

NYSDOH Environmental Laboratory Approval Program – PCM Checklist

LAB ID:	LABORATORY NAME:
DATE:	ASSESSOR NAME:

AIRBORNE FIBERS BY PHASE-CONTRAST MICROSCOPY

Method Number:

SOP Number:

Revision Number:

SOP Date:

Personnel records observed:

Name(s) of Permanent Employee

Name(s) of Seasonal Employee (if applicable)

Total Number of Samples Analyzed on Annual Basis (as reported to NYSDOH for fee calculation)

Year 1

Year 2

Year 3

	Y	N	N/A	Comment	Code
AIRBORNE FIBERS BY PHASE-CONTRAST LIGHT MICROSCOPY					
I. Analytical Method					
A. Is an approved test method employed? (40 CFR 763 – NIOSH 7400 A Rules and P&CAM 239)					G2104
B. Is method readily available to analyst?					G2106
C. Has each analyst completed a NIOSH 582 equivalent course? (Note: This applies to seasonal employees, too.)					G2108
II. Sample Collection					
A. Are samples collected using the following:					
1. 25-mm cassette with 50-mm extension cowl? (Note: not applicable to Belmouth)					G2112
2. Cellulose ester filter having a pore size of 0.45 to 1.2 µm?					G2114
3. Backup pad?					G2116
4. Calibrated sampling pump?					G2118
5. Flow rate between 0.5 and 16 L/min?					G2241
6. Minimum sampling volume of 900 L?					G2242
B. Are cassettes stored for at least 60 days in a retrievable fashion after result reporting?					G2119
III. Equipment and Supplies					
A. Is the number of microscopes onsite consistent with the number of samples analyzed?					For internal use only
B. Are the following pieces of equipment available:					
1. Phase-contrast light microscope equipped with:					
a. Blue or green filter?					G2126
b. 8X to 10X eyepiece?					G2128
c. 40X to 45X objective (numerical aperture = 0.65 to 0.75)?					G2130
d. Walton-Beckett Type G-22 graticule with a 100-µm diameter (area = 0.007854 mm²)?					G2132
e. Ocular phase-centering telescope or Bertran lens?					G2134
2. HSE/NPL Mark II phase shift test slide?					G2136
3. Stage micrometer (0.01-mm subdivisions)?					G2138
4. Glass slides, 25 X 75 mm, pre-cleaned and frosted end? (Note: Frosted end slides are used for orientation purposes.)					G2140
5. Cover slips, 22 X 22 mm, No. 1½?					G2142
6. Knife or scalpel with #10 surgical, steel curved blade?					G2144
7. Tweezers?					G2146
8. Hot block vaporizer (quick-fix type apparatus)?					G2148
9. Micropipets: (Note: syringes can be used. Pipets or syringes must be labeled.)					
a. 100 to 500 µL for acetone?					G2154
b. 5 µL for triacetin?					G2156
10. Acetone (reagent grade)?					G2158

NYSDOH Environmental Laboratory Approval Program – PCM Checklist

	Y	N	N/A	Comment	Code
a. Is the volume of acetone consumed consistent with the number of samples analyzed? (Note: Amount used can vary from 50 to 300 µl.)					For internal use only
11. Triacetin (glycerol triacetate, reagent grade)?					G2160
12. Lacquer or nail polish?					G2162
IV. Sample Preparation					
A. Is at least 25% of the filter used in making the slide?					G2402
B. Are the slides and cover slips checked for dust and fibers? Are they cleaned if necessary?					G2404
C. Is the collapsed filter mounted in triacetin and sealed with a cover slip? (Labs may also use P&CAM 239.)					G2406
D. Is each slide clearly labeled with the laboratory sample ID number?					G2408
E. Are slides that are kept longer than 24 hours sealed with lacquer or nail polish?					G2409
V. Sample Analysis					
A. Does the count sheet (used for QC) contain the following:					
1. Spaces on which to record the counts for each field of view?					G2412
2. Filter identification number?					G2414
3. Analyst's name?					G2416
4. Date and time of analysis?					G2418
5. Total fibers counted?					G2420
6. Total fields counted?					G2422
7. Fiber density (f/mm ²)					G2426
B. Is a minimum of 100 fields counted if fiber counts are less than 100? (Minimum counting time is 15 seconds per field (NIOSH 7400 A Rules (Issue 2, 08/15/1994) Measurement 19, Note 1).)					G2166
C. Is a minimum of 20 fields counted if fiber counts reach 100?					G2168
D. For new employees, and following ELAP approval of the iDOC for sample load, is each analyst's continued DOC challenged <u>quarterly</u> (i.e., four times a year) by laboratory management? (Note: Analyst's initial DOC must be approved by ELAP. Refer to Asbestos FAQ #12 on ELAP website.)					G2171
E. After the first year of employment, is each analyst's DOC for sample load challenged <u>semi-annually</u> (i.e., two times a year) by laboratory management?					G2165
1. Is analyst's sample load within the volume identified on her/his DOC?					G2169
VI. Calibrations					
A. Upon examination with the ELAP audit slides, is the following met:					
1. Walton-Beckett graticule found to have a diameter between 97 and 103 µm?					G2174
2. The actual field area documented and used?					G2175
3. Set 3 of the HSE/NPL slide visible? (Red: 4 fully visible; Green: 5 fully visible; Yellow: 6 fully visible)					G2176
4. Set 6 and higher of the HSE/NPL slide invisible? (Red: 5 partially visible; Green: 6 partially visible; Yellow: 7 partially visible)					G2178
B. Are the following records kept for each analyst per microscope:					
1. Daily check of phase-ring alignment?					G2182

NYSDOH Environmental Laboratory Approval Program – PCM Checklist

	Y	N	N/A	Comment	Code
2. Weekly check of HSE/NPL resolution?					G2184
3. Monthly check of Walton-Beckett graticule diameter?					G2186
C. Are records kept of pre- and post-survey sampling pump calibrations?					G2188
1. Are sampling pumps calibrated against calibrated rotameters?					G2190
a. Are rotameters calibrated before initial use and quarterly against a primary standard? (Note: Examples are spirometer, bubble burette, electronic bubble meter (Giliblator®) and primary flow calibrator (mini-BUCK™).)					G2192
b. Are dry gas meters (e.g., DryCal®) calibrated before initial use and annually or every 200 hours of operation , whichever is more frequent, against a primary standard (e.g., spirometer)?					G2194
D. Are there records to show that all clickers used to count fibers are calibrated monthly to 100 counts?					G2203
VII. Quality Control					
A. Are new filter lots checked for background contamination before use in the field? (Note: Manufacturer-provided QA checks are normally satisfactory.)					G2198
1. Are records kept of contamination checks (performed at a frequency of 1 in 25)?					G2200
2. Are new filter lots rejected when the background exceeds 5 fibers per 100 fields?					G2202
B. Is the average field blank determined for each set?					G2206
1. Is the average field blank based on 10% of samples (at least 2 blanks) per sample set?					G2208
2. Are results qualified on reports if the field blank average exceeds 7 fibers per 100 fields?					G2210
3. Is a limit of detection (LOD) estimated to be 5.5 fibers per 100 fields or 7 fibers/mm ² or an LOD calculated from its own samples determined?					G2211
C. Reference slides:					
1. Does each analyst count a minimum of one reference slide per workday ?					G2217
2. Does each analyst count a low-fiber (5-20 fibers/100 fields) reference slide at least twice per month ?					G2214
3. Does each analyst count a medium-fiber (21-50 fibers/100 fields) reference slide at least twice per month ?					G2215
4. Does each analyst count a high-fiber (51-100 fibers/100 fields) reference slide at least twice per month ?					G2216
5. Has the Relative Standard Deviation been determined for each reference slide					
a. on a monthly basis for inexperienced (<1 year) analysts?					G2218
b. on a semi-annual basis for experienced (>1 year) analysts?					G2219
6. Are at least 10% of all filters re-labeled by a person other than the analyst and submitted to the analyst for recounting? (Note: 20% is acceptable for a one person lab.)					G2220
7. Has the appropriate Relative Standard Deviation for each analyst been applied to recounts?					G2222
8. Are recounted results rejected if the difference exceeds control limits? (See calculation below.)					G2224
9. Are recount results recorded as individual fiber counts in the 100-field count sheets?					G2225
10. Does a person other than the analyst re-label slides prior to the second count?					G2227
VIII. Reports					
A. Do reports include fibers/mm ² and fibers/cm ³ ?					G2228

NYSDOH Environmental Laboratory Approval Program – PCM Checklist

	Y	N	N/A	Comment	Code
B. Are qualifying statements appended to airborne concentrations (fibers/cm ³) when the laboratory did not have control over sample collection?					G2230
C. Does the report to the client include intra-laboratory RSD from reference slides appropriate for the set of sample concentrations reported? (Note: This RSD represents the analyst's measurement of uncertainty. Lower RSD → more accurate, higher consistency)					G2232
IX. ELAP Consultant Audit Slide (Analyst needs to complete lab's count sheet for ELAP's on-site assessment records for audit slide (previous PT sample). In addition, the count sheet for the 'Pang' slide needs to be completed by analyst.)					
A. Is at least one radial line from filter center to the outer edge of filter counted?					G2236
B. When counting each graticule field, does the analyst continuously scan a range of focal planes by moving the fine focus knob up and down?					G2238
C. Is the calculated fiber density within the acceptable range?					G2240

Additional Notes:

