

REC'D AUG 10 1978

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GRACE

Construction Products Division

TO: E. S. Wood
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DATE: August 4, 1978

PLAINTIFF'S
EXHIBIT
WRG-1402A

FROM: R. C. Ericson
CC: R. A. Merther

SUBJECT: M.S.D.S. MONOKOTE
FILE: M.S.D.S. MONOKOTE

There appears to be agreement that we ought to have a Material Safety Data Sheet on MONOKOTE. The purpose of this memo is to present two options for the format with the objective of accepting one of the two, so that we can respond to pending requests. It may also be possible to use option 1 plus the technical bulletin on a selective basis.

Both versions face up to the two key issues "Airborne Asbestos Fiber and Free Silica" in the manner outlined below:

M.S.D.S. SECTION II - HAZARDOUS INGREDIENTS

Option #1

The physical handling of MONOKOTE fireproofing during application can create a nuisance dust level in excess of OSHA Standards. Normal industrial dust control practices should be followed.

Option #2

Contains trace quantities of Tremolite, a natural occurring impurity, classifiable as asbestos by OSHA Regulation 1910.1001 (refer to attached Technical Bulletin).

The physical handling of MONOKOTE fireproofing during application can create a nuisance dust level in excess of OSHA Standards. Normal industrial dust control practices should be followed.

M.S.D.S. SECTION V - HEALTH HAZARD DATA

Option #1

TLV: Dust - Respirable Fraction 5 MGM/M³ - Total Dust 15 MGM/M³

Option #2

TLV: Dust - (Respirable Fraction 5 MGM/M³ - Total Dust 15 MGM/M³)
TLV: Asbestos 2 Fibers/cc 8 hr. TWA 10 Fibers/cc max.
(See Attached Technical Bulletin)

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M.S.D.S. - MONOKOTE

Our basis for handling the "Free Silica" and asbestos fiber issues is as follows:

Issue #1 - Free Silica

- a.) Present in East Coast Gypsum sources only.
- b.) Consistently addressed as a non-hazard by both U. S. Gypsum and National Gypsum - Nuisance dust is only consideration.
- c.) The Eaton memos of February 1, 1978 and March 6, 1978, to me, show by jobsite sampling in Baltimore that we pass the adjusted TLV taking free silica (as a % of total dust) into account.
- d.) Result - no reference to a free silica hazard in Section II of the Material Safety Data Sheet.

Issue #2 - Airborne Fiber

- a.) Tremolite Levels - Our data base -- "Review of MONOKOTE fire-proofing as related to Section 25910 of the California Health and Safety Code." This report quotes A. D. Little report that MONOKOTE may contain fiber at a level of 4 parts per million.
- b.) Jobsite Airborne Fiber Levels - The same report says "Fiber counts are of the same order of magnitude that NIOSH has established as the minimum, which can be reliably detected and so far below even future OSHA Standards as to be classed as not hazardous."
- c.) The Marks Bill has been passed in California and contains exemption for products containing "less than 0.25% of naturally occurring contaminant."
- d.) Thus, Option #2 should enable us to handle the sales problems of formally stating the fact of Tremolite contaminant.

I feel that issuing a Material Safety Data Sheet now, based on available data, puts us in a better position to deal with the real world than ducking the issue and not issuing one. May I have your comments?

Finally, we could consider the alternative of using only option 1 with the technical bulletin as a back up where needed on a selective basis. We would handle requests for Material Safety Data Sheets in the following manner: A simple, routine request for an M.S.D.S. (from any source) would be answered with option 1. In the event an inquiry went beyond this and specifically asked questions about a possible asbestos content in MONOKOTE, we would respond with the technical bulletin as a supplement to the option #1 M.S.D.S. We could further control this supplemental response by requiring that it come from Cambridge Quality Assurance only and with the requirement that B. R. Williams be informed in advance of sending it out.

R. C. Ericson
R. C. Ericson

RCE:M
Attachment

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TECHNICAL BULLETINSUPPLEMENT TO MATERIAL SAFETY DATA SHEET FOR MONOKOTEThe Nature of MONOKOTE

MONOKOTE is a multi-component mixture of materials formulated to function as a direct-to-steel fireproofing material, which is capable of providing reliable fire protection throughout the life of the building. It contains expanded vermiculite which may include trace amounts of tremolite fibers as a naturally occurring mineral contaminant. Tremolite occurs naturally in many mineral deposits, including vermiculite. Most of the contaminant is removed during the refining of the raw vermiculite ore, during the high temperature processing of the vermiculite ore to expand it to a lightweight aggregate and during the manufacture of MONOKOTE.

In spite of these processing steps, however, it is possible that some trace amounts of tremolite could be carried by the vermiculite through these processes into the finished MONOKOTE product. There is no known process capable of completely eliminating this possibility.

The Tremolite Content of MONOKOTE

A number of samples of MONOKOTE have been analyzed by three competent independent laboratories to determine if any asbestos is present. All three laboratories reported no detectable asbestos in MONOKOTE. The three laboratories are:

- (1) Arthur D. Little, Inc. - Cambridge, MA
- (2) Mount Sinai Hospital Environmental Science Laboratories - New York, N. Y.
- (3) Truesdail Laboratories - Los Angeles, CA

In our own Grace laboratory, tremolite cannot normally be detected in MONOKOTE even when using sophisticated X-ray diffraction techniques. However, the theoretical possibility of tremolite being present led us to further investigations. An experienced consulting petrographer, who was assigned to this project, was able to find some evidence of trace quantities of tremolite in two out of seven samples of MONOKOTE, although in amounts too small to be quantified.

In an attempt to quantify the tremolite fibers present in MONOKOTE, Grace funded a six-month research project at Arthur D. Little, Inc. in which a combination of the most sophisticated and up-to-date analytical techniques were employed to quantify the tremolite fiber present in these two samples of MONOKOTE referenced above. Arthur D. Little, Inc.'s research results indicated that tremolite fibers were present, but at a level less than four parts per million, levels which are not generally detectable. This extensive research leads us to the conclusion that:

Although tremolite fibers may be present in MONOKOTE, they are present only at such extremely low levels as to be "de minimus" and clearly inconsequential.

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In spite of the foregoing, MONOKOTE might technically be considered in conflict with any regulation or specification banning asbestos in spite of the minute and insignificant amount of tremolite fibers which might be present.

Jobsite Airborne Fiber Levels

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Grace has conducted jobsite air sampling tests to measure fiber counts during the mixing and spraying of MONOKOTE. The samples taken are breathing zone air samples from MONOKOTE workers at MONOKOTE jobsites. They were collected on Millipore 37 millimeter diameter filters with 0.8 micron pore size. The fiber counting was done in our analytical laboratory using the standard phase contrast microscopic method approved by NIOSH.

Fiber counts taken by this method have an unknown error factor which has the effect of overstating fiber counts. This is because existing analytical methods cannot differentiate, at these low fiber levels, between the gypsum, glass and organic fibers which are part of the MONOKOTE formulation. The test results, therefore, include the measurement of other fibers in addition to tremolite which may be present. Values obtained, therefore, are considered maximum fiber count levels.

In addition, fiber counts include background fiber levels characteristic of the air quality and asbestos fibers which might be introduced from water which is mixed with MONOKOTE. Actual fiber counts from MONOKOTE only would, therefore, most likely be lower.

Grace's jobsite studies show fiber counts in the ranges listed below:

	<u>Fibers/ML.</u>	
	<u>8 Hr. TWA</u>	<u>Max.</u>
MK Mixer Operator	0.02 - 0.10	0.13 - 0.23
MK Sprayman	0.08 - 0.31	0.19 - 0.52

We believe that at the extremely low fiber levels which were measured (which measurements included counts of background fibers), MONOKOTE cannot be judged to be hazardous. The levels are not only far below today's Federal OSHA standards, but also far below the standards proposed for the future (.5 fibers maximum). In fact, the fiber counts measured when MONOKOTE is used are of the same order of magnitude that NIOSH has established as the minimum which can be reliably detected.

In spite of the foregoing, because of the specific language of OSHA Regulation 1910.1001, 4 (f), the regulation can be construed to require monitoring in any work area where there is use of a material which contains any asbestos.

Conclusion

In any case where the application of MONOKOTE is being considered and an applicable regulation or specification contains a requirement that the product be certified to be "free of asbestos" (implying at any detectable level, no matter how small) we would invite attention to the recent action of the State of California. This action was taken to alleviate unnecessary concerns which result from a total and complete ban on asbestos. The California regulation was amended so that it now contains an exemption for products containing "less than 0.25% of a naturally occurring contaminant."

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Exhibit 1402