PITTSBURGH PLATE GLASS COMPANY
CHEMICAL DIVISION LAKE CHARLES, LA.
ENGINEERING DEPARTMENT

SPECIFICATION NO. INS-A
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APPROVED

TITLE

INSULATION APPLICATION STANDARD

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A. GENERAL

1. The specifications contained herein shall be the established standards for insulation thicknesses, insulation materials and methods of application and finish for all piping, vessels and other equipment at the Lake Charles Plant of Pittsburgh Plate Glass Company, Chemical Division.

2. When the work covered in this specification is done by other than Pittsburgh, then Pittsburgh's Specification INS-C shall also apply.

3. All surfaces to be insulated shall be brush cleaned of all scale, dirt and foreign material before covering and under no circumstances shall a surface be covered while in a wet or otherwise unfit condition.

4. It is recommended that the method of notation shown on Page 2 be used on drawings, line schedules, etc. to indicate insulation for all piping and vessels. Insulation recommendations, using these notations, for most piping and vessels are given in Sections F and G of this Specification.

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INSULATION APPLICATION STANDARD

INSULATION NOTATION

INSULATION X : X & X: XXX

Temperature Glass & Insulation (Section B)

A -	-100° to -50°F.	PC Foamglas
B -	- 49° to 0° F.	
C -	1° to 35° F.	
D -	36° to 125°F.	
Efg	126° to 300° F.	
E		
F -	301° to 500° F.	Kaylo
G -	501° to 700° F.	
H -	701° to 900° F.	

Method of Application (Section D)

1. Hot Piping
2. Cold Piping
3. Hot Vessels (Stud Application) Includes Ducts
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5. Cold Vessels (Hot Asphalt Application)
6. Cold Vessels (Asphalt Adhesive Application)

Method of Finish (Section E)

1. Breathing Type Mastic & Asbestos Paper
2. Fibrated Asphalt Cutback & Glasfab
3. Canvas
4. Felt
5. Aluminum or Sheet Metal
6. Fire Resistive Mastic

Portion to be Insulated (See Sections F & G)

A - All welded and screwed pipe, tubing, ells, tees, branches and reducers.
B - All flanged, welded and screwed valves other than control valves including flanges on flanged valves
C - All flange unions and screwed unions
D - All flanged, welded and screwed control valves including flanges on flanged valves
E - All surfaces of vessel excluding items below except when they are listed
F - All nozzles on vessel
G - All manholes on vessel
H - Skirts and supports on vessel
J - Flanges of flanged head on vessel
K - Heads on vessel

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B. THICKNESS SCHEDULE

Insulation shall be applied in thicknesses specified in the following schedules or as shown on Construction Insulation Schedules. These thicknesses are based on recommendations of the manufacturers of the materials.

1. Thickness Schedule for PC Foamglas

Pipe or Vessel Size	Class A -100/-50°	Class B -49/0°	Class C 1/35°	Class D 36/125°	Class Efg 126/300°
4" & under	4"	3"	3"	1½"	1½"
6" - 12"	(6")	3"	3"	1½"	1½"
14" - 24"	(8")	(6")	4"	1½"	2"
Over 2 ft.	(12")	(6")	4"	2"	2"

2. Thickness Schedule for Kaylo

Pipe or Vessel Size	Class E 126°/300°	Class F 301/500°	Class G 501/700°	Class H 701/900°F.	
3" & under	1½"	1½"	2"	To 1½"	2"
4" - 12"	1½"	2"	(3")	2" to 4"	(3")
14" - 24"	1½"	2"	(3")	5" to 10"	(4")
Over 2 ft.	1½"	2"	(3")	12" -	(4")

NOTE: ( ) Parentheses indicate multi-layer insulation.
Specify: Pipe Insulation for 24" diam. or less.
Standard Curved Segments for 2' through 12' diam.
Standard Blocks for over 12' diam.

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INSULATION APPLICATION STANDARD

C. MATERIALS

All materials specified herein shall be used with approved equals used as substitutions only on written permission of the PPG Engineering Department.

1. Pipe and Block Insulation

a. Kaylo manufactured by Owens-Corning. The following materials (calcium silicate) may be used when Kaylo is not available:
Johns-Manville Thermobestos
Rubberoid Calsilite
Baldwin-Ehret-Hill Thermasil

b. Foamglas manufactured by Pittsburgh Corning Corporation
No substitutions shall be allowed on this product.

2. Fastening Devices

a. Bands shall be ½" or 3/4" x 0.020" thick Monel * (1/4 hard) and seals shall be 1" long solid Monel. The band stretcher shall not be of the crimping type but shall be a ratchet type stretcher as manufactured by Acme Steel Company or equal. Two seals per connection shall be used on large diameters and seals shall be crimped.
b. All wire shall be #14 Monel wire. *
c. All wire mesh shall be 1" hexagonal Monel wire mesh. *
d. For stud application 10 gauge Nelson weld studs and clips shall be used.
e. Asphalt impregnated glass cloth shall be Glasfab manufactured by Pittsburgh Corning Corp.
f. Aluminum screws shall be Parker-Kalon Type "A", No. 10 x 1/2", Binding Head.

* Stainless steel may be used in non-corrosive areas when approved by the Engineering Department.

3. Insulating Cements, Adhesives, Sealers and Finishes

a. Mineral wool insulating cement shall be J-M No. 450, B-E-H #1 or approved equal.
b. Asbestos finishing cement shall be J-M No. 352, B-E-H 200, or approved equal.
c. Asphalt adhesive and s aler shall be Insul-Mastic No. 507SF, Benjamin Foster 30-45, J-M Laptite or approved equal.

TITLE

INSULATION APPLICATION STANDARD

C. MATERIALS

3. Insulating Cements, Adhesives, Sealers and Finishes (Contd.)

d. Fibrated asphalt cutback on cold piping shall be Flintkote C-19 or approved equal.
e. Asphalt for hot application shall be Texaco No. 30 or approv d equal.
f. Breathing mastic on hot piping shall be J-M Insulkote, Flintkote Thermalkote or approved equal.
g. Roofing felt shall be 45# roofing felt similar to J-M Double Coated Flexstone.
h. Flashing cement shall be Flintkote Aduro Plastic or approved qual.
i. Aluminum jacketing material shall be 3SH-14 mill finish as manufactured by Reynolds Metals Company or Aluminum Company of America. Jackets shall be .024" thick 1¼" corrugated sheet for vertical vessels, .025" thick flat sheet for horizontal vessels and .020" thick flat sheet for piping.
j. Fire resistive mastic shall be Benjamin Foster 60-30N Fire Resistive Mastic or approved equal.
k. Asbestos paper, approximately 38 lbs. per roll, 36" wide, such as Philip Corey's "Fireguard" and Johns-Mansville's "Firetard" shall be used as finishes on pipe °F temperature Classes E through H.

D. APPLICATION METHODS

1. Hot Piping

A calcium silicate insulation such as Kaylo shall be used on temperature Classes E, F, G, and H except that PC Foamglas may be used for Class E when specified as Efg.

a. Pipe Insulation

The molded sectional insulation shall be neatly fitted to the pipe using the staggered joint method of application with all joints tightly butted together. The insulation shall be secured in place with Monel bands and seals using not less than (4) bands per 36" section. (#14 wire may be used on insulation where O.D. of insulation is 8" or under. 1/2" x .020 Monel Bands 9" O.D. through 24" insulation O.D. 3/4" x .020 Monel Bands 25" insulation O.D. and larger.) The seals shall be countersunk into the insulation. When two layers of insulation are used the first layer shall be secured (if so specified with three loops of #14 Monel wire per 36" section with the ends of the wire bent over and pressed into the insulation. All cracks and broken edges shall be filled with mineral wool insulating cement and smoothly pointed up. The ends of pipe insulation shall be stopped back of flanges a sufficient distance to permit removal of flange bolts. On piping finished with metal jacketing #12 Monel wir may be used in preference to bands.

D. APPLICATION METHODS

1. Hot Piping (Contd.)

b. Fittings

All welded and screwed fittings shall be insulated with segments of pipe insulation neatly mitered to fit and secured with Monel wire and/or bands. After the insulation has been secured in place, all voids shall be filled with mineral wool insulating cement and then finished with asbestos cement and a final coat of breathing type mastic. The over-all thickness shall be the same as adjacent pipe insulation. Monel wire mesh or Glasfab should be applied under the breathing type mastic as reinforcement.

c. Flanges and Flanged Valves

Flanges and flanged valves shall be insulated with molded cylinders cut to fit of pipe or block insulation. This insulation shall be properly cut and fitted to overlap the adjacent pipe insulation a distance equal to the thickness of the pipe insulation and secured in place with Monel bands and wire. Pointing up shall be done with mineral wool insulating cement and finishing shall be done with asbestos cement and a breathing type mastic. Flange covers shall be so fabricated and installed that the insulation can be removed with the least damage to adjoining pipe or fitting insulation. Monel wire mesh should be used as a reinforcing under the mastic.

d. Sealing Insulation Ends

In cases where flanges, valves, unions, etc. are specified to be left bare, the insulation shall be stopped a sufficient distance from the item where it shall be beveled and sealed using insulating cement and flashing cement to present a neat appearance and a water-proof seal.

e. Steam Traced Lines

The insulating of steam traced lines shall be done with the next larger size of pipe insulation which shall be cut to fit. Min ral wool insulating cement shall be used to fill voids.

D. APPLICATION METHODS (Contd.)

2. Cold Piping

PC Foamglas shall be used for insulating all cold piping, temperature Classes A, B, C, and D.

a. Pipe Insulation

The pipe surface shall be coated with an asphalt adhesive sealer, after which all joints of the Foamglas shall be coated with the asphalt adhesive and applied. A staggered joint method of application shall be used. All joints shall be tightly butted and pointed up and voids filled with the sealer material. In coating the surfaces of the pipe and insulation the area coated shall not be greater than where the adhesive sealer will remain in a tacky condition until the insulation is applied. On successive layers of insulation the outside of the preceding layer shall be coated with the adhesive sealer and the second layer applied in the same manner as first layer. Each layer of insulation shall be secured in place with Monel bands and seals. The bands shall be applied on 9" centers and the seals shall be countersunk into the insulation. The ends of pipe insulation adjacent valves and flanges shall be stopped back far enough to remove bolts and sealed to prevent moisture penetration when insulation is removed from flanges or valves.

b. Fittings

All fittings shall be insulated to the specified thickness with PC Foamglas fittings made from section of pipe insulation and blocks cut to fit and assembled using hot asphalt or asphalt adhesive. These insulation fittings shall be applied in the same manner as the pipe insulation.

c. Flanges and Valves

All flanges, valve bodies, valve bonnet and end flanges, and flanged fittings shall be insulated to the specified thickness with PC Foamglas segments made from PC Foamglas pipe section or block cut to fit and assembled either in the shop prior to application or in the field using hot asphalt or asphalt adhesive. The insulation on flanges shall be properly fitted to overlap adjacent pipe insulation a distance equal to the thickness of the pipe insulation. The insulation shall be secured with Monel bands and seals.

Do not us the asphalt adhesive and sealer directly on flange or valve surfaces but fill the voids between the insulation and insulated surfaces with Fiberglas secured with Monel wire.

D. APPLICATION METHODS

2. Cold Piping (Contd.)

d. Hangers

All hangers shall be outside the covering but not in contact with it as a support. Hardwood blocks of proper thickness and 10" to 12" in length shall be applied between the hanger and the pipe. A 16 gauge 180° Monel shield shall be placed between the covering over the wood block and the hanger.

e. Sealing Insulation

It is imperative that all insulation be sealed and waterproof d to prevent moisture penetration to the cold surface of the piping. All pipe insulation should be stopped and sealed a sufficient distance from all flanges and valves to allow the flange or valve and its insulation to be removed without allowing moisture penetration into or under the pipe insulation.

3. Hot Vessels or Ducts (Stud Application)

A calcium silicate type of insulation such as Kaylo shall be used for all temperature classes E, F, G, and H except that Foamglas may be used for Class E when specified as Efg.

a. Vessel Insulation

All specified surfaces shall be insulated with insulating blocks or lags neatly fitted in ashlar construction and secured with 10 gauge Nelson welding studs and speed clips. A minimum of one stud per square foot or block shall be used. The area around the pins shall be countersunk so that the speed clips and studs do not project above the surface of the block. The ends of the studs shall be cut off and the depression in the block filled with flashing cement or mineral wool insulating depending on the finish. All joints shall be tightly butted and pointed up and voids filled with mineral wool insulating cement.

TITLE

INSULATION APPLICATION STANDARD

D. APPLICATION METHODS

3. Hot Vessels or Ducts (Stud Application) (Contd.)

b. Expansion Joints

Expansion joints shall be installed on large vessels operating at elevated temperatures. For operating temperatures of 250°F. to 600°F. a circumferential joint should be installed at each 18 feet of length or height. For higher temperatures, one joint should be provided for each 9 feet. The expansion joint shall be approximately 2" and shall be filled with mineral wool or Fiberglas.

c. Sealing Insulation

Special attention and effort shall be taken in sealing the insulation at all points to make it waterproof, especially at nozzles and manholes, by properly flashing the insulation to the vessel surface.

4. Hot Vessels or Ducts (Band and Wire Application)

A calcium silicate type of insulation such as Kaylo shall be used for all temperature classes E, F, G, and H except that PC Foamglas shall be used for Class E when specified Efg.

a. Vessel Insulation

(1) All specified surfaces shall be insulated with insulating blocks or lags neatly cut and fitted in ashlar construction and secured in place with Monel wire and/or Monel bands and seals. The bands shall be placed on 9" centers and the seals shall be countersunk into the insulation. Steel washer and/or clips shall be welded to surface for fastening wire. Where wire is used, it should be laced around blocks with minimum of two wires per square foot. All joints shall be tightly butted and pointed up and all voids filled with mineral wool insulating cement. Where multi-layer insulation is specified each layer shall be banded and/or wired.

(2) The insulation in the area of manholes and nozzles shall be permanently held in place by a floating ring of 1/4" Monel rod or two Monel bands or 5 strands of #14 Monel wire.

TITLE

INSULATION APPLICATION STANDARD

D. APPLICATION METHODS

4. Hot Vessels or Ducts (Band and Wire Application)

a. Vessel Insulation (Contd.)

(3) The heads on vessels shall be insulated as outlined above with the final layer of insulation being permanently held in place by floating ring banding. The diameter of the ring shall be sufficient to accommodate the size and number of bands based on a 9" spacing at the outside face. The insulation inside the floating ring shall be secured by fastening at least four bands to the opposite side of the ring from which they would normally be attached. These bands shall be carried underneath the floating ring in order that the maximum utility of the band may be achieved. All bands of the floating ring assembly shall be attached on the straight portion of the vessel to a flat band of 1/8" x 3" Monel or several 3/4" bands. These bands shall be connected longitudinally with 3/4" by 0.020" Monel bands at not more than 30" center to center, which shall be applied over the circumferential bands and thes longitudinal bands shall be supported on approximately 10 foot centers by additional circumferential bands to prevent sagging.

b. Expansion Joints

Expansion joints shall be installed on large vessels operating at elevated temperatures. For operating temperatures of 250°F. to 600°F. a circumferential joint should be installed at each 18 feet of length or height. For higher temperatures, one joint should be provided for each 9 feet. The expansion joint shall be approximately 2" and shall be filled with mineral wool or Fiberglas.

c. Sealing Insulation

Special attention and effort shall be taken in sealing the insulation at all points to make it waterproof, especially at nozzles and manholes, by properly flashing the insulation to the vessel surface.

TITLE

INSULATION APPLICATION STANDARD

D. APPLICATION METHODS (Contd.)

5. Cold Vessels (Hot Asphalt Application)

PC Foamglas shall be used for insulating all cold vessels in Temperatur Classes A, B, C, and D.

a. Vessel Insulation

(1) All surfaces to be insulated shall be cleaned and primed with one brush coat of asphalt primer. The PC Foamglas blocks shall then be dipped in hot asphalt so that the inner face and all edges are coated and then applied and banded in place with temporary bands. The blocks shall be applied in ashlar construction and secured with Monel bands and seals. The bands shall be placed on 9" centers and the seals shall be countersunk. No band, regardless of vessel diameter, shall be over 10 ft. long.

(2) The insulation in the area of manholes and nozzles shall be permanently held in place by a floating ring of 1/4" Monel rod or two Monel bands or 5 strands of #14 Monel wire.

(3) The heads of vessels shall be insulated as outlined above with the final layer of insulation being permanently held in place by floating ring banding. The diameter of the ring shall be sufficient to accommodate the size and number of bands based on a 9" spacing at the outside face. The insulation insid the floating ring shall be secured by fastening at least four bands to the opposite side of the ring from which they would normally be attached. These bands shall be carried underneath the floating ring in order that the minimum utility of the band may be achieved. All bands of the floating ring assembly shall be attached on the straight portion of the vessel to a flat band of 1/8" x 3" Monel or several 3/4" bands. These bands shall be connected longitudinally with 3/4" by 0.020" Monel bands at not more than 30" center to center, which shall be applied over the circumferential bands and these longitudinal bands shall be supported on approximately 10-foot centers by additional circumferential bands to prevent sagging.

D. APPLICATION METHODS

5. Cold Vessels (Hot Asphalt Application) (Contd.)

b. Vessel Supports

Vessel saddles, supports and skirts shall be insulated at least 8" below the final layer in the same manner as the vessel.

c. Sealing Insulation

Special attention and effort shall be taken in sealing the insulation at all points to make it waterproof, especially at nozzles and manholes, by properly flashing the insulation to the vessel surface.

6. Cold Vessels (Asphalt Adhesive Application)

PC Foamglas shall be used for insulating all cold vessels in Temperature Classes A, B, C, and D.

a. Vessel Insulation

All surfaces to be insulated shall be primed with an asphalt adhesiv ; this area shall never be greater than that which will remain in a tacky condition until the insulation is applied. All joints of the Foamglas shall then be buttered with the asphalt adhesive and applied in ashlar construction. The insulation shall be secured with Monel bands placed on 9" centers with the seals countersunk into the insulation. All joints shall be tightly butted and pointed up and all voids filled with the asphalt adhesive and sealer. Where multi-layer insulation is specified each layer shall be applied in like manner and banded.

The insulation adjacent to manholes, nozzles and overheads shall be banded as specified in Items 5a (2) and 5a (3). The notes 5b and 5c regarding insulation of vessel supports and sealing insulation shall also apply for this method of application.

TITLE

INSULATION APPLICATION STANDARD

E. FINISHING METHODS

1. Breathing Type Mastic

This finish shall be used for Temperature Classes E through H only.

a. Piping

Pipe - asbestos paper - "Fireguard" or "Firetard" shall be banded on nine inch (9") centers and lapped three inches (3") on ends and three inches (3") on sides. The side shall be turned down.

Fittings shall be covered with a layer of breathing type mastic after which a layer of Glasfab shall be imbedded tightly in the mastic. A A final trowel or spray coat of mastic shall then be applied to completely cover Glasfab and give an even, smooth finish.

b. Vessels

Vessels insulated with Kaylo should first receive an over-all coat, approximately 1/4" thick, of asbestos cement. Reinforcing of 1" Monel hexagonal wire mesh tied with Monel wire to the banding shall then be applied. A heavy coat, 1/4" to 3/8" thick, of breathing type mastic shall then be troweled or sprayed over it. The finish shall be smooth and even.

Vessels insulated with PC Foamglas shall be finished as outlined for piping with the addition of 1/2" long Monel wire staples used to hold the Glasfab in place.

2. Fibrated Asphalt Cutback and Glasfab

This finish shall be used for Temperature Classes A through E only.

A light coat of Flintkote C-19 shall be troweled or sprayed (averaging 4-gallons per 100 sq. ft.) over the insulation. Glasfab shall then be imbedded and pulled tight in the mastic allowing a 20% overlap. On vessels, 1/2" long staples made of Monel wire shall be used to prevent the Glasfab from slipping. A final trowel or spray coat of the mastic (averaging 6-gallons per 100 sq. ft.) shall then be applied to completely cover the Glasfab and provide an even, smooth finish.

TITLE

INSULATION APPLICATION STANDARD

E. FINISHING METHODS (Contd.)

3. Canvas

This finish shall be used for interior only for Temperature Classes E through H only.

All insulation shall be finished with 8 oz. canvas pasted over a 1/4" layer of asbestos insulating cement. To avoid scorching, the canvas should be stopped short of any bare metal surface whose temperature exceeds 300°F. On vessels the asbestos insulating cement should be reinforced with 1" Monel hexagonal wire mesh.

4. Roofing Felt

This finish is recommended for Temperature Classes E through F on piping only, however, it may be used as an additional finish on horizontal vessels subject to foot traffic.

All surfaces shall be covered with roofing felt fitted in place with laps of not less than 3" and banded in place on 9" centers. All joints shall be sealed with asphalt adhesive sealer. Flanges and flanged fittings which can be covered with roofing felt shall have the felt extend over the insulation at least 1/8". On fittings, etc. where roofing felt cannot be used, a coating of breathing type mastic shall be used.

5. Aluminum Jacketing

This finish shall be used in the Power House only.

All insulating piping shall be covered with aluminum jackets machine rolled to fit the circumference of the pipe insulation and held in place with aluminum screws on 5" centers. Jackets shall be applied with a minimum 2" lap and with joints arranged so as to shed water. Horizontal seams on hot pipe shall not be fastened with screws. Expansion joints shall be provided where necessary.

When used on building exterior use one layer of 15 lb. felt between insulation and aluminum sheets.

TITLE

INSULATION APPLICATION STANDARD

E. FINISHING METHODS (Cont'd.)

6. Fire Resistive Mastic

Where specified an approved fire resistive mastic shall be used in place of breathing type mastic or fibrated asphalt cutback. Application shall be as shown under Finishes 1 and 2.

TITLE

INSULATION APPLICATION STANDARD

F. PIPING INSULATION SCHEDULE

The following insulation recommendations are for piping and are the standard notations explained in Item 4 of Section A.

Item	Description	See Notes	Insulation Recommendation
PL-1	Caustic (50% over 100°F.)	(4)	Efg:1 & 2:A
PL-6	Ammonia (Refrigerant)	(2, 5)	B:2 & 2:ABCD C:2 & 2:ABCD
PL-7	Chlorine (50# Liquid and at Loading)	(2, 5)	B:2 & 2:ABCD C:2 & 2:ABCD
PL-8	Chlorine Sniff Gas	(4, 5)	C:2 & 2:ABCD
PL-9	Chilled Water	(5)	D:2 & 2:ABCD
PL-11	Sulphuric Acid (90%)	(4, 5)	D:2 & 2:A
PL-13	Chlorine (Dry Gas)	(4)	B:2 & 2:ABCD C:2 & 2:ABCD
PL-14	Steam (30#)	(1, 3)	F:1 & 1:ABCD
PL-15	Steam (175#)	(1, 3)	G:1 & 1:ABCD
PL-16	Steam (400#)	(1, 3)	H:1 & 1:ABCD
PL-21	Steam (600#)	(1, 3)	H:1 & 3:ABCD
PL-23	Brine (CaCl)	-	B:2 & 2:ABCD
PL-28	Ammonia Still Bottoms Liquor (DH Plant)	-	E:1 & 1:A
PL-29 thru PL-31	50% Caustic in DH Plant	-	E:1 & 1:A
PL-36	Ammonia & Salt (DH Plant)	-	E:1 & 1:A
PL-38	Freon 12: Primary	(5)	B:2 & 2:ABCD
	Secondary	(5)	A:2 & 2:ABCD
PL-39	Caustic (73%)	(4)	F:1 & 1:ABC
PL-40	Caustic (Anhydrous)	-	H:1 & 1:A
PL-41	Dowtherm: Vapor	-	H:1 & 1:ABC
	Liquid	-	F:1 & 1:ABC
PL-44	Boiler Feed (400#)	(1, 3)	F:1 & 3:ABCD
PL-45	Boiler Water Treating	(1, 3 & 4)	E:1 & 3:ABC
PL-47	Boiler Feed (600#)	(1, 3)	F:1 & 3:ABCD
PL-48	Steam (90#)	-	F:1 & 1:ABC
-----	Steam Condensate	(1, 4)	E:1 & 1:A
PL-49	EDC, Customer Grade	(4)	Efg:1 & 1:AB
PL-50	EDC, Process Grade	(4)	Efg:1 & 1:AB
PL-51	Ethylene	(4)	Efg:1 & 1:AB
PL-57	Condensate	(3, 4)	E:1 & 1:A
PL-61	Trichloroethane (TCE)	(4)	Efg:1 & 6:A
PL-62	TeCE and PCE	(4)	Efg:1 & 6:A
PL-63	VDC	(4)	Efg:1 & 6:A
PL-64	Phenol	-	Efg:1 & 6:A
PL-66	Methyl Chloroform	(4)	Efg:1 & 6:A
PL-68	TBL	-	Efg:1 & 6:A
PL-74	Chlorine Dry Gas (HP)	(4)	Efg:1 & 6:ABCD

TITLE

INSULATION APPLICATION STANDARD

NOTES:

1. A breathing mastic finish is normally used throughout the plant on hot piping; however, a canvas finish may be used in the Power House.

2. Due to varied temperatures on some services, the actual temperature should be checked and the correct temperature class used.

3. Aluminum jacketing may be used as a finish in the Power House and in non-corrosive areas when specified by the PPG Engineering Department.

4. Piping in this service to be insulated only when specified by the PPG Engineering Department for personnel protection or process control.

5. Valves and adjacent piping operating in Temperature Classes A, B, C, D, and E should be cleaned and primed prior to insulation.

G. VESSEL INSULATION SCHEDULE

The following insulation recommendations are for vessels and are the standard notations explained in Item 4 of Section A. However, all vessel insulation should be specified by the PPG Engineering Department.

1. Recommended Vessel Insulation Practice

a. All vessels operating below 50°F. should be insulated with PC Foamglas using either Application Method 5 or 6 and Finish Method 2.

b. Caustic storage tanks should be insulated as follows:

50%	3/8" Insul-Mastic Type "D"
73%	Efg:3 & 2:E
Anhydrous	H:3 & 1:EFGHJK

c. Caustic evaporator steam chests:

Efg:3 & 1:E or Efg:3 & 2:E

d. Caustic Concentrators:

73%	F:4 & 1:EFGHJK
Anhydrous	G:4 & 1:EFGHJK

e. Heat exchangers, ducts, etc., operating in Temperature Classes F, G, and H should be insulated with Kaylo using either Application Method 3 or 4 and Finish Method 1.

f. Vessels operating in Temperature Classes A, B, C, D and E should be hand cleaned and primed prior to insulation.

g. Vessels operating in Temperature Class E and exposed to atmospheric conditions should preferably be insulated with Foamglas.