2016

Page: 3 of 18

## Procedure

---



### 2.0 Operating, Inspection and Application Parameters

- 2.1 When coatings systems are damaged, an increased load on the cathodic protection systems, coating repair expenses, and possible corrosion damage by exposure to excessive operating temperatures is likely to occur.

<b>Procedure Name:</b> <i>Coating Systems for Buried or Submerged Piping</i>	<b>Procedure Number:</b> 2-2160	
	<b>Date:</b> 03/25/2016	<b>Page:</b> 4 of 18

2.1.1 The high temperature situations will most likely occur immediately downstream of compressor stations.



2.4 Refer to Tables 1 thru 9 for the recommended maximum operating temperatures at each of the compressor stations. Operating below these temperatures will reduce the chance for damage to the corrosion coatings.

2.4.1 The Regional Technical Staff will review the temperature data from those compressor stations which have operated above the temperatures shown in the Tables below. This review will be done on an annual basis to determine whether there is a risk of coating damage and whether an action plan should be developed to reduce the risk associated with any possible coating damage. The review should include a review of the ILI data for the station discharge, a review of possible increase in cathodic protection requirements and any pipe and coating data that may be available. The plan should consider the following:

- Close interval survey over the first valve section.
- Above ground coating survey (DCVG or ACVG) over the first valve section.
- Two or more bell hole examinations in the first valve section.
- The need for additional cooling of the discharge gas streams.
- Accelerated integrity assessment such as an in-line inspection tool or direct assessment.

<b>Procedure Name: <i>Coating Systems for Buried or Submerged Piping</i></b>	<b>Procedure Number: 2-2160</b>	
	<b>Date: 03/25/2016</b>	<b>Page: 6 of 18</b>

<b>Table 1 Recommended Maximum Operating Gas Temperatures for Compressor Station Discharges</b>			
<b>Station Name (Texas Eastern)</b>	<b>Line No.</b>	<b>Coating Code</b>	<b>Recommended Maximum Operating Temperature (°F)</b>
Berne (ATHE-BERN)			
Berne (BERN-HOLB)			
Berne (ATHE-BERN)			
Bernville			
Bernville			
Bernville			
Bernville			
Bernville			
Blessing			
Blessing			
Chambersburg			
Chambersburg (special permit)			
Charco			
Clinton (CLIN-KOSC)			
Clinton (UCHC-CLIN)			
Clinton (CLIN-KOSC)			
Clinton (UCHC-CLIN)			
Clinton (UCHC-CLIN)			
Colerain			
Danville (DANV-OWSV)	10	CMPD	135
Danville (TOMP-DANV)	10	CMPD	135
Danville (DANV-OWSV)	15	CHPD	170
Danville (TOMP-DANV)	15	CHPD	170
Danville (DANV-OWSV)	25	CHRE	170
Danville (TOMP-DANV)	25	CHAE	170
Delmont			
Delmont			
Delmont			
Delmont			
Delmont			

<b>Procedure Name: <i>Coating Systems for Buried or Submerged Piping</i></b>	<b>Procedure Number: 2-2160</b>
	<b>Date: 03/25/2016</b> <b>Page: 18 of 18</b>

Table 9 Coating Codes					
	Type		Grade		Manufacturer
C	Coal Tar Enamel	S	Standard	P	Pittsburgh
A	Asphalt Enamel	M	Modified	B	Barretts
M	Asphalt Mastic	P	Plasticized	K	Koppers
T	Tape	H	Hot Line	R	Reilly
P	Thin Film Epoxy	E	E-120	L	Lion-Monsanto
W	Wax	A	E-120A	H	H.C. Price
		I)	Mastic	W	Wailes-Dove
		II)	Mastic	SR	Seamless Rubber
		III)	Mastic	PF	Plicoflex
		IV)	Mastic	A	Allied
		--	Not Designated	M	M.M.M.
				U	USS Chemical
				N	NAPKO

**COATING CODE SHALL ALWAYS BE SHOWN IN THE FOLLOWING ORDER:**

**TYPE - GRADE - MFGR - CLASS**

**C - M - P - D**

**Coal Tar Enamel – Modified – Pittsburgh – Primer, Enamel No. 1, Fiberglass Wrap No. 1, Asbestos Felt Wrap**

CLASS	C	D	E	F	K	L	O	R	S	U	V	W	X	Y
PRIMER	X	X	X	X	X	X	X	X	X	X	X	X		X
ENAMEL NO. 1	X	X	X	X	X	X	X	X	X	X				
FIBERGLASS WRAP NO. 1		X	X	X	X	X	X	X	X	X				
ENAMEL NO.2				X			X		X	X				
ASBESTOS FELT WRAP	X		X	X		X				X				
KRAFT WRAP		X			X		X							
ROCK SHIELD					X	X	X							
CONCRETE COATING								X	X	X		X		
ASPHALT MASTIC											X	X		
THIN FILM													X	
TAPE														X