

TYPE: Block

TEMPERATURE: to 1900°F

EAGLE-PICHER

**"PV"
SUPERTEMP BLOCK**

Description: Eagle-Picher "PV" Supertemp Block is composed of high temperature mineral fibers bonded with specially prepared binders to form a block insulation having optimum properties during both installation and service. Fibers are oriented to insure maximum strength and thermal efficiency. The blocks are "wet-sawed" by a patented process to provide precise dimensional tolerances and freedom from dust.

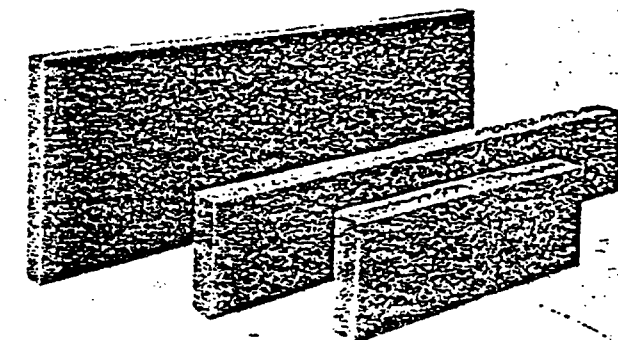
Uses: Recommended for direct application or refractory back-up insulation in petroleum and process units, power generation equipment, ovens, furnaces, kilns and other related equipment requiring an insulation that is economical, efficient and dimensionally stable.

Advantages:

Durability: Strong yet resilient, processed to maintain structural integrity during field application.

Absorption: Allows placement of castable refractories in direct contact with the block without degradation.

Installation: Can be impaled on pins without predrilling. Easily field fabricated with knife or saw. Standard sizes up to 24" x 36" permit rapid installation.



Physical Properties (cont'd):

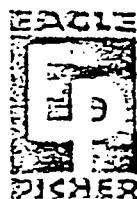
Linear Shrinkage
at 1600°F. 2.0%
1800°F. 2.2%
Modulus of Rupture 40.0 lbs./sq. in.
Compressive Strength 2,600 lbs./sq. ft.
at 10% Deformation

Physical Properties:

Service Temperature to 1900°F.
Density 16 - 18 lbs./cu. ft.
Moisture Absorption Nil
Fire Resistance Incombustible
Corrosion Does not cause or accelerate

Thermal Conductivity:

Mean Temperature °F.	"K" (Btu-in./hr./ sq. ft./°F.)
200	0.22
400	0.38
600	0.49
800	0.59
1000	0.69



Superglas® INSULATION



Type: Block
Temp. Limit: 2000°F

Description

Superex block insulation products are manufactured from carefully selected combinations of silica, lime, clays, and fibers for reinforcement purposes. These products are characterized by high strength, both cold and at elevated temperatures, and high refractoriness. They can be used right up to their temperature use limits — and in some conditions even beyond — should upset conditions occur. They uniquely combine low thermal conductivity and high stability at elevated temperatures to provide efficiency of construction and thermal performance, and long maintenance-free service. Superex Block products contain no asbestos fibers and are not soluble in water. Repeated wettings have no effect on this insulation.

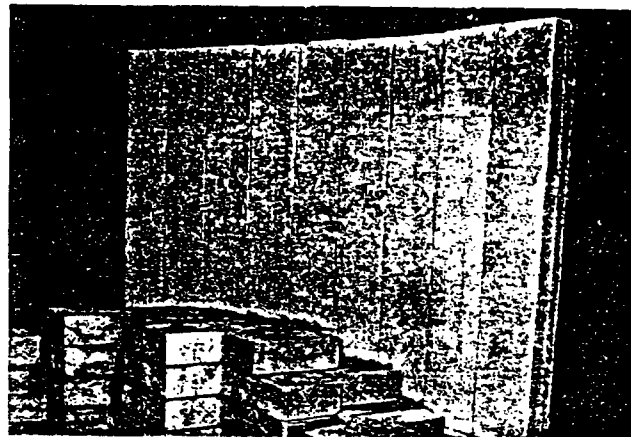
Superex products are not recommended as a furnace lining material exposed to combustion conditions unless a great deal of past experience shows the product to be satisfactory in a particular application.

Typical Applications

Superex block is designed as a backup insulation for all refractory constructions; i.e., insulating firebrick, dense fireclay brick, castables, plastic refractories and also ceramic fiber felts and blankets. All Superex block performs well at high temperatures and efficient designing of a refractory system with Superex as the backup insulation will reduce the amount of hot face refractories required.

The most thermally efficient and cost effective system is obtained when the lowest thermal conductivity materials are placed in the hottest possible location. The excellent heat resistance of Superex block allows this. The most thermally efficient systems utilize Superex 1600 as backup to Superex 2000.

Superex block is good insurance, too. Any refractory construction can be expected to crack in service and allow full furnace temperatures into the back-up insulation. Its high refractoriness will help to prevent catastrophic failure of important equipment and allow operation until a more convenient rebuild or repair time is reached.



Uses

Ovens
Soaking Pits
High Temperature
Mains and Flues
Industrial Boilers
Marine Boilers
Regenerators
Kilns
Roasters
Reverberatory
Furnaces

Reheat Furnaces
Annealing Furnaces
Heat Treating Furnaces
Combustion Air Piping
Bustle Pipes
Blast Furnace Stoves
Glass Lehrs
Car Tops
Forge Furnaces
Laboratory Furnaces
Cooking Equipment

Advantages

Exceptional Heat Resistance. Superex Block can be used to its full temperature use limit. Its high refractoriness also offers some insurance against immediate failure should these temperatures be exceeded.

Excellent Strength. Easy to install; resists damage both in installation and in operation.

Lightweight. Reduces structural steel requirements; ideal for insulating movable equipment.

Special Shapes. Good strength properties make Superex block ideal for cutting and grinding special shapes. J-M can supply these to your specific requirements.

Hi-ALUMINA

CERAMIC FIBER INSULATION

Contains No Asbestos

Type AH-50 For 1500°C (2732°F)

Type AH-30 For 1400°C (2552°F)

Type 410 For 1300°C (2372°F)

Hi-ALUMINA ceramic fiber products are made by bonding alumina-silica fibers with high purity alumina. No starch, silica, clays or asbestos are used. As a result, low density insulating products are obtained with high alumina contents. These Hi-ALUMINA products outperform conventional silica-bonded products.

Three products are offered for three temperature ranges with three markedly different costs. In this way, users are able to obtain the most economical insulation for any particular temperature range.

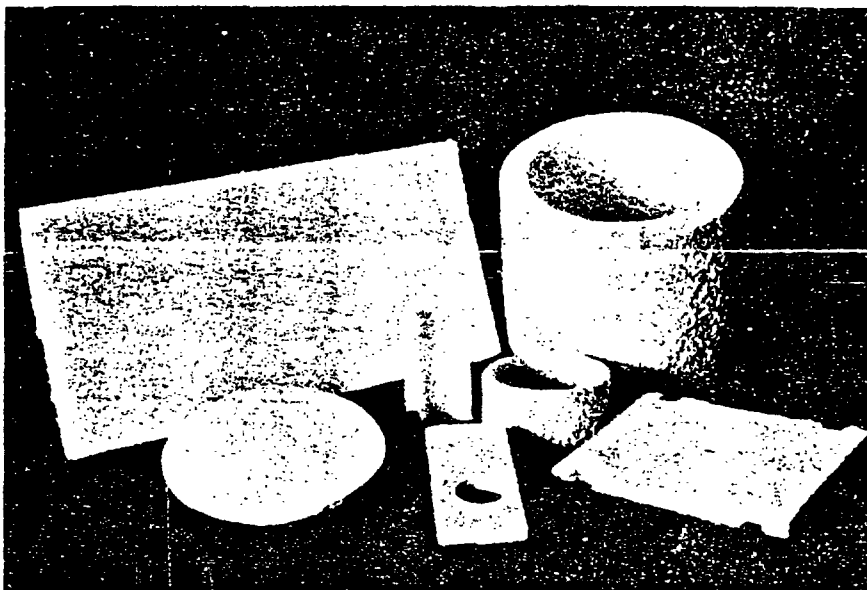
Also available for the 3000°F range are our ALL-ALUMINA products described in a separate bulletin (AA-320).

PRODUCTS AVAILABLE

Type AH-50 77% Al_2O_3 For 1500°C (2732°F)

Type AH-30 61% Al_2O_3 For 1400°C (2552°F)

Type 410 54% Al_2O_3 For 1300°C (2372°F)



All of the above products are available in the form of boards, tubes, cylinders or special shapes. The products can be varied in size, thickness, degree of hardness and surface finish.

APPLICATIONS

The principal use for these products is as a rigid form of a low density, high temperature insulation. The alumina-insulation requires 50% less insulation than conventional brick insulation. Fast heat-up, fast cool down and low heat storage make this insulation ideal because of today's energy shortage.

Among the insulation uses are furnace linings, back-up insulation, heat shielding, induction coil liners, combustion chambers, stack insulation and high temperature pipe insulation.

The non-wetting characteristics of alumina binder and alumina-silica fibers to molten metal makes these products desirable for many molten metal applications. Among these are riser sleeves, hot top linings, trough linings and tap out cones.

The low sodium content and high surface area of the alumina binder makes these products ideal catalyst supports for the flameless heater.

The low sodium content makes these products ideal for electrical heating element holders and radiant heater pads.

Other uses include burner blocks, expansion joints, kiln furniture, gaskets, peep hole plugs and seals.



1605 east ayre street
newport, delaware 19804
phone (302) 995-7194

MONO-BLOCK

Mineral Wool Insulation — For Service to 1900°F — Asbestos Free

DESCRIPTION:

MONO-BLOCK is composed of spun mineral fibers and inorganic binders especially formulated for resistance to high temperatures. A patented process interlocks the long mineral fibers to form a lightweight and rigid, yet resilient block which is shaped and fitted.

TYPICAL USES:

- Heat Treating Ovens
- Boilers
- Incinerators
- Chemical Treating Tanks
- Refinery Equipment
- Ducts and Breechings
- Feed Water Heaters
- Wind Tunnels¹
- Jet Silencers¹
- Fan Housings¹

¹Acoustical Applications



FEATURES:

- **Easy to Apply** — Easily cut with a knife. Conforms to slight curvatures or projections such as rivet heads, providing a snug fit without cracking or breaking. Can be impaled over welded studs without predrilling holes.
- **High Strength** — Strong because of long mineral fibers and unique manufacturing process which uses inorganic binders. This extra strength guards against breakage loss.
- **Low Chloride/Moisture Resistant** — Acceptable for use on austenitic stainless steel.
- **Effective Acoustical Properties** — High sound absorption efficiency makes this product applicable where acoustical treatment is required at elevated temperatures.

KEENE
CORPORATION
INSULATION

1505 FAIRFORD STREET, KALAMAZOO, MICHIGAN 49003
TELEPHONE (616) 343-1226 TELEX 8102771023

PHYSICAL PROPERTIES:

Density — 12 lbs./cu. ft. minimum
Compressive Strength — 10 lbs./sq. in. @ 10% deformation
Flexural Strength — 40 lbs./sq. in.
Linear Shrinkage after heating 24 hrs. at 1900°F
Soaking Heat — Less than 5%
Single Face — Less than 5%

THERMAL CONDUCTIVITY:

Mean Temp. °F	200	400	600	800	1000	1200
K	.36	.42	.51	.62	.75	.90

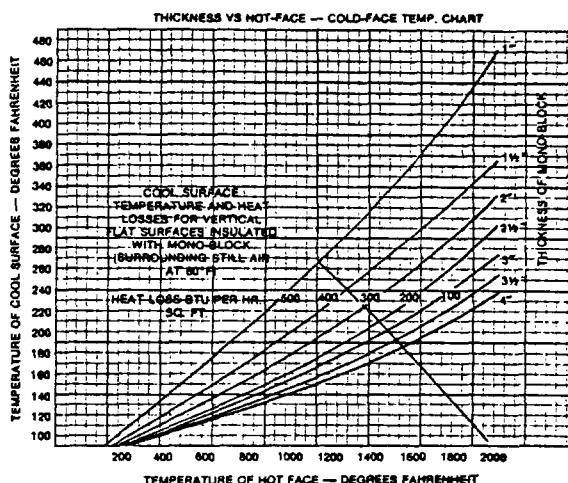
STANDARD SIZES AVAILABLE:

Length — 18, 36 inches
Width — 6, 12, 24 inches
Thickness — 1-4 inches in 1/2 inch increments

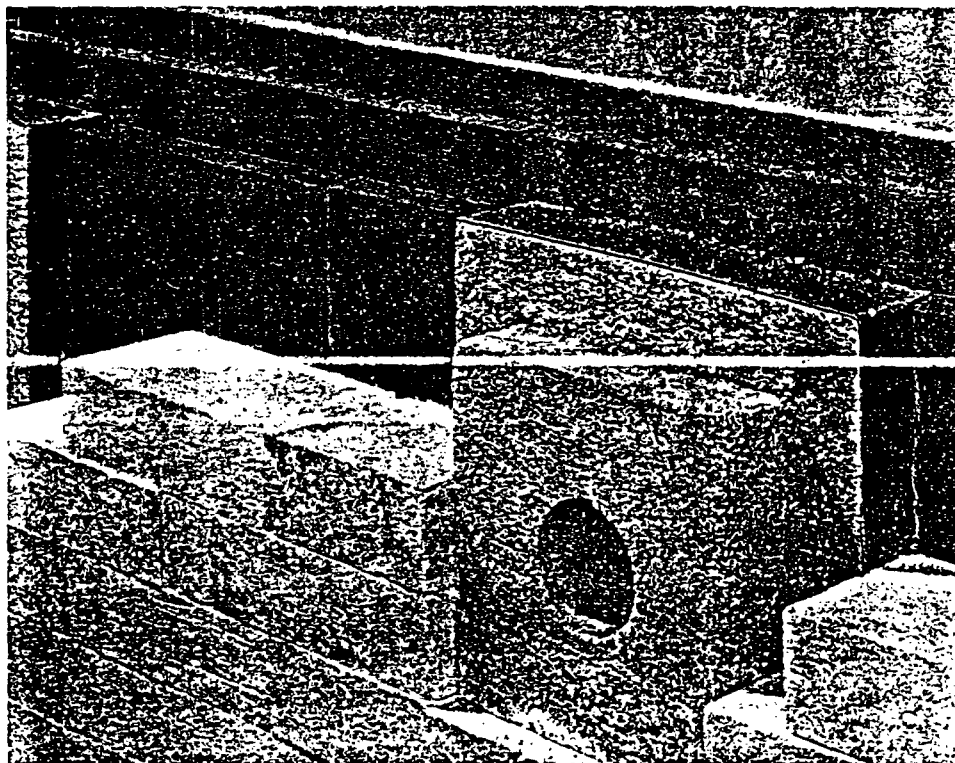
SPECIFICATION COMPLIANCE:

Military: MIL-I-24244A*
Federal: HH-I-558B Form A Class 5
ASTM: C612-70 Class 5

*Indicate on order when specification compliance is required.



1979 JAN 03



Delta-T specifications

Description	filled, spun ceramic fiber with inorganic binders	Anchor Materials	S.S. studs	
		Specific Heat, B.T.U./lb. ° F (2000° F)	.24	
		Loss on Ignition, % (max.)	1.6	
		Chemical Analysis, %	44.5 51.4 1.3 1.2 1.2 .4	
		Alumina Silica Calcium oxide Ferric oxide Titanium oxide Magnesium oxide	Al ₂ O ₃ SiO ₂ CaO Fe ₂ O ₃ TiO ₂ MgO	
Density, lb./cu. ft.	18	Atmospheres	resists oxidation and reduction	
Modulus of Rupture, psi.	65			
Compressive Strength	@ 5% deformation, psi.			20.0
	@ 5% deformation, psi. 400° F			26.2
	@ 5% deformation, psi. 2300° F			45.7
Resiliency, % (to 1400° F)	99	Standard sizes available Thickness (½" increments) Length Width Tolerances Custom sizes available	½"-4" 36" 24" ± ⅛"	
Linear Shrinkage, % (max.)	@ 1600° F			0.0
	@ 2000° F			1.15
	@ 2300° F			4.0

Thermal Conductivity	Mean Temp. °F	200	400	600	800	1000	1200	1400	1600
	K	.43	.52	.60	.74	.84	.98	1.15	1.30

KEENE
CORPORATION
Building Products Division

1603 Fullford Street, Kalamazoo, Michigan 49003



Manufacturers Of Low Density Refractories

rim products corporation 1605 east ayre st., newport, delaware 19804 phone (302) 995-7194

October 9, 1978

12 x 12 x 1"

Mr. William Keith
William Penn Hotel, 3rd Floor
ALUMINUM COMPANY OF AMERICA
1501 Alco Building
Pittsburgh, PA 15219

12 x 24 x 1" \$15.20
12 x 24 x 2"
36 x 12 x 1-2"

Dear Mr. Keith:

As you requested, we are shipping you samples (12" x 12" x 2") of our Hi-Alumina board.

Literature describing these products is enclosed. However, since you require greater compressibility than normal for these products, we are sending you modified Type 410 products.

The products we are sending you, Type 410-D3 and 410-D1 have the following physical properties:

Density	11 lbs/cu.ft.
Thermal conductivity At 1200°F	0.77 BTU-in./sq.ft.hr.°F
Linear shrinkage At 1200°F	Negligible

16 (227)

We do not have compressibility data.

Price of these products is \$3.80/board-ft. for any volume.

If these products do not have sufficient compressibility, let us know and we'll decrease stiffness further.

We also manufacture a unique product with excellent compressibility which is used as a special high temperature gasket. However, the cost of this material is high. Price is \$6.00/board-ft. (12" x 12" x 1"). It can be made in boards or shapes. If the cost is not prohibitive, you may wish to look at a sample.

If you have any questions or comments, don't hesitate to call or write.

Sincerely,

Mike

Michael Levitsky
Sales Manager

m1/1

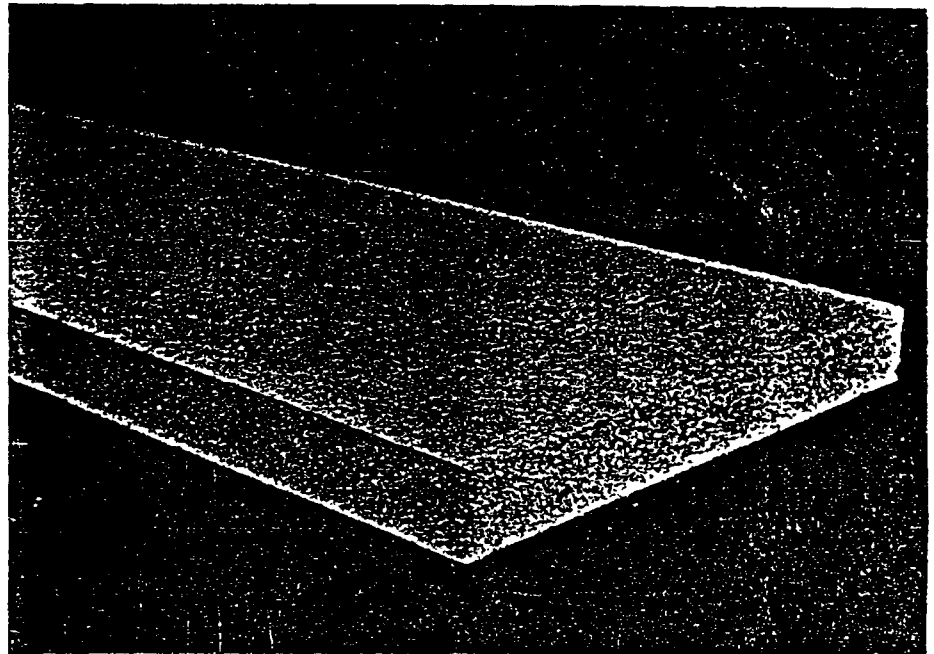
TECHNICAL DATA
SKAMOLEX INSULATING SLABS
White Cellulose Sulfate

	SKAMOLEX 1000 (PM-10)		SKAMOLEX 1000 SUPER	
DENSITY	kg/cbm lbs/ft	250 15.6	180 11.2	
MAXIMUM SERVICE TEMPERATURE	$^{\circ}\text{C}$ $^{\circ}\text{F}$	1000 1830	1050 1922	
COLD CRUSHING STRENGTH	kg/sq.cm lbs/sq.inch	16 230	20 285	
MODULUS OF RUPTURE	kg/sq.cm lbs/sq.inch	3 45	6 85	
REHEAT SHRINKAGE AT 1000 $^{\circ}\text{C}$ alt. 1830 $^{\circ}\text{F}$ 12 h	$^{\circ}\text{C}$ kcal/m.h. $^{\circ}\text{C}$ 200 $^{\circ}\text{C}$	2%	1.5%	
THERMAL CONDUCTIVITY		kcal/m.h. $^{\circ}\text{C}$	kcal/m.h. $^{\circ}\text{C}$	btu.in/sq.ft. $^{\circ}\text{F}$
200 $^{\circ}\text{C}$ - 392 $^{\circ}\text{F}$	0.056	0.452	0.053	0.427
400 $^{\circ}\text{C}$ - 752 $^{\circ}\text{F}$	0.076	0.613	0.072	0.581
600 $^{\circ}\text{C}$ - 1112 $^{\circ}\text{F}$	0.106	0.855	0.101	0.814
800 $^{\circ}\text{C}$ - 1472 $^{\circ}\text{F}$	0.134	1.081	0.127	1.024



IV 19 Block Insulation

Product Data Sheet



IV-19 Block Insulation is an asbestos-free insulation, manufactured from vermiculite granules and high temperature bonding materials. It is a versatile product available in a wide range of sizes.

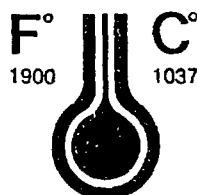
Because of its low conductivity, IV-19 is an economical, energy saving insulation. It exhibits minimal shrinkage at top temperature limits, and will not decompose even when exposed directly to flame at or beyond maximum service temperature.

IV-19 is an excellent back-up insulation as well as a highly efficient hot-face insulation for temperatures at or below 1900° F (1037° C). Its unique composition and hard surface helps insure strong adhesion of cement finishes, and provides superior handling qualities.

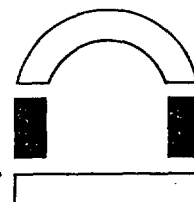
IV-19 can be manufactured with either straight or beveled edges to meet customer specifications. Standard sizes and weights are listed on the price sheet. Prices for custom size blocks will be quoted upon request.



Asbestos-free



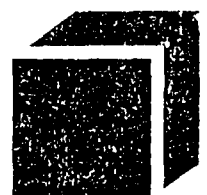
Temperature



Area



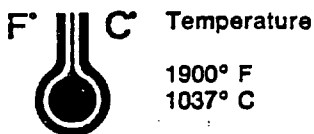
Method



Shipping

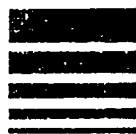
IV 19 Block Insulation

Physical Properties:



Temperature

1900° F
1037° C



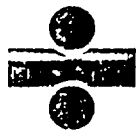
Conductivity

0.56 "k" at 200° F
(.0808 W/m·K at 93° C)
0.64 "k" at 400° F
(.0923 W/m·K at 204° C)
0.72 "k" at 600° F
(.1038 W/m·K at 315.6° C)
0.80 "k" at 800° F
(.1154 W/m·K at 425.7° C)
0.88 "k" at 1000° F
(.1269 W/m·K at 537.8° C)



Density

Cold: 20.5 lb/ft³
(328.4 kg/m³)
At 1900° F (1037° C):
19 lb/ft³ (304.4 kg/m³)



Crushing Strength

Cold: 125 PSI
(.0878 kg/mm²)
At 1900° F (1037° C):
51 PSI (.0359 kg/mm²)



Modulus of Rupture

Cold: 73.5 PSI
(.0517 kg/mm²)
At 1900° F (1037° C):
51.5 PSI (.0362 kg/mm²)



Linear Shrinkage

At 1900° F (1037° C):
2.25%



Chemical Analysis

Vermiculite, the basic component of IV-19, is a magnesium, aluminum, iron silicate. It contains

no free oxides.

Al ₂ O ₃	9.19	CaO	11.51
SiO ₂	54.38	K ₂ O	3.72
As Silicate		Cr ₂ O ₃ , TiO ₂	
Fe ₂ O ₃	5.35	Na ₂ O, Mn ₂ O ₄	0.86
Mg O	13.16	Combined H ₂ O	1.84

Area of Application:



End/Sidewalls

IV-19 has a wide variety of uses in high temperature industrial furnaces including end and side walls of various heating furnaces . . . soaking pits, reheat furnaces, carbonizing furnaces and other annealing furnaces. IV-19 is applied as backup insulation as well as hot face material at temperatures of 1900° F (1037° C) and below, for example IV-19 could be used in duct or flue linings and cyclones.

Method of Application:



Block Construction

Install, using standard procedures for block construction.

Shipping:



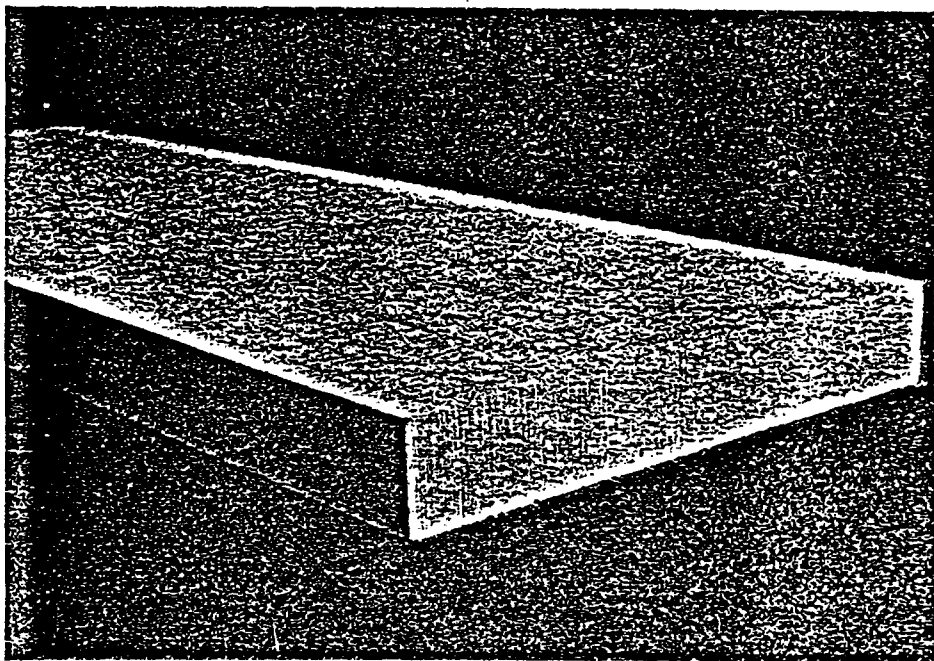
Carton

IV-19 is available in standard block thicknesses of 1" to 6" in ½" increments with the other dimensions measuring 6" x 18", 6" x 36", 12" x 18" or 12" x 36". Special sizes available on request.



IV-20 Block Insulation

Product Data Sheet



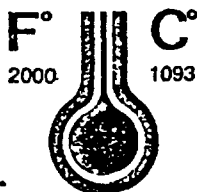
IV-20 Block Insulation, made from diatomaceous silica with a hydraulic binder, is a superior high temperature insulation for service to 2000° F (1093° C). According to ASTM testing procedures, IV-20 exhibits extremely high resistance to breakage at 2000° F (1093° C). Long maintenance-free service and maximum operating efficiency is assured by IV-20's unique combination of low conductivity and high stability. IV-20 is also very low in sulfur and iron, making it highly resistant to attack from atmospheric

conditions and greatly reducing the possibility of product contamination.

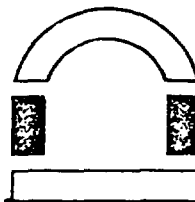
Like other International Vermiculite products, IV-20 is produced in a wide range of standard block sizes, available with either beveled or straight edges. This product can also be manufactured in special shapes to fit customer specifications, saving money on both installation and energy costs.



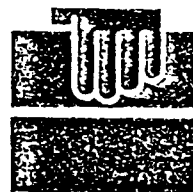
Asbestos-free



Temperature



Area



Method

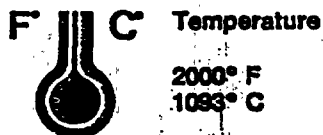


Shipping

Product Data Sheet

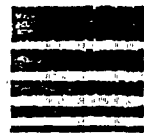
IV-20 Block Insulation

Physical Properties:



Temperature

2000° F
1093° C



Conductivity

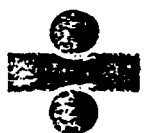
.65 "k" at 400°F
(.0938 W/m·K at 204.4°C)
.70 "k" at 600°F
(.1009 W/m·K at 315.6°C)

.77 "k" at 800°F
(.1111 W/m·K at 428.7°C)
.89 "k" at 1000°F
(.1284 W/m·K at 537.8°C)



Density

Cold: 24.5 lb/ft³
(392.2 kg/m³)
At 2000° F (1093° C):
23.5 lb/ft³ (376.4 kg/m³)



Crushing Strength

Cold: 176 PSI
(.1237 kg/mm²)
At 2000° F (1093° C):
150 PSI (.1055 kg/mm²)



Modulus of Rupture

Cold: 55 PSI
(.03867 kg/mm²)
At 2000° F (1093° C):
90 PSI (.0633 kg/mm²)



Linear Shrinkage

at 2000° F
(1093° C): 2.8%



Chemical Analysis

IV-20 is made from
diatomaceous silica with
hydraulic binder.

SiO ₂	79.0%	MgO	3.8%
Al ₂ O ₃	3.9%	Fe ₂ O ₃	1.3%
CaO	6.8%	Ignition loss	5.1%

Shipping:



Carton

IV-20 is available in
standard block
thicknesses of 1" to 6"
in 1/2" increments with
the other dimensions measuring
6" x 18", 6" x 36", 12" x 18" and
12" x 36". Special sizes available
on request.

Area of Application:



End or Side Walls

IV-20 is primarily a side
wall and end wall
insulating material.

Whether it's used as a
hot face or a backup depends upon
customer requirements and the IV-20's
2000° F (1093° C) service range. The
wide range of uses includes such
diverse applications as, soaking pits,
reheat and pusher furnaces, copper
reverberatory furnaces, petroleum
reactor vessels and oil fired water
tube boilers.

Method of Application:



Block Construction

Install using standard
procedures for block
construction.