

Final Standard Update - Summary of Suggested Changes and Justification

EL V1M3 Rev. 3.1, 10/20/2022

Specific changes presented in the final revisions to EL V1M3 are presented below. In addition, the Module was reorganized and rewritten to be technology based for improved clarity and ease of use by laboratories. These changes did not modify the language or intent of the module but did reorganize the document based upon applicable technologies for asbestos testing of environmental samples.

Original Text	Change Made	Justification
<i>Include current reference and language. (If presented for public view, ISO language should only be referenced.)</i>	<i>Don't need to work on specific language - just summarize change needed.</i>	<i>Why does this need to be changed/updated?</i>
Section 3.1; Non-Friable Organically Bound	Moved abbreviation	Editorial, document consistency
Section 5.0; "... Module 2, and Section 5.4.5."	Removed "and"	Editorial
Section 6.1a): Demonstration of Capabilities: "see section 1.6.2"	renumbered to read Section 6.2	Required due to reorganization
Section 6.1c): "... the on-going DOC shall be acceptable as an initial DOC.."	added to end of phase "for that analyst"	Clarify analyst requirements for DOC
Section 6.2.2.b): initial DOC; "At least four (4) aliquots..."	Remove "at least" and specified four (4) aliquots	Clarify requirement
Section 6.3.2a) On-Going DOC; "...acceptable performance of a blind sample (single blind to the analyst) or successful analysis of a blind sample	Added requirement that blind acceptable performance of a blind sample (single blind to the analyst and containing Asbestos) or successful analysis of a blind sample...; "	Clarification of requirement as on-going DOC is quantitative control
Section 6.3.2c); "at least four (4) consecutive..."	Remove "at least" and specify 4 consecutive samples	Clarify requirement
Section 7.2.1.1a) TEM Calibration; "...calibration shall be performed monthly..."	Changed to read "...performed every 30 days (plus or minus 5 days)	Clarify requirement
Section 7.2.1.1b) TEM Calc., camera constant: "...calibration shall be performed weekly..."	Changed to read "...performed every 7 days (plus or minus 2 days)	Clarify requirement
Section 7.2.1.1c) TEM Calc., Spot size; "... calibrate quarterly..."	Changed to read "...calibrate every 3 months (plus or minus 1 month) ..."	Clarify requirement
Section 7.2.1.1d) TEM Calc., Beam Dose; "... calibrate quarterly..."	Changed to read "...calibrate every 3 months (plus or minus 1 month) ..."	Clarify requirement
Section 7.2.1.1e). i. Energy Dispersive X-ray Analysis; "...at least two peaks..."	Changed to read "... 2 peaks..."	Clarify requirement
Section 7.2.1.1e) ii. "... resolve the Na K α line from the Cu L line shall be confirmed quarterly..."	Changed to read "...every 3 months (plus or minus 1 month) ..."	Clarify requirement
Section 7.2.1.1e) iii.; "... k-factors for elements found in asbestos (Na, Mg, Al, Si, Ca, and Fe) relative to Si shall be calibrated	Changed to read "...every 6 months plus or minus 1 month..."	Clarify requirement

Original Text	Change Made	Justification
semiannually.”		
Section 7.2.1.1.e) iv.; “... the detector resolution shall be checked quarterly.”	Changed to read “...every 3 months (plus or minus 1 month)”	Clarify requirement
Section 7.2.1.1.e) vi.; “... The sensitivity of the detector for collecting x-rays from small volumes shall be documented quarterly ...”	Changed to read “...every 3 months (plus or minus 1 month)”	Clarify requirement
Section 7.2.1.1.f); “Low Temperature Asher. In accordance with AHERA requirements (40CFR, Part 763, Subpart E, App. A), the low temperature asher shall be calibrated quarterly.	Added “Asbestos Hazard Emergency Response Act” to identify AHERA” and changed to read “...every 3 months (plus or minus 1 month).”	Clarify requirement
Section 7.2.1.2 Note: “... 0.8 MFL...”	Changed to read “... 0.8 million fibers per liter (MFL)...”	Define term MFL
Section 7.2.1.2 a); Replicate; “... This shall be performed at a frequency of one (1) per one hundred (100) samples, or at last annually, whichever is more frequent.”	Changed to read “...every 12 months (plus or minus 1 month) ...”	Clarify requirement
Section 7.2.1.2.b) Duplicate; “... shall be performed at a frequency of one (1) per one hundred (100) samples, or at least annually, whichever is more frequent.”	Changed to read “...or every 12 months (plus or minus 1 month) ...”	Clarify requirement
Section 7.2.1.2.c) Verified Analysis: “...The two (2) sets of results shall be compared according to Turner and Steel (NISTIR 5351). ...”	Added addition reference information; “... see Section 7.2.4.2(a)”	Informational added to assist users
Section 7.2.2.1 Air, Calibration: “All calibrations shall be performed in accordance with Section 7.2.1.1, with the exception of: a) magnification used for fiber counting shall be 15,000 to 20,000x and b) camera constant shall be performed at least monthly	Added “and b) calibration of the camera constant and changed monthly to every 30 days (plus or minus 5 days)	Clarify requirements
Section 7.2.2.2 Test Variability/Reproducibility; “The laboratory and TEM analysts shall obtain mean analytical results on NIST SRM 1876b or equivalent	Added name of SRM “(Chrysotile Asbestos)” and changed the reference to Verified analysis to “above” from “original “below”	Ensure proper SRM use, and reference relocation based upon reorganize document
Section 7.2.2.2.e) i. QC replicate; “A second, independent analysis shall be performed in accordance with Section 7.2.1.2.a);	Added “... with results evaluated for acceptance...”	Evaluation required after analysis to verify compliance
Section 7.2.2.2.e) iii.; Verified Analyses. A second, independent analysis shall be performed on the same grids and grid openings in accordance with Section 7.2.1.2.c).	Added “...with results evaluated for acceptance...”	Evaluation required after analysis to verify compliance
Section 7.2.2.2.f); “If more than one TEM is used for asbestos analysis, intermicroscope analyses shall be utilized to detect instrument bias.”	Added “... Criteria for acceptance shall be established and documented by the laboratory.”	Clarify requirement and have laboratory develop approach to evaluate potential bias.
Section 7.2.3.2.a); Intra-Analyst Precision; “At least one (1) out of fifty (50) samples shall be re-analyzed by the same analyst.	Deleted “At least one” and specified one (1) for every 50 samples and 10 samples,	Clarify requirements

Original Text	Change Made	Justification
For single analyst laboratories, at least one (1) out of every ten (10) samples shall be re-analyzed by the same analyst.)	respectively.	
Section 7.2.3.2.b); Inter-Analyst Precision; At least one (1) out of fifteen (15) samples shall be re-analyzed by another analyst.	Deleted "At least one" and specified one (1) for every 15 samples. Also deleted "...of an Asbestos Containing Materials..."	Clarify requirements Term ACM previously defined and repetition is redundant
Section 7.2.3.2.c): Inter-Laboratory Precision; "The laboratory shall participate in round robin testing with at least one (1) other laboratory. Samples shall be sent to this other laboratory at least four (4) times per year. At a minimum, all analysts shall participate annually.	Deleted "At least one" and specified one (1) other laboratory and deleted "at least 4" and specified four (4) times, respectively. Deleted "At a minimum" and changed annually to "every 12 months (plus or minus 1 month)".	Clarify requirements
Section 7.2.3.4 Data Reporting: The concentration of asbestos in a given sample shall be calculated in accordance the method utilized [e.g., EPA 600/M4-82-020 (1982), 40 CFR Part 763, Subpart E, Appendix E (2017), EPA 600/R-93/116 (1995).	Made editorial correction and added an additional reference. Section now reads: The concentration of asbestos in a given sample shall be calculated in accordance with the method utilized [e.g., EPA 600/M4-82-020 (1982), 40 CFR Part 763, Subpart E, Appendix E (2017), EPA 600/R-93/116 (1995), EPA 600/R-93/116 (1993)]. EPA 600/R-93/116 (1993)].	Editorial correction and reference added in response to comments.
Section 7.2.4.1.a) i; Water and Wastewater; "An acceptable bottle blank level is defined as < 0.01 Million Fibers per Liter (MFL) that are greater than 10 µm."	Deleted "Million Fibers per Liter" and retained simply MFL	MFL previously defined; repetition is redundant
Section 7.2.4.2.a) i; Other measures; "Filter preparations shall be made from all six (6) asbestos types from NIST SRMs 1866 and 1867 (or equivalent). These preparations shall have concentrations between one (1) and twenty (20) structures (>10µm) per 0.01 mm ² . One of these preparations shall be analyzed independently at a frequency of one (1) per one hundred (100) samples analyzed."	The following was added to the end of the illustrated phrase:" All six asbestos preparations shall be analyzed at least once every 2 years."	Clarify requirements and resolve presumptive nature of Section.
Section 7.2.4.2.b) i: Air: "Filter preparations shall be made from all six (6) asbestos types in accordance with Section 7.2.4.2.a) i."	Section language modified to read "Filter preparations shall be made, analyzed, and the results evaluated from all six (6) asbestos types in accordance with Section 7.2.4.2.a) i.	Need to analyze and evaluated stated as opposed to the presumptive.
Section 7.2.4.2.b) ii: NIST SRM 1876b or equivalent shall be analyzed annually	Changed "annually" to "every 12 months (plus or minus 1 month)" also added the requirement for each analyst.	Clarify requirement and ensure compliance for all analysts.

Original Text	Change Made	Justification
Section 7.2.4.3.a); Standards and Reagents; The QC program shall establish and maintain provisions for asbestos standards.	Section now reads “The laboratory in its QC program shall establish and maintain provisions for asbestos standards.”	Improve language clarity
Section 7.3.1.1. Phase Contrast Microscopy – Calibration: “At least once daily, the analyst shall use the telescope ocular (or Bertrand lens, for some microscopes) supplied by the manufacturer to ensure that the phase rings (annular diaphragm and phase-shifting elements) are concentric.”	Deleted “At least once” making a daily requirement	Clarify requirements
Section 7.3.1.2; “The phase-shift detection limit of the microscope shall be checked monthly.”	Changed “monthly \” to “every 30 days (plus or minus 5 days).”	Clarify requirements
Section 7.3.2.a) Test Variability/ Reproducibility – inter laboratory precision: ““Each laboratory analyzing air samples for compliance determination shall implement an inter-laboratory quality assurance program that includes participation of at least two (2) other independent laboratories. Each laboratory shall participate in round robin testing at least once every six (6) months with at least all the other laboratories in its inter-laboratory quality assurance group. Each laboratory shall submit slides typical of its own workload for use in this program. The round robin shall be designed, and results analyzed using appropriate statistical methodology. Results of this QA program shall be posted in each laboratory to keep the microscopists informed. Analysts shall participate at least annually.	The term “at least” was removed in all instances from this section (4 deletions)	Definitive time frames established to clarify requirement.
Section 7.3.2.b); Intra- and Inter- Analyst Precision; “Each analyst shall select and count a prepared slide from a “reference slide library” on each day on air counts are performed. Reference slides shall be prepared using well-behaved samples taken from the laboratory workload.	Changed to read; “Each analyst shall select and count a prepared slide from a “reference slide library” on each day on which the analyst performs air counts. Reference slides shall be prepared using well-characterized samples taken from the laboratory workload.	Editorial and grammatical corrections to clarify requirements
Section 7.3.3 Analytical Sensitivity; “An ideal counting range on the filter shall be 100 to 1300 fibers/mm2.”	Deleted the term “Ideal”; now reads “The counting range on the filter shall be 100 to 1300 fibers/mm2.”	Can not assess to a term such as Ideal. Clarify requirement
Section 7.4.1.1 Polarized Light Microscopy-calibration, Microscope Alignment. “To accurately measure the required optical properties, a properly aligned polarized light microscope (PLM) shall be utilized. The PLM	Deleted “polarized light microscope” and retained simple PLM as it was previously defined	Editorial correction

Original Text	Change Made	Justification
shall be aligned before each use.		
Section 7.4.1.2: "These liquids shall be calibrated at first use, and semiannually or next use, whichever is less	Deleted "semiannually" and changes language to "every 6 months (plus or minus 1 month)"	Clarify requirement
Section 7.4.2.a) Test Variability /Reproducibility, Intra-analyst Precision; "For laboratories that can participate in Inter-Analyst determinations, at least one (1) out of fifty (50) samples shall be re-analyzed by the same analyst. For single analyst laboratories, at least one (1) out of every ten (10) samples shall be re-analyzed by the same analyst.	Deleted the "at least" and now requires 1 out of every 50 or 1 out of every 10, respectively Also added the phrase to end of the current language; "The laboratory shall establish and document acceptance criteria consistent with the requirements in Section 7.4.4.2.	Clarify requirements and require establishment of acceptance criteria
Section 7.4.2.b) Inter-Analyst Precision: "At least one (1) out of fifteen (15) samples shall be re-analyzed by another analyst"	Deleted "at least" and require one out of 15 samples be re-analyzed	Clarify requirements
Section 7.4.2.c) Inter-laboratory precision:" The laboratory shall participate in round robin testing with at least one (1) other laboratory. Samples shall be sent to this other laboratory at least four (4) times per year. "All analysts shall participate at least annually."	Deleted "at least", frequency now defined Deleted "annually" and replaced with "every 12 months (plus or minus 1 month)."	Clarify requirements
Section 7.4.5.a) Quality Control-Friable materials: "At least one (1) blank slide shall be prepared daily or with every fifty (50) samples analyzed, whichever is less.	Deleted "at least" and require one blank slide..."	Clarify requirements
Section 7.4.5.b): Non-Friable Materials; "At least one (1) non-ACM non-friable material shall be prepared and analyzed with every twenty (20) samples analyzed.	Deleted "at least" and require one blank slide..."	Clarify requirements
Section 7.4.5. c); does not exist in previous versions of EL V1M3	Now Read: "c) For both Section 7.4.5 a) and Section 7.4.5 b), the laboratory shall establish and document acceptance criteria consistent with the Analytical Sensitivity requirements in Section 7.4.3.	Corrects omission from previous versions of EL V1M3; previously no requirement to establish acceptance limits.
Section 7.4.6.a) Other Measures-Friable Materials; "At least one (1) out of one hundred (100) samples, shall be a standard or reference sample that has been routinely resubmitted to determine the analyst's precision and accuracy as developed by the laboratory in accordance with quality control requirements".	Deleted "at least" and clarified requirement; revised language reads: "The laboratory shall analyze, out of one hundred (100) samples, one (1) standard or reference sample that has been routinely resubmitted to determine the analyst's precision and accuracy as developed by the laboratory in accordance with quality control requirements."	Clarify requirements

Original Text	Change Made	Justification
Section 7.4.6.b) Other Measures-Non-Friable Materials: "At least one (1) out of one hundred (100) samples shall be a verified quantitative standard that has routinely been resubmitted to determine analyst precision and accuracy."	Deleted "at least" and clarified language to read: "The laboratory shall analyze one (1) out of one hundred (100) samples with a verified quantitative standard that has routinely been resubmitted to determine analyst precision and accuracy."	Clarify requirements
Section 7.4.7.a) Standards and Reagents. "The QC program shall establish and maintain provisions for asbestos standards".	Section now reads "The laboratory in its QC program shall establish and maintain provisions for asbestos standards."	Improve language clarity
Section 7.5.3. Constant and Consistent Test Conditions for Sample Management: "Refer to specific method of analysis for additional requirements."	Section modified to read: "The laboratory shall refer and conform to the specific method of analysis for additional requirements."	Clarify requirements

Note: This table can be used to prepare for a public meeting to seek stakeholder input.

Note: When the standard has been developed and is presented as a Draft Standard, a new version of this table is prepared noting the actual changes made to the standard. The "Suggested Change" column will include the actual language from the DS. The "Original Text" column will include the language from the previous (if any) standard. The "Justification" column states the reason for the change and provides any additional comments the expert committee thinks are pertinent.