7. Calculations

7.1. Calculate the estimated airborne asbestos fiber concentration on the filter sample using the following formula:

where:

AC = Airborne fiber concentration

$$AC = \frac{\left[\left(\frac{FB}{FL}\right) - \left(\frac{BFB}{BFL}\right)\right] \times ECA}{1000 \times FR \times T \times MFA}$$

FB = Total number of fibers greater than 5μm counted

FL = Total number of fields counted on the filter

BFB = Total number of fibers greater than 5μm counted in the blank

BFL = Total number of fields counted on the blank

ECA = Effective collecting area of filter (385 mm^2 nominal for a 25-mm filter.)

FR = Pump flow rate (L/min)

MFA = Microscope count field area (mm^2). This is 0.00785 mm^2 for a Walton-Beckett Graticule.

T = Sample collection time (min)

1,000 = Conversion of L to cc

Note: The collection area of a filter is seldom equal to 385 mm^2. It is appropriate for laboratories to routinely monitor the exact diameter using an inside micrometer. The collection area is calculated according to the formula:

Area = $\pi(d/2)^2$

7.2. SHORT-CUT CALCULATION

Since a given analyst always has the same interpupillary distance, the number of fields per filter for a particular analyst will remain constant for a given size filter. The field size for that analyst is constant (*i.e*. the analyst is using an assigned microscope and is not changing the reticle).

For example, if the exposed area of the filter is always 385 mm^2 and the size of the field is always 0.00785 mm^2, the number of fields per filter will always be 49,000. In addition it is necessary to convert liters of air to cc. These three constants can then be combined such that ECA/(1,000 X MFA) = 49. The previous equation simplifies to:

$$AC = \frac{\left(\frac{FB}{FL}\right) - \left(\frac{BFB}{BFL}\right) \times 49}{FR \times T}$$