

INSULATION
FOR
PERSONNEL PROTECTION

PIPE AND FITTINGS

1. Insulation Material

1.1 Pipe

The insulation material for piping shall be one, or more, of the following, or Dow-approved equal:

- 1.1.1 "Hinged" type sectional fiber glass insulation,
3 foot or 6 foot lengths, suitable for continuous
service at 350° F., such as:

Gustin-Bacon Snap-On,

Johns-Manville Micro-Lok, or

Carey Thermoglas;

} For Class
G-P only,
From 140° F.
to 350° F.

Note: Plain fiber glass pipe insulation, or
insulation with factory applied jacket may be
used. See Sections 4 and 5 for type of jacket
required.

- 1.1.2 Mineral wool industrial pipe insulation, standard
lengths, fabricated to fit pipe, such as:

Baldwin-Ehret-Hill #101 pipe insulation, or

Carey mineral wool industrial pipe insula-
tion; or

} For Classes
C-P, D-P,
E-P, F-P,
and G-P.
From 140° F.
to 1000° F.

- 1.1.3 Insulating materials specified in Dow Standard
8-601, page 3, may be used.

1.2 Pipe Fittings and Valves

Note: The insulation shall be omitted from all valves and all
flanges for Class G-P insulation.

The insulation material for pipe fittings and valves shall be the
same material specified for piping or the material specified for
vessels and equipment (See Dow Standard 8-647).

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2. Insulation Thickness

CLASS	Temperature of Pipe or Equipment	NOMINAL INSULATION THICKNESS																
		NOMINAL PIPE SIZE																Over 24" and Flat Surf
		1" and Under	1 $\frac{1}{4}$ "	1 $\frac{1}{2}$ "	2	3	4	5	6	8	10	12	14	16	18	20	24	
C-P	1000°F. to 800°F.			2"				2 $\frac{1}{2}$ "						3"				3"
D-P	800°F. to 700°F.			1 $\frac{1}{2}$ "									2"					2"
E-P	700°F. to 600°F.	1"					1 $\frac{1}{2}$ "								2"			2"
F-P	600°F. to 350°F.			1"								1 $\frac{1}{2}$ "						1 $\frac{1}{2}$ "
G-P	350°F. to 140°F.				3/4"									1"				1"

NOTES:

1. For temperatures 800°F. and over, insulation shall be applied in double-layer construction with staggered joints, or in single-layer construction with Dow-approved expansion joints.
2. For temperatures 350 to 800°F. (Class D-P, E-P, and F-P) insulation shall be applied in single-layer construction with Dow-approved expansion joints.

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3. Application

3.1 Pipe

3.1.1 Fiber Glass, Plain

All end joints shall be tightly butted and the single longitudinal seam shall be held together with copper clad outward clinch insulation staples, 4 staples per 3-foot section.

No bands are required except over asbestos felt jacket. See Section 5.

3.1.2 Fiber Glass with 6-ounce Canvas Jacket

Apply the same as plain fiber glass. Paste down all canvas laps with white adhesive such as Foster's Lagfas 81-42W, Airbol, or Dow-approved equal.

3.1.3 Fiber Glass with 55-pound Asbestos Jacket, White Exterior

Apply the same as plain fiber glass. Seal asbestos laps with asphalt seam sealer.

Apply bands over the asbestos jacket as specified in Section 5.

3.1.4 Mineral Wool

Butt end joints. Secure longitudinal seams with lead wires furnished with the insulation, or with 16 gage 302 or 304 stainless steel wires on 9" centers.

3.2 Fittings, Valves, and Flanges

3.2.1 The insulation shall be stopped short of all flanges and valves on Class G-P insulation. The ends of the insulation shall be beveled to permit removal of the flange bolts. Flanges and valves with insulation hotter than Class G-P shall be insulated.

3.2.2 The insulation for fittings and the body of valves (when insulated) on pipe 2" and smaller shall consist of a built-up layer of insulating cement or other material suitable for the temperatures involved. Total thickness of insulation to equal that on adjoining pipe.

3.2.3 Fittings on piping 2 1/2" and larger and the bodies of the flanged valves (when insulated) shall be insulated with blanket or sectional insulation to a thickness equal to that on adjacent piping.

3.2.4 Flanges (when insulated) shall be covered with sectional pipe or blanket insulation to a thickness equal to that of the insulation on the adjacent piping.

3.2.5 The insulation on the body of 2 1/2" and larger fittings and valves and on all flanges shall be securely wired or banded in

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place. On flanges, the insulation shall be of such length as to extend not less than 2" or a distance equal to the insulation thickness, whichever is greater, over the adjacent pipe insulation on each side of the flange. The total thickness of the insulation shall be equal to that on the adjacent piping.

3.3 Bends

- 3.3.1 Bends shall be covered by mitering sectional insulation, or by using blanket insulation.

4. Finish Indoor

4.1 Pipe

- 4.1.1 The finish for pipes indoors in all areas, except in production plants, shall be 6-ounce white canvas lapped at least 2" at all joints and pasted over the insulation with white adhesive such as Foster's Lagfas 81-42W, Airbol, or Dow-approved equal. After the canvas is in place, apply a full coat of white adhesive.

Pipe furnished with 6-ounce canvas jacket will require sealing of the seams (See Section 3.1.2), followed by one full coat of white adhesive, Foster's 81-42W, Airbol, or Dow-approved equal.

4.2 Fittings, Valves, Flanges, and Bends

- 4.2.1 These items shall be finished with a two-coat application of a white FVA resin emulsion; such as Foster's 31-99 Sealfas Mastic or Dow-approved equal; reinforced with a layer of open-weave glass cloth. Lap all edges at least 2". All voids and pinholes must be covered, leaving a smooth, neat finish.

5. Finish Outdoor

5.1 Pipe

- 5.1.1 All piping outdoor, or otherwise exposed to the weather, shall be finished with a waterproof jacket of asbestos roofing felt, white one side, tightly wrapped on, with a cold seal of adhesive applied evenly over the entire surface of all lap joints. The weight of asbestos felt shall be 50 to 55 pounds/100 square foot. All joints shall be lapped as follows:

Insulated Outside Diameter	Minimum Joint Lap
Less than 8"	2"
8" and larger	3"

On horizontal pipes, the seams of the waterproof jacket shall be placed at the side of the pipe with the lap turned down in order to shed water.

Secure waterproof jackets with 302 or 304 stainless steel bands spaced a maximum of 10" from center to center of bands, with one

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band not more than 3" from the end of each jacket. Bands shall be 3/8" wide by .015" thick for all sizes of pipe.

5.2 Fittings, Valves, Flanges and Bends

5.2.1 Finish the same as indoor. See Section 4.2.

6. References

6.1 Dow Standards:

Standard No.

Title

8-647

Insulation of Personnel Protection - Vessels and Equipment.

ST0534426

Insulation Support
Rings (5y cems).
Rings extend 2-3
inches in thickness,
spaced on 18" c.
centers.

51021 In: 51-101-7

1111; 14529
1111; 14529

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1990

1910-1911

Metul Bonds
1500 New St E-614)

Weather: Foot Moist
Fire Ash or Glass
Clash (See Ser. B-635)
1 4

35 W. 302 Stainless
Steel Flashing

Swift-Ging

Free with
Annual Fee

Yasari Jholl
(Interior)

1. *Western Front Music*
 and 1" Hex Metal
 2. *Black Yife or Glass*
 3. *Clash (See 5rd. 8-635)*

Block Inverter -

Metal Bonds
(See Dow Sid. 8-614)

Weather-Proof Plastic
and 1" Hex Metal Mesh
Wire or Glass Cloth
(See Sig. 8.625)

EXPANSION JOINT AT INSULATION
SUPPORT RING

**EXPANSION JOINT AT
STIFFENER RING
(WIDER THAN INSULATION THICKNESS)**

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R. C. Middleton

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10/26/64

The question concerning asbestosis had to do with sawing Transite. Although the dust from such an operation will probably contain respirable particles of asbestos it is highly unlikely that enough exposure would exist in the use of Transite to represent a real hazard.

It was explained to the men that in using the epoxy resins it is necessary that contact with the skin does not occur. We explained that the seriousness of the rash stems from the fact that exposures which appear to be acceptable can result in sensitization and that once a person is sensitized he can no longer work with the epoxies.

We explained that the plant air was free of carbon monoxide and mercury and explained our plan for checking the air for oil mist and other particulate material. There was some discussion concerning the use of an oil trap in the air line. The equipment used in Midland was shown.

The men reported that those who had been involved in sand blasting equipment in the Catalyst Plant had been plagued with rashes which they associated with nickel salts. We stated that there is such a thing as dermatitis due to nickel and that surely the appearance of rashes associated with such contact indicated the need for keeping the material off the skin and for removing it if any contact should occur.

I hope you will forgive the tardiness of this report. My only excuse is that entirely too many demands have been placed on my time since last I saw you.

Best personal regards,

H. R. Hoyle

H. R. Hoyle
Biochemical Research Laboratory
1701 Building

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Enc.

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OFFICE COPY

Biochemical Research Laboratory

The Dow Chemical Company

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EXPOSURE TO FINE DUSTS ENCOUNTERED
BY WORKERS CUTTING VARIOUS TYPES OF
PIPE COVERING MATERIAL

File: T2.1-3-1
Date: July 21, 1965
By: E. J. Schneider

Signed E J Schneider Date 7/21/65

Checked H B Hoyle Date 7-22-65

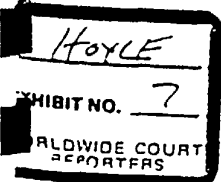
DOW CONFIDENTIAL PROBLEM

A question was raised by shop personnel after reading an article of the health hazards associated with exposure to asbestos. Is there a health hazard from asbestos in cutting various types of pipe covering material used at Dow Corning? The Environmental Research Laboratory was asked to evaluate the exposures to the fine dusts encountered by workers cutting the pipe covering material and to determine the possible health hazard.

CONCLUSIONS

1. Concentrations of total dust in excess of acceptable levels can be encountered by workers cutting pipe covering material both by hand and in using a table saw.
2. A total dust count or the number of particles per million cubic feet of air also exceeds acceptable levels at times.
3. The amount of asbestos fibers of significant length found within the dust exceeds 25 per cent of the fiber content,

DAK 01161



however, fibers constitute only 10 per cent of the total dust. The possibility that Dow Corning workers are being exposed to excessive amounts of asbestos fibers within the important fiber lengths (20-50 microns) is unlikely, however, it is advisable and prudent to have workers wear respiratory protection while cutting pipe covering material. This is especially true when using a table saw.

4. No one type of pipe covering material was found to have a significantly greater amount of asbestos fibers than the others. The Phillip Carey FiberCel material does produce considerable more fine dust than the others when cut.

ASBESTOS

In reviewing the literature⁽¹⁾ it is learned that the most common form of asbestos is known as chrysotile, a hydrous magnesium silicate containing from 12.5 to 14 per cent water of crystallization. There is another form of asbestos derived from amphibole which occurs as a variety of minerals consisting of iron, calcium and magnesium silicates with little water of constitution. This latter type of asbestos consists of shorter fibers but is more stable chemically than chrysotile and more resistant to acids and heat.

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⁽¹⁾ Industrial Toxicology - L. T. Fairnall, pp. 19-21, 1957.

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