

GRACE

ZONOLITE DIVISION

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CONFIDENTIAL

FIREPROOFING MATERIALS APPLIED BY THE "DRY HOSE" TECHNIQUE, A SUMMARY OF COMMERCIALY AVAILABLE PRODUCTS

January 20, 1966

Summary Report No. 1276

Laboratory Data Book No. 81, pp. 70, 71, 72, 73, 74, 75,
76, 77, 78, 79, 89

pilot Fire Test Reports 19 to 23, inclusive

Reference: Zonolite Test Reports 1048, 1090, 1094 & 1181

Work done by: R. J. Bragg & W. R. Payment

Work requested by: E. L. Perrine

Purpose of Test: This project has been conducted concurrently with the Mono-Kote Reformulation work (see Zonolite Test Report 1275 of Jan. 20, 1966), with the general objective to provide the Zonolite Division with the "Optimum Fireproofing Composition". Definition of this term is the lowest cost composition per hour of fire protection.

Abstract: An analysis of the competitive fireproofing industry a few months ago disclosed considerable data on ten types of fireproofing materials. This study, which was conducted by the author was slanted at the primary factors in this business. There are a few small operators as well as small operations by large concerns which have been eliminated from consideration by lack of activity.

A review of the top ten (included is Zonolite of course) is attached. Technical data, composition as far as known, and a brief listing of important fire tests is included for each product, as well as a Summary page listing the following data:

Product	Tamping Required?
Producer	Sealer Required?
Binder	Wet or Dry Mix?
Filler (s)	Type of Dust Control
Primer Required?	Whether a Market Factor
Base Adhesive Required?	

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The last line of the summary is our target, a new Zonolite fireproofing material, indicating most desirable properties - which we should build into any new "Dry Hose" material. These properties briefly described: Requires no primer or base adhesive or tamping. Cover coat is optional, and dust must be controlled during application. Naturally, this material has to be competitive in performance and cost.

These characteristics are identical to the relatively new Blaze-Shield, Type D, a blend of chrysotile asbestos and mineral wool produced by the United States Mineral Wool Company. Their binder is a proprietary mix which I've not seen.

This laboratory, under E. L. Perrine's direction, has been designing our development of cementitious mixes toward two goals: the first is the reformulation of Mono-Kote, primarily a formulation change, but material applied with the familiar wet-mix, plaster pump technique. The second goal has been a completely new material for application by the methods used by fibrous fireproofing applicators. In this latter work we have approached the goals mentioned above, but are in poor position to compare relative costs of our recent materials versus competition (i.e. Blaze-Shield, Type D). Some effort will be made to obtain competitive cost data.

When our final fire tests are completed on the "dry hose" materials, and cost analyses can be made, another test report will be submitted.

GENERAL PRODUCT DESCRIPTIONS

Air-O-Therm (10a/Ai)
1738 Rand Road
Des Plaines, Illinois

Jet-Sulation Type 400 - dry stone fiber (probably mineral wool), no asbestos, with "fireproof adhesive". Use primer and adhesive before spraying - while tacky.

2 1/2 in.	2 hour beam
2 3/4 in.	3 hour beam
3 1/8 in.	4 hour beam
3 5/8 in.	5 hour beam

Sprayed "Limpet" Asbestos (10a/Ar)
Armstrong Contracting and Supply Corp.
120 N. Lime Street
Lancaster, Pa.

Limpet Grade LW.25 or 100% asbestos fibers (Amosite)
WS.1 - Special white asbestos with 72% reflectance
BD.2 - Blend of asbestos and portland cement - for trowelling
TS.2 - White resin emulsion for overspray

BP.10-16 Asphalt Emulsion as adhesive material on metal bldgs

1 3/4 in.	4 hour beam
7/8 in.	3 hour beam
5/8 in.	2 hour beam
3 3/8 in.	5 hour column
2 1/4 in.	3 hour column
1 3/4 in.	3 hour column

Asbestospray Corp.
1060 Broad Street
Newark, N. J. 07102

(10a/As)

Virgin asbestos fiber mixed with mineral fiber and inorganic dry binder. Dust control is neutral additive added at the factory (DL-3 dust arresting additive approved by U. L.). Water binder plus Asbestospra. Adhesive first sprayed - fiber laid on while adhesive is still tacky.

3/4 in.	4 hour beam
3/4 in.	3 hour beam
3 1/4 in.	4 hour column
2 3/4 in.	3 hour column

Spray Craft (10a/Sm)
Sprayed Asbestos Mineral Fiber
Smith & Kanzler Co.
Linden, N. J.

Spray Craft Firetest Fiber is a blend of virgin asbestos fiber, mineral fiber and inorganic binders.

15/16 in.	4 hour beam
3/4 in.	4 hour beam
1/2 in.	3 hour beam
3 in.	4 hour column
2 in.	3 hour column

Type S - soft, low density, about 12 pcf

Type H - harder, about 20 pcf

Use Spray Craft Adhesive, Spray Craft Sealer - Fiber is applied while adhesive is still tacky.

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Thermo-Kote
Thermo-K Insulation
U.S. Insulation Sales Corp.
2306 Edwards St.
Houston 7, Texas

Lightweight loose fill organic per U.S. Patent No. 2,470,641;
meets Fed. Spec. HH-1-515; density 1.5 pcf; flame spread is 25.
Uses water soluble chemicals. Will smolder and glow under un-
favorable conditions.

Composition - probably paper fiber, nodulated organic. Upon
application, material can be rolled, tamped, plastered or painted.
There is no reference to adhesive, and no formal fire ratings.

Spray Don (10a/Sp)
Sprayon Insulation and Acoustics, Inc.
415 South Street
Newark 5, N. J.

Blends of virgin asbestos fiber and mineral wool and "high
content of cementitious materials". Utilizes steam pre-wetting
method of dust control. Use Spraydon Adhesive, apply fiber,
while adhesive is tacky, material must be tamped and oversprayed
with water. Sealer generally required.

1 1/8 in.	4 hour beam
1 in.	3 hour beam
3/4 in.	2 hour beam

Cafco Blaze-Shield (10a/Co)
United States Mineral Wool Co.
Stanhope, New Jersey

Mill quality controlled blend of virgin asbestos fiber, highly
refined, white mineral fiber and proprietary binders - dust
additive at factory. Uses Cafco Adhesive, a latex type water
emulsion, probably a polyvinyl acetate. Another description of
their fiber: 100% inorganic virgin Chrysotile and small pellet,
white mineral fiber plus 100% inorganic binders. This last binder
description does not fit the previous appellation of "latex type"
which of course would be organic.

1 in.	4 hour beam
7/8 in.	3 hour beam
1/2 in.	2 hour beam
2 1/2 in.	4 hour column

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Cafco Blaze-Shield, Type D
Producer as above

Virgin asbestos and white mineral wool and proprietary
Adhesive and tamping is eliminated. Transparent over
Shield-Coat, may be used when required.

7/8 in.	4 hour beam
1 3/4 in.	4 hour column
1 1/8 in.	3 hour column

Fire Shield, Fire Code and Mono-Kote are cementitious
fireproofing, manufactured by National Gypsum, United
Gypsum and Zonolite Division of W. R. Grace Co., re
Since this report concerns primarily dry hose type
these latter "wet" mixes shall not be elaborated c

Respectful

RJ Bragg

R. J. Bragg

Approved:

E. L. Perrine

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Skokke Laboratory

RJB:jj
enclosure: (1)

PRODUCT	PRODUCER	BINDER	FILLER(S)	PRIMER ¹	BASE ADHES. ²	TAMP.	SEALER	WET MIX	DRY MIX	DUST CONT'L	FACTORY IN MARY
Ther-Mote	Zonolite Div.	Cementitious	11-12% Vermiculite + Asbestos	No	No	No	No	Yes	No	Yes	Yes
Fire Code	U. S. Gypsum	Cementitious	Vermiculite or Perlite + Asbestos	No	No	No	No	Yes	No	Yes	Yes
Fire-Shield	Nat'l Gypsum	Cementitious	Perlite + Asbestos	No	No	No	No	Yes	No	Yes	No
Jet-Sulation Type 400	Air-O-Therm	Fire Proof Adhesive	Mineral Wool	Yes	Yes	Yes	Optional	No	Yes	No	Yes
"Lispet"	Armstrong Contr. & Supply Corp.	Resin Emulsion	100% Amosite Asbestos	No	Yes	Yes	Optional	No	Yes	No	Yes
Asbestospray	Asbestospray Co.	Inorganic Dry Binder	Asbestos & Mineral Wool	No	Yes	Yes	Optional	No	Yes	Yes at Factory	Yes
Spray Craft	Smith & Kessler	Inorganic Binder	Asbestos & Mineral Wool	No	Yes	Yes	Optional	No	Yes	No	Yes
Spray Don	Sprayon Insul. & Acoustics, Inc.	Cementitious	Asbestos & Mineral Wool	No	Yes	Yes	Optional	No	Yes	Yes-Steam Pre-Wet	Yes
Ther-Mote	U. S. Insulation Sales Corp.	Resin Type	Organic Paper Fiber	No	No	Yes	Optional	No	Yes	No	No
Glass-Shield	U. S. Mineral Wool Co.	Proprietary	Chry. Asbestos & Mineral Wool	No	Yes	Yes	Optional	No	Yes	Yes at Factory	Yes
Glass-Shield Type D	U. S. Mineral Wool Co.	Proprietary	Chry. Asbestos & Mineral Wool	No	No	No	Optional	No	Yes	Yes at Factory	Yes
Patented 3	Zonolite Div.		Vermiculites with Asbestos	No	No	No	Cover Coat Optional	No	Yes	Must be	Yes

1. Primer needed to condition surface.
2. Base adhesive is sprayed film of liquid adhesive, usually of starch or polyvinyl acetate type.
3. This is the product we are working on. See abstract.

RJR/1-20-66

100% Resin EVK when used in 4 cu. ft. mixes and everything being constant.



Asbestos. Plastic. No Benzene. 11-12% Asbestos. Transition product spray-on w/texture.
 Textured Coatings + Decorative white. Tint - OPA. w/ Asbestos.
 Spray. 100% Resin EVK. 100% of mixture - EVK. 100% of mixture - EVK. 100% of mixture - EVK.

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