

IN THE COURT OF COMMON PLEAS

SUMMIT COUNTY, OHIO

IN RE:	)	JUDGE VICTOR
	)	
NORTHERN OHIO TIRE	)	DEFENDANT COMBUSTION
WORKER LITIGATION	)	ENGINEERING, INC.'S
	)	RESPONSES TO PLAINTIFFS'
	)	QUESTIONNAIRE AND FIRST
	)	REQUEST FOR PRODUCTION
	)	<u>OF DOCUMENTS</u>

* * * * *

PRELIMINARY STATEMENT AND GENERAL OBJECTIONS

Defendant Combustion Engineering, Inc.'s ("C-E's") responses to Defendants' Questions and Request for Production of Documents ("Document Requests") each incorporate this Preliminary Statement and these General Objections.

Combustion Engineering, Inc. began manufacturing asbestos-containing insulation products on June 5, 1963 and discontinued the manufacture of all such products on August 30, 1972. As a result, its answers to these Questions and Document Requests respond within that time frame. To the extent that this Questionnaire and Document Request calls for information or documents prior to this date, this Defendant objects on the grounds that they are overly broad, unduly burdensome, seek information not relevant nor material to the subject matter of this case, and are not reasonably calculated to lead to the discovery of admissible evidence.

Combustion Engineering, Inc. makes the following additional General Objections to each of these Questions and Documents Requests:

1. This Defendant objects to these Questions to the extent that they purport to require it to "identify" documents on the grounds that such requests to "identify" are overly broad, unduly burdensome and oppressive.

2. This Defendant objects to these Questions and Document Requests to the extent that information subject to the attorney/client privilege and/or which constitutes privileged attorney work product is sought.

3. This Defendant objects to the definitions provided with these Questions and Document Requests as being overly broad, unduly burdensome and calculated to harass this Defendant rather than lead to the discovery of admissible evidence. This Defendant asserts that all terms should be given their usual and ordinary interpretation.

1. William F. Askinazi, Assistant General Counsel; answers based on information and belief.

2. This defendant objects to this question on the grounds that it is overly broad, unduly burdensome and seeks information which is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence. Without waiving this objection, this defendant states as follows:

C-E did not mine or mill asbestos. The term "processing" is so vague that it is not possible to provide an accurate and meaningful response. From 1963-1972, this defendant was involved in the manufacture and sale of various insulating cements and blocks.

Defendant further states that it did not manufacture or sell talc or soapstone and, therefore, questions relating thereto are not applicable to this defendant.

(a) See Exhibit A attached hereto.

(b)(i)(ii) This defendant objects to this question on the grounds that it is overly broad, unduly burdensome and seeks information which is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence. Without waiving the aforesaid objection, see Exhibit A attached hereto for the percentages and type of asbestos for each asbestos-containing product.

(iii) See Exhibit A attached hereto.

(c)(d)(e) See Exhibit A attached hereto.

(f) Generally, this defendant's asbestos-containing products were white or off-white in color. To the best of this defendant's knowledge, the only extant photograph of packaging is found in Exhibit C attached hereto.

(g) Defendant objects to this question on the grounds that it is vague, overly broad, unduly burdensome, seeks protected attorney work product material and calls for speculation as well as an expert scientific opinion. Furthermore, this interrogatory requires this defendant to be familiar with all products made by other manufacturers, which it is not.

(h) Thermal insulation.

(i) To the best of this defendant's knowledge, during the time it manufactured asbestos-containing insulation products, from mid-1963 to 1972, it acquired raw asbestos from the following companies: Johns-Manville Corporation; Carey-Canadian

Mines, Ltd.; Empire Ace Manufacturing Co.; Chicago Firebrick Co.; George A. Rowley Company; and Asbestos Corporation.

(j) This interrogatory is incomprehensible.

(k) The actual use and application of this Defendant's asbestos-containing products was dictated by customer practice, on which this defendant cannot speculate. See Exhibit C.

(l) See Exhibit C for only extant representation of a logo.

(m) Defendant objects to this question on the grounds that it is vague. Without waiving the aforesaid objection, this defendant states that the purpose of the corporation is to engage in any commercial, financial, mercantile, industrial, manufacturing, transportation, marine, exploration, mining, agriculture, research, licensing, servicing or agency business for which corporations may be organized under the general corporation law of Delaware.

(n) See response to Interrogatory No. 2(i)

(o) See Exhibit A.

3. This defendant objects to this question on the grounds that it is vague, overly broad, unduly burdensome and seeks information which is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence. Without prejudice to this objection, defendant responds as follows:

(a) Not applicable.

(b) Generating steam.

(c) Yes.

(d) Yes.

(e) Yes.

(f) See answer to Interrogatory No. 18.

(g) See answer to Interrogatory No. 18.

4. (a)(b) Paper bags, cardboard boxes or metal containers. See Exhibit B, which is a copy of the warning label placed on all of this defendants' asbestos-containing insulation products beginning in 1969, and Exhibit C which contains the only extant photograph of packaging of which this defendant is aware.

(c) This defendant had no trademarks for its asbestos-containing products. For trade names, see Exhibit A.

(d) This defendant objects to this question on the grounds that it is vague, overly broad, unduly burdensome, seeks information which is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence and impermissibly calls for speculation. Without waiving this objection, this defendant states that each of its asbestos-containing insulation products was packaged to reach the ultimate user without substantial change. However, this defendant does not have knowledge regarding what happened to those products once they left the possession of this defendant and therefore does not know if those products actually reached the ultimate user without substantial change.

(e) See Exhibits A, B and C attached hereto.

5. The correct name of this defendant is Combustion Engineering, Inc. This defendant was incorporated in Delaware on October 25, 1912 as the Locomotive Superheater Company. On March 1, 1921, the name was changed to the Superheater Company and was subsequently changed on December 31, 1948 to Combustion Engineering - Superheater, Inc. and finally changed on April 15, 1953 to Combustion Engineering, Inc.

6. This defendant, Combustion Engineering, Inc., is a Delaware corporation. Its principal place of business is 900 Long Ridge Road, Stamford, Connecticut. This defendant's statutory agent for the State of Connecticut is CT Corporation Systems, 1 Commercial Place, Hartford, CT. See answer to Interrogatory No. 5 for corporate history.

7. This defendant objects to Question No. 7 on the ground that the phrase "identify the nature and extent of such functions" is so vague that it is difficult to provide a meaningful response. Without waiving this objection, this defendant states as follows:

On June 5, 1963, Combustion Engineering, Inc. acquired substantially all of the assets of a company previously known as Refractory & Insulation Corporation (a New Jersey corporation). This involved the acquisition of a refractories and insulation manufacturing plant in Port Kennedy, Pennsylvania. The consideration for the purchase was cash in the amount of \$1,932,500. Combustion Engineering expressly assumed certain enumerated liabilities, which did not include the assumption of any tort liability. There were no common directors of the two companies and no common management prior to the acquisition.

On April 3, 1964, Combustion Engineering, Inc. purchased the assets of the Insulation Division of the M. H. Detrick Company (a Delaware corporation). Again, this acquisition was for cash, i.e.,

land, building, machinery and equipment - \$275,000, existing inventories and pending sales orders - \$61,503.32. No tort liability of Detrick was assumed in this transaction. The assets acquired were in Aurora, Illinois. As in the previous acquisition, there were no common directors of the two companies and there was no common management prior to the acquisition. The M. H. Detrick Company continued to exist after the acquisition and still exists today.

On March 27, 1969, Combustion Engineering acquired Walsh Refractories Corporation (a Missouri corporation) by way of statutory merger, and Combustion Engineering thus assumed whatever liabilities Walsh may have had. Walsh Refractories was in St. Louis, Missouri. Its principal business was the manufacture and sale of non-asbestos containing refractories, although it did manufacture three or four products containing asbestos, which products were of a specialized nature, usually made to order for a limited number of customers.

8. See response to No. 7 above.

9. This defendant is a diversified corporation engaging in many areas of manufacturing and, therefore, objects to this interrogatory on the grounds that it is vague, overly broad, unduly burdensome and seeks information which is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence.

10. No, this defendant was not in the insulation contracting business.

11. This defendant objects to this question on the grounds that it is overly broad, unduly burdensome and seeks information which is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence. Without waiving this objection, defendant states it had sales of asbestos-containing insulating products to Warren Tool as follows:

(a)(b)(c) 1969, Super Stic-tite, \$41.22; 1970, Super Stic-tite, \$108.80.

(d) No.

(e) 1963-65 R.T. Hegeman, Vice President Sales; 1966-68 George H. Andrews, Vice President, Sales; 1969-70 K.J. Kettner, Vice President, Sales; 1971-72 Thomas B. West, Vice President, Sales.

12. This defendant had two distributors of its asbestos-containing insulation products for the State of Ohio:

(a) (b) (c) Clark Asbestos Co., 1964-72;
 Miller Refractories Co., 1968-72.

(d) These companies placed orders and bought products from this defendant for resale to their customers. This defendant has no knowledge regarding its distributors' customers.

(e) There are no extant distributor agreements.

13. See answer to Interrogatory No. 12.

14. This defendant objects to this question on the grounds that it is vague, overly broad, unduly burdensome and seeks information that is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence. Without waiving the aforesaid objections, this defendant states that it sold Griptex Block, Super 711 Insulating Cement and Utility Thermal Finish Cement from 1963 to 1971 to Kaiser Refractory for resale under Kaiser's name.

15. This defendant objects to this question on the grounds that it is vague, overly broad, unduly burdensome and seeks information which is neither relevant to the subject matter of this action nor reasonably calculated to lead to the discovery of admissible evidence. Without waiving this objection, see answer to Interrogatory No. 14. Further, defendant purchased two products from Flintkote known as Thermalkote and Trowel Mastic, and these products were re-labeled and re-sold by this defendant under the names Weatherkote and Aircheck, respectively. This defendant does not have in its possession any written rebranding agreements.

16. See answer to Question No. 11.

17. This defendant objects to this question on the grounds that it is vague, overly broad, unduly burdensome and impermissibly calls for speculation. Without waiving this objection, this defendant states that actual use and application of its asbestos-containing insulation products were dictated by customer practice, to which this defendant cannot attest.

18. This defendant installed the following boilers at relevant Ohio locations:

1) B.F. Goodrich

B.F. Goodrich Chemical Plant, Avon Lake Village, Lorain County, Ohio
1948-2 Drum Bent Tube Package Boilers.
All insulation by Purchaser; no setting or insulation by CE.

2) Goodyear

Goodyear Tire & Rubber, St. Mary's Ohio
1972-1 Type "A" shop assembled boiler. CE furnished insulation for this boiler during the time period when non-asbestos insulation materials were being supplied for CE boilers.

3) Firestone Tire & Rubber Co.

1934-Firestone Tire & Rubber, Akron, Ohio
1 "SX" Cross Drum Sectional Header Boiler. CE furnished setting and insulation materials. Carey #12 hi-temp insulation block, hard finish and #12 hi-temp cement, piping insulation, asbestos sheeting and asbestos rope were purchased from Philip Carey. Hard finish cement was also purchased from General Insulating.

4) Dayton Tire & Rubber

1973-Dayton Tire & Rubber Co., Division of Firestone Tire & Rubber, Dayton, Ohio. 1 shop-assembled "VP" boiler. This is a post-1972 contract, and no asbestos insulation would have been involved. C-E supplied non-asbestos mineral fiber batt insulation.

Copies of extant, relevant documents can be made available for review at a mutually convenient time and place.

19. Defendant objects to this question on the grounds that it is vague, overly broad, unduly burdensome and seeks information which is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence. Without waiving this objection, defendant states that it did have some sales of asbestos-containing products in the State of Ohio.

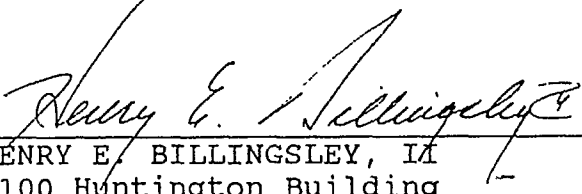
20. Defendant objects to this question on the grounds that it is vague, overly broad, unduly burdensome and seeks information which is neither relevant to the subject matter of this case nor reasonably calculated to lead to the discovery of admissible evidence. Without waiving this objection, defendant states that extant sales records are in the custody of its national coordinating counsel, Arter & Hadden, 10 West Broad Street, Columbus, Ohio 43215.

21. This defendant objects to this question on the grounds that it is overly broad, unduly burdensome and violates the privileges accorded to attorney-client communications and to attorney work product. Moreover, in preparing these responses reference has been made to responses prepared in the course of litigation pending over many years. These responses were based on

conversations and document reviews occurring throughout this period.

22. This defendant objects to this question on the grounds that it is overly broad, unduly burdensome and violates the privileges accorded to attorney-client communications and to attorney work product. Moreover, in preparing these responses reference has been made to responses prepared in the course of litigation pending over many years. These responses were based on conversations and document reviews occurring throughout this period.

ARTER & HADDEN

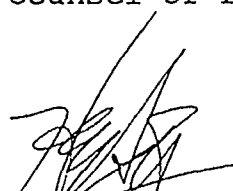


HENRY E. BILLINGSLEY, II
1100 Huntington Building
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(216) 696-1100

Attorney for Combustion
Engineering, Inc.

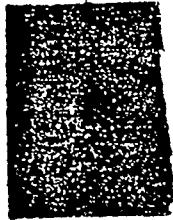
CERTIFICATE OF SERVICE

A copy of the foregoing Defendant Combustion Engineering, Inc.'s Responses to Plaintiffs' Questionnaire and First Request for Production of Documents has been mailed, regular U.S. Mail, postage prepaid, to R. Bryan Nace, Attorney for Plaintiffs, 503 Society Building, Akron, Ohio 44308 and all counsel of record this 7th day of December, 1990.



HENRY E. BILLINGSLEY, ESQ. ~

EXHIBIT B



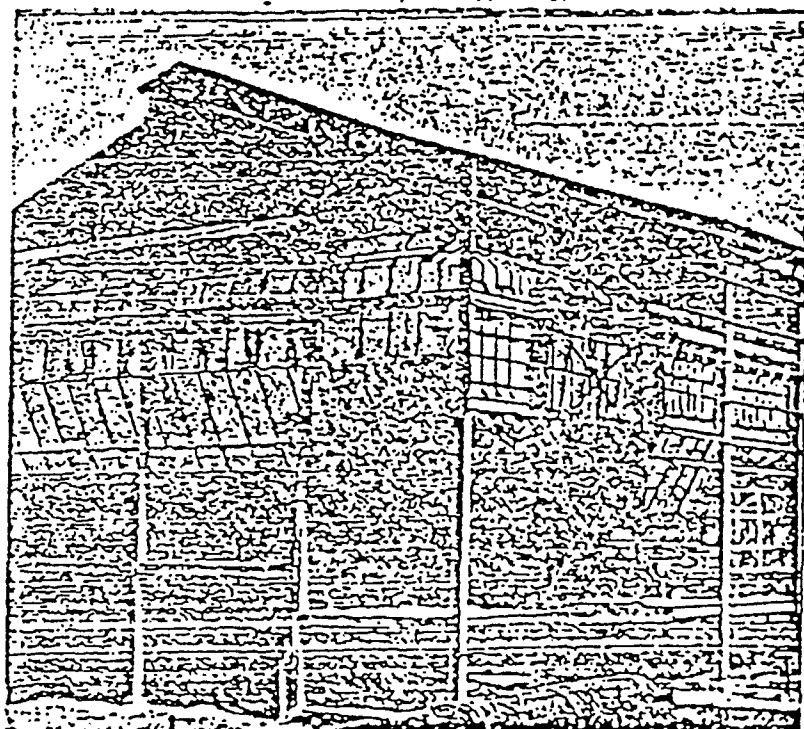
**CAUTION: This product contains
inhalation of asbestos may be harmful
not possible, wear respirators appropriate**

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 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

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

REFRACTORY & INSULATION CORPORATION

625 ILLINOIS AVE.
AURORA, ILLINOIS

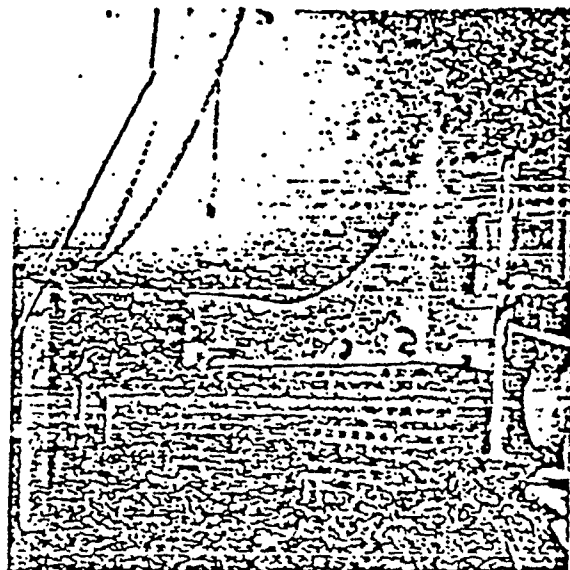
PORT KENNEDY
PENNSYLVANIA



REFRACTORY & INSULATION CORPORATION

UTILITY THERMAL FINISH 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.

REFRACTORY & INSULATION CORPORATION

SUPER 711 INSULATING CEMENT

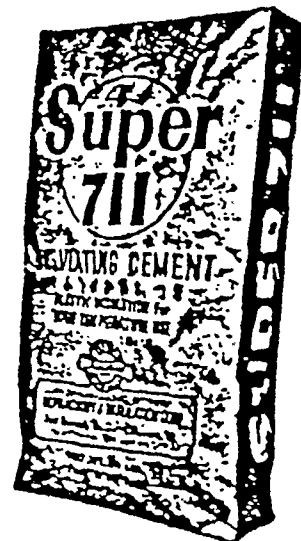
Trowel or Gun Grade



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.

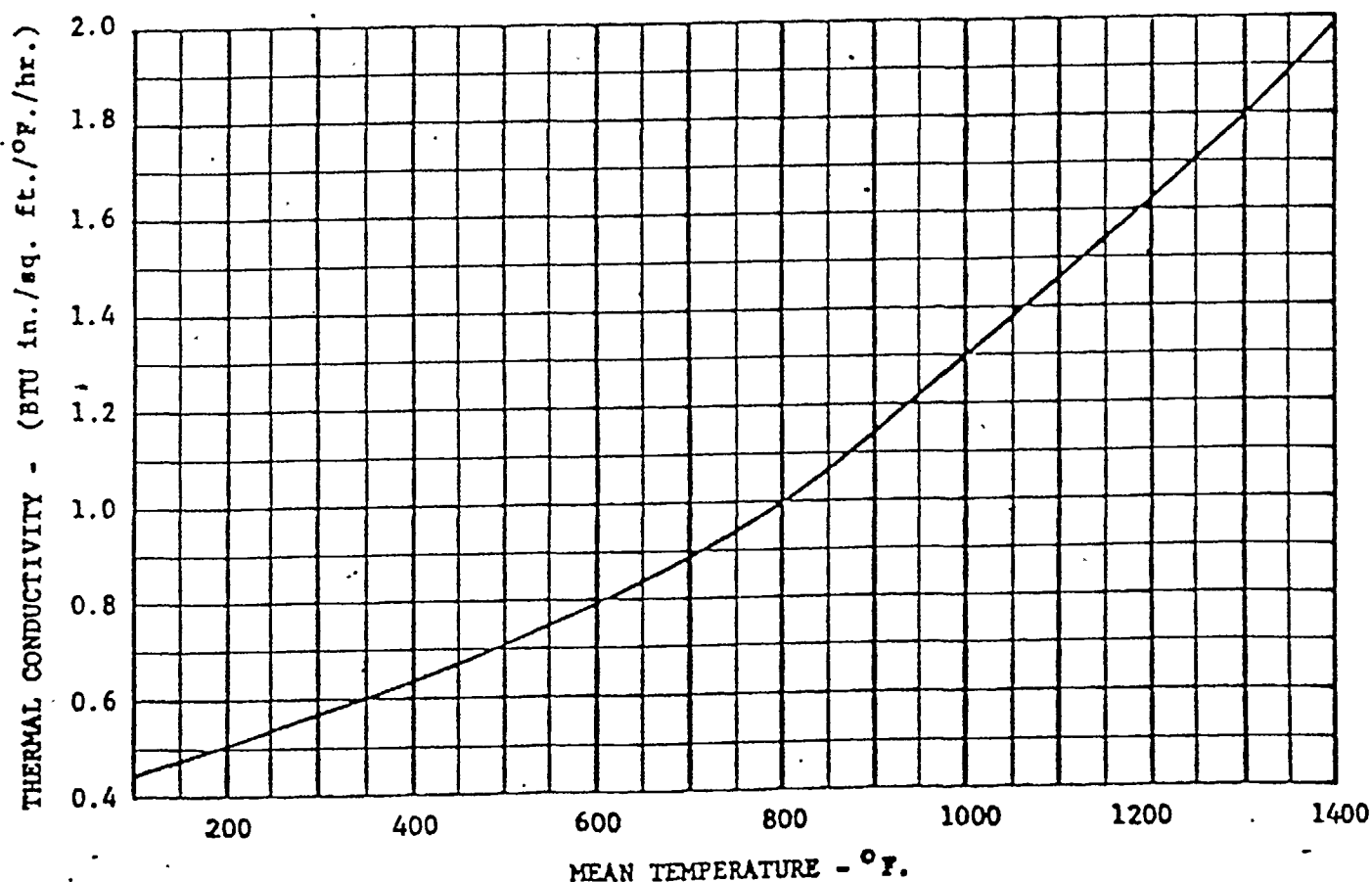
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PHYSICAL PROPERTIES OF SUPER 711 INSULATING CEMENT

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
625 ILLINOIS AVE.
AURORA, ILLINOIS

PORT KENNEDY
PENNSYLVANIA



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PYROSCAT* FIREPROOFING CEMENT

Application Details for Steel Columns and Beams

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.

3. 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. 36

C. Curing Pyroscat

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.

REFRACTORY & INSULATION CORPORATION

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"
1-3/4"
2"

2 Hours
3 Hours - (UL-R-3960)
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.

ADVANTAGES OF PYROSCAT (Continued)

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 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.

REFRACTORY & INSULATION CORPORATION

625 ILLINOIS AVE.
AURORA, ILLINOIS

PORT KENNEDY
PENNSYLVANIA



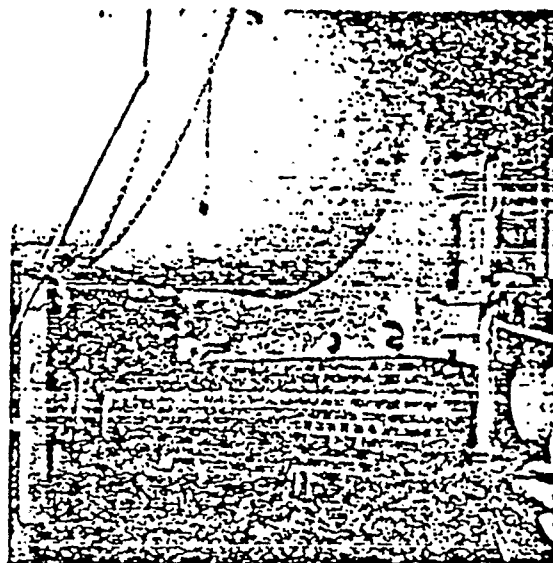
REFRACTORY & INSULATION CORPORATION

UTILITY THERMAL FINISH 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

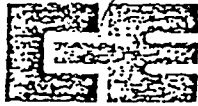
Utility dries to a smooth, light reflectant surface which as an interior finish, requires no further treatment. Utility, however, is easily painted if desired. Outdoor applications should be weather protected. Low temperature applications require a vapor seal type finish.

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.

INDUSTRIAL INSULATIONS

TECHNICAL DATA

 **REFRATORIES**
A DIVISION OF COMBUSTION ENGINEERING, INC.

ASBESTOS ROPE

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, vacuum seals on crucibles, and in many other dry heat-sealing applications, C-E Rope is recommended.

GRIPTEX BLOCK INSULATION

Griptex* is a major development in insulation offering a unique combination of characteristics. 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-1-564 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

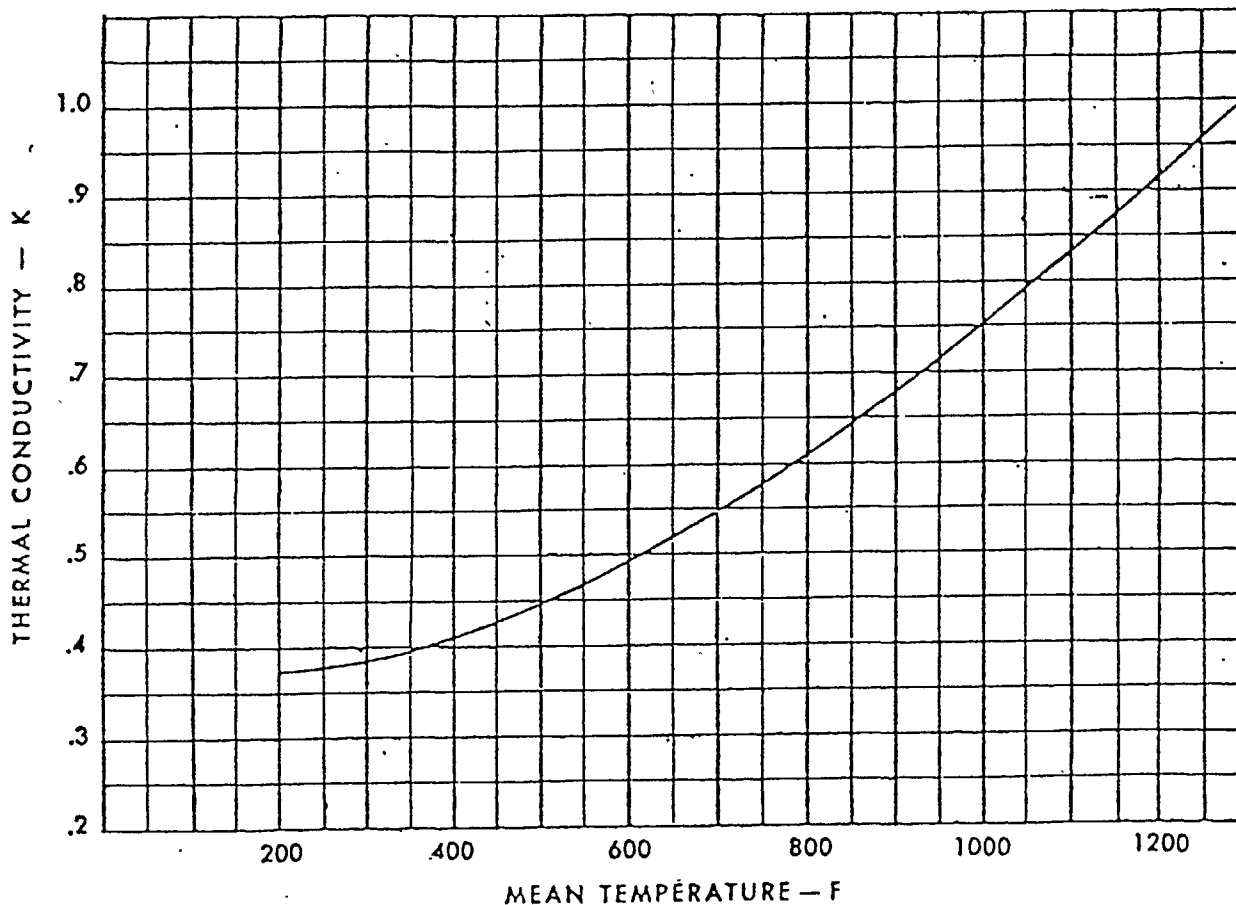
1. Mix Super Finish Stic-Tite thoroughly with 5 to 6 gals. fresh water per 25 lb. bag.
2. Allow the cement mix to soak for one-half hour before using to insure maximum workability.
3. Mix no more than will be applied in 4 hours.
4. If any of the batch has dried out, do not remix it with water or fresh, 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
 Sintering Temperature
 Thermal Conductivity
 Compressive Strength
 Density
 Stability
 Resistance to Moisture
 Resistance to Corrosion
 Handling Characteristics

Up to 1800°F.
 2100°F.
 See Accompanying Graph
 18 psi
 1.25 lbs./bd. ft.
 Inert - durable
 Water-repellent
 Non-corrosive
 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

OVENS, KILNS & DRYERS
VALVES & FITTINGS
TANKS & VESSELS

FURNACES

Heating
Heat Treating
Forging
Annealing
Normalizing

TURBINES & PUMPS
FAN HOUSINGS
DUCTS & BREECHINGS

SPECIFICATION REFERENCES

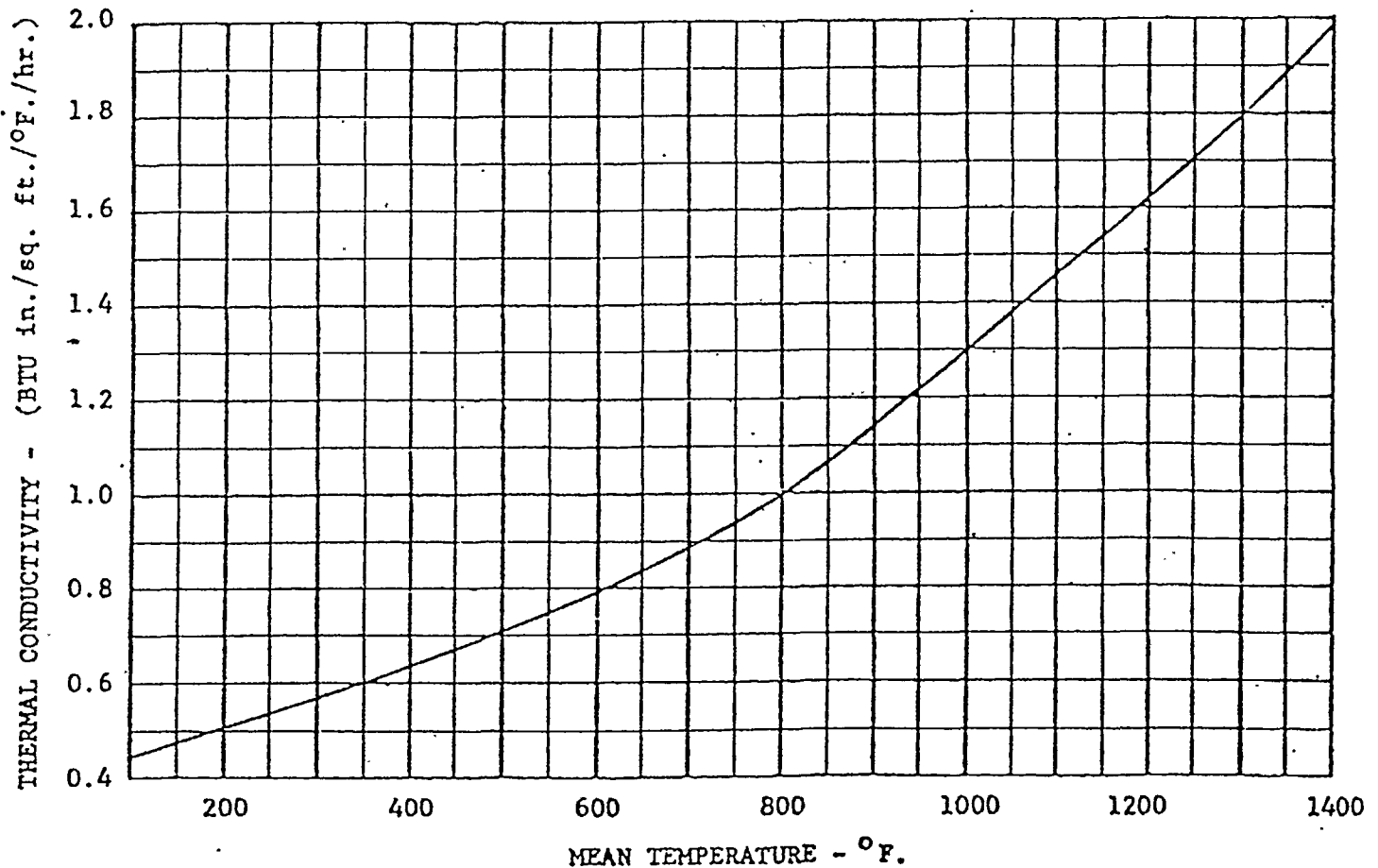
SUPER 711 Mineral Fiber Insulating Cement conforms to ASTM C-195-48; Federal Specification HH-C-168 (Class C); and/or Commercial Standard CS-117 of the U. S. Department of Commerce.

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, because 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

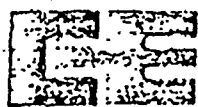
Chemical dispersion type asphalt mastics, such as PERMISEAL, incorporate a unique combination of the desirable qualities of the water emulsion and cutback types. They normally consist of petroleum asphalt dispersed in a non-flammable chemical with suitable fillers, blended in one consistency suitable 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 alkalis. 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.



REFRACTORIES

A DIVISION OF COMBUSTION ENGINEERING, INC.

Technical Bulletin

DURISEAL PROTECTIVE COATINGS

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 Temperature 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. 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

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. Pyroscat 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 weighs 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

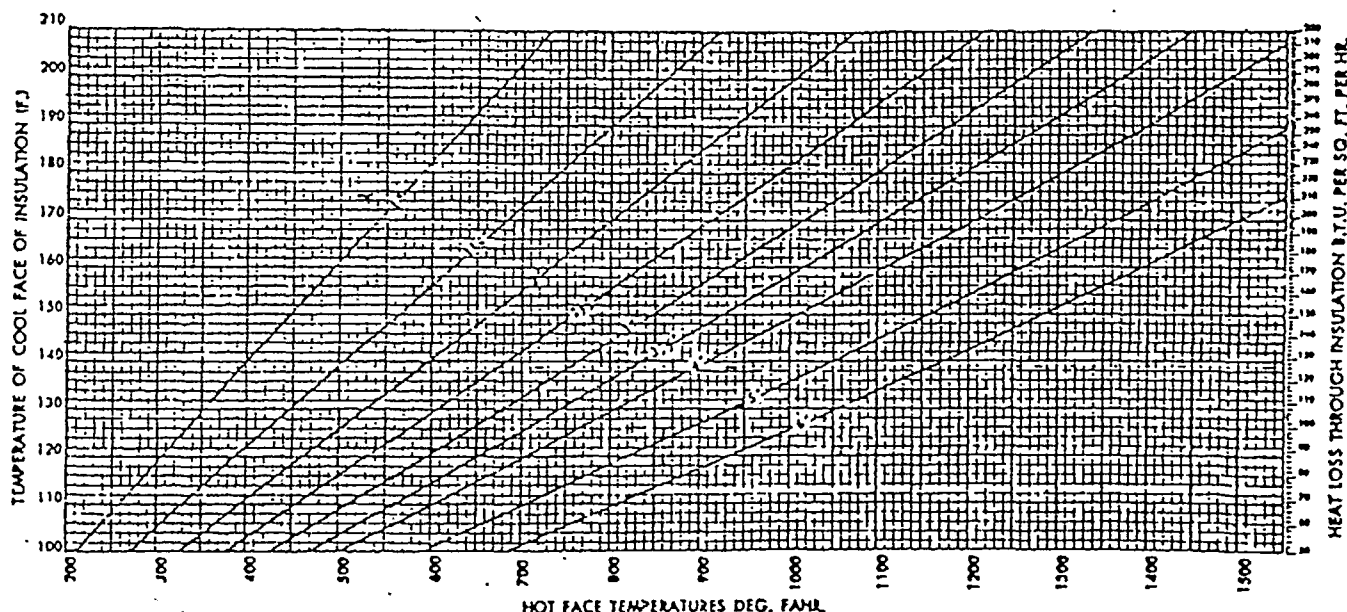
Stic-Tite and Super Stic-Tite plastic insulations are the most versatile insulating materials known. Mixed with water, right on the job, they adhere to any clean surface—and *stay on*—at all temperatures to 1800°F. They are light, strong and unusually durable.

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

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 severe 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.

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)
) SS: -
COUNTY OF MONTGOMERY)

Frank T. Christenson, being first duly sworn, deposes and states:

1) That I am the former Assistant to the Vice President of Industrial Sales of CE Refractories Division, Combustion Engineering, Inc.;

2) That I was employed by Combustion Engineering, Inc. for in excess of twenty-two years and am familiar with Combustion Engineering's involvement in the manufacture and sale of asbestos-containing insulation materials;

3) That Combustion Engineering, Inc., through a wholly owned subsidiary, first began to manufacture asbestos-containing insulation products on June 5, 1963; it removed the asbestos content from all such products in 1972; and that neither Combustion Engineering, Inc. nor any of its subsidiaries has manufactured any asbestos-containing insulation products since 1972;

4) That I have reviewed all available sales records and found no sales or deliveries of any asbestos-containing products to the following companies in the State of Ohio:

American Hard Rubber aka Midwest Rubber Reclaiming Co.;

Midwest Rubber, MBS Chemical Inc. aka Midwest Rubber Reclaiming Co.;

H. Muehlstein, Inc. aka H. Muehlstein Rubber Co.;

Teledyne Monarch Rubber Co. aka Monarch Rubber;

Ferriot, Inc. aka Ferriot Brothers;

Nye Rubber nka Polysar;

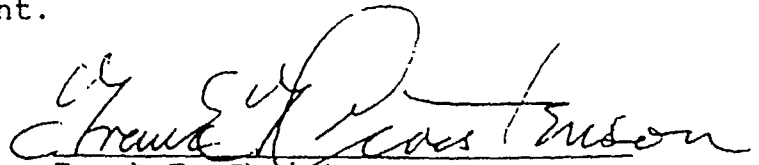
Sun Rubber;

Barefoot Corp: fka Barefoot Sole;

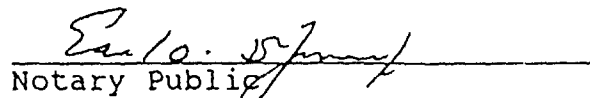
Ken-Tool aka RW Manufacturing; and

Miller Rubber Company aka B.F. Goodrich Plant
4.

Further Affiant Sayeth Naught.


Frank T. Christenson

Sworn to before me and subscribed in my presence this 5th
day of FEB, 1991.


Notary Public

MD1:251

NOTARIAL SEAL
EARL C. DIJENNO, JR., Notary Public
Plymouth Meeting, Montgomery Co.
My Commission Expires Nov. 20, 1992