

GRACE

AREA CODE 312/CENTRAL 6- CABLE ADDRESS "ZONOCO" CHICAGO, ILLINOIS

ZONOLITE

DIVISION W. R. GRACE & CO.

JUL 15 1963

135 SOUTH LA SALLE ST.
CHICAGO 3, ILLINOIS

MINERS AND MANUFACTURERS OF VERMICULITE PRODUCTS

PLAINTIFF'S
EXHIBIT
WRC-1194

July 11, 1963

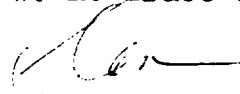
Mr. A. D. Bond, Jr.
Dewey and Almy Chemical Division
62 Whittemore Avenue
Cambridge, Massachusetts

Dear Art:

Enclosed is the balance of the comparisons of vermiculite with other products for home gardening and agricultural uses. These should be added to the building product and Terra-Lite comparisons that were sent to you on July 9th.

Very truly yours,

Zonolite Division
W. R. Grace & Co.



Daniel J. Boone

DJB:mz

cc: J. A. Kelley
R. W. Sterrett

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Mr. A. D. Bond, Jr.
Dewey and Almy Chemical Division
W. R. Grace & Co.
62 Whittemore Avenue
Cambridge, Massachusetts

Dear Art:

Bob Sterrett and I reviewed your list of competitive products and have prepared the attached comparisons for you. In addition to the comparisons on vermiculite as a soil conditioner, you will also receive, within the next few days, comparisons of various fertilizer conditioners and various carriers.

The carrier market is quite complex in that we are competing with everything from "nothing" to water to dust to clays to corn cobs -- you name it. In other words, the carrier market, in general, is quite extensive, but, up to the present time, we have only served a very narrow segment of it, particularly in home garden specialty products.

Very truly yours,

Zonolite Division
W. R. Grace & Co.


Daniel J. Boone

DJB:mz
Enclosures

cc Messrs: J. A. Kelley
R. W. Sterrett

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VERMICULITE VS. COMPETITIVE MATERIALSI. INSULATION

I. <u>INSULATION</u>	ADVANTAGES	DISADVANTAGES
Vermiculite (other than water-repellent)	Permanent...mineral...flowable... fireproof...inorganic...di-electric... rot proof...won't settle ...vermin and rodent proof. <u>For Attics:</u> Easy to install between joists in floors of attics...excellent to pour over old settled insulation...fits tightly against joists, sealing off heat leaks.	Higher "K" factor (less insulation efficiency) costs more per square foot...cannot be economically blown which restricts use in walls and other "hard-to-get-to" areas...not adaptable for "under roof" insulation in attics...not practical for <u>perimeter insulation</u>.
Vermiculite Water-Repellent Masonry Fill Insulation	Water-repellent...easy to visually distinguish water-repellent insulation...easily and rapidly installed...low cost...meets technical requirements for masonry wall insulation...uniform product...nationally available.	Difficult to install in existing buildings...higher priced than some competitive materials...higher "K" factor (less efficient) than some.
Glass Fiber and Rock Wool; Blowing Wool and Pouring Wool	Low "K" factor (efficient) can blow into existing walls and hard-to-get-to places...low cost...network of national applicators or "Blowers". Pouring wool is very low cost	Original installations "fluffed" Will settle and lose efficiency... Can create moisture (vapor) problems. <u>NOT</u> satisfactory for masonry walls. Pouring wool gives poor coverage...harder to install... is made from scraps or trimmings... <u>NOT</u> suitable for masonry walls.
Glass Fiber and Rock Wool Bats and Blankets	Low "K" factor...low cost...good public acceptance due to years of marketing and heavy advertising expenditures (for Fiberglas) by Owens-Corning...non-organic... Easily installed between wall studs in new construction...can be installed between joists under roof.	More difficult to install in attic floors...can settle and compress... irritates skin of workers...particularly bothersome to "do-it-yourself" workers ...can be affected by moisture...rugged competition and unstable market conditions. To insulate masonry walls, the walls must be furred out.

I. INSULATION (continued)	ADVANTAGES	DISADVANTAGES
Wood Fiber Bats and Blankets	Reasonably good "K" factor...can install under roofs...moderately priced...not appropriate for <u>masonry walls</u> . Same general features as for Glass Fiber and Rock Wool Bats and Blankets.	Combustible...difficult to install in floors of attics...more expensive than some competitive materials...produced in only a few places
Paper	Low "K" factor...supposedly an efficient insulation...inexpensive...especially in areas where produced.	Combustible...deteriorates from moisture...not permanent...not universally available...can be damaged by and nested in by rodents. Not appropriate for <u>masonry walls</u> .
Board Insulations (Fiber--Glass Polystyrene)	Can be nailed to roof joists, providing insulation for whole attic...ideal when rooms are to be added in attics...good perimeter insulation. Polystyrene board can be sealed to inside of masonry wall and used as a plaster base. Good insulation.	Not practical for attic floors... polystyrene and vegetable boards highly combustible...mineral boards less combustible but <u>NOT</u> fireproof. Polystyrene is an expensive application for masonry and requires more time...Difficult base to plaster over.
Perlite	Good "K" factor. . . easy to install...universally available ...low cost.	Difficult to determine visually if perlite has been treated for water repellency for <u>masonry walls</u> . Even though generally available throughout the country, there is a lack of uniformity.
Polyurathane	Pump into masonry walls of existing buildings...excellent insulation.	Special equipment required...high priced application in the United States now.

I. INSULATION (continued) ADVANTAGES DISADVANTAGES

High Temperature Vermiculite Insulation	Excellent insulator at high temperature...permanent...can be poured, sprayed, or trowelled.	Refractory specialists control market.
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II. PLASTER AGGREGATES

Vermiculite

Easy to pump...universally available...fire tested at Underwriters' Laboratories... lightweight...good fireproofers...reduces steel requirements in multi-story buildings.

Makes low strength wall...holds moisture...rolls on plasterer's tools...difficult to apply finish coats.

Perlite

Easy to apply by hand...keeps tools clean...stronger than vermiculite...dries faster than vermiculite...is either job mixed or mill mixed...lower cost than vermiculite... reduces steel.

Lack of stability and uniformity... irritates workers' skin and eyes... delayed expansion...can provide a brittle wall, easy to crack... hard to pump.

Sand

Strong wall...low cost...universal available (though quality can vary)...usually applied by hand...sand pumps are more costly.

Heavy to handle...does not reduce dead load of building...not always clean or uniform.

III. CONCRETE AGGREGATES

ADVANTAGES

DISADVANTAGES

Vermiculite

Easy to pump...good yields...
lightweight...fireproof...
reduces dead load of buildings.
Apply over most bases...can be
used for roofs. Also use for
floors...reasonably priced...
can be poured over odd shaped
roofs...uniform and staple...
no expansion joints required

Holds moisture...higher "K" factor
than some...floors require a hard
concrete topping...more expensive
than some lightweight concretes...
low compressive strength.

Perlite

Better "K" factor than vermicu-
lite...more compressive strength
...reduces dead load...less
moisture than vermiculite...
lower cost.

Lack of stability...actually "grows".
not uniform...needs expansion
joints (vermiculite does not)...
hard to pump.

Expanded Shale,
Slate, Clay

Good structural strength...ideal
for floors and blocks...low cost
in areas where produced.

Poor insulator...too heavy for "in-
sulating concrete roofs"...not always
uniform...density frequently varies
...not always available.

Pumice

Good structural strength...ideal
for floors and blocks...low cost
in areas where produced.

Poor insulator...too heavy for
"insulating concrete roofs"...not
always uniform...density frequently
varies...not always available...
lacks stability...quality and
density vary.

Steel Mill Slag

Good structural strength...ideal
for floors and blocks...low cost
in areas where produced.

Not uniform...poor insulator...
quality and density vary.

III. CONCRETE AGGREGATES (continued)	ADVANTAGES	DISADVANTAGES
Gypsum Decks	(Note: Not a lightweight insulating concrete, but competitive with lightweight concrete decks)...low cost...fast set...can be applied the year around	Poor insulation...moisture problems...heavy
Rigid Boards	(Note: This is not concrete, but competes with lightweight concrete roofs) Low "K" factors...place on top of reinforced concrete decks and large metal decks...installed by the roofer...low cost...very versatile to handle...can be installed during any season.	Many are combustible...in case of fire, mastic adhesives add to hazard...difficult to apply over odd shapes.
IV. FIREPROOFING		
Vermiculite	Excellent bonding properties...forms solid uniform surface...easy to apply...highly efficient...can be pumped...greater fire resistant properties...firm, strong surface.	Insufficient surface strength if subjected to traffic damage such as on columns in a garage or warehouse...higher priced than some competitors...less acoustical properties than some competition. This is a problem when specification calls for a combination of fireproofing and acoustics.
Sprayed Asbestos Or Mineral Wool	Low cost...network of established insulation applicators who are going into fireproofing...excellent acoustical properties.	Weak material...dirty to handle...workers need masks...quality frequently questionable because thickness can be "fluffed".

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AGRICULTURAL USES VS. COMPETITIVE PRODUCTSII. FERTILIZER CONDITIONERADVANTAGESDISADVANTAGESVermiculite

Acts as a parting agent and helps to prevent caking in low and high analysis fertilizers. In high analysis fertilizers (for farm crops--not home turf fertilizers like Scott), the low bulk density is extremely important--use about 15 to 30 lbs. per ton of plant food...supply is readily available--eliminating need for excessive storage...not a waste material with sharp price fluctuation influenced by availability...fireproof...adds some potash to formulation...in lightweight home lawn fertilizers, it makes a lighter, easier to handle end product...a carrier of plant nutrients...bulking agent and diluent for dry mixing "lightweight".

Cost... "high" price per ton for expanded material ...fertilizer people think in "tons"...less need in pelletized fertilizer... not adaptable for liquid fertilizers, which are used extensively on the west coast.

Peanut hulls; Rice hulls; Tobacco stems

Low cost in areas where available...customarily used in many plants.

Price can fluctuate from "lows" to "highs"...combustible...requires large storage facilities...heavy weight disadvantage, particularly in high analysis...not particularly desirable in new "lightweights" for home lawns.

Ground corn cobs

Increased use in new "lightweights"...can act as a carrier for plant nutrients...low price in certain areas...uniform size.

Heavier...can "absorb" nitrogen from soil...does not have carrying properties and surface area of vermiculite.

VERMICULITE HOME GARDEN

AND

AGRICULTURAL USES VS. COMPETITIVE PRODUCTS

II. FERTILIZER CONDITIONER(continued)	ADVANTAGES	DISADVANTAGES
Perlite	Acts as a parting agent and helps to prevent caking in low and high analysis fertilizers...not a waste material with sharp price fluctuation influenced by availability...bulking agent and diluent for dry mixing lightweight fertilizers.	Poor carrier of plant nutrients in new lightweight home garden fertilizers...poor carrier of liquid applied plant nutrients...does not contain any potash...not adaptable for liquid fertilizers.

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ANDAGRICULTURAL USES VS. COMPETITIVE PRODUCTSIII. CARRIERSADVANTAGESDISADVANTAGES

Vermiculite

Can absorb large quantities of liquids and remain free-flowing
 ...high porosity, high void volume to surface area ratio, and relatively chemically inert
 ...can absorb solid chemicals at melting point...slow release of chemicals...non-abrasive... can be applied from spreaders or from planes.

Cost in some locations because of availability of local products... frequently competes with waste products...when very fine sized carriers, e.g. dust, are required, vermiculite is not competitive... light weight can cause drifting... general lack of knowledge about vermiculite...clays have been used, accepted, tested, and approved over a period of years...water is used extensively for spray applications.

Clays

Lower cost per ton...availability in some areas influences price... heavier weight if drifting is a problem.

Less surface area...less absorbent... not available in all areas...heavier for some applications.

Corn cobs

Low price in certain areas... uniform size...has acceptance from several important home garden supply producers of fertilizers and weed control products.

Less absorbent...less surface area... higher density...not available in all areas.

Cocoa shells;
Pecan shells;
Rice hulls

Low price in certain areas.

Less surface area, less absorbent, not available in all areas...higher density.

ANDAGRICULTURAL USES VS. COMPETITIVE PRODUCTS

III. CARRIERS (continued)	ADVANTAGES	DISADVANTAGES
Perlite	Lower price in some areas... availability influences data ...free flowing.	Less absorbent...abrasiveness... can be detrimental to spreaders and equipment.

VERMICULITE HOME GARDEN
AND
AGRICULTURAL USES VS. COMPETITIVE PRODUCTS

I. MULCH, SOIL CONDITIONER STARTING MEDIUM	ADVANTAGES	DISADVANTAGES
Vermiculite (Terra-Lite)	Lightweight...clean and sterile ...weed free...breaks up heavy soil...retains moisture... hastens propagation of seeds and cuttings...furnishes some trace minerals...bulb storage ...mulch...mineral...permanent ...good conditioner for golf greens...less sprinkling.	Not organic...costs more than peat moss...not generally known by home gardeners and general public (better gardeners and growers aware of it) Marketed for relatively short time compared to most competitors.
Peat Moss	Organic -- rots and blends into soil...actually helps build soil...known and used for hundreds of years...actually is a "habit" with gardeners...breaks up heavy soil...retains moisture...mulch...low price.	Most gardeners use so sparingly that it contributes little to the soil...not good as a seed or cutting starter...hard to apply...usually has to be shredded.
Cocoa Hulls	Good mulch...low cost...organic	Availability sometimes limited ...primarily a mulch...not used for starting seeds or cuttings...not generally used as a soil conditioner
Redwood Bark	Good mulch...low cost...especially in areas where produced	Not always available...use generally confined to mulching and ground cover...pulls nitrogen from soil

I. MULCH, ETC. (continued)

ADVANTAGES

DISADVANTAGES

Perlite

Low cost...claims to provide better drainage than vermiculite.

Dusty...less moisture retention than vermiculite...color

Bloated Clays

Vigorously promoted for turf work...especially for golf course greens and tees... breaks up heavy soils, aerates them, and provides good drainage.

More difficult to handle than vermiculite...not readily available...does not retain moisture...more watering required than when vermiculite was used.