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HERRON & HERRON

KNOX, RICKSEN, SNOOK, ANTHONY & ROBBINS
One Kaiser Plaza, Suite 850
Oakland, California 94612

Attorneys for Defendant,
COMBUSTION ENGINEERING, INC.

PLAINTIFF'S EXHIBIT
CE-370

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF ALAMEDA

IN RE: DISCOVERY FOR RELATED SHIPYARD ASBESTOS CASES (HERRON)	No. 795 582 COMBUSTION ENGINEERING, INC.'S RESPONSES TO PLAINTIFF'S SECOND SET OF INTERROGATORIES

PROPOUNDING PARTIES: CONSOLIDATED SHIPYARD ASBESTOS CASES OF HERRON

RESPONDING PARTY: COMBUSTION ENGINEERING, INC.

SET NUMBER: TWO

Defendant COMBUSTION ENGINEERING, INC. answers and objects to plaintiff's interrogatories as follows:

GENERAL OBJECTION APPLICABLE TO ALL INTERROGATORIES

COMBUSTION ENGINEERING, INC. objects to these interrogatories to the extent that they are overboard and unduly burdensome and oppressive in that they seek information which is neither

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relevant to the subject matter of this action nor reasonably calculated to lead to the discovery of admissible evidence.

In particular, COMBUSTION ENGINEERING, INC. objects to the use of contention interrogatories in that there are no adversary issues between defendants raised by the pleadings although this defendant reserves the right to prove any and all facts regarding the mining, supplying, distributing and/or manufacturing of asbestos or asbestos containing products and/or materials at time of trial.

This defendant COMBUSTION ENGINEERING, INC. answers interrogatories as follows:

NO. 1

Frank T. Christenson; Assistant to Vice President of Industrial Sales; C-E Refractories of Combustion Engineering, Inc.; P.O. Box 828; Valley Forge, Pennsylvania.

NO. 2

Yes

(a) Combustion Engineering, Inc.

(b) Delaware

(c) 900 Long Ridge Road, Stanford, Connecticut

(d) Yes

(e) Public

NO. 3

October 25, 1912 - The Locomotive Superheader Co.; March 1, 1921 - The Superheater Co.; December 31, 1948 - Combustion Engineering - Superheater, Inc; April 15, 1953 to date - Combustion

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Engineering, Inc.

NO. 4 & 5

Refractory and Insulation Corp. The Insulation Division of M.H. Detrick Co.; Walsh Refractories Corp.

NO. 6

No.

NO. 7

During the time that this Defendant was in the business of manufacturing asbestos-containing products, i.e., from mid-1963 through 1972, it maintained no organization charts specifically with respect to such business.

NO. 8

Defendant objects to this interrogatory on the ground that it is entirely irrelevant to any of the issues involved in this case. This Defendant was in the business of manufacturing asbestos-containing insulation products from June 5, 1963 through 1972, and the corporate minutes for that entire period of time have been reviewed and there is no mention of asbestos or asbestos-containing products in any such minutes.

NO. 9

Defendant objects to Interrogatory No. 9 on the ground that it is entirely irrelevant to the issues in this case. Moreover, Defendant is a public corporation and its annual report is readily available to plaintiff. Therefore, plaintiff can, if he wishes, obtain such information.

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NO. 10

No.

NO. 11

This Defendant manufactured and sold asbestos-containing insulation products beginning on June 5, 1963 and discontinued such activities in 1972.

NO. 12

(a) (b) (c) (d) (f) See Exhibit "A", attached hereto.

(e) For the most part, these products were white or off-white. Defendant has no records of the various logos used on the packaging, but there were no logos on the product itself.

(g) The manufactured asbestos-containing products can be segregated into four categories. A description of the various processes follows:

(1) Insulating Cements, Fills and Insulating Castables

Ingredients were proportioned, mixed and bagged. Quality control procedures involved measuring the adhesiveness of the product and measuring shrinkage of a sample which was wet and then dried. Coverage was also measured occasionally. Insulating castables were tested for modulus of rupture, compressive strength, density and screen analysis.

(2) Mineral Wool Block - Griptex

This product mix was weighed, mixed with water, extruded to desired thickness onto wire mesh trays. The trays were then dried in an oven; the block removed, trimmed, cut if necessary, and placed in cartons. Quality control involved

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weighing the block, testing for compressive strength and occasionally for shrinkage at temperatures.

(3) Insulating Block

The product mix was weighed, mixed with water; the slurry poured into boxes where water was suctioned from the slurry, leaving a "blank" or "slug", 12" x 36" x 6" thick. The slug was put in a curing chamber on trays, then transferred to a drying oven. After drying, they were trimmed and cut into various sizes and thicknesses, then placed in cartons. Quality control procedures were to test for density and compressive strength. Shrinkage at temperatures was also tested occasionally.

(4) Wet Mix Products

These products were weighed, wet mixed and packed in steel drums. Quality control procedures were to test for consistency, moisture loss and screen analysis.

(h) Combustion Engineering, Inc.

(i) Unknown

(j) None - Not applicable

(k) Defendant has no records from which it can answer this interrogatory with specificity; however, Defendant believes that during the time this Defendant manufactured asbestos-containing insulation products, i.e., from June 5, 1963 through 1972, it obtained raw asbestos from the following companies: Johns-Manville Corp., Empire Ace Manufacturing Co., George A. Rowley Co., Asbestos Spray Co., Carey-Canadian Mines, Ltd., Chicago Firebrick Co., Asbestos Corp.

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(1) Yes

(i) and (ii) This Defendant's distributor in California from 1968 through 1972 was Pryor Giggey Co., of Santa Fe Springs, California.

During said period, the following sales were made to the Pryor Giggey Co.:

1968 - Griptex Insulating Block, $499.32; Super 711 Insulating Cement, $306.00

1969 - No sales

1970 - Griptex Insulating Block, $3,952.80; Super 711 Insulating Cement, $227.80

1971 - Griptex Block, $3,868.56; Super 711 Cement, $594.00

1972 - Griptex Block, $9,454.32; Super 711 Insulating Cement, $342; Stic-Tite Insulating Cement, $114

Defendant has no records prior to 1968.

(iii) What records exist are in the custody of Frank T. Christenson. See interrogatory No. 1

(m) To the best of this Defendant's knowledge, no.

(n) See answer to Interrogatory No. 12 (1) (ii).

(o) See Exhibit "A", attached hereto.

(p) Sales records. Further, see answer to Interrogatory No. 12 (1) (iii).

NO. 13

See answer to Interrogatory No. 12

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NO. 14

See answer to Interrogatory No. 12.

NO. 15

This Defendant is unaware of what sales may have been made by any company listed on Exhibit "A" other than itself.

NO. 16

This Defendant is unaware of what sales may have been made by any company listed on Exhibit "A" other than itself.

NO. 17

Not applicable.

NO. 18

Not applicable.

NO. 19

See answer to Interrogatory No. 12 (k).

NO. 20

This Defendant distributed a product called Weatherkote, which consisted of asbestos fibers in an emulsion. This product was manufactured by the Flintkote Corporation and their name for the product was Thermalkote. See Exhinit "A" for inclusive dates.

NO. 21

To the best of this Defendant's knowledge, no.

NO. 22

See Exhibit "A", attached hereto. This Defendant has no records of the various logos that appeared on the packaging. In 1969, the following appeared on the packaging of all asbestos-containing materials: "CAUTION: This product contains asbestos.

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Excessive inhalation of asbestos may be harmful. If adequate ventilation is not possible, wear respirators approved by U.S. Bureau of Mines."

NO. 23

No.

NO. 24

Yes.

(a) See answer to Interrogatory No. 22. In addition, see Exhibit "B" attached hereto.

(b) 1969 - 1972

(c) This Defendant has no records from which it can answer this interrogatory with specificity; however, it is this Defendant's understanding that an awareness of the health hazards of asbestos was the main consideration for using the warning.

(d) None.

(e) This Defendant has no records from which it can answer this interrogatory with specificity.

NO. 25

No.

NO. 26

Not applicable.

NO. 27

This Defendant has no records from which it can answer this interrogatory with specificity; however, it believes that its name and logos did appear on the packaging of the various asbestos-containing insulation products.

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NO. 28

Warnings were placed on the packaging. See previous answers.

NO. 29

No. Proper use and application of this Defendant's asbestos-containing products were left to industry practice.

NO. 30

No.

NO. 31

See answer to Interrogatory No. 24 (d) and (e).

NO. 32

This Defendant did not advertise its asbestos-containing insulation products.

NO. 33

This Defendant objects to Interrogatory No. 33 on the grounds that it is entirely irrelevant to the issues involved in this case. Moreover, this is an obvious attempt by plaintiff to harass this Defendant, who has been involved in excess of 8,000 asbestos claims. To require Defendant to make such lists and to product such depositions is burdensome and harassing to this Defendant.

NO. 34

No.

NO. 35

No.

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NO. 36.

No.

NO. 37

No.

NO. 38

No.

NO. 39

No.

NO. 40

This Defendant has no records from which it can answer this interrogatory with any specificity, although this Defendant believes that very little, if any, of its asbestos-containing products was transported to the San Francisco Bay Area.

NO. 41

This Defendant has some incomplete material from 1964 and some material from 1970 which was informational and given to distributors of this Defendant's asbestos insulation products. Said material is attached hereto as Exhibit "C".

NO. 42

To the best of this Defendant's knowledge, no.

NO. 43

No.

DATED: August 22, 1983.

KNOX, RICKSEN, SNOOK, ANTHONY & ROBBINS

By _____
Rupert H. Ricksen
Attorneys for Defendant
COMBUSTION ENGINEERING, INC.

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I, RUPERT H. RICKSEN, hereby declare under penalty of perjury that I am one of the attorneys for Defendant COMBUSTION ENGINEERING, INC., a corporation, in the above-entitled action; that said defendant maintains its principal place of business outside of the county in which I maintain my office and place of business; and that for that reason I make this declaration for and on behalf of said defendant; that I have read the foregoing RESPONSES TO PLAINTIFF'S SECOND SET OF INTERROGATORIES and know the contents thereof and the same is true of my own knowledge except as to those matters therein stated upon information or belief, and as to those matters, I believe it to be true.

Executed at Oakland, California, this 22nd day of August, 1983.

RUPERT H. RICKSEN

[illegible] & ROBBINS
ORDWAY BUILDI[illegible] - KAISER CENTER
ONE KAISE ZA, SUITE 850
OAKLAND, C[illegible]IFORNIA 94612
(415) 893-1000

States, and over the age of 18 years, and not a party to the within action; my business address is ONE KAISER PLAZA, SUITE #850, OAKLAND, CA, 94612. I executed this declaration and served a true copy of the foregoing document by mail by placing same in an envelope, sealed, fully prepaid postage thereon and depositing said envelope in the U. S. Mail at Oakland, California, on the 22 day of August, 1983, addressed as follows:

(X) A.C and S.
VAN DE POEL & STRICKLAND
36 - 14th St, #1316
Oakland, CA 94612

(X) ARMSTRONG CORK
GUDMONDSON, SIGGINS & STONE
235 Montgomery Street
San Francisco, CA 94104

( ) ASARCO - LAKE ASBESTOS
PETTIT & MARTIN
600 Montgomery Street
San Francisco, CA 94111

( ) ASBESTOS CORPORATION
( ) SOUTHERN PACIFIC
CROSBY, HEAFEY, et. al.
1939 Harrison Street
Oakland, CA 94612

( ) BABCOCK & WILSON
ANDERSON, GALLOWAY, et al
2201 Broadway #319
Oakland, CA 94612

( ) BRINCO MINING, LTD.
STARK, STEWART, et al
180 Grand Avenue
Oakland, CA 94612

( ) BELL ASBESTOS
RUSS & DANIELS
333 Market Street
San Francisco, CA 94133

( ) BENDIX CORPORATION
GORDON & REES
601 Montgomery Street
San Francisco, CA 94111

( ) THLEHEM STEEL
LLIAM PARRISH
2710 California St.
San Francisco, CA 94115

( ) BIGELOW-LIPTAK CO.
COOPER, WHITE & COOPER
44 Montgomery St.
San Francisco, CA 94104

( ) CASSIER ASBESTOS
STARK, STEWART, et al
Fidelity Plaza, 14th Flr.
180 Grand Avenue
Oakland, CA 94612

(X) CELOTEX
BERRY & BERRY
1221 Broadway, #1880
Oakland, CA 94612

( ) NORTHWEST COPPER WORKS
ELIZASSEN, POSTEL, et al
50 California St., #600
San Francisco, CA 94111

(X) OWENS-CORNING
POPELKA, ALLARD, et al
1 Almaden Blvd. 8th Flr.
San Jose, CA 95113

(X) OWENS-ILLINOIS
MORGENSTEIN, LADD, et al
255 California St., 8th Flr.
San Francisco, CA 94104

( ) PITTSBURGH CORNING
HASSARD, BONNINGTON, ROGERS
44 Montgomery St., #3500
Francisco, CA 94104

( ) PLANT INSULATION (PLANT ASB)
LEACH & SCHNEIDER
2833 Laguna Street
San Francisco, CA 94123

( ) PLANT ASBESTOS
MARTIN & RYAN LAW OFFICES
Ordway Bldg., #785
Oakland, CA 94612

( ) CERTAIN-TEED
FREITAS, McCARTHY, BETTINI, et al
960 - 5th Avenue
San Rafael, CA 94901

( ) THE CLAREMONT CO., INC.
WILD & JEFFREY
10 Vinton Court at Grant Avenue
San Francisco, CA 94108

(X) CROWN CORK & SEAL
FORD MOTOR COMPANY
MARK H. ROSENTHAL, ESQ.
3 Embarcadero Ctr..
San Francisco, CA 94111

(X) EAGLE-PICHER
WININGHAM, ROBERTS & ROGIE
425 California St., #401
San Francisco, CA 94104

( ) E.I. duPONT, deNEMOURS & CO.
PILLSBURY, MADISON & SUTRO
225 Bush Street
San Francisco, CA 94111

(X) FIBREBOARD
LAW OFFICES OF RONALD E. HOTHEM
369 Broadway
San Francisco, CA 94133

( ) FLEXITALLIC GASKET CO., INC.
BLEDSOE, CATHCART, BOYD, et al
650 California St., Ste. 2828
San Francisco, CA 94108

(X) FLINTKOTE
LaFOLLETTE, JOHNSON
320 No. Vermont Ave.
Los Angeles, CA 90017

(X) FORTY-EIGHTY INSULATIONS
DILLINGHAM & MURPHY
225 Bush Street
San Francisco, CA 94104

(X) GAF - RUBEROID
McCUTCHEN, DOYLE, etc.
#3 Embarcadero Center
San Francisco, CA 94111

(X) GARLOCK - COLT LTD.
GLASPY, ELLIOTT, CREECH
171 - 12th St., #100
Oakland, CA 94607

( ) GENERAL DYNAMICS
PELAVIN, NORBERG, HARLOCK, et al
2 Embarcadero Center, 23rd Flr.
San Francisco, CA 94111

( ) PPG INDUSTRIES
BISHOP & BARRY
220 Bush Street, #350
San Francisco, CA 94104
(*PPG*Non-Sac./Solano Cases)

(X) RAYBESTOS MANHATTAN
MALONEY, CHASE, FISHER
#4 Embarcadero, 25th Flr.
San Francisco, CA 94111

( ) ROCK WOOL MFG. CO.
BERG & PHELPS
615 S. Flower St., #1900
Los Angeles, CA 90017

( ) RYDER INDUSTRIES
JAMES ENGLISH
400 Montgomery Street
San Francisco, CA 94104

( ) SACOMO-SIERRA, INC. &
SACOMA MFG. CO., INC.
BRONSON, BRONSON & McKINNON
555 California St., Ste. 3400
San Francisco, CA 94104

( ) SEPCO CORP.
RANDOLPH, SELMAN & LEVANAS
11620 Wilshire Blvd.
Los Angeles, CA 90025

( ) GENERAL MOTORS
PARICHAN, RENBERG, et al
2350 W. Shaw, Ste. #130
Fresno, CA 93711

( ) GEORGIA PACIFIC CORP.
MARRON, REID & SHEEY
One Nob Hill Circle
San Francisco, CA 94123

(X) H. K. PORTER - SO. TEXTILE
LAW OFFICES OF WILLIAM J. DUKE
433 California St., #330
San Francisco, CA 94104

LEACH & SCHNEIDER, APC
2833 Laguna Street
San Francisco, CA 94111

( ) J. P. STEVENS
CARROLL. BURDICK, et al
1 Ecker Bldg., #400
San Francisco, CA 94105

( ) KAISER ALUMINUM & CHEMICAL
KAISER STEEL CORP.
THELEN, MARRIN, JOHNSON, et al
2 Embarcadero Center
San Francisco, CA 94111

(X) KAISER CEMENT & GYPSUM
KINCAID, GIANUNGIO & CAUDLE
100 Webster Street, #300
Oakland, CA 94607

(X) KEENE CORP.
MULLALLY, CEDERBORG, et al
436 - 14th Street, #1405
Oakland, CA 94612

( ) MUNDET CORK
CROWN/FORD MOTOR CO.
BARFIELD, BARFIELD, et al
One California St., #2125
San Francisco, CA 94111

(X) NATIONAL GYPSUM COMPANY
OWEN, MELBYE & ROHLFF
700 Jefferson Avenue
Redwood City, CA 94063

(X) NICOLET
ST. CLAIR, ZAPPETTINI
235 Montgomery St., #635
San Francisco, CA 94104

( ) NORTH AMERICAN ASBESTOS
ERICKSON, MACKENROTH
100 Oak Street
Oakland, CA 94607

( ) SOUTHERN TEXTILE
LAW OFFICES OF WM. J. DUKE
433 California St., #330
San Francisco, CA 94104

( ) STANDARD ASBESTOS
LA FOLLETTE, JOHNSON
320 No. Vermont Avenue
Los Angeles, CA 90004

( ) STATES STEAMSHIP CO.
LOW, BALL & LYNCH
601 California St.
San Francisco, CA 94108

(X) THORPE INSULATION
JAMES CUSICK
4201 Wilshire Boulevard
Los Angeles, CA 90010

( ) TURNER & NEWALL
MONGER, TOOLES & RICKERSHAUSER
612 So. Flower Street
Los Angeles, CA 90017

(X) U. S. GYPSUM
JOHN J. MURRAY, ESQ.
702 Marhsall St., #250
Redwood City, CA 94063

(X) HERRON & HERRO
600 Montgomery
Street, 33rd
Floor
San Francisco,
California
94111

(X) WESTERN MACARTHUR
HARDIN, COOK, LOPER
#1 Kaiser Plaza, #171
Oakland, CA 9461

( )

Charlene Ka
Charlene Kayo

INDUSTRIAL INSULATIONS

TECHNICAL DATA

REFRACTORIES
A DIVISION OF COMBUSTION ENGINEERING, INC.

EXHIBIT C

500° ROPE IS A COMMERCIAL GRADE, WHITE CHRYSOTILE ASBESTOS FIBER.
1000° ROPE IS A PURE 98/100% WHITE CHRYSOTILE ASBESTOS FIBER.

APPLICATIONS OF C-E ASBESTOS ROPE . . HERE ARE SOME OF THE MANY SERVICES

STEEL MILLS AND FOUNDRIES

Uses for C-E Asbestos Rope are almost endless. Sealing molds, vacuum-pouring equipment (where leakage can ruin an entire billet), sand molds off from pouring ladles, calking joints in large cores which must be segmented.

ATOMIC ENERGY

1000° is standard in the Industry because it withstands an integrated neutron flux of 10^{19} NTV units.

MARINE SERVICE

C-E Asbestos Rope is essential in the Engine Room for general boiler service such as calking, filling and expansion joints, wrapping hard-to-reach steam lines and in emergencies, for quick repair of damaged steam lines.

GENERAL INDUSTRY

Anywhere heat sealing is required, whether heat-treating furnaces, boilers or processing operations.

POWER PLANTS

Between boiler walls and brick-work to allow for expansion and contraction, wrapping steam and exhaust lines where space limitations preclude formed insulation, covering small ducts, calking hard-to-reach spaces, insulating hot pipes passing through fire-walls and bulkheads. It is the standard for use in grooves for door sealing, between boiler sections, expansion joints and in handling hot gases.

ASBESTOS ROPE CAN HANDLE EFFICIENTLY AND ECONOMICALLY

CHEMICAL INDUSTRIES

C-E 1000° rope is successfully used as calking rope for bell and spigot joints in chemical lines. Because it contains no organic components, it is used as yarning rope for water lines. In addition to its heat-resistance, the chemically inert characteristics have made it a "standard" in other chemical-handling operations such as packing for carboy-stoppers, and in Cryogenic services, and other applications where this property is required.

ALUMINUM PLANTS

Anywhere the control of heat and sealing is needed—heat-treating ovens, grooves for door sealing, pouring ladles, vauum seals on crucibles, and in many other dry heat-sealing spplications, C-E Rope is recommended.

Griptex* is a major development in insulation offering a unique combination of characteriscs. Special mineral fibers combined with high temperature bonding materials, provide practical advantages. The embossed hard finish surface provides superior handling strength and stronger adhesion of cement finishes. The combination of flexibility and high strength make impaling over welded pins easy, without pre-drilling. The neutral PH of Griptex Block assures against corrosive action. This particularly is important when used in conjunction with aluminum jacketing.

Hydraulic setting cements and castable refractories may be applied directly to Griptex Block without premature loss of mixing water needed for proper hydration.

EFFICIENT

The felted fiber core of Griptex Block offers the maximum buffering action against heat penetration up to 1800°F. The thermal conductivity at 200°F. means temperature is .37 BTU; at 600°F. it is .49 BTU.

APPLICATION METHODS

Griptex may be simply impaled over standard welded pins and secured with speed clips or may be secured in place with metal bands. A sharp knife is the only tool needed to fabricate Griptex to fit irregular shaped equipment. Simply press over bolt heads and projections without additional cutting. Outdoor applications should be weatherproofed.

RECOMMENDED USES

BOILERS
- Drums
- Headers
- Walls
- Economizers
- Air Preheaters

FURNACES
- Heating
- Heat Treating
- Forging
- Annealing
- Normalizing

OVENS, KILNS & DRYERS
FIREPROOFING
TANKS & VESSELS

TURBINES & PUMPS
FAN HOUSING
DUCTS & BREECHINGS

SPECIFICATION REFERENCES

High Temperature mineral fiber block insulation shall be GRIPTEX complying with the performance requirements of ASTM C-392, Class 2; Federal Specification HH-I-564 and/or Commercial Standard CS-117 of the U. S. Department of Commerce.

*A C-E trade name.

A SMOOTH, ONE–COAT PLASTIC FINISH INSULATION

Super Finish Stic-Tite provides a *smooth*, hard, fibrous finish covering for insulating blankets, block, standard Stic-Tite and other insulations. It is a dry, finely ground, pure white mixture of high quality mineral wool and diatomaceous earth which, when mixed with the proper amount of water, is ready for instant use. Like standard Stic-Tite, it forms a spongy mass of dead air cells which stops air infiltration and resultant heat loss.

NO ROUGHING COAT–FINISHES SMOOTH

Super Finish Stic-Tite is applied in a single coat. *It can be troweled very smooth* for pleasing white appearance. No roughing coat is needed, thereby saving materials and labor. It does not shrink or crack. There is no pointing up or patching necessary after Super Finish Stic-Tite has dried.

USE SUPER FINISH STIC–TITE

WHEN a *perfectly smooth, one-coat* plastic finish insulation is specified for temperatures up to 1700°F.

WHEN necessary to cover blankets, block or standard Stic-Tite in order to provide a *smooth*, hard, white surface.

DOESN'T COME OFF

Super Finish Stic-Tite adheres strongly to overhead, vertical and curved surfaces and rounded corners. Once it has dried, the bond is unaffected by vibration, impact or moisture.

CAN BE APPLIED ON COLD OR HOT SURFACES

Because it doesn't shrink during drying, Super Finish Stic-Tite can be applied directly to cold or hot metal or brick surfaces up to 175°F. It dries hard, without shrinking, in about 2 hours. When applied to hotter surfaces, a rough coat of standard Stic-Tite is recommended.

GOES A LONG WAY

Super Finish Stic-Tite gives excellent coverage. One hundred pounds cover an 80 sq. ft. surface with a 1/2" thick layer; 120 sq. ft. with a 3/8" thick layer; or 160 sq. ft. with a 1/4" thick layer. This is by far the lowest cost coverage of any other one-coat finish insulation available.

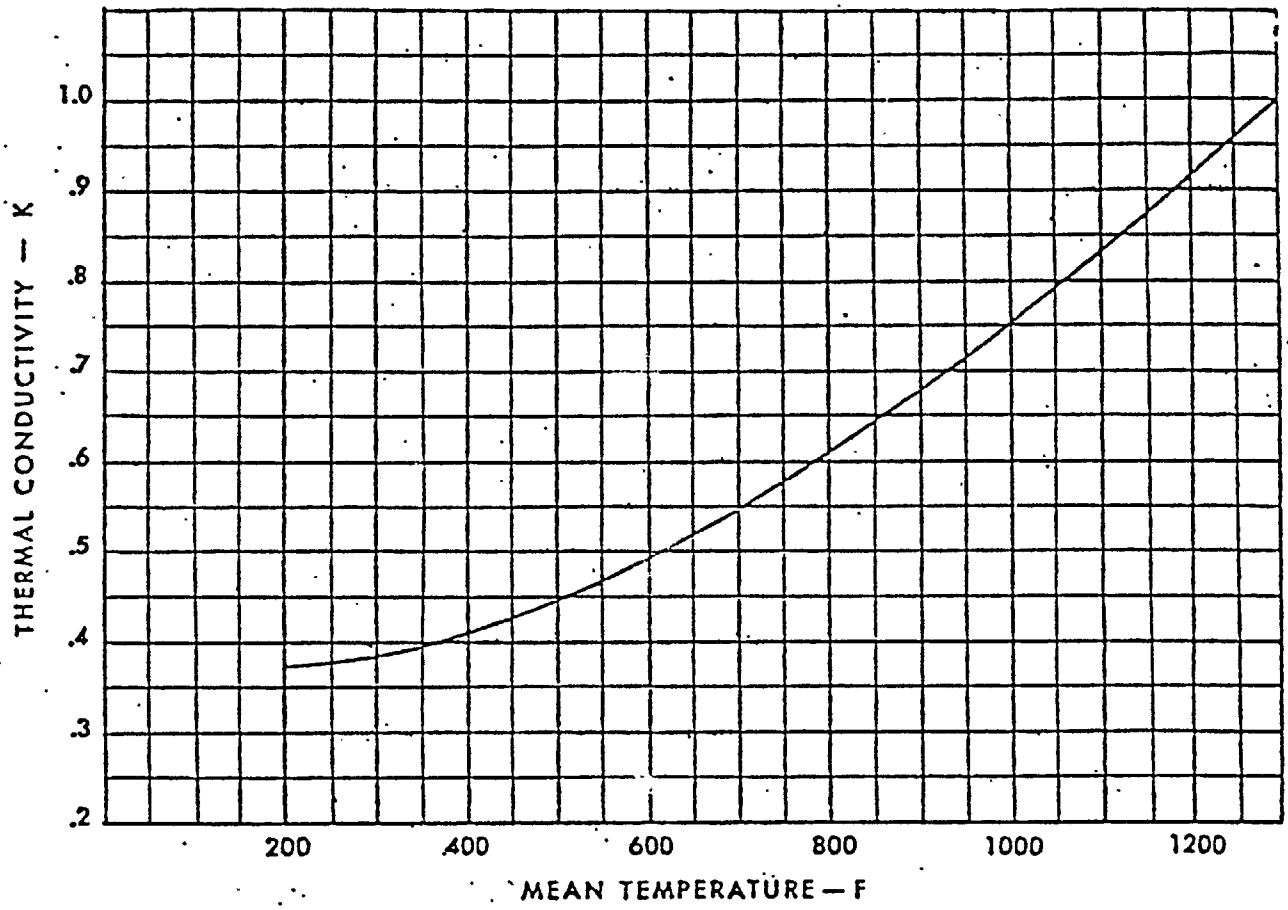
HOW TO APPLY SUPER FINISH STIC–TITE

1. Mix Super Finish Stic-Tite thoroughly with 5 to 6 gals. fresh water per 25 lb. bag.
2. Allow the cement mix to soak for one-half hour before using to insure maximum workability.
3. Mix no more than will be applied in 4 hours.
4. If any of the batch has dried out, do not remix it with water or fresh, dry material as the resultant finish will not be hard. Use only fresh batches.
5. For smoothest finish, trowel the cement to at least 3/8" thickness.
6. Where used as a finish coat over an insulating cement roughing coat, be sure the undercoat has set overnight before applying Super Finish Stic-Tite.
7. Where a given area cannot be finished in a continuous application, the joints should be feather-edged.

SUMMARY OF PHYSICAL PROPERTIES

Use Limit	Up to 1800°F.
Sintering Temperature	2100°F.
Thermal Conductivity	See Accompanying Graph
Compressive Strength	18 psi
Density	1.25 lbs./bd. ft.
Stability	Inert - durable
Resistance to Moisture	Water-repellent
Resistance to Corrosion	Non-corrosive
Handling Characteristics	Excellent

THERMAL CONDUCTIVITY — GRIPTEX BLOCK



STANDARD SIZES

6"x12"	12"x12"	12"x36"
6"x18"	12"x18"	18"x24"
6"x36"	12"x24"	24"x36"

thicknesses range from 1" to 4"—in 1/2" increments.

TEAR TAPE CARTON

Griptex block is packaged in the new . . . easy open . . . tear tape carton. This easy open carton simply zips in half, forming two convenient containers . . . less waste . . . less damage . . . less lost time.

SUPER 711 INSULATING CEMENT

SUPER 711 Insulating Cement is a mixture of high temperature mineral fibers specially processed into resilient wool nodules, combined with asbestos and suitable binders to form a high temperature plastic insulation. Water added according to directions gives a trowelable consistency that is ready for application on equipment to be operated at temperatures up to 1800°F.

WIDE USAGE

SUPER 711 is a versatile material for many types of insulation requirements. Applied over block or blanket insulations, it fills open joints and provides a monolithic surface for whatever type of subsequent finish is specified. Its plastic flexibility permits application directly to regular or curved surfaces -- such as valves, fittings, tanks and vessels.

EASY TO APPLY

SUPER 711 has excellent adhesive qualities. Its increased stickability means a better job in less time, from wet to dry. Will not slip or roll under trowel application and may be easily gun applied. This superior workability is a result of fine mineral nodules, special manufacturing methods and quality control.

MAXIMUM COVERAGE - LOW SHRINKAGE

SUPER 711 Insulating Cement assures maximum coverage and low shrinkage. The resilient nodules of mineral fiber do not collapse when mixed with water. See table of Physical Properties for coverage.

RECOMMENDED USES

BOILERS
- Drums
- Headers
- Walls
- Economizers
- Air Preheaters

FURNACES
- Heating
- Heat Treating
- Forging
- Annealing
- Normalizing

OVENS, KILNS & DRYERS

VALVES & FITTINGS

TANKS & VESSELS

TURBINES & PUMPS

FAN HOUSINGS

DUCTS & BREECHINGS

SPECIFICATION REFERENCES

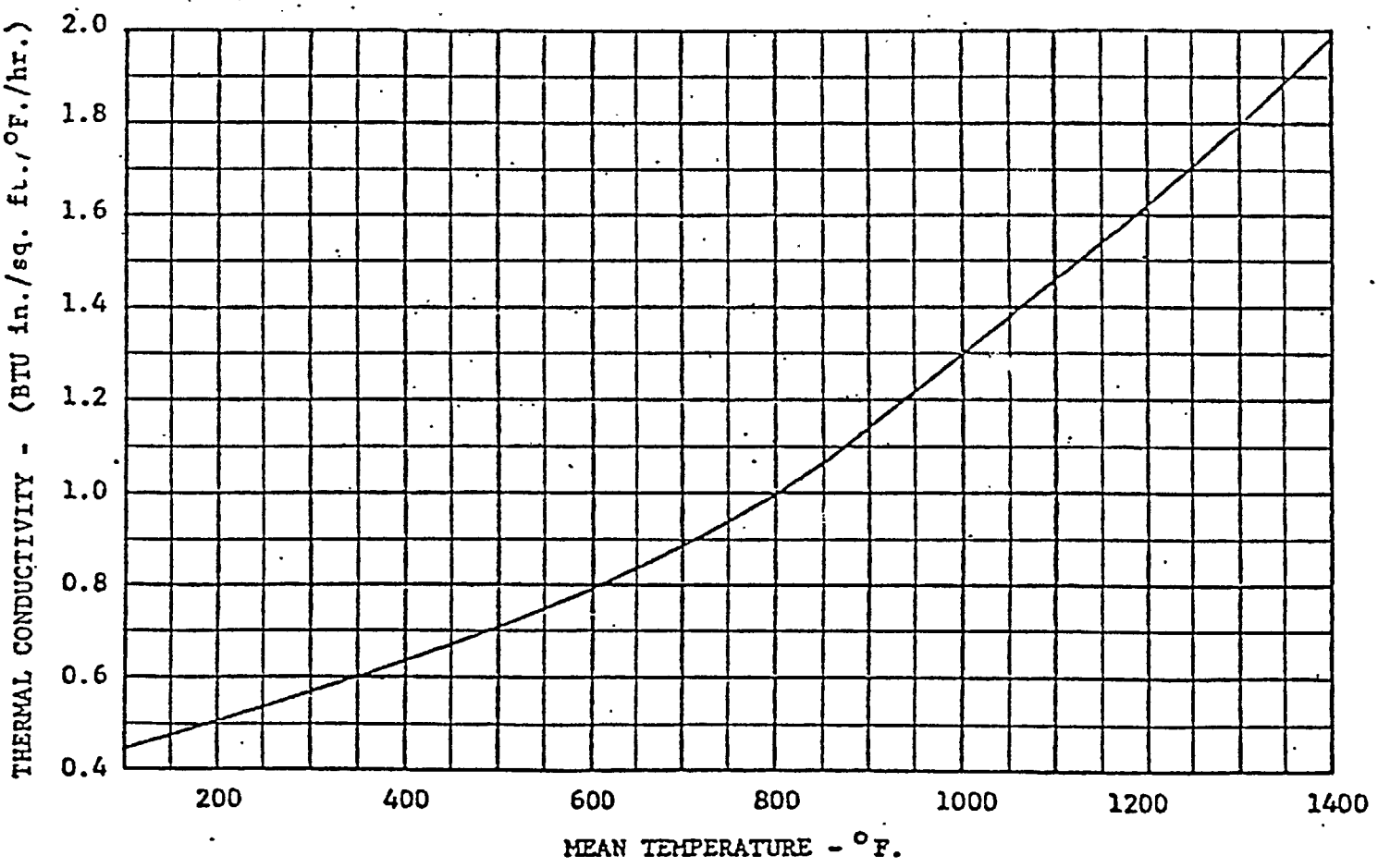
SUPER 711 Mineral Fiber Insulating Cement conforms to ASTM C-195-48; Federal Specification HH-C-168 (Class C); and/or Commercial Standard CS-117 of the U. S. Department of Commerce.

PHYSICAL PROPERTIES OF SUPER 711 INSULATING CEMENT

Service Temperature	1800°F.
Water Ratio	12 gals. per 50 lbs. bag
Dry Coverage	50 sq. ft. 1" thick per 100 lbs.
Material Requirements	2 lbs. per sq. ft. 1" thick
Compressive Strength	45 psi
Density (Applied and Dried)	24 lbs. per cubic foot
Shrinkage (Wet to Dry, by Volume)	15%
Thermal Conductivity	See Chart
Reclaimable to	1000°F.
Adhesion to Steel (Wet)	6 psi
Adhesion to Steel (Dry)	9 psi
Corrosion Resistance to Steel	Non-corrosive
Shipping Containers (Sewn Closure)	50 lb. paper bags

Tabulated values represent typical performance levels of SUPER 711 Insulating Cement - Trowel Grade. SUPER 711 Grade Cement consists of the same basic materials that smaller mineral wool nodules are utilized to facilitate application.

THERMAL CONDUCTIVITY OF SUPER 711 INSULATING CEMENT



Utility Thermal Finish Cement is composed of high quality mineral fiber, hydraulic binders, and other suitable materials. Utility combines the flexibility, high temperature resistance, and excellent insulating qualities of uniformly nodulated mineral fiber with the strength, low shrinkage, and smooth finish of hydraulic setting cement. The result is a quick setting, smooth finish, thermal resistant, single layer insulating finish cement. For temperatures up to 1200°F.

QUICK SETTING

Utility Insulating Finish Cement develops a smooth, durable, protective finish within a few hours after application and without the presence of heat. Subsequent drying produces no excessive surface cracking or shrinkage in thickness, and occasional wetting does no damage after hydraulic set. Long drying periods under normal conditions are eliminated. Saves time in applying weatherproofing paint, or other finishes. Jobs are easier to schedule; scaffolding costs are reduced.

ONE COAT APPLICATION

Utility is normally applied in a single layer application. A second layer is needed only when multiple layer thicknesses are specified. Utility is virtually an all-purpose insulating finish cement, designed primarily for use over Griptex block or blanket insulations. Utility is widely used for insulating valves, fittings, heated equipment, and as an anti-sweat insulation for cold water tanks, pumps, etc.

Utility trowels with a good key on block insulation, blanket insulation and insulating cement. It has good wet adhesion to clean steel surfaces, such as valves and fittings.

PLEASING APPEARANCE

Utility dries to a smooth, light reflectant surface which as an interior finish, requires no further treatment. Utility, however, is easily painted if desired. Outdoor applications should be weather protected. Low temperature applications require a vapor seal type finish.

EXCELLENT THERMAL QUALITIES

Utility has a "K" factor of .79 at 600°F. mean temperature. This excellent insulating value as compared to other finish cements is a very desirable advantage when figuring job and operating costs.

PHYSICAL PROPERTIES

Service Temperature	1200°F.
Water Ratio (Trowel Application)	7 gals. per 50 lb. bag
Dry Coverage (Trowel Application)	37 sq. ft. 1/2" thick per 50 lb. bag
Setting Time	2 to 4 hours average conditions.
Material Requirements (Trowel Application)	1.3 lbs. per sq. ft. 1/2" thick.
Compressive Strength (Air Cured)	135 psi.
Compressive Strength (@ 1200°F.)	105 psi.
Density (Applied and Dried)	35 lbs. per cubic foot.
Shrinkage (Wet to Dry)	Negligible.
"K" Factor at 600°F. Mean Temperature	.79 Btu.
Corrosion Resistance to Steel	Non-corrosive.
Surface Treatment	Easily painted or weatherproofed when required.
Shipping Containers (Sewn Closure	50 lbs. paper bag.

MIXING

Utility Thermal Finish Cement should be mixed in a clean mortar box or mixer, using approximately 7 gallons of water per 50 lbs. bag for a good troweling consistency over most blocks, blankets, or insulating cements. Because of the hydraulic binder, Utility should not be mixed with water more than two hours in advance of its application. With cold mixing water (below 60°F.) it remains workable up to 4 hrs.

STORAGE

Store in a cool, dry location until ready to use.

Basically there are three types of asphalt mastics used in the insulation field. They are usually classified as water emulsion, solvent cutback, or chemical dispersion types. The thinning agent or dispersion chemical determines which basic classification will be given a particular product, and dictates the end use of the resultant product.

It is important to know which thinning agent is used to determine the useful qualities of a particularly blended asphalt mastic. The quality and/or type of basic asphalt determines the service temperature of the product involved.

WATER EMULSION ASPHALT MASTICS

The water emulsion type of asphalt weather coating such as Thermal Coat, is normally a blend of petroleum asphalt, asbestos fiber and Bentonite clay, emulsified in water.

Water emulsions are primarily used as a breathing mastic, i.e., if suitable pressure is built up beneath its surface, moisture present will pass through to the atmosphere. However, atmospheric pressure is normally not sufficient to pass moisture back through to the insulation, except, of course, on low temperature work. In this case, a vapor barrier type mastic such as Duriseal is essential.

Summer grade water emulsions, becuase of the water present, will freeze and should be protected at all times prior to and during application. Alcohol is usually added to Winter grade emulsions. The amount used determines the resistance to freezing of the resultant product. Water emulsions should always be stored and used at temperatures above freezing in any event. A water emulsion that has been frozen is useless and will "alligator" if applied.

Water emulsions usually are suitable only for trowel application and are used wherever a breathing mastic is required. Because they lack the adhesive qualities and resiliency of a cutback type mastic, they should be mechanically bonded to poultry netting except on extremely small surfaces. They should be used in conjunction with a cutback or dispersion type flashing compound. Water emulsions can only be repaired with such types of mastics since they do not bond to themselves. It is imperative that they be repaired as soon as possible if a break in the applied surface should occur to insure service life of the product.

Thermal Coat may be applied at temperatures up to 200°F. and will withstand a maximum temperature of 450°F. after drying.

CAUTION:

Water emulsions are soluble in water and should not be applied if there is a possibility of rain washing the product within twelve hours of the initial application time. Keep Winter Grade above 20°F.

CHEMICAL DISPERSION TYPE ASPHALT MASTICS

Chemical dispersion type asphalt mastics, such as PERMISEAL, incorporate a unique combination of the desirable qualities of the water emulsion and cutback types. They normally consist of petroleum asphalt dispersed in a non-flammable chemical with suitable fillers, blended in one consistency suitable for brush, trowel or spray applications. Containing non-flammable solvents, they are fire-safe for use around open flame, welding torches and similar hazardous job conditions. They have the breathing characteristic of a water emulsion for a period of sixty to ninety days after application. This controlled curing process prevents shrinkage of the surface film and permits trapped moisture to escape. The result is a flexible, blister free, vapor seal type coating of exceptional toughness. A good chemical dispersion product is not affected by freezing and resists most acids and alkalies. However, solubility in water is a factor, depending upon humidity conditions, for a period of eight to twelve hours or longer after application. The anodizing and rust inhibiting agents contained in PERMISEAL make this product excellent for metal protection purposes. PERMISEAL has a useful service temperature up to 300°F. and a maximum of 400°F.

CAUTION:

Dispersion type mastics should be treated the same as water emulsion types, in that they should not be applied if there is a danger of rain washing within eight to twelve hours of the application time. Under proper temperature and humidity conditions, PERMISEAL will be dry to touch in four hours or less.

WEATHER COATINGS AND SEALERS

CLASSIFICATION	WATER EMULSION	CHEMICAL DISPERSION
	THERMAL COAT	PERMISEAL
Application Method	Trowel	Brush-Trowel-Spray
Maximum Temperature	450 F.	400°F.
Application Temperature	40°F. to 200°F.	40°F. to 200°F.
Coverage - Wet	5-6 sq. ft., 1/4" thick/gal.	10 sq. ft., 1/4" thick/gal.
Coverage - Dried	5-6 sq. ft., 1/8" thick/gal.	10 sq. ft., 1/8" thick/gal. 20 sq. ft., 1/16" thick/gal.
Trowel or Flash Coat	1/4" thick wet	1/4" thick wet
Brush or Spray Coat	Trowel only	Brush or Spray two 1/8" thick wet coats reinforced as req'd.
Reinforcement when required	Poultry netting	Suitable fabric
General Use	Breather type weater coating	Weather coating and sealer for insulation, masonry steel, alum.
Adhesive Strength	Should be bonded to poultry netting	Excellent after curing on clean dry surface
Curing for Best Results	Avoid low temperature and high humidity conditions	Avoid low temperature and high humidity conditions
Flame Resistance	Non-flammable	Non-flammable
Freeze Resistance	Protect from freezing	Not affected
Corrosion Resistance	Not inhibited	Inhibited against rust and corrosion
Vapor Resistance	Will breathe	Will breathe during 2-3 month curing period, then becomes vapor-seal
Packaged	5 Gal. 50 Gal. Steel Container	5 gal. and 54 gal. (plastic liner) steel container
Shipping Weight	55 lbs. 550 lbs.	45 lbs. 480 lbs.

Type T-178, T-278

Duriseal Protective Coatings are special blends of mastics, combined with asbestos fiber and mineral fillers to provide an excellent sealing material. Applied over masonry settings, they dry slowly to form a black, fire-resistant, air-tight film that is impervious to water exposure, chemical attack and normal abrasion. Duriseal Coatings also are used in conjunction with Detrick Thermal Coat where a flexible flashing compound is required to seal joints around openings, as a calking compound, and for low temperature stack linings to prevent corrosion.

STANDARD TEMPERATURE GRADES (To 400 F)

For surface temperatures that will not be operated in excess of 350-400°F the Standard Grades are recommended. Standard Type T-178 is made to a semi-viscous, troweling consistency.

HIGH TEMPERATURE GRADES (To 700 F)

When surface temperatures will exceed 400°F during operation, but not in excess of 700°F, Duriseal High Temperatury Coatings should be used.

EASY TO APPLY

Duriseal Coatings may be applied over any cool, clean, dry surface, using suitable membrane between spray coats and for patching purposes. Where used, membrane should be lapped 4" at all joints or around patch applications. For ease of application, the best workable temperature range is 50°F to 100°F Storage temperature should not exceed 100°F.Duriseal Protective Coatings require no thinning.

COVERAGE

Material requirements are estimated on wet coverage of approximately 5 to 6 square feet (1/4" thick) per gallon.

CONTAINERS

Duriseal Protective Coatings are shipped in 5 or 55 gallon steel containers.

CAUTION:

Surface during application should be above 100°F for indoor applications or 130°F for outdoor applications. Provide adequate ventilation and do not apply in vicinity of open flame, welding arcs, etc.

FOR FIREPROOFING STRUCTURAL STEEL

Pyroscat is a special formulation of high-temperature aggregates, asbestos fibers, hydraulic binder and other materials. These ingredients are factory blended to a uniform dry mixture that is ready for application after mixing with water at the job site. Pyroscat is adapted to application by spraying, casting and trowelling techniques, depending on job conditions.

USES:

Pyroscat provides a lightweight, fire-retardent protective treatment for structural steel columns, beams, tower skirts, LP gas tanks, and other exposed applications in refineries and chemical plants. Pryoscat sets up to a hard, durable sheath capable of withstanding for hours the 2000°F. flame temperatures and high-pressure water streams commonly encountered in industrial fires.

RECOMMENDED THICKNESSES:

Fire-retardent materials are customarily rated in Hours, based on a given thickness used and on the method of application. For example, fire ratings for steel columns represent the number of hours required for heat from a "standard fire" to penetrate the protective treatment as applied, and to increase the steel column temperature to a critical level (1200°F.) The thermal conductivity and heat capacity of a material are of some importance in an ASTM Fire Test. But the ability of the complete treatment to withstand thermal shock without destruction is one of the most significant factors in determining practical fire ratings in industrial installations.

The Pyroscat thicknesses recommended below were determined by physical tests on a series of sprayed, cast and trowelled applications. Tests included direct exposure to 100 psi hose pressure, both before and after subjecting the Pyroscat treatment to severe flame conditions.

THICKNESS OF PYROSCAT	APPROX. FIRE RESISTANCE RATING
1"	2 Hours
1-3/4"	3 Hours (UL-R-3960)
2"	4 Hours

ADVANTAGES OF PYROSCAT

SAFER WHILE FIGHTING FIRES . . . Many concrete aggregates and common bricks used for fireproofing purposes will spall and shatter when they are heated and subjected to hose stream. Pryoscat remains virtually unaffected after direct flame exposure and saturation with a 200 psi hose stream.

LIGHTER WEIGHT . . . Pyroscat weighs less than 55 lbs./cu. ft. in place, compared to approximately 150 lbs./cu. ft. for conventional concrete fireproofing. Excess dead weight is eliminated. As usually sprayed or trowelled in a protective sheath, Pyroscat weights about 1/10 as much as formed concrete - at equivalent thickness per running foot.

*A C-E trade name.

ADVANTAGES OF PYROSCAT (Continued)

SPRAY, CAST OR TROWEL . . . Pyroscat is specially formulated to permit installation by spray, trowel and casting techniques, depending on local job conditions. No other fireproofing material is as versatile from an application standpoint. Employs conventional supporting materials and placement. Only the one fireproofing material is required - no need for subsequent finishing layers nor heavy mastic coatings.

DURABLE AND WEATHER-RESISTANT . . . Pyroscat develops great strength from its selected high-temperature aggregates and hydraulic-setting binders. It withstands continued cycles of saturated freeze-and-thaw weathering tests.

SUMMARY OF PHYSICAL PROPERTIES

Coverage (Trowelled)	1.1 cu. ft./50 lb. bag
Material Required (Trowel Application)	45 lbs. per cu. ft.
Air-Cured Weight (After Hydration and Drying)	54.5 lbs. per cu. ft.
Compressive Strength - Air-Cured	1650 psi
Compressive Strength After Firing at 1500°F.	1.5%
Lineal Shrinkage - Air Cured	Less than 1%
Lineal Shrinkage After Firing at 1500°F.	1.5%
Density After Firing at 1500°F.	39.1 lbs. per cu. ft.
Fusion Temperature	2200 F
Thermal Conductivity (k) at 1000°F. Mean Temp.	1.50 Btu
Setting Time	4 to 6 hours
Mixing Water:	
For Spray & Trowel Consistency	3-1/2 Gal. water/50 lbs. bag
For Casting Consistency	5 Gal. water/50 lbs. bag

Curing:

Pyroscat is a cementitious material and should be kept moist during the curing period of 72 hours or longer.

BOILER WALL COATING CEMENT

ELIMINATES AIR INFILTRATION

PREVENTS HEAT LEAKAGE

SAVES FUEL

INCREASES BOILER EFFICIENCY

Air-Check Cement is an asphaltic-asbestos fibre mixture in plastic form for covering the outside of both fire brick and red brick boiler walls. It is also used for pointing up cracks in boiler walls. Its safe, effective limit of usefulness is 350°F.

Air-Check Cement is tough, rubbery, plastic, easy to apply. A 3/16" thick coat troweled over the surface, dries to a thickness of slightly more than 1/8". It remains semi-plastic even though in service for a number of years.

ALL PURPOSE PLASTIC INSULATION

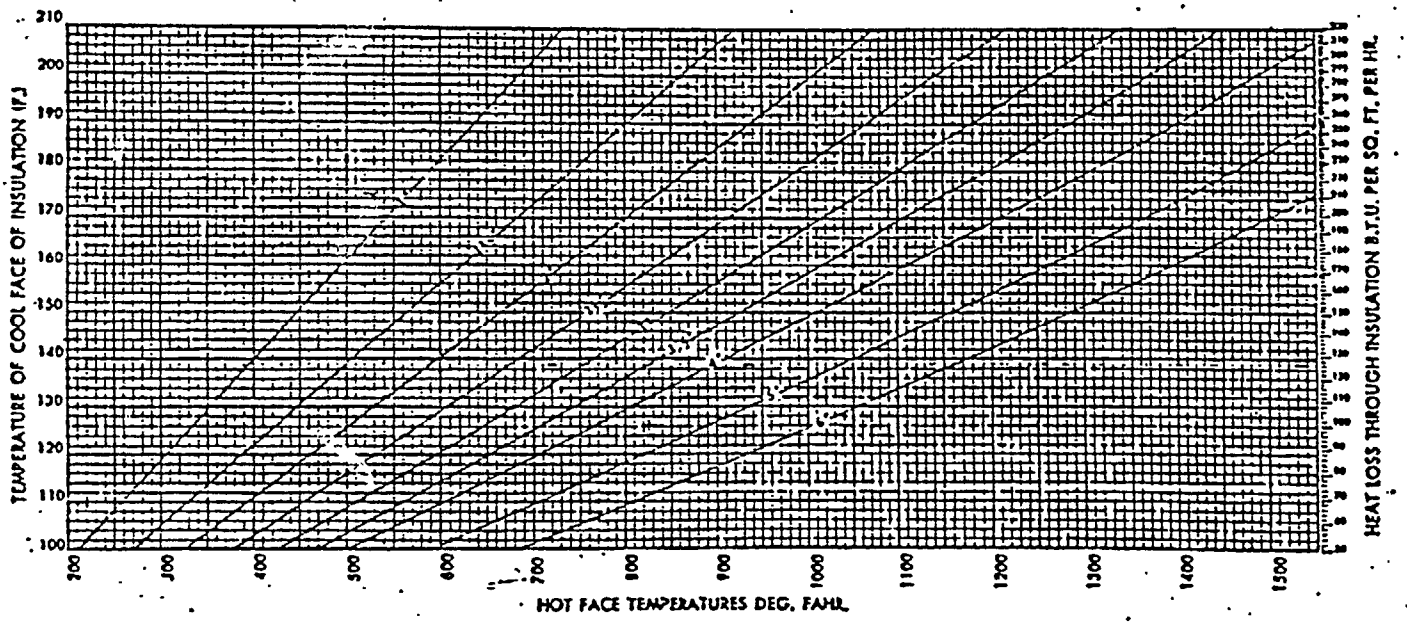
Stic-Tite and Super Stic-Tite plastic insulations are the most versatile insulating materials known. Mixed with water, right on the job, they adhere to any clean surface—and *stay on*—at all temperatures to 1800°F. They are light, strong and unusually durable.

Both Stic-Tites are a powerful barrier against heat loss. Composed of a special mixture of mineral wool and diatomaceous earth, the applied and dried material forms a spongy mass of billions of dead air cells, uniform in size and well isolated from each other. This stops air infiltration and resultant heat transmission.

HOW TO SELECT THE RIGHT THICKNESS

Estimate the operating temperature of your installation, (hot face). Follow the hot face temperature (bottom of chart) vertically until it intersects the line connecting the cool face (left hand column) or B.t.u. loss (right hand column). Use the amount of Stic-Tite indicated on the curve nearest the point of intersection.

For example, assume operating temperature is 825°F. and a cool face of 139° or 126 B.t.u. loss is desired. Follow the 825° line vertically until it intersects the horizontal 139° and 126 B.t.u. loss lines. The intersection is nearest the 3-1/2" Stic-Tite curve. Therefore, 3-1/2" of Stic-Tite should be used. At the same operating temperature if a cool face of 124° or B.t.u. loss of 96 is desired, the intersection would be nearest the 5" Stic-Tite curve. Therefore, 5" of Stic-Tite should be used.



WHERE STIC-TITE IS USED

- Air Heaters
- Burner casings
- Boiler, front, side and rear walls
- Breechings
- Cookers
- Drum heads
- Elbows
- Flanges
- Feed water heaters
- Furnace and Oven; walls, floors, roofs
- Gas generators
- Hot air ducts
- Hot air lines
- Hot piping
- Hot water heaters
- Kettles
- Reaction vessels
- Regenerator faces
- Steam heaters
- Steam pumps
- Tanks
- Tube doors
- Uptakes
- Valves and fittings
- All irregular surfaces

CAN BE USED ON ALL SURFACES

Stic-Tite adheres strongly and permanently to metal (special inhibitors help prevent rusting of metal surface), tile, brick, insulating block and blankets or other clean surfaces, hot or cold. It can be used in difficult places where other types of insulation are unsuitable—on intricate piping, on elbows and flanges, on slanting vertical or curved surfaces and rounded corners. Stic-Tite provides a monolithic, seamless, jointless covering which can be troweled perfectly smooth for appearance.

EXCELLENT ADHESION—REALLY "STAYS ON"

Stic-Tite adheres permanently without lifting off or shaking loose even when subjected to sever vibration, abrasion or impact.

STOPS HEAT LOSS

The spongy mass of dead air cells checks air infiltration—prevents heat loss. Since dry Stic-Tite does not shrink or form cracks, the high insulating efficiency is never impaired.

EASY TO APPLY

Stic-Tite, mixed with the proper amount of water, forms an easily workable, plastic mass which can be troweled or safely applied with the bare hands. The usual practice is to apply first a roughing coat over the area to be covered, then trowel smooth around joints, over the surface and elbows, curves, etc.

LARGE COVERAGE

Since Stic-Tite dries with practically no shrinkage (an inch of Stic-Tite applied wet remains practically an inch thick when dry), less is required to provide sufficient insulating thickness. Mixed and applied as directed, 100 lbs. of the material cover 45 sq. ft. with a 1" thick layer.

CAN BE REUSED

If used at temperatures below 900°F., old Stic-Tite can be removed from equipment, crushed, mixed with clean water and reapplied like new Stic-Tite. This makes equipment repairs less costly since the insulation can be saved. Reclaimed Stic-Tite is equal to the new product in insulating efficiency, adhesion and plasticity.

SAVES LABOR AND MATERIALS

Stic-Tite is so easy to apply on all types of regular and irregular surfaces and over other insulations that labor cost is very low. Skilled men are not needed. Since Stic-Tite adheres so strongly, reinforcing wires and other supports are unnecessary when used up to 1-1/2" thick.

CONVENIENT PACKING

Stic-Tite is shipped dry in heavy, lined, dustless paper bags containing 25 lbs. and 50 lbs. each. It does not deteriorate in dry storage—can be kept indefinitely if dampness or wet places are avoided.

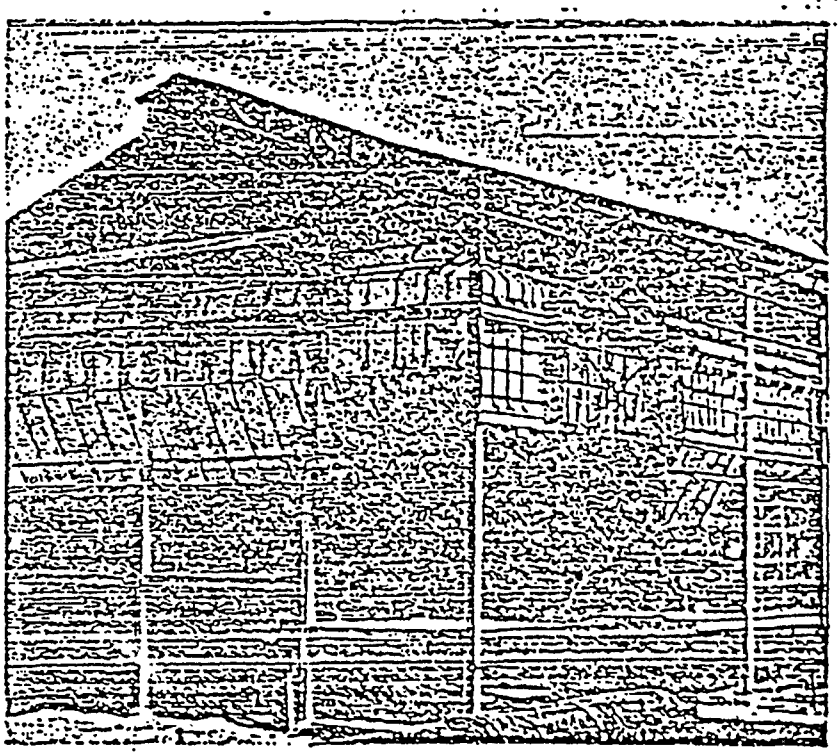
HOW TO APPLY

1. Each 50# bag should be mixed with 12 gallons (100 lbs.) of fresh water.
2. After thoroughly mixing, Stic-Tite can be applied immediately, but better results can be obtained by allowing it to soak for at least a half hour or longer.
3. All surfaces to be covered should be free of paint, dust, dirt and grease.
4. Roughing coats can be applied by hand or trowel or combination of hand and trowel.
5. If hot surfaces are to be insulated with Stic-Tite, the material should be spotted in place with a trowel and dragged down to a feather edge. The spotted material will dry quickly and then a rough coat about 1" thick can be applied over and between the spots.
6. On cold surfaces for covering up to 1-1/2" thick, after being mixed according to directions on the bag, Stic-Tite should be applied by spreading it over the surface to as even a thickness as possible. After the rough coat has dried out, a finish coat up to 1/2" thick can be applied over the rough surface and finished with a trowel to a smooth, attractive finish. Stic-Tite can be used up to 1-1/2" thick without reinforcing.
7. For covering over 1-1/2" thick, apply a rough coat about 1" thick. When rough coat is dry apply another 1" coat and continue until desired thickness is obtained. Each coat should be dried before additional coats are applied. Prior to application of finish coat, we recommend reinforcing with #20 gauge 2" mesh chicken wire.
8. Finish coats should be applied from 1/4" to 1/2" thick, troweled to a smooth, hard finish. Where desired, Stic-Tite finish can be painted. Best results are obtained by painting with a glue sizing and paint over this.
9. If more Stic-Tite is mixed than can be used, the left over material can be laid aside and remixed with water at a later date when it is required.

Service Temperature	1200°F.
Water Ratio (Trowel Application)	7 gals. per 50 lb. bag.
Dry Coverage (Trowel Application)	37 sq. ft. 1/2" thick per 50 lb. bag
Setting Time	2 to 4 hrs. average conditions.
Material Requirements (Trowel Application)	1.3 lbs. per sq. ft. 1/2" thick.
Compressive Strength (Air Cured)	135 psi.
Compressive Strength (@1200°F.)	105 psi.
Abrasion Factor (Air Cured)	98 seconds (MHD Method 102).
Density (Applied and Dried)	35 lbs. per cubic foot.
Shrinkage (Wet to Dry)	Negligible.
"K" Factor at 600°F. Mean Temperature	.79 Btu.
Corrosion Resistance to Steel	Non-corrosive.
Surface Treatment	Easily painted or weatherproofed when required.
Shipping Containers (Sewn Closure)	50 lb. paper bag.

MIXING

Utility Thermal Finish Cement should be mixed in a clean mortar box or mixer, using approximately 7 gallons of water per 50 lb. bag for a good troweling consistency over most blocks, blankets, or insulating cements. Because of the hydraulic binder, Utility should not be mixed with water more than two hours in advance of its application. With cold mixing water (below 60°F), it remains workable up to 4 hrs.



Utility Gunned on Balloon Flue.

STORAGE

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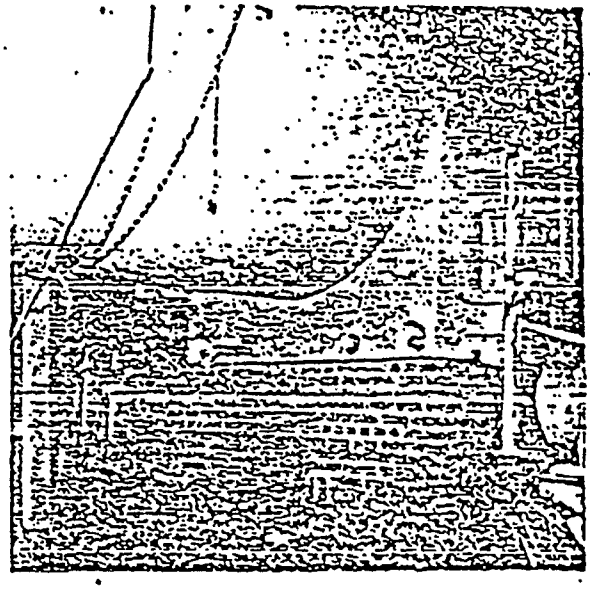
REFRACTORY & INSULATION CORPORATION
625 ILLINOIS AVE.
AURORA, ILLINOIS
PORT KENNEDY
PENNSYLVANIA

UTILITY THERMAL FINISH CEMENT



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Trowel or Gun Grade

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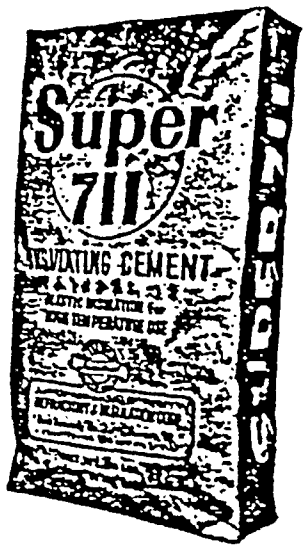

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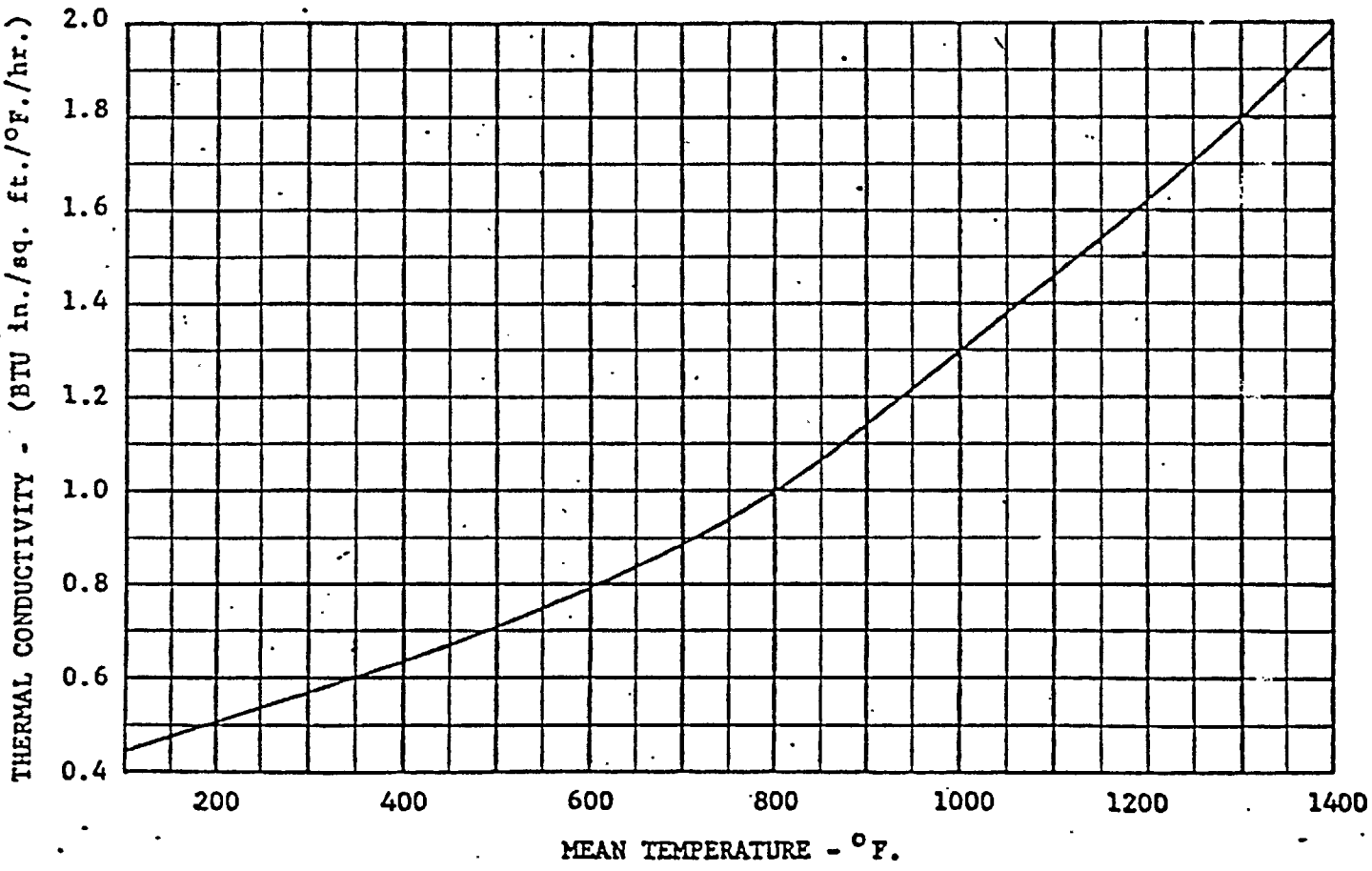
May 1964

Service Temperature	1800°F.
Water Ratio	12 gals. per 50 lb. bag
Dry Coverage -	50 sq.ft. 1" thick per 100 lbs.
Material Requirements	2 lbs. per sq.ft. 1" thick
Compressive Strength	45 psi
Density (Applied and Dried)	24 lbs. per cubic foot
Shrinkage (Wet to Dry, by Volume)	15%
Thermal Conductivity	See Chart
Reclaimable to	1000°F.
Adhesion to Steel (Wet)	6 psi
Adhesion to Steel (Dry)	9 psi
Corrosion Resistance to Steel	Non-corrosive
Shipping Containers (Sewn Closure)	50 lb. paper bags

Tabulated values represent typical performance levels of SUPER 711 Insulating Cement - Trowel Grade. SUPER 711 "Gun" Grade Cement consists of the same basic materials that smaller mineral wool nodules are utilized to facilitate application.

THERMAL CONDUCTIVITY OF SUPER 711 INSULATING CEMENT



REFRACTORY & INSULATION CORPORATION
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AURORA, ILLINOIS
PORT KENNEDY
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A. Surface Preparation

1. Remove dirt, scale or loose paint from the surface to be treated, then apply rust preventative paint or coating when specified.

2. For trowel applications to columns and beams, form 3/8" rib lath (or paper-backed lath) to box-in the member. Apply rib lath with ribs turned in and spanned from flange to flange. On members 14" and larger, first weld 1/4" rods across the flanges approximately 12" to 18" on centers to provide additional support for the lath. Secure the lath in place with wire or bands. For gun application, use 2 x 2 #16 paper-backed lath such as Steeltex.

   a) Provide 2" firestops on columns at 8' to 12' intervals (or as otherwise specified). Form the metal lath into a horizontal shelf extending to and supported at the web. Apply Pyroscat 2" thick in the opening. Provide similar stops at the top elevation of the fireproofing.

   b) Plasterer's corner bead may be wired to the metal lath, forming and supporting it to attain the total Pyroscat thickness specified. Corner bead shall be of the type having open-mesh legs to facilitate complete filling of the corners. The corner bead may be spaced the proper distance from the flanges by means of corner clips, rods, studs; or Pyroscat may be spotted-in to space the corner bead at specified fireproofing thickness.

B. Application of Pyroscat

1. Mix Pyroscat to recommended consistency with clean, fresh water, before application. Refer to mixing instructions on the bag and use no more water than called for. Mix Pyroscat to a homogeneous plastic mass; avoid over-mixing, particularly with mechanical mixers.

   a) Apply Pyroscat well into the metal lath, installing approximately 1/2 the total thickness in the scratch coat. Leave the first coat rough or scratch the surface.

   b) On the underside of beams, the application may be in three coats. Apply a thin scratch coat first to improve adhesion.

   c) If corner bead was not applied previously, wire it in place when the scratch coat has set.

2. Let the scratch coat harden until well set (4 to 6 hours or longer), then double-back with the finish coat. Apply it flush with the corner bead. Sponge-float the surface to a textured finish or as otherwise specified.

   a) When application of the finish coat is deferred over night or longer, wet down the scratch coat thoroughly before proceeding with the finish coat.

1. Pyroscat is a cementitious material; to develop its strength, keep it moist for 72 hours or longer. Depending on atmospheric conditions when applied, the required water retention may be accomplished with wet burlap, periodic water spray or a hydrostatic (resin-base) sealer.

2. Following the curing period and when visual moisture has dried, apply a suitable flashing material at all intersecting joints and exposed ends of members treated (Duriseal T-178 Coating).

3. Pyroscat may be painted with (1) masonry paint, (2) two coats of asphalt-base aluminum paint, or (3) other finishes as specified for operating conditions involved. (Note: When conventional masonry paint of the hydrating-type is used, wet down the Pyroscat before painting to insure proper hydration).

ALTERNATES FOR TOWER SKIRTS (VERTICAL)

A-2 Attach a layer of 1" x 1" square mesh reinforcing, positioned 1" away from the skirt, i.e., at the approximate center of the fireproofing thickness specified.

a) Trowel or gun Pyroscat solidly through openings in the square mesh, bringing the scratch coat out approximately 1" thick. Start at the bottom of the skirt and work upward. Leave the surface rough, or scratch it when trowel applied.

b) Screed strips may be attached temporarily over the square mesh reinforcing, to accurately gauge the thickness of the second layer.

c) When fireproofing is applied to skirts of heated vessels while they are in operation, heat conducted to the skirt may prematurely dry the initial layer of Pyroscat. Wet the first coat thoroughly, particularly at the top, before applying the final layer.

ALTERNATES FOR HORIZONTAL TANKS

A-2 Bolster bars are preferred for anchorage of the reinforcing mesh. The bolster bar selected would have legs extending from the tank surface approximately one-half of the total thickness of Pyroscat to be applied. Form the bolster bars to fit the tank curvature, then weld or wire in place circumferentially approximately 3' on centers. Wire the reinforcing mesh to the bolster bars.

C-3 When tanks so fireproofed are to be operated below ambient temperature, suitable vapor-sealing treatment is recommended after the Pyroscat has been cured, dried and flashed.

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PYROSCAT*

For Fireproofing Structural Steel

Pyroscat is a special formulation of high-temperature aggregates, asbestos fibers, hydraulic binder and other materials. These ingredients are factory blended to a uniform dry mixture that is ready for application after mixing with water at the job site. Pyroscat is adapted to application by spraying, casting and trowelling techniques, depending on job conditions.

USES:

Pyroscat provides a lightweight, fire-retardent protective treatment for structural steel columns, beams, tower skirts, LP gas tanks, and other exposed applications in refineries and chemical plants. Pyroscat sets up to a hard, durable sheath capable of withstanding for hours the 2000°F. flame temperatures and high-pressure water streams commonly encountered in industrial fires.

RECOMMENDED THICKNESSES:

Fire-retardent materials are customarily rated in Hours, based on a given thickness used and on the method of application. For example, fire ratings for steel columns represent the number of hours required for heat from a "standard fire" to penetrate the protective treatment as applied, and to increase the steel column temperature to a critical level (1200°F.). The thermal conductivity and heat capacity of a material are of some importance in an ASTM Fire Test. But the ability of the complete treatment to withstand thermal shock without destruction is one of the most significant factors in determining practical fire ratings in industrial installations.

The Pyroscat thicknesses recommended below were determined by physical tests on a series of sprayed, cast and trowelled applications. Tests included direct exposure to 100 psi hose pressure, both before and after subjecting the Pyroscat treatment to severe flame conditions.

Thickness of Pyroscat	Approx. Fire Resistance Rating
1"	2 Hours
1-3/4"	3 Hours - (UL-R-3960)
2"	4 Hours

38a.

ADVANTAGES OF PYROSCAT

Safer While Fighting Fires .... Many concrete aggregates and common bricks used for fireproofing purposes will spall and shatter when they are heated and subjected to a hose stream. Pyroscat remains virtually unaffected after direct flame exposure and saturation with a 100 psi hose stream.

May, 1964

*An R & I trade name.

Lighter Weight.... Pyroscat weighs less than 55 lbs./cu. ft. to approximately 150 lbs./cu. ft. for conventional concrete fireproofing. Excess dead weight is eliminated. As usually sprayed or trowelled in a protective sheath, Pyroscat weighs about 1/10 as much as formed concrete - at equivalent thickness per running foot.

Spray, Cast or Trowel.... Pyroscat is specially formulated to permit installation by spray, trowel and casting techniques, depending on local job conditions. No other fireproofing material is as versatile from an application standpoint. Employs conventional supporting materials and placement. Only the one fireproofing material is required - no need for subsequent finishing layers nor heavy mastic coatings.

Durable and Weather-Resistant.... Pyroscat develops great strength from its selected high-temperature aggregates and hydraulic-setting binders. It withstands continued cycles of saturated freeze-and-thaw weathering tests.

SUMMARY OF PHYSICAL PROPERTIES:

Coverage (Trowelled)	1.1 cu. ft./50 lb. bag
Material Required (Trowel Application)	45 lbs. per cu. ft.
Air-Cured Weight (After Hydration and Drying)	54.5 lbs. per cu. ft.
Compressive Strength - Air-Cured	1650 psi
Compressive Strength After Firing at 1500°F.	1.5%
Lineal Shrinkage - Air Cured	Less than 1%
Lineal Shrinkage After Firing at 1500°F.	1.5%
Density After Firing at 1500°F.	49.1 lbs. per cu. ft.
Fusion Temperature	2200 F
Thermal Conductivity (k) at 1000°F. Mean Temp.	1.50 Btu
Setting Time	4 to 6 hours
Mixing Water:	
For Spray & Trowel Consistency	3-1/2 Gal. water/50 lb. bag
For Casting Consistency	5 Gal. water/50 lb. bag

Curing:

Pyroscat is a cementitious material and should be kept moist during the curing period of 72 hours or longer.

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SULATING BLOCK	C-E START	ESTIMATED STOP	PERCENT AND TYPE OF ASBESTOS	CONTAINER
(=) #12 Insulating Block (R)	1963	1966	4.5(A)	Cardboard Carton
(=, #19 Insulating Block (R)	1963	1966	4.6(A)	Cardboard Carton
(=) Griptex* Mineral Wool Block (D)	1964	1972	2.0(C)	Cardboard Carton
(=) Kaiser M. Block (D)	Unknown	1971	2.0(C)	Cardboard Carton
INSULATING CEMENTS				
(=) Stic-tite* (R)	1963	6/27/72	38.6-42.2(C)	50 lb bags
(D)	1964	8/30/72		
(m) Super Stic-tite (R)	1964	6/27/72	9.89-10(C)	50 lb bags
(D)	1964	8/30/72		
(m) Super Finish Stic-tite (R)	1963	6/27/72	11.5-13.1(C)	50 lb bags
(m) Super Finish (R)	8/10/65	1/10/68	14.2(C)	40 lb bags
(m) Super 711(D)	1964	6/27/72	13.7(C)	50 lb bags
(m Kaiser Mineral Wool Cement (D)	1964	1971	13.7(C)	50 lb bags
(m) Utility Thermal Finish Cement (D)	1964	2/28/72	4.75(C)	50 lb bags
(m) Casing Cement (D)	1964	1969	4.9(C)	50 lb bags
(m) MHD Finishing Cement (D)	1964	1968	68.03(C)	50 lb bags
(m) Pyroscat* Fireproofing Cement (D)	1964	6/8/72	3.0(C)	50 lb bags
(m) Hilite Insulating Cement (D)	1964	1968	9.1(C)	50 lb bags
(m) A-1199 Insulating Cement (R)	1963	1966	43.4(C)	50 lb bags
(m) SDK 50 (R)	1963	1966	0.4(A)	50 lb bags
(m) Buck Stay Cement A-1360 (R)	1965	1966	0.8(A)	50 lb bags
(m) Castablock* (R)	1965	1/19/66	1.2(A)	50 lb bags
(m) Stirrup Cement (R)	1965	1966	42.7(C)	50 lb bags
(m) Calcrete 30 (D)	1964	1970	7.8(C)	50 lb bags
MISCELLANEOUS PRODUCTS				
(j) Asbestos Rope (D)	1964	1965	100.00(C)	tied 100 ft coils-1/2 to 3" in diameter
(j) Permiseal (D) (fibers in emulsion)	1964	1975	Approx. 3.0(C)	5 & 54 gal. steel containers
(j) Weatherkote (R) (fibers in emulsion) (Thermal Kote since 1976)	1963	1977	Approx. 3.0(C)	5, 30 & 55 gal. steel containers
			Approx.	5, 30 & 55 gal.

MISCELLANEOUS PRODUCTS	C-E START	ESTIMATED STOP	PERCENT AND TYPE OF ASBESTOS	CONTAINER
(m) Block Stick (R)	1963	6/28/72	22.0(C)	6 gal. steel containers
(m) Gunisul	1963	1966	Approx. 1.0(A)	50 lb. bags
(m) Mix A (R)	1963	6/27/72	6.0(C)	40 lb. bags
(m) Fibrous Adhesive (D)	1964	1965	13.1(C)	Steel container
(m) Hytempt Flexible Compound (R)	1963	1972	30.0(C)	5 gal. steel containers
(m) Expansion Joint Material (R)	1963	1966	100.0(A)	25 lb. bags
INSULATING REFRACTORIES				
(m) Light Wate 22 (W)	1969	6/26/72	10.0(C)/ 27.0(C)	50 lb. bags
MISCELLANEOUS PRODUCTS DISTRIBUTED BY C-E				
(d) K-12 Calcium Silicate Block	1963	1969	Unknown	
(d) K-12 Calcium Silicate Pipe Covering	1963	1969	Unknown	
d) K-20 Insulating Block	1963	1969	Unknown	
d) Kaylo 10 Calcium Silicate Block	1963	1969	Unknown	
d) Kaylo Calcium Silicate Pipe Covering	1963	1969	Unknown	
d) Kaylo 20 Block	1963	1969	Unknown	
d) J-M Thermobestos Calcium Silicate Block	1963	1969	Unknown	
d) J-M Thermobestos Calcium Pipe Covering	1963	1969	Unknown	
d) J-M Asbestos Cloth	1963	1969	Unknown	
d) J-M Asbestos Gasketing	1963	1969	Unknown	

EY

R) - R & I - Port Kennedy, Pennsylvania
D) - Detrick - Aurora, Illinois
W) - Walsh - St. Louis, Missouri
m) - manufactured
d) - distributed
C) - containing chrysotile
A) - containing amosite
*) - Trademark

CAUTION: This product contains asbestos fibers. Exces
inhalation of asbestos may be harmful. If adequate ventilatio
not possible, wear respirators approved by U.S. Bureau of M