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ASBESTOS FIBER STUDY

FOR

BORG AND BECK DIVISION

BORG-WARNER CORPORATION

CHICAGO, ILLINOIS

INTRODUCTION

This report covers an asbestos fiber study conducted in this plant on November 14, 1972.

The operations investigated included initial facing inspection, burst testing, facing drilling, clutch assembly and inspection, and waste hopper dumping.

SUMMARY OF RESULTS

Exposures in excess of the current OSHA 8-hour average limit were found at over half of the locations tested.

When compared with the revised standard that will take effect July 1, 1976, all samples except two "ambient" levels show excessive exposures.

Exposures in excess of the "Ceiling Limit" were found at two riveting operations and during the waste hopper dumping. The actual number of exposures in excess of this limit is probably higher, as many riveting machine operators spend only half of their time riveting clutch facings.

RECOMMENDATIONS

1. Supply U.S. Bureau of Mines approved respirators to all employees (except drill machine operators) working with the clutch facings, instruct them in how to wear the devices properly, and enforce their wearing.

2. Begin immediate vacuuming of the clutch facings at various stages in the operations, clean all work tables at specific intervals (several times per day), and thoroughly clean the whole area at the end of each day.

3. Provide local exhaust ventilation at all riveting machines, balancers, and operations where the clutches must be struck as a part of the assembly/inspection process.

4. Incorporate a central vacuuming system into the recommended exhaust system and provide a sufficient number of outlets for covering all areas, including the burst testing and initial inspection area.

5. Establish a rigid housekeeping program to make use of the recommended systems, and ensure its enforcement.

6. All clutch facing scrap and sweepings from all areas should be promptly disposed of "in sealed impermeable bags, or other closed, impermeable containers". Caution labels should be afixed to all waste containers, including the barrels used for storing the waste prior to disposal.

7. The waste hopper dumping operation should be modified to cut the amount of dust released during the changing of the drums.

8. Baseline "annual examinations" should be obtained on all affected employees.

EQUIPMENT AND STUDY PROCEDURES

Unless otherwise noted on the attached data sheets, the samples were collected at the workers' breathing zones using Millipore filters and self-powered, portable pumps. The asbestos fibers were counted at 430x magnification using phase contrast illumination. Forty fields were counted for each analysis. Two "blanks" were submitted with the actual samples.

The location of the samples, sampling times, and resulting fiber concentrations are shown on the attached data sheets. The concentrations given include the effects of the two blanks.

DISCUSSION

Because of the relatively large number of excessive exposures found during this study, it is suggested that all employees other than the drilling machine operators wear U.S. Bureau of Mines approved respirators. There are, admittedly, operations that are not producing excessive asbestos exposures. However, because the people in this shop shift from one operation to

another so frequently, the only practical way of ensuring that all people are adequately protected is to provide the proper respirators, train the employees, and ensure that they are worn. These respirators may be the more general "rigid" device with a separate filter attachment, or one of the newly approved disposable units. As the individual, non-disposable types must be inspected and cleaned daily, and also require the daily changing of the filters, the disposable types will probably be less expensive as they should only be needed for a short period of time. Of course, the devices should be disposed of properly at the end of the work day.

After thoroughly observing the operations associated with the manufacturing of the completed clutches, it is felt that a significant amount of the total asbestos exposures is coming from the loose fibers that are on the clutch facings. This idea is borne out somewhat by the exposure the clutch facing inspector received while checking several new pallets of facings (sample #1). While working in an area that is considerably cleaner than the general work table in the assembly area, he received an exposure that is higher than most other employees' exposures. Furthermore, close observation of the riveting operations shows that the riveter impacts shake loose fibers, and the additional sliding/throwing/striking of the clutches also knocks off loose particles. By keeping these loose fibers at a minimum, it is felt that the exposures should be reduced significantly. While this can probably best be done by a central vacuum system, immediate results may be obtained by using one or two commercial vacuum cleaners with good filters on them. As the inspection and burst testing are only done periodically, it would only be necessary to tie up one of the units for a few minutes each day. Vacuuming each pallet of clutch facings as it is placed in the work area would eliminate any loose fibers that are present before the assembly operation begins. Further observation of the clutch facings during the manufacturing process would then show which operations are creating additional loose fibers, thereby pinpointing where additional vacuuming must be done.

As fibers will undoubtedly continue to be knocked loose during the riveting and other similarly abusing operations, it will be necessary to periodically clean the riveting machines and work tables. This should be done several times a day, and the whole area, including the floors, should receive a thorough vacuuming at the end of each workday. These vacuums should be properly labeled (suggestion: a stencil stating "For clutch facings only" and the proper warning sign as stated in OSHA), and the material in the containers should be disposed of properly.

While rigid housekeeping rules will do little to enhance production figures, they will definitely be necessary if these ventilation systems are to function properly and if the employees' breathing zone exposures are to remain below the permissible limits. Written procedures should be developed for housekeeping, and they should be rigidly enforced.

The emptying of the outside waste hopper should also receive attention. While the exposure time is extremely short, the violation technically exists because the "Ceiling Limit" is being exceeded. This operation should be investigated for the purpose of determining a way that allows the barrels to be exchanged without producing excessive fiber exposures. It may be possible to do this by using the following procedure: close the slide valve above the barrel and allow the remaining asbestos fibers to settle. Striking the canvas tubing should facilitate their separation from this material. After allowing a suitable time for all fibers to settle, a corner of the barrel lid should be raised slightly and a water hose equipped with a spray nozzle should be inserted in the small opening. Some water should be sprayed onto the top of the dust waste; only enough moisture to wet the upper layer is necessary. Once the fibers have become wet, they should tend to remain within the barrel. The barrel should then be moved (possibly by a hand-truck placed under it before removing the lid) in a manner that will not disturb the contents. The full barrel should be "capped" immediately, and then an empty barrel should be placed under the discharge. The full barrel should be properly labeled.

OSHA contains requirements for special medical examinations when employees are exposed to asbestos fibers. Because these people have been exposed, some to "high" concentrations, it is recommended that these medical examinations be given to all employees in the affected area. These medicals will provide "baselines" for future comparison, and can be invaluable if other medical problems having similar symptoms should occur. Whenever possible, the employee performing the clutch facing inventory should be one of those who has had a "baseline" medical.

While the actual wording of the OSHA regulation calls for these medicals when an employee is "in an occupation exposed to airborne concentrations of asbestos fibers...", they are making allowances for the fact that virtually everyone, even those not employed by companies working with asbestos, receives some exposure to asbestos fibers. We were advised

by an OSHA Region V Industrial Hygienist that they are considering a concentration of less than 1 fiber per centimeter of air to be the cut-off point on these medical examinations. This essentially eliminates the need for submitting all employees in this plant to these medical examinations, as all employees and management are certainly exposed to some asbestos.

Copies of the current OSHA regulations on asbestos (Federal Register, October 18, 1972), and the OSHA Sampling Data Sheet on asbestos (#2), are attached. It is suggested that both these documents be reviewed thoroughly.

Respectfully submitted,

Norman R. Dotti

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