

interoffice
M E M O R A N D U M

to: William Longo
from: Margaret Manville
subject: Eagle Picher Supertemp
date: March 21, 2000

Eagle Picher Interrogatories show Supertemp Block Insulation contained chrysotile asbestos from 1938 until 1945. One Interrogatory stated the product was manufactured until 1951 but contained asbestos only until 1948 (Exhibit GR 99, attached). The Product Specification Sheets you sent show that some form of Supertemp was manufactured until 1958, however, the company does not address this in any interrogatories. The sales brochures we have for Supertemp and Supertemp PV are not dated and do not state if these products contained asbestos.

You noted in your letter the service temperature of these products were 1700° but we have an Interrogatory (ACS 246, attached) and a sales brochure for Supertemp PV that list the service temperature to up to 1900°.

One interesting note, Eagle Picher admits in a 1990 Interrogatory (NAR 168, attached) that even though " ...a small percentage of chrysotile asbestos fiber was charged against a product known as 'Supertemp Block'. However, former plant managers of the Company deny that the product ever contained asbestos fiber."

Hope you find this information and the attached documents helpful.

ATTORNEY WORK PRODUCT - CONFIDENTIAL



MAR 09 00* 18969

March 6, 2000

Ms. LeAnne Jackson
Baron and Budd
3102 Oak Lawn Avenue
Suite 1100
Dallas, TX 75219

cc: kim P
Pat A

Do either of you know
anything about this

RE: Eagle-Pitcher Non-Asbestos Insulating Block Material

Dear LeAnne:

Enclosed please find some Eagle-Pitcher manufacturing specifications for what looks like a non-asbestos containing thermal insulation block material that had a service temperature of up to 1700°F. Interesting enough, Ol's and OCF's Kaylo 10 was only good to about 1200°F.

Also, it looks like at a minimum, this material was manufactured from 1946 to 1958. Of course, there may be additional specification sheets that I don't have.

If you have any additional information on this product, I would appreciate it if you could forward a copy to me.

Sincerely,

Bill

William E. Longo, Ph.D.
President

WEL/mac

Can we help him
By

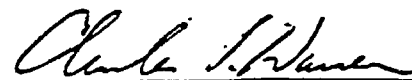
ANSWER:

See attached agreement.

Respectfully submitted,

GRIGSBY, GACA & DAVIES, P.C.

By

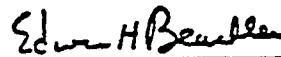


Charles S. Warren, Esquire
Attorneys for North
American Refractories
Company, one of the
defendants

Respectfully submitted,

McARDLE, CAROSELLI,
SPAGNOLLI & BEACHLER

By



Edwin H. Beachler
Attorney for Plaintiffs

AMERICAN REFRACTORIES CO. CLEVELAND, OHIO 44114
DIVISION OF ELTRA CORPORATION

PLANT NUMBER	85	MANIFEST NUMBER
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SALES DEPT.

No. C-138

TO
NAME
ADDRESS
CITY
STATE

ROUTE VIA NARCO TRUCK

TO
T. NO. 740
E
H.K. PORTER CO., INC.
CONNORS STEEL DIV.
P.O. BOX 118

RESS
HUNTINGTON, W. VA. 25706

REQUESTED SHIPPED MAY 20 1970

DATE ENTERED	CUST. ORDER NO.	CUST. REQ. NO.	CUST. ORDER DATED
6/1/70	7428	BW-541	
SHIPPED FROM	NET WEIGHT	FREIGHT RATE	DATE OF SHIPMENT
TON OHIO			
PRICES INCLUDE FREIGHT	PPD COL	TOTAL SHIPPED	9" EQUIV. TONS
			DATE/RELEASE NO.
REQUESTED ROUTING	CAR NO. OR B/L NO.		

CAR NO. OR
B/L NO.[illegible]

BILLING DEPT:

PRICE ON ASHLAND HI-GRADE 10 $\frac{1}{2}$ X4 $\frac{1}{2}$ X3 STS.
TO MEET COMPETITION PER GAM/NLS.

REMARKS:

SHIPPED ON MANIFEST # 80-170 DO NOT DUP
TYPE "C" AND "S" PROTECTION.



EAGLE-PICHER Insulation Division PRODUCT SPECIFICATION

CONFIDENTIAL • FOR EMPLOYEES ONLY • NOT FOR DISTRIBUTION

This specification forms the basis for all Manufacturing Specifications, Fabricating Specifications, Purchasing Specifications, Inspection Procedures, Advertising, Sales Promotion and Product Reference data. No deviation may be made from these requirements except under emergency conditions in which case the deviation shall be reported promptly to the Insulation Engineering Department. Revisions may be requested by written memorandum giving reasons for the desired change. Until such recommendations have been adopted and incorporated in a revised issue, the provisions of this Specification shall govern.—T. C. CARTER.

No. 1-1

Effective March 11, 1947

Issued March 11, 1947

Supersedes T.P.S. I-1
Dated 12-19-46

1. Product Name:

**EAGLE-PICHER SUPERIOR BLOCK INSULATION
(Code 429)**

CONFIDENTIAL

2. Description:

- a. The product is a dry, dark gray, relatively dust free, homogeneous insulating block, composed of Eagle-Picher Mineral Wool Fiber with suitable binding agents, formed into a semi-rigid or rigid material. Blocks are flat and rectangular with square corners and sides and ends parallel. Blocks are water repellant and shall be sufficiently strong to withstand normal shipping and installation without excessive breakage.
- b. Raw materials, processing and/or fabrication required shall be in accordance with Manufacturing Specification dated December 6, 1946.

3. Governing or Guiding Specifications:

- a. U. S. Department of Commerce Commercial Standard CS 117-44 (Governing).
- b. U. S. Department of Commerce Commercial Standard CS 121-46 (Governing).
- c. Federal Specification HH-I-564 (Governing).
- d. Navy Department Specification 32-I-30 (Guiding).
- e. A.S.T.M. M-18 (Guiding). (Note: This A.S.T.M. specification was cancelled).

4. Patents, Trade Marks and Copyrights:

- a. Trade Mark No. (Pending).

5. Causes for Rejection:

- a. Use of improper ingredients in manufacture.
- b. Non-compliance with performance properties specified in paragraphs 2 and 6.
- c. Presence of foreign materials.
- d. Non-uniformity as to shape or other physical properties.

(Note: Any lot or shipment which does not meet with all requirements of this specification shall be rejected. Such products of sub-standard quality shall be plainly marked and stored separately pending disposition).

6. Dimensional Requirements and other Physical and Chemical Properties:

a. Standard sizes are:

Length	18"
Width	6" and 12"
Thickness	1", 1-1/2", 2", 2-1/2", 3", 3-1/2", 4".

Special sizes available within maximum dimensions of 4" x 12" x 18".

Width, Length and Thickness tolerances shall be plus or minus 1/8".

b. Physical and Chemical Properties - Performance Requirements.

(Note: Performance properties listed below shall be tested at a frequency of every 6 months unless otherwise specified).

Supertenn

Property	Specification	Tolerance	Test Procedure	
			E-P Number	Source
Breaking Load (6" Wide Specimen on 10" Span)	1" Thick - 8 lbs Min. 2" Thick - 40 lbs Min. 3" Thick - 110 lbs Min. 4" Thick - 140 lbs Min.	Minus zero " " " "	I-146a	ASTM C-203 4ST
Compressive Strength	2000 lbs/sq.ft. Min. at 5% compression of original thickness or at failure, which- ever is lower.	Minus zero	I-126a	ASTM C-165
Corrosion (To Steel)	Shall not accelerate corrosion	None	I-130a	CS-131
Density	18#/cu.ft. Minimum 22#/cu.ft. Maximum	Minus zero Plus zero	I-136a	CS-131
Fire Resistance	Material shall be rated incombustible	None	I-144b	CS-131
Linear Shrinkage	2% Max. after 6 hours @ 1500°F	Plus zero	I-168b	HE-I-56
Loss in Weight	2% Max. after 6 hours @ 1500°F	Plus zero	I-190b	HE-I-56
Moisture Absorption	1% Maximum by weight	Plus zero	I-104b	CS-131
Temperature Resistance	No failure or change in state which will adversely affect its use after exposure to 1700°F (one face) for 96 hours.	None	I-180b	CS-131
Thermal Conductivity	.42 Btu Max. @ 200°F Mean T. .51 Btu Max. @ 400°F Mean T. .61 Btu Max. @ 600°F Mean T. .75 Btu Max @ 800°F Mean T.	Plus zero " " " " " "	I-184a	CS-131 or ASTM C-177

c. Factory Control Tests:

Quality control tests shall be made periodically as called for in the Manufacturing Specification to insure continuous compliance with the performance property limits specified in paragraphs 2a., 6a. and 6b.

7. Inspection Procedures:

- a. Visual inspection shall be maintained on all material manufactured.
- b. Samples for performance test purposes shall be tested in accordance with paragraph 6b and reported in triplicate to the Insulation Engineering Department, Cincinnati. Such samples shall be taken at random from material in standard shipping containers which have been warehoused for a minimum of two weeks.
- c. Before making any changes in the product such as in purchased ingredients, manufacturing process, packaging, etc., which may affect either the physical properties, performance or appearance of the product, samples shall be submitted to the Insulation Engineering Department for approval. When such changes are authorized, tests shall be made as covered in paragraph 6b and the results forwarded to Cincinnati.

8. Preparation for Shipment:

- a. Containers shall be 275# test cartons of design adequate to protect products and of proper dimensions to restrict shifting in transit. Carton shall be marked with freight classification stamp. Carton sizes shall be as follows:

Block Thickness

1", 1-1/2", 2", 3", 4"
 2-1/2"
 3-1/2"

Carton Size

24-1/8" x 18-1/8" x 12-1/8"
 30-1/8" x 18-1/8" x 12-1/8"
 28-1/8" x 18-1/8" x 12-1/8"

- b. Pending completion of carton study, the plain cartons shall be stencilled as indicated in paragraph 8a & d. Upon completion of study the cartons shall be printed in the type colors and layout as per approved design.
- c. Cartons shall be clearly stencilled with number and size of pieces and square feet and board feet per carton using data from the following table.

Thickness	Bl.Ft./ctn.	Sq.Ft./ctn.	Pieces per Ctn.	
			6" x 18"	12" x 18"
1"	36	36	48	24
1-1/2"	36	24	32	16
2"	36	18	24	12
2-1/2"	45	18	24	12
3"	36	12	16	8
3-1/2"	42	12	16	8
4"	36	9	12	6

- 4
8. d. A lot number shall be stamped on each container to permit complete manufacturing identification when required.
- e. Cartons shall be tightly glue-sealed, then stored in a dry, protected location.

Insulation Engineering Department

By _____

H. E. Lewis

DAST:mab

THE EAGLE-PICHER COMPANY
INSULATION DIVISION

MANUFACTURING SPECIFICATION

PLANT PRODUCTION MUST FOLLOW THIS SPECIFICATION.

Emergency Change may be made but shall be promptly reported to the Production Manager and may not extend beyond the Emergency. Permanent Change must be submitted to and be approved by the Production Manager before use by any Plant.

Product Supertemp Block

Plant Joplin

Page 1 of 4 Pages

Effective November, 1950

Supersedes Spec. Dated 12/6/46

Revised Items Entire Form & Contents

Prepared By C. E. Young

Approved:

Production Mgr. [Signature]

Division Mgr. [Signature]

CONFIDENTIAL

I. PRODUCT DESCRIPTION

- (a) Eagle-Picher Supertemp Block is a dark grey, dry, relatively dust free block composed of Eagle-Picher Mineral Wool thoroughly blended with suitable binding agents. The finished product is semi-rigid and rectangular in shape with square corners and parallel faces.

II. PRODUCT INFORMATION

- | | |
|---|--|
| (a) Density | 22-24 lbs./cu.ft. |
| (b) Service temperature | Up to 1700F, one face |
| (c) Fire resistance | Incombustible |
| (d) Corrosion on steel | None |
| (e) Performance @ 1700F, one face | |
| Volumetric shrinkage | 2% |
| Linear shrinkage | 2% |
| Loss in weight | 2% |
| (f) Compressive strength
(10% deformation) | 18 psi |
| (g) Breaking strength
(1" x 6" on 10" span) | 12 lbs. |
| (h) Thermal conductivity (k) in
BTU in/sq.ft/hr/°F | 0.37 @ 200F M.T.
0.53 @ 500F M.T.
0.64 @ 700F M.T. |
| (i) Block Sizes | |
| Length | 18" and 36" |
| Width | 6" and 12" |
| Thickness | 1" to 4" in ½" increments |
| (j) Packages | Cartons |
| (k) Net Weight, per carton | 66, 77, and 82.5 lbs. |



Void - See Revision 3/24/52

III. RAW MATERIALS

<u>MATERIAL</u>	<u>WT. PER MIX*</u>	<u>PERCENT*</u>
(a) Tufted Wool (Type H-1 in burlap bags)	350 lbs.	85.8%
(b) Bentonite Clay -200 Mesh, 95% min. -300 Mesh, 70% min.	50 lbs.	12.3%
(c) Hydrated Lime (High Calcium)	2.5 lbs.	0.6%
(d) Starch (#126 Buffalo Corn Starch)	5.5 lbs.	1.3%
	408.0 lbs.	100.0%

*NOTE: Weights and percentages are approximate only. In practice, measurement is by volume rather than by weight.

IV. PROCESSING

- (C)
- (a) The clay, lime, and starch are added to 55 gallons of water, under agitation, in pre-mix tank.
 - (b) When this slurry is thoroughly blended, it is heated to approximately 200°F, being kept under continuous agitation during the heating.
 - (c) The hot slurry is then moved by gravity from the pre-mix tank to the mixing tank.
 - (d) Here, the slurry is again placed under agitation and 10-35 pound bags of wool, plus sufficient water to bring the whole mixture to 450 gallons, are added.
 - (e) Mixing continues, until the wool fibers are thoroughly dispersed and suspended in the slurry.
 - (f) The resultant slurry is then metered in the mold boxes, allowed to drain and pressed to the desired thickness.
 - (g) The mold boxes are removed and returned for refilling.
 - (h) The pressed, green blocks are sent to the drying ovens on rack cars.

The blocks are dried for approximately 4 days with in-going gases to ovens at 400°F.

After drying, the blocks are allowed to cool to a handling temperature.



IV. PROCESSING (Cont'd)

- (k) The cooled blocks are then planed and sawed to the desired dimensions.
- (l) Acceptable Blocks are packed in cartons which are then closed, marked, and placed in storage or made ready for shipment. See VI-b below for quantities.

V. PRODUCT CONTROL

- (a) Product control tests shall be conducted as often as is necessary to maintain the quality limits set forth in the following table but with no less frequency than indicated.

PROPERTY	VALUE	MIN. TEST FREQUENCY	TEST PROCEDURE
(1) Dustiness	Relatively free	Continuous	Visual
(2) Waterproofness	To be determined	0.25% Production	To be determined
(3) Density		0.25% Production	E-P I-136a
Minimum	22 lb/cu.ft.		
Maximum	24 lb/cu.ft.		
(4) Breakload		0.25% Production	Navy 32-I-3
1"x6" on 10" span	12 lb. min.		
(5) Dimensional Tolerance	-0 / 1/8 inch	0.25% Production	Visual

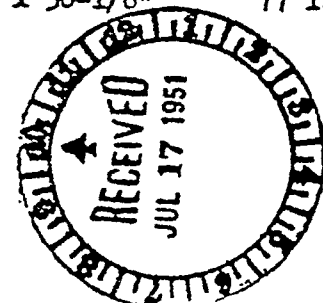
- (b) Substandard material shall be set aside for disposition as directed by Plant Manager

VI. PACKAGING

- (a) Packages shall be regular slotted cartons made from 275 lb. test stock.

- (b) Packages shall be filled in accordance with the following table:

BLOCK SIZE	BLOCK THICKNESS	BD. FT. PER CARTON	CARTON SIZE	APPROX. MIN.NET WT. PER CARTON
6" and 12" x 18"	1, 1½, 2, 3, 4 in.	36	24-1/8" x 18-1/8" x 12-1/8"	66 lbs.
6" and 12" x 18"	2½ in.	45	30-1/8" x 18-1/8" x 12-1/8"	82½ lbs.
6" and 12" x 18"	3½ in.	42	28-1/8" x 18-1/8" x 12-1/8"	77 lbs.
6" and 12" x 36"	1, 1½, 2, 3, 4 in.	36	12-1/8" x 12-1/8" x 36-1/8"	66 lbs.
6" and 12" x 36"	2½ in.	45	15-1/8" x 12-1/8" x 36-1/8"	82½ lbs.
6" and 12" x 36"	3½ in.	42	14-1/8" x 12-1/8" x 36-1/8"	77 lbs.



VI. PACKAGING (Cont'd)

- (c) Cartons shall be printed in accordance with E-P Form layout D-212.
- (d) Cartons shall be closed by gluing top and bottom.
- (e) All cartons shall be marked with a code number that will permit complete manufacturing identification.
- (f) This product shall be identified on shipping forms as "Mineral Wool Blocks in Cartons".



THE EAGLE-PICHER COMPANY
INSULATION DIVISION

MANUFACTURING SPECIFICATION

PLANT PRODUCTION MUST FOLLOW THIS SPECIFICATION.

Emergency Change may be made but shall be promptly reported to the Production Manager and may not extend beyond the Emergency. Permanent Change must be submitted to and be approved by the Production Manager before use by any Plant.

Product- Supertemp Block

Plant- Joplin

Page- 1 of 4

Effective- March 24, 1952

Supersedes- November, 1950

Revised Items- VI- 6 b

Prepared By- C. E. Young

Approved:

Production Mgr.

Division Mgr.

CONFIDENTIAL

I. PRODUCT DESCRIPTION

- (a) Eagle-Picher Supertemp Block is a dark grey, dry, relatively dust free block composed of Eagle-Picher Mineral Wool thoroughly blended with suitable binding agents. The finished product is semi-rigid and rectangular in shape with square corners and parallel faces.

II. PRODUCT INFORMATION

- | | |
|---|--|
| (a) Density | 22-24 lbs/cu.ft. |
| (b) Service temperature | Up to 1700F, one face |
| (c) Fire resistance | Incombustible |
| (d) Corrosion on steel | None |
| (e) Performance @ 1700F, one face | |
| Volumetric shrinkage | 2% |
| Linear shrinkage | 2% |
| Loss in weight | 2% |
| (f) Compressive strength
(10% deformation) | 18 psi |
| (g) Breaking strength
(1" x 6" on 10" span) | 12 lbs. |
| (h) Thermal conductivity (k) in
BTU in/sq.ft/hr/ F | 0.37 @ 200F M.T.
0.53 @ 500F M.T.
0.64 @ 700F M.T. |
| (i) Block Sizes | |
| Length | 18" and 36" |
| Width | 6" and 12" |
| Thickness | 1" to 4" in 1/2" increments |
| (j) Packages | Cartons |
| (k) Net Weight, per carton | 66, 77, and 82.5 lbs. |

III. RAW MATERIALS

	<u>MATERIAL</u>	<u>WT. PER MIX*</u>	<u>PERCENT</u>
(a)	Tufted Wool (Type H-1 in burlap bags)	350 lbs.	85.8%
(b)	Bentonite Clay -200 Mesh, 95% min. -300 Mesh, 70% min.	50 lbs.	12.3%
(c)	Hydrated Lime (High Calcium)	2.5 lbs	0.6%
(d)	Starch (#126 Buffalo Corn Starch)	5.5 lbs.	1.3%
		408.0 lbs.	100.0%

*NOTE: Weights and percentages are approximate only. In practice, measurement is by volume rather than by weight.

IV. PROCESSING

- (a) The clay, lime, and starch are added to 55 gallons of water, under agitation, in pre-mix tank.
- (b) When this slurry is thoroughly blended, it is heated to approximately 200F, being kept under continuous agitation during the heating.
- (c) The hot slurry is then moved by gravity from the pre-mix tank to the mixing tank.
- (d) Here, the slurry is again placed under agitation and 10-35 pound bags of wool, plus sufficient water to bring the whole mixture to 450 gallons, are added.
- (e) Mixing continues, until the wool fibers are thoroughly dispersed and suspended in the slurry.
- (f) The resultant slurry is then metered in the mold boxes, allowed to drain and pressed to the desired thickness.
- (g) The mold boxes are removed and returned for refilling.
- (h) The pressed, green blocks are sent to the drying ovens on rack cars.
- (i) The blocks are dried for approximately 4 days with in-going gases to ovens at 400F.
- (j) After drying, the blocks are allowed to cool to a handling temperature.

IV. PROCESSING (Cont'd)

- (k) The cooled blocks are then planed and sawed to the desired dimensions.
- (l) Acceptable Blocks are packed in cartons which are then closed, marked and placed in storage or made ready for shipment. See VI-h below for quantities.

V. PRODUCT CONTROL

- (a) Product control tests shall be conducted as often as is necessary to maintain the quality limits set forth in the following table but with no less frequency than indicated.

<u>PROPERTY</u>	<u>VALUE</u>	<u>MIN. TEST FREQUENCY</u>	<u>TEST PROCEDURE</u>
(1) Dustiness	Relatively free	Continuous	Visual
(2) Waterproofness	To be determined	0.25% Production	To be determined
(3) Density Minimum Maximum	22 lb/cu.ft. 24 lb/cu.ft.	0.25% Production	E-P I-136a
(4) Breakload 1"x 6" on 10" span	12 lb. min.	0.25% Production	Navy 32-I-3
(5) Dimensional Tolerance	-0 + 1/8"	0.25% Production	Visual

- (b) Substandard material shall be set aside for disposition as directed by Plant Manager.

VI. PACKAGING

- (a) Packages shall be regular slotted cartons made from 275 lb. test stock.
- (b) Packages shall be filled in accordance with the following table:

<u>BLOCK SIZE</u>	<u>BLOCK THICKNESS</u>	<u>BD. FT. PER CARTON</u>	<u>CARTON SIZE</u>	<u>APPROX. MIN. NET WT. PER CARTON</u>
6" and 12" x 18"	1, 1½, 2, 2½, 3 in.	45	30-1/8" x 18-1/8" x 12-1/8"	82½ lbs.
6" and 12" x 18"	3½, 4 in.	42	28-1/8" x 18-1/8" x 12-1/8"	77 lbs.
6" and 12" x 36"	1, 1½, 2, 3, 4 in.	36	12-1/8" x 12-1/8" x 36-1/8"	66 lbs.
6" and 12" x 36"	2½ in.	45	15-1/8" x 12-1/8" x 36-1/8"	82½ lbs.
6" and 12" x 36"	3½ in.	42	14-1/8" x 12-1/8" x 36-1/8"	77 lbs.

VI. PACKAGING (Cont'd)

- (c) Cartons shall be printed in accordance with E-P layout D-112.
- (d) Cartons shall be closed by gluing top and bottom.
- (e) All cartons shall be marked with a code number that will permit complete manufacturing identification.
- (f) This product shall be identified on shipping forms as "Mineral Wool Blocks in Cartons".

THE EAGLE-PICHER COMPANY
INSULATION DIVISION

MANUFACTURING SPECIFICATION

PLANT PRODUCTION MUST FOLLOW THIS SPECIFICATION.

Emergency Change may be made but shall be promptly reported to the Production Manager and may not extend beyond the Emergency. Permanent Change must be submitted to and be approved by the Production Manager before use by any Plant.

Product PV Supertemp Block

Plant Joplin

Page 1 of 5

Effective June 14, 1958

Supersedes Spec. dated 3-4-52

Revised Items Entire Specification

Prepared By D. A. Schaalal

Approved:

Production Mgr. Alton L. Jones

Division Mgr. Alex J. Christie

I. PRODUCT DESCRIPTION

- 1.1 Eagle-Picher PV Supertemp Block is a dark gray mineral wool insulating block composed of Eagle-Picher Mineral Wool and suitable binding agents. The block is relatively dust free, water repellant and formed into semi-rigid rectangular shapes having square corners and parallel faces.

II. PRODUCT INFORMATION

- | | |
|---|---|
| 2.1 Density | 16 to 18 lbs./cu. ft. |
| 2.2 Service temperature | Up to 1900 F, one face |
| 2.3 Fire resistance | Incombustible |
| 2.4 Corrosion on steel | None |
| 2.5 Performance @ 1900 F, one face | |
| Volumetric shrinkage | 2% |
| Linear shrinkage | 2% |
| Loss in weight | 2% |
| 2.6 Compressive strength at 10% deformation | 18 psi |
| 2.7 Breaking strength 1" x 6" on 10" span | 23 lbs |
| 2.8 Thermal conductivity (k) in BTU in./sq. ft./hr./deg. F. | 0.37 @ 200 F M.T.
0.53 @ 500 F M.T.
0.64 @ 700 F M.T. |
| 2.9 Standard Block Sizes: | |
| Length | 18" and 36" |
| Width | 6" and 12" |
| Thickness | 1" thru 4" in 1/2" increments |
| 2.10 Packages | Cartons |
| 2.11 Net Weight per carton | 63.68 and 72 lbs |

III. RAW MATERIALS AND FORMULATION

	<u>MATERIAL</u>	<u>FORMULATION</u>	
		<u>LBS./BICK</u>	<u>PERCENT</u>
3.1	Eagle-Picher Supertemp Granulated Wool	180.0	90.77
3.2	Starch (Archer-Daniels-Midland "Adcol 105" Sorghum Starch)	4.0	2.02
3.3	Bentonite Clay 95% min. thru 200 mesh 70% min. thru 300 mesh Substitution Factor, 200 min.	11.0	5.55
3.4	Aluminum Sulfate, powdered	2.7	1.36
3.5	Caustic Soda, Flakes	0.6	.30
TOTAL		198.3	100.00

* NOTE: Weights and percentages are approximate. Slight deviations are made in formulation to secure proper draining of block in the wet molding process.

IV. PROCESSING - Pressure - vacuum molding and wet sawing method.

- 4.1 Approximately 35 gallons of water are run into the primary mix tank. Then the starch is added and cooked until the temperature of the starch solution is approximately 200 F. Constant agitation is maintained during this operation.
- 4.2 Sufficient water is added to bring level up to 145 gallons. Clay is added at the same time. Agitation is continued and this portion of the mixing cycle consumes approximately 1½ minutes. This permits clay to be adequately dispersed and expanded.
- 4.3 One pint of caustic solution is then added. Solution is made by adding 75 lbs. of caustic soda to 18½ gallons water. Agitation is continued for at least 1½ minutes to permit further expansion of clay.
- 4.4 The aluminum sulfate is then added and agitation is continued for at least two minutes. This flocculates the clay and the mix is ready for transfer to the secondary mix tank.

IV. PROCESSING (Cont'd)

- 4.5 The wool is placed in a hopper which can transfer its contents into the secondary mix tank. Normally, small pieces of scrap block and trim from the wet sawing process are added here to salvage the value of material in them. This is equivalent to adding approximately one bag (30 lbs) of wool.

The wool and slurry are then transferred into the secondary mix tank and water is added to bring level up to 450 gallons of mix. A minimum of agitation is used to disperse the mix and to avoid breaking the wool fibers.

- 4.6 Once the mix is sufficiently agitated, it is transferred to the surge tank and is ready for the molding operation. The surge tank provides a minimum of agitation and only during the period of drawing off the mix to the scale box.
- 4.7 The scale box automatically measures the mix. Approximately $8\frac{1}{2}$ master blocks are obtained from one mix.
- 4.8 The pressure vacuum equipment then drains the excess water from the mix and molds the semi-dry master block.
- 4.9 Each master block is positioned on a carrier pan and is then automatically moved through the wet sawing process to be cut to the proper width, length and thickness. (Note: The combination of thickness adds up to 5 inches.)
- 4.10 The master blocks are checked for dimensions and irregularities prior to loading onto drying carts. Substandard pieces are removed and fed back with the wet trim.
- 4.11 The blocks are dried in ovens at approximately 400 F for 70 hours.
- 4.12 After drying, the blocks are removed from the ovens and permitted to cool.
- 4.13 Blocks are removed from the carts and packaged. Final inspection is made just prior to inserting the blocks into cartons.
- 4.14 Cartons are identified to show contents and date of packing. They are then ready to ship or be palletized and put into the warehouse.

V. PRODUCT CONTROL

- 5.1 Product control tests shall be conducted as often as is necessary to maintain the quality limits set forth in the following table but with no less frequency than indicated.

V. PRODUCT CONTROL (Cont'd)

<u>PROPERTY</u>	<u>VALUE</u>	<u>MIN. TEST FREQUENCY</u>	<u>TEST PROCEDURE</u>
5.1.1 Dustiness	Relatively free	Continuous	Visual
5.1.2 Waterproofness	Sheds water	.5% Production	Apply water
5.1.3 Density			
Minimum	16 lbs/cu. ft.	.5% Production	E-P I-136a
Maximum	20 lbs/cu. ft.		
5.1.4 Breaking Strength	20 18 lb. min. ave. 1" x 6" on 10" span (None below 18 lb.)	.5% Production	Navy 32-I-3
5.1.5 Dimensional Tolerance		Continuous	Visual
Thickness	+ 1/16"		and gage
Len. & Width	+ 1/8"		

5.2 Substandard material shall be set aside for disposition as directed by the plant manager.

VI. PACKAGING

6.1 Packages shall be regular slotted cartons made from ¹⁰⁰275 lb. test stock with $\frac{1}{4}$ " flute and tape closure. Standard carton sizes are as follows:

- 16" carton - 16-1/8" X 12-1/8" X 36-1/8"
- 15" carton - 15-1/8" X 12-1/8" X 36-1/8"
- 14" carton - 14-1/8" X 12-1/8" X 36-1/8"

6.2 Cartons shall be printed in accordance with E-P form layout D-147. The 14" cartons are plain except for "contents panel". Colors are GCMH #21 green and #22 orange.

6.3 Cartons shall be filled in accordance with the following tables:

<u>BLOCK THICKNESS</u>	<u>BD. FT. PER CTN.</u>	<u>CTN. SIZE</u>	<u>APPROX. GROSS WT. PER CTN. LBS.</u>
1", 2", 4"	48	16"	74
1 1/2", 2 1/2", 3"	45	15"	69
3 1/2"	42	14"	65

<u>BLOCK THICKNESS</u>	<u>PIECES PER CARTON</u>		
	<u>6 X 18</u>	<u>6 X 36 or 12 X 18</u>	<u>12 X 36</u>
1"	64	32	16
1 1/2"	40	20	10
2"	32	16	8
2 1/2"	24	12	6
3"	20	10	5
3 1/2"	16	8	4
4"	16	8	4

VI. PACKAGING (Cont'd)

- 6.4 Cartons shall be closed by gluing top and bottom.
- 6.5 All cartons shall be marked with a code number that will permit complete manufacturing identification.
- 6.6 Cars or trucks shall be inspected and any wire, nails, or other protuberances which might tear cartons shall be removed. Cartons shall be suitably protected, if such hazards cannot be removed, to prevent damage in transit or when opening doors at destination.
- 6.7 This product shall be identified on shipping forms as "Mineral Wool Blocks in Cartons".

15th Dec or over.

Koa

Supplies 230V