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PLAINTIFF'S
EXHIBIT
WRG-573a

Lab. Report No. 740300 October 6, 1970

Dusting Test Conducted on Zonolite Mono-Kote Fireproofing Material

W. R. Grace & Co.
Construction Products Division
62 Whittemore Avenue
Cambridge, Mass. 02140
Attn: Mr. Walter Payment
Research Dept.

J. N. Schoenberger

Director, Physical Sciences Division

BOWSER-MORNER Testing Laboratories, Inc.

Test Report in Accordance
MIL-STD-831

BOWSER-MORNER
Testing Laboratories, Inc.

ADMINISTRATIVE DATA

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PURPOSE OF TEST:

To determine if exposure to a high-velocity airstream will cause erosion or dusting of the Zonolite Mono-Kote.

MANUFACTURER:

W. R. Grace & Company
Construction Products Division
62 Whittemore Avenue
Cambridge, Massachusettes 02140

MANUFACTURER'S TYPE OR PART NUMBER:

Zonolite Mono-Kote Fireproofing Material

DRAWING, SPECIFICATION OR EXHIBIT:

QUANTITY OF ITEMS TESTED:

Three (3) Pans

DATE TESTS COMPLETED:

September 19, 1973

TESTS CONDUCTED BY:

The Staff of The Physical Sciences Division
Bowser-Morner Testing Laboratories, Inc.

DISPOSITION OF SPECIMEN:

Retained by Bowser-Morner Testing Laboratories, Inc. pending instructions from Client.

FACTUAL DATA

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SECTION I - RESULTS OF TEST

Following are the results obtained during testing of the sample Zonolite Mono-Kote Material. Tests were conducted as specified in Appendix B, using the equipment described in Appendix A.

No dusting could be detected using the method of iso-kinetic sampling.

The amounts of dust detected were extremely small, and are regarded by this laboratory as within the band of weighing error. The amount of dust found downstream from the Mono-Kote could not be distinguished from the ambient dust level.

A microscopic examination of the filter surface revealed no particles which could be definitely identified. Under this examination, at a variety of magnification powers, the appearance of the upstream filter was virtually identical to that of the downstream filter.

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TEST EQUIPMENT

Following is a description of the test equipment used in conducting the Dusting Test on the sample Zonolite Mono-Kote.

A wind tunnel designed and fabricated by Bowser-Morner Testing Laboratories, Inc. was used to provide the 50 mph air velocity over the Zonolite samples.

The tunnel consists of an ILC Electric Ventilating Co. Model BC-40 squirrel-cage blower driven by a three H.P. U.S. Varidrive Unit, Model VEU-GH, driving air through a 18" high X 12" wide tunnel which tapers down to a 6" high by 12" wide section at the Zonolite samples. Furnace filters were used to filter ambient air at the blower inlet.

Velocity was measured by a 1/4" O.D. Ellison pitot tube and 0-2" H_2O inclined draft gage.

Sampling was accomplished using a Bell & Gosset 1/4 HP vacuum pump, two 10 liter/minute Millipore Corp. limiting orifices, four Ashcroft 30" vacuum to 150 psi Bourdon tube gages, two Bowser-Morner Testing Laboratories, Inc. filter holders, and a number of Millipore Corp. AAWG 04700 cellulose acetate surface type filter membranes, 47 mm. in diameter.

Filters were weighed on a Sartorius 0-200 gram balance with .0001g smallest divisions.

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TEST PROCEDURES

Following is a description of the test procedures used in conducting the Erosion Test on the sample Zonolite Mono-Kote.

Three 10" X 13 3/4" X 2" aluminum trays were sprayed level with the Zonolite Mono-Kote material at the Winters Bank site. Spraying and curing procedures can be found in Report No. 740301 from our Construction Materials Analysis Dept. (See attached report).

The sampling nozzle I.D. necessary to produce an iso-kinetic sampling condition (a condition in which the velocity inside the sampling probe is the same as the air velocity inside the duct being sampled) was calculated, and two (2) suitable probes fabricated. One sampler probe was installed in the duct approximately one (1) foot upstream of the two trays of Zonolite Mono-Kote being tested, and approximately one (1) inch higher than the surface of the Zonolite Mono-Kote. The two (2) trays of sample material were installed in cutouts in the floor of the duct such that the surface of the Zonolite Mono-Kote was nearly flush with the floor of the duct. The 6 foot section of duct in which the samples were placed was of rectangular cross-section, 12" wide and 6" high (see sketch in Appendix C.)

The sampling rate was held constant by use of fixed orifices which are factory-calibrated to allow a flow of 1[illegible] liters per minute of air providing the pressure on the downstream side is 53% or less of the pressure on the upstream side. This pressure drop was monitored by bourdon tube gages. Air was drawn through the sampling system by means of a vacuum pump. (See schematic in Appendix C).

The air velocity in the duct was brought up slowly to 50 mph and held there for 10 minutes to purge any loose particles present in the duct or on the Zonolite Mono-Kote. Sampling was then begun at both sampling probes and was continued for 24 hours. The sampling filters were changed each eight (8) hours.

The quantity of dust collected was determined by weighing. The filter disks were dried prior to weighing for one (1) hour in 95°C chamber, and kept in a dessicator until immediately before weighing. After the eight (8) hour sampling period, the filters were dried in the same manner before final weighing.

The purpose of the upstream sample is to establish the ambient dust level, which can then be subtracted from the total, leaving only the dust contributed by the Zonolite Mono-Kote.

This establishes an amount of dust per cubic foot of air, which can be related to the total amount of airflow through the duct during the test which in turn yeilds the total dust evolved from the Zonolite Mono-Kote surface area.

Duct airflow was established by means of a velocity profile which can be found on the data sheets in Appendix C.

BOWSER-MORNER Testing Laboratories, Inc.

CHEMISTS • INSPECTORS • ENGINEERS
Founded 1911

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MAIL ADDRESS P.O. BOX
DAYTON, OHIO 4540
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October 5, 1970

Pretzinger and Pretzinger
Architects and Engineers
1155 Reibold Building
Dayton, Ohio 45402

Attn: Mr. Albert Pretzinger

Re: Lab. Report No. 740301
Zonolite Mono-Kote Testing

Dear Sir:

On July 6, 1970, Zonolite Mono-Kote Material was sampled at the Winters Bank Project. Three (3) pans and nine (9) cube molds were filled by having the Mono-Kote sprayed directly into the molds. The specimens remained on the project site overnight in an air-conditioned office and were taken to the Laboratory on July 7, 1970. All specimens were then room cured at normal temperature for 28+ days. The above sampling and curing methods had been prearranged at the meeting of July 2, 1970, St. Mary's Hall, University of Dayton.

On September 15 through 19, 1970, Wind-Tunnel Erosion Tests were conducted on the pan samples at Bowser-Morner Testing Laboratories. Please refer to Report No. 740300 of the Product Evaluation Laboratory for detailed procedures and test results.

On September 25, 1970, eight (8) two inch (2") cubes of Mono-Kote were tested for density and Compressive Strength, after having previously been dried in accordance with A.S.T.M. C472. These cubes represented the same material as that tested for wind-erosion.

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Density, PCF	Compressive Strength, PSI
25.2	34.6
26.9	48.0
25.5	42.5
25.9	42.5
26.2	40.2
27.4	39.0
26.5	45.5
25.9	43.6
26.2 (Average)	42.0 (Average)

Respectfully submitted,

BOWSER-MORNER Testing Laboratories, Inc.

Thomas W. Schommer
Manager, Materials Analysis Laboratory
Construction Materials Division

3-Pretzinger & Pretzinger
1-File
1-Thomas W. Schommer
1-Div. III

TWS/blm

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