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UNION CARBIDE CORPORATION
CHEMICALS AND PLASTICS
ENGINEERING
SOUTH CHARLESTON, WEST VIRGINIA

MEMORANDUM

PLAINTIFF'S EXHIBIT
UC-4613

February 22, 1973

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FYI

INSULATION-DESIGN CRITERIA
SPIRITS-GRADE ETHANOL REFINEMENT
ETHANOL PLANT NO. 12
TEXAS CITY, TEXAS

Following are the recommended material and thickness specifications for each anticipated service condition:

Service	Temperature Range	Material Specification	Insulation Thickness
Process - Piping and Equipment	Above 50°F	2A(1)	TIM-101-515
Process - Piping	Below 50°F	1A(2)	TIM-111-515
Process - Equipment	Below 50°F	1M	TIM-111-515
Process Equipment - Subjected to Cyclic or Thawout Temps.	Below 50°F normal (up to 400°F thawout)	1M-B	TIM-111-515
Utility Piping (Steam, Water, Air, etc.)	50°F to 250°F	3A	
Utility Equipment (Steam, Water, Air, etc.)	50°F to 250°F	7M(3)	
Steam Traced Lines or Equip.(4)	All temperatures	2A(1)	TIM-101-515
Personnel Protection - Piping	135°F to 250°F	3A	
Personnel Protection - Equipment	135°F to 250°F	7M(3)	

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Service	Temperature Range	Material Specifications	Insulation Thickness
Personnel Protection - Piping or Equipment	250°F and above	2A(1)	TIM-142-515
Fire Protection - Piping and Equipment	Above 50°F	4A(1)	TIM-133-515
Fire Protection - Piping	50°F and below	1A(2)	TIM-134-515
Fire Protection - Equipment	50°F and below	1M	TIM-134-515

Notes

(1) All valves, fittings and other irregular surfaces shall receive a mastic weather barrier.

(2) Aluminum jacketing used in services operating below 50°F shall have a baked-on acrylic enamel finish on the outside to prevent condensation.

(3) On small equipment where spraying of urethane would be impractical, Material Specification 2M may be used.

(4) For steam operating at 400°F or less, copper tracing shall be used. For steam operating above 400°F, stainless steel tracing shall be used.

Because of restrictive regulations imposed by the Occupational Safety and Health Administration (OSHA), the Texas City Plant has adopted a policy stating that no new asbestos-containing insulations shall be installed on new installations. Material Specification 2A presently approves calcium silicate products which still contain asbestos fibers. By the time material procurement is necessary, asbestos-free products will be readily available; therefore, the material for Specification 2A should be one of the following:

Kaylo 10-AF - Owens-Corning Fiberglas Corp.

Thermo-12 - Johns-Manville Corporation

Super Caltemp, Type MA - Pabco Industrial Products

This criteria is being issued for simultaneous review and preparation of Insulation and Heat Tracing Schedules. Any comments should be directed to the writer.

E. C. Powell, Jr.

ECP:jr

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cc: Fred Keller
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INSULATION-DESIGN CRITERIA
SPIRITS-GRADE ETHANOL REFINEMENT
ETHANOL PLANT NO. 12
TEXAS CITY, TEXAS

Following are the recommended material and thickness specifications for each anticipated service condition:

Service	Temperature Range	Material Specification	Insulation Thickness
Process - Piping and Equipment	Above 50°F	2A(1)	TIM-101-515
Process - Piping	Below 50°F	1A(2)	TIM-111-515
Process - Equipment	Below 50°F	1M	TIM-111-515
Process Equipment - Subjected to Cyclic or Thawout Temps.	Below 50°F normal (up to 400°F thawout)	1M-B	TIM-111-515
Utility Piping (Steam, Water, Air, etc.)	50°F to 250°F	3A	
Utility Equipment (Steam, Water, Air, etc.)	50°F to 250°F	7M(3)	
Steam Traced Lines or Equip.(4)	All temperatures	2A(1)	TIM-101-515
Personnel Protection - Piping	135°F to 250°F	3A	
Personnel Protection - Equipment	135°F to 250°F	7M(3)	

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Service	Temperature Range	Material Specifications	Insulation Thickness
Personnel Protection - Piping or Equipment	250°F and above	2A(1)	TDM-142-515
Fire Protection - Piping and Equipment	Above 50°F	4A(1)	TDM-133-515
Fire Protection - Piping	50°F and below	1A(2)	TDM-134-515
Fire Protection - Equipment	50°F and below	1M	TDM-134-515

Notes

(1) All valves, fittings and other irregular surfaces shall receive a mastic weather barrier.

(2) Aluminum jacketing used in services operating below 50°F shall have a baked-on acrylic enamel finish on the outside to prevent condensation.

(3) On small equipment where spraying of urethane would be impractical, Material Specification 2M may be used.

(4) For steam operating at 400°F or less, copper tracing shall be used. For steam operating above 400°F, stainless steel tracing shall be used.

Because of restrictive regulations imposed by the Occupational Safety and Health Administration (OSHA), the Texas City Plant has adopted a policy stating that no new asbestos-containing insulations shall be installed on new installations. Material Specification 2A presently approves calcium silicate products which still contain asbestos fibers. By the time material procurement is necessary, asbestos-free products will be readily available; therefore, the material for Specification 2A should be one of the following:

Kaylo 10-AF - Owens-Corning Fiberglas Corp.

Thermo-12 - Johns-Manville Corporation

Super Caltemp, Type HA - Pabco Industrial Products

This criteria is being issued for simultaneous review and preparation of Insulation and Heat Tracing Schedules. Any comments should be directed to the writer.

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