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611

UNION CARBIDE — INTERNAL CORRESPONDENCE

UNION CARBIDE CHEMICALS COMPANY • INSTITUTE PLANT P. O. BOX 2831, CHARLESTON, WEST VIRGINIA

To (Name) Mr. G. J. Ratcliffe
Company
Location Industrial Relations

Date 20 July 1962
Originating Dept. Medical Department - Plant 512
Answering letter date

Copy to
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Mr. R. A. Huber
Mr. B. F. King
Mr. F. B. Snyder
Dr. C. U. Dernehl
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Mr. E. G. Heinz
Mr. P. E. Henry
Mr. R. A. Neal
Mr. D. R. Matheny
Mr. N. H. Ketcham

Subject: Insulation Block Dust Survey
Construction Insulation Shop
Plant 511

Enclosed is an industrial hygiene report by Mr. R. E. Peele on the potential hazardousness of "new and improved" "Thermobestos" insulation blocks submitted by the manufacturer for evaluation by band saw processing in the Construction Department's Insulation Shop. The report points out that the three "new and improved" sample blocks, subjected to test conditions identical with those in use and reported upon in March of this year, are an improvement somewhat, but these blocks too, release quantities of asbestos dust particles into the working environment considerably above the acceptable safe limits (i.e., the T.L.V.). Therefore, definitely, the processing of "new and improved" blocks also constitute a hazard to health.

Mr. Peele recommends that "Thermobestos" blocks not be processed in the Construction Department Insulation Shop until they meet acceptable standards and I concur fully.

Very truly yours,

R. J. Sexton, M.D.
Plant Medical Director

RJS:gl

Enclosure

INDUSTRIAL HYGIENE SURVEY

CONSTRUCTION INSULATION SHOP - BUILDING 511-2018

REPORT 62-IH-2-G-1

SUMMARY: In March of this year, following an industrial hygiene survey, it was recommended that band saw fabrication of "Thermobestos" insulation blocks in the Construction Department Insulation Shop at Plant 512 should cease completely and permanently unless the blocks, or the dust control techniques used in fabricating the blocks, are improved so that atmospheric dust concentrations are found to be within acceptable safe limits. In the following month of April, three new "Thermobestos" insulation blocks were submitted to Plant 511 for evaluation under environmental conditions identical with those experienced heretofore.

Critical analysis of the data obtained on this more recent survey revealed the existence of some degree of improvement in the dust contamination associated with the fabrication of these particular "Thermobestos" insulation blocks. However, the magnitude of the improvement did not reduce the atmospheric dust concentrations to within the recommended safe acceptable limits of 20 mppcf (million particles per cubic foot) of air. Therefore, the recommendations remain exactly as those stated in the report of the survey of March, 1962*.

INTRODUCTION: It was established unquestionably, in an industrial hygiene report submitted in March of this year, i.e., Report 62-IH-1-G-1, that an inhalation hazard to health is produced within the Construction Insulation Shop whenever "Thermobestos" insulation blocks are fabricated. Furthermore, it was recommended also that the fabrication of "Thermobestos" insulation blocks should cease until at least one of the following two conditions are met: First, that the atmospheric dust problem is reduced to below 20 mppcf of air through the use of ventilation, etc., or, second, that, if a new insulation block should be manufactured by the producer of "Thermobestos" blocks that, it would be subjected to testing under identical conditions as before thereby establishing the fact that it will not release, upon fabrication with a band saw, dust concentrations in excess of 20 mppcf of air.

The Industrial Hygiene Department's recommendations met exact compliance by those responsible persons in the Construction Insulation Shop, in that no "Thermobestos" insulation blocks have been fabricated with band saws for use in this plant since the date of the issuance of these recommendations. However, some change in procedure was indicated when, on 25 April 1962, this department was contacted by Mr. D. R. Matheny, General Foreman of the Insulation Shop. At that time, Mr. Matheny requested an evaluation of a new "Thermobestos" insulation block which had been developed by the manufacturer, in an effort to comply with the specifications as stated in the second part of the above listed recommendations.

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*Insulation Block Dust Survey, Construction Insulation Shop, Plant 511, Report 62-IH-1-G-1.

DISCUSSION: Mr. Matheny's request for services was immediately acted upon at which time two basic decisions were made: First, Friday, the 27th of April, would be the most opportune time for obtaining the information needed in the performance of this evaluation and, second, two atmospheric dust samples of each condition should be obtained with each one being taken in identical locations so as to provide greater reliability. These sampling plans had to be altered somewhat, however, on the site, when it was discovered that the manufacturer had provided only three insulation blocks each of which differed in the precise manner in which it had been produced*.

This shortage of material, with identical characteristics, complicated the sampling and evaluation procedures somewhat, since it was impossible, therefore, to obtain more than one sample of atmospheric dust being produced by any one material (in actuality, a total of only three atmospheric dust samples were collected during the test period). However, this complication was not so severe as to render the sample data of no use, as is revealed in the condensed explanation of the sampling procedure selected on this date which is as follows:

First: The data contained on page 8 of Report 62-IH-1-6-1 revealed clearly that the greatest concentrations of atmospheric dust were produced at the band saws, and that location #3, i.e., #2 band saw while sawing, definitely provided the greatest hazard to health. Consequently each of the three samples, under consideration in this report, i.e., 62-IH-2-G-1, were taken at this same location.

Second: All of the results revealed in the preceding report, i.e., 62-IH-1-G-1, were obtained during the late fall and winter, therefore, the doors to the building were closed for purposes of heat conservation. These environmental conditions were duplicated during the performance of this second survey.

Third: The operator of the #2 band saw employed sawing techniques as nearly identical with those in evidence during the preceding periods of evaluation as were possible to duplicate, i.e., position of the block with respect to the saw blade, speed of feeding the block into the saw blade, position of the operator's head with respect to the block, etc.

Fourth: Each of the dust samples obtained during the time of performing the initial survey were held in the operator's breathing zone. This feature was also duplicated for this second survey, i.e., 62-IH-2-G-1.

EVALUATION: Each of the three samples collected were evaluated in the laboratory in accordance with recommended and prescribed light field microscopic counting techniques as referred to and identified in Report 62-IH-1-G-1. It should be noted that no effort was expended to obtain anything more than a knowledge of the concentration of dust in the air since the composition and particle size of this material should not be expected to deviate to any degree from the prior recorded values. This supposition was based on two facts, (1) the

*In accordance with information received from the manufacturer each block was composed of identically the same materials and was formed in the same general manner, i.e., by the "Pan Method". However, the similarity in production differed from here on with the manufacturer being the only one in possession of the exact description and the specific alterations incorporated in each method.

chemical make up of these materials was reported as being identical with the "Thermobestos" materials reported on in the prior survey and, (2) the sawing techniques utilized on both occasions were identical in nature.

PROCEDURES: Both sampling and analytical methods were identical in detail with those described in the earlier report, with sampling being accomplished through the use of the Mine Safety Appliance Company's Midget Impinger Pump and Apparatus and the analysis taking place in accordance with light field microscopic counting techniques.

RESULTS: Analysis of the physical data contained on page 5 reveals that the atmospheric dust concentration in mppcf (million particles per cubic foot) of air for each of the three new materials was

(a) 36.8 mppcf of air for J.M. #21,

(b) 48.1 mppcf of air for J.M.#22, and

(c) 44.1 mppcf of air for J.M. #23.

CONCLUSIONS:

(1) None of these three samples revealed a concentration as high as that recorded in the previous report for "Thermobestos" exposures in this position, i.e., 101.4 mppcf of air for Location #3. However, by the same token, none of the present three samples revealed a concentration as low as that recorded for "Kaylo" exposures in this position, i.e., 17.1 mppcf of air for Location #3.

(2) Each of the three values exceeded the established T.L.V. (Threshold Limit Value) of 20 mppcf of air by a substantial amount.

(3) None of the three insulation materials, i.e., J.M.#21, J.M.#22, and J.M.#23, as submitted by the manufacturer of "Thermobestos", should be fabricated with band saws in the Insulation Shop by our employees unless the manufacturer complies exactly with the following conditions:

The physical and/or chemical characteristics and composition of these materials are improved to the degree that some further future evaluation might reveal them to be incapable of releasing concentrations of dust into the atmosphere that are in excess of the T.L.V.

RECOMMENDATIONS:

Do not fabricate the 18" x 36" x 4" "Thermobestos" insulation blocks (J.M.#21, J.M.#22, J.M.#23) with existing equipment unless -

(1) The producer of this material can further improve his product to the point that it will not release, upon fabrication with our ventilated band saws, dust concentrations in excess of 20 mppcf of air, or,

(2) The atmospheric dust problem can be reduced to below 20 mppcf of air through the use of improved ventilation techniques, or other safeguarding measures.

Submitted by: Robert E. Peele

Robert E. Peele
Industrial Hygienist

REP:gl

15 July 1962

INDUSTRIAL HYGIENE SURVEY

EVALUATION OF ATMOSPHERIC DUST CONCENTRATIONS

AT THE CONSTRUCTION INSULATION SHOP

Atmospheric Dust Concentration Data

on Three "Thermobestos" Materials

As Collected with the Midget Impinger Pump and Apparatus

TYPE OF DUST MATERIAL	SAMPLE							
	LOCATION	Rate in cfm	Time in Min.	Vol. in C.F.	Blank # Particles	Dilution Factor	Count # Particles	Conc. in mppcf of Air
JM #21	#2 Band Saw, Breathing Level of Operator	0.1	10	1.0	8.3	100	94.8	36.8
JM #22	Same as Above	0.1	10	1.0	8.3	250	57.8	48.1
JM #23	Same as Above	0.1	10	1.0	8.3	200	65.0	44.1