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A TEST TO DEMONSTRATE THE RELEASE OF ASBESTOS FIBERS FROM GARLOCK GASKETS

INTRODUCTION

In the replacement of gasket material from a flange, sections of the gasket material adheres to metal surfaces of flange and requires vigorous abrasion to remove this material and prepare the flange for a new gasket. Air Quality Services, Inc. was requested to devise a test procedure to demonstrate the asbestos fiber release from Garlock gasket material during this abrasion procedure.

TEST MATERIAL ANALYSIS

Garlock Gaskets were supplied by your office. The asbestos content of the gasket material was determined. The results of the microscopic examination of the Garlock Gasket material is presented in Table I. Our laboratory is accredited by the EPA for the identification and quantification of asbestos in bulk samples.

The gasket material used in the demonstration was AQS #42002, Thick Garlock Gasket Material, that was 95% chrysotile asbestos.

CONSTRUCTION OF WORK CHAMBER

The test procedure had to be designed to protect the environment from contamination with asbestos fibers and to protect the operator of the wire brush. We used a glove bag obtained from I2R Company. The dimensions of the glove bag are 37" x 37". The glove bag was placed on a concrete slab and a work surface was constructed inside the glove bag. The work surface was a hardwood cutting board supported on 2" x 4" blocks. A light weight frame was constructed of dowel rods and connectors made of wood to support the glove bag and provide an adequate work area. Electrical power inside the glove box was obtained by

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placing an extension cord through the plastic and securely taping the plastic around the cord. A 3/4 in. variable speed drill with a wire brush was placed into the glove bag. Clamps were used to hold the gasket on the work surface for the test. The necessary cleaning materials, amended water and wiping cloths were placed in the glove bag before the test. A sampling pump and a 25 millimeter filter for collecting asbestos fibers was placed in the bag. The filter was located to approximate the location of the face of the operator.

BACKGROUND ASBESTOS LEVELS

In order to determine the background of the glove bag after it was constructed, a background air sample was collected. A battery operated pump operating at 5 liters per minute was operated in the closed glove bag for two hours. The background level in the glove bag is shown in Table II and is less than 0.001 fib/cc (fibers per cubic centimeter).

ABRASION TEST

After we determined the background asbestos levels, the Garlock Asbestos Gasket, stored in a sealed plastic bag was placed in the glove bag and the glove bag was resealed.

The operator, Mr. William Snodgrass of Air Quality Services, Inc. was equipped with personal protective equipment that included a disposable Tyvak Coveralls with a hood. He wore a half mask respirator equipped with filter cartridges approved for asbestos protection.

The battery operated pump used for sampling during the abrading test was calibrated at 2.6 liters per minute or approximately half the flow rate of the background sample.

The Garlock Gasket was then removed from the sealed plastic bag inside the sealed glove bag and clamped to the wooden work surface. The air sampling pump was turned on, the start time noted and the gasket was lightly abraded with the wire brush for five minutes.

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The glove bag was left sealed and the asbestos sampling continued for fifty five minutes. The total sampling time was one hour.

The analysis of the asbestos fibers was done according to the OSHA regulations, 1910.1001 Appendix A. procedure. Air Quality Services, Inc. participates in the Asbestos Proficiency Analytical Testing Program (PAT) developed by NIOSH and operated by the AIHA. The Air Quality Services laboratory is rated "proficient" in the quantification of asbestos fibers by Phase Contrast Microscopy.

The results of five minutes of mild abrasion of the Garlock Gasket is presented in Table II. The current OSHA Standard of 0.2 fibers per cc was exceeded by a factor of 30.

Air Quality Services, Inc. has developed a procedure to demonstrate that ~~fibers are released when the asbestos gasket material is abraded.~~ The demonstration procedure is safe for the operator and the environment. The only source of the fibers was the Gasket Material. After one hour of sampling, the pump was turned off and the Garlock Gasket was returned to its sealed plastic bag.

CLEANUP AND DISPOSAL OF THE TEST CHAMBER

The interior of the glove bag and all the equipment was wetted with amended water. The interior of the glove bag was wiped down and a small opening was made in the bag. Each piece of equipment was wiped and passed out of the bag. The bag was then evacuated and disposed of in a labeled plastic bag.

VIDEO TAPING OF THE PROCEDURE

A video tape of the background and abrasion tests were made and is enclosed. Only the first five minutes and the last five minutes of the background air test was recorded on video tape. The entire abrasion test was recorded.