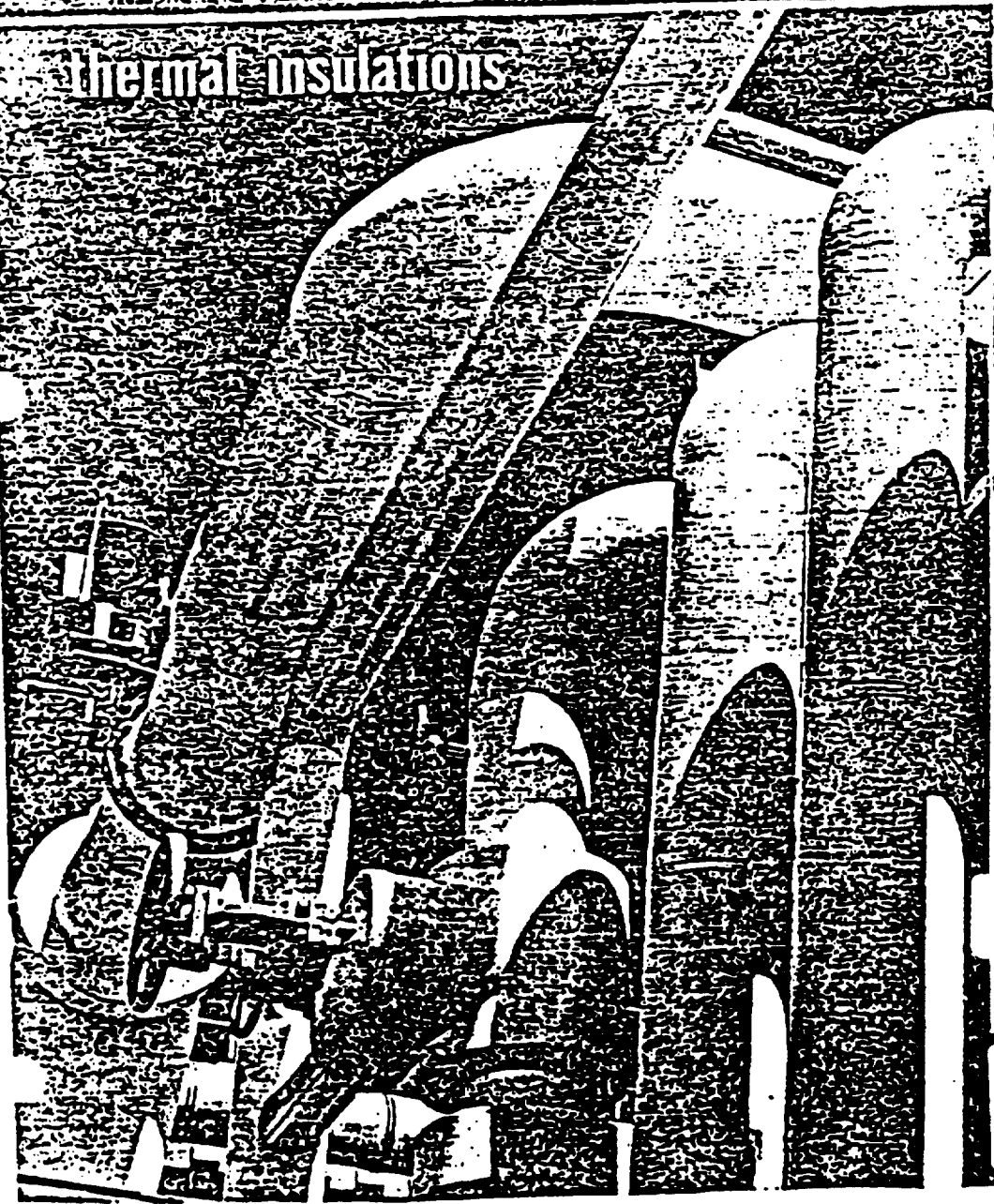


RUBEROID

thermal insulations

Calcium insulation	2-3-5
TEANA-100 insulation	2-3-5
Min. Glass Insulation	2-3-5
Commercial Asbestos	2-3-5
Asbestos Millboard	2-3-5
Asbestos Rollboard	2-3-5
Asbestos Annular Flange	2-3-5
Asbestos Gaskets	2-3-5
Insulating Cement	2-3-5



MICH01570

EXHIBIT
CAF/ BETA
12/8/55 JPL

RUBEROID CALSILITE

an improved calcium silicate insulation for use on
process and power steam piping and equipment

MICH01571

Calsilite offers distinct application advantages to the cost conscious user. Calsilite Insulations are quickly and easily applied, light and convenient to handle. Calsilite sections fit accurately on standard pipe sizes, finish smoothly and provide a fine, neat appearance with a minimum of labor cost. Calsilite — normally provided with standard weight canvas jackets — may also be finished with heavy canvas or other types of weatherproof jacketing.

Advantages:

Improved thermal design: Radical new formulation of Calsilite means superior strength and durability under almost any exterior or interior industrial conditions. Calsilite is non-soluble in water and is not affected by most normal acids and alkalis. It retains its shape under all conditions, including excessive condensation, high humidity . . . even complete saturation . . . yet returns to normal thermal efficiency when dried out.

Improved texture: Texture of Calsilite is so fine that insulation can be easily cut for any application. Even the smallest segments can be mitred with a minimum of breakage or crumbling. Reduction in loss of material means increased savings.

Ease of application: Calsilite is easy to fabricate, even for the most involved or detailed application. No special equipment required. Compatible Ruberoid cements finish joints and fittings neatly and evenly.

Variety of shapes and sizes: Made in half sectional, three segmental and regular segmental shapes as well as block forms, Calsilite eliminates the need to stock a variety of different types of insulation. Sizes correspond to standard iron pipe and copper tubing.



Physical Characteristics

Thermal Conductivity (BTU/sq. ft./inch/hr./°F.)	at 200°F. (Mean)	0.35
	300°F. "	0.40
	400°F. "	0.45
	500°F. "	0.50
	600°F. "	0.55
Density	(Average)	12 lbs./cu. ft.
Moisture Absorption (Volume)	After 6 hours exposure in atmosphere of 90% relative humidity at 120°F. dry bulb temperature	0.7%
Flexural Strength	Lbs./sq. in. (average)	100
Resistance to Abrasion	Loss in Weight (Max.) After 10 min.	10%
	Loss in Weight (Max.) After 20 min.	20%
Change under Soaking Heat	Loss of Weight	
	24 hrs. @ 1200°F.	7.5%
	6 hrs. @ 1000°F.	7.0%
Linear Shrinkage	24 hrs. @ 1200°F.	1.5%
	6 hrs. @ 1000°F.	0.8%
Compressive Strength	5% deformation after immersion in water for 16 hours while wet (Min.)	175 psi

Recommended Thickness for Commercial and Industrial Design

MICH01572

Pipe Covering							Block			
Temperature of pipe (°F)							ambient temperature 80°F			
pipe size	200°	400°	600°	800°	1000°	1250°	equip. temp. (°F)	commercial (110°F max. surface temp.)	power (130°F max. surface temp.)	process (150°F max. surface temp.)
1/4	1	1 1/2	2	2 1/2	3	3	200	1 1/2	2 1/2	3 1/2
3/8	1	1 1/2	2	2 1/2	3	3	300	1 1/2	2 1/2	3 1/2
1	1	1 1/2	2	2 1/2	3	3	400	2 1/2	3 1/2	4 1/2
1 1/4	1	1 1/2	2	2 1/2	3	3 1/2	500	3 1/2	4 1/2	5 1/2
1 1/2	1	1 1/2	2	2 1/2	3	3 1/2	600	4 1/2	5 1/2	6 1/2
2	1	1 1/2	2	2 1/2	3 1/2	3 1/2	700	5 1/2	6 1/2	7 1/2
2 1/2	1	1 1/2	2	3	3 1/2	3 1/2	800	6 1/2	7 1/2	8 1/2
3	1	1 1/2	2 1/2	3	3 1/2	4	900	7 1/2	8 1/2	9 1/2
4	1	2	2 1/2	3	3 1/2	4	1000	8 1/2	9 1/2	10 1/2
5	1 1/2	2	2 1/2	3	3 1/2	4	1100	9 1/2	10 1/2	11 1/2
6	1 1/2	2	2 1/2	3	3 1/2	4	1200	10 1/2	11 1/2	12 1/2
7	1 1/2	2	2 1/2	3	3 1/2	4				
8	1 1/2	2	2 1/2	3	3 1/2	4				
9	1 1/2	2	2 1/2	3	3 1/2	4				
10	1 1/2	2	2 1/2	3	4	4 1/2				
12	1 1/2	2	2 1/2	3 1/2	4	4 1/2				
14	1 1/2	2 1/2	3	3 1/2	4	4 1/2				
16	1 1/2	2 1/2	3	3 1/2	4	4 1/2				
18	1 1/2	2 1/2	3	3 1/2	4	4 1/2				
20	1 1/2	2 1/2	3	3 1/2	4	4 1/2				
24	1 1/2	2 1/2	3	3 1/2	4	4 1/2				

Note: It is recommended that double layer application with staggered joints be used on all installations of 600° and above.

Calafite-HI - For temperatures to 1800°. For information regarding Calafite-HI, contact New York office.

RUBEROID T/NA 100 multi-purpose insulation jacketing

superior in appearance . . . superior wherever atmospheric conditions present severe maintenance problems . . . no specialized installation

Ruberoid T/NA 100 is a new and revolutionary material that represents a major break-through in the field of insulation jacketing. T/NA 100 is the first and only flexible jacketing to be virtually fireproof and provide unparalleled resistance to outdoor weathering. Because of its unusual flexibility and workability, T/NA 100 simplifies the application process and offers a significant saving in installation costs. The versatility of T/NA 100 makes it as effective for covering insulated tanks as for protecting insulated piping.

Ruberoid T/NA 100 combines asbestos fibre, an inorganic material of established durability and flame resistance, with Tedlar,[®] a new PVF film of unique characteristics that has been developed in the laboratories of Du Pont. The asbestos fibre is formed into a tough asbestos felt, using an elastomeric binder. "Tedlar" is permanently laminated to the asbestos felt with an elastomeric adhesive.

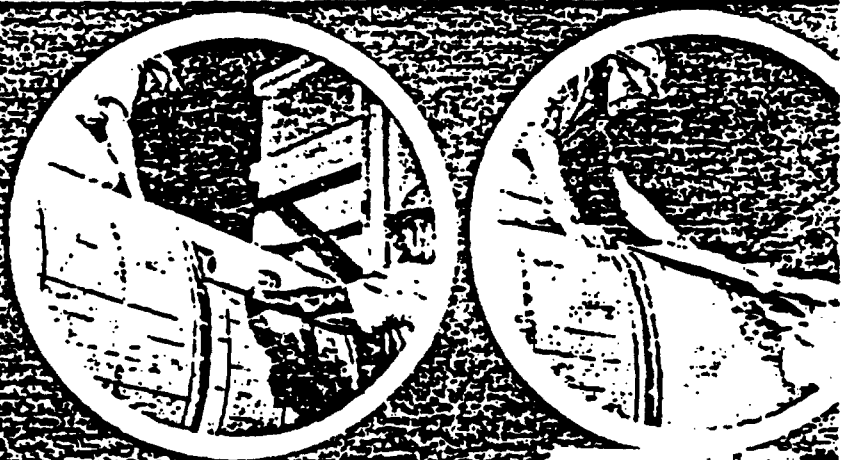
Ruberoid T/NA 100 also eliminates any need for painting or weatherproofing, thus setting a standard of durability and maintenance-ease never before attained in any insulation-jacketing material.

© Du Pont's Registered Trademark

MICH01573

Substantial Savings in Installation

Flexible T/NA-100 wraps easily into position and may be secured with an ordinary staple gun. All joints are sealed with T/NA-100 Finishing Tape or recommended adhesives.



01-0215842

MICH01574

Features:

Flexible: Tough and flexible over wide temperature range, from minus 50°F to over 200°F.

Flame-resistant: T/NA 100 has been labelled with a flame spread rating of 25 by Underwriter's Laboratories, Inc.

Weather-resistant: Exposed surface is "Tedlar" and is essentially unaffected by ultra-violet light. Will not chalk, craze or erode on exposure; will not corrode in industrial atmospheres.

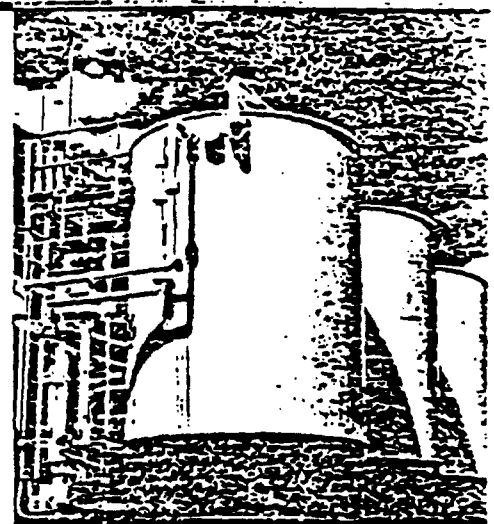
Chemical and solvent resistant: Retains its form and strength even when boiled in strong acids and bases. Unaffected at ordinary temperatures by many classes of common solvent, including hydrocarbons and chlorinated solvents. T/NA 100 is impermeable to greases and oils, is unaffected in strength and appearance by soil bacteria.

Designed for multi-purpose use: Flexibility of material permits its use over large areas as well as narrow-diameter pipelines.

Resistant to puncture and abrasion: Tough "Tedlar" surface is designed to take wear and tear.

Easy to repair: Damage can be readily repaired by patching with T/NA 100 Finishing Tape.

Bright white surface: Attractive, highly reflective. Other colors under development.



Material Specifications:

Width of Roll 35.5 in.

Length 166.7 lin. ft.

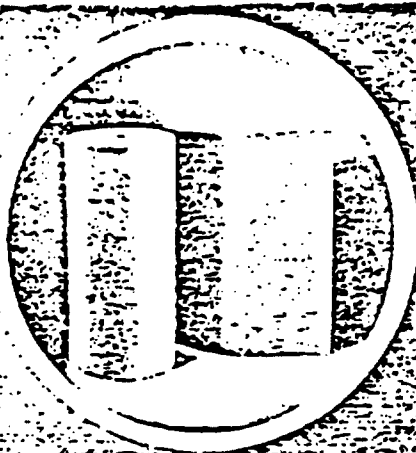
Area (Gross) 500.0 sq. ft.

Approx. Shipping Weight 60.0 lbs.

Note: Butt Strap Stock available in rolls, 4 inches wide x 166.7 lineal feet.

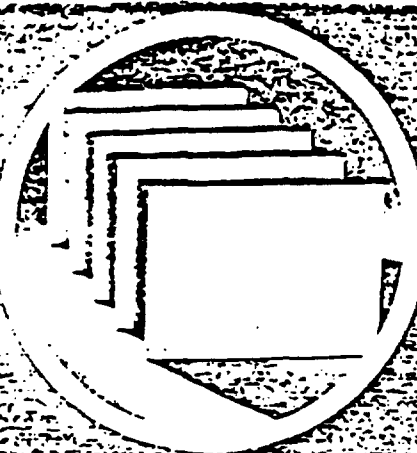


Other Insulation Products



Commercial Asbestos Paper

As a fire retardant with all the properties of a thin, pliable paper, Ruberoid Asbestos Paper has a multiplicity of uses in residential and general building work and in industrial applications. It can be used to wrap furnace pipes, air-conditioning ducts, furnaces, jackets and for the protection of wood partitions exposed to heat. This product is ideal for any application where paper is desired and a degree of fireproofing is required.



Asbestos Millboard

Asbestos Millboard is designed to be used wherever a lightweight, inexpensive fireproofing material is required. It is employed widely in insulating ovens and ranges and for lining grates, ceilings and walls. Its many residential and industrial uses are apparent when it is considered that the product is fire retardant, vermin proof and can be used as protection against acid fumes.



Insulation Cements

Ruberoid offers a cement for every temperature problem . . . for both insulating and finishing.

Product	Temp. Range
Grade 313 Mineral Wool Cement	2100°F
Calcilite Cement	1250°F
Grade 412 Single Coat Cement	1250°F
Grade 214 Asbestos Cement	1000°F
Grade 115 Asbestos Cement	1000°F

Asbestos Rollboard

Asbestos Rollboard is basically the same product as Ruberoid Asbestos Paper, except that it is made in thicknesses of $\frac{1}{8}$ " and $\frac{1}{2}$ ". It is used for general fire proofing, and heat resisting purposes. It will withstand temperatures up to 350°F.

Asbestos Furnace Tape

Ruberoid Asbestos Paper in tape widths has been cut in convenient size small rolls, making it easy to handle in the furnace industry. This tape can be used for sealing joints in the application of cellular insulation on furnaces and pipes and air conditioning ducts.

Asbestos Electrolytic Paper

This special long fibre asbestos paper is specifically manufactured for chlorine manufacturers using electrolytic cell process. It is available only upon special order.

The RUBEROID Co.

Industrial Insulation Division 733 Third Avenue, New York, N. Y. 10017

MICH01575

01-0215844

Printed in U.S.A.

Fiber Glass Pipe Insulation

for use on hot, cold and chilled water lines; brine, refrigerant and special process lines; dual temperature, steam and other hot lines to 370°F.

This lightweight pipe insulation is made of long, fine glass fibers bonded together with a thermosetting resin. Lightweight and one-piece construction with "spring-hinge" full length opening and automatic closing feature speeds on-the-job handling. Resiliency of glass fibers prevents breaking and crumbling of edges, saves waste, makes tighter joints, saves patching costs.

Sizes

Available in three-foot sections, in standard wall thickness and sizes for iron pipe and copper tubing either bare or with factory-applied jackets.

JACKETING* INFORMATION

Curves 4 oz., 6 oz., and 8 oz., in addition to standard curves.

GP General Purpose: white bleached kraft laminated to aluminum foil. Recommended for 1/2" and 3/4" thicknesses in all pipe sizes.

Vapor Barriers

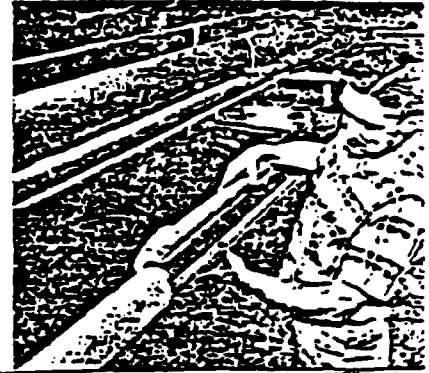
Dual Temperature

WX White Vapor Barrier: three-ply with white bleached kraft, aluminum foil, and black asphalt-impregnated kraft.

FB Flame Bar: fire-resistant jacket, U.L. flame-spread rating: 25. Three-ply: outer ply white bleached embossed kraft bonded to aluminum foil with flame-extinguishing adhesive, reinforced with fiber glass both directions.

Weather Resistant: three weights of roofing felt available—35 lb., 45 lb., 55 lb., and premium quality D.C. Flaxstone. For 1" thick and over pipe insulation, for all pipe sizes.

* Factory applied.



Fiber Glass Insulation . . . fine fibered

for use wherever the greatest thermal and acoustical efficiency in the smallest space is required

MICH01576

This low density, resilient, blanket-type thermal and acoustical insulation is made of long, extremely fine, glass fibers, bonded with a thermosetting phenolic resin. The insulation will easily conform to curved surfaces and angles . . . resists breakdown and sagging from vibration and bumps . . . yields under impact without damage.

Facing Information

Available on all densities and thicknesses either with no tabs or with 1 or 2 2-inch tabs

RKL LIGHTWEIGHT VAPOR BARRIER PAPER (Reinforced Kraft, Light): Two layers of 30-lb. Kraft paper, reinforced with fiber glass yarn scrim (1" x 1" spacing) in asphalt lamination.

.001 AL Aluminum Foil
.002 ALX Aluminum Foil
(Recommended as vapor barrier)

High degree of heat reflection. Foil adds its own insulating value through its excellent radiant heat reflectivity. Incombustible.

PSX Reinforced Foil and Paper (Foil, Scrim, Kraft): A layer of aluminum foil, reinforced with fiber glass yarn mesh and laminated to 40 lb. fire-resistant Kraft. Very strong. Foil adds to insulating value.

APV Vinyl Plastic

WPV Aluminum white or green pigmented.

GPV Effective vapor barrier. Provides attractive finish.

PSXL Foil Skin Kraft, lightweight plastic coating, black.



Dimensional Limitations, Standard Product

density	thickness	width	length
.6 &	1/2"	24", 36", 48", 72"	200'
.75 lb.	1", 1 1/2", 2"	24", 36", 48", 72"	100'
	3"	24", 36", 72"	50'
	1/2"	24", 36", 48", 72"	200'
1.0 lb.	1", 1 1/2"	24", 36", 48", 72"	100'
	2"	24", 36", 48", 72"	50'
1.5 lb.	1/2"	24", 36", 48", 72"	200'
	1"	24", 36", 48", 72"	100'
2.0 lb.	1/2"	24", 36", 48", 72"	100'
	1"	24", 36", 48", 72"	50'

Special Fiber Insulation

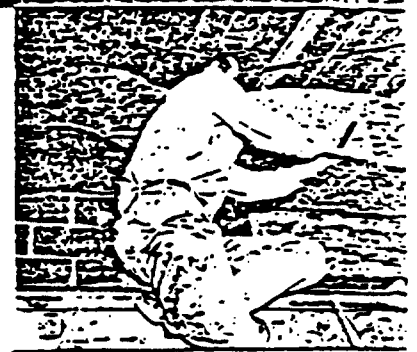
for insulating housings, plenum chambers, and air conditioning ducts in offices, factories, institutional and commercial buildings of all kinds

This insulation is felted from long, tough, super-springy siliceous fibers of unusual fineness. Extremely low in thermal conductivity, it has a temperature limit of 450°F. The fibers are non-absorptive, corrosion-resistant, moisture-resistant and incombustible. They have been treated to resist capillary action, will neither rot nor mildew.

Standard Sizes, Thicknesses and Available Facings

Type	Wt. per Cu. Ft. lb.	Length	Width, inches	Thickness, inches	Facings
No. 411 (flexible)	3.00	48", 60"	30	1" to 3"	VS, FSK, APV
No. 411 (flexible)	3.00	25' (rolls)	30	1" to 2"	VS, FSK, APV
No. 412 (semi-rigid)	3.50	48", 60"	30	1" to 3"	VS, FSK, APV, AP
No. 413 (semi-rigid)	4.25	48", 60"	30	1" to 3"	VS, FSK, APV, AP
No. 414 (semi-rigid)	6.00	48", 60"	30	1/2", 3/4" & 1" to 4"	VS, FSK, APV, AP
No. 415 (semi-rigid)	8.00	48", 60"	30	1/2", 3/4" & 1" to 3"	VS, FSK, APV, AP
No. 416 (semi-rigid)	9.00	48", 60"	30	1/2", 3/4" & 1" to 2"	VS, FSK, APV, AP

* in 1/2" increments.



Facing Information

VS: Heavy asphalt-kraft paper. Applied with wrap around edge to 413, 414, 415 & 416. Applied with no edge wrapping to one surface of 411 and 412.

FSK: Foil scrim kraft. Flame resistant.

APV: .004" aluminum pigmented vinyl film.

AP: Asbestos paper.

Fiber Glass Insulation . . . textile fibered

for use as a duct liner and duct wrap, for refrigerated trucks and trailers, air conditioning and heating equipment

MICH01577

This lightweight, resilient, semi-rigid blanket insulation is composed of fine glass fibers, reinforced with glass textile fiber and bonded with a thermosetting resin. It is especially effective as a liner for air conditioning and heating ducts . . . will absorb air-borne noises in the 250 to 4000 cps range and dampen vibration.

Facing Information

Available on all densities and thicknesses either with no tabs or with 1 or 2 2-inch tabs

RKL LIGHTWEIGHT VAPOR BARRIER PAPER (Reinforced Kraft, Light): Two layers of 30-lb. Kraft paper, reinforced with fiber glass yarn scrim (1" x 1" spacing) in asphalt lamination.

.001 AL Aluminum Foil
.002 ALX Aluminum Foil
(Recommended as vapor barrier)

High degree of heat reflection. Foil adds its own insulating value through its excellent radiant heat reflectivity. Incombustible.

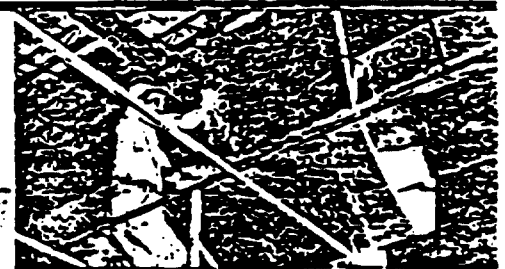
FSK Reinforced Foil and Paper (Foil, Scrim, Kraft): A layer of aluminum foil, reinforced with fiber glass yarn mesh and laminated to 40 lb. fire-resistant Kraft. Very strong. Foil adds to insulating value.

APV Vinyl Plastic

WPV Aluminum white or green pigmented.

GPV Effective vapor barrier. Provides attractive finish.

PSKL Foil Skin Kraft, lightweight plastic sheathing, black.



Dimensional Limitations, Standard Product

density	thickness	width	length
.6, .75 &	1", 1 1/2"	24", 36", 48"	100'
1.0 lb.	2", 3"	24", 36", 48"	50'
	1/2"	24", 36", 48"	100'
1.5 lb.	1", 1 1/2", 2"	24", 36", 48"	50'
	1/2"	24", 36", 48"	100'
2.0 lb.	1", 1 1/2"	24", 36", 48"	50'
	1/2"	24", 36", 48"	100'
3.0 lb.	1"	24", 36", 48"	50'