

and filter may be seen in Figure 3. A central collection site in the test grid was used for the "breakin test" and the final "high temperature" test.

Samples of the three pairs of filters (breakin, normal use, and high temperature use) were subjected to a clarification process involving low temperature ashing to oxidize all organic material and mechanical action to separate the particles. This assures maximum detectability of asbestos fiber (2).

RESULTS AND DISCUSSION

Transmission electron microscopy at 40,000 magnification was used in the search for fibers. At this magnification the ultimate fibrils appear to be above one millimeter (0.040 inch) in diameter. Quantity, length, and apparent diameter measurements provided data for calculation of asbestos fiber mass per unit of filter area. Coupled with dimension, mass, and flow determinations from the dynamometer tests, this data was used to calculate the emitted asbestos fiber concentration in the collected wear dust, in the cooling air stream, and from the brake lining worn. The size distribution of collected fibers was not determined by this method, since the clarification process involved sufficient mechanical action to reduce most fiber bundles to the ultimate fibril size.

Additional samples of the "normal use" test filters were examined on the TEM without recourse to the clarification process, in an effort to determine the asbestos fiber size distribution. Roughly 10% of the asbestos fiber was visible on the background sample, based on the results from corresponding samples after clarification. The largest observed fiber bundle was 0.20 μ m in diameter and over 1.1 μ m long. A similar direct TEM search of the "normal use" test filter revealed about 2% of the asbestos fibers observed after clarification. This reduced percentage of visible fiber was attributed to the greater concentration of obscuring matter in the test filter. However, the largest observed asbestos fiber in the test filter (0.13 μ m in diameter and over 1.2 μ m long) was about the same size as was found on the background sample.