Dear Mr. Lees,

ASBESTOS FIBRE RELEASE FROM ASBESTOS INSULATION BOARD

I wish to confirm the result of the test carried out to determine the number of respirable airborne fibres released from Asbestos Insulation Board (AIB) by the insertion and removal of drawing pins.

Background

Asbestos Insulation Board generally contains 25-40% by weight of amosite, “brown” asbestos. This product was very widely used in the UK until about 1980. From the information provided in Simpson (1979) it can be calculated that about 140 million square metres of AIB was produced in the UK. Although some proportion of this total would have been exported, it can be assumed that a significant proportion was used in the UK. A major use of AIB was to provide a strong, non-combustible wall board which was widely used in buildings such as schools, hospitals and offices.

Test methodology

The test was carried out on a wallpaper covered AIB panel which was about to be removed under controlled conditions from a bathroom in a multi-storey block. The test was carried out in an asbestos enclosure erected by a Licensed asbestos contractor.

The test was carried out by inserting and removing a poster drawing pin into and out of an AIB panel while collecting any materials released from the AIB using a version of the micro vacuuming technique described in ASTM Standard 5755-95, ASTM (1995). The ASTM technique involves using a sampling pump to draw materials off a surface and onto a sampling filter held in a suitable cassette.
For this test, the sampling filter was placed in a personal sampling cyclone to remove non-respirable matter. This prevents obscuration of fibres by non-fibrous materials.

After sample collection, the filter was sent to Mr. Sanderson of Casella Limited who analysed the filter using Phrase Contrast Optical Microscopy to determine the number of respirable fibres collected. The analysis was undertaken using the standard counting rules specified by the Health and Safety Executive. That is, only fibres longer than 5 micrometers, with diameters less than 3 micrometers and with length to diameter ratios > 5:1 were counted.

Prior to carrying out the tests, the surface of the wallpaper was cleaned using a “Wet wipe” moist tissue.

One hundred insertions and removals were made, 75 with the pin inserted into a fresh area of the surface each time and 25 with the insertions made within an area approximately 25 mm square to simulate the effect of pins being inserted into a previously damaged surface, i.e., as could have occurred in the vicinity of the corners of sheets of paper.

Although the local extraction provided by the sampling technique would have collected almost all materials released from the AIB, an FFP3 filtering facepiece respirator and protective clothing was worn during the test.

RESULT

From Mr. Sanderson’s analysis, a total of approximately 650,000 respirable fibres were released as a result of the 100 drawing pin insertions and removals.

That is, over 6,000 respirable asbestos fibres were released per single drawing pin insertion and removal.

COMMENT

Although it is unlikely that any one individual in a classroom, teacher or pupil, would have inhaled all of the amosite fibres released by drawing pin insertion and removal, the above result clearly demonstrates that a significant number of respirable fibres were released into the classroom by pinning materials onto the walls. These fibres would have contaminated the classroom and the teacher and the pupils would have inhaled some proportion of the fibres. As the teacher was almost certainly close to any materials released from the AIB, it is considered likely that the teacher would have inhaled a not insignificant number of respirable fibres.

While it is not possible to reliably quantify the number of fibres inhaled by any one individual, and therefore not possible to quantitatively assess the risk of developing mesothelioma from such exposure, it can be stated that the risk of developing mesothelioma would not have been zero.
It should be noted that the results obtained in this test were similar to those obtained in two previous tests which involved drilling 4 mm diameter holes 10 mm deep into AIB. Both tests suggested that about 70,000 respirable fibres were released per hole drilled.

Given the larger diameter of the drill used in the earlier tests compared with the drawing pin used in the test described above, the three sets of results demonstrate the same order of magnitude of fibre release.

As discussed, I hope to be able to carry out a further series of tests in the near future.

For your information, I enclose a summary cv.

If you have any queries, please do not hesitate to contact me.

Yours sincerely,

Robin M Howie.
REFERENCES
