

manufacturers of a complete line of
HEAT AND COLD INSULATIONS

KEENE

BUILDING PRODUCTS CORPORATION

INSULATION & CONTRACTING DIVISION

Keene Corporation is a multi-division manufacturer serving the building construction, industrial and filtration/pollution control markets.

The Industrial and Contracting Division is an integral part of the Keene Building Products Group. And has manufactured molded insulation products since 1898. It manufactures and sells industrial insulation materials and products made of calcium silicate and mineral wool. Calcium silicate is sold in the form of block and pipe covering for applications up to 1200 degrees F. Mineral wool is sold in a variety of forms, for applications up to 1900 degrees F. The Division also sells fiberglass insulation products for commercial applications up to 450 F.

products are available through . . .

A national network of Keene Corporation contractors and distributors. These groups offer broad experience, engineering know-how and are fully qualified to install Keene insulation products on all types of piping and equipment. In addition, Keene Corporation's own highly skilled engineers can provide technical guidance and assistance for all insulation problems, large or small.

For the name of the contractor/distributor nearest you, contact any one of our branch sales offices or consult the local Yellow Pages.

plants

Huntington, Indiana · Kalamazoo, Michigan
Trenton, New Jersey · Valley Forge, Pennsylvania

Home Office: P.O. Box 145, Princeton, N.J. 08540
(609) 452-8090

All products
in this catalogue
are manufactured
ASBESTOS FREE

1 [illegible]

2 Mineral Wool Insulation
Free-Lok Pipe Insulation to 1200 F
Curved Mono-Block Pipe Insulation to 1000 F
Mono-Block to 1000 F
Therms K to 1000 F
Super Felt to 800 F
Metal-Mesh Blanket to 1200 F
Super Powerhouse to 1200 F
No. 1 Cement to 1000 F

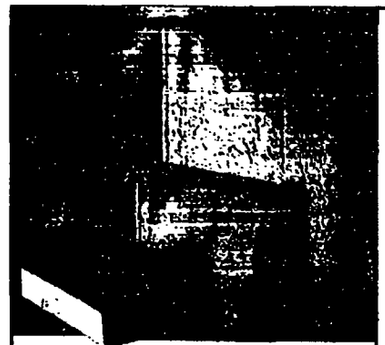
3 Glass Insulations
Mono-Kover to 370 F
Commercial Duct Wrap

4 Industrial Sound Control Products
Sonosorber
Hansoquilt

5 Service Addresses
Addresses and Telephone Numbers

1 calcium silicate insulation/for service to 1200F

THERMASIL BLOCK INSULATION



Thermasil block insulation is a molded, hydrous calcium silicate insulation—a blend of special inorganic ingredients reinforced with mineral fibers, especially formulated for use at temperatures up to 1200 F.

Thermasil is chemically converted under carefully controlled conditions into a strong, hard, light, chemically stable insulation material. Molded on modern equipment in a new, process-controlled plant, the inside and outside surfaces of Thermasil are tough, smooth and dust-free. Provides inhibition against chloride attack of AUSTENITIC stainless steel. (See page 5 for details)

Designed as an insulation and not as a structural material, Thermasil hardness is deliberately controlled within a range which provides a unique balance between strength and workability. This balance permits ease of shaping and fitting with knife or saw. Thermasil, because of its chemical stability, is not damaged by water and will regain its excellent thermal insulation properties upon drying.

physical properties

Density — 12.0 lb/cu. ft.
Compressive strength — 100 lb/sq. in. @ 5% deformation
Flexural strength — 75 lb/sq. in.
Linear shrinkage after heating @ 1200 F — 1.5% max.

thermal conductivity

Mean temp. F	100	300	500	700
K	.31	.41	.51	.61

specification compliance

Federal: HH-I-533c, Type I
Military: MIL-I-2819D, Classes I and 2
MIL-I-24244, Types 3A, 3B
U. S. Coast Guard: Incombustible Material I-94.009/40/0
ASTM: [illegible]

352839

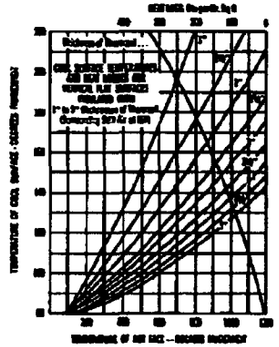
available sizes and thicknesses

Lengths — 18, 36 inches
Widths — 3, 6, 12 inches
Thicknesses — 1, 1½, 2, 2½, 3
Curved and scored block are also available

recommended thickness

temp. range F	thickness (Nominal inches)
100- 199	1½
200- 299	2
300- 399	2½
400- 499	3
500- 599	3½
600- 699	3½
700- 799	4
800- 899	4
900- 999	4½
1000-1200	5

thickness vs hot face-cold face temperatures



suggested application specifications

1 Insulating material
All heated surfaces shall be insulated with—thick Thermasil calcium silicate insulation, as manufactured by Keene Building Products Corp., Insulation and Contracting Div.

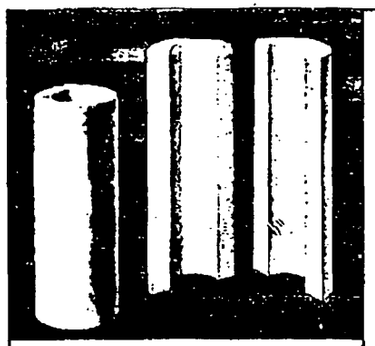
2 application
On flat and large-radius cylindrical surfaces, Thermasil block insulation shall be held in place with wires stretched over the face of the blocks and anchored to studs or clips, welded to the face of the surface to be insulated. Joints and corners shall be painted with Super Powerhouse Cement. On cylinders and ducts up to 12 feet in diameter, encircling bands ½" wide on 12-18-inch centers shall be used to hold blocks in place.

3 finishing
a. Block insulation shall be finished with Super Powerhouse Cement applied over woven wire mesh.
b. Block insulation outdoors shall be finished with Super Powerhouse Cement then weatherproofed with FibreKote.

PLAINTIFF'S
EXHIBIT
KN-420

1 calcium silicate insulation/for service to 1200F

THERMASIL PIPE INSULATION



Thermasil pipe insulation is a molded, hydrous calcium silicate insulation—a blend of special inorganic ingredients reinforced with mineral fibers. Thermasil is chemically converted under carefully controlled conditions into strong, hard, light, chemically stable insulation material. Molded on modern equipment in a new process-controlled plant, the inside and outside surfaces of Thermasil are tough, smooth and dust-free. Provides inhibition of chloride attack on AUSTENITIC stainless steel.
(See page 5 for details).

jackets

Canvas, standard weight and 8 oz. available
45# asphalt saturated asbestos felt
Aluminum (.015") with vapor-barrier liner
Stainless Steel

physical properties

Density—12.0 lb/ cu. ft.

Flexural strength—75 lb/sq. in.
Linear shrinkage after heating @ 1200F—1.5% max.

thermal conductivity

Mean temp. F	100	300	500	700
K	.31	.41	.51	.61

specification compliance

Federal HH-I-523c, Type II
Military: MIL-I-27810
Grade I, Class b
Grade II, Class d
Grade III, Class e, types I and II
MIL-I-24244, Types IA, IC, ID, IE
U.S. Coast Guard: Incombustible Material 164.009/49/0
ASTM: C 533-67

available sizes and thicknesses

nominal thicknesses	single layer sectional	double layer sectional	inner layer sectional —outer layer segmental
1"	½"—4" copper tubing	—	—/—
1"	½"—6" IPS	—	—/—
1½"	½"—18" IPS	—	—
2"	½"—18" IPS	½"—4" IPS	—
2½"	½"—18" IPS	½"—6" IPS	—
3"	½"—18" IPS	½"—16" IPS	17"—18" IPS
3½"	½"—18" IPS	½"—15" IPS	16"—18" IPS
4"	½"—18" IPS	½"—15" IPS	16"—18" IPS
4½"	½"—14" IPS	½"—14" IPS	15"—18" IPS
5"	½"—12" IPS	½"—12" IPS	14"—18" IPS

recommended thicknesses

pipe size (inches)	temperature (F) of pipe: 100 to 199	200 to 299	300 to 399	400 to 499	500 to 599	600 to 699	700 to 799	800 to 899	900 to 999	1000 to 1099	1100 to 1200
1½ or less	1	1	1½	2	2	2½	2½	2½	3	3	3
2	1	1	1½	2	2	2½	3	3	3	3½	3½
2½	1	1	1½	2	2	2½	3	3	3	3½	3½
3	1	1	1½	2	2	2½	3	3	3	3½	3½
3½	1	1	1½	2	2	2½	3	3	3½	3½	3½
4	1	1½	2	2	2½	2½	3	3½	3½	4	4
4½	1	1½	2	2	2½	2½	3	3½	3½	4	4
5	1	1½	2	2	2½	3	3½	3½	4	4	4½
6	1	1½	2	2	3	3	3½	3½	4	4	4½
7	1½	1½	2	2½	3	3	3½	3½	4	4	5
8	1½	1½	2	2½	3	3	3½	3½	4	4½	5
9	1½	1½	2	2½	3	3	3½	3½	4	4½	5
10	1½	1½	2	2½	3	3	3½	4	4½	4½	5
11	1½	1½	2	2½	3	3	3½	4	4½	5	5
12/over	1½	2	2	3	3½	3½	4	4	4½	5	5

suggested application specifications

1 insulating material

All heated pipes and tubing shall be insulated with ___ thick Thermasil calcium silicate insulation, as manufactured by Keene Building Products Corp., Insulation and Contracting Div.

2 application

On pipes up to 12-inch, Thermasil pipe insulation shall be secured with factory applied canvas jackets pasted in place. When specified, bands shall be applied over the canvas. On larger sizes, and for the inner layer of double-layer covering, the insulation shall be wired in place on 9-inch centers. Fittings, etc., shall be insulated with Super Powerhouse Cement or covered with pre-fabricated tees finished with Super Powerhouse Cement.

3 finishing

a. Pipe insulation shall be covered with canvas pasted in place and painted, or with aluminum jacketing.
b. Pipe insulation outdoors shall be weatherproofed with asphalt-coated roofing felt, aluminum or stainless steel jackets, as specified.

352840

1 calcium silicate insulation/test data

TEST DATA ON STANDARD THERMASIL PIPE AND BLOCK

Information shown on page 4 is repeated below for your convenience. See page 3 for similar information on Thermasil Block Insulation.

Catastrophic failure of AUSTENITIC stainless steel processing equipment and piping as a result of chloride stress corrosion cracking can now be inhibited. The "Accelerated Dana Test" was designed to measure the inhibitory properties of an insulation in preventing corrosion cracking of stressed stainless steel test coupons when exposed to a heated chloride solution. Continued testing of this property of standard Thermasil by a major chemical manufacturer and an independent laboratory has shown that Thermasil exceeds the 6-day exposure requirement without cracking of the stainless steel test coupons.

With Thermasil, it is not necessary to order a special product or maintain a separate inventory for use on stainless steel, the inhibition is "built-in" to each piece as a part of the manufacturing process.

Typical test results are shown below:

test data

Tests conducted by Lehigh Testing Laboratories

material tested

Thermasil Calcium Silicate Pipe & Block Insulation

tests performed

Leaching Tests for: Total Chlorides	(Cl)	59 ppm
Chlorides Total Silicates	(SiO_2)	3920 ppm
Silicates Calcium Silicate	($CaSiO_3$)	50 ppm
Sodium Silicate	(Na_2SiO_3)	8100 ppm

Accelerated Dana Test:

Thermasil pipe and block insulation pass this test.

352841

physical properties

Density—12.0 lb/ cu. ft.

Flexural strength—75 lb/sq. in.
Linear shrinkage after heating @ 1200F—1.5% max.

thermal conductivity

Mean temp. F	100	300	500	700
K	.31	.41	.51	.61

recommended thicknesses

pipe size (inches)	temperature (F) of pipe: 100 to 199	200 to 299	300 to 399	400 to 499	500 to 599	600 to 699	700 to 799	800 to 899	900 to 999	1000 to 1099	1100 to 1200
1½ or less	1	1	1½	2	2	2½	2½	2½	3	3	3
2	1	1	1½	2	2	2½	3	3	3	3½	3½
2½	1	1	1½	2	2	2½	3	3	3	3½	3½
3	1	1	1½	2	2	2½	3	3	3	3½	3½
3½	1	1	1½	2	2	2½	3	3	3½	3½	3½
4	1	1½	2	2	2½	2½	3	3	3½	4	4
4½	1	1½	2	2	2½	2½	3	3½	3½	4	4
5	1	1½	2	2	2½	3	3½	3½	4	4	4½
6	1	1½	2	2	3	3	3½	3½	4	4	4½
7	1½	1½	2	2½	3	3	3½	3½	4	4	5
8	1½	1½	2	2½	3	3	3½	3½	4	4½	5
9	1½	1½	2	2½	3	3	3½	3½	4	4½	5
10	1½	1½	2	2½	3	3	3½	4	4½	4½	5
11	1½	1½	2	2½	3	3	3½	4	4½	5	5
12/over	1½	2	2	3	3½	3½	4	4	4½	5	5

available sizes and thicknesses

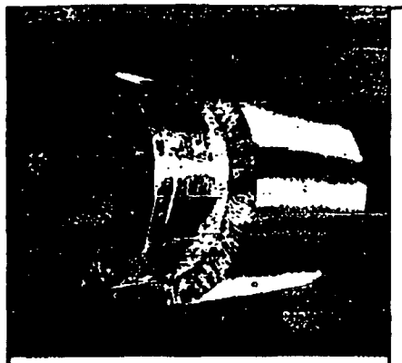
nominal thicknesses	single layer sectional	double layer sectional	inner layer sectional —outer layer segmental
1"	½"—copper tubing	—	—
1"	½"— 6" IPS	—	—
1½"	½"—18" IPS	—	—
2"	½"—18" IPS	½"— 4" IPS	—
2½"	½"—18" IPS	½"— 6" IPS	—
3"	½"—18" IPS	½"—18" IPS	17"—18" IPS
3½"	½"—15" IPS	½"—15" IPS	16"—18" IPS
4½"	½"—14" IPS	½"—14" IPS	15"—18" IPS
5"	½"—12" IPS	½"—12" IPS	14"—18" IPS

specification compliance

Federal HH-I-523C Type II
Military: MIL-I-27810
Grade I, class b
Grade II, class d
Grade III, class e types I and II
MIL-I-24244 types IA, IC, ID, IE
U. S. Coast Guard: Incombustible material 164.009/49/0
ASTM: C 533-67

2 mineral wool insulation/for service to 1200F

PRES-LOK A MINERAL FIBER INSULATION—ASBESTOS FREE



available sizes and thicknesses

Length—2' sections
Pipe size—6" ips thru 23"OD
Thickness—1" thru 5" in ½" increments

facings available

FRJ Jacketed
.016 Smooth Alum.
.016 Embossed Alum.
On Alum. Faced — 1 Buttstrap Furnished per section plus 1 extra

mineral wool pipe insulation

Description:
Pipe insulation made of spun Mineral Wool with binders, by a patented Keene Corporation process. This Product contains NO ASBESTOS.

Uses:
For heated pipes to 1200°F.

Features:
Light weight. Max. temperature range 1200°F. Easy to handle and apply. Snug Mineral Wool joints. Moisture resistant. Non-corrosive, stable in service and non-combustible.

Thermal Conductivity:

Mean Temp.	K
100	.24
200	.31
300	.38
500	.52
700	.63

These K Factors are tests made on the pipe, not flat sheets.

Specifications:
HH-I 558a Form D Type IV Class 14-15 with Alum. Jkt.

Packaging:
Shipped flat in corrugated boxes

thickness required

to result in insulation surface temperature less than 140°F
Note: Use tables prepared by H.I.M.A.

Pipe Temp. °F	350	400	500	600	700	800	900	1000	1100
Temp. Diff °F	160	260	360	460	560	660	760	860	960
K-Factor	.28	.28	.32	.36	.38	.41	.46	.48	.52
Pipe Size "ips" / Factor									
6" .008	1	1½	2	2½	2½	3	3½	3½	4
8" .007	1½	1½	2	2½	2½	3½	3½	4	4
10" .007	1½	2	2½	2½	3	3½	4	4	4½
12" .006	1½	2	2½	2½	3	3½	4	4	4½
14" .006	1½	2	2½	3	3	4	4	4½	5
16" .006	1½	2	2½	3	3½	4	4½	4½	5
18" .005	1½	2	2½	3	3½	4	4½	4½	5
20" .0045	1½	2	2½	3	3½	4	4½	4½	5
24" .0045	1½	2	3	3	3½	4	4½	5	5½

application specifications

Insulating Material:
All heated pipes 6" to 23" O.D. and tubing shall be insulated with ____ thick Presiok Pipe Insulation as manufactured by Keene Corporation, Insulation and Contracting Div. Inner layer faced with U/L rated foil-scrim-kraft cover. Outer layer/or single layer faced with .015 aluminum (plain or embossed) with Presiok joint. Pipes smaller than 6" O.D. shall be insulated with Keene's Thermasil Pipe Covering. Vessels larger than 23" O.D. shall be insulated with Keene's Curved Monoblock.

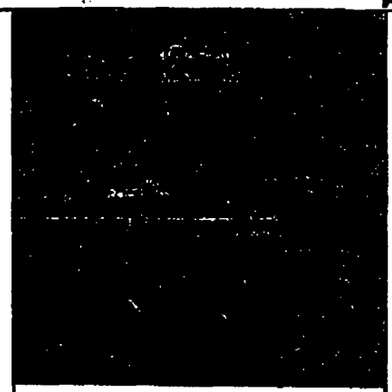
Application:
Single/or Outer Layer with Aluminum Jacket
Drape over horizontal lines, or pull around vertical lines, so that Presiok joint faces the applicator as shown in step #1 of Presiok bulletin. Pull snug and manually engage first lock joint. Place insulation band around insulation and mount tightening tool in the stud holes at the ends of the band as shown in step #2. Squeeze tool handle several times to make assembly of tool, band, and insulation firmly snug. Pipe cover may now be repositioned along pipe or rotated as desired. At desired location, continue squeezing tightening tool handle until second joint audibly "snaps" in place. Presiok is now installed. Press release button to relax tension on tool and band, but leave the assembly hanging in place ready to slide onto the next section.

Inner Layer with FRJ Cover
Drape over horizontal lines, or pull around vertical lines as shown in step #5 of Presiok bulletin. Using pressure sensitive tape, pull insulation snugly around pipe by hand. Use tension band and tightening tool as described above to tighten insulation securely around pipe. Reposition pressure sensitive tape for maximum tightening and release tool. Install next section and slide tool and band onto it and repeat tightening procedure. If no outer layer of aluminum faced Presiok is to be installed, the butt joints should be covered with pressure sensitive tape of the same material as the scrim facing. It should also be noted that the plain Presiok (foil-scrim-kraft facing) can be job-site finished with asphalt coated roofing felt, aluminum, or stainless steel as desired. In these cases, the finishing material shall be pulled to a tightness that will obtain a specified O.D. equal to the O.D. of the pipe plus twice the thickness of the insulation so that proper performance is obtained.

35-2842

2 mineral wool insulation/for service to 1900F

CURVED MONO-BLOCK MINERAL FIBER BLOCK for large pipe or vessels ASBESTOS FREE



Curved Mono Block is composed of high temperature resistant spun mineral fibers and inorganic binders. A patented process interlocks the long mineral fibers to form a lightweight, rigid yet resilient block which is easily shaped and fitted. Its excellent handling qualities are supplemented by a high insulating efficiency over an operating temperature range to 1900F. High sound absorption efficiency makes this product interesting for use where acoustical treatment is required at elevated temperatures. It is for curved surfaces of diameters starting at 24" and thru 60". This product contains no asbestos.

physical properties

Density — 16 lb/cu. ft.

Compressive strength — 10 lb/sq. in. @ 5% deformation.

Flexural strength — 40 lb/sq. in.

Linear shrinkage after heating at 1900F — less than 5%.

thermal conductivity

Mean temp. F	200	400	600	800	1000	1200
K	.36	.42	.51	.625	.765	.90

specification compliance

Federal: HH-I-558a Form A Class 6; HH-I-564, Form 1, Types A, B, C, D.
Commercial Standard: CS117, block, class A. C. D.
ASTM: C612-67T, class D.

available sizes and thicknesses

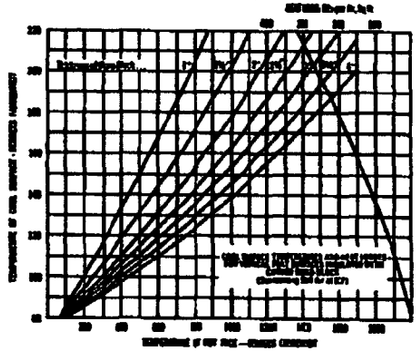
Length — 36"
Width — Diameters 24"-60"
Thicknesses — 1½" through 3" in ½ inch increments

35-2843

recommended thicknesses

Hot face temp. degrees F	Thickness inches	Hot face temp degrees F	Thickness inches
up to 800	1 to 1½	800 to 1000	4
800 to 850	2	1000 to 1200	4½
850 to 900	2	1200 to 1400	5
900 to 950	2½	1400 to 1600	6

thickness vs. hot-face-cold-face temp chart.



sound absorption coefficients—

Mounting No. 4

Frequency, Hz	125	250	500	1000	2000	4000	NRC
3 inches thick	.35	.85	.90	.95	1.01	1.10	.90
4 inches thick	.57	.85	.90	.99	1.01	1.10	.95
6 inches thick	.80	.85	.90	.99	1.01	1.10	.96

suggested application specifications

1. Insulating material

All pipes and/or vessels 24" O.D. thru 60" O.D. shall be insulated with — thick Curved Mono-Block: a rigid mineral fiber block insulation mfd. by Keene Building Products Corp., Insulation and Contracting Div.

2. application

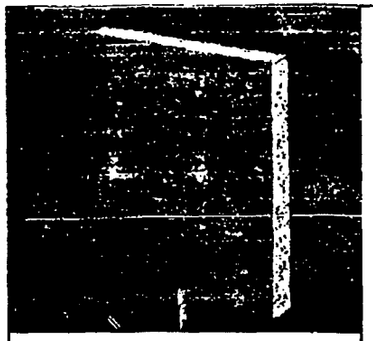
Block insulation shall be held in place with ½ inch bands. Bands shall be spaced on 12 to 18 inch centers.

3. finishing

On large areas over 4 feet square, and on surfaces subject to vibration or movement from thermal expansion, woven wire mesh shall be applied over Mono-Block insulation and fastened to bands. Super Powerhouse Cement ½ inch thick shall then be applied, filling all cracks to form a level surface and then smoothed with a steel trowel. For outdoor service, Aluminum Jacket may be applied in conventional manner.

2 mineral wool insulations/for service to 1900F

MONO-BLOCK MINERAL FIBER BLOCK —ASBESTOS FREE



Mono Block is composed of high temperature resistant spun mineral fibers and inorganic binders. A patented process interlocks the long mineral fibers to form a lightweight, rigid yet resilient block which is easily shaped and fitted. Monoblock physical characteristics permit impaling it over spot welded mounting pins without pre-drilling the blocks. Its excellent handling qualities are supplemented by a high insulating efficiency over an operating temperature range to 1900 F. High sound absorption efficiency makes this product interesting for use where acoustical treatment is required at elevated temperatures.

physical properties

Density — 13 lb/cu. ft.
Compressive strength — 10 lb/sq. in. @ 5% deformation.
Flexural strength — 40 lb/sq. in.
Linear shrinkage after heating at 1900 F — less than 5%

thermal conductivity

Mean temp. F	200	400	600	800	1000	1200
K	.36	.42	.51	.625	.755	.90

specification compliance

Federal: HH-I-558a Form A Class 5;
HH-I-564, Form I, Types A, B, C, D.
Commercial Standard: CS117, block, class A, C, D.
ASTM: C612-67T, class D.

352844

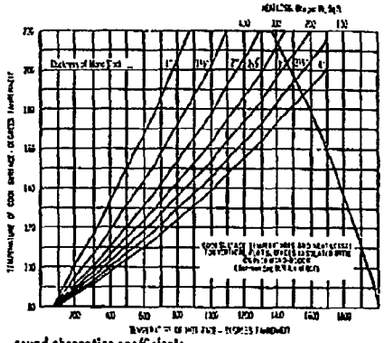
available sizes and thicknesses

Length — 18, 36 inches
Width — 6, 12, 24 inches
Thicknesses — 1 through 4 in ½ inch increments
Curved block also available

recommended thicknesses

Hot face temp. degrees F	Thickness inches	Hot face temp degrees F	Thickness inches
up to 300	1 to 1½	800 to 1000	4
300 to 450	2	1000 to 1200	4½
450 to 600	3	1200 to 1400	5
600 to 800	3½	1400 to 1600	6

thickness vs. hot-face-cold-face temp chart.



sound absorption coefficients—

Mounting No. 4

Frequency, Hz	125	250	500	1000	2000	4000	NRC
2 inches thick	.56	.83	.66	.93	1.01	1.10	.90
4 inches thick	.57	.83	.90	.93	1.01	1.10	.90
6 inches thick	.63	.85	.90	.93	1.01	1.10	.90

suggested application specifications

1 Insulating material

All heated surfaces shall be insulated with — thick Mono-Block; a rigid mineral fiber block insulation mfd. by Keene Building Products Corp., Insulation and Contracting Div.

2 application

On flat surfaces, Mono-Block shall be impaled over welded studs or pins on suitable centers and held in place with washers or clips. Joints and corners shall be pointed with Super Powerhouse Cement, before finishing.

On curved surfaces, block insulation shall be held in place with ½ inch bands on cylinders up to 6 feet in diameter and ¾ inch bands on larger cylinders. Bands shall be spaced on 12 to 18 inch centers. Joints and corners shall be pointed with Super Powerhouse Cement, before finishing.

On irregular surfaces, depressions shall be filled with a trowel coat of No. 1 Plus insulating cement, over which Mono-Block shall be applied.

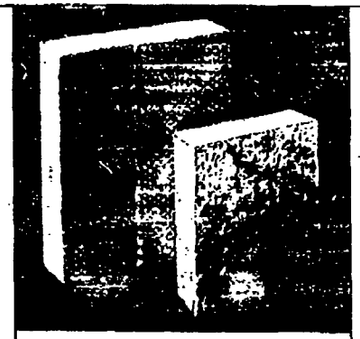
3 finishing

On large areas over 4 feet square, and on surfaces subject to vibration or movement from thermal expansion, woven wire mesh shall be applied over Mono-Block insulation and fastened to pins or studs. Super Powerhouse Cement ½ inch thick shall then be applied, filling all cracks to form a level surface and then smoothed with a steel trowel.

For outdoor service, after the Super Powerhouse Cement has dried, woven wire mesh shall be stretched tightly over it, fastened securely, and ¼" thick FibreKote weatherproofing shall be applied over all.

2 mineral wool insulations/for service to 1000F

THERMA-K MINERAL FIBER BLOCK —ASBESTOS FREE



Therma-K is a semi-rigid mineral fiber block insulation; lighter in weight and available in larger sheets than rigid-type block insulation. For use on heated flat surfaces where maximum temperature does not exceed 1000 F. In addition, Therma-K is recommended for use over a temperature reducing layer of higher temperature block insulation. Note: Under service conditions in excess of 450 F, the binder nearest the hot side will carbonize to a depth dependent on actual temperature and time. The material will maintain its insulating value and remain in place if properly mechanically supported.

physical properties

Density — 8 lb/cu. ft.
Flexural strength — 25 lb/sq. in.
Compressive strength — 150 lb/sq. ft. @ 10% deformation
Linear shrinkage after heating @ 1000 F — negligible

thermal conductivity

Mean temp. F	75	200	300	400	500
K	.25	.33	.34	.40	.48

specification compliance

Federal: HH-I-558a Form A, Class 3
ASTM: C612-70, Class 2,3,4

available sizes and thicknesses

Length — 48 inches
Width — 24 inches
Thicknesses — 1" through 3" in ½" increments

852845

recommended thicknesses

100-200 F	1"
200-300 F	1½
300-400 F	2
400-500 F	3

suggested application specifications

1 insulating material

Specified heated surfaces shall be insulated with — thick Therma-K mineral fiber block as manufactured by Keene Building Products Corp., Insulation and Contracting Div.

2 application

On flat or large-radius cylindrical surfaces, Therma-K shall be impaled over welded studs, pins or wires on suitable centers and secured with washers or clips.

On rectangular ducts, Therma-K blocks shall be held on with encircling metal bands, except that on vertical and underneath horizontal surfaces 30 inches or more wide, pins or clips shall be used to supplement the bands.

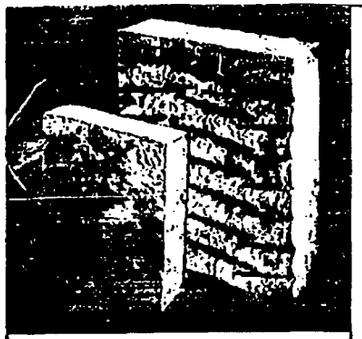
3 finishing

When specified, aluminum sheets fastened with suitable mechanical supports shall be used to cover Therma-K insulation.

When a cement finish is specified, expanded metal lath shall be fastened to the face of the Therma-K, then a ½ inch thick coat of Super Powerhouse Cement applied.

2 mineral wool insulations/for service to 600F

SPUN FELT MINERAL FIBER FELT –ASBESTOS FREE



Spun felt insulation is fabricated from long, fine, felted mineral fibers and is highly effective when applied to equipment with surface temperatures ranging from – 150 to 450 F. When mechanically supported Spun Felts of 6 pound density or heavier are effective to 1000 F. Densities lighter than 6 pound may be used to 600 F if mechanically supported.

Spun Felt is a highly resilient material in flexible or semi-rigid form and made in standard densities from 3 to 8 pounds. Its high temperature resistant, moisture repellent and incombustible fibers are felted and bonded together with a uniformly distributed phenolic resin to provide a structure with extremely low thermal conductivity.

thermal conductivity

Mean temp. F	50	75	100	200	300	400	500
K (3 lb.)	.26	.27	.29	.34	.42	.53	–
K (4 lb.)	.24	.25	.27	.31	.38	.46	.565
K (6 lb.)	–	.24	.25	.29	.36	.46	.57
K (8 lb.)	–	.24	.25	.28	.35	.43	.53

specification compliance

Federal: HH-I-542, Type II
HH-I-558a Form A, Classes 1, 2, 3
HH-I-557, Type I, Class 2
HH-I-563, Type II, Class D
Military: MIL-I-16683C
Commercial Standard: CS 105 Felt, CS 117 Felt
ASTM: C 553-64T, Types II, III, Classes F-1, F-2
C 612-61T, Class A

available sizes and thicknesses

Lengths: 24", 30", 36", 48"
Widths: 12", 24"
Thickness: 1" through 4" by ½" increments
Densities: 3, 3½, 4, 4½, 6 and 8 lb/ft³

Fire Hazard Classification:
(UL Guide No. 40 U8 3)

Flame Spread	25 or less
Fuel Contributed	50 or less
Smoke Developed	50 or less

sound absorption coefficients—

Mounting No. 4

Frequency, Hz	125	250	500	1000	2000	4000	NRC
3½ lb. 2" thk.	.34	.78	.89	.96	.98	1.02	.90
4" thk.	.50	.93	.99	.96	.99	1.06	.95
6" thk.	.59	.95	.99	.96	.99	1.06	.93
6 lb. 2" thk.	.36	.91	.96	.94	.93	.90	.88
4" thk.	.54	.95	.96	.94	.93	.83	.95

suggested application specifications

1 Insulating material

All heated surfaces shall be insulated with _____ thick Spun Felt mineral wool insulation as supplied by Keene Building Products Corp., Insulation and Contracting Div.

2 Application

On flat and curved surfaces Spun Felt shall be impaled on welded or cemented pins or studs on suitable centers and secured with washers or clips. Insulation shall be cut to fit neatly around surface projections and adjoining edges shall be butted tightly together.

On cylindrical vessels ½ inch metal bands shall be used to supplement pins and to obtain a more uniform surface.

On rectangular ducts Spun Felt shall be applied with adhesive and securing bands or tapes, except that on underneath horizontal surfaces 30 inches or more in width, pins or clips shall be used to supplement the adhesive.

On round ducts, Kraft's type felts shall be fitted around the circumference and held in place with bands or tapes

When specified for vapor barrier or other reasons, facing felts shall be applied to the exposed surface and secured with a suitable adhesive and supplementary tapes or bands. Seams and joints shall be sealed with suitable vapor barrier strips. If the facing is penetrated by pins, punctures or tears, a vapor barrier cement shall be used to seal the openings.

3 Finishing

When a cement finish is specified, metal mesh reinforcing shall be securely fastened over the felt surface, then Super Powerhouse Cement shall be applied ½-inch thick and trowelled to a smooth finish.

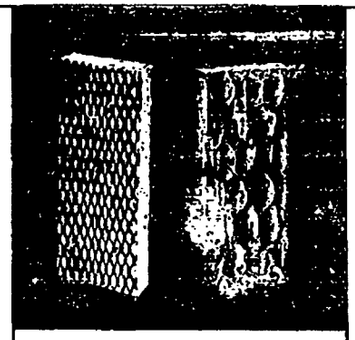
For outdoor service, the finish shall be

a. Insulating cement, over which shall be applied waved wire netting and ½-inch thick FibreKote weatherproofing, or
b. Galvanized or Aluminum metal sheets, mechanically fastened.

352846

2 mineral wool insulations/for service to 1200F

METAL MESH BLANKET TYPE –ASBESTOS FREE



Metal Mesh Blanket Insulation consists of flexible blankets manufactured by felting high temperature, moisture resistant, spun mineral fibers in large flat sheets between different styles of metal fabrics. Since the blanket is flexible, it can be applied to curved or irregular surfaces without breaking. If the equipment does not have a casing, and a cement finish is desired, style 2-A blanket, which has expanded metal lath on one side, makes a good surface for adhering cement. This eliminates the need for other metal fabric before application of the finishing cement.

thermal conductivity

Mean temp. F	100	300	500	800
K	.25	.37	.49	.83

specification compliance

Federal: HH-I-558a Form C, Class II
HH-I-558 Type I, Classes A, B, C
Military: MIL-I-2818B
ASTM: C 592-65T Class II

available sizes and thicknesses

LENGTH – 48, 96 inches
WIDTH – 24 inches
THICKNESSES – 1 to 6 inches in ½ inch increments

352847

facings

1. 1" Wire Mesh both sides.
2. 1" Wire Mesh and Stucco Lath.

2-A 1" Wire Mesh and Expanded Metal Lath.

3. Stucco Lath both sides.

Other facings available on request.

recommended thicknesses

Hot surface temp., deg. F	Thickness (inches)
100 to 200	1½
200 to 300	2
300 to 500	3
500 to 800	4
800 to 1000	5
1000 to 1200	6

suggested application specifications

1 Insulating material

All heated surfaces shall be insulated with _____ thick metal-fabric enclosed spun mineral fiber blankets as manufactured by Keene Building Products Corp., Insulation and Contracting Div.

2 Application

For vessels and tanks over 36 inches diameter – Angles or clip angles shall be welded circumferentially around the vessel at intervals of 4 or 8 feet, depending on the length of blankets specified, and the upper end of each blanket wired to them. As an alternate, pins or bent wires shall be welded to the vessel surface and the blankets impaled over them.

On large vessels operating at 600 F or higher, expansion joints shall be installed to avoid gaps in the insulation.

The blankets shall be secured by ¾" wide circumferential bands on 12" – 18" centers. The abutting edges of the outer metal fabric shall be faced together with soft annealed iron wire.

For large flat surfaces – Blankets shall be impaled over pins, studs or bent wires welded to the surface; with adjoining edges butted firmly and faced together.

3 Finishing

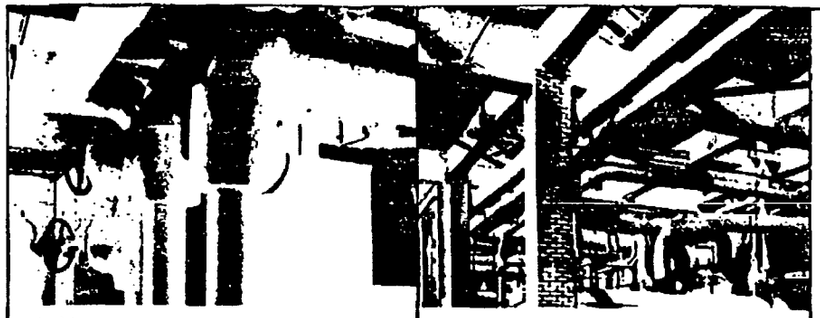
Indoor use – A ½ to ¾ inch thickness of Super Powerhouse Cement shall be applied and finished smoothly using a steel trowel. After drying, the surface may be painted or covered with canvas applied with lagging adhesive.

Outdoor use – Over a cement finish applied as for indoor use, 1 inch mesh woven wire netting shall be applied, followed by ¼ inch thick FibreKote asphaltic weatherproofing.

2 mineral wool insulations/insulating cements

/for service to 1200F /for service to 1900F

SUPER POWERHOUSE—ASBESTOS FREE NO. 1 PLUS—ASBESTOS FREE



A high temperature-resisting mineral fiber cement with a hydraulic-setting binder. Mixed with water it can be trowelled on any surface with little effort. Sets quickly to form a white, glazed surface. After drying, may be painted without further treatment. Apply weatherproofing directly for outdoor service.

Super Powerhouse Cement incorporates qualities of easy trowelling, finish application, one coat, quick hydraulic set with no drying shrinkage cracks. Excellent adhesive qualities.

physical properties (after molding and drying)

Recommended water ration – 6½ gal/50 lb. bag

Coverage, dry – 35 sq. ft. per 100 lb. at 1 inch thickness

thermal conductivity

Mean temp. F	200	400	600
K	.66	.97	1.075

recommended thicknesses

For insulating irregular areas—same as adjacent insulation
For finishing—single coat ½ inch thick

specification compliance

Federal: SS-C 160 Type III Grade F

ASTM: C 449-64

*Indicate on order when specification compliance is required.

suggested application specifications

1 insulating – finishing material

All insulating-finishing cement shall be Super Powerhouse hydraulic setting cement as manufactured by Keene Building Products Corporation, Insulation and Contracting Div.

2 application

Hard surface finish – all insulating block, metal-mesh blankets and insulating cement shall be finished with ½-inch thick Super Powerhouse Cement applied in one coat and trowelled to a smooth finish. Pipe fittings – valves, etc., – in pipe lines smaller than 4-in IPS shall be covered with Super Powerhouse Cement built up to the same thickness as adjacent pipe insulation and trowelled smooth.

3 finishing (alternates)

a. No further finish to be applied

b. Canvas (on pipe lines) – After drying, the cement shall be covered with 6 or 8 oz. canvas, cemented and painted as specified.

c. Paint – After drying, the cement surface shall be painted as specified

d. Outdoors – Cement shall be covered with woven wire mesh securely fastened, and ½-inch of FibreKote weatherproofing.

A dry mineral fiber, clays mixture. Resilient fibers and special binder produce a whiter finish that looks, handles and sets better.

Trowel applied after mixing with water, forms a corrosion inhibitive insulation for heated surfaces. May be used for leveling, patching, fittings and general insulating work.

physical properties (after molding and drying)

Recommended water ratio – 9½ gal/50 lb. bag
Coverage, dry – 45 sq. ft., 1 in. thick/100 lb.
Linear shrinkage after 24 hr. at 1900F-3% max.

thermal conductivity

Mean temp. F	200	400	600	800	1000
K	0.54	0.62	0.69	0.80	1.00

recommended thicknesses

Hot surface temperature	Thickness (inches)	Hot surface temperature	Thickness (inches)
100 to 175 F	1	950 to 1100 F	4
175 to 325 F	1½	1100 to 1300 F	5
325 to 550 F	2	1300 to 1600 F	5½
550 to 750 F	2½	1600 to 1900 F	6½
750 to 950 F	3	–	–

specification compliance

Federal: SS-C-160 Type 3 Grade U

ASTM: C 195-64

* Indicate on order when specification compliance is required.

suggested application specifications

1 insulating material

All mineral wool insulating cement shall be No. 1 Plus as manufactured by Keene Building Products Corporation, Insulation and Contracting Div.

2 application

No. 1 Plus insulating cement shall be applied by spotting on first coat. After drying the next coat shall be roughed on or troweled smooth, depending on total thickness specified. Each coat shall be reinforced with woven wire mesh before applying final coat of cement which shall be troweled level.

3 finishing (alternates)

Hard surface – ½" coat of Super Powerhouse Cement shall be applied and troweled smooth. When specified, the surface shall be painted after drying.

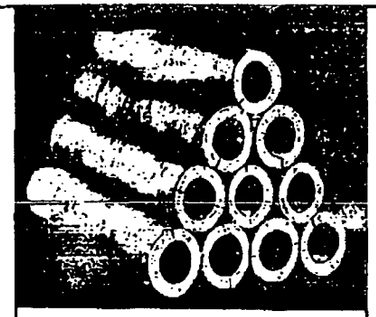
Canvas – After drying, the cement shall be covered with 6 or 8 oz. canvas applied with lagging adhesive

Outdoor – After drying, the cement shall be covered with woven wire mesh securely fastened, then with ½-inch thick FibreKote weatherproofing

352849

3 glass insulation/for service to 370F*

MONO-KOVER ONE PIECE PIPE INSULATION



MONO-KOVER

Mono-Kover pipe insulation is manufactured from long, fine, flame-attenuated glass fibers, bonded with thermosetting resin and uniformly produced in one-piece for easy, fast application. It is produced in 3-foot sections.

All Mono-Kover pipe insulations are tested for Fire and Smoke Hazard Classification ratings on a COMPOSITE basis—insulation, jacket and adhesive used to secure jacket to insulation—in accordance with ASTM E-84, NFPA 225 and UL 723. Ratings do not exceed the following:

Composite Product Ratings
FHC 25/50

jackets

VB-Vapor Barrier for piping up to 500 F*. White kraft bonded to aluminum foil, reinforced with fiber glass yarn. Kraft paper is permanently treated (not merely salt treated) to assure permanent fire and smoke safety, and to prevent corrosion of foil.

VB-T - VB with pressure sensitive tape closure system.

GVB-Glass cloth Vapor Barrier for exposed piping up to 500 F*. Tough, pre-sized glass cloth with vapor barrier coating on the inside surface. Permanent fire and smoke safety. Presents well-tailored appearance.

thermal conductivity

mean temp. F	50	100	200	300
K	0.205	0.22	0.265	0.32

specification compliance

Federal: HH-I-558a Form C, Type III, Class 12 & 13;
Military: MIL-I-22344B

352849

recommended thicknesses

pipe surface temp. F	150	200	250	300	350
pipe size (inches)	wall thickness (nominal inches)				
for general piping					
¼	½	½	½	1	1½
⅜	½	½	1	1	1½
½	½	½	1	1	1½
1¼, 1½, 2	½	½	1	1½	1½
2½, 3, 3½, 4, 4½	½	½	1	1½	2
5, 6	½	½	1½	1½	2
7, 8	½	1	1½	1½	2
9, 10	½	1	1½	2	2
11	1	1	1½	2	2
12, 14, 15, 16, 17, 18	1	1	1½	2	3
19, 20, 21, 22, 23, 24	1	1	1½	2	3
sizes 25 through 33 made to special order.					
for hot water and low pressure steam					
½, ¾, 1, 1¼	½	½	½	½	½
1½, 2, 2½	½	½	½	½	½
3, 3½, 4, 4½, 5, 6	½	½	½	¾	1
7	½	½	½	1	1
8, 9, 10	½	½	1	1	1
11, 12	1	1	1	1	1
for cold piping and dual temperature service*					
	Insulation thickness (inches), by range of nominal pipe sizes				
temp. F	¼ to 1¼	1½ to 3	3½ to 5	6 to 10	11 to 24	25 to 36
50 to ambient	½	½	½	1	1	1
50 to 35	½	1	1½	1½	1½	1½
35 to 0	1½	1½	2	2	2½	2½
0 to –30	1½	2	2½	2½	3	3
below –30	to meet design conditions					

*when appropriate vapor barrier facings are applied.

jacket properties

	VB & VB-T	GVB
Water Vapor Permeability (ASTM-E96)	.02 perm	.02 perm
Beach Puncture (ASTM-D-781-59T)	50 oz. in./in. tear	150 oz. in./in. tear
Tensile Strength —Ultimate	30 lbs./in. width**	100 lbs./in. width*
Mullen Burst (ASTM-D-774-63T)	70 psi	300 psi

*ASTM-D-902-61
**TAPPI-404-os61

technical data

General Properties of Insulation
Temperature limit .....370 F*
Moisture absorption .....less than 0.2% by volume
Alkalinity .....less than 0.6% expressed as Na_2O
Corrosivity
(with steel, copper, aluminum) .....does not cause or accelerate
Capillarity .....negligible
Shrinkage .....none
Resistance to fungi and bacteria .....does not breed or promote

*500 F service available on 1" thickness and above.
Unless 500 F is specified on the order, 370 F will be supplied.
*Available for use to 500 F on special order.

3 glass insulation / for service to 250F

COMMERCIAL DUCT WRAP



Made of extremely fine, flame-attenuated glass fibers, bonded with a thermosetting resin. Commercial duct wrap, blanket-type insulations are lightweight, highly resilient and flexible.

For the control of heat loss or gain or the prevention of condensation. Commercial duct wrap installations offer maximum thermal performance at low cost. They are ideal for use on round or rectangular sheet metal ducts in cooling and heating systems, plenums or other surfaces where temperature control is essential.

advantages:

High thermal performance, resilient and flexible, fire safety, strong, easy to handle and apply, durable.

available forms:

Commercial duct wrap is available in 1", 1½" and 2" thickness. It is supplied in roll form with any of the factory-applied vapor barrier facings listed below.

thermal resistance

$R = \frac{L}{k}$

1"	R-4	4.0 (minimum) at 75F mean temp.
1½"	R-6	6.0 (minimum) at 75F mean temp.
2"	R-8	8.0 (minimum) at 75F mean temp.

(Facing not included)

packaging information:

TYPE (THICKNESS)	BLANKET WIDTH (INCHES)	ROLL LENGTH (FEET)
1"	48	100
1½"	48	100
2"	48	50

Available faced only.

facing information:

FSK
Reinforced Foil and Paper (Foil-Scrim-Kraft)
Aluminum foil (minimum .7-mil) reinforced with fiber glass yarn mesh and laminated to 40-lb. chemically-treated, fire-resistant kraft. UL rated.

RKL
Lightweight Vapor Barrier Paper (Reinforced Kraft, Light)
Two thicknesses of 30-lb. kraft reinforced with fiber glass yarn scrim (1" x 1" spacing) in asphalt lamination. Combustible.

FSKL
Lightweight Foil and Paper (Foil-Scrim-Kraft, Lightweight)
Aluminum foil (minimum .35-mil) reinforced with light fiber glass yarn mesh and laminated with asphalt to 50-lb. kraft. Combustible.

ALX
Aluminum Foil.
.002" thick. UL rated.

WPV/APV
White or Aluminum Pigmented Vinyl.
.004" thick. Effective vapor barrier. Combustible.

CLS1V
Class 1 Vinyl, White or Aluminum Pigmented.
.004" thick. Meets NFPA 90A and 90B

Underwriters' Laboratories Fire Hazard Classification:
The following products meet the Fire Hazard Classification requirements of NFPA 90A and 90B Standards and FHA as tested by UL as a composite product (insulation, adhesive and facing). UL Guide No. 40 U8.3, Card R3711A.

Commercial Duct Wrap with FSK
Commercial Duct Wrap with ALX
Commercial Duct Wrap with Class 1 Vinyl } FHC 25/50

Compliance with Government Specs.:
HH-I-00559 Form B, Type III
HH-I-00559 Form B, Type III
MIL-I-22023, Type I, Class 2

When ordering material to comply with any Government Specification, a statement of that fact must appear on the purchase order. Government regulations prohibit the certification of compliance after shipment has been made.

technical data:

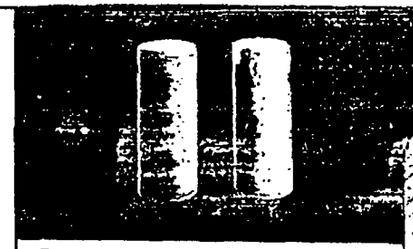
General Properties

Temperature (maximum)	250F
Moisture Absorption	Less than 0.2% by volume
Alkalinity	Less than 0.6% expressed as Na_2O
Corrosivity (with steel, copper or aluminum)	Does not cause or accelerate
Odor	None
Capillarity (after 24 hours)	Negligible
Shrinkage	None
Resistance to fungi and bacteria	Does not breed or promote

352850

4 Industrial sound control products

SONOSORBER®



For factories, school gymnasiums, auditoriums, convention halls and large areas

These functional sound absorbers have been designed for one purpose—to absorb sound with maximum efficiency. They employ all three methods of converting acoustical energy: absorption of noise as a resonator; as an acoustical blanket; and by means of diffraction. The total effect obtained is acoustical absorption efficiency in excess of unity—that is, more than 100% of sound absorption is obtained from each square foot of surface.

description:

Pressure-molded mineral fibers of specific density and thickness. All exposed surfaces protected by reinforcing mesh moisture repelling and dust proof. Each Sonosorber has 2 built-in steel hangers (eyelet type) for suspension by wire in horizontal or vertical position.

Approximately 12" diameter round cylinder shape; approximately 24" length; approximately 4 lbs. 8 oz. per unit.

Fully incombustible—no maintenance.

installation:

Sonosorbers may be simply hung from the overhead construction in locations and/or centers indicated by engineering recommendations by means of steel wire (14 gauge or heavier). Where units are to be installed in straight rows, a suitable gauge steel wire may be stretched horizontally, with turnbuckles at each end secured to opposite walls and the units suspended on such wire using the hanger eyelet.

Geometric spacing and method of hanging should be computed for each individual noise problem. Generally speaking the spacing may vary from 2' on center in both directions to 6' on center in both directions, depending upon the results required and area to be covered.

recommended uses:

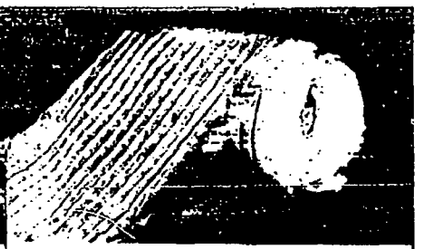
Factories and industrial areas of all types, arsenals, gymnasiums, arenas and similar large spaces where maximum absorption is required and acoustical ceilings are impractical and too expensive.

performance data:

Frequency C.P.S.	128	256	512	1024	2048	4096	NRC Range
Sabins per unit	5.0	5.9	6.1	8.0	10.5	9.7	7.6

352851

HANSOQUILT®



studio blanket

description:

An all-purpose sound absorber for use where function, low material cost, simplicity of installation and maintenance is of primary importance. It is a lightweight, tough and efficient acoustical blanket manufactured of long-staple glass fibers with an open-mesh, flame-proof fabric on both sides and long edges. The fabric is securely stitched with nylon cord through the glass fibers.

dimensions:

Thickness: Nominal 1" and 2" thicknesses (shipped compressed).

Width: Standard 24" width not including fabric edges extending beyond blanket.

Length: Standard rools are 40' long in 1" thickness and 25' long in 2" thickness.

thermal insulation value:

The K Factor is .25.

recommended uses:

• Sound Stages and TV Studios • Auditorium Stage Areas • Auditoriums and Theaters • Music Rooms • Gymnasiums and Natatoriums • Pistol and Rifle Ranges • Pin-Setting Machine Areas—Bowling Alleys • Dry Wall Soundproof Partitions • Suspended Isolation Ceilings • Mechanical Equipment Rooms and Fan Plenums • Improvement of Sound Transmission Loss of Existing Partitions.

installation:

Because of its strong, light-weight construction, Hansoquilt can be easily and rapidly erected, requiring simple provisions for fastening. Normally, it is simply secured on top to freely drape down to floor in area to be treated. Manual with complete installation recommendations available on request.

Mounting	Thickness	COEFFICIENTS 125	250	500	1000	2000	4000	NRC Range
2	Nom. 1"	.09	.15	.41	.78	.90	.90	.60-.60
2	Nom. 2"	.02	.21	.60	.93	.95	.91	.65-.75

specifications:

SCOPE

A. The general conditions of the specifications are part of this section.

B. Provide all labor, material, and equipment required to supply and install Keene Hansoquilt studio blanket as shown on drawings and as specified.

materials:

The blanket shall be Keene Hansoquilt Studio blanket, 24" wide, nominal (1", 2") thickness, having a NRC range of (.50-.60, .65-.75).

FOR IMMEDIATE SERVICE

PHONE OR WRITE TO NEAREST KEENE OFFICE IN YOUR AREA

Cincinnati, Ohio 45208
2867 Station Avenue
Phone: (513) 961-1190

Kapaville, Georgia 30054 (Atlanta)
3348 A Hamilton Blvd. S.E.
Phone: (404) 768-3442

Birmingham, Alabama 35283
3211 8th Avenue North
Phone: (205) 251-9281

Buffalo, New York 14240
803 Walden Avenue
Phone: (716) 896-4400

Detroit, Michigan 48238
14401 Prairie Ave.
Phone: (313) 864-6100

Houston, Texas 77011
6501 Supply Row
Phone: (713) 928-2416

Fort Worth, Texas 76102
1300 E. Belknap Street
Phone: (817) 332-9775

Jacksonville, Florida 32206
1510 East Adams Street
Phone: (904) 353-7436

Orlando, Florida 32804
4206 No. Orange Blossom Trail
Phone: (305) 295-3170

Valley Forge, Pa. 19481 (Phila.)
Phone: (215) 783-0430

Rochester, New York 14606
8 Cairn Street Bldg. 1-F
Phone: (716) 235-2443

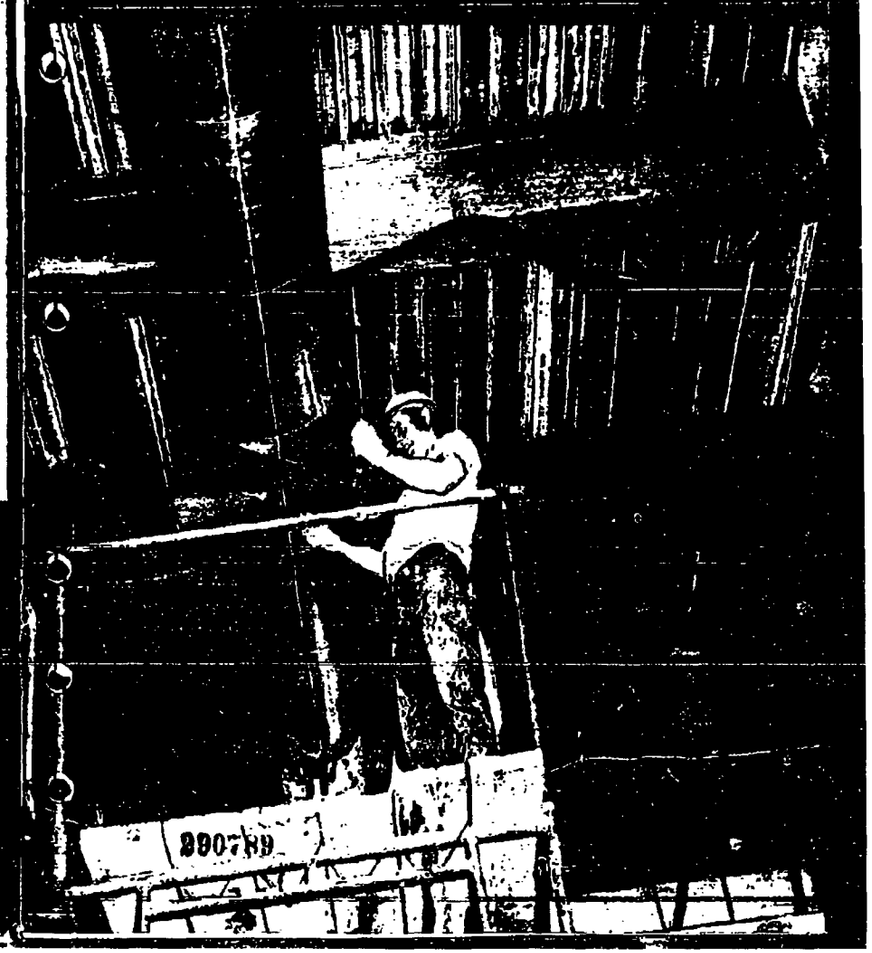
Maryland Heights, Mo. 63043
11644 Fairgrove Blvd.
Phone: (314) 567-1611

Princeton, New Jersey 08540
Post Office Box 145
Phone: (609) 452-8090

352852

KEENE

KEENE





manufacturers of a complete line of
HEAT AND COLD INSULATIONS

KEENE

BUILDING PRODUCTS CORPORATION

INSULATION & CONTRACTING DIVISION

Keene Corporation is a multi-division manufacturer serving the building construction, industrial and filtration/pollution control markets.

The Industrial and Contracting Division is an integral part of the Keene Building Products Group. And has manufactured molded insulation products since 1898. It manufactures and sells industrial insulation materials and products made of calcium silicate and mineral wool. Calcium silicate is sold in the form of block and pipe covering for applications up to 1200 degrees F. Mineral wool is sold in a variety of forms, for applications up to 1900 degrees F. The Division also sells fiberglass insulation products for commercial applications up to 450 F.

products are available through . . .

A national network of Keene Corporation contractors and distributors. These groups offer broad experience, engineering know-how and are fully qualified to install Keene insulation products on all types of piping and equipment. In addition, Keene Corporation's own highly skilled engineers can provide technical guidance and assistance for all insulation problems, large or small.

For the name of the contractor/distributor nearest you, contact any one of our branch sales offices or consult the local Yellow Pages.

plants

Huntington, Indiana — Kalamazoo, Michigan
Trenton, New Jersey — Valley Forge, Pennsylvania

Home Office: P.O. Box 145, Princeton, N.J. 08540
(609) 452-6090

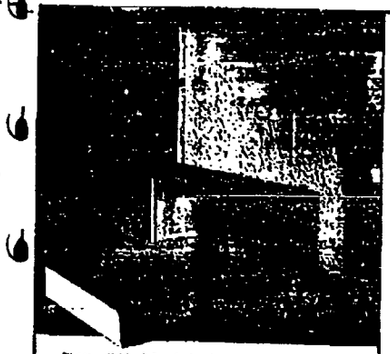
All products
In this catalogue
are manufactured
ASBESTOS FREE

1 Calcium Silicate Insulations
Thermasil Block to 1200 F 3
Thermasil Pipe Insulation
Thermasil for Stainless Pipe 8
2 Mineral Wool Insulation
Non-Lint Pipe Insulation
to 1200 F 6
Curved Mono-Block
Pipe Insulation to 1200 F 7
Mono-Block to 1900 F 8
Thermo K to 1000 F 9
Spun Felt to 600 F 10
Metal-Mesh Blanket to 1200 F 11
Super Powerhouse to 1200 F 12
No. 1 Cement to 1900 F 12
3 Glass Insulations
Dyno-Kore to 370 F 13
Commercial Duct Wrap 14
4 Industrial Sound Control Products
Sonosorber 10
Hassoquilt 15
5 Service Addresses
Addresses and Telephone Numbers 16

290790

1 calcium silicate insulation/for service to 1200F

THERMASIL BLOCK INSULATION



Thermasil block insulation is a molded, hydrous calcium silicate insulation—a blend of special inorganic ingredients reinforced with mineral fibers, especially formulated for use at temperatures up to 1200 F.

Thermasil is chemically converted under carefully controlled conditions into a strong, hard, light, chemically stable insulation material. Molded on modern equipment in a new, process-controlled plant, the inside and outside surfaces of Thermasil are tough, smooth and dust-free. Provides inhibition against chloride attack of AUSTENITIC stainless steel. (See page 5 for details)

Designed as an insulation and not as a structural material, Thermasil hardness is deliberately controlled within a range which provides a unique balance between strength and workability. This balance permits ease of shaping and fitting with knife or saw. Thermasil, because of its chemical stability, is not damaged by water and will regain its excellent thermal insulation properties upon drying.

physical properties

Density — 12.0 lb/cu. ft.
Compressive strength — 100 lb/sq. in. @ 5% deformation
Flexural strength — 75 lb/sq. in.
Linear shrinkage after heating @ 1250 F — 1.6% max.

thermal conductivity

Mean temp. F	100	300	500	700
K	.31	.41	.51	.61

specification compliance

Federal: HH-I-523c, Type I
Military: MIL-I-2315D, Classes 1 and 2
MIL-I-24244, Types 3A, 3B
U. S. Coast Guard: Incombustible Material 154.009/49/0
ASTM: C 533-67

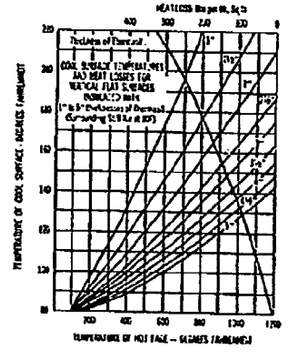
available sizes and thicknesses

Lengths — 18, 36 inches
Widths — 3, 6, 12 inches
Thicknesses — 1, 1½, 2, 2½, 3
Curved and scored block are also available

recommended thickness

Temp. range F	Thickness (Nominal inches)
100- 199	1½
200- 299	2
300- 399	2½
400- 499	3
500- 599	3½
600- 699	3½
700- 799	4
800- 899	4
900- 999	4½
1000-1200	5

thickness vs hot face-cold face temperatures



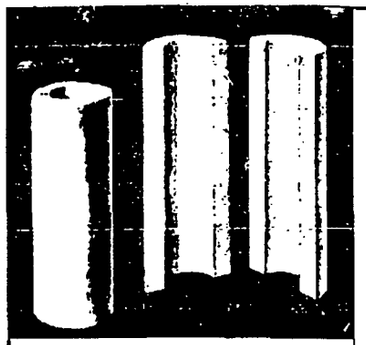
suggested application specifications

1 Insulating material
All heated surfaces shall be insulated with—thick Thermasil calcium silicate insulation, as manufactured by Keene Building Products Corp., Insulation and Contracting Div.
2 application
On flat and large-radius cylindrical surfaces. Thermasil block insulation shall be held in place with wires stretched over the face of the blocks and anchored to studs or clips, welded to the face of the surface to be insulated. Joints and corners shall be pointed with Super Powerhouse Cement. On cylinders and ducts up to 12 feet in diameter, encircling bands ¾" wide on 12-18-inch centers shall be used to hold blocks in place.
3 finishing
a. Block insulation shall be finished with Super Powerhouse Cement applied over woven wire mesh.
b. Block insulation outdoors shall be finished with Super Powerhouse Cement then weatherproofed with FibreKote.

290791

1 calcium silicate insulation/for service to 1200F

THERMASIL PIPE INSULATION



Thermasil pipe insulation is a molded, hydrous calcium silicate insulation—a blend of special inorganic ingredients reinforced with mineral fibers. Thermasil is chemically converted under carefully controlled conditions into strong, hard, light, chemically stable insulation material. Molded on modern equipment in a new process-controlled plant, the inside and outside surfaces of Thermasil are tough, smooth and dust-free. Provides inhibition of chloride attack on AUSTENITIC stainless steel.
(See page 5 for details).

jackets

Canvas, standard weight and 8 oz. available
45# asphalt saturated asbestos felt
Aluminum (.016") with vapor-barrier liner
Stainless Steel

physical properties

Density—12.0 lb/ cu. ft.

Flexural strength—75 lb/sq. in.

Linear shrinkage after heating @ 1200F—1.5% max.

thermal conductivity

Mean temp. F	100	300	500	700
K	.31	.41	.51	.61

specification compliance

Federal HH-I-523 c.Type II
Military: MIL-I-2781D
Grade I, Class b
Grade II, Class d
Grade III, Class a, types I and II
MIL-I-24244.Types IA, IC, ID, IE
U.S. Coast Guard: Incombustible Material 164.009/49/0
ASTM: C 533-67

available sizes and thicknesses

nominal thicknesses	single layer sectional	double layer sectional	inner layer sectional —outer layer segmental
1"	½"— 4" copper tubing	—	—
1"	½"— 6" IPS	—	—
1½"	½"—10" IPS	—	—
2"	½"—18" IPS	½"— 4" IPS	—
2½"	½"—18" IPS	½"— 6" IPS	—
3"	½"—16" IPS	½"—16" IPS	17"—18" IPS
3½"	½"—16" IPS	½"—15" IPS	16"—18" IPS
4"	½"—15" IPS	½"—15" IPS	16"—18" IPS
4½"	½"—14" IPS	½"—14" IPS	15"—18" IPS
5"	½"—12" IPS	½"—12" IPS	14"—18" IPS

recommended thicknesses

	temperature (F) of pipe										
pipe size (inches)	100 to 199	200 to 299	300 to 399	400 to 499	500 to 599	600 to 699	700 to 799	800 to 899	900 to 999	1000 to 1099	1100 to 1200
1½ or less	1	1	1½	2	2	2½	2½	2½	3	3	3
2	1	1	1½	2	2	2½	3	3	3	3½	3½
2½	1	1	1½	2	2	2½	3	3	3	3½	3½
3	1	1	1½	2	2	2½	3	3	3	3½	3½
3½	1	1	1½	2	2	2½	3	3	3½	3½	3½
4	1	1½	2	2	2½	2½	3	3	3½	4	4
4½	1	1½	2	2	2½	2½	3	3½	3½	4	4
5	1	1½	2	2	2½	3	3½	3½	4	4	4½
6	1	1½	2	2	3	3	3½	3½	4	4	4½
7	1½	1½	2	2½	3	3	3½	3½	4	4	5
8	1½	1½	2	2½	3	3	3½	3½	4	4½	5
9	1½	1½	2	2½	3	3	3½	3½	4	4½	5
10	1½	1½	2	2½	3	3	3½	4	4½	4½	5
11	1½	1½	2	2½	3	3	3½	4	4½	5	5
12/over	1½	2	2	3	3½	3½	4	4	4½	5	5

suggested application specifications

1 Insulating material

All heated pipes and tubing shall be insulated with —thick Thermasil calcium silicate insulation as manufactured by Keene Building Products Corp. Insulation and Contracting Div.

2 application

On pipes up to 12-inch, Thermasil pipe insulation shall be secured with factory applied canvas jackets pasted in place. When specified, bands shall be applied over the canvas. On larger pipes, and for the inner layer of double-layer covering, the insulation shall be wired in place on 9-inch centers. Fittings, etc., shall be insulated with Super Powerhouse Cement or covered with pre-fabricated forms finished with Super Powerhouse Cement.

3 finishing

a. Pipe insulation shall be covered with canvas pasted in place and painted, or with aluminum jacketing.
b. Pipe insulation outdoors shall be weatherproofed with asphalt-coated roofing felt, aluminum or stainless steel jackets, as specified

290792

1 calcium silicate insulation/test data

TEST DATA ON STANDARD THERMASIL PIPE AND BLOCK

Information shown on page 4 is repeated below for your convenience. See page 3 for similar information on Thermasil Block Insulation.

Catastrophic failure of AUSTENITIC stainless steel processing equipment and piping as a result of chloride stress corrosion cracking can now be inhibited. The "Accelerated Dana Test" was designed to measure the inhibitory properties of an insulation in preventing corrosion cracking of stressed stainless steel test coupons when exposed to a heated chloride solution. Continued testing of this property of standard Thermasil by a major chemical manufacturer and an independent laboratory has shown that Thermasil exceeds the 6-day exposure requirement without cracking of the stainless steel test coupons.

With Thermasil, it is not necessary to order a special product or maintain a separate inventory for use on stainless steel, the inhibition is "built-in" to each piece as a part of the manufacturing process.

Typical test results are shown below:

test data

Tests conducted by Lehigh Testing Laboratories

material tested

Thermasil Calcium Silicate Pipe & Block Insulation

tests performed

Leaching Tests for: Chlorides	Total Chlorides	(Cl) 50 ppm
	Total Silicates	(SiO_2) 3920 ppm
Silicates	Calcium Silicate	($CaSiO_3$) 50 ppm
	Sodium Silicate	(Na_2SiO_3) 8100 ppm

Accelerated Dana Test:

Thermasil pipe and block insulation pass this test.

physical properties

Density—12.0 lb/ cu. ft.

Flexural strength—75 lb/sq. in.

Linear shrinkage after heating @ 1200F—1.5% max.

thermal conductivity

Mean temp. F	100	300	500	700
K	.31	.41	.51	.61

recommended thicknesses

	temperature (F) of pipe										
pipe size (inches)	100 to 199	200 to 299	300 to 399	400 to 499	500 to 599	600 to 699	700 to 799	800 to 899	900 to 999	1000 to 1099	1100 to 1200
1½ or less	1	1	1½	2	2	2½	2½	2½	3	3	3
2	1	1	1½	2	2	2½	3	3	3	3½	3½
2½	1	1	1½	2	2	2½	3	3	3	3½	3½
3	1	1	1½	2	2	2½	3	3	3	3½	3½
3½	1	1	1½	2	2	2½	3	3	3½	3½	3½
4	1	1	1½	2	2	2½	2½	3	3½	4	4
4½	1	1½	2	2	2½	2½	3	3½	3½	4	4
5	1	1½	2	2	2½	3	3	3½	4	4	4½
6	1	1½	2	2	3	3	3½	3½	4	4	4½
7	1½	1½	2	2½	3	3	3½	3½	4	4	5
8	1½	1½	2	2½	3	3	3½	3½	4	4½	5
9	1½	1½	2	2½	3	3	3½	3½	4	4½	5
10	1½	1½	2	2½	3	3	3½	4	4½	4½	5
11	1½	1½	2	2½	3	3	3½	4	4½	5	5
12/over	1½	2	2	3	3½	3½	4	4	4½	5	5

available sizes and thicknesses

nominal thicknesses	single layer sectional	double layer sectional	inner layer sectional —outer layer segmental
1"	½"—copper tubing	—	—
1"	½"— 6" IPS	—	—
1½"	½"—10" IPS	—	—
2"	½"—18" IPS	½"— 4" IPS	—
2½"	½"—16" IPS	½"— 6" IPS	—
3"	½"—16" IPS	½"—16" IPS	17"—18" IPS
3½"	½"—15" IPS	½"—16" IPS	16"—18" IPS
4½"	½"—14" IPS	½"—14" IPS	15"—18" IPS
5"	½"—12" IPS	½"—12" IPS	14"—18" IPS

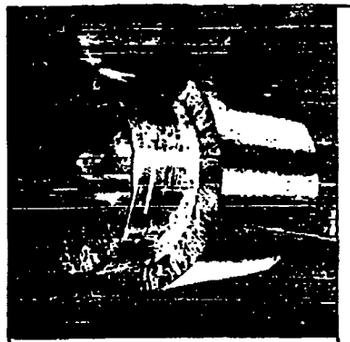
specification compliance

Federal HH-I-523C Type II
Military: MIL-I-2781D
Grade I, class b
Grade II, class d
Grade III, class a types I and II
MIL-I-24244 types IA, IC, ID, IE
U.S. Coast Guard: Incombustible materials 164.009/49/0
ASTM: C 533-67

290793

2 mineral wool insulation/for service to 1200F

PRES-LOK A MINERAL FIBER INSULATION–ASBESTOS FREE



available sizes and thicknesses

Length—2' sections
Pipe size—6" Ips thru 23"OD
Thickness—1" thru 5" in ½" increments

facings available

FRJ Jacketed
.016 Smooth Alum.
.016 Embossed Alum.
On Alum. Faced — 1 Buttstrap Furnished per section plus 1 extra

mineral wool pipe insulation

Description:
Pipe insulation made of spun Mineral Wool with binders, by a patented Keene Corporation process. This Product contains NO ASBESTOS.

Uses:
For heated pipes to 1200°F.

Features:
Light weight. Max. temperature range 1200°F. Easy to handle and apply. Snug Mineral Wool joints. Moisture resistant. Non-corrosive, stable in service and non-combustible.

Thermal Conductivity:

Mean Temp.	K
100	.24
200	.31
300	.38
500	.52
700	.63

These K Factors are tests made on the pipe, not flat sheets.

Specifications:
HH-I-558a Form C Type IV Class 14-15 with Alum. Jkt.

Packaging:
Shipped flat in corrugated boxes

thickness required

to result in insulation surface temperature less than 140°F
Note: Use tables prepared by M.I.M.A.

Pipe Temp. °F	300	400	500	600	700	800	900	1000	1100
Temp. Dif °F	160	260	360	460	560	660	760	860	960
K-Factor	.25	.28	.32	.35	.38	.41	.45	.48	.52
Pipe Size	"D" Factor								
6"	.003	1	1½	2	2½	2½	3	3½	3½	4
8"	.007	1½	1½	2	2½	2½	3½	3½	4	4
10"	.007	1½	2	2½	2½	3	3½	4	4	4½
12"	.006	1½	2	2½	2½	3	3½	4	4	4½
14"	.006	1½	2	2½	3	3	4	4	4½	5
16"	.006	1½	2	2½	3	3½	4	4½	4½	5
18"	.005	1½	2	2½	3	3½	4	4½	4½	5
20"	.0045	1½	2	2½	3	3½	4	4½	4½	5
24"	.0045	1½	2	3	3	3½	4	4½	5	5½

application specifications

Insulating Material:
All heated pipes 6" to 23" O.D. and tubing shall be insulated with ____ thick Preslok Pipe Insulation as manufactured by Keene Corporation, Insulation and Contracting Div. Inner layer faced with U/L rated fo kraft-kraft cover. Outer layer for single layer faced with .016 aluminum (plain or embossed) with Preslok joint. Pipes smaller than 6" O.D. shall be insulated with Keene's Thermast Pipe Covering. Vessels larger than 23" O.D. shall be insulated with Keene's Curved Monoblock

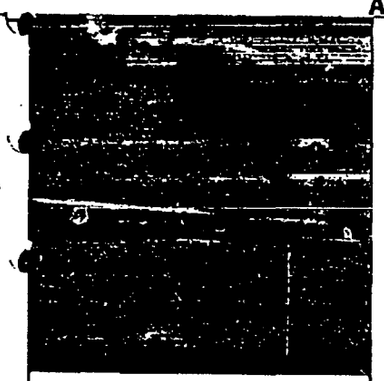
Application:
Single or Outer Layer with Aluminum Jacket
Drape over horizontal lines, or pull around vertical lines, so that Preslok joint faces the applicator as shown in step #1 of Preslok bulletin. Pull snug and manually engage first lock joint. Place tension band around insulation and mount tightening tool in the slot holes at the ends of the band as shown in step #2. Squeeze tool handle several times to make assembly of tool, band, and insulation firmly snug. Pipe cover may now be repositioned along pipe or rotated as desired. At desired location, continue squeezing tightening tool handle until second joint audibly "snaps" in place. Preslok is now installed. Press release button to relax tension on tool and band, but leave the assembly hanging in place ready to slide onto the next section.

Inner Layer with FRJ Cover
Drape over horizontal lines, or pull around vertical lines as shown in step #5 of Preslok bulletin. Using pressure sensitive tape, pull insulation snugly around pipe by hand. Use tension band and tightening tool as described above to tighten insulation securely around pipe. Reposition pressure sensitive tape for maximum tightening and release tool. Install next section and slide tool and band onto it and repeat fastening procedure. If no outer layer of aluminum faced Preslok is to be installed, the butt joints should be covered with pressure sensitive tape of the same material as the scrim facing. It should also be noted that the plain Preslok (foil-scrim-kraft facing) can be job-site finished with asphalt coated roofing felt, aluminum, or stainless steel as desired. In these cases, the finishing material shall be pulled to a tightness that will obtain a specified O.D. equal to the O.D. of the pipe plus twice the thickness of the insulation so that proper performance is obtained.

290791

2 mineral wool insulation/for service to 1900F

CURVED MONO-BLOCK MINERAL FIBER BLOCK for large pipe or vessels ASBESTOS FREE



Curved Mono Block is composed of high temperature resistant spun mineral fibers and inorganic binders. A patented process interlocks the long mineral fibers to form a lightweight, rigid yet resilient block which is easily shaped and fitted. Its excellent handling qualities are supplemented by a high insulating efficiency over an operating temperature range to 1900F. High sound absorption efficiency makes this product interesting for use where acoustical treatment is required at elevated temperatures. It is for curved surfaces of diameters starting at 24" and thru 60". This product contains no asbestos.

physical properties

Density — 15 lb/cu. ft.

Compressive strength — 10 lb/sq. in. @ 5% deformation.

Flexural strength — 40 lb/sq. in.

Linear shrinkage after heating at 1900 F — less than 5%.

thermal conductivity

Mean temp. F	200	400	600	800	1000	1200
K	.36	.42	.51	.625	.755	.90

specification compliance

Federal: HH-I-558a Form A Class 5;
HH-I-564, Form 1, Types A, B, C, D.
Commercial Standard: CS117, block, class A, C, D.
ASTM: C612-67T, class D.

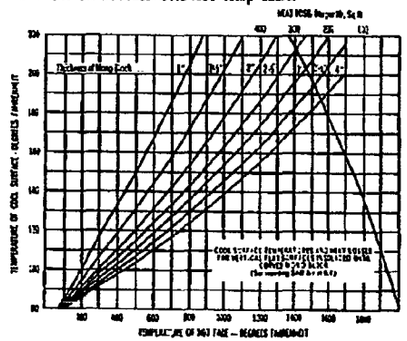
available sizes and thicknesses

Length — 36"
Width — Diameters 24"-60"
Thicknesses — 1½" through 3" in ½ inch increments

recommended thicknesses

Hot face temp. degrees F	Thickness inches	Hot face temp degrees F	Thickness inches
up to 300	1 to 1½	800 to 1000	4
300 to 450	2	1000 to 1200	4½
450 to 600	3	1200 to 1400	5
600 to 800	3½	1400 to 1600	6

thickness vs. hot-face–cold-face temp chart.



sound absorption coefficients—

Mounting No. 4

Frequency, Hz	125	250	500	1000	2000	4000	NRC
2 inches thick	.56	.83	.88	.93	1.01	1.10	.90
4 inches thick	.57	.83	.90	.93	1.05	1.10	.90
6 inches thick	.63	.85	.90	.93	1.03	1.10	.90

suggested application specifications

1. Insulating material

All pipes and/or vessels 24" O.D. thru 60" O.D. shall be insulated with — thick Curved Mono-Block; a rigid mineral fiber block insulation mfd. by Keene Building Products Corp., Insulation and Contracting Div.

2. application

Block insulation shall be held in place with ½ inch bands. Bands shall be spaced on 12 to 18 inch centers.

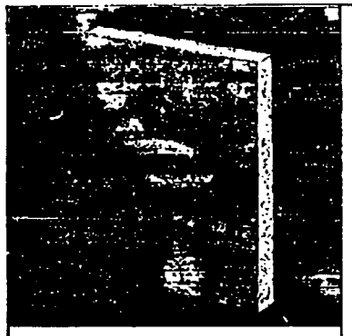
3. finishing

On large areas over 4 feet square, and on surfaces subject to vibration or movement from thermal expansion, woven wire mesh shall be applied over Mono-Block insulation and fastened to bands. Super Powerhouse Cement ½ inch thick shall then be applied, filling all cracks to form a level surface and then smoothed with a steel trowel. For outdoor service, Aluminum Jacket may be applied in conventional manner.

290795

2 mineral wool insulations/for service to 1900F

MONO-BLOCK MINERAL FIBER BLOCK —ASBESTOS FREE



Mono Block is composed of high temperature resistant spun mineral fibers and inorganic binders. A patented process interlocks the long mineral fibers to form a lightweight, rigid yet resilient block which is easily shaped and fitted. Monoblock physical characteristics permit impaling it over spot welded mounting pins without pre-drilling the blocks. Its excellent heating qualities are supplemented by a high insulating efficiency over an operating temperature range to 1900 F. High sound absorption efficiency makes this product interesting for use where acoustical treatment is required at elevated temperatures.

physical properties

Density – 13 lb/cu. ft

Compressive strength – 13 lb/sq. in. @ 5% deformation.

Flexural strength – 40 lb/sq. in.

Linear shrinkage after heating at 1900 F – less than 5%

thermal conductivity

Mean temp. F	200	400	600	800	1000	1200
K	.36	.42	.51	.625	.755	.90

specification compliance

Federal: HH-I-558a Form A Class 5;
HH-I-564, Form 1, Types A, B, C, D.
Commercial Standard: CS117, block, class A, C, D.
ASTM: C612-67T, class D.

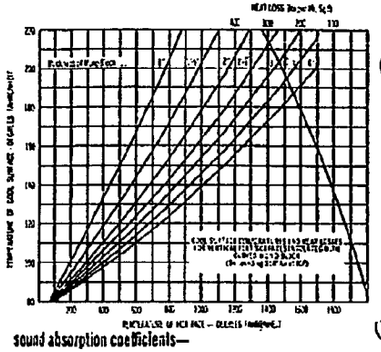
available sizes and thicknesses

Length – 18, 36 inches
Width – 6, 12, 24 inches
Thicknesses – 1 through 4 in ½ inch increments
Curved block also available

recommended thicknesses

Hot face temp. degrees F	Thickness inches	Hot face temp degrees F	Thickness inches
up to 300	1 to 1½	900 to 1000	4
300 to 450	2	1000 to 1200	4½
450 to 600	3	1200 to 1400	5
600 to 800	3½	1400 to 1900	6

thickness vs. hot-face-cold-face temp chart.



sound absorption coefficients—

Mounting No. 4

Frequency, Hz	125	250	500	1000	2000	4000	NRC
2 inches thick	.55	.83	.86	.93	1.01	1.10	.90
4 inches thick	.57	.83	.90	.93	1.01	1.10	.90
6 inches thick	.63	.85	.90	.93	1.01	1.10	.99

suggested application specifications

1 Insulating material

All heated surfaces shall be insulated with — thick Mono-Block; a rigid mineral fiber block insulation mfd. by Keene Building Products Corp., Insulation and Contracting Div.

2 application

On flat surfaces, Mono-Block shall be impaled over welded studs or pins on suitable centers and held in place with washers or clips. Joints and corners shall be pointed with Super Powerhouse Cement, before finishing.

On curved surfaces, block insulation shall be held in place with ½ inch bands on cylinders up to 6 feet in diameter and ¾ inch bands on larger cylinders. Bands shall be spaced on 12 to 18 inch centers. Joints and corners shall be pointed with Super Powerhouse Cement, before finishing.

On irregular surfaces, depressions shall be filled with a trowel coat of No. 1 Plus insulating cement, over which Mono-Block shall be applied.

3 finishing

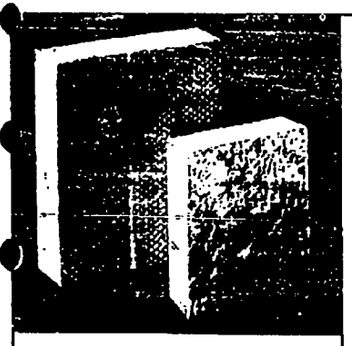
On large areas over 4 feet square, and on surfaces subject to vibration or movement from thermal expansion, woven wire mesh shall be applied over Mono-Block insulation and fastened to pins or studs. Super Powerhouse Cement ½ inch thick shall then be applied, filling all cracks to form a level surface and then smoothed with a steel trowel.

For outdoor service, after the Super Powerhouse Cement has dried, woven wire mesh shall be stretched tightly over it, fastened securely, and ¼" thick FibreKote weatherproofing shall be applied over all.

290796

2 mineral wool insulations/for service to 1000F

THERMA-K MINERAL FIBER BLOCK —ASBESTOS FREE



Therma-K is a semi-rigid mineral fiber block insulation; lighter in weight and available in larger sheets than rigid-type block insulation. For use on heated flat surfaces where maximum temperature does not exceed 1000 F. In addition, Therma-K is recommended for use over a temperature reducing layer of higher temperature block insulation. Note: Under service conditions in excess of 450 F, the binder nearest the hot side will carbonize to a depth dependent on actual temperature and time. The material will maintain its insulating value and remain in place if properly mechanically supported.

physical properties

Density – 8 lb/cu. ft.
Flexural strength – 25 lb/sq. in.
Compressive strength – 150 lb/sq. in. @ 10% deformation
Linear shrinkage after heating @ 1000 F – Negligible

thermal conductivity

Mean temp. F	75	200	300	400	500
K	.25	.30	.34	.40	.48

specification compliance

Federal: HH-I-558a Form A, Class 3
ASTM: C612-70, Class 2,3,4

available sizes and thicknesses

Length – 48 inches
Width – 24 inches
Thicknesses – 1" through 3" in ½" increments

recommended thicknesses

100-200 F	1"
200-300 F	1½
300-400 F	2
400-500 F	3

suggested application specifications

1 Insulating material

Specified heated surfaces shall be insulated with — thick Therma-K mineral fiber block as manufactured by Keene Building Products Corp., Insulation and Contracting Div.

2 application

On flat or large-radius cylindrical surfaces, Therma-K shall be impaled over welded studs, pins or tabs on suitable centers and secured with washers or clips.

On rectangular ducts, Therma-K blocks shall be held on with oscillating metal bands, except that on vertical and underneath horizontal surfaces 30 inches or more wide, pins or clips shall be used to supplement the bands.

3 finishing

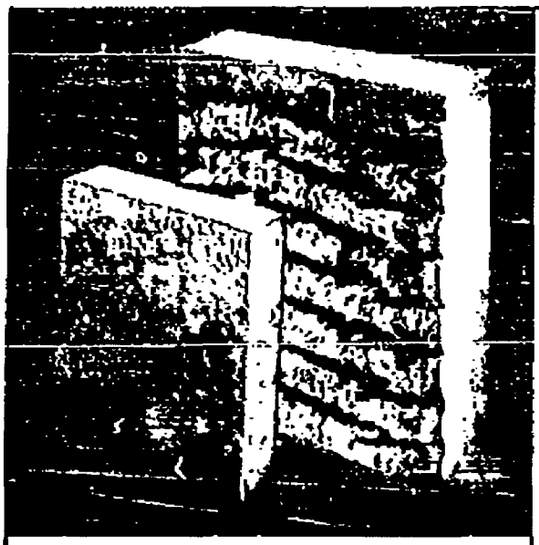
When specified, aluminum sheets fastened with suitable mechanical supports shall be used to cover Therma-K insulation.

When a cement finish is specified, expanded metal lath shall be fastened to the face of the Therma-K, then a ¼ inch thick coat of Super Powerhouse Cement applied.

290797

2 mineral wool insulations/for service to 600F

SPUN FELT MINERAL FIBER FELT—ASBESTOS FREE



Spun felt insulation is fabricated from long, fine, felted mineral fibers and is highly effective when applied to equipment with surface temperatures ranging from—150 to 450 F. When mechanically supported Spun Felts of 6 pound density or heavier are effective to 1000 F. Densities lighter than 6 pound may be used to 600 F if mechanically supported.

Spun Felt is a highly resilient material in flexible or semi-rigid form and made in standard densities from 3 to 8 pounds. Its high temperature resistant, moisture repellent and incombustible fibers are felted and bonded together with a uniformly distributed phenolic resin to provide a structure with extremely low thermal conductivity.

thermal conductivity

Mean temp. F	50	75	100	200	300	400	500
K (3 lb.)	.25	.27	.29	.34	.42	.53	—
K (4 lb.)	.24	.26	.27	.31	.38	.48	.565
K (6 lb.)	—	.24	.25	.29	.36	.45	.57
K (8 lb.)	—	.24	.25	.28	.35	.43	.53

specification compliance

Federal: HH-I-542, Type II
HH-I-558a Form A, Classes 1, 2, 3
HH-I-562, Type I, Class 2
HH-I-563, Type II, Class D
Military: MIL-I-16535C
Commercial Standard: CS 105 Felt, CS 117 Felt
ASTM: C 553-64T, Types II, III, Classes F-1, F-2
C 612-67T, Class A

available sizes and thicknesses

Lengths: 24", 30", 36", 48"
Widths: 12", 24"
Thickness: 1" through 4" by ½" increments
Densities: 3, 3½, 4, 4½, 6 and 8 lb/ft³

Fire Hazard Classification:
(UL Guide No. 40 U9.3)

Flame Spread	25 or less
Fuel Contributed	50 or less
Smoke Developed	50 or less

sound absorption coefficients—

Mounting No. 4

Frequency, Hz	125	250	500	1000	2000	4000	NRC
2½ lb. 2" thk.	.34	.78	.69	.96	.96	1.02	.90
4" thk.	.50	.93	.99	.96	.99	1.06	.95
6" thk.	.59	.98	.99	.98	.99	1.06	.98
6 lb. 2" thk.	.36	.91	.98	.94	.93	.90	.85
4" thk.	.54	.95	.96	.94	.93	.93	.95

suggested application specifications

1 insulating material

All heated surfaces shall be insulated with_____thick Spun Felt mineral wool insulation as supplied by Keene Building Products Corp., Insulation and Contracting Div.

2 application

On flat and curved surfaces Spun Felt shall be impaled on welded or cemented pins or studs on suitable centers and secured with washers or clips. Insulation shall be cut to fit neatly around surface projections and adjoining edges shall be butted tightly together.

On cylindrical vessels ¾ inch metal bands shall be used to supplement pins and to obtain a more uniform surface.

On rectangular ducts Spun Felt shall be applied with adhesive and encircling bands or tapes, except that on undermesh horizontal surfaces 30 inches or more in width, pins or clips shall be used to supplement the adhesive.

On round ducts, flexible type felts shall be fitted around the circumference and held in place with bands or tapes.

When specified for vapor barrier or other reasons, facing felts shall be applied to the exposed surface and secured with a suitable adhesive and supplementary tapes or bands. Seams and joints shall be sealed with suitable vapor barrier strips. If the facing is penetrated by pins, punctured or torn, a vapor barrier cement shall be used to seal the openings.

3 finishing

When a cement finish is specified, metal mesh reinforcing shall be securely fastened over the felt surface, then Super Powerhouse Cement shall be applied ½-inch thick and troweled to a smooth finish.

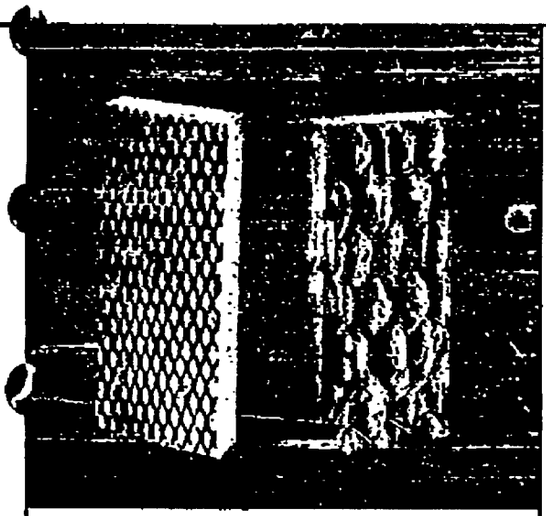
For outdoor service, the finish shall be

a. Insulating cement, over which shall be applied woven wire netting and ½-inch thick FibreKote weatherproofing, or
b. Galvanized or Aluminum metal sheets, mechanically fastened.

290133

2 mineral wool insulations/for service to 1200F

METAL MESH BLANKET TYPE — ASBESTOS FREE



Metal Mesh Blanket Insulation consists of flexible blankets manufactured by felting high temperature, moisture resistant, spun mineral fibers in large flat sheets between different styles of metal fabrics. Since the blanket is flexible, it can be applied to curved or irregular surfaces without breaking. If the equipment does not have a casing, and a cement finish is desired, style 2-A blanket, which has expanded metal lath on one side, makes a good surface for adhering cement. This eliminates the need for other metal fabric before application of the finishing cement.

thermal conductivity

Mean temp. F	100	300	500	700
K	.25	.37	.49	.63

specification compliance

Federal: HH-I-559a Form C, Class II
HH-I-56B Type I, Classes A, B, C
Military: MIL-I-2818B
ASTM: C 592-66T Class II

available sizes and thicknesses

LENGTH — 48, 96 inches
WIDTH — 24 inches
THICKNESSES — 1 to 8 inches in ½ inch increments

facings

1. 1" Wire Mesh both sides.
2. 1" Wire Mesh and Stucco Lath.

2-A 1" Wire Mesh and Expanded Metal Lath.

3. Stucco Lath both sides.

Other facings available on request.

recommended thicknesses

Hot surface temp., deg. F	Thickness (inches)
100 to 200	1½
200 to 300	2
300 to 500	3
500 to 800	4
800 to 1000	5
1000 to 1200	6

suggested application specifications

1 Insulating material

All heated surfaces shall be insulated with _____ thick metal-fabric enclosed spun mineral fiber blankets as manufactured by Keene Building Products Corp., Insulation and Contracting Div.

2 Application

For vessels and tanks over 36 inches diameter — Angles or clip angles shall be welded circumferentially around the vessel at intervals of 4 or 8 feet, depending on the length of blankets specified, and the upper end of each blanket wired to them. As an alternate, pins or bent wires shall be welded to the vessel surface and the blankets impaled over them.

On large vessels operating at 600 F or higher, expansion joints shall be installed to avoid gaps in the insulation.

The blankets shall be secured by ¾" wide circumferential bands on 12" — 18" centers. The abutting edges of the outer metal fabric shall be laced together with soft annealed iron wire.

For large flat surfaces — Blankets shall be impaled over pins, studs or bent wires welded to the surface; with adjoining edges butted firmly and laced together.

3 Finishing

Indoor use — A ½ to ¾ inch thickness of Super Powerhouse Cement shall be applied and finished smoothly using a steel trowel. After drying, the surface may be painted or covered with canvas applied with lagging adhesive.

Outdoor use — Over a cement finish applied as for indoor use, 1 inch mesh woven wire netting shall be applied, followed by ¼ inch thick FibreKote asphaltic weatherproofing.

· 290799

2 mineral wool insulations/insulating cements

/for service to 1200F

SUPER POWERHOUSE—ASBESTOS FREE



A high temperature-resisting mineral fiber cement with a hydraulic-setting binder. Mixed with water it can be troweled on any surface with little effort. Sets quickly to form a white, glazed surface. After drying, may be painted without further treatment. Apply weatherproofing directly for outdoor service.

Super Powerhouse Cement incorporates qualities of easy troweling, finish application, one coat, quick hydraulic set with no drying shrinkage cracks. Excellent adhesive qualities.

physical properties (after molding and drying)

Recommended water ration – 6½ gal./50 lb. bag

Coverage, dry – 35 sq. ft. per 100 lb. at 1 inch thickness

thermal conductivity

Mean temp. F	200	400	600
K	.66	.97	1.075

recommended thicknesses

For insulating irregular areas—same as adjacent insulation
For finishing—single coat ½ inch thick

specification compliance

Federal: SS-C 160 Type III Grade F

ASTM: C 449-64

*Indicate on order when specification compliance is required

suggested application specifications

1 Insulating – finishing material

All insulating-finishing cement shall be Super Powerhouse hydraulic setting cement as manufactured by Keene Building Products Corporation, Insulation and Contracting Div.

2 application

Hard surface finish – all insulating block, metal-mesh blankets and insulating cement shall be finished with ½-inch thick Super Powerhouse Cement applied in one coat and troweled to a smooth finish. Pipe fittings – valves, etc., – in pipe lines smaller than 4-in. IPS shall be covered with Super Powerhouse Cement built up to the same thickness as adjacent pipe insulation and troweled smooth.

3 finishing (alternates)

a. No further finish to be applied

b. Canvas (on pipe lines) – After drying, the cement shall be covered with 8 or 6 oz. canvas, cemented and painted as specified.

c. Paint – After drying, the cement surface shall be painted as specified.

d. Outdoors – Cement shall be covered with woven wire mesh securely fastened, and ½-inch of FibreKote weatherproofing.

/for service to 1900F

NO. 1 PLUS—ASBESTOS FREE



A dry mineral fiber, clays mixture. Resilient fibers and special binder produce a whiter finish that looks, handles and sets better.

Trowel applied after mixing with water, forms a corrosion inhibitive insulation for heated surfaces. May be used for leveling, patching, fittings and general insulating work.

physical properties (after molding and drying)

Recommended water ratio – 9½ gal./50 lb. bag
Coverage, dry – 45 sq. ft., 1 in. thick/100 lb.
Linear shrinkage after 24 hr. at 1900F-3% max.

thermal conductivity

Mean temp. F	200	400	600	800	1000
K	0.54	0.62	0.69	0.80	1.00

recommended thicknesses

Hot surface temperature	Thickness (inches)	Hot surface temperature	Thickness (inches)
100 to 175 F	1	950 to 1150 F	4
175 to 325 F	1½	1100 to 1300 F	5
325 to 550 F	2	1300 to 1500 F	5½
550 to 750 F	2½	1600 to 1800 F	6½
750 to 950 F	3	–	–

specification compliance

Federal: SS-C-160 Type 3 Grade U

ASTM: C 195-64

* Indicate on order when specification compliance is required.

suggested application specifications

1 insulating material

All mineral wool insulating cement shall be No. 1 Plus as manufactured by Keene Building Products Corporation, Insulation and Contracting Div.

2 application

No 1 Plus insulating cement shall be applied by spotting on first coat. After drying the next coat shall be roughed on or troweled smooth, depending on total thickness specified. Each coat shall be reinforced with woven wire mesh before applying final coat of cement which shall be troweled level.

3 finishing (alternates)

Hard surface – ½" coat of Super Powerhouse Cement shall be applied and troweled smooth. When specified, the surface shall be painted after drying.

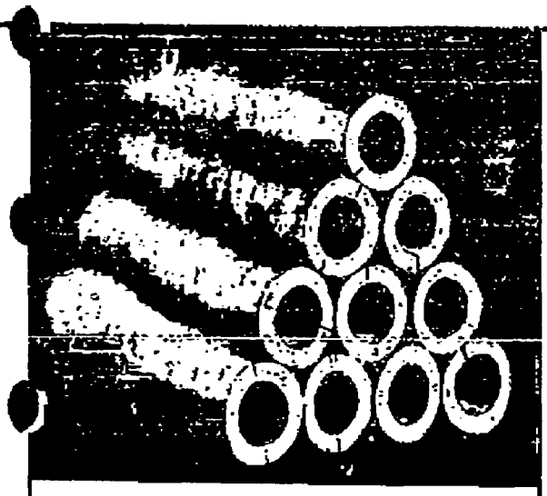
Canvas – After drying, the cement shall be covered with 6 or 8 oz. canvas applied with lagging adhesive.

Outdoor – After drying, the cement shall be covered with woven wire mesh securely fastened, then with ½-inch thick FibreKote weatherproofing.

290800

3 glass insulation/for service to 370F*

MONO-KOVER ONE PIECE PIPE INSULATION



MONO-KOVER

Mono-Kover pipe insulation is manufactured from long, fine, flame-attenuated glass fibers, bonded with thermosetting resin and uniformly produced in one-piece for easy, fast application. It is produced in 3-foot sections.

All Mono-Kover pipe insulations are tested for Fire and Smoke Hazard Classification ratings on a COMPOSITE basis—insulation, jacket and adhesive used to secure jacket to insulation—in accordance with ASTM E-84, NFPA 225 and UL 723. Ratings do not exceed the following:

Composite Product Ratings
FHC 25/50

Jackets

VB-Vapor Barrier for piping up to 500 F*. White kraft bonded to aluminum foil, reinforced with fiber glass yarn. Kraft paper is permanently treated (not merely salt treated) to assure permanent fire and smoke safety, and to prevent corrosion of foil.

VB-T - VB with pressure sensitive tape closure system.

GVB-Glass cloth Vapor Barrier for exposed piping up to 600 F*. Tough, pre-sized glass cloth with vapor barrier coating on the inside surface. Permanent fire and smoke safety. Presents well-tailored appearance.

thermal conductivity

mean temp. F	50	100	200	300
K	0.225	0.22	0.265	0.32

specification compliance

Federal: HH-I-558a Form D, Type III, Class 12 & 13;
Military: MIL-I-22344B

recommended thicknesses

pipe surface temp. F	150	200	250	300	350
pipe size (inches)	wall thickness (nominal inches)				
for general piping					
½	½	½	¾	1	1½
¾	½	½	1	1	1½
1	½	¾	1	1	1½
1¼, 1½, 2	½	¾	1	1½	1½
2½, 3, 3½, 4, 4½	½	¾	1	1½	2
5, 6	½	¾	1½	1½	2
7, 8	½	1	1½	1½	2
9, 10	½	1	1½	2	2
11	1	1	1½	2	2
12, 14, 15, 16, 17, 18	1	1	1½	2	3
19, 20, 21, 22, 23, 24	1	1	1½	2	3
sizes 25 through 33 made to special order.					
for hot water and low pressure steam					
½, ¾, 1, 1½	½	½	½	½	¾
1½, 2, 2½	½	½	½	¾	¾
3, 3½, 4, 4½, 5, 6	½	½	½	¾	1
7	½	½	½	1	1
8, 9, 10	½	½	1	1	1
11, 12	1	1	1	1	1
for cold piping and dual temperature service*					

	Insulation thickness (inches), by range of nominal pipe sizes					
temp. F	¼ to 1¼	1½ to 3	3½ to 5	6 to 10	11 to 24	25 to 36
50 to ambient	½	¾	¾	1	1	1
50 to 35	¾	1	1½	1½	1½	1½
35 to 0	1½	1½	2	2	2½	2½
0 to −30	1½	2	2½	2½	3	3
below −30	to meet design conditions					

*when appropriate vapor barrier jackets are applied.

jacket properties

	VB & VB-T	GVB
Water Vapor Permeability (ASTM-E96)	.02 perm	.02 perm
Beach Puncture (ASTM-D-781-59T)	50 oz. in./in. tear	150 oz. in./in. tear
Tensile Strength —Ultimate	30 lbs./in. width**	100 lbs./in. width*
Mullen Burst (ASTM-D-774-63T)	70 psi	300 psi

*ASTM-D-902-61
**TAPPI-404-os61

technical data

General Properties of Insulation
Temperature limit .....370 F*
Moisture absorption .....less than 0.2% by volume
Alkalinity .....less than 0.6% expressed as Na_2O
Corrosivity
(with steel, copper, aluminum) .....does not cause or accelerate
Capillarity .....negligible
Shrinkage .....none
Resistance to fungi and bacteria .....does not breed or promote

*500 F service available on 1" thickness and above.
Unless 500 F is specified on the order, 370 F will be supplied.
*Available for use to 500 F on special order.

290801

3 glass insulation/for service to 250F

COMMERCIAL DUCT WRAP



Made of extremely fine, flame-attenuated glass fibers, bonded with a thermosetting resin. Commercial duct wrap, blanket-type insulations are lightweight, highly resilient and flexible.

For the control of heat loss or gain or the prevention of condensation. Commercial duct wrap insulations offer maximum thermal performance at low cost. They are ideal for use on round or rectangular sheet metal ducts in cooling and heating systems, plenums or other surfaces where temperature control is essential.

advantages:

High thermal performance, resilient and flexible, fire safety, strong, easy to handle and apply, durable.

available forms:

Commercial duct wrap is available in 1", 1½" and 2" thickness. It is supplied in roll form with any of the factory-applied vapor barrier facings listed below.

thermal resistance

$$R = \frac{L}{k}$$

1" R-4 4.0 (minimum) at 75F mean temp.
1½" R-6 6.0 (minimum) at 75F mean temp.
2" R-8 8.0 (minimum) at 75F mean temp.
(Facing not included)

packaging information:

TYPE (THICKNESS)	BLANKET WIDTH (INCHES)	ROLL LENGTH (FEET)
1"	48	100
1½"	48	100
2"	48	50

Available faced only.

facing information:

FSK
Reinforced Foil and Paper (Foil-Scrim-Kraft)
Aluminum foil (minimum .7-mil), reinforced with fiber glass yarn mesh and laminated to 40-lb. chemically-treated, fire-resistant kraft. UL rated.

RXL
Lightweight Vapor Barrier Paper (Reinforced Kraft, Light)
Two thicknesses of 30-lb. kraft reinforced with fiber glass yarn scrim (1" x 1" spacing) in asphalt lamination. Combustible.

FSKL
Lightweight Foil and Paper (Foil-Scrim-Kraft, Lightweight)
Aluminum foil (minimum .35-mil) reinforced with light fiber glass yarn mesh and laminated with asphalt to 50-lb. kraft. Combustible.

ALX
Aluminum Foil.
.002" thick. UL rated.

WPV/APV
White or Aluminum Pigmented Vinyl.
.004" thick. Effective vapor barrier. Combustible.

CLS1V
Class 1 Vinyl, White or Aluminum Pigmented.
.004" thick. Meets NFPA 90A and 90B

Underwriters' Laboratories Fire Hazard Classification:
The following products meet the Fire Hazard Classification requirements of NFPA 90A and 90B Standards and FHA as tested by UL as a composite product (insulation, adhesive and facing). UL Guide No. 40 U8.3. Card R3711A.

Commercial Duct Wrap with FSK
Commercial Duct Wrap with ALX
Commercial Duct Wrap with Class 1 Vinyl
} FHC 25/50

Compliance with Government Specs.:
HH-I-00558 Form B, Type III
HH-I-00559 Form B, Type III
MIL-I-22023, Type 1, Class 2

When ordering material to comply with any Government Specification, a statement of that fact must appear on the purchase order. Government regulations prohibit the certification of compliance after shipment has been made.

technical data:

General Properties

Temperature (maximum) 250F
Moisture Absorption ..... Less than 0.2% by volume
Alkalinity ..... Less than 0.6% expressed as Na_2O
Corrosivity
(with steel, copper or aluminum) . Does not cause or accelerate
Odor ..... None
Capillarity (after 24 hours) ..... Negligible
Shrinkage ..... None
Resistance to fungi and bacteria .... Does not breed or promote

· 290802

4 Industrial sound control products

SONOSORBER®



For factories, school gymnasiums, auditoriums, convention halls and large areas

These functional sound absorbers have been designed for one purpose—to absorb sound with maxmum efficiency. They employ all three methods of converting acoustical energy: absorption of noise as a resonator; as an acoustical blanket; and by means of diffraction. The total effect obtained is acoustical absorption efficiency in excess of unity—that is, more than 100% of sound absorption is obtained from each square foot of surface.

description:

Pressure-moulded mineral fibers of specific density and thickness. All exposed surfaces protected by reinforcing mesh moisture repelling and dust proof. Each Sonosorber has 2 built-in steel hangers (eyelet type) for suspension by wire in horizontal or vertical position.

Approximately 12" diameter round cylinder shape; approximately 24" length; approximately 4 lbs., 6 oz. per unit.

Fully incombustible—no maintenance.

installation:

Sonosorbers may be simply hung from the overhead construction in locations and/or centers indicated by engineering recommendations by means of steel wire (14 gauge or heavier). Where units are to be installed in straight rows, a suitable gauge steel wire may be stretched horizontally, with turnbuckles at each end secured to opposite walls and the units suspended on such wire using the hanger eyelet.

Geometric spacing and method of hanging should be computed for each individual noise problem. Generally speaking the spacing may vary from 2" on center in both directions to 6' on center in both directions, depending upon the results required and area to be covered.

recommended uses:

Factories and industrial areas of all types, arsenals, gymnasiums, arenas and similar large spaces where maximum absorption is required and acoustical ceilings are impractical and too expensive.

performance data:

Frequency C.P.S.	128	256	512	1024	2048	4096	NRC Range
Sabins per unit	5.0	5.9	6.1	8.0	10.5	9.7	7.6

HANSOQUILT®

studio blanket

description:

An all-purpose sound absorber for use where function, low material cost, simplicity of installation and maintenance is of primary importance. It is a lightweight, tough and efficient acoustical blanket manufactured of long-staple glass fibers with an open-mesh, flame-proof fabric on both sides and long edges. The fabric is securely stitched with nylon-cord through the glass fibers.

dimensions:

Thicknesses: Nominal 1" and 2" thicknesses (shipped compressed).

Width: Standard 24" width not including fabric edges extending beyond blanket.

Length: Standard rools are 40' long in 1" thickness and 25' long in 2" thickness.

thermal insulation value:

The K Factor is .25.

recommended uses:

• Sound Stages and TV Studios • Auditorium Stage Areas • Auditoriums and Theaters • Music Rooms • Gymnasiums and Natatoriums • Pistol and Rifle Ranges • Pin-Setting Machine Areas—Bowling Alleys • Dry Wall Soundproof Partitions • Suspended Isolation Ceilings • Mechanical Equipment Rooms and Fan Plenums • Improvement of Sound Transmission Loss of Existing Partitions.

installation:

Because of its strong, light-weight construction, Hansoquilt can be easily and rapidly erected, requiring simple provisions for fastening. Normally, it is simply secured on top to freely drape down to floor in area to be treated. Manual with complete installation recommendations available on request.

Mounting	Thickness	COEFFICIENTS 125	250	500	1000	2000	4000	NRC Range
2	Nom. 1"	.09	.15	.41	.78	.90	.90	.50-.60
2	Nom. 2"	.02	.21	.60	.99	.95	.91	.65-.75

specifications:

SCOPE

A. The general conditions of the specifications are part of this section.

B. Provide all labor, material, and equipment required to supply and install Keene Hansoquilt studio blanket as shown on drawings and as specified.

materials:

The blanket shall be Keene Hansoquilt Studio blanket, 24" wide, nominal (1", 2") thickness, having a NRC range of (.50-.60, .65-.75).

290803

5

FOR IMMEDIATE SERVICE

PHONE OR WRITE TO NEAREST KEENE OFFICE IN YOUR AREA

Cincinnati, Ohio 45206
2867 Stanton Avenue
Phone: (513) 961-1190

Hapeville, Georgia 30054 (Atlanta)
3349 A Hamilton Blvd. S.E.
Phone: (404) 768-3442

Birmingham, Alabama 35203
3211 8th Avenue North
Phone: (205) 251-9261

Buffalo, New York 14240
603 Weiden Avenue
Phone: (716) 896-4400

Detroit, Michigan 48238
14401 Prairie Ave.
Phone: (313) 864-8100

Houston, Texas 77011
6601 Supply Row
Phone: (713) 928-2416

Fort Worth, Texas 76102
1300 E. Belknap Street
Phone: (817) 332-9775

Jacksonville, Florida 32206
1510 East Adams Street
Phone: (904) 353-7436

Orlando, Florida 32804
4206 No. Orange Blossom Trail
Phone: (305) 295-3170

Valley Forge, Pa. 19481 (Phila.)
Phone: (215) 783-0430

Rochester, New York 14606
8 Cairn Street Bldg. 1-F
Phone: (716) 235-2443

Maryland Heights, Mo. 63042
11644 Fairgrove Blvd.
Phone: (314) 567-1811

Princeton, New Jersey 08540
Post Office Box 145
Phone: (609) 452-8090

KEENE