

CertainTeed

Date

June 4, 1980

To

Nick Pocock

KE C-111
Location and mail code

Hillsboro, 257

Subject

FIBER COUNTING

From

Janis
Janis Woodson

Location and mail code

VF Corp. #4

I would like to thank you and everyone at the Hillsboro Plant for the fine cooperation and southern hospitality extended to me during my visit.

Per our conversation on fiber counting, attached find pages from the NIOSH "Sampling and Evaluating Airborne Asbestos Dust" Manual. I have highlighted paragraphs 8.3.5 and 8.3.6, which are in regard to a fiber and mass of material. One basic rule to remember is "if in doubt, count it".

By having such a heavy particulate concentration on a filter, many fibers could be hidden or obscured which would lead to a lower count. Shorter duration samples, obtaining 3 or 4 samples in an 8-hour day will help avoid this problem.

If you have any questions or comments please call me.

P.S. The "Cacti" survived the trip well, my thanks again to Jim Landrum.

JLW/ejb

Attachment

PLAINTIFF'S EXHIBIT

CT-1425

CTD020669

- 8.2.2.5 Separate the middle and bottom sections of the field monitor case to expose the filter. Cut a triangular wedge from the center to the edge of the filter using the scalpel. The size of the wedge should approximate one-eighth of the filter surface. The filter can be very carefully removed from the cassette for cutting, but this should only be done with great care.
- 8.2.2.6 Grasp the filter wedge with the tweezers on the perimeter of the filter which was clamped between the monitor case sections. Do not touch the filter with your fingers. Place the wedge, sample side up, upon the mounting medium.
- 8.2.2.7 Pick up a clean cover slip with tweezers and carefully place it on the filter wedge. Once this contact has been made, do not reposition the cover slip.
- 8.2.2.8 Label the slide with the sample number and current date before proceeding to the next filter. On the bottom (backside) of the slide trace the perimeter of the filter wedge with a felt tip marking pen. This will enable the counter, after the filter has become transparent, to stay within the filter perimeter when counting.
- 8.2.2.9 The sample should become transparent within fifteen minutes. If the filter appears cloudy, it may be necessary to press very lightly on the cover slip. This is rarely necessary; however, counting should not be started until an hour after the mounting. This allows the microscopic texture of the filter to become invisible to microscope viewing.
- 8.2.2.10 Discard the sample mount after two days if it has not been counted. Crystals appearing similar to asbestos fibers may begin to grow at the mounting media/air interfaces. They seldom present any problems if the slide is examined before two days. In any case, stay away from the filter's edges when counting and sizing.

8.3 Counting of Fibers

- 8.3.1 Place the slide on the mechanical stage and position the center of the wedge under the objective lens and focus upon the sample. Start counting from one end of the wedge and

progress along a radial line to the other end (count in either direction from perimeter to wedge tip). Random fields are selected, without looking into the eyepieces, by slightly advancing the slide in one direction with the mechanical stage control.

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- 8.3.2 It is essential to continually scan over a range of focal planes (generally the upper 10 to 15 micrometers of the filter surface) with the fine focus control during each field count. This is especially necessary for asbestos fibers due to their impaction into the filter matrix.
 - 8.3.3 On most airborne samples asbestos fibers will generally have fiber diameters less than one micrometer. Therefore, it is necessary to look carefully for faint fiber images.
 - 8.3.4 Regularly check phase ring alignment.
 - 8.3.5 When an agglomerate (mass of material) covers a significant portion of the field of view (approx 1/6 or greater) reject the field and select another. (Do not include it in the number of fields counted.) However, report the fact as it may have meaning on other data collection.
 - 8.3.6 Bundles of fibers are counted as one fiber unless both ends of the fiber can be clearly resolved.
 - 8.3.7 Count only fibers with a length to width ratio greater than or equal to 3:1.
 - 8.3.8 Count only fibers greater than 5 micrometers in length. (Be as accurate as possible in accepting fibers near this length). Measure curved fibers along the curve to estimate the total length.
 - 8.3.9 Count as many fields as necessary to yield a total count of at least 100 fibers. Exceptions: a) count at least 20 fields even if you count more than 100 fibers, and b) stop at 100 fields even if you haven't reached 100 fibers.
 - 8.3.10 For fibers that cross either one or two sides of the counting field, the following procedure is used to obtain a representative count.

COUNT any fiber greater than 5 micrometers in length, that lies entirely within the counting area. COUNT as "1/2 fiber" any fiber with only one end lying within the counting area. DO NOT COUNT any fiber crossing any two sides.

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Reject and do not count all other fibers. Refer to Figure 5 through 10. Note that the fibers in Figure 5 through 10 are not representative of the appearance of most asbestos fibers. Most fibers have a very faint image.

9. CALIBRATION AND STANDARDS

9.1 Sampling Train Calibration

The accurate calibration of the sampling pump is essential to the correct calculation of the air volume sampled. The frequency of calibration is dependent on the use, care, and handling to which the pump is subjected. Pumps must be recalibrated if they have just been repaired, misused, or received from the manufacturer. If the pump receives hard usage, more frequent calibration may be necessary. Ordinarily pumps should be calibrated in the laboratory both before they are used in the field and after they have been used to collect a large number of field samples.

The accuracy of calibration is dependent upon the type of instrument used as a reference. The choice of a calibration instrument will depend largely on where the calibration is performed. For laboratory testing, a 1-liter buret used as a soapbubble flow meter or wet-test meter is recommended. Other standard calibrating instruments, such as a spirometer, Marriott's bottle, or dry gas meter can be used. The calibration should be of sufficient precision such that the 95% confidence limits on the flow rate are $\pm 10\%$ (95% of the flow rates will fall with $\pm 10\%$ of the calibrated value).

Instructions for calibration with the soapbubble flow meter follow. The sampling train used (pump, hose, filter cassette) in the pump calibration should be the same as the one used in the field.

- 9.1.1 Check the voltage of the pump battery with a voltmeter both with the pump off and while it is operating to assure adequate voltage for calibration. If necessary, charge the battery to manufacturer's specifications.
- 9.1.2 Fill a beaker with 10 ml of soap solution.
- 9.1.3 Connect the filter cassette inlet to the top of the buret with length of hose.
- 9.1.4 Turn the pump on and moisten the inside of the soapbubble meter by immersing the open end of the buret into the soap solution and drawing bubbles up the inside of the buret. Perform this task until the bubbles are able to travel the entire length of the buret without breaking.

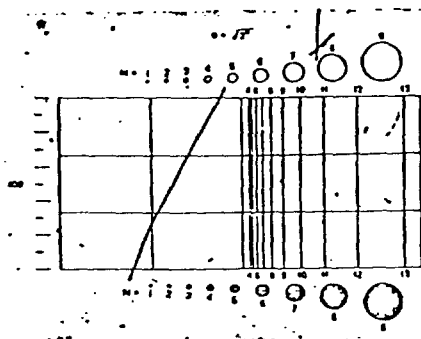


Figure 5. DO NOT COUNT, fiber crosses both top and bottom sides.

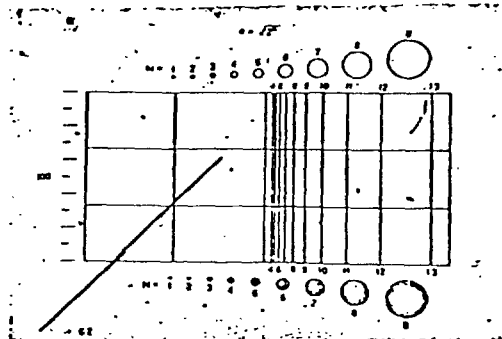


Figure 8. COUNT, as "1/2 fiber," fiber crosses bottom side and one end lies within count area.

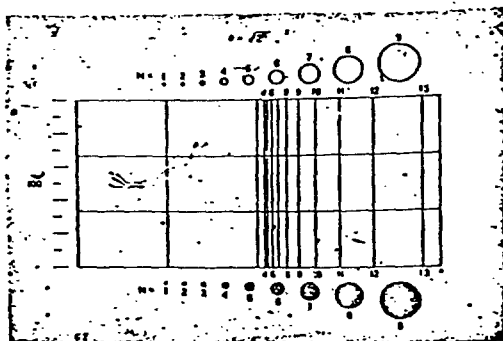


Figure 6. COUNT, as one fiber.

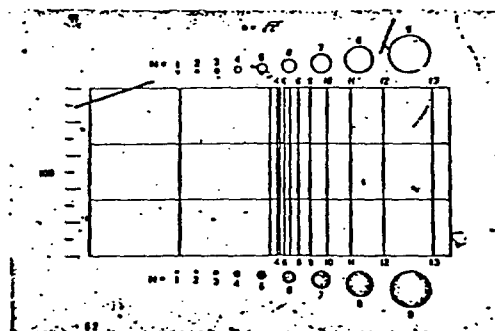


Figure 9. DO NOT COUNT, fiber crosses two sides.

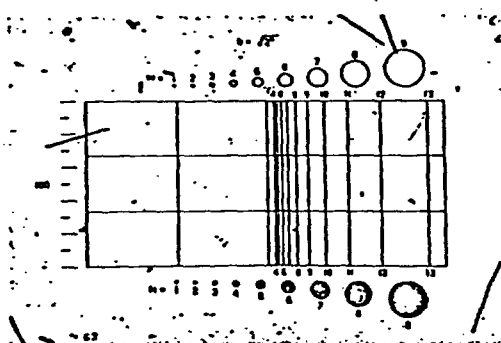


Figure 7. COUNT, as "1/2 fiber," fiber crosses left side and one end lies within count area.

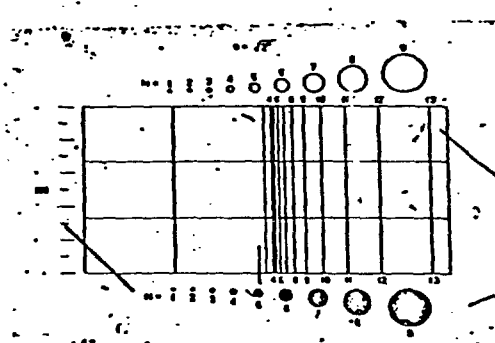


Figure 10. DO NOT COUNT, fiber crosses two sides (bottom left corner). COUNT, as "1/2 fiber," fiber crosses bottom side and one end lies within count area. COUNT, as one fiber (top right corner).